

**REPORT OF THE  
STATE CORPORATION COMMISSION**

**Evaluation of the 2009  
Conservation, Efficiency and  
Renewable Resource Self-  
Assessment Report of the  
Virginia Electric Cooperatives  
(Chapter 824 of the 2009 Acts  
of Assembly)**

**TO THE GOVERNOR AND  
THE GENERAL ASSEMBLY OF VIRGINIA**



**HOUSE DOCUMENT NO. 20**

**COMMONWEALTH OF VIRGINIA  
RICHMOND 2009**





**Commonwealth of Virginia**

**State Corporation Commission**

**Report to the Governor of the Commonwealth of Virginia  
and the Virginia General Assembly**



**Evaluation of the 2009 Conservation, Efficiency and Renewable  
Resource Self-Assessment Report of the Virginia Electric Cooperatives**

**Pursuant to Chapter 824 of the  
2009 Acts of the Virginia General Assembly**

**December 1, 2009**



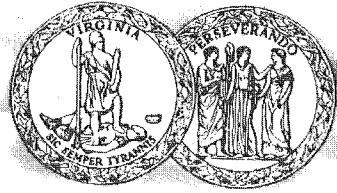
# COMMONWEALTH OF VIRGINIA

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## STATE CORPORATION COMMISSION

December 1, 2009

TO: The Honorable Timothy M. Kaine  
Governor, Commonwealth of Virginia

Members of the Virginia General Assembly

The State Corporation Commission is pleased to transmit its evaluation of the 2009 Conservation, Efficiency and Renewable Resource Self-Assessment Report of the Virginia Electric Cooperatives. This report was submitted to the Commission on October 30, 2009, to evaluate for accuracy and completeness and to forward to the Governor and the General Assembly by December 1, 2009, pursuant to Chapter 824 of the 2009 Acts of the General Assembly. As always, we will gladly provide additional information or assistance upon request.

Respectfully submitted,

Mark C. Christie  
Chairman

Judith Williams Jagdmann  
Commissioner

James C. Dimitri  
Commissioner

## **Executive Summary**

The State Corporation Commission (“Commission” or “SCC”) concludes that the 2009 Conservation, Efficiency and Renewable Resource Self-Assessment Report of the Virginia Electric Cooperatives (“Report”) appears complete and accurate. The Commission also notes, however, that the short turn-around time for completing its evaluation precluded the Commission from its usual practice of soliciting comments and/or testimony to provide a more thorough exploration of the Report. Furthermore, while the Commission does not take a position regarding any potential legislation discussed by the Cooperatives in the Report, it recommends further analysis of such proposals before implementation.

## **INTRODUCTION**

The Virginia, Maryland & Delaware Association of Electric Cooperatives (“Cooperatives” or “Association”) submitted the Report on October 20, 2009. Pursuant to Chapter 824 of the 2009 Acts of Assembly (“Chapter 824”), the Cooperatives were directed to submit such a Report to the Commission to evaluate for accuracy and completeness before forwarding to the Governor and the General Assembly. Specifically Chapter 824 provides as follows:

2. That each utility consumer services cooperative (cooperative) organized or operated pursuant to Article 1 (§ [56-231.15](#) et seq.) of Chapter 9.1 of Title 56 of the Code of Virginia shall, on or before October 31, 2009, file with the State Corporation Commission (Commission) an assessment of the statutory, regulatory, organizational, physical, contractual, financial, and market impediments to cooperative implementation of initiatives relating to dynamic rates, standby rates, interruptible rates, and rates for purchases of electricity generated from renewable sources. Each cooperative shall conduct its assessment and submit such assessment individually, collectively with one or more other cooperatives, or collectively through an association of cooperatives. The Commission shall review each assessment to evaluate its accuracy and completeness. On or before December 1, 2009, the Commission shall forward each assessment to the Governor and the General Assembly along with the Commission's evaluation of the accuracy and completeness of each report.

## **SUMMARY AND EVALUATION OF REPORT**

The Report describes the Cooperatives and their role in the electric industry. It also outlines the distinctions between cooperatives and investor-owned utilities. The Report identifies the primary distinctions as: (1) Cooperative owners are also their customers; (2) Cooperative rates reflect their costs; and (3) Cooperative assessment of risks and opportunities focus on the benefit to the member-consumer to promote reliability and decrease costs. The Cooperatives point out that their governance, organizational and financial characteristics differ from other utilities and reflect their rural heritage, demographics and load characteristics. The Report further recognizes that

“there is nearly as much diversity among Cooperatives” with regard to “size, demographics, geography, topography, line density, access to infrastructure, and deployment of advanced technologies” as exists with investor-owned utilities.

The Report highlights the Cooperatives’ history to promote demand response and energy efficiency programs, describing established load control programs, consumer education efforts, and exploring future programs such as advanced, prepaid metering technology. The Report discusses “the specific statutory, regulatory, organizational, physical, contractual, financial and market impediments to Cooperative implementation of initiatives relating to dynamic rates, standby rates, interruptible rates and rates for purchases of electricity generated from renewable sources.” A brief summary of such discussion within the Report is provided as Attachment A.

The Cooperatives believe there are statutory impediments to starting two potential promising programs, prepaid metering and tariffs for energy derived 100% from renewable resources, and that legislation appears necessary for the Cooperatives to implement. The Report recommends the following:

Enact legislation clarifying the validity in Virginia of rates for electricity from 100 percent renewable energy using RECs to qualify power sold under such rates as 100 percent renewable energy.

Enact legislation clarifying the installation of prepaid meters in support of prepaid service, and the operation of those meters to terminate service when prepayment is exhausted, does not violate any pre-termination notice requirement.

Recognize the Cooperatives’ legacy of proactive leadership in conservation, demand response, and energy efficiency in benchmarking future initiatives.

Adopt an analysis equivalent to the Cooperatives’ Member-Consumer Benefit Analysis model in deliberations of future initiatives that may affect the Cooperatives, and refrain from enacting mandates that will impose costs on cooperative member-consumers without specific commensurate benefits to those same member-consumers.<sup>1</sup>

Upon review, the Report appears complete. The Report provides a good history of the Cooperatives’ role in the electricity industry and a description of what they have accomplished and their future plans with respect to energy conservation, energy

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<sup>1</sup> Report at p. 69.

efficiency and renewable energy. However, the Cooperatives' stated impediments to the implementation of programs relating to dynamic rates, standby rates, interruptible rates, and rates for purchases of electricity generated from renewable sources warrant additional analysis.

On page 64, the Report states "Virginia does not recognize RECs [renewable energy credits] as an acceptable method to offer renewable energy rates." This is not entirely correct as the SCC has approved programs offering the opportunity to support renewable power through the purchase of RECs (Case Nos. PUE-2008-00044 and PUE-2008-00057). The SCC has, however, determined that such purchases of RECs do not constitute the "purchase [of] electric energy provided 100% from renewable energy" as specified in § 56-577 A 5 of the Code of Virginia and, as such, do not satisfy the required statutory criteria for eliminating the option for other suppliers to provide such renewable energy.

Additionally, the Cooperatives use this forum to raise a regulatory concern associated with prepaid meters. It is unclear how prepaid meters relate to "dynamic rates, standby rates, interruptible rates and rates for purchase of electricity generated from renewable resources." Regardless, the Commission is unable to reach a conclusion regarding the merits of prepaid meters or any potential impediment to their implementation without further information. Moreover, while the Commission does not take a position regarding potential legislation related to prepaid meters, the Commission notes the performance details of such a program should be thoroughly addressed to avoid any unintended consequences regarding termination of service.<sup>2</sup>

## **CONCLUSION**

The Commission concludes that the Cooperatives' Report appears complete and accurate. The Commission also notes, however, that the short turn-around time to receive, review and report on the Cooperatives' submission precluded the SCC from its usual

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<sup>2</sup> See *The Dallas Morning News*, *Public Utility Commission working on rules that target prepaid electricity companies*, October 26, 2009.

practice of soliciting comments and/or testimony to provide a more thorough exploration of the Report.

The Commission forwards the 2009 Conservation, Efficiency and Renewable Resource Self-Assessment Report of the Virginia Electric Cooperatives to the Governor and the General Assembly.



## **Attachment A**

The Cooperatives' Report is a broad, "big picture" overview of the fundamental differences in the organization, governance and business model that differentiates investor-owned electric utilities from the electric service Cooperatives that operate in the Commonwealth. The Report claims these differences require that the Cooperatives be treated differently than investor-owned electric utilities, regarding the implementation of programs on dynamic rates, standby rates, interruptible rates, and rates for the purchase of electricity generated by renewable resources, pursuant to Chapter 824 of the 2009 Virginia Acts of Assembly.

The Report explains that the Cooperatives are subject to uncoordinated regulation from federal and state agencies that hinders the development of certain programs. Higher rates of return and tax incentives are not effective, because Cooperatives are non-profit enterprises, owned by its members, following cooperative principles. In addition, the Cooperatives vary greatly by service area characteristics, number of customers, and financial resources. By their nature, Cooperatives are conservative and do not like to invest in programs that are speculative.

The Report does not provide any data on specific issues affecting the Cooperatives, such as cost estimates of the mandates, but includes two tables containing service area macro variables such as demographic data, income data and customer profiles for each of the 13 Cooperatives.

The Report indicates that the Cooperatives have exercised much leadership in promoting conservation, demand response and energy efficiency, and provides a list of some of their accomplishments in these areas. The Report states that these achievements should be taken into account when setting benchmarks for future mandates.

The Cooperatives claim to face a number of obstacles to implement initiatives relating to dynamic rates, standby rates, interruptible rates, and rates to purchase electricity from renewable resources. We note the Report claims that changes to PJM's Reliability Pricing Model are regarded as an obstacle to interruptible rates and PJM's minimum size limits on power flows is a problem to the provision of renewable energy.

The Report identifies the following for the Cooperatives:

### **Impediments to Dynamic Rates**

Overview: Such rates are expected to make demand more price elastic.

1. Statutory: None, if program passed a member-consumer benefit analysis.
2. Regulatory: None, if program passed a member-consumer benefit analysis.
3. Organizational: Cooperatives already have programs that accomplish much of the goals of this program. Additional mandates will only increase cost without providing much in new benefits.
4. Physical: Program will increase billing costs and equipment costs. There also are issues associated with the ownership and control of metering devices. By law, these rights belong exclusively to the Cooperatives.
5. Contractual: Cooperatives generally buy their power under wholesale power supply contracts. These contracts presently have limited time-based pricing options.
6. Financial: Administrative cost of implementing program will outweigh the benefits of the programs.
7. Market Impediments: Studies (internet references are given on pp. 50 and 51) show little customer interest and little customer benefit from such programs.

Assessment: Advanced metering devices and associated rates should be offered only if there is enough demand from Cooperative customers, and on a cost-effective basis. They should not be mandated.

### **Impediments to Stand-by Rates**

Overview: Pricing such service is problematic, citing special cases within Central Virginia, Shenandoah Valley and NOVEC.

1. Statutory: None, if program passed a member-consumer benefit analysis.
2. Regulatory: None, if program passed a member-consumer benefit analysis.
3. Organizational: None, if program passed a member-consumer benefit analysis.
4. Physical: Highly customer specific, difficult to provide and hedge internally.
5. Contractual: None, if program passed a member-consumer benefit analysis.

6. Financial: Difficult to price and hedge. Program places financial burden on Cooperatives.

7. Market Impediments: None, if program passed a member-consumer benefit analysis.

Assessment: Cooperatives already offer these programs and no mandate is necessary or appropriate.

### **Impediments to Interruptible Rates**

Overview: 10 cooperatives already have interruptible rates. Pricing (rewards and penalties) the service is difficult.

1. Statutory: None, if program passed a member-consumer benefit analysis.

2. Regulatory: None, if program passed a member-consumer benefit analysis.

3. Organizational: None, if program passed a member-consumer benefit analysis.

4. Physical: Requires good forecast of system peak demand and good communications infrastructure. Again, pricing the service is difficult.

5. Contractual: Dependent on the Cooperative's wholesale purchase power contract, which may not allow flexibility to accommodate the rates.

6. Financial: Subject to financial risks such as customers "gaming" the system.

7. Market Impediments: Must adapt changes in wholesale power market design. Example given - PJM's numerous changes to its 2006 Reliability Pricing Model can make an "interruptible rate instantly stale and ineffective."

Assessment: Cooperatives can and do offer interruptible rates. No mandate is necessary.

### **Rates for purchases of electricity from Renewable Sources**

Overview: Cooperatives are not generators and generally do not have control over their generation resource mix. There are technical, contractual and market barriers to offer renewable energy to members.

1. Statutory: The only practical way to offer a renewable rate is to purchase renewable energy certificates ("RECs") associated with 100 percent of renewable power to be sold to customers desiring the green power. However, by regulatory determination

in Case PUE-2008-00044, Virginia does not recognize offering RECs as meeting the requirement to provide renewable energy rates. Staff clarifies that the Commission has allowed utilities to offer programs providing the opportunity to support renewable power through the purchase of RECs.

2. Regulatory: Same as statutory.

3. Organizational: Cooperatives do not control their power generation resource mix and associated power flows over the transmission grid.

4. Physical: Electric current flows in a network cannot be switched from a specific generator to a specific customer. In addition, network operation requires including other power sources in the mix sold to a customer.

5. Contractual: Most Cooperatives obtain power through wholesale power contracts and do not control the generation mix or the transmission network. Central Virginia Electric Cooperative (pp. 66 and 67) is given as an example of how wholesale power contract limitations and PJM minimum size limits on power flows can be problematic.

6. Financial: Renewable energy is more expensive than energy from fossil or nuclear sources.

7. Market Impediments: Same as financial.

Assessment: The Cooperatives will need legislation that allows the bundling of undifferentiated power with RECs and rates that recover the cost of the RECs.





October 30, 2009

**VIA HAND DELIVERY**

Hon. Joel H. Peck, Clerk  
Document Control Center  
State Corporation Commission  
Tyler Building  
1300 East Main Street  
Richmond, Virginia 23219

*Re: Virginia Electric Cooperatives' Self-Assessment Report  
Submitted Pursuant to Chapter 824 of the 2009 Virginia Acts of Assembly  
Case No.: PUE-2009-\_\_\_\_\_*

Dear Mr. Peck:

Please find enclosed an original and fifteen copies of the *2009 Conservation, Efficiency, and Renewable Resource Self-Assessment Report of the Virginia Electric Cooperatives to the Governor and the General Assembly* (the "Report") submitted by the Virginia, Maryland, and Delaware Association of Electric Cooperatives, on behalf of the thirteen Virginia Electric Cooperatives. The Report is being submitted as required by HB 2506 and SB 1248, enacted as Chapter 824 of the 2009 Virginia Acts of Assembly.

Please do not hesitate to contact me if you have any questions and thank you for bringing this document to the attention of the Commission.

Very truly yours,

Samuel R. Brumberg *for*  
James Patrick Guy, II

cc: Mr. Howard M. Spinner, Director, Division of Economics and Finance  
Mr. William F. Stephens, Director, Division of Energy Regulation  
Arlen Bolstad, Esquire, Deputy General Counsel  
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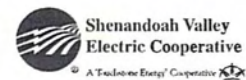


2009

CONSERVATION, EFFICIENCY AND  
RENEWABLE RESOURCE  
SELF-ASSESSMENT REPORT  
OF THE VIRGINIA ELECTRIC  
COOPERATIVES TO THE GOVERNOR  
AND THE GENERAL ASSEMBLY

FILED WITH THE STATE CORPORATION COMMISSION

OCTOBER 30, 2009





**2009 Conservation, Efficiency, and Renewable Resource  
Self-Assessment Report of the Virginia Electric Cooperatives to  
the Governor and the General Assembly**

**Filed with the State Corporation Commission**

**October 30, 2009**

Pursuant to House Bill (“HB”) 2506 and Senate Bill (“SB”) 1248, the Virginia, Maryland & Delaware Association of Electric Cooperatives (“Association”) submits this 2009 Conservation, Efficiency, and Renewable Resource Self-Assessment Report of the Virginia Electric Cooperatives (“Report”) on behalf of each of the thirteen member distribution electric cooperatives that do business in the Commonwealth of Virginia, all of whom are members of the Association: A&N Electric Cooperative, BARC Electric Cooperative, Central Virginia Electric Cooperative, Community Electric Cooperative, Craig-Botetourt Electric Cooperative, Mecklenburg Electric Cooperative, Northern Neck Electric Cooperative, Northern Virginia Electric Cooperative, Powell Valley Electric Cooperative, Prince George Electric Cooperative, Rappahannock Electric Cooperative, Shenandoah Valley Electric Cooperative and Southside Electric Cooperative (each individually a “Cooperative,” and collectively the “Cooperatives”).



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# TAB 1

## EXECUTIVE SUMMARY

Virginia's electric Cooperatives have served as stewards of their members' resources for seven decades. Their statutory mission to provide reliable electric service at the lowest cost consistent with sound economy and prudent management, has required them to be conscientious stewards of the capital and other resources that their members have consigned to their care in pursuit of this mission.

Throughout the Commonwealth, many Virginians have come to believe that the duty of stewardship extends to shared natural resources, including the environment, and many Cooperative members share this view. Cooperative stewardship has for many years included a pragmatic approach to conservation and energy efficiency. Cooperative consumer demand response programs date back several decades. Cooperatives have been investing in sophisticated metering technology since long before the term "smart grid" entered the public lexicon.

Cooperatives serve a single master – the member-consumer. There are no profit-seeking investors to satisfy. Cooperative prices reflect only their costs, not markets, not profits. Cooperatives assess risks and opportunities with a sole focus on the benefit to member-consumers. Energy efficiencies are implemented when and where they promote reliability and decrease cost. Every initiative is evaluated in light of its cost and benefit to the member-consumers.

The Cooperatives truly are different from other electric utilities. Their governance and organization are unlike those of investor-owned or municipal utilities. They are operated consistently with the Cooperative Principles, and they have a very different financial model. Because of their rural heritage, their demographics and load characteristics are very different from other utilities.

As different as they are from other types of utilities, there is nearly as much diversity among Cooperatives. Their size, demographics, geography, topography, line density, access to

infrastructure, and deployment of advanced technologies vary widely from Cooperative to Cooperative. What works well at one Cooperative may well be impractical and inappropriate for another.

In addition, electric Cooperatives in Virginia were vertically unbundled long before the industry restructuring of the last decade. Because the Cooperatives do not own and operate their own generation fleets, they are generally dependent on contracts with third parties for wholesale power supply. This affords them much less control over resource mix, fuel diversity, dynamic price signals and other initiatives that a vertically integrated, investor-owned utility is positioned to implement.

Virginia's electric Cooperatives have long been leaders in the promotion of demand response and energy efficiency programs. Well-established load control programs and consumer education efforts have been effective for many years without the need for a statutory or regulatory mandate. In addition, in 2009, Cooperatives in Virginia have:

- distributed valuable coupons for compact fluorescent bulbs,
- made energy-efficiency loans available to their members from Farm Credit,
- conducted energy surveys,
- distributed energy efficiency calendars to members,
- introduced voluntary residential load reduction programs,
- introduced an air conditioner switch program,
- conducted energy efficiency "how to" clinics,
- donated 4200 compact fluorescent bulbs to state parks throughout Virginia,
- implemented residential time of use rates, and
- begun adjusting tariffs to align fixed costs with fixed charges.

Several Virginia Cooperatives are exploring deployment of advanced, pre-paid metering technology, which has been demonstrated to modify consumer behavior to promote energy conservation and efficiency.



While the Cooperatives embrace the stewardship values that underlie demand response and energy efficiency initiatives, and implement such programs where they make practical sense for their member-consumers, there are meaningful challenges to the imposition of mandatory programs, generally designed for vertically integrated, investor-owned utilities. These challenges include the cooperative business model, the enormous diversity among Cooperatives, and uneven access to high speed, backbone communications infrastructure.

Ultimately, the Cooperatives evaluate initiatives according to a “Member-Consumer Benefit Analysis.” Employing this analysis, they have already implemented, and continue to explore, initiatives that make practical sense for their member-consumers. Overlapping and uncoordinated regulatory mandates at the state and federal level run the risk of imposing significant additional costs on Virginia consumers without an identifiable gain in efficiency or resource conservation.

This Self-Assessment report discusses in detail the specific statutory, regulatory, organizational, physical, contractual, financial, and market impediments to Cooperative implementation of initiatives relating to dynamic rates, standby rates, interruptible rates, and rates for purchases of electricity generated from renewable sources. In some cases, the Cooperatives are already moving forward, to the extent it makes sense to do so. In others, there are good reasons for them to be more cautious.

There are statutory impediments to implementation of two promising programs – prepaid metering and tariffs for energy 100% from renewable resources. Legislation appears to be necessary for Virginia electric Cooperatives to be able to implement these programs.

The Cooperatives’ practical approach to assessment of member-consumer costs and benefits is consistent with their statutory mandate, their duty of stewardship and their historic mission, dating back to the 1930s and 40s. Imposition of mandatory programs, designed to be effective tools for investor-owned electric utilities, is unnecessary at best, and risks being wasteful and counterproductive. Any targets that are mandated must take into account the significant work that the Cooperatives have already done.

The Cooperatives are proud of their legacy of proactive leadership in conservation, demand response, and energy efficiency.

# TAB 2

## BACKGROUND

Virginia legislators introduced more than 80 bills directly related to the energy industry in the General Assembly Session of 2009. Rapidly rising energy prices, widespread concerns about climate effects of carbon dioxide emissions, and the worst economic decline in a generation prompted a broad sense of urgency regarding energy issues for many legislative leaders and their constituents.

The initiatives were numerous and diverse. Some were innovative to a degree that would have required a more thorough review and greater collaboration than was feasible in the brief context of the Session. Others included duplicative or conflicting mandates that ran the risk of increasing costs to consumers without a commensurate improvement in conservation, efficiency, or climate effect. Some of the more straightforward and potentially effective initiatives were based on assumptions that would work for investor-owned utilities (“IOUs”), but would have required significant and time-consuming adjustments to adapt them to the cooperative model. Many of the proposed initiatives would unintentionally have been ineffective or disproportionately burdensome for the Cooperatives and their member-consumers.

The Cooperatives discussed these challenges with legislators who were leaders in the energy initiatives. These leaders expressed reluctance to delay adoption of mandates directed at Virginia’s investor-owned electric utilities, or to take the time necessary to customize them for the thirteen diverse, smaller Cooperatives. Nevertheless, some legislative leaders were interested in better understanding how and why the Cooperatives were different, and how this difference affects their ability to participate in mandates imposed on and embraced by the larger IOUs. In response, the Cooperatives agreed to assess the impediments to applying the same mandates to the Cooperatives as are applied to the IOUs, and to report that assessment to the Governor and General Assembly, with a review for completeness and accuracy by the State Corporation Commission (“Commission”). The self-assessment is mandated in Chapter 824 of the 2009 Acts of Assembly, as follows:



2. That each utility consumer services cooperative (cooperative) organized or operated pursuant to Article 1 (§ 56-231.15 et seq.) of Chapter 9.1 of Title 56 of the Code of Virginia shall, on or before October 31, 2009, file with the State Corporation Commission (Commission) an assessment of the statutory, regulatory, organizational, physical, contractual, financial, and market impediments to cooperative implementation of initiatives relating to dynamic rates, standby rates, interruptible rates, and rates for purchases of electricity generated from renewable sources. Each cooperative shall conduct its assessment and submit such assessment individually, collectively with one or more other cooperatives, or collectively through an association of cooperatives. The Commission shall review each assessment to evaluate its accuracy and completeness. On or before December 1, 2009, the Commission shall forward each assessment to the Governor and the General Assembly along with the Commission's evaluation of the accuracy and completeness of each report.

This Report will describe the distinctive organizational and financial characteristics of the Cooperatives as compared with IOUs, the Cooperatives' history of leadership and engagement in energy efficiency for their member-consumers, their current efforts and initiatives, and the impediments to and opportunities for additional initiatives.<sup>1</sup>

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<sup>1</sup> A Glossary of terms and acronyms used in this report is attached as Exhibit A.



# TAB 3

## VIRGINIA'S ELECTRIC COOPERATIVES

Currently, Virginia's electric Cooperatives serve over 475,000 meters throughout the state. Upon the completion of a pending proposed territorial acquisition,<sup>2</sup> the Cooperatives will serve approximately 580,000 meters. While their combined service territories cover approximately two-thirds of the land mass of the Commonwealth of Virginia,<sup>3</sup> these territories only include approximately 15% of the total electric load in Virginia, reflecting the rural heritage of the cooperative program.

### *Organization and Governance*

The Cooperatives are not-for-profit enterprises, wholly owned by the member-consumers they serve, governed by democratically-elected boards, and operated on a cooperative basis.

In Virginia, electric distribution cooperatives are organized and operated pursuant to the Utility Consumer Services Cooperatives Act ("Cooperatives Act"), Va. Code §§ 56-231.15 through 56-231.37. With the exception of Powell Valley Electric Cooperative, whose rates are established by the Tennessee Valley Authority ("TVA"), the Cooperatives are regulated by the Commission. Pursuant to the Cooperatives Act, the Cooperatives are organized "for the principal purpose of making energy, energy services, and other utility services available at the lowest cost consistent with sound economy and prudent management of the business of such cooperative and such other purposes as its membership shall approve ...." Va. Code § 56-231.16. This mandate is the basis for the Cooperatives' mission to provide the most reliable service possible at the lowest reasonable cost to their member-owners. Responsive to their member-consumers' interests, the Cooperatives have for many years worked to accomplish their mission in an environmentally responsible way, mindful of reliability and cost impacts.

Each Cooperative is governed by a board of directors, democratically elected by the member-consumers in accordance with § 56-231.28 of the Cooperatives Act, and within the terms of

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<sup>2</sup> Rappahannock Electric Cooperative and Shenandoah Valley Electric Cooperative have entered into agreements to acquire the Virginia electric distribution facilities and territory of Allegheny Power.

<sup>3</sup> A map illustrating the Cooperatives' service territories is attached as Exhibit B.

each Cooperative's charter and by-laws. As not-for-profit enterprises, the Cooperatives are exempt from federal income taxation pursuant to section 501(c)(12) of the Internal Revenue Code. Because there are no investor-owners, directors and employees are uniquely accountable to their consumers. There is no conflict between the interests of investors and the interests of ratepayers because those parties and interests are identical.

### *The Cooperative Principles*

Each Cooperative is autonomous, and they vary widely in size, location, resources, how and from whom they purchase power and other factors; however, they do share a unique business model based on the Cooperatives Act and on seven guiding cooperative principles:<sup>4</sup>

1. **Voluntary and Open Membership**—Cooperatives are voluntary organizations, open to all persons able to use their services and willing to accept the responsibilities of membership without gender, social, racial, political, or religious discrimination.
2. **Democratic Member Control**—Cooperatives are democratic organizations controlled by their members, who actively participate in setting policies and making decisions. The elected representatives are accountable to the membership. In primary cooperatives, members have equal voting rights (one member, one vote) and cooperatives at other levels are organized in a democratic manner.
3. **Members' Economic Participation**—Members contribute equitably to, and democratically control, the capital of their cooperative. At least part of the capital is usually the common property of the cooperative. Members usually receive limited

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<sup>4</sup> See "Statement on Co-operative Identity," from the International Cooperative Alliance, available at <http://www.ICA.co-op/coop/principles.html> (last accessed October 28, 2009). (Spelling formed to Standard American Usage.) The guiding cooperative principals contained herein apply to all cooperatives, not just electric distribution entities. The original principles were promulgated by the Rochdale Society of Equitable Pioneers, an early cooperative of twenty-eight weavers and artisans, in 1844. The original "Rochdale Principles" were: (1) open membership, (2) democratic control, in the form of one man, one vote, (3) distribution of surplus in proportion to trade, (4) payment of limited interest on capital, (5) political and religious neutrality, (6) cash trading with no extension of credit, and (7) the promotion of education.



compensation, if any, on capital subscribed as a condition of membership.<sup>5</sup> Members allocate surpluses for any or all of the following purposes: developing the cooperative, possibly by setting up reserves, parts of which at least would be indivisible; benefiting members in proportion to their transactions with the cooperative; and supporting other activities approved by the membership.

**4. Autonomy and Independence**—Cooperatives are autonomous, self-help organizations controlled by their members. If they enter into agreements with other organizations, including governments, or raise capital from external sources, they do so on terms that ensure democratic control by their members and maintain their cooperative autonomy.

**5. Education, Training, and Information**—Cooperatives provide education and training for their members, elected representatives, managers, and employees so they can contribute effectively to the development of their cooperatives. They inform the general public, particularly young people and opinion leaders, about the nature and benefits of cooperation.

**6. Cooperation Among Cooperatives**—Cooperatives serve their members most effectively and strengthen the cooperative movement by working together through local, national, regional, and international structures.

**7. Concern for Community**—While focusing on member needs, cooperatives work for the sustainable development of their communities through policies accepted by the members.

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<sup>5</sup> No added compensation is paid on capital subscribed by the members of the Cooperatives.

### *Financial Model*

Cooperatives are operated on a not-for-profit basis for the mutual and exclusive benefit of their member-owners. Each Virginia Cooperative's central objective is to provide safe and reliable electric service to its members at the lowest price that it can reasonably charge over the long term, achieved by pooling resources and appropriately assigning and recovering all costs. Member-consumers participate in and are impacted by cost savings as well as cost increases. For a cooperative, the operative focus is on minimizing the cost of providing service to its member-owners, rather than maximizing profits. In a cooperative, all benefits ultimately accrue to the members and, conversely, the members are responsible for all costs. Revenues in excess of costs each year are allocated to the member-consumers based on their patronage with the cooperative in the form of capital credits. This patronage capital, credited to the member-consumers, serves as a cooperative's operating equity. Dependent on the cooperative's financial condition and subject to the board of director's discretion, capital credits are "rotated" and refunded back to member-consumers in the form of checks or credits against electric bills.<sup>6</sup>

As a part of their long-term financing, many of the Cooperatives have debt financing issued or guaranteed by the United States Department of Agriculture's Rural Utilities Service ("RUS"). RUS guarantees function as a mortgage over all of the Cooperative's plant and property. Additional debt financing may be obtained from the National Rural Utilities Cooperative Finance Corporation ("CFC"), CoBank (a national bank for cooperatives organized as a part of the United States Farm Credit System), and other, more traditional, lenders.

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<sup>6</sup> Other arrangements are often made for returning outstanding capital credits of a decedent's estate.



### *Demographics and Load Characteristics*

One of the consequences of the Cooperatives' rural legacy is that their communities and populations are generally different from the higher-density, higher-growth regions typically served by IOUs. Their populations are generally somewhat older and less affluent.<sup>7</sup>

In July 2009, Virginia's average annual *per capita* income was approximately \$43,000.<sup>8</sup> The average for the populations served by the Cooperatives was meaningfully less, at approximately \$36,500. Excluding Northern Virginia Electric Cooperative and Rappahannock Electric Cooperative, whose territories are increasingly suburban, the average annual *per capita* income in the remaining Cooperatives' territories was just over \$31,900. For three Cooperatives, it is less than \$30,000. Throughout Virginia, 12% of the population was aged sixty-five or older. Across the Cooperatives' territories, it is a point higher, at 13%, with four Cooperatives having 15 to 16% of their populations over sixty-five, and five Cooperatives having 17 to 21% of their populations over the age of sixty-five. When the Virginia unemployment rate was 7.3% in July 2009, seven Cooperative territories had unemployment rates in excess of 8.0%, with one as high as 12.5%.

Cooperative load is predominantly residential. The peak demand of some of the Cooperatives, individually, is less than several large, individual industrial users in Virginia.

### *Diversity Among Cooperatives*

The Virginia electric Cooperatives share much in common; however, there also is significant diversity among them. Their diverse size, demographics, population and line density, weather and usage patterns, topography, local economies and industries, supporting infrastructure, proximity to metropolitan centers, and other factors can vary widely from one Cooperative to another. A&N Electric Cooperative, on the Eastern Shore, and Northern Neck Electric Cooperative, on the Northern Neck peninsula on the western shore of the Chesapeake Bay,

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<sup>7</sup> This is not uniformly true, as some Cooperative territories have enjoyed significant economic development and population growth over the last two decades.

<sup>8</sup> For all data in this section see Exhibit E, attached.

have very different topography and weather than BARC Electric Cooperative and Craig-Botetourt Electric Cooperative in the Blue Ridge Mountains. Economic development follows very different patterns in the service territories of Northern Virginia Electric Cooperative and Rappahannock Electric Cooperative compared to Mecklenburg Electric Cooperative or Southside Electric Cooperative. Cooperatives are essentially local, and they are just as diverse as Virginia – perhaps more so, as many serve the remotest parts of our Commonwealth.

**Size.** The number of meters served by the Cooperatives ranges from fewer than 7,000 to more than 141,000. There also are vast differences in sizes of service territories.<sup>9</sup>

**Demographics.** Just as there are meaningful demographic differences between the Cooperatives as a group and the rest of the Commonwealth, there are significant demographic differences among the Cooperatives. Rates of unemployment range from 5.9% to more than double that at 12.5%. Annual average *per capita* income ranges from a low of about \$26,000 in several Cooperative territories to almost double that at \$48,000. The percentage of the population that is over sixty-five ranges from a low of 8% (less than 1 in 10) to highs of more than 20% – one-fifth of the population.<sup>10</sup>

**Line Density.** Line density refers to the number of meters per mile of electric line. Meters per mile of line range from just over five meters to twenty-two meters per mile.<sup>11</sup>

**Communications Infrastructure.** Very significant among the differences in the Cooperatives is the level and availability of communications technology, in many cases a product of geographic location. Two factors that affect the types of communication infrastructure available to the Cooperatives are the differences in the topography of the state and the contrast of rural areas versus urban areas. Within the subset of electric Cooperatives of Virginia, there are vast differences. One of the differences is the

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<sup>9</sup> See Exhibits B and F.

<sup>10</sup> For all data in this section, see Exhibit E.

<sup>11</sup> See Exhibit F.



diversity of the topography of the terrains that each serves. In the western portions of the state, there are limited means by which necessary information can be passed from the Cooperative to the end consumer. The types of communication range from slower speed dial-up to higher speed broadband Internet or radio communications. The mountainous topography limits the available options for two reasons. It creates unreachable areas and pockets of low-density concentrations of population. The other difference is the urban-versus-rural aspect of each Cooperative's service territory. In the more urban areas, the Cooperatives have a greater range of communications technology available to them.

Currently, none of the Cooperatives has universal access to broadband, which is necessary to support advanced metering, throughout its territory. Some Cooperatives still depend on self-reading of meters, while others have already installed advanced metering infrastructure ("AMI").

**Advanced Metering Deployment.** A recent survey undertaken by the Federal Energy Regulatory Commission ("FERC") documented cooperative leadership in deploying advanced grid technologies. The 2008 FERC Demand Response and Advanced Metering Survey ("2008 FERC Survey") indicated that advanced metering penetration (*i.e.*, the ratio of advanced meters to all installed meters) has increased substantially in nearly all regions and across all types of electric utilities since 2006, and noted that the high penetration levels achieved by cooperatives in the past two years has been particularly impressive. According to FERC, on a national basis, advanced metering penetration by electric cooperatives increased from 3.8 percent in 2006 to an impressive 16.4 percent in 2008.<sup>12</sup>

For some of the Cooperatives, developing technologies such as AMI, distribution automation, and the related integrative software that are all part of a "smart grid,"

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<sup>12</sup> Federal Energy Regulatory Commission, "Assessment of Demand Response & Advanced Metering: Staff Report," available at <http://www.ferc.gov/legal/staff-reports/12-08-demand-response.pdf> (last accessed Sept. 17, 2009).



make good business sense. The Cooperatives serve a wide range of customers in an equally wide range of service territories, but they almost invariably have a higher concentration of residential customers and a lower density of customers per mile of line. For example, on average, Dominion Virginia Power serves over 40 meters per mile of line, compared to the Cooperatives who, on average, serve less than 10 meters per mile of line. This disparity affects many business practices, including the allocation of the costs of implementing AMI among the member-consumers.

The operational benefits of technologies like AMI and other distribution automation technologies are often heightened in the kinds of territories many of the Cooperatives serve, rural areas with low population densities, because the low population density tends to increase the costs of meter reading, outage response, system maintenance, and distribution losses. The potential benefit from technology that helps the Cooperatives address those issues is obvious.

While the Cooperatives are favorably disposed toward smart grid development, determining the "appropriate factors" in the context of smart grid investment can be tricky business. Investment in a qualified smart grid system may or may not be appropriate for a given system at a given point in time. This is not a situation in which a cookie-cutter, one-size-fits-all approach is likely to be the best solution or in the public interest. In some areas, certain elements of the smart grid may never be shown to be of sufficient value to justify their implementation. It would be virtually impossible to establish a uniform set of "appropriate factors" upon which an electric utility could demonstrate that it properly considered an investment in a qualified smart grid system.

### *Vertically Unbundled*

Even before electric utility restructuring, the Cooperatives were not vertically integrated utilities. Unlike Dominion Virginia Power and AEP Virginia, the Cooperatives, with very few exceptions, do not own power generating facilities, do not own transmission lines, and do not

manage their own wholesale power resources. Instead, they contract with other entities to provide these services.

The Cooperatives provide distribution service over their wires and are resellers at retail of electric power. Because of the nature of their wholesale power arrangements, they generally do not control their own power resource mix, which may affect their ability to implement renewable portfolio standards (“RPS”), integrated resource planning (“IRP”), and other such programs.

### *Wholesale Supply*

The Cooperatives generally procure their wholesale power supply and transmission services through long-term “requirements” contracts that provide just the power and transmission needed to serve their retail load. As a consequence, most of the Cooperatives do not participate directly in hourly or daily energy markets as generators, sellers, or buyers.

Nine of Virginia’s Cooperatives are members of Old Dominion Electric Cooperative (“ODEC”) and purchase their wholesale power under long-term, full requirements contracts with ODEC. Other Cooperatives have entered into similar arrangements, albeit for shorter durations, with IOUs or other wholesale energy suppliers.

### **ODEC Members**

ODEC is a utility aggregation cooperative organized under Va. Code §§ 56-231.38 through 56-231.52. It aggregates the load of its members and provides their full power requirements<sup>13</sup> and other services under forty-five-year all-requirements wholesale power contracts that were accepted for filing by FERC in late 2008.<sup>14</sup>

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<sup>13</sup> ODEC serves all of its member Cooperatives’ power requirements, excluding a small increment of power purchased by some ODEC members from the Southeastern Power Administration (“SEPA”). This SEPA power is generated from federally-owned hydroelectric power plants at the John H. Kerr Dam and Reservoir and the Philpott Lake project, both in southern Virginia.

<sup>14</sup> See FERC Docket No. ER08-1458-000.



ODEC's revenues are based on a formula wholesale rate. This wholesale rate formula is approved by FERC and is applied to the demand and energy sales made to each of ODEC's member distribution cooperatives. ODEC's rates and services generally are not subject to State Corporation Commission regulation.

ODEC's wholesale rate is designed to recover ODEC's cost of service and to create a firm equity base for the cooperative. Like its members, ODEC is also a not-for-profit cooperative. Its rate formula is not designed to achieve a return on equity. Rather, the rate formula is designed to collect required revenues based on estimated costs, with a true-up mechanism at the year's end to ensure that all costs are collected. Any difference is refunded or collected as required.

ODEC's rate formula is applied to a single class of customers, its member distribution cooperatives. The wholesale rate applies to A&N Electric Cooperative, BARC Electric Cooperative, Community Electric Cooperative, Mecklenburg Electric Cooperative, Northern Neck Electric Cooperative, Prince George Electric Cooperative, Rappahannock Electric Cooperative, Shenandoah Valley Electric Cooperative, and Southside Electric Cooperative in Virginia, as well as Choptank Electric Cooperative in Maryland and Delaware Electric Cooperative in Delaware.

Each member cooperative of ODEC is charged based on the same wholesale demand and energy rates, often called "postage stamp" rates. The demand and energy rates are developed based on transmission and distribution voltage levels. Any difference between the estimated cost of energy used to meet ODEC's Energy Requirement and the actual cost of such energy is reflected in a Fuel Adjustment Factor.

Demand and energy are each billed on a monthly basis. The demand charge is established at the clock-hour (60-minute period) in each calendar month coincident with the time of the system peak in the pertinent transmission control area. Energy is billed, without regard to location or time of use, as used during the calendar month.

**Central Virginia Electric Cooperative**

Central Virginia Electric Cooperative currently purchases all of its energy through a contract with Constellation Energy Commodities Group. The contract, which extends through May 31, 2012, provides for all sales to be based on a flat energy rate, except for an interruptible energy carve-out block of 10 million kWhs annually for a customer's snowmaking system. Other than the interruptible energy carve-out, the rate does not vary by season, day, or hour. There is no demand component in the energy rate. Transmission and some ancillary services are purchased through the PJM Interconnection, L.L.C. ("PJM"), the regional transmission operator. The transmission and ancillary rates include factors based on seasonal demand, but these factors do not provide a significant variance within the overall wholesale power costs by season.

At this time, Central Virginia Electric Cooperative is negotiating with potential future power suppliers and generation asset developers to determine the best options for its power supply after May 2012. The form and factors of the costs, through wholesale rates and/or asset ownership costs, are unknown at this time.

**Craig-Botetourt Electric Cooperative**

Craig-Botetourt Electric Cooperative purchases its wholesale power under long-term, full requirements contracts with IOUs and independent wholesale energy suppliers.

**Northern Virginia Electric Cooperative**

In 2009, Northern Virginia Electric Cooperative took responsibility for managing its own wholesale power supply and transmission services. The Cooperative's wholesale power supply portfolio is a mixture of asset-backed requirement contracts, long and short-term energy blocks, and reliance on the daily and hourly energy markets for its residual needs. Additionally, Northern Virginia Electric Cooperative provides its largest and most sophisticated customers access to the daily and hourly energy markets to further their energy procurement objectives.

**Powell Valley Electric Cooperative**

Powell Valley Electric Cooperative purchases its power requirements from the TVA.

# TAB 4



## COOPERATIVE LEADERSHIP IN DEMAND RESPONSE AND ENERGY EFFICIENCY

The efficient and economical use of electricity is not new for Virginia's distribution Cooperatives. Over the years, the Cooperatives have conducted a variety of programs that reduce both electricity usage and peak demand.<sup>15</sup>

The Cooperatives support demand response ("DR") and energy efficiency ("EE") programs and have successfully implemented demand reduction programs since the late 1970s, which has resulted in significant reduction in billed peak demand. This reduction in peak demand has been achieved through a variety of programs including direct load control, water heater and air conditioner switches, voltage control, and interruptible rates.

### *Load Control*

In the late 1970s, many of the Cooperatives began installing switches on water heaters as a direct load control program. The process of implementing direct load control is ongoing to this day. Some of the distribution Cooperatives have installed similar switch devices on air conditioners/HVAC systems.<sup>16</sup> In addition, most are exercising voltage reduction on their distribution systems. Most of the Cooperatives have initiated some form of interruptible rates which provide an incentive for customers who are able to curtail or shift load at peak times. A few Cooperative consumers participate in the demand response programs offered by PJM, the mid-Atlantic area regional transmission organization ("RTO"). Through these programs, the Cooperatives can reduce monthly peak demand by as much as 200 MWs.

### *Consumer Education*

While the Cooperatives are fully engaged in the development and implementation of specific programs, it is widely recognized that consumer behavior is the most critical component to the success of these programs. As such, the Cooperatives have spent considerable effort and time educating their member-consumers on EE and DR measures, and will continue to identify new

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<sup>15</sup> See Comments filed by the Cooperatives and the Association in Commission Case No. PUE-2009-00023.

<sup>16</sup> HVAC stands for heating, ventilation, and air conditioning.

communication vehicles for expanding the education process in the future. Along with other utilities, the Cooperatives also are looking forward to working with the Commission when it initiates the Consumer Education campaign, as directed by the General Assembly. In the meantime, the education and information efforts currently in use by the Association and the Cooperatives include the following:

### **Member Magazine**

Each issue of *Cooperative Living* magazine, with an approximate circulation of 500,000 consumers, includes monthly articles on energy efficiency, as well as energy efficiency tips. Samples of such articles are included in Exhibit H.

### **Other Print Advertising**

Some of the Cooperatives create and place advertisements in local and regional newspapers and magazines that teach consumers – whether or not they are Cooperative customers – how to reduce their energy use. A sample of such a print ad is included in Exhibit H.

### **Local Community Fairs and Energy Expos**

Cooperatives distribute compact fluorescent light (“CFL”) bulbs along with literature on direct load control, energy tips, and existing services provided by the Cooperative on EE and DR programs.

### **Youth Education**

Cooperatives participate in the classroom at various grade levels to educate youth on electricity in general, and energy efficiency measures they can take home.

### **Energy Analysis**

For many years, the Cooperatives have performed home energy consultations and audits for their members. Moving forward, the Cooperatives are expanding their



capabilities and providing training for Cooperative staff to perform additional energy “visits” and more extensive audits. Most of the Cooperatives offer their members an on-line audit tool on their websites. This allows members to input basic household characteristics and receive recommendations on energy efficiency actions they can take to lower their energy use. The on-line audit will also direct members to other complementary programs. With the low concentration of commercial and industrial-class consumers, the Cooperatives work with such entities on a case-by-case basis.

Northern Virginia Electric Cooperative introduced a new energy efficiency tool on its website in 2009. The Home Energy Suite is available at any time and can be accessed from anywhere with an Internet connection. The interactive home feature provides a wealth of useful room-by-room energy-related information. Customers may use an impressive array of appliance calculators to improve their understanding of energy usage in their homes. The calculators demonstrate how just a few simple lifestyle changes, or the purchase of energy efficient appliances or CFL bulbs, can help them better manage their electricity use. Thousands of “hits” have been recorded on the site since it was established in May 2009. Other Cooperatives in Virginia are considering implementation of the same or a similar product.

### **Bill Inserts**

The Cooperatives use a variety of informative and educational bill inserts to promote conservation and efficiency. Samples of bill inserts from various Cooperatives are included in Exhibit H.

### **Television Ads**

The Cooperatives have sponsored or created and placed advertisements on television advising customers of ways to reduce energy use. For example, Northern Virginia Electric Cooperative’s award-winning “Use It Wisely” campaign, currently in its second year, comprises five versions of 30-second and 15-second spots that highlight optimum

thermostat settings, changing HVAC filters, cleaning refrigerator coils, unplugging “vampire” electrical devices, adding insulation, and changing to CFL bulbs. A pictorial representation of one of Northern Virginia Electric Cooperative’s television commercials is included in Exhibit H.

### **Radio Public Service Announcements**

Cooperatives sponsor numerous radio broadcasts of informative public service announcements. For example, Northern Neck Electric Cooperative has sponsored the following message:

Conserving energy at home and work is a shared responsibility between you and Northern Neck Electric Cooperative, a Touchstone Energy Provider. Saving energy is as simple as flipping a switch. As much as a third of the typical monthly electric bill goes to lighting. Teach your family members to turn out the lights when no one is in the room. Remember that computers still use electricity when left on in the screensaver mode and cell phone chargers plugged into an outlet use electricity even without the phone attached. Electrical appliances burn energy when switched off because of the timers, clocks, memory and remote "on" and "off" switches. Satellite receivers for televisions and VCRs, among other appliances, use almost as much electricity when they are switched off as when they are on. Plug the most wasteful appliances into fuse-protected power strips (also known as surge protectors) that, when turned off, can disrupt the flow of electricity when the appliances aren't being used. Technological advances have introduced many electrical appliances that are energy efficient. Saving energy can reduce your electricity usage and save you money. NNEC promotes energy efficiency through the Energy Guide web page links under Products and Services at [www.nnec.coop](http://www.nnec.coop).

### **Websites**

Many Cooperatives maintain websites that feature energy-efficiency best-practices and energy-saving tips. For example, Northern Virginia Electric Cooperative’s website ([www.novec.com](http://www.novec.com)) highlights energy-saving messaging right on its home page, and maintains an extensive section that includes articles and tips on energy-use reduction, plus links to websites of other federal and Virginia energy programs.



### **Telephone Hold Announcements**

Cooperatives play informative conservation and efficiency messages to their customers who are on hold.

### **Highway Billboards**

The Cooperatives have for many years captured the attention of commuters via highway billboards that feature energy-saving tips.

### *2009 Cooperative Initiatives*

The Cooperatives have fully embraced the value of innovations within the energy industry (demand response, energy efficiency and renewable energy) and continue to enhance their current programs while developing and implementing new initiatives. In 2009, the Cooperatives' voluntary initiatives have included the following:

#### **CFL Coupon Program**

Last spring, the Cooperatives provided a CFL manufacturer's coupons to their member-consumers for \$1 off the purchase of any GE-brand CFL bulb. This fall, they will distribute coupons for \$2.50 off. The coupons have been included in *Cooperative Living* magazine, and Cooperative newsletters, as well as distributed directly to member-consumers and Cooperative employees.

#### **Energy Efficiency Loan Referral Program with Farm Credit**

The Cooperatives are working with Virginia's Farm Credit agencies to encourage and assist member-consumers in making their homes and farms more energy efficient. Through a referral program, Cooperative member-consumers are now immediately eligible to apply for energy efficiency loans from their local Farm Credit office.



## **Energy Survey**

ODEC surveyed all of its member cooperatives to obtain energy usage data and consumer behavior characteristics relating to energy efficiency for use in program development. The data obtained should prove instrumental in developing new EE programs for the ODEC member cooperatives.

## **Energy Efficiency Calendar (2009 and 2010)**

In 2009, Rappahannock Electric Cooperative distributed 86,000 energy efficiency calendars to its member-consumers. Other Cooperatives are planning to distribute energy efficiency calendars in 2010.

## **Residential Voluntary Load Reduction Program**

A voluntary load reduction program is being introduced at several Cooperatives. It is a concerted effort to limit load at the time of the peak each month through communication with member-consumers. It also involves the operation of direct load control devices and voltage reduction.<sup>17</sup>

## **Air Conditioner Switch Pilot Program**

A pilot program was initiated in 2009 with Rappahannock Electric Cooperative whereby a switch device installed on air conditioning units will be controlled at the time of the peak. The pilot will study various cycling strategies and member-consumer reaction. A similar program is underway at Northern Neck Electric Cooperative. Northern Virginia Electric Cooperative has included control of air conditioning systems in its load management program since its inception and regularly evaluates alternative cycling strategies.

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<sup>17</sup> Northern Virginia Electric Cooperative has operated its voluntary load management program for the past 30 years and today maintains 43,000 direct load control points. The Cooperative remotely activates switches on participating customers' water heaters and air conditioning compressors to cycle off the units for short periods during peak-use times. By curbing this peak use, the Cooperative has saved its customers more than \$40 million in power cost adjustment charges and purchased energy costs since 1979.

### **Energy Efficiency “How-To” Clinics**

The Cooperatives have sponsored clinics, often conducted at local hardware stores, to help inform consumers on steps and measures they can take to use energy more efficiently.

### **Donation of CFL Bulbs to the Virginia State Park System**

In January 2009, the distribution Cooperatives contributed 4,200 CFL replacement bulbs for use in all the state parks in the Commonwealth, saving the Virginia Department of Conservation and Recreation more than \$56,000 in annual energy costs and, amazingly, reducing total usage from 320 kW to less than 80 kW.

### **Residential Time-of-Use Rates**

Mecklenburg Electric Cooperative and Northern Neck Electric Cooperative have filed new tariffs for residential time-of-use rates.<sup>18</sup>

### **Aligning Fixed Costs With Fixed Charges**

House Bill 1819 was introduced and enacted at the request of the Cooperatives during the 2009 General Assembly session. This legislation allows a Cooperative, with an affirmative resolution of its board of directors, to make revenue-neutral adjustments to its rates that are reasonably calculated to collect any or all of the fixed costs of owning and operating its electric distribution system through a new or modified fixed monthly charge. The adjusted monthly charge would be in lieu of charges that are based on the volume of electric energy used. This adjustment was necessary to allow Cooperatives to provide net metering and other low-usage services to customers who choose them, without imposing subsidization costs on other member-consumers. In addition, and perhaps more importantly, an appropriate monthly fixed charge reduces reliance on volumetric energy sales for fixed cost recovery. If fixed cost recovery remains tied to

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<sup>18</sup> Copies of the tariffs are attached as Exhibit I.



consumption, revenues may not be sufficient to cover costs in the event consumption drops in response to successful EE and conservation programs. Eliminating reliance on consumption-based revenue for fixed costs helps eliminate disincentives to promoting EE programs.

### *Opportunities*

The Cooperatives continue to look for new programs and ways to encourage DR and EE programs, subject to appropriate measurement and verification (“M&V”) standards.

One example is the Cooperatives’ interest in offering pre-paid meter service to member-consumers. This service benefits the Cooperative by reducing collection expenses and it benefits interested member-consumers who otherwise might not be able to arrange for service without providing a substantial security deposit. In addition, there is some thought that the increased awareness of energy usage may help change consumption patterns and contribute to reduced energy usage.

Pre-paid metering is being given significant consideration by the Cooperatives and could be implemented in the near term where appropriate, subject to regulatory or statutory clarification confirming that the Cooperatives have the authority to do so, and after developing appropriate procedures and safeguards regarding disconnection procedures.<sup>19</sup>

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<sup>19</sup> Installation of meters that automatically stop the flow of electricity when pre-payment is exhausted may require the Cooperatives to seek regulatory or legislative clarification that operation of such meters would not violate mandatory disconnection notice procedures.

# TAB 5



## CHALLENGES TO IMPLEMENTING COST-EFFECTIVE MANDATES

### The Cooperative Business Model

Some mandates and incentives are ineffective in the context of the Cooperatives' distinctive business model. Others may impose a disproportionate burden on the Cooperatives' member-consumers.

Enhanced rates of return are a common tool for promoting certain behaviors on the part of IOUs, such as making investments in renewable energy generation resources.<sup>20</sup> An enhanced rate of return allows shareholders to realize a greater profit if an IOU makes certain types of investment. While this benefits the shareholders, and promotes the desired investments, it imposes a commensurate cost on ratepayers. A not-for-profit cooperative, on the other hand, is not motivated to action by an enhanced rate of return. Its "shareholders" are its customers, and profits are not sought by a cooperative or enjoyed by its member-consumers. The cost, however, would impose an added burden on the member-consumers. Similarly, tax incentives are generally of little or no value to a tax-exempt cooperative.

Since they are generally smaller compared to IOUs, the Cooperatives have fewer customers among whom to spread costs of implementing new programs and systems. When electric utility industry restructuring was adopted in Virginia, each Cooperative made significant capital investments in electronic data exchange systems, new billing systems, consumer education, and new tariffs to accommodate competitors who, by and large, never materialized in Virginia. The cost of those systems could not be shared with risk-taking investors seeking profits and was not subsidized by government grants or aid. The entire cost was borne by the member-consumers. Cooperatives tend to be very cautious about making significant investments in speculative programs that do not have a very significant potential for a direct benefit to the member-consumers who will pay for such investments.

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<sup>20</sup> See, e.g., Va. Code § 56-585.1 (giving IOUs enhanced rates of return on certain investments).

Similarly, the Cooperatives are very attentive to the initiatives and experience of better financed and more entrepreneurial IOUs. Those initiatives that are proven to benefit ratepayers can be imitated and those that are not, avoided.

### **Diversity Among Cooperatives**

Just as the Cooperatives are different from IOUs, they are also very different from each other, as discussed in greater detail above. This diversity is a strength of the cooperative system in Virginia and nationally, in that it allows many ideas and initiatives to be tried on a small scale and, if successful and appropriate, to be duplicated elsewhere. On the other hand, diversity among Cooperatives makes it difficult to craft mandates, or even voluntary programs, that will be suitable for all the Cooperatives at the same time.

### **Communications Technology**

Many of the innovative programs addressing load control and demand response rely on advanced metering technologies. These technologies are information intensive and require access to high-speed communications infrastructure. As discussed above, substantial portions of the many Cooperatives' service territories lack access to such infrastructure, and none has broadband Internet access throughout its entire service territory.

### **Cost Effect on Member-Consumers**

The Cooperatives generally base their evaluation of programs and requirements on three standards: (i) they must provide economic benefit for the member-consumers, individually and collectively; (ii) they must not be permitted to interfere in any way with the reliable operation of the distribution system, and (iii) they must support protection of the safety and well-being of the Cooperatives' member-consumers and employees, as well as of the general public. We will hereinafter refer to this as the "Member-Consumer Benefit Analysis."

For example, the development and installation of a group of technologies collectively referred to as "smart grid" has received considerable recent attention. Where one or more of these



technologies is suitable for a particular Cooperative, applying the Member-Consumer Benefit Analysis, that Cooperative already has an incentive to deploy it and is likely to do so. Indeed, Cooperatives have already deployed outage notification systems and “SCADA: because of the operational benefit to their members. However, broad mandates for the expenditure of the Cooperatives’ resources on complete smart grid development risk missing the mark. Implementation of these technologies is not considered by the Cooperatives to be an end in itself. The level of investment in such technologies should be commensurate with the consumer benefit realized from the investment. Cooperatives are extremely reluctant to impose the cost of such investment on their member-consumers unless they will clearly benefit from those investments. Furthermore, the Member-Consumer Benefit Analysis may lead different Cooperatives to make different investment choices with respect to the same technologies, depending on their particular circumstances.

The optimal level of development and investment in technologies will differ according to local conditions on each system, local consumer interest, and individual system needs.

### **Baseline for Measurement**

Some initiatives to promote conservation and energy efficiency seek to establish specific numerical or percentage targets for utilities. Because the Cooperatives have proactively promoted conservation and energy efficiency among their member-consumers for decades, they have already achieved much of the improvement that may not have been as actively pursued on other types of system. The Cooperatives’ mission is reliability and low cost, rather than profits, and they have already captured the first tier of available improvements. Colloquially, the Cooperatives have already gathered the “low hanging fruit.” Requiring the Cooperatives to expand their already successful EE and DR efforts may impose higher costs and greater inconvenience on the Cooperatives’ and their member-consumers with less effect as compared to other utilities who have not started, just started, or recently revived dormant programs, and their consumers.

## Uncoordinated Regulatory Mandates

The Cooperatives and their power suppliers are subject to an extensive and sometimes overlapping regulatory scheme. With the exception of Powell Valley Electric Cooperative, the Cooperatives' rates and service are regulated by the Commission. The Cooperatives are subject to additional RUS regulatory oversight, as they borrow from the RUS. Other lenders may impose mortgage or indenture covenants, usually addressed to the continued financial strength of the Cooperative. Wholesale power agreements are generally regulated by FERC. Most wholesale power suppliers are subject to some degree of Securities and Exchange Commission regulation. While the rating agencies (Moody's, Fitch, and Standard & Poor's) do not regulate directly, their concerns and suggestions can have a very real impact on how rated companies conduct their businesses. There are reliability and safety standards administered by the SERC Reliability Corporation ("SERC," formerly known as the Southeastern Electric Reliability Council) and the North American Electric Reliability Corporation ("NERC"). The Internal Revenue Service enforces conditions on the Cooperatives' tax exemptions, including limitations on service to non-members and unrelated business income. As the administrator of the regional transmission system and power markets, PJM indirectly requires the Cooperatives, through their wholesale power suppliers, to conform to an extremely broad spectrum of standards and mandates, including generation reserves, transmission congestion attributes, and data reporting. In the case of the Cooperatives, the ultimate regulators are the member-consumers who own the utility and provide all of its revenues.

While each of these regulators and quasi-regulators has a distinctive and important role, and there are some clear lines demarking the limits of their authority, responsibility for new areas, such as DR and EE mandates and incentives, are less clear. As a consequence, mandates and incentives relating to the same, overlapping, or closely-related activities can come from a variety of well-intended, but uncoordinated, authorities. Aside from the costs associated with implementation and reconciliation of uncoordinated programs, there is the possibility that a behavior mandated by one authority could be incentivized as "voluntary" by another, or worse, that mandates or incentives could conflict.



As wholesale energy markets have developed, DR and EE programs are increasingly available in the different markets administered by the RTO at the wholesale level. An important aspect for utilities to consider in implementing DR and EE programs at the retail level is how these programs may interact with comparable programs administered by the RTO at the wholesale level. DR and EE programs provide important load reduction and other benefits at the wholesale and the retail level but, in order to get the full benefit of these reductions, appropriate M&V standards must be in place. As explained more fully below, appropriate M&V standards need to be implemented at both the wholesale and retail level to ensure, among other things, that the promised DR and EE actually is occurring as promised, that consumers are not getting paid twice for the same DR or EE, and that the DR and EE initiatives are not being double counted.

#### *DR and EE Participation at the Wholesale Level*

The generation and transmission utilities in Virginia were required to join PJM, the RTO that coordinates the movement of electricity in thirteen states and the District of Columbia.<sup>21</sup> PJM is regulated by FERC and operates the wholesale electricity market by overseeing transmission planning and operations and by dispatching generation when needed to meet energy demand in the region. PJM's energy market operates much like a stock exchange, with market participants establishing a price for electricity by matching supply and demand. Generators offer their energy into the market and the offers are stacked from lowest cost to highest cost until all demand is met. The price charged for energy is the locational marginal price ("LMP") which reflects the value of the energy, congestion, and losses at the specific location and time it is delivered. LMP represents the marginal cost to provide energy in a specific location, and all suppliers providing energy at that location are paid the LMP price regardless of their actual offer.

PJM operates a number of markets in which generation and DR resources can participate. DR resources have always been able to participate to some extent in the PJM markets and, in

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<sup>21</sup> The states participating in PJM are Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

recent times, the opportunity to participate has expanded. This expansion has occurred largely due to FERC's renewed emphasis on allowing these resources to participate in the wholesale markets on the same basis as generation resources. Currently, DR resources are able to participate in the PJM Energy, Day-Ahead Scheduling Reserve, Capacity and Synchronized Reserves, and Regulation markets, while EE resources are able to participate in the Capacity market. Additional information about these markets can be found in Exhibit C. DR and EE resources participating in these markets can compete equally with generation resources and are paid for performance in the same manner as generation resources.

#### *Curtailment Service Providers*

DR and EE resources can participate in PJM's wholesale programs either by becoming a PJM member and participating directly in the markets or by working through an aggregator, identified as a curtailment service provider ("CSP"). Historically, large industrial companies have become PJM members and participated directly in the wholesale markets because the economics of doing so are in their favor. Northern Virginia Electric Cooperative currently helps enroll its largest and most sophisticated commercial and industrial customers, as well as some of its non-jurisdictional customers, in the wholesale DR and EE programs of PJM. The advent of CSPs, in recent times, allows smaller customers that normally are not able to participate in the market to also participate. The CSP, for a fee, combines the load reduction of a number of smaller customers and bids the aggregate load reduction into the PJM markets.

#### *Measurement and Valuation in Wholesale Markets*

Despite these opportunities for DR and EE resources to participate in PJM's markets, M&V has been and continues to be a concern. The increased participation in wholesale markets by smaller customers, generally through CSPs, has compounded these concerns due to the difficulty involved in measuring whether individual consumers are actually reducing load at the time promised. PJM is currently working on developing and implementing M&V procedures to ensure that DR and EE resources are performing when required. These M&V measures are necessary to ensure that the load reduction at the wholesale level occurs when needed and at



the amounts promised, so that consumers are not paying for actions not taken and so that system reliability is maintained. M&V is needed at the retail level to ensure that the load forecasts are accurate and to help ensure that the same DR and EE are not being counted at both the retail and wholesale level.

Measurable and verifiable DR and EE provide benefits for the system, for load as a whole by reducing overall demand, and for the individual consumers who engage in DR and EE. It is also important to realize that effective implementation of DR and EE programs will require coordination with the wholesale markets. The Cooperatives have engaged in DR and EE initiatives and will continue to do so while attempting to coordinate and maximize the benefits available at the wholesale and retail level in a manner that serves the best interests of their member-consumers.

#### *Coordination between Retail and Wholesale DR and EE Programs*

The ability of DR and EE resources to participate in the wholesale markets, especially at the small consumer level, has created new challenges for DR and EE at the retail level. One challenge is the potential for “double dipping,” where consumers may be paid for the same reduction at both the wholesale and the retail levels, which will produce additional costs for all consumers. The double-dipping possibilities become more egregious if appropriate M&V processes are not in place to ensure that the EE resource is working or that the DR resource is actually shifting or reducing usage.

This double dipping can occur in a number of ways. For example, many retail and federal programs attempt to foster the use of energy efficient appliances by offering rebates. Of course, the cost of these rebates is ultimately borne by all consumers. Consumers who take advantage of these rebates are able to purchase the appliances at a reduced price and, since the appliances use less energy, these consumers will also benefit from a reduction in their retail electric bill. Then, if EE programs expand such that a consumer or an aggregator is able to accumulate and bid appliances into the capacity market as an EE resource, the consumer would receive additional payments from that market. Therefore, in support of the EE of this

consumer, other consumers will have paid not only the cost of the rebate but also the added cost of the EE resource that was bid into the wholesale market.

*Implementation and Policy Considerations Going Forward*

If DR and EE programs are mandated without adequate consideration of implementation and M&V issues, the benefits of DR and EE are in danger of being lost in the zeal to do as much as possible in the shortest period of time. All implementation and compensation issues must be thoroughly evaluated to ensure that the costs and payments are equitable and that the benefits are real.



# Assessments



# TAB 6



## DYNAMIC RATES

### Definition - Dynamic Rates

Dynamic rates are active, changing rates that are reflective of dynamic pricing. “Dynamic pricing” describes programs that pass wholesale price signals through in pricing to retail consumers (a “price-responsive load”). Dynamic pricing includes real-time pricing. Time-of-use rates may or may not be “dynamic,” depending on whether they pass through wholesale price signals or merely approximate general corresponding patterns in time and price.

### Overview

Proponents of dynamic rates and dynamic pricing contend that “[i]mplementation of dynamic pricing is the most efficient means to introduce elasticity into markets.”<sup>22</sup> The theory is that if consumers of electricity have to pay more when demand is highest, they will modify their consumption patterns to reduce their own demand or shift it to periods of lower demand when costs are lower.

### Impediments

#### *Statutory Impediments*

There are no statutory impediments to implementation of dynamic rates by the Cooperatives. If other impediments are overcome, and if a Member-Consumer Benefit Analysis demonstrated value to member-consumers, the Cooperatives could implement dynamic rates.

#### *Regulatory Impediments*

There are no regulatory impediments to implementation of dynamic rates by the Cooperatives. If other impediments are overcome, and if a Member-Consumer Benefit Analysis demonstrated value to member-consumers, the Cooperatives could implement dynamic rates.

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<sup>22</sup> *Policy and Technical Issues Associated with ISO Demand Response Programs*, National Association of Regulatory Utility Commissioners (“NARUC”) (July 2002), at 41.

### *Organizational Impediments*

The Cooperatives, by their structure, are designed to pass savings on energy costs along to their member-consumers. Many of the Cooperatives already have a variety of programs in place to help reduce the demand for electricity during the peak period. Such programs range from residential load control of electric water heaters and HVAC equipment to tariffs and riders that provide credits or other incentives to large commercial or industrial customers who manage their electricity use in a way that limits their contribution to the peak period demand. In most residential load management programs the customer allows the Cooperative to install a switch that the Cooperative uses to remotely control the connected appliance.

In commercial and industrial applications, the electric utility or another service provider informs the consumer of upcoming peaks, thus allowing the customer to curtail use during the peak time and receive an economic benefit. The metering equipment necessary to monitor commercial and industrial participation in such programs is provided at no additional costs to the customer, and additional facilities requested by the customer for the purpose of receiving notice of demand periods are provided under the service provider's Terms and Conditions or Excess Facilities tariff. This is not a mandated process and is not an option offered to or exercised by all customers. Overall, these programs have the potential to reduce coincident peak demand.

Demand-response programs and the metering and communications services associated with them already accomplish the goal of enabling "the customer to manage energy use and cost through advanced metering and communications technology." Energy Policy Act of 2005, § 1252(a)(14) ("EPAct 2005"). Any additional retail time-based rates will come with significant development and implementation costs while producing no offsetting value, at least not until wholesale rates also reflect time-based savings that can be passed on to the consumer.



### *Physical Impediments*

**Billing Systems.** The use of time-based rates would also require modifications to existing billing statements to include at least three additional pieces of billing data (consumption during each time period, kWh rate for each period, and calculated charges for each period) to comply with the billing information requirements of 20 VAC 5-312-90(I)(1) (2005). Such significant changes would come close on the heels of the many information technology changes that were made to accommodate retail access. The costs of the system changes will ultimately be borne by the member-consumers of the Cooperatives with no guaranteed benefit.

**Meters.** When requested by a member-consumer, the Cooperatives will provide additional metering data, including time-based consumption data. The member-consumer is typically required to pay for any additional metering or communication equipment beyond what is regularly necessary for gathering usage information for the applicable tariff. In most cases where such advanced metering is requested, it is related to the member-consumer's desire to better understand its usage patterns, in order to identify ways to further reduce peak billing demand or to monitor the energy use of particular equipment or processes within a facility.

Since the benefits of such advanced metering services are limited to the customer requesting such services, it is only fair that the customer receiving the benefits pay the costs of such services. Until time-based rates become practical and valuable for all customers, there is no value in providing such metering equipment to all customers upon request, unless the customer requesting the equipment bears the full cost of such service.

**Ownership and Control of Metering Devices.** In 2001, the General Assembly specifically assigned the distribution Cooperatives the right and duty to be the sole providers of metering services within their certified territories. This remains an appropriate public policy for Virginia. Generally, the Cooperatives have a greater proportion of residential

and small commercial loads, and smaller industrial loads, than do IOUs. The Cooperatives, because of their member-owned corporate structure, have an ongoing incentive to provide their member-consumers with service at a low cost. As the entity responsible for billing its own members and performing the enrollment functions related to retail access, as well as the party responsible for the safety and accuracy of metering equipment and the safety of the people installing meters, it is imperative that the Cooperatives retain ownership of the meter.

If competitive service providers offer time-based metering, the distribution utility responsible for providing the metering services should retain ownership of the meter, have access to the meter data, and be permitted to charge the competitive provider or the customer benefiting from the time-based rate for the meter and costs associated with gathering the additional metering data. Additionally, the utility providing the meter should be permitted to charge the competitive provider for the cost of the meter, its installation, and other charges incurred in developing, implementing, and operating the internal systems necessary to accommodate various billing systems.

As an alternative, the competitive provider may desire to install a separate meter beyond the distribution utility's meter to monitor time-of-use consumption. The competitive provider could access the "sub-meter" via telephone or the internet to acquire billing data for generation services. Consumption data measured at the utility's meter would still be used for month-end balancing and settling of wholesale transactions.

### *Contractual Impediments*

The Cooperatives purchase power through contracts with their wholesale power suppliers that presently offer limited time-based pricing options. Time-of-use pricing is embedded in the price under the terms of these existing contracts. The costs of the distribution system – which comprise the other main cost category for the Cooperatives – are the same regardless of when the electricity is used by the consumer. Therefore, the Cooperatives will need to work in



conjunction with their wholesale power suppliers to be able to pass through to member-consumers any savings based on either wholesale power or operating cost savings.

For some Cooperatives, the wholesale pricing component most closely related to a time-based activity is the demand charge from ODEC, the wholesale power provider for several of the Virginia distribution Cooperatives. For the mainland Virginia ODEC members, this charge is based on each member Cooperative's peak demand, measured in kilowatts, during Dominion Virginia Power's one hour peak demand period each calendar month.<sup>23</sup>

Generally speaking, the Cooperatives that are not associated with ODEC purchase all of their power supply requirements through wholesale power contracts that offer only a flat energy (price per kWh) rate for almost all purchases.<sup>24</sup> There is no price variation reflecting time of day, or day of month, for these purchases. Given that there are no real-time cost variations on the wholesale side for most Cooperatives, there is not a way to offer higher or lower time-based charges without creating subsidies within and across rate classes for those Cooperatives.

For customers that qualify for Northern Virginia Electric Cooperative's HV-1 tariff, that Cooperative has offered dynamic rates that reflect the PJM market place on an hour-by-hour basis, so that customers may choose to curtail their load during high price hours.

### *Financial Impediments*

Until the Cooperatives' wholesale pricing includes a more transparent time-of-use component, the benefits of a real-time pricing ("RTP") program are not likely to outweigh the administrative costs of implementing such a program. The key determinant, as stated by FERC and the EAct 2005, is that "a time-of-day rate charged by an electric utility for providing electric service to each class of electric consumers *shall be determined to be cost-effective* with respect to each such class if the long-run benefits of such rate to the electric utility and its electric consumers in

<sup>23</sup> For A & N Electric Cooperative, the charge is based on its peak demand during Delmarva Power & Light Company's one hour peak.

<sup>24</sup> For Northern Virginia Electric Cooperative, there is some price variation reflected in the monthly or seasonal offerings associated with such purchases.

the class concerned are likely to exceed the metering and communications costs and other costs associated with the use of such rates.” EAct 2005, § 1252(a) (emphasis added).

The changes associated with adopting the new standards would be costly, time-consuming and, based on the experiences described in September 2005 State Corporation Commission Report to the Commission on Electric Utility Restructuring,<sup>25</sup> would likely have few participants and produce even fewer benefits. Even the simplest time-based rate would require the metering, acquisition, and analysis of at least twice as much data (kWh consumption during period A and period B) as is currently being collected (total kWh consumption during a billing period). Existing meters would need to be replaced or retrofitted to “time-stamp” the usage information. Communications and information technology systems may need to be upgraded to accommodate the acquisition and processing of the additional data.

#### *Market Impediments*

A national study of 43 electric utilities that offered some sort of RTP revealed that only three of the utilities surveyed had more than 100 participants, and 30 programs had “no participation in the RTP program.”<sup>26</sup> The survey also found most participants in the RTP programs did not adjust electricity use until the price reached \$0.80 per kWh.<sup>27</sup> Additionally, only one utility surveyed saw a greater than 1% reduction in peak demand and many of these programs are losing, not gaining, participants.<sup>28</sup> Finally, the survey revealed that 30% of the utilities with RTP programs have started to phase out the programs.<sup>29</sup> Other studies of RTP programs offered by various electric utilities across the country reveal that customer response is extremely variable

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<sup>25</sup> *Report to the Commission on Electric Utility Restructuring of the Virginia General Assembly and the Governor of the Commonwealth of Virginia*, State Corporation Commission (Sept. 1, 2005), available at [http://www.scc.virginia.gov/comm/reports/2005\\_intro.pdf](http://www.scc.virginia.gov/comm/reports/2005_intro.pdf) (last accessed Sept. 17, 2009).

<sup>26</sup> Ernesto Orlando Lawrence Berkley National Laboratory, *A Survey of Utility Experience with Real Time Pricing*, available at <http://certs.lbl.gov/PDF/54238.pdf> (last accessed Sept. 17, 2009).

<sup>27</sup> *Id.*

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*



and that those customers with on-site generation were more responsive than customers without.<sup>30</sup>

There are risks of additional, unintended consequences. For example, a reduction in peak demand could merely reflect a *shift* in the load to off-peak hours, not a reduction in overall energy use and emissions. If participation is low, the costs of implementing and administering the system may exceed the benefit. Some classes of consumers may not respond to price signals by reducing their demand. It is possible that a time-based metering program may not be in demand in a certain area but would be popular in another, or is not economically feasible in a particular market but would be successful in another. Time-of-use rates can provide significant savings for the user, but a significant investment in in-home automation is necessary to maximize savings. Such automation may be beyond the financial or technical ability of many residential users, thus limiting its application. The Cooperatives are reluctant to impose costs on many to benefit a few.

### Assessment

Many of the Cooperatives already have a variety of programs in place to help reduce the demand for electricity during the peak period. Such programs range from residential load control of electric water heaters and HVAC equipment to tariffs and riders that provide credits or other incentives to large commercial or industrial customers who manage their electricity use in a way that limits their contribution to the peak period demand. In most residential load management programs the customer allows the Cooperative to install a switch that the Cooperative uses to remotely control the connected appliance. Two Cooperatives have already filed retail time-of-use tariffs, but the current benefit of those tariffs is unclear.

As stated above, the Cooperatives have interruptible rates in place, primarily in commercial and industrial applications, whereby the Cooperative informs the consumer of expected peaks, at which time the customer can (or must) curtail use in order to receive an economic benefit. The

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<sup>30</sup> See *id.*; Hopper et al., available at [http://eetd.lbl.gov/EA/EMS/reports/NMPNC\\_LBNL\\_54761.pdf](http://eetd.lbl.gov/EA/EMS/reports/NMPNC_LBNL_54761.pdf) and at [http://eetdd.lbl.gov/EA/EMP/reports/57128\\_app.pdf](http://eetdd.lbl.gov/EA/EMP/reports/57128_app.pdf).



metering equipment needed for monitoring a commercial or industrial customer's participation in such programs usually is provided at no additional cost to the customer, but the costs of additional facilities requested by the customer for receiving notice of the peak demand periods are covered under the Cooperative's Terms and Conditions or an Excess Facilities tariff. Overall, these programs have the potential to reduce coincident peak demand, but they are voluntary and are not practical for many customers.

DR programs and the associated metering and communications services support the goal of enabling customer management of energy use and cost through advanced metering and communications technology, as called for in EPAAct 2005, § 1252(a)(14). However, there will be significant development and implementation costs, with little or no offsetting value or benefits, associated with any additional time-based retail rate offerings, at least until wholesale power rates are structured to reflect time-based savings that can be passed through to the consumer.

For these reasons, the Cooperatives do not believe they should be required to offer a time-based rate schedule or real-time pricing to all customer classes. The General Assembly should not attempt to create a single solution for all Cooperative consumers due to the myriad issues outlined within this Report. Each Cooperative should be permitted to assess these complex and interrelated goals and issues in determining whether to offer voluntarily RTP programs to consumers, or other programs and tariffs that would be optional to those consumers, where the benefit outweighs the cost to the individual member.

Virginia's Cooperatives should be permitted to make Member-Consumer Benefit Analysis based decisions about whether and to what extent they can or should offer a time-based metering program to all customers. Requiring the Cooperatives to offer customers time-based metering and time-based rate schedules, as well as the metering equipment necessary to offer such rates, conflicts with the goals of the cooperative business model.

By mandating that the Cooperatives offer these services, the General Assembly would be imposing a regulatory regimen on the Cooperatives in lieu of allowing market forces, best business practices, and prudent utility practices to govern services available to consumers. Each

Cooperative should be free to evaluate its programs and their costs, benefits, and other attributes, to determine whether to implement programs that are cost-beneficial to Member-Consumers.

Additionally, the Cooperatives should be permitted to decide whether to offer time-based metering data and equipment based on the desires of their membership. There is no value in offering such services and equipment without market demand. Finally, the distribution provider is responsible for enrolling customers, billing, and ensuring the safety and accuracy of the metering equipment, and therefore should be permitted to retain ownership and control of metering devices.

In summary, the desires, needs, costs and benefits of the Cooperatives' member-consumers should be the determining factors in deciding, on a cost-effective basis, the availability of advanced metering services from the Cooperatives, and the associated rates. Such services should not be mandated.





# TAB 7

## STANDBY RATES

### Definition – Standby Rate

A standby rate is a rate for standby service. Standby service is a type of electric service offered where the customer already has some means of generating electricity, and the utility's service is available "on standby" relative to the customer's or user's own generation. The utility usually stands ready to provide standby service in the event the customer needs to buy it.<sup>31</sup> Three examples of customer-specific arrangements made by Cooperatives are described below.

### Overview

The challenge with standby rates is not whether they can be offered, but how they should be priced. The Cooperatives believe that rates for standby service must capture the costs, including the risks and a share of the overhead, imposed on the system by the service. The alternative, imposing additional costs and risks on the other member-consumers, would be contrary to the Cooperatives' Member-Consumer Benefit Analysis. These costs and risks are likely to vary significantly from one customer to another. Accordingly, the Cooperatives have historically negotiated standby rates on a case-specific basis.

Central Virginia Electric Cooperative currently provides a service similar to standby service for the Tenaska gas-fired generator located in its service territory in Fluvanna County. In any given month that the generator is not a net producer of electricity into the PJM system, it becomes a retail customer of the Cooperative. Under this arrangement, the generator has been a customer during only six different months since 2005. This is an unusual case in that none of PJM, the plant, or the Cooperative knows whether the generator is a net consumer or not until after the month has ended, since one hour of operation at its normal output makes the generator a net producer for any given month. When selling to the generator, Central Virginia Electric Cooperative provides energy at a direct pass-through cost to Tenaska, based on PJM

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<sup>31</sup> See, e.g., Order Denying Reh'g, *AES Somerset, LLC v. Niagara Mohawk Power Corp.*, Docket No. EL03-204-001 (Jan. 21, 2005).

LMP pricing, plus a fixed charge in the billing to cover the Cooperative's administrative costs for the unusual arrangement.

Shenandoah Valley Electric Cooperative uses special contracts, separately negotiated, to provide any required standby service and capacity to a member requesting it. There may be specific monthly minimums to be met under such contracts based, in part, on the capacity and facilities required by the standby service customer, and what capacity and facilities the Cooperative has available. The construction of added facilities, if needed for such service, would be addressed by the contract and, in accordance with the Cooperative's Terms and Conditions for Providing Electric Distribution Service, may require a contribution-in-aid-of construction ("CIAC"). Energy is provided at Shenandoah Valley Electric Cooperative's standard rates, subject to the contractual monthly minimum.

Northern Virginia Electric Cooperative supplies standby service to a landfill that generates electricity by burning methane. This relatively new, contract-based arrangement involves a minimum demand component charged to the landfill, which covers the Cooperative's fixed costs. The contract also contains a standing large-power service rate for energy, billed as that energy is consumed. Distribution costs and all utility plant expenses are covered in the minimum charge. In addition, a CIAC payment was made by the landfill to cover the costs of initially interconnecting with Northern Virginia Electric Cooperative's distribution system.

## **Impediments**

### *Statutory Impediments*

There are no statutory impediments to implementation of standby rates by the Cooperatives. If other impediments are overcome, and if a Member-Consumer Benefit Analysis demonstrates value to member-consumers, the Cooperatives can, and do, offer standby rates.



*Regulatory Impediments*

There are no regulatory impediments to implementation of standby rates by the Cooperatives. If other impediments are overcome, and if a Member-Consumer Benefit Analysis demonstrates value to member-consumers, the Cooperatives can, and do, offer standby rates.

*Organizational Impediments*

There are no organizational impediments to implementation of standby rates by the Cooperatives. If other impediments are overcome, and if a Member-Consumer Benefit Analysis demonstrates value to member-consumers, the Cooperatives can, and do, offer standby rates.

*Physical Impediments*

As discussed, the circumstances of standby service customers are facility-specific and their requirements vary widely, as do the costs and risks of providing that service. Demand for standby service is inherently difficult to forecast, and is consequently more costly to hedge and serve.

*Contractual Impediments*

There are no contractual impediments to implementation of standby rates by the Cooperatives. If other impediments are overcome, and if a Member-Consumer Benefit Analysis demonstrates value to member-consumers, the Cooperatives can, and do, offer standby rates.

*Financial Impediments*

It is difficult to price standby service to capture the risks that it imposes on a Cooperative's system. Because the Cooperative cannot know when to expect to provide the service, it is difficult to hedge against the demand. Typically, standby rates must include a comparatively high, fixed monthly charge. Volumetric charges are ineffective at capturing the costs of a service that may only rarely entail the actual delivery of power. In contrast to the significant

effort required to price and provide the service, the revenues to the Cooperative are often comparatively low.

### *Market Impediments*

There are no market impediments to implementation of standby rates by the Cooperatives. If other impediments are overcome, and if a Member-Consumer Benefit Analysis demonstrates value to member-consumers, the Cooperatives can, and do, offer standby rates.

### **Assessment**

No mandate is necessary or appropriate. Cooperatives stand ready to offer standby service to their member-consumers, subject to appropriate pricing to capture all associated cost, including a share of overhead and a share of the risk and appropriate tariffs to pass those costs on to the customer receiving the standby service.

# TAB 8



## INTERRUPTIBLE RATES

### Definition – Interruptible Rates

An interruptible rate can be defined as “[t]he lower rate offered to a customer (generally a large industrial or commercial entity) who agrees to have electric service interrupted, usually during a high-demand period.”<sup>32</sup> Interruptible service usually contemplates rate schedules or contracts that anticipate and permit service interruption on short notice. This arrangement enables the electric distribution utility to deal with peak demands (and the associated high cost of service) by rationing the service. If properly administered, an interruptible rate can provide benefits for individual consumers and for the Cooperative as a whole.

### Overview

A&N Electric Cooperative, Central Virginia Electric Cooperative, Community Electric Cooperative, Mecklenburg Electric Cooperative, Northern Neck Electric Cooperative, Prince George Electric Cooperative, Rappahannock Electric Cooperative, Southside Electric Cooperative, Shenandoah Valley Electric Cooperative, and Northern Virginia Electric Cooperative have all initiated some form of interruptible rates that provide an incentive for certain member-consumers who are able to curtail or shift load at peak times. The challenge with interruptible rates is establishing the appropriate rewards or penalties to the member-consumer for complying or failing to comply with a curtailment signal from the Cooperative.

Central Virginia Electric Cooperative has offered an interruptible rate rider to its member-consumers since 1995. Since 2006, the rate rider has only been available to members with snowmaking equipment. Interruptible rates call for voluntary interruption by the member. For these rates, the demand component is essentially removed from the monthly charges if the member interrupts during all of the requested periods during the month. Should the member decide not to interrupt during a requested period, the demand component is charged. The

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<sup>32</sup> *IRC Staff Subcommittee Glossary*, NARUC, at 37.

design of the rates has been based on wholesale contract rates to assure that other member-consumers do not subsidize the members who choose interruptible service.

## **Impediments**

### *Statutory Impediments*

There are no statutory impediments to implementation of interruptible rates by the Cooperatives. If the other impediments are overcome, and if a Member-Consumer Benefit Analysis demonstrates value to member-consumers, the Cooperatives can and do offer interruptible rates.

### *Regulatory Impediments*

There are no regulatory impediments to implementation of interruptible rates by the Cooperatives. If the other impediments are overcome, and if a Member-Consumer Benefit Analysis demonstrates value to member-consumers, the Cooperatives can and do offer interruptible rates.

### *Organizational Impediments*

There are no organizational impediments to implementation of interruptible rates by the Cooperatives. If the other impediments are overcome, and if a Member-Consumer Benefit Analysis demonstrates value to member-consumers, the Cooperatives can and do offer interruptible rates.

### *Physical Impediments*

The effectiveness of interruptible rates in curtailing load during peak demand is dependent on good forecasts of system demand peaks, timely communicated to and acted upon by users. When the demand peaks are hard to predict, interruptible rates are less effective. When communication infrastructure and systems limit the ability to communicate curtailment signals, interruptible rates are less effective. Most significantly, many interruptible rates provide only



for “voluntary” curtailment by users. This can make the interruptible rate less effective, and also makes it critically important to strike the right balance of rewards and penalties for compliance and failure to curtail when signaled. Users may be unable to curtail unless they have access to some other generation source, such as distributed generation, during the curtailment.

#### *Contractual Impediments*

Contracts and tariffs implementing interruptible rates must be flexible enough to adapt to changes in wholesale power markets, discussed further under market impediments, below. In addition, some Cooperatives do not receive meaningful wholesale pricing signals from their wholesale power providers that would make interruptible rates an effective tool for reducing peak demand on their systems.

#### *Financial Impediments*

There are a number of financial risks, rather than impediments. First, interruptible rates have the potential, by merely shifting demand in time, of encouraging a net increase in energy use. Also, there is tremendous potential for “double dipping” or adopting other ways of “gaming” various incentives such that the other member-consumers end up paying for multiple subsidies of the same curtailment behavior. Monitoring and verification are critical components of an effective, beneficial interruptible rate.

#### *Market Impediments*

Allowing for changes in market design is a major risk of any interruptible tariff or contract. For the rate to provide a meaningful benefit to the system, curtailments have to be aligned with market signals. As components of the wholesale power market evolve and change, the interruptible rate should change as well. For example, since implementing its Reliability Pricing Model in 2006, PJM has modified its capacity construct numerous times. Such a change could render an interruptible rate instantly stale and ineffective if the rate is not adjusted to account for the changed market design.



## Assessment

Cooperatives can and do offer interruptible rates. There are challenges in properly structuring the applicable tariff or contract, and physical constraints may mean that interruptible rates are not effective for some users. However, no mandate is necessary.

# TAB 9

## RATES FOR PURCHASES OF ELECTRICITY FROM RENEWABLE SOURCES

### Definition – Renewable Energy

“Renewable energy” means energy derived from sunlight, wind, falling water, biomass, sustainable or otherwise, (the definitions of which shall be liberally construed), energy from waste, municipal solid waste, wave motion, tides, and geothermal power, and does not include energy derived from coal, oil, natural gas, or nuclear power. Renewable energy shall also include the proportion of the thermal or electric energy from a facility that results from the co-firing of biomass.<sup>33</sup>

### Overview

Renewable energy is an important component of the Commonwealth’s energy future, but cannot be a complete substitute for energy generated with fossil and nuclear fuels. The Cooperatives applaud the development of economically-viable renewable energy resources, but they are not generators and generally do not have direct control over their generation resource mix. The Cooperatives would like to be able to offer green energy alternatives to their members who would like to choose that option, but there are technical, market, and contractual barriers to their ability to procure renewable energy and to directing that particular energy to particular meters. These impediments are addressed in more detail below, and in comments filed by the Cooperatives with regard to the Commission’s Renewable Portfolio Standards on February 4, 2008, which are attached hereto as Exhibit G.<sup>34</sup>

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<sup>33</sup> Va. Code § 56-576.

<sup>34</sup> Comments of the Virginia Electric Cooperatives, the VMD Association of Electric Cooperatives, and Old Dominion Electric Cooperative, Case No. PUE-2007-00107 (Feb. 4, 2008).



## Impediments

### *Statutory and Regulatory Impediments*

When legislation to terminate capped rates and customer choice was enacted in Virginia in 2007, provision was made for customers who might wish to choose to buy only power generated from renewable resources. Section 56-577(A)(5) provides:

5. After the expiration or termination of capped rates, individual retail customers of electric energy within the Commonwealth, regardless of customer class, shall be permitted to purchase *electric energy provided 100 percent from renewable energy* from any supplier of electric energy licensed to sell retail electric energy within the Commonwealth, except for any incumbent electric utility other than the incumbent electric utility serving the exclusive service territory in which such a customer is located, if the incumbent electric utility serving the exclusive service territory does not offer an approved tariff for electric energy provided 100 percent from renewable energy.

*Id.* (emphasis added). The only practical method for providing a renewable energy rate is to procure renewable energy certificates ("RECs"). The certificates, also called "Renewable Energy Credits," Tradable Renewable Certificates ("TRCs") or "green tags," are traded in several markets and are available in small quantities if that is desired. Consequently, most cooperatives and IOUs began planning to offer renewable energy rates by procuring RECs in quantities sufficient to associate with 100 percent of the power anticipated to be sold to customers choosing a renewable or "green energy" tariff.

In Case No. PUE-2008-00044, however, the Commission determined that merely offering power along with associated RECs would not satisfy the statutory requirement for "electric energy 100 percent from renewable energy." Accordingly, Virginia does not recognize RECs as an acceptable method to offer renewable energy rates.

### *Organizational Impediments*

The Cooperatives generally do not control their power generation resource mix. They purchase substantially all of their power requirements under wholesale power contracts. In addition, they do not control or direct the transmission of electric energy from generators, over the transmission grid, to their own delivery points, even if it were possible to do so.

### *Physical Impediments*

Electric power is fungible. Once energy is delivered from a generator onto the grid, it is commingled with all the other energy on the grid. There is no way to tag or identify electrons generated from renewable resources to differentiate them from other electrons on the system. While commerce and regulation entertain the convenient fiction that power can be delivered by a designated path from a particular source to a particular sink, in physics there is no mechanism (or reason) to track the path of particular energy. The only way to ensure that a particular consumer can be assured of using *only* renewable energy is to disconnect from the grid and interconnect with one or more physically separate renewable generators. Of course, once such a consumer is off the grid, it is no longer a utility customer.

Another physical impediment relates to the reliability of some forms of renewable energy. Solar and wind-powered generation depend on the availability of resources that are not constant, are sometimes hard to forecast, and cannot be stored. Moreover, the best locations for harnessing these sources (mountain tops, deserts, and off-shore) are often remote from transmission system access. Other resources, such as biomass and bio-fuels, are more reliable, but subject to market disruptions of supply.

Finally, in addition to the difficulty encountered in tracking the flow of electrons, there is an added dimension of difficulty found in instantaneously matching supply and demand. It is essentially impossible to ensure that 100% of a consumer's demand on a cold winter morning is met exclusively from renewable sources such as wind and solar. The need to maintain system reliability requires that demand be instantaneously supplied by whatever resources are immediately available.

### *Contractual Impediments*

As discussed above, most of the Cooperatives procure substantially all of their power through wholesale power contracts, and generally the wholesale power supplier, not the Cooperative,



controls the resource mix.<sup>35</sup> These wholesale transactions are subject to FERC's exclusive regulatory jurisdiction.

An example may be illustrative. Central Virginia Electric Cooperative is restricted from purchasing energy from any other supplier under its wholesale power contract. There is a contract provision that requires the supplier to purchase and deliver to Central Virginia Electric Cooperative renewable energy sufficient to meet any state mandate. The cost for that energy will be passed through to Central Virginia Electric Cooperative at the market cost for its purchase.

The contract provisions limit the ability to offer a member a choice of green power that is not mandated by the state, since Central Virginia Electric Cooperative cannot purchase energy outside its contract. On the other hand, if the state mandates that all energy supplies must include a fixed percentage of green energy, Central Virginia Electric Cooperative would be forced to comply and all members would share the cost.

After May 2012, Central Virginia Electric Cooperative could contractually make renewable energy available to its member-consumers under a new contract; however, there would still be significant impediments at that time. If the renewable energy is made available on a voluntary basis, there may be issues with meeting minimum requirements for scheduling energy through the PJM system. If the renewable energy is purchased in larger scheduling blocks to meet the PJM minimums, members who do not choose the renewable power would subsidize the purchases, as the excess renewable energy would have to be included in the overall wholesale supply mix. If the renewable energy comes from a single source, the energy would only be available when that source was on-line. If full-time renewable energy was required, it is highly likely that multiple renewable energy sources would have to be aggregated, which would increase costs and lead to over-purchases, with the excess energy and its cost being subsidized

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<sup>35</sup> It should be noted that Northern Virginia Electric Cooperative is not subject to the same contractual impediments that some of the other Cooperatives face. Northern Virginia Electric Cooperative presently can, does, and will continue to, seriously evaluate and appropriately include available renewable resources as potential options for meeting its on-going power supply requirements.



by member-consumers who did not choose renewable energy. If the limits of access due to minimum scheduling requirements lead the state to require that Central Virginia Electric Cooperative continue to maintain the systems to allow for retail choice (to allow the members who want renewable energy to have access to other suppliers should any ever decide to offer retail service in Central Virginia Electric Cooperative territory), member-consumers not choosing the renewable energy would subsidize the systems that allow that choice.

#### *Financial and Market Impediments*

Typically, power from renewable resources is more costly than power from fossil or nuclear fuels. In addition, growing demand for renewable energy, driven by statutory and regulatory mandates on the West Coast and in the Northeast, is applying upward pressure to prices that are already higher. In some cases, renewable energy can command a higher price even when its renewable attributes have been commercially separated from the power through sales of associated RECs to other parties.

#### **Assessment**

The Cooperatives could offer renewable energy rates to their member-consumers who would like to choose that option, provided, first, that those rates can be based on a bundling of undifferentiated power with RECs, and, second, that the rate captures the cost of the RECs and recovers that cost from the member-consumers who choose the green tariff. Legislation will likely be necessary for renewable energy rates structured on this model to be valid in Virginia. Overall, however, the challenges facing the Virginia Cooperatives are similar to those encountered by the energy industry as a whole – including the challenge of balancing the national desire for more renewable resources with the interests of their member-consumers in continuing the long-standing tradition of delivering reliable power supply at an affordable price.



# TAB 10



## RECOMMENDATIONS

The Cooperatives respectfully recommend the following:

1. Enact legislation clarifying the validity in Virginia of rates for electricity from 100 percent renewable energy using RECs to qualify power sold under such rates as 100 percent renewable energy.
2. Enact legislation clarifying that installation of prepaid meters in support of prepaid service, and the operation of those meters to terminate service when prepayment is exhausted, does not violate any pre-termination notice requirement.
3. Recognize the Cooperatives' legacy of proactive leadership in conservation, demand response, and energy efficiency in benchmarking future initiatives.
4. Adopt an analysis equivalent to the Cooperatives' Member-Consumer Benefit Analysis model in deliberations of future initiatives that may affect the Cooperatives, and refrain from enacting mandates that will impose costs on Cooperative member-consumers without specific commensurate benefits to those same member-consumers.



# TAB 11



## CLOSING

The Cooperatives are proud of our legacy of proactive leadership in conservation, demand response and energy efficiency over many years. We are grateful to our member-consumers for the trust they repose in us as stewards of their property and as their electric service providers. We appreciate this opportunity to communicate in a more comprehensive and thoughtful medium with our leaders in Virginia about our initiatives and challenges. We look forward to continuing our collaboration with policy makers, regulators, other utilities, other stake-holders, and most of all, our member-consumers, as we work together to ensure that Virginia's future includes reliable, affordable power and a clean, healthy environment.



# TAB A



**EXHIBIT A: GLOSSARY****Alternating Current (AC)**

Electric current that reverses its direction regularly.

**Alternative Fuels**

Sources of heat energy other than coal, nuclear power, natural gas or oil used to generate electricity; sources are usually renewable materials such as wood chips, solar power, wind power, or garbage.

**Ampere**

Unit of measurement of electric current. It's proportional to the quantity of electrons flowing through a conductor past a given point in one second.

**Base Load**

The minimum electric load over a given period of time.

**Biomass Conversion**

The process of producing fuels or energy from renewable organic matter such as plants or animal wastes; fuel produced by this process is sometimes used to generate electricity.

**Blackout**

A temporary loss of electricity in an area because of failure of generation or transmission equipment.

**British Thermal Unit (Btu)**

Amount of heat needed to raise the temperature of one pound of water by one degree Fahrenheit.

**Brownout**

A voltage reduction during an electrical shortage that causes conditions such as dim lights.

**Bulk Power**

Large amounts of electricity transported over high-voltage transmission lines.

**Capacity**

The load for which a generating unit, generating station, or other electrical apparatus is rated by the user or the manufacturer.

### **Capital Credits**

Any payments made by cooperative members in excess of the cost of service are essentially capital investments by the members and are assigned to each member's Capital Credit account.

### **Circuit**

A conductor, such as wire, through which electric current flows; also the path electric current takes from the power source to the device using the power and then back to the source.

### **Clean-Coal Technology**

A broad term covering any type of new technology for reducing emissions from coal-fired power plants.

### **Cogeneration**

Using waste heat from an industry to produce electricity, or from electric utilities to produce steam for an industry or hot water for a building.

### **Conductor**

Any substance, usually metallic, that will carry electricity.

### **Curtailed service provider (CSP)**

An independent, for-profit company, sometimes associated or affiliated with an electric utility, that generally acts as an aggregator to provide DR- and EE-related services to its customers. CSPs also act as intermediaries between a customer and a utility when demand reduction or curtailment is ordered.

### **Current**

A flow of electrically charged particles. The unit of measurement is an ampere.

### **Customer Classifications**

Customers are categorized and charged by primary use of electricity. These include: residential, commercial, industrial, public street and highway lighting, public authorities, railroads, and railways.

### **Delivery Point**

The connection between two lines where one utility supplies power to another utility's system.

### **Demand**

The rate at which electric energy is delivered to a system. The primary source of demand is the power-consuming equipment of the customers.



**Demand Response (DR)**

As defined by the Virginia Code, “measures aimed at shifting time of use of electricity from peak-use periods to times of lower demand by inducing retail customers to curtail electricity usage during periods of congestion and higher prices in the electrical grid.”<sup>36</sup>

**Distribution System**

The poles, wire, and transformers used to deliver electric energy from a bulk power supplier to the consumer.

**Double Dipping**

Circumstances in which consumers get paid at both the wholesale and the retail levels for the same reduction in energy usage, which produces additional costs for all consumers.

**Dynamic Pricing**

While not being specifically defined in federal or Virginia statutory law, the concept of dynamic pricing describes programs which pass through wholesale price signals in pricing to retail consumers (a “price-responsive load”), or describes tariffs that incorporate a time-varying price. Dynamic pricing includes real-time pricing. Implementation of dynamic rates would be made possible by advanced metering technologies, new communications technologies, load control hardware and software, and new control and management systems.<sup>37</sup>

**Electric Cooperative**

Independent, locally-owned business enterprise, incorporated under the laws of the state in which it operates. Consumers who get service are members of the cooperative and share responsibility for its success or failure along with the benefits they receive.

**Electric Energy**

As commonly used in the electric utility industry, electric energy is measured in kilowatt-hours.

**Electron**

Any of the negatively charged particles that form a part of all atoms.

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<sup>36</sup> See Va. Code § 56-576.

<sup>37</sup> *Policy and Technical Issues Associated with ISO Demand Response Programs*, NARUC (July 2002) at 1, 2, 7, 8, 39, et seq.



## **Energy Audit**

A study of residential, commercial, or industrial buildings that shows energy users how to save money by using energy more efficiently.

## **Energy Efficiency (EE) Program**

As defined by the Virginia Code, an energy efficiency program is “a program that reduces the total amount of electricity that is required for the same process or activity implemented after the expiration of capped rates. Energy efficiency programs include equipment, physical, or program change designed to produce measured and verified reductions in the amount of electricity required to perform the same function and produce the same or a similar outcome. Energy efficiency programs may include, but are not limited to, (i) programs that result in improvements in lighting design, heating, ventilation, and air conditioning systems, appliances, building envelopes, and industrial and commercial processes; and (ii) measures, such as but not limited to the installation of advanced meters, implemented or installed by utilities, that reduce fuel use or losses of electricity and otherwise improve internal operating efficiency in generation, transmission, and distribution systems. Energy efficiency programs include demand response, combined heat and power and waste heat recovery, curtailment, or other programs that are designed to reduce electricity consumption so long as they reduce the total amount of electricity that is required for the same process or activity. Utilities shall be authorized to install and operate such advanced metering technology and equipment on a customer's premises; however, nothing in this chapter establishes a requirement that an energy efficiency program be implemented on a customer's premises and be connected to a customer's wiring on the customer's side of the inter-connection without the customer's expressed consent.”<sup>38</sup>

## **Energy Efficiency Rating (EER)**

A measure of how efficiently an appliance uses energy. Determined by dividing the Btu per hour output by the number of watts used. A higher EER means greater efficiency.

## **Federal Energy Regulatory Commission (FERC)**

The federal agency responsible for regulating, *inter alia*, rates for the wholesale sale of electric energy and the transmission of electric energy in interstate commerce.

## **Generation Plant**

A plant that has generators and other equipment for producing electricity.

## **Ground**

A conducting body (the earth or object connected to the earth) whose potential is zero and to which an electric circuit can be connected.

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<sup>38</sup> See Va. Code § 56-576.

**Heat Pump**

A system that supplies both space heating and cooling. In the heating cycle, the heat pump removes heat from the outside air and pumps it indoors. When cooling, the heat pump works in reverse, using a heat exchanger and compression system similar to a refrigerator.

**Hydroelectricity**

Producing electricity by water power, usually falling water that turns a turbine.

**Insulator**

A nonconductor, usually of glass or porcelain, for insulating and supporting electric wires.

**Interconnection**

A tie permitting the flow of electricity between the facilities of two electric systems.

**Interruptible Rate**

Lower rate offered to customers willing to have electric service interrupted, saving the utility from providing more expensive power.

**Investor-Owned Utility (IOU)**

Tax-paying, for-profit businesses usually financed by the sale of securities, engaged in the provision of utility services to the public at large. Often corporations owned in shares sold to the public, organized in Virginia as public service companies.

**Kilowatt (kW)**

A unit of electrical power equal to 1,000 watts.

**Kilowatt-hour (kWh)**

A unit of energy or work equal to 1,000 watt-hours. The basic measure of electric energy generation or use. A 100-watt light bulb burning for 10 hours uses one kilowatt-hour.

**Line Loss**

Electric energy lost in the process of transmitting it over power lines.

**Load**

The amount of electric power delivered or required at any specified point on a system. Load originates at the power-consuming equipment of the customers.

**Measurement & Verification (M&V)**

Under the Virginia Electric Utility Regulation Act, as stated in § 56-576 of the Virginia Code, "Measured and verified" means "a process determined pursuant to methods accepted for use by utilities and industries to measure, verify, and validate energy savings and peak demand



savings. This may include the protocol established by the United States Department of Energy, Office of Federal Energy Management Programs, Measurement and Verification Guidance for Federal Energy Projects, measurement and verification standards developed by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), or engineering-based estimates of energy and demand savings associated with specific energy efficiency measures, as determined by the Commission.” For purposes of this Report, we will define “Measurement & Verification” as guidelines and methods for measuring and verifying the savings associated with energy efficiency, demand response, or other, similar programs, determined by comparing the energy use before and after the installation of the subject energy conservation measures. A proper determination of savings will include adjusting for changes that affect energy use but that are not caused by the conservation measures.

**Megawatt (MW)**

1,000 kilowatts or 1,000,000 watts.

**Megawatt-hour (MWh)**

1,000 kilowatt-hours.

**Member-Consumer Benefit Analysis**

The three-part standard on which Cooperatives generally base their evaluation of programs and requirements: (i) they must provide economic benefit for the consumer both individually and collectively; (ii) they must not be permitted to interfere in any way with the reliable operation of the distribution system, and (iii) they must support protection of the safety and well-being of the Cooperatives' member-consumers and employees, as well as of the general public.

**Meter**

Device that measures the amount of electricity used.

**Old Dominion Electric Cooperative (ODEC)**

A wholesale power supply (generation and transmission) cooperative that supplies full requirements power under long-term contracts to nine cooperatives in Virginia, one in Maryland, and one in Delaware.

**Outage**

Interruption of service to an electric consumer because a power plant, transmission line or other facility is not operating.

**Passive Solar Energy**

Energy from the sun's radiation that can be used to heat and to light without requiring complicated machinery. Usually controlled by building design and location.



**Patronage Capital**

Excess revenue after expenses have been paid. It is treated as advances of capital by the consumer-owned members and credits to them on the basis of their contributions to revenues. (*See also "Capital Credits."*)

**Peak Demand**

The maximum rate at which electric energy is delivered to or by a system during a specific period of time.

**Peaking Unit**

Part of an electric generating plant used only at high-use periods to provide sufficient electric capacity for the system to meet its peak demand.

**PJM Interconnection, L.L.C. (PJM)**

The RTO that coordinates the movement of electricity in thirteen states, including Virginia, and the District of Columbia.

**Power Grid**

A network of generation, transmission, and distribution systems that is interconnected.

**Renewable Energy**

Energy derived from sunlight, wind, falling water, biomass, sustainable or otherwise, (the definitions of which shall be liberally construed), energy from waste, municipal solid waste, wave motion, tides, and geothermal power, and does not include energy derived from coal, oil, natural gas or nuclear power. Renewable energy shall also include the proportion of the thermal or electric energy from a facility that results from the co-firing of biomass.<sup>39</sup>

**Renewable Energy Certificate (REC)**

Also known as a green tag, Renewable Energy Credit, or Tradable Renewable Certificate (TRC), these are tradable environmental commodities in the United States that represent proof that electricity was generated from an eligible renewable energy resource. These certificates can be sold and traded or bartered on the open market, and the owner of the REC can claim to have purchased renewable energy. RECs are intended to incentivize renewable energy by providing a production subsidy to electricity generated from renewable sources. The purchaser of a REC receives only a certificate; the energy associated with a REC is fed into the electrical grid (by mandate), sold separately, and used by another party. A qualifying renewable generator is

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<sup>39</sup> See Va. Code § 56-576.

credited with one REC for every 1,000 kWh or 1 MWh of electricity it produces and a certifying agency gives each REC a unique identification number to make sure it doesn't get double-counted.

### **Regional Transmission Organization (RTO)**

A FERC-regulated organization that manages and controls, but does not own or maintain, the transmission system. An RTO also usually performs some market management and administration functions. Nationally, they are often referred to as "independent system operators," or "ISO" though there are some technical differences between an ISO and an RTO. In Virginia, RTOs are referred to as "Regional Transmission Entities," see Va. Code § 56-577 and § 56-579.

### **Seasonal Energy Efficiency Rating (SEER)**

A measure of the efficiency of air-conditioning systems. The higher the SEER, the more energy efficient the cooling system.

### **Standby Service**

A type of electric service where the customer already has some means for generating electricity, and the utility's service is "on standby" relative to the customer's or user's own generation. The utility usually stands ready to provide standby service in the event the customer needs to buy it.<sup>40</sup>

### **Substation**

An assemblage of equipment that enables switching and/or changing or regulating the voltage of electricity.

### **Surge**

Overvoltages lasting longer than one-sixtieth (1/60th) of a second. Can be caused by automatic switching on or off of motor-driven devices, or a lightning strike on or near a power line.

### **Sustainable Energy**

Energy that comes from renewable energy sources such as solar, wind, hydro, bio-mass, geothermal, or tidal.

### **Transformer**

A device to change the voltage of alternating-current electricity.

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<sup>40</sup> See, e.g., Order Denying Reh'g, *AES Somerset, LLC v. Niagara Mohawk Power Corp.*, Docket No. EL03-204-001 (Jan. 21, 2005).



**Transmission System**

All the lines, poles and other equipment used to move bulk electricity from a generating plant to a distribution system.

**Turbine**

Converts the energy of moving water, steam, or air to rotation, which can then be used to power a generator.

**Volt**

A unit of electric force that measures the pressure of electricity.

**Voltage**

An electromotive force that acts like water pressure to cause electrons to flow. Voltage is a measure of the potential for current flow and may exist between objects without a flow of current.

**Volt-Ampere**

The basic unit of electric power; figured as the product of a system's voltage multiplied by amperes.

**Watt**

The standard unit of electric power, named for James Watt, a 19th-century Scottish engineer. A measure of the power that can be generated by an electric current. One horsepower is equivalent to approximately 746 watts.

**Watt-hour Meter**

Instrument used to measure and record kilowatt-hour consumption. (*See also "Meter."*)

**Wheeling**

Transmitting bulk electricity from a generating plant to a distribution system across a third system's lines.

**Wind Turbine**

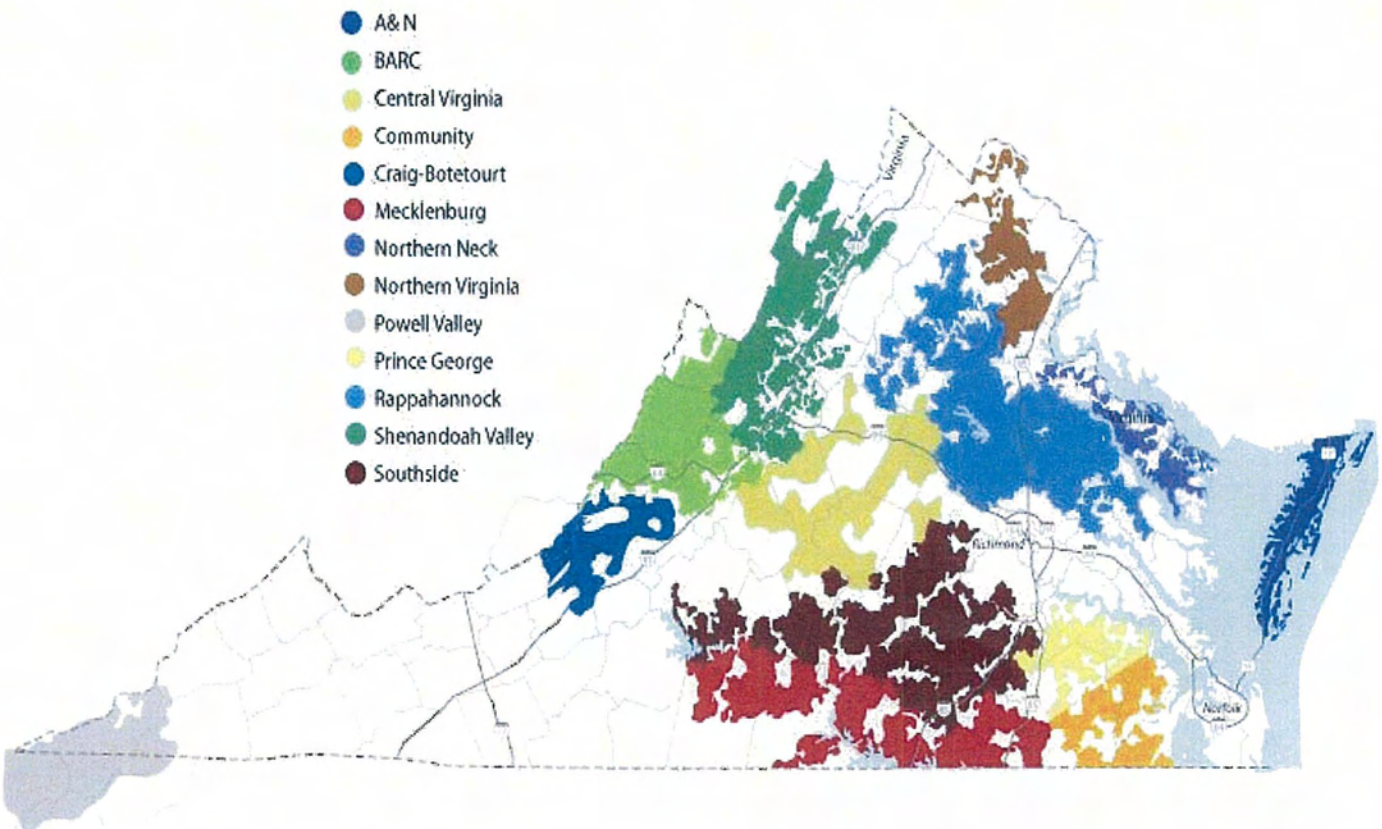
A turbine that captures the wind's energy with two or three propeller-like blades, which are mounted on a rotor, to generate electricity.





# TAB B

EXHIBIT B: MAP OF THE VIRGINIA COOPERATIVES' SERVICE TERRITORY







**TAB C**

## EXHIBIT C: DR AND EE PARTICIPATION IN PJM WHOLESALE MARKETS

**DR Participation in PJM Markets – DR can participate in the following markets on the same basis as generation**

- Energy - PJM's Economic Load Response program enables DR to respond to LMP by reducing consumption and receiving a payment for the reduction. Using the day-ahead alternative, qualified market participants may offer to reduce their load in advance of real-time operations and receive payments based on day-ahead LMP for the reductions.
- Day-Ahead Scheduling Reserve - The Day-Ahead Scheduling Reserve Market is a market-based mechanism to procure supplemental, 30-minute reserves on the PJM System on a day-ahead basis in order to meet unanticipated system conditions during actual operations.
- Capacity – PJM's forward capacity market called the Reliability Pricing Model ("RPM") commits capacity through an administrative auction process three years in advance of when it is needed. DR resources would commit to a pre-determined amount of load reduction three years in the future.
- Synchronized Reserves - Synchronized reserve service provides a market for the sale and purchase of the synchronized reserve energy service which supplies electricity if the grid has an unexpected need for more power on short notice. The power output of generating units supplying synchronized reserve can be increased quickly to supply the needed energy to balance supply and demand; demand resources also can bid to supply synchronized reserve by reducing their energy use on short notice.
- Regulation - Regulation service corrects for short-term changes in electricity use that might affect the stability of the power system. It helps match generation and load and adjusts generation output to maintain the desired frequency. DSR resources that bid



demand reductions into the Regulation Market must meet all the requirements of regulation, including the real-time telemetry requirement.

### **EE Participation in PJM's Capacity Market**

Although EE resources cannot be called upon reduce load to balance supply and demand upon request like DR can, EE is able to participate in PJM's capacity market along with DR. The capacity market relies on forecasts of energy usage three years in advance and conducts an auction so that resources can commit to provide this energy when it is needed. For example, an auction would be held in 2009 to meet forecasted energy needs for 2012-2013. EE resources can bid into this auction up to four times and if taken would have to deliver reduction in energy usage in the delivery year. DR and EE resources that are taken in the capacity auction are paid the auction clearing price.

# TAB D

**EXHIBIT D: THE COOPERATIVE MEMBER BILL**

The distribution Cooperatives are not vertically integrated utilities. Because of this simple fact, the 13 distribution Cooperatives within the Commonwealth all have separate and distinct billing requirements. While it is true that the information contained on a Cooperative's consumer bill is regulated by the Commission, how this information is presented varies widely from Cooperative to Cooperative.<sup>41</sup>

**Customer Delivery.**

The "customer delivery," "basic service," or "access" charge generally is the first line item on a consumer's bill and is a fixed monthly fee charged to each and every energized electric service. This "access" charge covers the fixed cost of purchasing, installing and financing equipment and materials needed to deliver electricity to the consumer from a substation, and other costs common to all connections (e.g., billing, payment processing, meter reading, maintenance, depreciation, property taxes, and interest expense).

Listed below are some of the fixed-cost items covered by the basic customer delivery charge:

- The purchase, installation and financing of power poles, transformers, distribution lines, service and ground wire, insulators, and other parts and materials
- The purchase, installation and financing of meters and metering equipment
- The purchase, installation and financing of the outage-reporting system
- Expenses related to reading meters monthly and sending out monthly bills.

**Energy Delivery.**

The "energy delivery" or "energy usage" charge generally is based on each member's monthly usage (kWh) (but may also have a demand (kW) component) and covers costs associated with maintaining the Cooperative's distribution system and sustaining quality service. It also covers costs for measures undertaken to ensure reliability, efficient and timely outage restoration, and quality customer service.

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<sup>41</sup> Examples of all thirteen distribution Cooperative bills are included to this appendix at the end of this section.



The energy delivery or usage charge covers costs associated with efforts such as:

- The maintenance and clearing of right of way
- Maintaining utility poles
- Building and maintaining substations and related equipment
- Preparations and readiness to restore power 24 hours a day, 7 days a week, in every foreseeable weather condition and emergency circumstance
- Safety compliance costs
- Vehicles and the fuel used to operate them
- Salaries, benefits and training for Cooperative employees
- Communications equipment and maintenance
- Meeting financial, legal and regulatory requirements

#### Energy Supply.

The “energy supply” or “electricity supply” charge generally is also based on monthly usage (kWh) (but may also have a demand (kW) component) and covers the cost of the construction and maintenance of generating facilities that provide wholesale power to Virginia’s Cooperatives through their power supplier. It represents a portion of the dollars, along with the fuel charge, that the Cooperatives pay for wholesale power. Additionally, this charge covers the cost of energy purchases made in the market to accommodate the Cooperatives’ needs over and above what is generated from the facilities the power supplier owns. Also covered in this charge are the costs associated with transmitting the power purchased over the transmission grid, to substations where the Cooperatives assume control of the electricity and deliver it to the consumer through the distribution system. Most of the transmission lines over which electricity travels to reach substations are owned by Dominion Virginia Power or other large IOUs that charge fees for utilizing their facilities. The energy supply charge includes those costs as well. The energy supply charge and fuel charge constitute a major part (68 percent) of what a consumer pays each month and again, represent dollars that are paid for wholesale power.

### Fuel Charge.

The “fuel charge,” “fuel adjustment,” or “fuel factor” covers the cost of the fuels used to generate electricity purchased by the power supplier and used by Cooperative members in their homes and businesses. It too is based on monthly usage (kWh) and is a direct monthly pass-through. As stated before, these charges, along with dollars collected under the energy supply charge, are not retained by the Cooperatives, but are paid to the supplier for the electricity consumed. Coal, natural gas, uranium, and fuel oil are all used in the power stations. This charge covers the cost of those fuels. This charge also covers the Cooperatives’ wholesale power cost adjustment (WPCA) charges, variable transmission costs (LMP), varying costs of market purchases of supplemental power, and changes in the cost of owning generation assets (wholesale demand rate). This fuel charge is in no way related to the gasoline and diesel in vehicles used by the Cooperatives to construct and maintain the electric lines that serve members.

### Other Charges.

The remaining miscellaneous charges covered under this line consist of various taxes levied and set by local and state governmental entities and, for those who have requested the service, the charges for security lights.

Consumer Bills – A representative copy of typical customer bill from each Cooperative is attached below.







PO Box 290  
Tasley, VA 23441-0290

21275 Cooperative Way Tasley, VA 23441  
Office Hours: Monday - Friday 7:30 a.m. - 4:30 p.m.  
Billing Inquiries: 757-787-9750 or 800-431-2632  
www.anec.com

JOE CONSUMER  
123 ANY STREET  
ANYTOWN VA 12345-0000

Account # 1234567	
Bill Date 09/24/2009	
Total Due Upon Receipt	\$169.01
Previous Balance	196.07
Payments since last bill - Thank You	-196.07
<b>Balance Forward</b>	<b>0.00</b>
ANEC Distribution Delivery Service	42.93
ANEC Electricity Supply Service	119.43
State and Local Taxes	6.65
Current Charges (pay by 10/20/09 to avoid late fee)	169.01
<b>TOTAL DUE</b>	<b>\$169.01</b>

**LATE FEES APPLY IF PAYMENT NOT RECEIVED BY DUE DATE.**



Service Address: 123 ANY STREET			Description: RT XXX			Rate: AR Bill Type: REGULAR/					
Meter	From Rdg	Date	To Rdg	Date	Mult	KWH Usg	Dmd Rdg	Dmd Usg	KVAR Usg	Pwr Fctr	Load Fctr
41324	5007	08/12/2009	6316	09/12/2009	1	1309					

**ANEC Distribution Delivery Service (Regulated)**

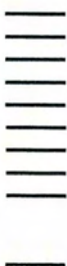
Customer Charge		3.84
Delivery Charge	500.000 KWH @ 0.03756	18.78
	809.000 KWH @ 0.02510	20.31
		42.93

**State and Local Taxes**

Virginia Consumption Tax	1.94
Accomack County Tax	4.20
Virginia Sales and Use Tax Surcharge	0.51
	6.65

**ANEC Electricity Supply Service (Unregulated)**

Surcharge Per KWH		8.22
Supply Charge	500.000 KWH @ 0.05169	25.85
	809.000 KWH @ 0.04910	39.72
Fuel Charge	1309.000 KWH @ 0.03487	45.64
		119.43



Surcharge of \$.00628/kWh covers increased capacity charges passed on from ODEC, ANEC's wholesale power supplier. Capacity charges include the fixed cost of assets ODEC owns.

Pay by check or credit card at www.anec.com  
or return this payment coupon with your check or money order payable to ANEC. See reverse side to pay by credit card.

JOE CONSUMER  
123 ANY STREET  
ANYTOWN, VA 12345-0000

Account # 1234567	
Balance Forward Due by 10/04/2009	0.00
Current Balance Due by 10/20/2009	169.01
<b>Total Amount Due Now</b>	<b>\$169.01</b>
Amount Enclosed	_____

Your payment and any returned checks may be processed electronically.

Mass List Opt Out   
Check this box to donate to Members Helping Members.

Send Payment to:  
**A&N ELECTRIC COOPERATIVE**  
PO BOX 290  
TASLEY VA 23441-0290



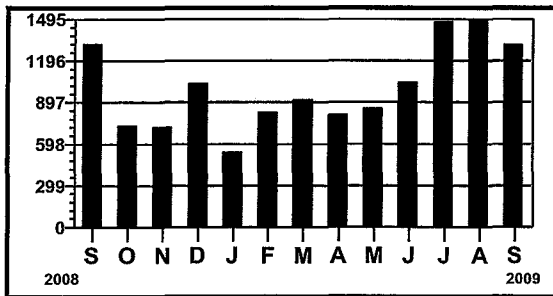
**Mass list:** Under the Virginia Energy Choice Program, ANEC must – unless you instruct us otherwise – provide your name, address, account number and electric use to competitive service providers. Check the **Opt Out** box on the front of your bill and your information will not be provided. If you have already opted out, you may opt back in at any time, by checking the **Opt In** box on the front of your bill.

**Energy Choice:** Electric Distribution service is regulated by the Virginia State Corporation Commission and must be purchased from ANEC. Electric Supply service may be purchased from ANEC or a Competitive Service Provider.

**Price to compare:** Your price to compare based on this billing period is \$.08656 per kWh. This amount provides a comparison value, based on the current month's cost, to help you evaluate offers from competing service suppliers.

**Members Helping Members:** If the MHM box is selected then \$1 will be added to your bill each month. If you pay your bill using electronic payment or other options that do not require you to return the payment stub, you may print a MHM sign up form on our website at [www.anec.com](http://www.anec.com) or call our office to have a form mailed to you. If you choose to stop your donation please contact our office. Your YTD tax deductible donation to MHM will be shown on your January statement for the preceding year.

Annual Kwh Use



To Pay with Visa  or MasterCard

Enter Credit Card # \_\_\_\_\_ 3 digit security code \_\_\_\_\_ Expiration Date \_\_\_\_\_  
from back of card

Signature of cardholder \_\_\_\_\_

Bill payments may be made by check or credit/debit card online at [www.anec.com](http://www.anec.com). If you currently read your meter, report your meter reading at the same time.

ANEC will automatically debit your bank account or your Visa or MasterCard each month. Visit [www.anec.com](http://www.anec.com) for more details or contact our office.

New mailing address, email address or phone number? Please enter it here.

\_\_\_\_\_  
\_\_\_\_\_

# BARC Electric Cooperative

P.O. Box 264 Millboro, Virginia 22460-0264  
 24 Hr. Emerg. Service 1-800-846-BARC (2272)  
 www.barcelectric.coop

ACCOUNT NUMBER	NAME	RATE	MAP NUMBER	METER #	METER ID	TELEPHONE		
██████████	██████████	10	101213031	87195473	██████████	██████████		
SERVICE FROM	TO	NO. DAYS	BILL TYPE	METER READING PREVIOUS	PRESENT	MULTIPLIER	KWH USAGE	CHARGES
08/12/09	09/12/09	31	7	82541	83319	1	778	
<b>BARC ELECTRIC COOPERATIVE PREVIOUS REGULATED SERVICES</b>								
Balance Forward								113.18
Payments Received Since Last Billing								-125.00
Previous Credit Balance								-11.82
<b>BARC ELECTRIC COOPERATIVE CURRENT REGULATED SERVICES (Schedule A - Residential)</b>								
<b>Electric Supply Services</b>								
GENERATION								38.07
FUEL FACTOR (0.026420 / KWH) 778								20.35
<b>Electric Distribution Services</b>								
DISTRB SERVICE								41.86
VA SALES & USE TAX SURCHARGE								0.42
<b>State and Local Taxes</b>								
SPECIAL REGULATORY TAX								0.06
LOCAL CONSUMPTION TAX								0.30
STATE CONSUMPTION TAX								0.79
Total Current Regulated Services Due By 10/16/09								102.05
ACCOUNT BALANCE AS OF 09/21/09								90.23
BEGINNING NEXT MONTH, YOUR NEW MONTHLY BUDGET PAYMENT WILL BE 0.00								
ACCOUNT BALANCE AS OF 11/20/07								90.23
<b>TOTAL AMOUNT DUE</b>								<b>125.00</b>
<b>Your Price to Compare is: \$0.075350/KWH</b>				<b>BILL DATE</b>	<b>TOTAL DUE NOW</b>		\$ 125.00	
COMPARISONS	DAYS SERVICE	COST PER DAY		09/21/09	CURRENT BILL DUE BY	10/16/09		
CURRENT BILLING PERIOD	31	3.24						
<p style="text-align: center;"><b>Your Electricity Use Over The Last 13 Months</b></p>				<b>TYPE OF BILL</b> 0 REGULAR BILL 1 ESTIMATED 3 MINIMUM 4 FINAL BILL		<b>BUDGET/PD BY DRAFT</b>		

## IMPORTANT MEMBER INFORMATION

You may contact your Cooperative via information on the front of your bill during business hours 8 a.m. - 5:30 p.m. Monday through Friday except on holidays. You may contact us for emergencies after hours, weekends and holidays by calling 800-846-2272.

You may pay your bill by mail, pay at the Co-op offices, or pay at one of our authorized collection banks. You may pay with Visa or Master Card online or at the office. You may also fill out your credit card information on your bill stub and mail it in. We only accept Visa or Master Card.

- **Current Bill:** Payment must be received in the Co-op on or before 3:30 p.m. of the due date to avoid 1.5% late charge.
- **Previous Amount Due:** Current bill dates do not apply, previous balance is subject to disconnect if unpaid ten (10) days after bill date. Pay previous

## UNDERSTANDING YOUR BILL

**Opt-Out -** Under ENERGY CHOICE, BARC must - unless you instruct us otherwise - provide your name, address, account number and electricity usage information to licensed suppliers. If you do not want your information released, you can "opt-out" by checking the box on your remittance stub or by calling BARC at 1-800-846-2272. Should you wish to reverse a prior decision to opt-out, please call BARC during the business hours Monday through Friday 8:00 a.m. till 5:30 p.m. except on holidays.

**Competitive Service Provider ("CSP") -** An entity licensed by the Virginia State Corporation Commission (SCC) to sell competitive energy services. They are referred to as CSP or Suppliers.

**Competitive Transitions Charge ("CTC") -** This charge may



amounts by mail, online, or at the Co-op office.  
You may pay using credit card, we accept VISA  
or Master Card only.

- **PLEASE ALLOW AMPLE TIME FOR  
DELIVERY WHEN USING THE MAIL.**

**Telephone Number:** Please furnish your telephone number  
on the return portion of your bill if it is not shown on the front.

**BARC Services:**

**AMR** - Service provided to Automatically report your Meter  
Reading to BARC each month.

**Security Lights** - BARC offers yard lights and post light  
service for a monthly fee plus possible construction costs.  
Contact the Co-op office for more information.

**Automated Payment Plan** - Have your bill automatically deducted from your  
checking or savings account. Request  
an enrollment form by calling or visiting our office.

**Forty eight (48) hours before you dig, call MISS  
UTILITY at 800-552-7001. It is the LAW.**

apply to customers who choose a CSP. Virginia Law permits  
this charge, which is set by the SCC, to give utilities the opportunity to recover  
past investments made while they expected to serve all customers.

**Electric Distribution Service** - The delivery of electricity  
directly to a home or business. BARC is regulated by the SCC  
and is responsible for maintaining the equipment to distribute  
the electricity as well as delivering it to customers. BARC will  
remain your distribution provider. **YOU CAN NOT SHOP  
FOR THIS SERVICE.**

**Price to Compare** - The regulated price per kWh plus the  
current month's fuel adjustment factor for electric supply  
service less any competitive transition charge (CTC). This  
price may vary based on your applicable BARC unbundled  
rate. A CSP must offer a lower price in order for you to save  
money on the energy supply portion of your bill. Once you  
choose a CSP, the price to compare will no longer appear on  
your electric bill.

**kWH** - kWH is a measure of electrical energy (unit of energy)  
that represents a 1,000 watt unit of energy for one hour.

**Rate Schedule** - Our rate schedules are available at  
[www.barcelectric.coop](http://www.barcelectric.coop) or upon request at the Co-op office.

**Demand Charge/kW** - The largest electrical use or highest  
demand for electricity averaged in any 15 minutes period per  
month. It is measured in kiloWatts and charges are calculated  
based on the cost per kW. This charge does not apply to most  
residential rates.



# CENTRAL VIRGINIA ELECTRIC COOPERATIVE

P.O. Box 247 • Lovington, VA 22949-0247  
800-367-2832 • www.forcvec.com

- Check this box for address/telephone correction or message. Please print on reverse side.
- Our records indicate that you do want your account information released to licensed suppliers of energy in the Virginia Energy Choice program. Please check this box if you would like to change your selection

731  
0

SAMPLE BILL  
123 STREET  
CITY VA 12345-1234



If paying by credit card, you will be charged a \$3.95 convenience fee		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CARD NUMBER		AMOUNT		
SIGNATURE		EXP. DATE		
ACCOUNT NUMBER <b>001-1234-00</b>		STATEMENT DATE <b>09/05/09</b>		
TOTAL CURRENT CHARGES DUE BY <b>09/28/09</b>		TOTAL ACCOUNT BALANCE DUE <b>\$96.15</b>		
AMOUNT ENCLOSED		\$		

Please remit to:

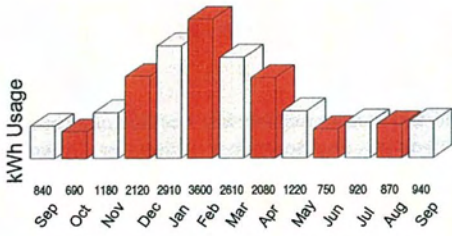
CENTRAL VIRGINIA ELECTRIC COOPERATIVE.  
P.O. BOX 247  
LOVINGSTON, VA 22949-0247



ACCOUNT INFORMATION	
BILLING DATE	09/05/09
CUSTOMER NAME	SAMPLE BILL
CUSTOMER PHONE NUMBER	(434) 123-4567
ACCOUNT NUMBER	001-1234-00
POLE NUMBER	ABC123
SERVICE ADDRESS:	123 STREET

Electricity Consumption Data							
Meter Number	Current Reading	Previous Reading	Reading		Number of Days	Multiplier	kWh Used
12345	6566	6472	From 08/02/09	To 09/02/09	31	10	940
Average Cost Per Day						\$ 3.070	

Important Messages from CVEC	



Previous 12 Month  
Total Energy Consumption: 19790  
Price to Compare for Energy Choice: 0.048390

Electricity Service Charges	
Total Previous Balance	180.95
Payments received since your last billing date	182.29
Thank You!	
Date: 8/06/2009 Late Fee	1.34
Balance Forward	0.00
<b>Current Charges (Rate Schedule - Residential)</b>	
Distribution Basic Charge	17.49
Distribution Usage Charge	25.46
CVEC Distribution Charges (Regulated) Subtotal	42.95
<b>CVEC Electricity Supply Charges</b>	
Energy	42.75
PCA .00542 Per Kwh	5.09
CVEC Electricity Supply Charges Subtotal	47.84
Nelson County Taxes	3.00
Tax Recovery Surcharge	.96
Utility Consumption Tax	1.40
<b>Total Current Charges</b>	<b>96.15</b>

If Total Account Balance Due is not received by 09/28/09 a 1.5% Late Charge will be added to your account

REG

TOTAL AMOUNT DUE

\$96.15

If you are not moving, but wish to change the address where you receive your mail, or if your service address has changed as a result of a 911 address conversion, please enter your new address below.

Please check one of the following:

- Address change is both service and mailing address
- Address change is service address only
- Address change is mailing address only

If your telephone number has changed or is different from the number printed on the front of this bill, please write in your new number. This will allow us to contact you, in the event it should become necessary:

Please Remit Payments to:  
**Central Virginia Electric Cooperative**  
 P.O. Box 247, Lovington, VA 22949-0247

**AUTOMATED PAYMENT OPTION APPLICATION**

I (we) hereby authorize Central Virginia Electric Cooperative to instruct my bank/credit union to make utility payments from my checking account at the financial institution listed below.

I understand that I control my payments and if at any time I decide to discontinue this payment service, I must notify the Cooperative in writing; the Cooperative will remove my account(s) from this plan by the next month's billing cycle.

Consumer Name (as on bill):		Second Name (as on bill):	
Address:			
Phone #:	Date:	CVEC Account Number(s):	
Social Security # or Tax Payer ID:		Financial Institution:	

Signature \_\_\_\_\_

You must enclose a VOIDED-CHECK so we can record the banking information. You will see the following statement on our monthly billing statement: "(AMOUNT) TO BE DRAFTED ON OR AFTER (DATE)." This will advise you of the date and amount of the next debit.



**Our Mission is to Improve the Quality of Your Life in a Quietly Impressive Way.**

**Contact Your Cooperative**

Via Telephone: All purposes 1-800-367-2832  
 Via Internet: Web site www.forcvec.com

Via Mail: P.O. Box 247  
 Lovington, VA 22949  
 Hours: 8:30 a.m. - 5:00 p.m. Mon - Fri

**CVEC Services**

**Surge Suppression Systems** - CVEC offers two levels of surge suppression devices to its members. The basic program includes a meter base unit that provides a warranty for the repair or replacement of standard white good appliances. The second level of protection involves point-of-use protection devices that plug directly into the wall to which the customer then plugs in their sensitive electronic equipment. This package is available for a monthly fee.  
**Automated Payment Option** - is a payment option that allows the amount of the customer's electric bill to be automatically deducted from their bank account. This optional service means that you no longer need to write a check, go to a payment center, or use a stamp to mail a payment. For your convenience, an Automated Payment Option authorization form is attached above, or a form may be requested by calling 1-800-367-2832 or by visiting our website at [www.forcvec.com](http://www.forcvec.com).

**Automatic Phone Pay** - is a payment option that allows you to pay by phone using Discover, Mastercard, Visa or Check-by-Phone. This option may be utilized by calling 1-800-367-2832 and choosing option number three. However, please keep in mind that there is a convenience fee of \$4.95 charged for this method of payment.

**Understanding Your Bill / Energy Choice**

**Opt-Out** -- Under ENERGY CHOICE, CVEC must - unless you instruct us otherwise - provide your name, address, account number, and electricity usage information to licensed suppliers. If you do not want your account information released, you may "opt-out" - or you may reverse a prior decision - by checking the box on your remittance stub, by going online at <http://www.forcvec.com>, or calling CVEC at 1-800-367-2832.

**Competitive Service Provider (CSP)** - is an entity licensed by the Virginia State Corporation Commission (SCC) to sell competitive energy services. They are referred to as a CSP or as a Supplier.

**Distribution Service** - is the delivery of electricity directly to a home or business. CVEC is regulated by the SCC and is responsible for delivering electricity to customers, as well as maintaining the equipment to distribute the electricity. The charges for delivery of energy and equipment maintenance appear on your bill as Distribution Basic Charge and Distribution Usage. The consumer CANNOT shop for this service. These charges are regulated by the SCC and are not subject to customer choice.

**Electricity Supply Service** - is the generation and transmission of electricity. This service may be purchased from a CSP and is the service for which you shop. The price may vary, depending on which supplier you choose.

**KWH** - KWH is a measure of electrical energy (unit of energy) that represents a 1,000-watt unit of energy for one hour.

**Rate Schedule** - is the price used to calculate your electric bill. Our rate schedules can be found on our website, or you may call our office to request a copy.

**Multiplier** - Some meters are programmed to record energy at a slower rate due to the demand needed. Once the readings are obtained, the usage is increased by the programmed rate (multiplier).

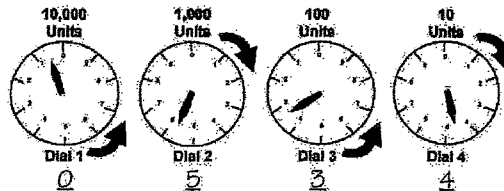
**Price to Compare** - This is the regulated rate per energy unit of electricity supply service (kWh) plus or minus the power cost adjustment (PCA).

**Taxes** - State and Local taxes collected through the Cooperative's monthly bill and remitted directly to the applicable locality and to the State of Virginia.

**PCA** - Power Cost Adjustment is the regulated monthly adjustment to your base cost of energy to allow for changes in energy cost such as fuel.

**How to Read Your Meter**

- Write down the value of each dial.
- Note: The dials alternate directions. You can tell which way the pointers are turning by the sequence of the numbers.
- When the pointer is between two numbers, please use the smaller digit.



THIS METER READS: 0-5-3-4





# Craig-Botetourt Electric Cooperative

P.O. Box 265, New Castle, Virginia 24127  
(540) 864-5121 (800) 760-2232

E-MAIL: [craigbot@tds.net](mailto:craigbot@tds.net)  
Website [www.craigbot.com](http://www.craigbot.com)



ACCOUNT NUMBER	NAME	RATE	CLASS	LOCATION	MULT	METER NUMBER	
0000	JOHN DOE	1	1	1230234	1	0000	
SERVICE FROM	TO	BILL TYPE	READING PREVIOUS	READING PRESENT	READING TYPE	KWH USAGE	CHARGES
08/26/09	09/26/09	0	78914	79278	CONSUMER READ	364	
<b>ELECTRIC DISTRIBUTION SERVICE (REGULATED CHARGES)</b>							
BALANCE FORWARD FROM PREVIOUS MONTH							81.09
PAYMENTS APPLIED							-81.09
<b>CURRENT MONTH ELECTRIC DISTRIBUTION SERVICE CHARGES</b>							
DISTRIBUTION							20.37
FACILITIES CHARGE							14.00
<b>STATE AND LOCAL TAXES</b>							
COUNTY CONSUMPTION TAX							3.00
SCC SPECIAL CONSUMPTION TAX							0.03
VA LOCAL CONSUMPTION TAX							0.14
STATE CONSUMPTION TAX							0.37
<b>ELECTRIC SUPPLY SERVICE (REGULATED CHARGES)</b>							
ENERGY SUPPLIER							20.68
FUEL FACTOR							0.86
<b>TOTAL CURRENT ELECTRIC CHARGES AND TAXES DUE</b>							<b>59.45</b>

Your Price to Compare is \$0.056800 per Kwh

**TOTAL DUE NOW** \$ 59.45

Your Electricity Use Over The Last 13 Months



PLEASE CHECK YOUR BILL TO MAKE SURE WE HAVE YOUR CORRECT MAILING ADDRESS. SOME BILLS ARE BEING RETURNED TO US DUE TO OLD OR INCORRECT ADDRESSES.

**TO REPORT POWER OUTAGE CALL:**  
(540) 864-5121 OR (800) 760-2232

**48 HOURS BEFORE YOU DIG  
CALL "MISS UTILITY" 1-800-552-7001  
IT'S THE LAW!**

Your Telephone Number on file is *964-0000* Please let us know if this is incorrect.



**Community Electric Cooperative**  
**PO Box 267**  
**Windsor VA 23487-0267**  
 A Touchstone Energy® Cooperative

Account # \_\_\_\_\_  
 Budget Due **\$160.00**  
 Due Date **10/10/2009**  
 Amount Enclosed \_\_\_\_\_

Date Read: \_\_\_/\_\_\_/\_\_\_

Please make corrections to address or phone # below.

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OPT OUT   
 See Back

Send Payment to:  
**COMMUNITY ELECTRIC COOPERATIVE**  
**PO BOX 267**  
**WINDSOR VA 23487-0267**



Manage your account at [www.comelec.coop](http://www.comelec.coop) or detach and return above portion with your payment and meter reading in the enclosed envelope.

**Electrical Use Data for Statement Date September 28, 2009**

Account #	Account Name	Service Address			Service Type	Bill Type	Map Loc#
Meter #	From Rdg	To Rdg	Mult.	KWH	RESIDENTIAL	BUDGET	
	79830	81510	1.0000	1680			

**CEC Distribution Service**

BASE CHARGE	8.40
200 KWH @ 0.034400	6.88
600 KWH @ 0.023390	14.03
880 KWH @ 0.018860	16.60
<b>Total Distribution Service Charges:</b>	<b>45.91</b>

**CEC Other Charges**

STATE/LOCAL CONSUMPTION TAX	2.54
LOCAL UTILITY TAX	3.00
OUTDOOR LIGHT (40 KWH)	8.09
SALES TAX SURCHARGE	0.43
SURGE MO LEASE	4.50
<b>Total Other Charges</b>	<b>18.56</b>

**CEC Energy Supply Service**

1680 KWH @ 0.051820	87.06
WPCA 1720 KWH @ 0.037670	64.80
<b>Total Energy Supply Service Charges:</b>	<b>151.86</b>

**Summary of Charges**

Previous Balance	160.06
Payments	160.00 CR
<b>Balance forward</b>	<b>0.06</b>
Total CEC Distribution Service	45.91
Total CEC Energy Supply Service	151.86
Total CEC Other Charges	18.56
<b>Total Amount Due</b>	<b>\$216.39</b>
<b>Budget Amount Due</b>	<b>\$160.00</b>

Office Hours: 8:00 AM - 5:00 PM Monday - Friday  
 Emergency Service day or night 757-242-6181  
 Outside depository available for after hours payments. Electronic communications and payments may be made through [www.comelec.coop](http://www.comelec.coop).

Due Date: 10/10/2009 Penalty Date: 10/20/2009

**BALANCE FORWARD**

Remember -- If you have a Balance Forward amount, you must pay the Cooperative a minimum of the Balance Forward amount on or before the 10th of the month to avoid disconnection of your service. If a Cooperative representative is sent to disconnect your account for non-payment of your bill, you will be required to pay all previously billed amounts plus a \$20 collection fee to avoid disconnection of service.

**NEVER OPERATE A HOME BACKUP GENERATOR WITHOUT A PROPERLY INSTALLED TRANSFER SWITCH THAT DISCONNECTS IT FROM MAIN POWER LINES. FOR A \$50 INSTALL FEE AND \$12.75 MONTHLY LEASE, WE CAN INSTALL AN EASY TO USE AND SAFE EMERGENCY TRANSFER SWITCH BEHIND YOUR METER. NO REWIRING IS NEEDED.**





**OPT OUT:** Under the Virginia Energy Choice Program, CEC must release certain information about you and your electric account to Competitive Service Providers (CSP's) for marketing purposes. If you do **not** want your information released, please check the box on the front marked "Opt Out" and send that portion of the bill in with your meter reading and payment. You only need to let us know once, so if you have called, e-mailed or written us before, you need not do so again.

**E-Z PAY:** Under this program, you authorize CEC to debit your checking account for the amount of your bill on or about the 10th of every month. If you are interested, please fill out and sign below, and return with your meter reading and payment. Include a voided check from the account you wish CEC to debit if the account is different from the one used in paying your current bill. If you read your own meter, you will still have to call, mail or use E-Bill to provide a meter reading.

I/We hereby authorize Community Electric Cooperative to automatically debit my/our checking account, listed below, for the amount of my/our monthly electric service bill. I understand that the debit will occur on or about the 10th of each month and agree to have the funds available in the listed account. I further understand that this agreement will remain in effect until cancelled, at any time, by either party, by written notification from one party to the other. Written notification to the Financial Institution involved will not be sufficient.

Name \_\_\_\_\_  
 Signed \_\_\_\_\_ Date \_\_\_\_\_  
 CEC Electric Account Number(s)  
 (If multiple accounts, list all to be paid by bank draft.)

Bank Name: \_\_\_\_\_ Checking Account #: \_\_\_\_\_  
**Please include a voided check with your application to insure proper routing information is used.**

**Information for Retail Access:**

Following are some terms used in presenting the charges on the front of the bill. Below are brief explanations of those charges. You may call CEC any time during normal business hours and we will be glad to answer questions you might have or you can call 1-877-YES-2004 or visit [www.yesvachoice.com](http://www.yesvachoice.com) to have questions answered by a representative of the Virginia State Corporation Commission (SCC)

**Distribution Service:** These are charges regulated by the SCC representing the cost to deliver energy to your service location. They include the ownership, operation and maintenance of CEC's electric distribution system.

**Energy Supply Service:** These are charges for the energy consumed by you during the billing period. If your energy is provided under CEC's default service tariff, the rate charged is regulated by the SCC. It also includes a charge for fuel, labeled WPCA, which changes monthly and is regulated by the SCC. CEC may, in the future, offer a competitive rate to its members. If offered, that rate will be competitive (unregulated). Generally, the charges in this section of the bill are the ones you defer if you choose to purchase energy from a Competitive Service Provider (CSP). If you purchase energy from a CSP, you will defer these charges, but may incur a Competitive Transition Charge (CTC, sometimes called "wires charge") the amount of which is regulated by the SCC.

**Other Charges:** This area lists other charges such as fees, deposits, outdoor light charges and taxes. All charges are regulated by the SCC except the taxes, the amount of which is determined by the state or locality for which they are being collected.

**Price to Compare:** This is the exact amount of CEC charges you will defer if you choose to shop. It is equal to the CEC default rate charges plus the current WPCA less the Competitive Transition Charge.

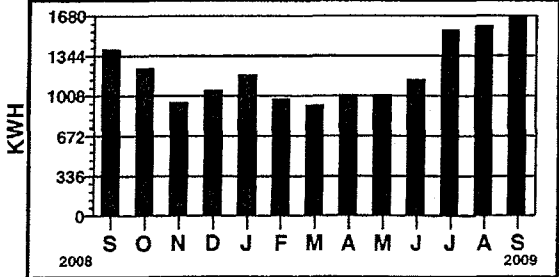
**Payment of Bill**

You may pay your bill by US mail, the internet ([www.comelec.coop](http://www.comelec.coop) then click on E-Bill), automatic bank draft (E-Z Pay), the night drop box located at the Cooperative office (to the left of the drive thru window), or in person during normal office hours. If using after hours drop box or US mail, it is recommended that you pay by check or money order and not use cash.

**CSP Billing Details**

**Annual Kwh Use**

This chart will not reflect your monthly usage accurately unless you read your meter on the same date each month.





# Mecklenburg Electric Cooperative

Your Touchstone Energy® Cooperative

Districts: Chase City, Emporia, Gretna  
Headquarters Office:  
PO Box 2451 Chase City, VA 23924

POWER OUTAGE ONLY: 1-877-632-5688 | District Office: 434-372-6200 OR 1-800-989-4161

To pay by credit card anytime: PRESS 1

### Electricity Consumption Data

Meter Number	Current Reading	Previous Reading	kWh Used	Multiplier	Reading	Days Billed
00000000	86288	85284	1004	1	from 06/30/2009 to 07/30/2009	30
Class: House				Rate: Schedule R-U		

### Account Information

BILLING DATE	CYCLE	PR/SEC	STATUS
08/04/2009	01	P	A
Next Bill Date	CUSTOMER PHONE NUMBER		
09/01/2009	555-555-1234		
CUSTOMER NAME			
JOHN SAMPLE			
ACCOUNT NUMBER			
123-45-678-90 A			
SERVICE ADDRESS			
1234 MAIN ST. ANYWHERE, VA			

### Important Messages from MEC

\*Fuel charge listed below is not, in any way, associated with the gasoline and diesel used in MEC's vehicles. The fuel charge covers uranium, coal, natural gas, and #2 fuel oil used to produce the electricity consumed by our Members.

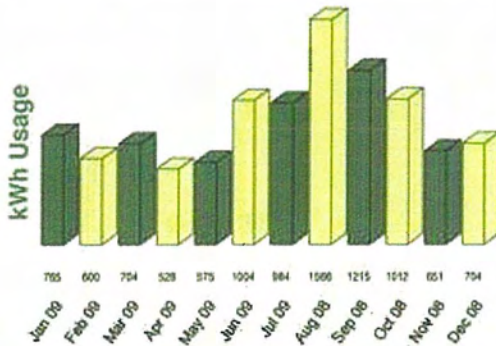
To avoid Late Charge of 1 1/2% payment in full must be received by 09/01/2009

### Billing Detail

Previous Balance	\$ 316.14
Payment Received <i>Thank You for your payment!</i>	\$ 158.89
Balance Forward	\$ 157.25
<b>DISTRIBUTION SERVICE:</b>	
Customer Delivery	\$ 16.00
Energy Delivery	\$ 36.74
<b>ELECTRICITY SUPPLY SERVICE:</b>	
Energy Supply	\$ 51.36
*Generation Fuels \$.03744/kWh	\$ 37.59
<b>OTHER CHARGES:</b>	
Mecklenburg Cnty Tax	\$ 3.00
VA Consumption Tax	\$ 1.60
VA Surcharge	\$ 0.39
Security Light 70 kWh	\$ 8.05
*Security Light Generation Fuels .03744/kWh	\$ 2.62
Late Charge	\$ 2.29
<b>Current Amount</b>	<b>\$ 159.64</b>
<b>DELINQUENT AMOUNT</b>	<b>\$ 157.25</b>
DISCONNECT DATE 08/18/2009	

Bill Due When Presented

TOTAL DUE: \$316.89



## DISCONNECT NOTICE

Your service WILL BE DISCONNECTED if \$157.25 is NOT PAID BY: 08/18/2009.



MECKLENBURG ELECTRIC COOPERATIVE  
P.O. BOX 2451  
CHASE CITY, VA 23924-2451

79

Check this box for address/telephone correction or message. Please print on reverse side.

### Return This Portion With Your Payment

Bill Date	Cycle	Status	Account Number
08/04/2009	01	A	123-45-678-90 A
Delinquent Amount must be paid by 08/18/2009		Delinquent Amount Due	
		<b>\$157.25</b>	
Next Bill Date		Total Amount Due	
09/01/2009		<b>\$316.89</b>	

0001011940 2 0

JOHN SAMPLE  
1234 MAIN ST  
ANYWHERE, VA 12345

MECKLENBURG ELECTRIC COOPERATIVE  
P.O. BOX 2451  
CHASE CITY, VA 23924-2451



276260020100003168910





Page 1 of 2

**Account Number**      **Service Address**

**Account Name:** \_\_\_\_\_  
**Billing Date:**      09/21/09

**Electricity Service Charges**

<b>Total Previous Charges</b>	<b>\$ 71.56</b>
Payments received since your last billing date	71.56
▶ <b>Balance Forward</b>	<b>\$ .00</b>

**Current Charges** (Sch R-2-U Residential Service)

<b>NNEC Distribution Service</b>	
Access Charge	22.23
Energy Delivery Charge	6.75
Sales and Use Tax Surcharge	.36
Res H/P Sodium S/L	9.25
<b>NNEC Distribution Service Subtotal</b>	<b>38.59</b>
<b>NNEC Electricity Supply Service</b>	
Energy Charge	12.85
Power Adj(\$0.00723/kWh)	2.18
Fuel Adjustment(\$0.03423/kWh)	10.34
<b>Electricity Supply Service Subtotal</b>	<b>25.37</b>
Northumberland Co Locality Tax	3.00
VA Consumption Tax	.44
▶ <b>Total Current Charges</b>	<b>\$ 67.40</b>

**Total Amount Due**      **\$ 67.40**

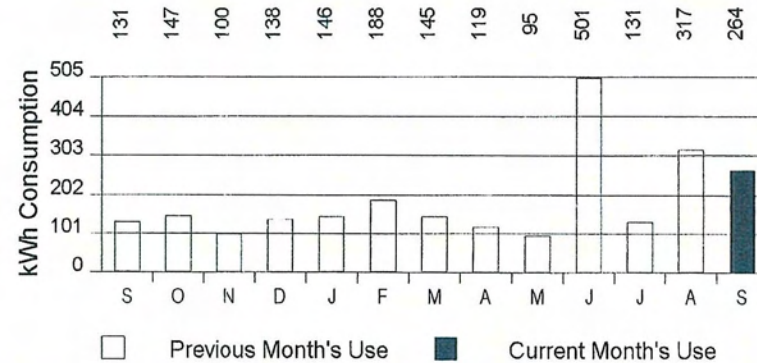
Please remit payment on or before October 19, 2009 to avoid a 1.5% late fee.

<b>Price to Compare</b>	<b>¢/kWh</b>
<b>Jun-Sep</b>	<b>9.046¢</b>
<b>Oct-May</b>	<b>8.785¢</b>
<b>Annual Average</b>	<b>8.868¢</b>

**Electricity Use Data**

Meter Number	Current Reading	Current Read Date	Last Reading	Last Read Date	Mult.	Current kWh Used
16238861	11846	09/14/09	11582	08/14/09	1	264

**Monthly Energy Use**



**Messages from NNEC**

**IMPORTANT TELEPHONE NUMBERS**

Whether you need to contact the Customer Service Department or report an electricity outage, call Northern Neck Electric Cooperative day or night using the toll-free number 1-800-243-2860 or local calls (804) 333-3621.

Please detach at perforation and return this portion with a check or money order made payable to NNEC.



NORTHERN VIRGINIA ELECTRIC COOPERATIVE

Account Number		Payments Credited Through		Billing Period Date From To		Bill Mailed	Billing Days	Amount Due		
000000000-000		08/12/2009		07/01/2009 - 07/30/2009		08/14/2009	29	341.49		
kWh Meter Reading Present	kWh Meter Reading Previous	kWh Reading	Multiplier	kWh Usage	kWh Usage SL Usage	kWh	Meter Number	Code (S)	Cycle	Rate (S)
91885	89245		1	2640			22539006	R	7	1A1
Premises Address									Tax Code	
1234 Main Street									FX	

Balance Forward 0.00

**NOVEC Distribution Services: Government Regulated**

NOVEC Service Charge	10.50	
First 300 kWh (300 x 0.0260300)	7.81	
Over 300 kWh (2340 x 0.0231300)	54.12	
Local Utility Tax	4.00	
Virginia Consumption Tax	3.83	
<b>Subtotal</b>		<b>80.26</b>

**NOVEC Electricity Supply Services: Government Regulated**

First 300 kWh (300 x 0.0551500)	16.55	
Over 300 kWh (2340 x 0.0551500)	129.05	
Power Cost Adjustment Charge (2640 x 0.0438000)	115.63	
<b>Subtotal</b>		<b>261.23</b>

Date Billed 08/12/2009

Amount Due by 2:00 P.M. On 09/10/2009 341.49

Bill Is Due And Payable Upon Receipt

Amount Due After 2:00 P.M. On 09/10/2009 346.49

1.5% Penalty If Not Paid by 2:00 P.M.

**Distribution Service** - Is the government-regulated delivery of electricity that must be purchased through the distribution facilities of the local distribution company (NOVEC), by a retail cooperative member-customer.

**Electricity Supply Service** - Is the generation of electricity and its transmission to the local distribution company (NOVEC), on behalf of the retail cooperative member-customer. It may be purchased from any licensed provider in the competitive market but, if applicable, may result in a competitive transition charge.

**Price To Compare:** If you were to choose an alternate energy supplier, your price to compare this month is: \$0.0989 per kWh. You can use this price to evaluate offers from alternative energy suppliers.







# Powell Valley Electric Cooperative

1  
4

Jonesville Office  
P.O. Box 308  
Jonesville, VA 24263  
(276) 346-6003

Sneedville Office  
P.O. Box 193  
Sneedville, TN 37869  
(423) 733-2207

Tazewell Office  
P.O. Box 1528  
New Tazewell, TN 37824  
(423) 626-5204

Office Hours: Monday thru Friday 8:00 to 5:00

ACCOUNT NUMBER	NAME			SERVICE ADDRESS			RATE	CYCLE	LOCATION #	METER #
							22	61	1476	7427911
SERVICE		#	BILL	READING		MULTIPLIER	KWH USAGE	CHARGES		
FROM	TO	DAYS	TYPE	PREVIOUS	PRESENT					
01/09/08	02/08/08	30	0	37188	38629	1	1441	103.19		
TVA FUEL COST ADJUSTMENT								4.21		
CUSTOMER CHARGE								8.94		
STATE/LOCAL TAX								2.88		
TO BE PAID BY DRAFT										
	DAYS SERVICE	TOTAL KWH	AVG. KWH/DAY	COST PER DAY		CURRENT CHARGES		\$ 119.22		
CURRENT BILLING PERIOD	30	1441	48	3.87		PREVIOUS BALANCE		\$ 103.71		
PREVIOUS BILLING PERIOD	30	1234	41	3.36		PAYMENT PREVIOUS BALANCE		\$ -103.71		
SAME PERIOD LAST YEAR	30	1582	52	4.08		AMOUNT DUE		\$ 119.22		
				<b>Bill Type</b> 0 Regular      5 Pro-rated 1 Estimated    6 Min Pro-rated 2 Minimum and Est    7 Levelized 3 Minimum      8 TVA Loan 4 Final		DUE DATE		02/29/08		1 1/2 % LATE PAYMENT CHARGE WILL BE ADDED IF NOT PAID BY THE DUE DATE

**\*\*\*DISCONNECT DATE IS 4:00 P.M. ON MARCH 7, 2008\*\*\*  
PLEASE PAY BEFORE THEN TO AVOID A \$10.00 CHARGE AND POSSIBLE DISCONNECTION OF SERVICE. NO MORE NOTICES WILL BE MAILED.**

- ASK ABOUT THESE MEMBER SERVICES**
- Bill Payment by Bank Draft
  - Energy Efficient Home Program
  - Water Heater Switch Program
  - Levelized Billing
  - Energy Audits
  - Round-up / We Care Program

RETAIN THIS COPY FOR YOUR RECORDS

PLEASE DETACH AND RETURN THIS PORTION WITH PAYMENT



**Powell Valley Electric Cooperative**  
P.O. Box 308 Jonesville, VA 24263  
RETURN SERVICE REQUESTED

ACCOUNT #	BILL DATE	DUE DATE
	02/11/08	02/29/08
CYCLE	CURRENT CHARGES	
61		\$119.22
	PREVIOUS BALANCE	
		\$0.00
TELEPHONE #	TOTAL AMOUNT DUE	
		\$119.22
	ENTER AMOUNT PAID	

SNGLP



Please note change of address or phone #

PENNINGTON GAP VA 24277-9505

POWELL VALLEY ELECTRIC COOPERATIVE  
PO BOX 308  
JONESVILLE, VA 24263-0308



0000000000 0000169901 00000011922 00000011922 3



**PRINCE GEORGE  
ELECTRIC COOPERATIVE**

Post Office Box 620  
Waverly, VA 23890-0620

A Touchstone Energy® Cooperative

Account #	
Current Charges Due By 08/20/2009	137.05
Total Due	\$54.29
Amount Enclosed	

43394  
14-14-23

Please make corrections to address or phone # below.

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OPT OUT   
OPT IN

Send Payment to:  
**PRINCE GEORGE ELECTRIC COOPERATIVE**  
**PO BOX 620**  
**WAVERLY, VA 23890-0620**

259 1 AV 0 33R

4 259  
C-2 P-5

WAKEFIELD VA 23888-3012



Detach and return above portion with your payment in the enclosed envelope.

**Electrical Use Data for Statement Date July 28, 2009**

804

Account #	Account Name	Service Address	Service Type	Bill Type	Map Loc#
13394		WHITE MARSH RI	RESIDENTIAL	REGULAR	14-14-23
Meter #	From Rdg	To Rdg	Mult.	KWH	
13394	17602	18724	1.0000	1122	

**PGEC Distribution Service**

500 KWH @ 0.016975	8.49
622 KWH @ 0.014575	9.06
BASE FACILITIES CHARGE	8.80
<b>Total Distribution Service Charges:</b>	<b>26.35</b>

**PGEC Other Charges/Credits**

VIRGINIA CONSUMPTION TAX	1.66
SALES TAX SURCHARGE	0.49
<b>Total Other Charges</b>	<b>2.15</b>

**PGEC Energy Supply Service**

1122 KWH @ 0.060963	68.40
FUEL CLAUSE ADJ 1122 KWH @ 0.035780	40.15
<b>Total Energy Supply Service Charges:</b>	<b>108.55</b>

**Summary of Charges/Credits**

Previous Balance	42.24
Payments	125.00 CR
<b>Balance Forward</b>	<b>82.76 CR</b>
Total PGEC Distribution Service	26.35
Total PGEC Energy Supply Service	108.55
Total PGEC Other Charges/Credits	2.15
<b>Total Current Charges Due 08/20/2009</b>	<b>137.05</b>

Office Hours: 8:00 AM - 5:00 PM Monday - Friday  
Emergency Service day or night 804-834-2424  
Outside depository available for after hours payments.

**Total Amount Due \$54.29**

\*\*\*MEMBERS - COMPLETE & RETURN ENCLOSED PROXY CARD FOR CHANCE TO WIN \$250 IN FREE ELECTRICITY!! IF UNABLE TO ATTEND ANNUAL MEETING AUG 24, 2009, PLEASE FILL IN & SIGN PROXY CARD TO BE ENTERED INTO A DRAWING. 3 CHANCES TO WIN!!!

ENERGY TIP FOR JULY - CLEAN OR REPLACE FILTERS ON FURNACES ONE A MONTH OR AS NEEDED





PLEASE COMPLETE TO MAKE PAYMENT BY CREDIT CARD

CREDIT CARD  VISA  MasterCard  Discover  
 CARD # \_\_\_\_\_ EXP DATE \_\_\_\_\_  
 SIGNATURE \_\_\_\_\_



**Prince George Electric Cooperative**

7103 General Mahone Highway  
 Post Office Box 620  
 Waverly VA 23890-0620  
 Telephone: (804) 834-2424

5722 Courthouse Road  
 Post Office Box 2200  
 Prince George, VA 23875-2098  
 Telephone: (804) 834-2424

[www.pgec.coop](http://www.pgec.coop)

**Mass list:** Under the Virginia Energy Choice Program, PGEC must – unless you instruct us otherwise – provide your name, address, account number and electric use to competitive service providers. Check the **Opt Out** box on the front of your bill and your information will not be provided. If you have already opted out, you may opt back in at any time, by checking the **Opt In** box on the front of your bill.

**Energy Choice:** Electric Distribution service is regulated by the Virginia State Corporation Commission and must be purchased from PGEC. Electric Supply service may be purchased from PGEC or a Competitive Service Provider.

**Price to compare:** Your price to compare based on this billing period is \$.067330. This amount provides a comparison value, based on the current month's cost, to help you evaluate offers from competing service suppliers.

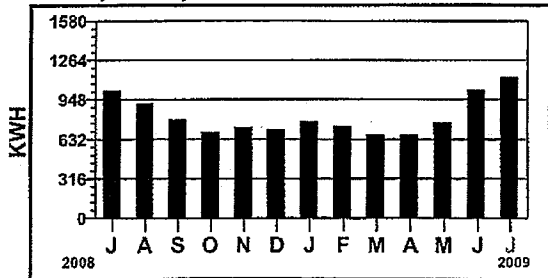
**Payment of Bill and Collection Procedures**

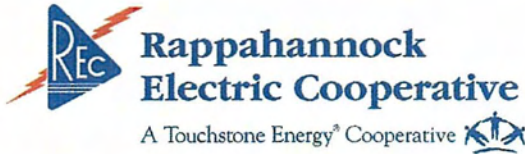
A good credit rating is established by paying the full account balance (current charges) by the due date each month. Accounts with a balance forward amount are subject to disconnection for nonpayment if not paid in full by the date shown. Credit history on this account will be reviewed periodically and the account may be charged an additional security deposit.

**ADDITIONAL MESSAGES**

**Annual Kwh Use**

This chart will not reflect your monthly usage accurately unless you read your meter on the same date each month.





Account Number: 0000000000  
 Previous balance due immediately  
 Current Charges due 03/30/09

**TOTAL AMOUNT DUE: \$211.00**

- Enroll in Operation Round Up® Information on back  
 Address Change form on Back  
 Request for Information form on back

AMOUNT ENCLOSED \_\_\_\_\_

John Customer  
 Jane Customer  
 1000 Main Street  
 Anytown VA 22737-0000

PO Box 34849  
 Alexandria VA 22334-0849



0 0000000000 0000000000 0000000 0

PLEASE DETACH AND RETURN THE ABOVE PORTION WITH YOUR PAYMENT

PAGE 1



**Quick Payment Options**

**Phone Numbers:**

Call us 24 hours a day, 7 days a week  
 or visit [www.myrec.coop](http://www.myrec.coop)

800-552-3904 540-825-8373  
 804-633-5011 540-898-8500

Protect your valuable appliances for only 20 cents per day. REC's HomeGuard surge protection protects at the meter and the outlet, no store bought protector does that. Call today to upgrade your surge protection. 800-851-3275.

Account Name: John Customer  
 Jane Customer  
 Account Number: 0000000000

Billing Date: March 5, 2009  
**TOTAL AMOUNT DUE: 211.00**

**Account Summary**

Account balance on last bill: 329.81  
 Payments received as of 03/05/09: -211.00  
 Previous balance due immediately: 118.81  
 Current Charges due 03/30/09: 246.74

**Budget Summary:** PLEASE NOTE NEW BUDGET PAYMENT AMOUNT.

Payments applied as of 03/05/09: -211.00  
 Budget previous balance due immediately: 0.00  
 Budget Current Charges due 03/30/09: 211.00

**TOTAL ACCOUNT BALANCE 365.55**

**TOTAL BUDGET BALANCE 211.00**

**Billing Detail** 1000 Main Street SDID # 000000000-00000000

Meter No. - 00000000 Rate Schedule A-U Residential Service - See Page 2 for schedules

Service From	To	Energy Readings Present	Previous	kWh Used	No Days	Meter Multiplier	Reading Method
02/03/09	03/03/09	4555	4368	1,870	28	10	Regular

**REC Current Charges**

**Regulated Charges:**  
 Distribution Delivery 55.07  
 Electricity Supply Service 102.08  
 Wholesale Power Cost Adj 80.82  
 Virginia Consumption Tax 2.77  
 County Tax 3.00  
**Total REC Regulated Charges 243.74**  
**Total Current Charges 246.74**

**Unregulated Charges:**  
 Individual Outage Notification 3.00  
**Total REC Unregulated Charges 3.00**

History	
Mo & Yr	kWh
MAR-08	2600
APR-08	2090
MAY-08	1610
JUN-08	1210
JUL-08	1170
AUG-08	1450
SEP-08	1560
OCT-08	1010
NOV-08	1090
DEC-08	1270
JAN-09	1710
FEB-09	3000









**Shenandoah Valley  
Electric Cooperative**

Page 1 of 2

**Billing Date:** 08/28/09  
**Customer Name:** John Q Customer  
**Account Number:** 11111-001  
**Location Number:** 1-111-11-11  
**Service District:** Rockingham

**Service Address**  
 123 Main Street

**Telephone Number**  
 540-555-5555

**Electricity Service Charges**

Total Previous Balance	\$ 99.23
Payments recvd since last billing date	99.23
Thank You!	
▶ Balance Forward	.00
<b>Current Charges (Schedule A-10-VA Residential)</b>	
Basic Consumer Charge	13.76
Variable Distribution Charge	18.97
<b>SVEC Distribution Charges (Regulated) Subtotal</b>	<b>32.73</b>
<b>SVEC Electricity Supply Charges</b>	
Power and Energy Charge	39.26
Fuel Adjustment (\$0.03328/KWH)	29.85
Rider OD-09 (\$0.00516/KWH)	4.63
<b>SVEC Electricity Supply Charges Subtotal</b>	<b>73.74</b>
Rockingham Co Utility Tax	2.00
VA Consumption Tax	1.32
Sales & Use Surcharge	1.19
▶ Total Current Charges	<b>\$ 110.98</b>

**Total Amount Due \$ 110.98**

Bill is due and payable upon receipt. To avoid a 1.5% Late Payment Charge, pay Total Amount Due by 09/20/09. Payments made at locations other than SVEC offices may be delayed up to 5 days.

**Electricity Bill**

**Electricity Consumption Data**

Meter Number	Current Reading	Reading Date	Previous Reading	Number of Days	Mult.	KWH/KW Used
11-111-111	18072	08/21/09	17175	32	1	897

**Electricity Consumption History**

Billing Month	KWH	Billing Month	KWH
Aug 08	820	Mar 09	879
Sept 08	823	Apr 09	915
Oct 08	701	May 09	743
Nov 08	866	June 09	855
Dec 08	975	July 09	806
Jan 09	1,043	Aug 09	897
Feb 09	971		

Total Energy (KWH) Usage: 11,294

**Messages from SVEC**

Thank you for your prompt payment.

Our records indicate the physical address associated with this account location is 123 Main Street. If this is incorrect, please contact your local SVEC office.

To contact SVEC for all purposes please call 434-2200.

Go to [www.svec.coop](http://www.svec.coop) to sign up for SVEC-Online. Click on My Account, then follow the directions to review your account and conduct business with the Cooperative.

Please detach at perforation and return this portion with a check or money order made payable to SVEC.

Check this box for address correction or message. Please print on reverse side.

Our records indicate that you do NOT want your account information released to licensed suppliers of energy in the Virginia Energy Choice program. Please check this box if you would like to change your selection.

Acct# 11111-001

Loc # 1-111-11-11 Meter # 11-111-111

Total Amount Due  
Amount Enclosed:

\$ 110.98

\$

LES

John Q Customer  
 123 Main Street  
 Anywhere VA 22888-8888

Seq# 2,109





# Proven Power

## Contact Your Cooperative

<b>Via Telephone</b>	
Augusta County NTELOS calling area	941-0011
Augusta County Verizon calling area	515-0011
Rockingham County	434-2200
All other areas	1-800-234-7832
<b>Via Internet</b>	
Web Site	www.svec.coop
<b>Via Mail</b>	
	P.O. Box 236
	Mt. Crawford, VA 22841
	Hours 8:00 am - 4:30 pm Mon-Fri

## SVEC Special Services

**Security Lights** — The Cooperative offers yard light and post light service for a monthly fee plus possible construction costs. Contact your local service office for more information.

**Surge Suppression Systems** — SVEC offers two levels of surge suppression devices to its members. The basic program includes a meter base unit that provides a warranty for the repair or replacement of standard white good appliances. This is available for a monthly fee and a one-time installation fee. The second level of protection involves point-of-use protection devices that plug directly into the wall to which the customer then plugs in their sensitive electronic equipment. The plug-in units also carry a warranty and are available for purchase.

**Eazy Pay** — A payment option which allows the amount of the customer's electric bill to be automatically deducted from their bank account. This optional service means that you no longer need to write a check, go to a payment center or use a stamp. An Eazy Pay authorization form may be requested from any of our offices by calling 1-800-234-7832 or may be requested via e-mail from our website at [www.svec.coop](http://www.svec.coop) (click on "Contact Us").

**Third Party Notification** — Some customers due to illness, disability, absence for extended periods of time or other reasons, may have difficulty in managing their financial affairs in a timely manner. This program permits these customers to have the option to designate a third party such as a relative, friend, clergyman, power of attorney or other individual to be notified of pending termination of electric service for failure to make required payments. The third party is not legally responsible for payment of the customer's bill or for any actions relative to the customer's electric service.

**Load Management** — This program helps keep rates stable by controlling customers hot water heaters during peak demand. Additional information is available at [www.svec.coop](http://www.svec.coop).

**Energy Efficiency Survey** — SVEC provides free home energy surveys to its residential members. The purpose of the survey is to help customers understand how they consume electricity and how to get the most for their energy dollar. Additional information is also available at [www.svec.coop](http://www.svec.coop).

## Understanding Your Bill

Page 2 of 2

**Electric Distribution Service** — The delivery of electricity directly to a home or business. SVEC is regulated by the State Corporation Commission and is responsible for maintaining the equipment to distribute the electricity as well as delivering it to customers. **YOU CANNOT SHOP FOR THIS SERVICE.**

**Electric Supply Service** — The generation and transmission of electricity. This service may be purchased from a competitive service provider. This is the service for which you can shop and the price may vary depending on which supplier you choose.

**KWH** — KWH is a measure of electrical energy (unit of energy) that represents a 1,000 watt unit of energy for one hour.

**Demand Charge/KW** — The largest electrical use or highest demand for electricity averaged in any 15 minute period per month. It is measured in Kilowatts and charges are calculated based on the cost per KW.

**Rate Schedule** — Our rate schedules are available at [www.svec.coop](http://www.svec.coop) or upon request at any of our offices.

If your telephone number has changed or is different from the number printed on the front of this bill, and you have not notified SVEC, please write in your new number in the event we need to contact you.

If you are not moving, but wish to change the address where you receive your mail, or if your service address has changed as a result of a 911 address conversion, please enter your new address below.

Please check one of the following:

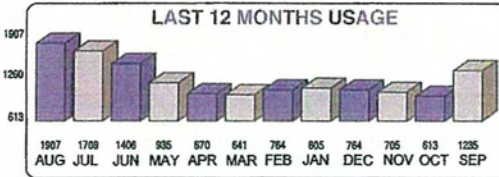
- Address change is both service and mailing address
- Address change is service address only
- Address change is mailing address only

Please Remit Payments to:  
Shenandoah Valley Electric Cooperative  
P.O. Box 236, Mt. Crawford, VA 22841-0236

Reminder: All bills are due and payable when rendered.  
 Budget bill accounts should be paid by due date indicated.

ACCOUNT INFORMATION	
LOCATION NUMBER [REDACTED]	PHONE NUMBER [REDACTED]
MEMBER NAME(S) [REDACTED]	
SERVICE ADDRESS [REDACTED]	
CREWE, VA 23930	
SERVICE LOCATION HOME	
SUBSTATION VICTORIA	BOARD OF DIRECTORS DISTRICT 1
BILLING ADDRESS [REDACTED]	
CREWE VA 23930-0007	

YOUR ENERGY USAGE - METER 32212			
	Current Billing Period	Previous Billing Period	Same Period Last Year
Average Daily Use	40	61	39
Average Daily Temp	80	77	72
Average Daily Cost	5.55	7.97	5.69
Days in Billing Period	31	31	31
Average Monthly Usage	1268	1907	1235



METER READING INFORMATION			
METER	PRESENT READING	PREVIOUS READING	MULTIPLIER
[REDACTED]	80241	78973	1
kWh		kWh	Kvar
1268			

EXPLANATION OF CHARGES	
RESIDENTIAL	SOUTHSIDE ELECTRIC COOPERATIVE
PREVIOUS CHARGES	247.36
PAYMENT RECEIVED <i>THANK YOU</i>	-247.36
BALANCE FORWARD	
RESIDENTIAL FIXED CHARGE	11.00
RESIDENTIAL ENERGY CHARGE	115.34
WHOLESALE POWER COST ADJ. .03201	40.59
VA SALES & USE SURCHARGE	0.31
<b>SEC CURRENT CHARGES</b>	<b>167.24</b>
NOTTOWAY UTILITY TAX	3.00
NOTTOWAY LOCAL CONSUMPTION TAX	0.48
SPECIAL REGULATORY TAX	1.39
TOTAL CURRENT CHARGES	172.11
<b>TOTAL CHARGES NOW DUE</b>	<b>172.11</b>

PLEASE PAY THIS AMOUNT **\$ 172.11**  
 DUE BY 10/19/09

**Important Message**  
**HELP US HELP YOU...**  
 Update your telephone number for calls regarding billing and outage issues...

Price to Compare for Energy Choice: 0.08829

- Check this box and see reverse side for address or telephone changes.
- Your monthly budget payment will be \$ 135.00. To sign up for budget, check the box, PAY TOTAL DUE and Initial. Your next billing statement will begin your budget payment. Initials
- As of this billing date, our records indicate that you want your account information distributed to licensed energy providers in the Virginia Energy Choice program. Please check this box if you would like to change your selection.

1 5  
 [REDACTED]  
 [REDACTED]  
 CREWE VA 23930-[REDACTED]  
 [REDACTED]

PLEASE TEAR HERE AND ENCLOSE BOTTOM PORTION WITH PAYMENT  
 DO NOT USE STAPLES OR TAPE ON YOUR CHECKS OR STUBS

CARD NUMBER		
SIGNATURE		
SECURITY CODE	EXP. DATE	AMOUNT
STATEMENT DATE	DUE DATE	ACCOUNT NUMBER
09/30/09	10/19/09	[REDACTED]
OUTSTANDING BALANCE		CURRENT CHARGES
\$ 0.00		\$ 172.11
TOTAL DUE		AMOUNT ENCLOSED
\$ 172.11		\$

SOUTHSIDE ELECTRIC COOPERATIVE, INC.  
 PO BOX 7  
 CREWE VA 23930-0007  
 [Barcode]

00000 [REDACTED] 000000000000000172110000000000000000000172110



## INFORMATION ABOUT YOUR BILL

### Emergencies & Repairs

1-800-552-2118

This is the number to call to report power outages and safety hazards.

### For Your Protection - Employee Identification

All Southside Electric Cooperative employees who need to come onto your property carry a special picture identification card. Feel free to ask for this ID. If you are still not sure, please call.

#### TERMS USED IN YOUR BILL

**Actual Meter Reading:** A reading by Cooperative personnel or automated meter reading device.

**Budget Billing:** A fixed amount to be paid each month by the individual member is determined based upon the previous year's electric usage. Any previous balances (debit or credit) will be included in this calculation to "true up" the account. The account(s) are then reviewed during the budget year and could be revised every six (6) months to reflect changing weather patterns and other factors that might affect actual usage.

**Consumption Tax:** State and local taxes on the energy consumption by customers.

**Discontinuance of Electric Service:** Bills for electric service are due when presented. Amounts unpaid beyond the due date on the bill are considered past due and may be reflected on our next bill. Amounts shown past due not paid as noted on your bill will be cause for disconnection of service. **NO CASH WILL BE COLLECTED IN THE FIELD AFTER HOURS (6 P.M.).**

Reconnection of service will be done after all billing arrears, fees and deposits have been satisfied. No reconnection will be performed after 9:00 p.m.

**Estimated Meter Reading:** When we are unable to obtain an actual reading, we estimate your usage. Any difference between what we estimated and your actual usage will be corrected the next time we read your meter.

**Fixed Charge:** The monthly basic distribution charge to cover costs of having facilities available, such as meter reading, equipment, maintenance and billing.

**Kilowatt (KW):** A measure of demand for power during a preset time - minutes, hours, days or months. One kilowatt is equal to 1,000 watts.

**Kilowatt-Hour (kWh):** The basic unit of measure for the electricity you use. One kWh is the amount of energy you would use to light a 100 watt light bulb for 10 hours. Customers are usually charged for electricity in cents per kilowatt-hour.

**Meter Reading Schedule:** We make every effort to read your meter monthly. If for some reason we cannot read your meter, we will send you an estimated bill.

**Multiplier:** If this is on your bill, we must multiply the electric use recorded on your meter by the number shown. This gives us the total kilowatt hours (and kilowatts, if applicable) you used for this billing period.

**Service Fees:** Charges associated with connecting and disconnecting your service, collections, meter testing and other administrative fees.

**Rate Information:** Complete rate schedules are available for review during business hours at our offices, call 1-800-552-2118, or visit our Website at [www.sec.coop](http://www.sec.coop)

**Virginia Sales & Use Surcharge Tax:** A sale tax levied by the state Virginia on SEC's purchases of utility poles, transformers, conductors and other material/equipment associated with providing electric service(s) to Cooperative members. This monthly surcharge reflects a member's portion of the amount of use tax the Cooperative pays for materials that were previously exempt from such tax.

**Wholesale Power Cost Adjustment (WPCA):** A charge or credit reflecting an increase or decrease in Southside's cost of power at wholesale.

#### ENERGY CHOICE DEFINITIONS

**Competitive Service Provider or CSP:** A person or company, licensed by the State Corporation Commission, that sells or offers to sell competitive energy services (aggregation, electricity supply service).

**Competitive Transition Charge:** A temporary charge, approved by the State Corporation Commission, will print on every customer's bill who choose to procure electricity supply service from a CSP. It is designed to recover Southside's transition or stranded costs. Most of this charge is not new; it has always been part of our rates.

**Distribution Service:** Charges regulated by the State Corporation Commission for the use of Southside's wires, transformers, substations and other equipment used to deliver electricity to end-use customers from the high voltage transmission lines. Distribution service must be purchased from Southside.

**Electricity Supply Service:** The generation and transmission of electricity. This service may be purchased from a competitive service provider. This is the service for which you can shop, and the price may vary depending upon which supplier you choose.

**Price to Compare:** The rate or price per energy unit used for comparing one competitive service provider against another in a competitive environment.

**Transmission:** Charges for moving high voltage electricity from a generation facility to the Southside's distribution lines.

PLEASE INDICATE ANY CHARGES TO WHERE  
YOU WANT YOUR BILL MAILED HERE:

STREET \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PLEASE INDICATE ANY CHARGES TO YOUR SERVICE ADDRESS HERE:

STREET \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PLEASE MAKE ANY CORRECTIONS TO YOUR  
TELEPHONE NUMBER HERE:

( ) \_\_\_\_\_

#### IMPORTANT INFORMATION

Southside Electric Cooperative's office hours are from 8:00-5:00 Monday through Friday, excluding holidays.

Contact Us & Mail Your Payments To:  
Southside Electric Cooperative  
P.O. Box 7, Crews, VA 23930  
Or Call: 1-800-552-2118

Remember you may pay your bill by eCheck or credit card using our website or 800 number.

- [www.sec.coop](http://www.sec.coop) and select "Click to pay your bill".
- 1-800-552-2118 and follow the prompts to your account information.

# TAB E

EXHIBIT E: INCOME AND DEMOGRAPHICS CHART<sup>42</sup>

	Unemployment Rate %	Income Disposal Personal	Income Per Capita	Total Population	Population Ages 45-64	% of Population Ages 45-64	Population Ages 65 & Over	% of Population Ages 65 & Over
A & N	9.4	1,237.29	26,382.32	51.90	13.60	26%	9.25	18%
BARC	8.1	930.26	33,243.63	30.92	8.55	28%	6.21	20%
Central VA	7.1	2,612.75	33,133.24	90.74	24.17	27%	14.31	16%
Community	7.7	884.67	33,509.42	28.99	7.76	27%	3.80	13%
Craig-Botetourt	7.7	460.57	32,616.74	15.89	4.73	30%	2.51	16%
Mecklenburg	12.5	1,884.47	26,231.65	80.25	21.65	27%	14.62	18%
Northern Neck	9.6	1,388.62	34,338.96	45.02	11.47	25%	9.46	21%
NOVEC	5.9	13,624.50	48,174.45	327.14	83.85	26%	25.37	8%
Powell Valley	9.6	457.05	25,908.53	19.57	5.51	28%	3.28	17%
Prince George	9.1	783.16	28,895.34	31.34	8.06	26%	3.57	11%
Rappahannock	7.6	8,740.90	36,199.22	274.27	70.27	26%	34.87	13%
Shenandoah Valley	7.2	2,539.76	31,114.58	92.16	23.07	25%	13.93	15%
Southside	8.9	3,846.16	31,213.46	140.68	37.51	27%	21.04	15%
VMD Association	7.7	39,390.16	36,540.70	1,228.90	320.60	26%	162.2	13%
VA State	7.3	294,201.45	42,735.20	7,844.57	2,080.79	27%	957.98	12%

<sup>42</sup> Income and demographic values, weighted based on the number of meters per county served by the Cooperative, were prepared by the ODEC Office of Forecasting & Member Services. These calculations derive in part from data supplied by Moody's Economy.Com, Inc., subject to all rights reserved under license, and protected under applicable law.





# TAB F

EXHIBIT F: CUSTOMER PROFILES BY COOPERATIVE<sup>43</sup>

				Residential	%	C&I	%	C&I	%	Public	%
2008	Miles	Customers	Per Mile	Sales	Residential	Sales <1000 KVA	C&I	Sales >1000KVA	C&I	Authorities	Public
A & N	2,367	34,394	14.5	30,238	88%	3,898	11%	6	0%	174	1%
BARC	2,002	12,589	6.3	12,017	95%	570	5%	2	0%	-	0%
Central VA	4,440	34,220	7.7	30,970	91%	3,243	9%	7	0%	-	0%
Community	1,559	10,820	6.9	9,064	84%	1,709	16%	2	0%	32	0%
Craig-Botetourt	1,311	6,987	5.3	5,453	78%	594	9%	38	1%	83	1%
Mecklenburg	4,354	31,393	7.2	29,578	94%	1,471	5%	20	0%	324	1%
Northern Neck	2,042	18,414	9	16,714	91%	1,625	9%	0	0%	75	0%
NOVEC	6,465	141,925	22	131,137	92%	10,683	8%	89	0%	16	0%
Powell Valley	3,461	30,186	8.7	25,333	84%	4,801	16%	7	0%	45	0%
Prince George	1,249	11,020	8.8	9,870	90%	1,038	9%	10	0%	102	1%
Rappahannock	12,393	100,757	8.1	93,323	93%	4,652	5%	293	0%	2,489	2%
Shen Valley	5,171	38,248	7.4	29,981	78%	6,080	16%	23	0%	-	0%
Southside	8,130	53,755	6.6	51,463	96%	1,980	4%	9	0%	303	1%
<b>Totals</b>	<b>54,944</b>	<b>524,708</b>	<b>9.1</b>	<b>475,141</b>	<b>89%</b>	<b>42,344</b>	<b>9%</b>	<b>506</b>	<b>0%</b>	<b>3,643</b>	<b>1%</b>

<sup>43</sup> Customer Profile data is based on information reported by the Cooperatives on RUS Form 7 at year-end 2008. The totals include some non-Virginia customers served by Craig-Botetourt Electric Cooperative, Powell Valley Electric Cooperative, and Shenandoah Valley Electric Cooperative.





**TAB G**

**EXHIBIT G: VIRGINIA COOPERATIVES' COMMENTS IN CASE NO. PUE-2007-00107**







2008 FEB -4 P 3:30

February 4, 2008

*By Hand Delivery*

Mr. Joel H. Peck, Clerk  
State Corporation Commission  
Document Control Center  
1300 East Main Street  
Richmond, Virginia 23219

Re: *Ex Parte: In the matter of establishing rules and regulations to implement the sale of electricity from renewable sources through a renewable energy portfolio standard program pursuant to § 56-585.2 of the Code of Virginia*  
Case No. PUE-2007-00107

Dear Mr. Peck:

Pursuant to Ordering Paragraph (4) of the State Corporation Commission's December 3, 2007, *Order Establishing Proceeding*, in the above-referenced case, enclosed are the original and 15 copies of general comments and specific responses to the seven questions propounded by the Commission, submitted on behalf of the Virginia members of the VMD Association of Electric Cooperative and Old Dominion Electric Cooperative.

Also enclosed are an extra copy of this filing and a self-addressed stamped envelope. Please date stamp the extra copy and return it to me.

Thank you for your attention to this matter.

Sincerely,

John A. Pirko

JAP/clj

Enclosure

cc: Edward D. Tatum, Jr.  
Richard Johnstone  
Susan Rubin  
Lopa Parikh  
Catherine Powers  
Erin Puryear  
Virginia Cooperatives

E-mail: john.pirko@leclairryan.com  
Direct Phone: 804.968.2982  
Direct Fax: 804.783.7680

4201 Dominion Boulevard, Suite 200  
Glen Allen, Virginia 23060  
Phone: 804.270.0070 \ Fax: 804.270.4715

**COMMONWEALTH OF VIRGINIA  
STATE CORPORATION COMMISSION**

COMMONWEALTH OF VIRGINIA )  
)  
At the relation of the )  
)  
STATE CORPORATION COMMISSION )  
)  
*Ex Parte:* In the matter of establishing rules )  
and regulations to implement the sale of electricity )  
from renewable sources through a renewable )  
energy portfolio standard program pursuant )  
to § 56-585.2 of the Code of Virginia )

Case No. PUE-2007-00107

**COMMENTS OF THE VIRGINIA MEMBERS OF  
THE VMD ASSOCIATION OF ELECTRIC COOPERATIVES AND  
OLD DOMINION ELECTRIC COOPERATIVE**

Pursuant to Ordering Paragraph (4) of the Virginia State Corporation Commission's ("Commission") *Order Establishing Proceeding* ("Order") in this case, issued on December 3, 2007, the Virginia members of the VMD Association of Electric Cooperatives ("VA Co-ops")<sup>1</sup> and Old Dominion Electric Cooperative ("ODEC") (jointly, the "Cooperatives"), through their undersigned counsel, hereby submit these general comments and specific responses to the seven questions propounded by the Commission in the initial Order in this proceeding. For their comments and responses, the Cooperatives state as follows:

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<sup>1</sup> The Virginia member cooperatives of the VMD Association of Electric Cooperatives include A & N Electric Cooperative, BARC Electric Cooperative, Central Virginia Electric Cooperative, Community Electric Cooperative, Mecklenburg Electric Cooperative, Northern Neck Electric Cooperative, Northern Virginia Electric Cooperative, Powell Valley Electric Cooperative, Prince George Electric Cooperative, Rappahannock Electric Cooperative, Shenandoah Electric Cooperative, and Southside Electric Cooperative.



## **I. Introduction**

The VA Co-ops are not-for-profit utility consumer services cooperatives organized under the laws of the Commonwealth of Virginia serving more than 490,000 retail customers (meters) in Virginia. Each is owned by and operated for the benefit of its member consumers, and each cooperative's primary corporate objective is to provide reliable retail electric service to its member consumers at the lowest reasonable cost. The impact a renewable energy portfolio standard ("RPS") would have on a cooperative is best measured in terms of the effect it would have on the reliability of the Cooperative's service and the ultimate cost of providing service to the Cooperative's members.

ODEC is a not-for-profit utility aggregation cooperative formed under the laws of the Commonwealth of Virginia that provides generation, transmission, ancillary and other related services to its twelve electric distribution cooperative members (ten of which are in Virginia). ODEC is owned by its member cooperatives who are also its customers, purchasing substantially all of their power requirements from ODEC (with limited exceptions)<sup>2</sup> under "all-requirements" wholesale power contracts. All in, the ODEC member cooperatives serve more than 535,000 retail customers (meters) in Virginia, Delaware, Maryland, and parts of West Virginia.

Each of the Cooperatives was created and is operated on a not-for-profit basis by its member-owners for their mutual and exclusive benefit under the principle of sharing costs. Consistent with cooperative principles, each Cooperative's central objective is to provide reliable and responsive service to its members at the lowest price that it can reasonably charge its members over the long term, achieved by pooling all resources and sharing all costs. With

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<sup>2</sup> A small increment of power is provided through contracts between certain of the member cooperatives and the Southeastern Power Administration ("SEPA").

ODEC, the impacts of inevitable fluctuations in specific resource costs on any individual distribution cooperative are minimized by pooling the various resource costs. Each member shares in cost savings as well as cost increases, without regard for the origin of such costs. For a cooperative, the operating focus is on minimizing the cost of providing service to its member-owners, rather than maximizing profits. Unlike an investor-owned utility, there is no dichotomy between the interests of investors and the interests of ratepayers because those interests are one and the same. In a cooperative, all benefits accrue to the members, and the members are responsible for all costs.

## **II. Discussion**

### **1. Background**

In this proceeding, the Commission is seeking to carry out the General Assembly's directive that it establish, among other things, incentives for regulated electric utilities to implement or increase the sale of electricity from renewable sources through development of a program emphasizing a "renewable energy portfolio standard" ("RPS"). The specific statutory provision at issue, Code of Virginia § 56-585.2, provides detailed requirements for the incentives to be made available to certain regulated utilities for achieving certain renewable goals. The statute sets out the target goals that must be attained by any regulated utility seeking to capture incentive payments as well as how to measure whether those goals are attained, and identifies

which retail customers will be required to fund the incremental cost of the renewable generation, including the specified incentives.<sup>3</sup>

Regulated utilities seeking to capture the incentive payments to be offered for operating a successful RPS program must secure prior Commission approval of its proposed program. The relevant statute states that “[a]ny *investor-owned incumbent electric utility* may apply to the Commission for approval to participate in a renewable energy portfolio standard program, as defined in this section.”<sup>4</sup> The incentives offered to encourage development of an RPS program are provided in the form of an increase in the “fair combined rate of return on common equity for each utility participating in such program.”<sup>5</sup> Thus, while the Cooperatives are not barred from developing RPS programs, the statute clearly is aimed at fostering the development of such programs by investor-owned utilities.<sup>6</sup>

The statute directs the Commission to “promulgate such rules and regulations as may be necessary to implement the provisions of this section including a requirement that participants verify whether the RPS goals are met in accordance with this section.”<sup>7</sup> This proceeding was established to begin the process of satisfying this statutory requirement. The Commission,

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<sup>3</sup> The statute is unusually detailed. For example, it identifies the sustainable biomass and biomass-based waste-to-energy resources a utility may use in meeting RPS goals. Included in the statutory list (“without limitation”) are: mill residue (except wood chips, sawdust and bark); pre-commercial soft wood thinning; slash; logging and construction debris; brush; yard waste; shipping crates; dunnage; non-merchantable waste paper; landscape or right-of-way tree trimmings; agricultural and vineyard materials; grain; legumes; sugar; and gas produced from the anaerobic decomposition of animal waste.

<sup>4</sup> Va. Code § 56-585.2.B (emphasis added). That section goes on to state that “[t]he Commission shall approve such application if the applicant demonstrates that it has a reasonable expectation of achieving 12 percent of its base year electric energy sales from renewable energy sources during calendar year 2022 ....”

<sup>5</sup> Va. Code § 56-585.2.C. This is in addition to recovery of incremental RPS program costs, fully described in § 56-585.2.E.

<sup>6</sup> In addition, for the ODEC-member cooperatives, the provision of power supply is controlled at the ODEC level; therefore, the benefit or impact of an incentive program would be indirect.

<sup>7</sup> Va. Code § 56-585.2.G.



however, has elected not to issue proposed rules at this time to address the General Assembly's mandate. Instead, the Commission has posed a series of questions designed to obtain stakeholder input as to what type of rules, if any, need to be promulgated, either now or sometime in the future. Only after it receives comments and reply comments will the Commission decide whether to issue specific proposed rules to implement the provisions of § 56-585.2 or an order finding that such rules are not necessary.

While the Cooperatives are not included in the description of electric utilities eligible for RPS program incentives, they have elected to participate in this proceeding and to respond to the Commission's inquiries because the Cooperatives believe their future interests could be affected by choices made in this proceeding. Across the country, various individuals and groups are advocating the imposition of *mandatory* renewable energy portfolio standards (or something comparable) on *all* electric utilities. In some cases the proposed standards have targets higher than 12% and deadlines occurring sooner than 2022. There someday may be legislative proposals in Virginia for mandatory RPS standards or programs of one form or another that may apply to all electric utilities, and this proceeding may set the pattern and precedents for possible future programs. Therefore, the Cooperatives have elected to have their voice heard now by participating in this proceeding.

## **2. General Comments**

As stated above, owned by its customers, a cooperative measures success by the reliability of its service and its responsiveness to members' needs, while minimizing costs to members. Over the long term, consistent with the principles behind operating as a cooperative, each Cooperative seeks to pool resources and share costs in order to provide the most reliable service to its members at the lowest reasonable price that it can charge.

In light of ever-increasing costs for materials, equipment, and operations, especially the spiraling price of fuel, the Cooperatives are generally supportive of whatever *cost-effective* resource options are available, including proposals to develop renewable resources. The Cooperatives readily support the development of electric generation from all varieties of renewable resources, including resources that replenish themselves naturally, resources that make use of residual materials, and resources that recycle waste. The Cooperatives are fully prepared to make energy from renewable resources a larger part of their electric fuel mix and therefore support the *responsible* development and use of *cost-effective* renewable resources, consistent with the goal of providing all of their member-consumers with continued safe, reliable, and affordable electric service.

Electric cooperatives also have been active participants in efforts to develop a fair and cogent national renewable energy policy, largely through the efforts of their national trade organization, the National Rural Electric Cooperative Association (“NRECA”). Across the country, electric cooperatives are actively expanding their fuel portfolios to include an array of renewable resources, including wind, solar, geothermal, biomass, manure, and hydroelectric. The NRECA estimates that electric cooperatives now own or have purchase contracts for more than 750 MW of renewable energy generation. In 2007, cooperative-owned renewable resources and cooperative purchases from renewable energy sources accounted for 11 percent of the power consumed by cooperatives nationwide, as compared to approximately 9 percent for the nation’s electric utility sector as a whole.<sup>8</sup>

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<sup>8</sup> In addition, on Feb. 28, 2007, the NRECA agreed to participate in the national 25 x '25 Action Plan. Under that plan, America’s farms, ranches and forests are scheduled provide 25 percent of the total energy consumed in the United States by the year 2025, while continuing to produce safe, abundant, and affordable food, feed and fiber.

Electricity from federally-owned hydroelectric power projects is an especially important and affordable resource for electric cooperatives. Hydroelectric generation has been a valuable power supply resource for Virginia's electric cooperatives for a number of years. Several of Virginia's distribution cooperatives receive a portion of their power supply from the Southeastern Power Administration ("SEPA"). This power is provided from SEPA's hydroelectric generation facilities at the John H. Kerr Dam and Reservoir and Philpott Lake projects in Southside Virginia. In addition, since 1938, VMD Association member Craig-Botetourt Electric Cooperative has had 300 kW in hydroelectric generation available from its Meadow Creek facility. While this may be a relatively small facility, Craig-Botetourt serves to illustrate that even a smaller cooperative can contribute to the development of renewable energy resources in areas where such projects might otherwise be deemed unfeasible.

ODEC also is involved in the development and use of electric power from renewable resources. ODEC now purchases approximately 12,500 MWh per year from a landfill gas project and actively pursues adding other renewable resources to its generation mix. ODEC is exploring additional renewable energy opportunities, including the development of energy from manure and poultry litter as well as the feasibility of switch grass-fueled generation. In short, the Cooperatives are actively seeking to make renewable energy a bigger part of the available electric power mix.

Based on their involvement with hydroelectric power, one area of concern to many cooperatives, especially those Virginia Cooperatives receiving energy from SEPA, is the treatment existing hydroelectric generation facilities will receive under future renewable resource programs. To the extent there are requirements associated with future renewable resource programs in Virginia that affect the Cooperatives, the Cooperatives undoubtedly would seek to



have their current renewable hydroelectric resources recognized and properly credited as renewable resources.

Regarding the issue of creating and offering incentives favoring the development of renewable energy resources, once again the Cooperatives would emphasize the twin concerns of cost effectiveness and fairness. Any incentives that are offered should bear an appropriate, proportionate relationship to the value of the program, *i.e.*, the incentives offered should not skew the cost-benefit analysis such that the benefits offered by a renewable resource are overwhelmed by its costs. In addition, the Cooperatives believe that appropriate funding for research and development of renewable energy resources makes good sense, and such funding could well include incentives to encourage full utilization of domestic renewable resources, *provided* such incentives are available and beneficial to, and accessible by, all segments of the industry on an equitable basis.

However, the Cooperatives do *not* support the imposition of renewable resource mandates on electric utilities. Mandated renewable resource standards could undermine a Cooperative's control of its power supply decision-making, serve as a threat to system reliability, and unnecessarily increase the cost of electricity for member-consumers. Mandated programs can ignore important local differences, increase energy costs to consumers, and unknowingly impose undue burdens on consumers, especially consumers in rural areas. The Cooperatives stand firmly opposed to any mandated RPS standards or programs.

### **3. The Commission's Questions**

The Cooperatives offer the following in response to the Commission's seven questions:

- (1) Should there be a standard package of data and information that utilities must file in order to demonstrate that they have achieved an RPS goal as those goals change through time as set forth in § 56-585.2 D? If so, what data and information should be provided to the Commission? In the alternative, should such applications be instead handled on a case-by-case basis?

The Cooperatives generally believe it would make sense to have a standard, uniform set of data and information that a utility claiming to have achieved an RPS goal must submit in order to demonstrate that it has, in fact, met its goal as established in § 56-585.2 D of the Code. The only way to administer such a program fairly, especially when incentive payments above and beyond the incremental cost of the program itself are involved, is to have an established, uniform set of applicable requirements. At a minimum, the Commission should require the collection and submission of data sufficient to provide a meaningful measure of the utility's compliance with the requirements of the statute and the Commission's rules, and to measure the utility's progress in achieving its stated goals. While the Commission could retain the flexibility to request supplemental data and information beyond the minimum required information, on a case-by-case basis, there must still be a baseline of required information to insure fairness to electricity consumers as well as fairness among participating utilities. The statute specifically directs the Commission to include in its regulations a requirement that participants verify whether the RPS goals have been met. In order to verify whether RPS goals have been met, the Commission must establish some standard baseline of required data and information that must be submitted.

- (2) What special procedural rules, if any, should apply to proceedings regarding applications submitted pursuant to § 56-585.2 of the Code for award of incentives to utilities for RPS Goals attained?

As is often the case with a new regulatory program, a basic set of procedural rules will be needed to consider, evaluate, and fairly administer proposed renewable energy portfolio standards and programs. The procedural rules should provide a description of the basic data and

information required to establish such a program. One element that should be included in any set of special procedural rules and guidelines for RPS programs is a rule setting deadlines for Commission action on an RPS program application. The approval process should be streamlined and expedited; there should be a specific timeline that, in the absence of extraordinary circumstances, the Commission and its staff must follow and satisfy.

- (3) What special procedural rules should apply to proceedings opened to establish and provide for recovery of all incremental costs incurred for the purpose of such participation in a RPS program?

At this time, it does not appear that special procedural rules need be adopted for proceedings to establish and provide for recovery of the incremental costs incurred for the purpose of participation in an RPS program. Basic methods by which the Commission evaluates the incremental costs of any given program are already well established.

- (4) Should a tracking system be required to ensure that renewable resource certificates are appropriately and accurately credited to renewable resource facilities? If so, how should such a tracking system be designed and what entity should maintain the tracking system?

Yes, use of a tracking system to ensure that renewable resource certificates are appropriately and accurately credited to renewable resource facilities would be appropriate. Experience has shown that absent a credible tracking system, participants in programs wherein special incentives or rewards are awarded are more likely to become lax in meeting the standards prescribed by the relevant statute. It makes no sense to set a standard that a facility must satisfy in order to qualify for a program, then not establish a tracking system to verify that such facility continues to qualify and satisfy the standards it has been represented as able to meet.

PJM Environmental Information Services, Inc., a subsidiary of PJM Interconnection LLC, has developed a system designed to track such compliance, known as the Generator Attributes Tracking System (GATS), and has been operating the system for several years. GATS tracks the



attributes of subscriber generation assets and the ownership of those attributes as they are traded or used to meet government standards. The GATS system may be an appropriate mechanism for tracking Virginia RPS programs.<sup>9</sup>

- (5) The Commission seeks comment as to whether there are programs or elements of programs adopted by other states that may be appropriate and comply with the provisions set forth in § 56-585.2.<sup>5</sup>

<sup>5</sup> See, e.g., North Carolina's ncGreenPower program. This program provides for voluntary (double tax deductible) contributions collected by electric companies and then provided to an independent § 501(c)3 organization. The monies are paid out to in-state only "green" electricity producers, providing those producers with an incremental cash flow in excess of that provided by the utility" (sic) "avoided-cost" established by the North Carolina Public Utilities Commission. The ncGreenPower model may be viewed at <http://www.ncgreenpower.org>.

(Footnote from Commission Order.)

Neither Maryland nor Delaware have required all cooperatives to participate in or adopt a mandatory RPS. In Maryland, Choptank Electric Cooperative was exempted from the state statute due to Choptank's wholesale power contract with ODEC. In Delaware, Delaware Electric Cooperative was exempted from the state statute as long as it offers a renewable retail rate to its

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<sup>9</sup> At the PJM Environmental Information System, Inc., website (<http://www.pjm-eis.com>), the GATS system is described as follows:

The Generation Attribute Tracking System (GATS) provides information about how megawatt-hours of electricity were generated. The data are used to meet the information disclosure requirements of states with fuel mix and emissions disclosure requirements or that have renewable portfolio standard requirements. Participation in GATS is by paid subscription.

The GATS database contains information for each individual generation unit. It creates generator-specific electronic certificates that identify the generation attributes necessary for electricity suppliers to satisfy state policies and to document claims made about "green" power. Data in the GATS include: megawatt-hours produced, emissions data (primarily from the U.S. Environmental Protection Agency and supplemented from other sources), fuel source, location, state program qualification and ownership of attributes for each megawatt-hour tracked.

The attributes or characteristics of the generation are recorded into the database as an electronic certificate after the electricity is produced. There is one certificate with a unique serial number identifying the attributes of the generation for each megawatt-hour produced. For owners of generation a certificate provides a means to sell or transfer the generation attributes to a buyer. For state agencies seeking effective ways to implement policies and regulations, certificates and a central database provide a means to monitor, verify and document compliance. For load serving entities the system is an effective, efficient means to comply with attribute disclosure and portfolio standards.

members. DEC also has a fund, not unlike the North Carolina fund the Commission described in its initial Order (at footnote 5), but DEC itself administers the fund. Based on the special member/owner relationship that cooperatives have with their customers, a self-administered renewables/energy efficiency fund would be better than a state-wide or state-run fund, as it would give more control to the local cooperative, which is more familiar with its customer base and the local renewable resources.

(6) Virginia Code Section 56-585.2 F states in part:

A participating utility shall be required to fulfill any remaining deficit needed to fulfill its RPS Goals from new renewable energy supplies at reasonable cost and in a prudent manner to be determined by the Commission at the time of approval of any application made pursuant to subsection B.

What standards should the Commission apply in determining the reasonableness and prudence of these resource acquisitions?

The Commission should continue to use the prudence review methodology it has been using to evaluate the reasonableness and prudence of resource acquisition decisions made by various utilities for many years. The Commission has ample familiarity with measuring and evaluating the reasonableness and prudence of decisions made by electric utilities.

(7) Virginia Code Section 56-585 .2 E states in part:

All incremental costs of the RPS program shall be allocated to and recovered from the utility's customer classes based on the demand created by the class and within the class based on energy used by the individual customer in the class, except that the incremental costs of the RPS program shall not be allocated to or recovered from customers that are served within the large industrial rate classes of the participating utilities and that are served at primary or transmission voltage.

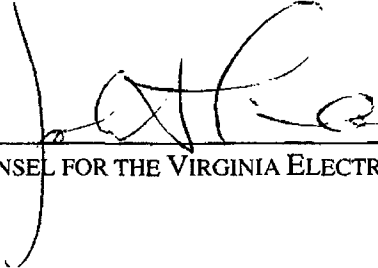
How shall the Commission determine which customer classes and subclasses should be construed to fall within the "large industrial rate classes of participating utilities" that are not to be allocated incremental costs of the RPS program, given that such a customer may be served at transmission or primary voltage?

The Commission should use the utilities' previously approved tariffs to determine what customers or customer classes meet the criteria in the legislation. Similarly, the Commission should have little trouble identifying which eligible customers are or can be served at primary or transmission voltage.

**III. Conclusion**

WHEREFORE, the Virginia members of the VMD Association of Electric Cooperatives and Old Dominion Electric Cooperative respectfully submit these comments. The Cooperatives appreciate the Commission's willingness to receive and consider stakeholder comments on these important issues.

Respectfully submitted,



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# TAB H

**EXHIBIT H: SAMPLES OF CONSUMER EDUCATION MATERIALS, ADVERTISING AND BILL INSERTS FROM VARIOUS  
ELECTRIC COOPERATIVES**





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ELECTRIC COOPERATIVES**



## Security and Energy Efficiency On a Roll

**Q.** When I visited Europe, I saw attractive rolling window shutters. They worked great for blocking heat and cold and as security against storms and thieves. Why wouldn't they work as well here in the U.S.? - Ann F.

**A.** Actually, they do work very well in the U.S. too. Rolling window shutters have been popular in Europe (with their extremely high energy costs) and along the hurricane-prone regions of the U.S. for many years. When they are rolled up and completely opened, rolling shutters are totally hidden from view, so you are probably not aware of how many homes have them already.

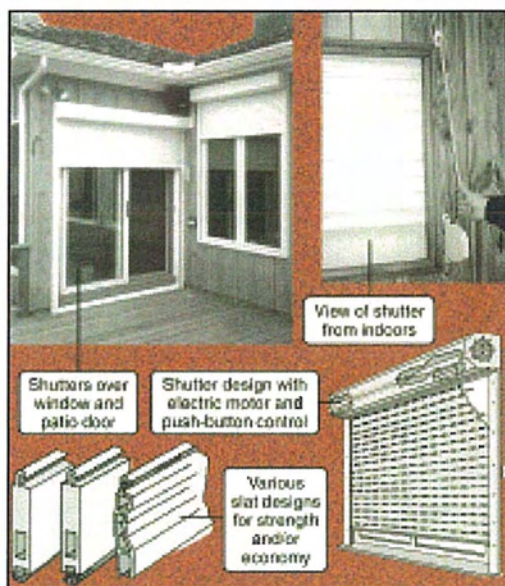
Now, with more concern about security, energy savings, tornado/hurricane protection and privacy with today's smaller lots, rolling shutters are becoming popular throughout the entire U.S. Without sacrificing security and privacy, rolling shutters allow you to still have efficient natural ventilation and daylighting through your windows.

If you have never seen rolling shutters over windows, patio doors or porches on a house, they are quite attractive. They are available in many colors and slat shapes and sizes and are custom designed to fit each window or door opening perfectly. Custom ones can even be made to fit new contemporary-shaped window shapes like arched, triangular and trapezoidal.

Installing rolling shutters saves money in several ways. The slats — many of the hollow ones are filled with foam insulation — create an insulating dead air space outside your window glass to lower both heating and cooling bills. This improves single-pane window efficiency by about 65% and double-pane window efficiency by about 50%. The protection from the elements also reduces window and door maintenance and can increase their lives.

Most rolling shutters are made of many horizontal 1.5- to 2-inch-high durable insulating slats that operate similar to an old roll-

top desk. The ends of the slats slide in small, but strong, channels that are attached to the sides of the outdoor window opening. In retrofitting an existing house, the slats roll up into a long narrow housing that is hidden under the roof overhang. In new construction, the housing can be hidden inside the roof soffit.



### Rolling shutters for security, efficiency, privacy.

For convenience and security, you open and close the shutters from indoors. The least expensive method, usually for only small to standard-size windows, uses a small indoor strap to operate the shutter. The strap comes indoors at the top through a small sealed hole in the wall and it operates smoothly and easily.

For rolling shutters on standard to larger windows or doors, an optional indoor hand crank mechanism is often used. This is very durable and makes it easy to open the shutter precisely as much as you want. For very large shutters, or for extra convenience, an electric drive motor, built into the housing, is used to raise and lower the rolling shutter.

If you select a motor drive option and you plan to install shutters on several windows/doors, consider one with hand-held, remote controls, just like on your TV. Some motor/control units allow you to program

several groups of shutters together. You press one remote control button and only the programmed shutters raise or lower simultaneously. Timers, sun, wind and rain sensors can also automatically close shutters when you are away from home.

The interlocking flanges that hold adjacent slats together have open slots cut into them. When the shutter is totally lowered and closes against the weather-stripping seal at the bottom, the upper interlocking flange on each slat slides up completely into the slot above it. This hides these open slots inside the mating slats to block all light and about 70% of outdoor noise.

As you start to raise the shutter, the slats spread apart before the bottom seal actually begins to lift from the sill and uncover the window. If you just start to raise it a little, only a few slats separate to expose some slot openings for natural lighting and ventilation.

Raise it a little more to expose more open slots for controllable levels of light and ventilation. At this point, the shutter is still resting on the sill for privacy. Raise it slightly more and it begins to uncover your window or all the way up to totally uncover your window.

The basic slat material options (in increasing cost) that you can choose from are — PVC plastic, rolled aluminum with insulation, and extruded aluminum. Insulated rolled aluminum is tougher than PVC for greater wind and impact resistance. Extruded aluminum slats are the strongest, but they are heavier and are not usually filled with insulation.

Write for (or instantly download — [www.dullely.com](http://www.dullely.com)) Update Bulletin No. 693 — buyer's guide of 13 rolling shutter manufacturers showing slat material/size/color and opening control options, insulation, prices, features and illustrations. ■

Send your questions and Utility Bills Update requests to James Dullely, c/o Living, 6906 Royalgreen Dr., Cincinnati, OH 45244. When requesting a Utility Bills Update, please include \$3 and a business-size, self-addressed, stamped envelope and indicate update number. To rush delivery or read all previous columns, go online to <http://www.dullely.com>.



## Quiet, Efficient Front-Loading Washers

**Q.** I need a new clothes washer. I heard about quiet, efficient new front-loader models, but since they use less water, I worry about allergies from ineffective rinsing. Do they really wash and rinse well? — Peg J.

**A.** Front-loading clothes washers (horizontal axis) are superior in most ways to the typical top-loading ones that are most popular in the U.S. In Europe and most of the rest of the world, efficient front-loaders are predominantly used. With a more international market, front-loaders are designed with very high-quality materials for a longer life instead of the typical throwaway U.S. mentality.

By design, front-loaders wash and rinse much more effectively than top-loaders. By using less water, less detergent and less energy to heat the hot wash water, the annual savings of operating a front-loader as compared to a top-loader can be as much as \$100. Also, the gentle tumbling washing action, as opposed to being beaten with an oscillating agitator, minimizes damage and premature fading of your clothes.

Instead of filling a tub with water and using a plastic agitator to move the water as in a top-loader, a front-loader uses gravity. As the tub spins on a horizontal axis, the clothes gently tumble through the sudsy water. An automatic sensor determines the proper water level for the size of the load.

Since the tub is only partially filled with water, the clothes actually fall through the air from the top of the tub as it spins. This allows them to fan out before they reach the water and swish through it again. There is very little clumping of clothes so they are thoroughly cleaned.

Many of the models have built-in adjustable water heater elements that can raise the wash water to as high as 200 degrees. This improves cleaning and is

ideal for washing children's clothes and during cold and flu seasons.

With a horizontal axis and no agitator, a front-loader can spin several times faster (up to 1,600 rpm) than typical top-loaders to rinse out more detergent residue. Most of the models include special shock

to the clothes in a front-loader for the physically-impaired is a consideration for the elderly.

If you really prefer a top-loader, select one of the brand new designs that use the lifting washing motion. Instead of using an agitator, these use a wash plate to create a unique wavelike motion to gently lift and bounce the clothes through a waterfall of sudsy water. It fluffs up the clothes for very effective cleaning and rinsing. By eliminating the agitator, there is also more room for a larger load of clothes.

Like a front-loader, this design uses less than half as much water and detergent as a standard top-loader. For less than full loads, sensors automatically determine the optimum amount of water to use. Using an efficient variable-speed motor and a unique six-point suspension, effective high spinning speeds are possible to reduce drying time.

There are also combination space-saving front-loader washer/dryers that do both the washing and drying in the same unit from start to finish. You put in the dirty clothes and take out clean dry clothes. Most of these use a condensing-type of dryer so that they do not have to be vented outdoors. They just need an electrical outlet and a cold water faucet. Portable models on casters are available that have small built-in heaters to warm the wash water.

Write for (or instantly download — [www.dulley.com](http://www.dulley.com)) Update Bulletin No. 866 — buyer's guide of 12 front-loader, lifting top-loader and combination washer/dryers showing load capacities, water usage, spin speeds, preset cycles, convenience features, prices and cost-to-use chart. ■



### Front-loading washers last longer and use less water.

absorbers and suspensions to minimize noise and vibration. An electronic brain senses if the load is unbalanced. If so, the tub automatically stops, rotates back and forth to even out the load and then spins again.

For effective rinsing, some models use an electronic suds sensor. If too much suds are still present, they automatically run through several extra rinse cycles until the suds are adequately cleared. You may also select models with manual settings up to seven rinse cycles per load. Depending on the fabrics and load size, you preset the number of rinses.

Other than the improved washing and drying effectiveness, a front-loader design allows the washer and dryer to be stacked on top of one another to save floor space. This is important in today's more efficient, compact houses. Also, the ease of access

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## Brighten Your Landscape with Solar Lights

**Q.** *I need outdoor security and landscaping lights, but I hate to run wiring because of the sidewalk and damage to my gardens. Has solar light brightness improved to the point where they are usable?*  
— Ann K.

**A.** New designs of brighter solar-powered lights are a perfect match with your security and landscaping needs. With no wiring required, you will not have to dig through any of your gardens and landscaping. Even with do-it-yourself low-voltage lights, it is still a hassle trying to get the stiff, heavy cable under or around sidewalks.

Solar-powered yard lights are simple devices. They have three basic components — a light bulb, a rechargeable battery, and a small solar cell panel built into the top of the light. Since they use no electricity, they operate for free and create no air pollution. To install one, just attach it to your house wall, a deck rail or steps, or push a mounting post into the ground. Generally, it is a good idea to let the sun charge it up for a couple of days first and then switch it on. All models have electric eyes that switch on automatically from dusk to dawn.

The styles of many of the new solar-powered accent and security lights have gone contemporary. For versatility and because they are so easy to move as you change your landscaping, select ones that can be mounted either on a post or against a wall. With advances in solar cell technology and efficiency, the smaller solar cells are integrated into the sleek new designs.

If you tried older solar lights before and were dissatisfied, you will be surprised at the much brighter light output, styles and features of the new ones. The older dim incandescent bulbs have been replaced with high-tech white LED's (light-emitting diodes), fluorescent and halogen bulbs. Not only are they brighter, but their higher efficiency provides more hours of light at night on a single day's recharge from the sun.

Although not for your garden, the newest designs are solar-powered street number lights. One design that I use is a solar mailbox with my lighted red street numbers on each side. I also have another solar address locator, with 4-inch amber LED numerals up closer to my front door. The numbers are visible up to about 100 feet away.

These not only ensure that the pizza delivery person finds your house before the pizza gets cold, but it enhances security. If

actually produce some usable light that you can work or read near. They typically use four- or five-watt bulbs. This may not sound like much light, but at night with no other lights on, it is quite bright. The fluorescent bulbs, like LED's, last a very long time.

For a combination of security and landscaping lighting, select an LED/halogen motion-sensing model. At dusk, the electric eye automatically switches on a dim amber LED for accent or pathway lighting. When motion is detected within 20 feet of the light, a bright halogen bulb comes on for three minutes. This will provide enough light for guests to safely walk to your door and it will definitely scare away prowlers.

Security-only, bright motion-sensing solar lights are also effective. These typically use a remote solar panel so that the light itself can be located in a shady area, like under a roof overhang. The solar panel, less than one foot square, is attached to the light with a tiny wire. These can cycle on and off more than 100 times on a single day's charge from the sun.

Other solar-powered lighting options are flashlights and bright lanterns. Some have a fluorescent and torch light on one side for camping or car emergencies, like changing a tire, and a warning flashing light on the other side. A solar panel is built into the side. The flasher will operate up to 40 hours and the torch light up to 8 hours on a single

charge.

Write for (or instantly download — [www.dulley.com](http://www.dulley.com)) Utility Bills Update No. 756 — buyer's guide of new high-tech solar-powered street address markers, accent, security and specialty lights, styles, maximum on-times, bulb types and prices. ■



### New brighter solar light technology and styles

you ever make a 911 call, the rescue squad or fire department can find your house immediately. From what paramedics say, finding the proper house quickly can make the difference between life and death.

Solar-powered lights that use LED bulbs provide the most efficient and most hours of light at night. After a sunny day, eight to ten hours of light is possible the following night. LED's are most effective for landscaping accent lighting and marking pathways and steps up to a deck. As a reference, they are generally not bright enough to read by at night.

The brightest solar-powered lights use small compact fluorescent bulbs. These

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## Retractable Awnings Lower Peak AC Load

The sun bakes our walls and deck. I need some type of movable awning for shade and rain protection while still having a sky view at night and solar heat in the winter. What is the best type of awning to use? — Paul N.

Providing shade for your house and deck is very important for reducing your peak air-conditioning load on hot afternoons. In particular, if your house has brick or masonry walls, the sun's heat is absorbed and this can keep your house uncomfortably warm well into the evening.

There are several types of movable awnings available, but the most convenient for your needs is a large lateral-arm retractable awning to cover your deck and wall. In addition to providing shade, by selecting the proper fabric, installing one can provide protection from even heavy rains and storms. I have sat under the retractable awning at my own home and have never had a drop of rainwater come through.

A lateral-arm retractable awning is unique because it is supported only where it attaches to the house wall. This cantilever design eliminates the inconvenience of having awning supports at the outer corners that rest on the deck or patio. Since it is attached flush against the house wall, it provides very effective and complete shading of the house wall when it is opened. There are hundreds of styles, patterns and colors of decorative fabrics that can be used on a retractable awning. Since the fabric rolls up and is hidden against the wall or under the roof soffit when it is closed, it is not continually exposed to the sun's rays or harsh weather. This, along with ultraviolet ray inhibitors in the fabric, provide it a long life with little fading. A lateral-arm retractable awning can be opened any amount, from just a few inches to its full projection length, from the house wall. This gives you complete control over the amount of shading and rain protection that

you want. For example, when entertaining, you may not want to have the entire deck covered.

Although the lateral arms are very strong, they are not strong enough to handle a heavy snow load in the full open position. I found this out the hard way one winter when one elbow broke. This is gen-

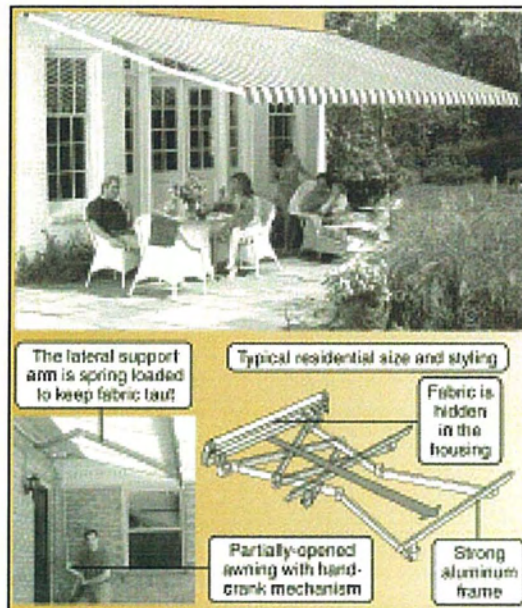
with up to 14-foot projections out from the wall. Since you can open one any amount you wish, it is often wise to get one that has a slightly greater projection than you currently need. A larger one just has slightly longer arms and a larger fabric roll against the house wall.

Even the largest awnings are easy to open and close with a hand crank mechanism like I have at my house. For more convenience though, select an optional electric motor drive that is hidden up against the house wall by the fabric roll. Push a button and it opens or closes to any position. If your budget is not tight, consider adding a high-tech wind and rain sensor to control it automatically when you are away.

Another movable shading option for a window or wall is a retractable vertical awning. The width can be as narrow as two feet for small window shading or as wide as you need. They have hand cranks or are motorized and they are available with see-through, colorful acrylic or total blackout privacy fabrics.

If your deck is not located directly against a wall, consider a freestanding retractable awning design. An easy-to-move butterfly design extends out from the frame on both sides and retracts into a narrow protective hood at the center. There are also non-lateral arm awnings that swing down over a window.

Write for (or instantly download at [www.dulley.com](http://www.dulley.com)) Utility Bills Update No. 465 — buyer's guide of nine manufacturers of various retractable awning designs listing maximum widths, projections, features, prices, installation instructions and a fabric selector guide. ■



### Retractable awnings provide sun and rain protection.

erally not a problem because you usually keep it closed in the winter for maximum passive solar heat gain.

To visualize how a retractable awning works, hold your arms chest high and tight against your chest with your elbows out to the sides. Now slowly straighten out your arms and imagine them covered with fabric on a roll. This is exactly how a retractable awning opens and closes over a deck or patio.

The two lateral arms are spring-loaded at the elbows with the spring force trying to straighten them out. These springs create just enough tension on the fabric, stored in the roll on the wall, so that it stays taut no matter how far the awning is opened. With it mounted at the proper slope angle, rainwater will not puddle on it.

Lateral arm retractable awnings can be made in sizes from 4 feet to 40 feet wide

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# From SHOWER to FLOWER

Greywater is any used water that didn't come from a toilet and it makes up roughly 60 percent of what normally goes down the drain. Although "used," it's still clean enough for most yard plantings. In fact, many of the drier western states consider it a valuable resource for irrigation, and one that's already been paid for.

If you get a water bill each month for 4,000 gallons, it's easy to see how economically attractive it is to use 60 percent of it (or 2,400 gallons) on your flowers and trees to make them green. As a subsurface irrigation system, greywater can keep a lawn green, too. During our dry summers, this not only saves you a lot of water, but also a lot of that other green stuff — money.

However, you must construct your system correctly or you'll be having a lot of dead plants instead.

Greywater systems can be simple or very sophisticated. In the "bad old days," a greywater system was basically a pipe between the drain on a sink or shower and the outdoors. The problem with this is that the high concentration of soapy material in one area often harmed plants and reduced soil drainage. This is not recommended and local plumbing codes will not allow it either. The good news is that modern greywater technology has become pretty fail-safe. Some even have filters to make it safer for vegetable plants.

### FOR MORE INFO

- *Building Professional's Greywater Guide*
- *Create an Oasis with Greywater*

Both publications are by A. Ludwig and are available from: Jade Mountain Inc.; 800-442-1972; <http://www.jademountain.com/grey.html>.



Now before you run off and start construction, it's a good idea take care of the following first:

- 1) **Install low-flow showerheads, faucets and a water-efficient clothes washer to reduce your overall water consumption.** Most houses produce far more greywater in one day than needed for a typical yard. For this reason, many systems have a way to direct unneeded water down the sewer main. Unlike rainwater, greywater should never be stored since it quickly becomes a potential health hazard as bacteria multiplies in a tank on hot summer days.
- 2) **Check with your local plumbing inspector's office for guidelines.** Some will encourage greywater systems while others aren't familiar with them at all. To help both of you, the Uniform Plumbing Code of the International Association of Plumbing and Mechanical Officials, Appendix G, and the California Plumbing Code, Appendix J, both offer specific guidance.
- 3) **How difficult is it to split up your drains?** How will you protect the system from freezing in the winter?
- 4) **Slope of the land:** Is your house higher than the landscape or will you need to pump the greywater uphill?
- 5) **If you use modern chemical cleaners in your wash, go back to the basics of simple soaps and "Earth-friendly detergents."** Avoid things that claim to soften, whiten, or have enzymatic powers. All of these may hurt plants. Also, many cleaners are alkaline or have salt in them and can adversely affect the pH of the water and soil. The books and Web site listed to the left offer excellent advice for alternative cleaners and soil repair.

Once you've sorted out these preliminaries, you can start designing. If you use a well for your drinking water, keep the greywater irrigation far away from the well head. If you already have an irrigation system that uses potable water, it's best to install a separate greywater system to avoid cross contamination.

In order of desirability, the sources of greywater are: showers, bathtubs, bathroom sinks, and lastly, clothes-washing machines. Water from kitchen sinks and dishwashers often holds grease and food particles and should not be used in recycling systems.

Packaged commercial systems are also available that include everything you'll need to make your system safe and reliable for many years. All of them include the major items like: a surge tank, valves, controls and other components to make the right modifications. Depending on complexity, these systems cost from a few hundred to several thousand dollars.

Homes that are much higher than the landscape can use gravity to move the water through the surge tank and on to the irrigation piping. Where needed, a sump pump at the bottom of the surge tank pushes the water to the irrigation area. Be aware that any sump pump may become a maintenance problem if it should fail or get clogged. Always provide an overflow to the sewer main or some other safe place in the event of a pump failure. The irrigation system must also be clearly labeled as "Non-Potable Water. Not for Drinking."

A few last words: Some people feel that since most bacteria can't survive very long in sunlight, greywater is safe for vegetable gardens. If you have underground irrigation, this is obviously not the case, since there is no sun underground; special filters help, but check with your plumbing code officials to be sure. According to the California Department of Water Resources, greywater should NOT be used on food crops, period! To be on the safe side, use it only on ornamental plants, shrubs, and the roots of trees (including fruit trees). Never spray greywater into the air, since the atomized mist can be dangerous if it gets in your eyes or is inhaled. Apply greywater only to the base of the plants or in an underground irrigation system. ■



# Energy Use for Appliances

Household appliances, including lighting, account for roughly 23 percent of energy consumption in the average Virginia home. Because these appliances are primarily powered by electricity, which is more expensive per unit of energy than other fuels, they comprise a larger share of the average household energy expenditure: roughly 30 percent.

## What Can You Do About Your Appliance Energy Use?

There is a lot you can do to control and reduce appliance energy use. If any of your appliances need replacement, you can select more efficient models. Even if your current appliances don't need to be replaced, it might be a good idea to do a little research now so that when they do go, and you have to rush out to buy replacements, you'll know what you want. (As you know, appliances usually fail over holiday weekends when the in-laws are visiting!).

If you aren't planning to replace an existing appliance, there are often simple measures that can be taken to improve its energy performance. And, even if your appliances are in perfect working order, adjusting the way you use them can often reduce their energy consumption. Contact Craig-Botetourt Electric Cooperative for more details at (540) 864-5121.

## Shopping for New Appliances

Most new appliances tend to be considerably more energy-efficient than their predecessors. Energy efficiency alone is rarely enough justification for replacing an old appliance since the energy savings are typically not great enough to justify the cost of the new appliance. However, there are many reasons people decide to replace an old appliance. It may have stopped working completely or it may simply not look right in a newly remodeled kitchen.

Regardless of the reason for buying a new appliance, it almost always pays to buy an energy-efficient model.

One very useful resource is the *Consumer Guide to Home Energy Savings*, published each year by the American Council for an Energy Efficient Economy (2140 Shattuck Avenue #202, Berkeley, CA 94704).

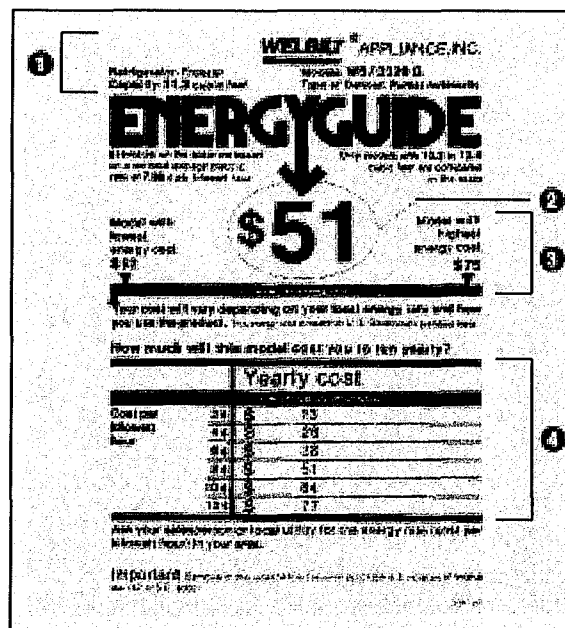
## The EnergyGuide Label

One of the most useful tools for shopping for energy-efficient appliances is the EnergyGuide label. Federal law requires that EnergyGuide labels be attached to all new refrigerators, freezers, water heaters, dishwashers, clothes washers, air conditioners, heat pumps, furnaces, and boilers. The following explanation should give you a good idea of exactly what the EnergyGuide labels tell you and how it can help you make an informed decision when shopping for new energy-efficient appliances.

## How to Use the EnergyGuide Label

1. Top of label: Type of appliance, capacity, model number.
2. The large number tells you the approximate yearly energy cost in dollars. It is based on the average cost of electricity around the country, which changes from year to year.

The labels on different models or even on the same models in different stores may have been printed at different times, so the numbers might be a little different. Also, because your electricity costs are probably different from the national average, this may not tell you how much the refrigerator will cost to operate in your area (see #4 below).



All EnergyGuide labels use this basic format. They are bright yellow with bold black letters and numbers.

3. This is a scale that shows how the refrigerator compares with other similar models on the market in terms of energy efficiency. The operating

costs of the most efficient and least efficient of this size category are shown on the scale. A word of caution: the ranges provided on EnergyGuide labels are not updated regularly and may be inaccurate. In other words, even though the scale shows this particular model to be at the high-efficiency (low energy cost) end of the scale, the scale itself may have shifted as more efficient models have come onto the market. The best thing to do is to shop around until you are satisfied you are getting the best buy for your money.

4. The yearly energy cost table provides a way for you to figure out how much the refrigerator will cost to operate in your area, based on your electricity rates. To find out how much you pay for electricity, look on your most recent utility bill.



## Solar Fans Are Ideal for Summer Attic Cooling

**Q.** I have a few attic vents, but I can still feel the sun's heat radiating from the ceiling during the afternoon. It is uncomfortably warm. What do you think of installing more standard vents or new solar vents? — John A.

**A.** People are often surprised when they realize how much heat blasts down into their homes from a hot attic in the afternoon sun. A dark roof can easily reach 150 degrees in the hot sun. This heat radiates down to the room ceilings below and on to your body. This also forces your air conditioner to run longer, increasing your utility bills.

Attic-floor insulation is excellent for blocking low-temperature conductive heat flow through the ceiling during both winter and summer, but it is relatively ineffective at blocking radiant heat from a super-hot, 150-degree roof. The radiant heat flow can make the insulation itself get hot and then it holds the heat even longer.

The best method to block this heat from a hot roof is a combination of adequate attic ventilation and low-emissivity, reflective foil stapled under the roof rafters. The ventilation helps reduce the roof temperature and the foil shields the attic floor and ceiling from the radiant heat transfer.

I installed attic foil and additional vents in my own home when I moved in and the temperature in the second-floor bedrooms immediately dropped by eight degrees. Before that, the air coming out the few old vents was so hot, I could not hold my hand over it.

Attic ventilation is also needed during the winter to remove moist air that leaks up from the living areas. If the attic is not well vented, this moisture in the air can condense and drip down on the insulation. Wet insulation is not only ineffective, but it can actually damage the attic lumber.

There are many types of roof- and attic-ventilation methods, but solar-powered attic vent fans are effective and operate for free from the sun's energy. They are an ideal fit with summer attic cooling because the solar fan runs faster as the sun gets more intense and hotter. At night, they stop running.

There are many design variations, but in all of them, a small solar-cell (photovoltaic

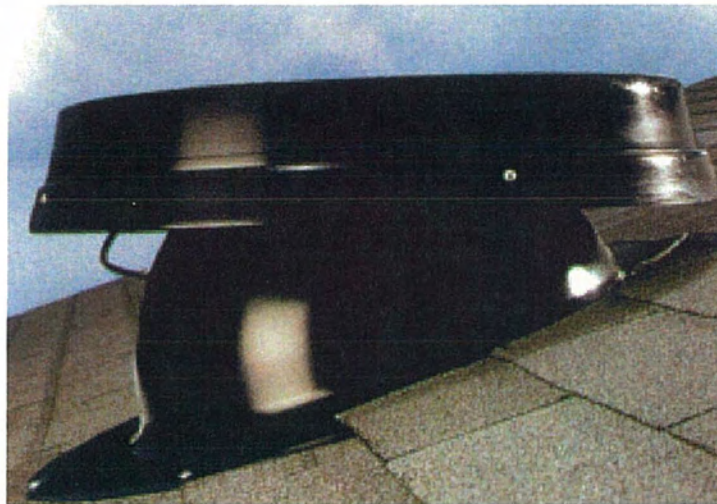
self-contained models have the solar cell panel built neatly into the top of the fan housing. The housing can be either round or rectangular. These models are ideal for a roof with an unshaded, southern exposure because no external wiring is required.

For non-southern roof exposures, or for shade problems, use a remote design with a separate solar-cell panel and a fan. With up to a 20-ft. safe, low-voltage wire, you can usually find a location for the panel so it faces the sun for maximum electricity output. A remote design also allows you to install an on/off switch if you wish.

Since there is no high-voltage electrical wiring needed with solar-powered fans, installing one or two solar fans is a simple do-it-yourself project. Carefully remove a few shingles and saw a round hole through the roof. Nail the fan in place through its flashing and replace the shingles with some roofing cement.

Natural attic ventilation is also an option, but you will have to install many more roof vents or a ridge vent along the entire length of the roof peak. Installing turbine vents instead requires fewer vents and can increase the amount of natural ventilation. A unique electric-powered internal ridge vent is still another option.

Write for (or instantly download at [www.dulley.com](http://www.dulley.com)) Utility Bills Update No. 657 — buyer's guide of 11 solar-powered attic-vent and turbine fans listing air-flow ratings, watts, sizes, features, prices, and a sizing-selector chart. ■



**There are many design variations, but in all of them, a small solar cell (photovoltaic - PV) panel converts the sun's rays into low-voltage direct-current electricity. The solar panel is wired to a small efficient motor with the fan blades attached to its shaft.**

— PV) panel converts the sun's rays into low-voltage direct-current electricity. The solar panel is wired to a small efficient motor with the fan blades attached to its shaft.

Some solar-powered fans have a very low profile and look similar to ordinary roof vents. Other designs project higher from the roof to provide better exposure to the sun's rays. All of the designs have flashing attached to the housing. It slips under the shingles to eliminate leaks when it rains.

Solar-powered vent fans range in size from mini, four-inch-diameter models to the more typical 12- to 16-inch sizes. The maximum air flow rates are about 1,000 cubic feet per minute for the larger ones. The mini-models have a built-in rechargeable battery so they continue to run when the sun goes down, removing any residual heat in the attic.

The two basic designs of solar fans are self-contained (integral) and remote. The

*Send your questions and Utility Bills Update requests to James Dulley, c/o Living, 6906 Royalgreen Dr., Cincinnati, OH 45244. When requesting a Utility Bills Update, please include \$3 and a business-size, self-addressed, stamped envelope and indicate update number. To rush delivery or read all previous columns, go online to <http://www.dulley.com>.*



## Attractive, Energy-Efficient Garage Doors



*I want to replace my inefficient, leaky, noisy garage door with a new insulated one with decorative, yet secure, glass windows for natural light. What are the best designs, materials and features to consider?*

—Martha D.

**A** When it comes to overall energy efficiency and street appearance of a house, people often forget about the door on the garage. Keep in mind that on a typical home, the garage door covers more than 30 percent of the frontal area. With lifetime warranties on many of the models, a new efficient, insulated garage door can be a good investment in your home.

Even though an attached garage is not heated or cooled, its energy efficiency still has an effect on your monthly utility bills. Just think how many times each day the door from the house to the garage is opened. Each time, it lets a gust of cold or hot, humid air enter your house from the garage.

An efficient garage acts as a huge thermal buffer between your house walls and the extreme outdoor temperatures, as well as blocking the direct force of the wind against the exterior house walls. Also, if you restore old cars in the garage like I do, you probably won't need to switch on an electric heater while you are working out there during the winter.

The two primary design features that impact the energy efficiency of a garage door are the thickness and type of insulation and the airtightness of horizontal weather seals between each of the panels. The number and quality of the glass, if you select a door with windows, is also important if you plan to work in the garage. For most activities in the garage, the natural light from a series of windows is adequate without having to switch on an electric light.

February 2002/[www.co-opliving.com](http://www.co-opliving.com)

Since the panels constitute the majority of a garage door, their insulation level has the greatest impact on efficiency. Insulation levels in the top-quality, two-inch-thick doors range from about R-6 to R-18. Choose a door with a plastic thermal break between the indoor and outdoor steel skins. This blocks a direct path through the metal for heat to bypass the insulation.



**An efficient garage door acts as a huge thermal buffer between your house and the extreme outdoor temperatures.**

Injected polyurethane foam provides the highest insulation value in the limited space between the garage door skins. Injected means liquid is pumped inside and expands as it begins to foam. The other effective insulation type is a piece of polystyrene foam (like a cooler) that is placed inside the door before the two skins are sealed together.

Check the joint design between the door panels for safety and efficiency. The newest designs are pinch-resistance joints that tend to push fingers out of the joint as the door closes (great around children). With the complexity of the mating surfaces, pinch-resistant joints also tend to be very airtight.

Several of the best standard-seal designs to look for are tongue-and-groove, shiplap, compression and flexible polyurethane. Of these, tongue-and-groove and shiplap joints form an interlocking seal between the two panels for lifelong seals. There is no flexing or compressions as with the other two designs. Some garage doors use a combination of seal designs.

Although the garage-door opener has an impact on the noise level when a garage door opens, the design of the door is most

significant. High-quality rollers, hardware, counterbalance springs and adjustable tracks reduce the noise to where it will not wake you, even with a bedroom above. For do-it-yourself garage-door insulation, consider a garage door with a safe counterbalance spring adjuster. Some can be wound up using a cordless drill and a socket.

The newest garage doors are carriage-styles. When closed, they resemble side-hinged carriage doors. They open upward though, like a regular section garage door. Some use insulated steel with wood trim while others use all real wood with insulation. Grained stainable steel doors also resemble real wood. Beautiful copper (resists salt air) and tough composite plastic door skins are also available.

Another recent improvement is the use of energy-efficient windows in the garage door for natural light and decorative qualities. You can choose durable crystal-clear acrylic plastic windows in attractive beveled and leaded designs. There are also optional inexpensive decorative snap-in panes that allow you to quickly change the look of the door whenever you wish.

Real glass windows are available in frosted and leaded (for privacy) and efficient double-pane styles. The newest styles have different window shapes across the door to create a sunset pattern.

Write for (or instantly download at [www.dulley.com](http://www.dulley.com)) Utility Bills Update No. 894 — buyer's guide of 11 insulated garage-door manufacturers listing insulation types/levels, styles, materials, colors, glass

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## Geothermal Heat Pumps

## Unearthing the Treasure in Your Own Back Yard

**R**ight beneath your feet is all the energy you need to heat your home in the winter and cool it in the summer. Harnessing this energy might ultimately allow you to condition your living space more economically than you can imagine.

No, you're not standing over an oil field, a coal mine or a uranium vein. That's just good old Mother Earth down there, and a few feet below your shoes, she stays a constant temperature — around 55 degrees Fahrenheit — year 'round.

Using this constant earth temperature to reduce your heating and cooling costs is the job of the ground-source, or geothermal, heat pump. Where traditional air-to-air heat pumps lose heating and cooling efficiency in extreme high and extreme low temperatures, ground-source systems have a steady, mid-range temperature store — Mother Earth — with which to work.

Geothermal heat pumps have increasingly been a part of home environment conditioning systems for about two decades now. Simply put, geothermal heat pumps use energy stored in the earth for heating and cooling. There are four basic types — closed loop, open loop, pond or lake loops, and boiler/tower systems. The first three are the most common types used with residences.

According to the Geothermal Heat Pump Consortium, geo-exchange systems provide space conditioning — heating, cooling, and humidity control. They may also provide water heating — either to supplement or replace conventional water heaters. Geo-exchange systems work by moving heat, rather than by converting chemical energy to heat like in a

furnace. Every geo-exchange system has three major subsystems or parts: a geothermal heat pump to move heat between the building and the fluid in the earth connection, an earth connection for transferring heat between its fluid and the earth, and a distribution subsystem for delivering heating or cooling to the building. Each system may also have a desuperheater to supplement the building's water heater, or a full-demand water heater to meet all of the building's hot water needs.

In heating mode, heat is extracted from the fluid in the earth connection by the geothermal heat pump and distributed to the home or building — typically through a system of air ducts. Cooler air from the building is returned to the geothermal heat pump, where it cools the fluid flowing to the earth connection. The fluid is then re-warmed as it flows through the earth connection.

In cooling mode, the process is reversed. The relatively cool fluid from the earth connection absorbs heat from the building and transfers it to the ground.

For purposes of illustration, following are profiles of two geothermal systems — different types in different parts of the state.

#### A Closed Loop in the Valley

Carl Hoover is a member of Sunset Drive United Methodist Church's board of directors. The church is in picturesque Broadway, located in Virginia's Shenandoah Valley. Carl's wife, Nancy, is a member of Shenandoah Valley Electric Cooperative's board of directors. In November 1994, the church installed a geothermal heat pump at the parsonage. "We priced oil, gas, and other types of sys-



**Carl Hoover (r) and the Rev. Jeff Butcher, pastor of Sunset Drive United Methodist Church, stand in the backyard of the parsonage where the home's geothermal heat-pump wells were dug.**

tems," notes Hoover. "Someone in the church offered to pay \$6,000 toward the cost if we installed a geothermal unit, so that's the way we went."

The system installed has 450 linear feet of tubing in three 150-foot wells, each six inches in diameter and backfilled with a slurry of bentonite, a clay compound that hardens like concrete. The tubing is a closed loop through which an environmentally friendly, water-based, energy-exchange solution circulates, absorbing energy before entering the heat-pump compressor.

"We immediately saw about a 50-percent reduction in the amount of electricity used," says Hoover. Since the geothermal unit was installed, Hoover estimates the church has saved an average of \$1,000 annually on electric bills, based on the reduced amount of kilowatt-hours used.

The parsonage, built in 1964, is a 2,200-

square-foot brick rancher with a basement. "In June through September of the year, there has actually been a slight increase in the number of kilowatt-hours used, because the whole house is being cooled with this geothermal unit, where before, there were window air-conditioning units. But the overall comfort level is much better now, and the overall savings amounts to between \$900 and \$1,000 a year," Hoover says.

Last summer the compressor failed and had to be replaced, Hoover continues. "The only drawback I see to this type of system is service." Because there aren't as many geothermal heat pumps in use as there are air-to-air units, "There aren't enough trained technicians in place yet to service the units," Hoover says. Still, he says the church is very satisfied with the choice to go geothermal.

"Performance has been excellent. The church is very satisfied, and the two ministers

**Gary Drummond modified his open-loop system to include a flow meter, water-temperature and pressure gauges.**



who have lived in the parsonage since the system was installed have both been satisfied," Hoover concludes.

#### An Open Loop on the Eastern Shore

Gary Drummond has an affinity for things technical. The newest member of A&N Electric Cooperative's board of directors, he is a State Farm insurance representative and a retired jet fighter pilot who lives near Parksley on Virginia's Eastern Shore. When he and his family built a new home, Drummond decided to equip it with an open-loop geothermal system.

"The heat pumps were installed about 10 years ago when we built our house," Drummond says.

"I was considering hot water heat and central A/C also, but didn't want to use fossil fuel. My first experience with a geothermal unit was in my office. That worked out so well that I decided to use the same in the house. I had a cost comparison done and geothermal was the least expensive to operate over time, so I went that route."

Drummond had three Florida Heat Pumps installed in his home. "At that time, the contractor felt that using well water, as opposed to the closed-loop method, was the preferred way to go because of the near-constant ground-water temperature," Drummond continues. "We have two supply wells and two return wells to put the water back in the ground. These also supply our domestic water use. I have them set up so that one well acts as a primary-

supply well, turning on when water pressure drops to 40 psi and off at 60 psi. The second well will come on if the pressure drops down to 38 psi and off at 60 psi. Sometimes, if all three heat pumps are running at the same time and there is domestic water use, the second pump is needed; but not that often.

"Some contractors have had trouble with return wells not taking the water back into the ground. I haven't had this problem, but to take a precaution against this, I installed a sand filter that catches silt, sand and other debris and prevents this from clogging up the return wells. I customized the parameters I can monitor to include a flow meter to monitor gallons per minute, a water-temperature gauge to monitor entering and leaving water temps, and a pressure gauge to monitor back pressure, which would indicate any problems with the return wells taking the water. To me, all of this helps to fine tune and troubleshoot the system."

Ten years later, how does Drummond rate his system?

"There is no pollution of the environment and there are no outdoor units to deal with. Air temperature runs around 105 degrees on the heating cycle and 52 degrees on the cooling cycle. I have the desuperheater installed on one of the units that provides supplemental hot water during the cooling months. Our home is totally electric and I like having just one bill for everything."

For additional information on geothermal heat pump systems, visit the Geothermal Heat Pump Consortium Web site at <http://www.ghpc.org/home.htm>, or call (202) 508-5500. ■



## INDUSTRY NEWS



# Clover Power Station Wins Top Environmental Award

Clover Power Station received the Governor's Environmental Excellence Award for Manufacturers during the 79th annual meeting of the Virginia Manufacturer's Association (VMA) Sept. 27 in Hot Springs.

### First-Place Honors

Clover Power Station is jointly owned by Old Dominion Electric Cooperative and Dominion Virginia Power. Clover received the first-place award in the Large Manufacturer category of this prestigious environmental-programs competition. In all, six Virginia businesses received recognition at the VMA meeting.

"These award winners clearly illustrate how Virginia's corporate citizens are dedi-

cated to taking effective steps in protecting our natural resources," Governor Jim Gilmore said. "Not only do they demonstrate excellence in the goods they produce, they also set a remarkable example of environmental stewardship for other Virginia manufacturers to follow."

The Governor's Environmental Excellence Awards are designed to encourage Virginia's industries to implement the state's pollution-prevention policies, promote outstanding environmental stewardship, and recognize excellence in pollution-prevention efforts among Virginia manufacturers each year. Awards were announced in two categories: Environmental Projects and Environmental Programs.

"The award is further evidence of Old

Dominion's commitment to the environment and its desire to make its power-generation facilities as community-friendly and benign as possible," said John Lee, Old Dominion's vice president of cooperative affairs. "Being a productive, contributing member of the communities where our facilities are located is a cooperative tradition — a tradition that's at the core of Old Dominion's way of doing business," he added.

In the award citation, VMA noted that "The Clover Power Station (Clover) utilizes the best available pollution control technology. From its inception, environmental protection has been of utmost consideration at Clover. Nearly one-third of Clover's \$1.2 billion construction cost is devoted to the

Lt. Gov. John Hager (front) and John Paul Woodley, secretary of natural resources (right) congratulate representatives of Old Dominion Electric Cooperative and Dominion Virginia Power (standing from left) Andy Yaros and Bill Bolin (DVP), John Lee, David Smith and Jack Reasor (ODEC).

latest pollution-control technologies. The Clover Power Station is the cleanest pulverized-coal-fired power station ever built in Virginia and one of the cleanest in the world. Clover has surpassed regulatory permitting requirements; the owners of Clover also took extraordinary steps to mitigate any environmental or cultural impact created by the station. Special projects were developed through partnerships to specifically protect natural and cultural resources, reduce environmental impacts, and enhance wildlife habitat on the surrounding property."

### All Virginia Manufacturers Eligible

Companies are divided into two categories, "smaller manufacturers" and "larger manufacturers." While VMA facilitates the awards program, any manufacturer in Virginia is eligible to win. Entries are judged on their environmental impact and social significance; efficiency and cost effectiveness; originality and innovation; and technical value and transferability.

The awards program is underwritten by VMA Outreach, an organization of VMA members committed to promoting communication and cooperation among industry, government, environmentalists, and the general public to improve Virginia's environment. The awards program is endorsed by the Office of the Governor and the Department of Environmental Quality.

Old Dominion Electric Cooperative is half owner of Clover Power Station. Old Dominion is a generation-and-transmission cooperative owned by 12 electric-distribution cooperatives — 10 in Virginia and one each in Maryland and Delaware. Old Dominion's members include A&N Electric Cooperative, BARC Electric Cooperative, Choptank Electric Cooperative, Community Electric Cooperative, Delaware Electric Cooperative, Mecklenburg Electric Cooperative, Northern Neck Electric Cooperative, Northern Virginia Electric Cooperative, Prince George Electric Cooperative, Rappahannock Electric Cooperative, Shenandoah Valley Electric Cooperative, and Southside Electric Cooperative. ■

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## Cool It for Less with a Whole-House Fan

**Q.** *On mild days and evenings, I like to open windows to get some fresh, cool air into my house. Would using a whole-house fan draw the air in quicker? Do these fans use much less electricity than my central air conditioner?*

— Gary W.

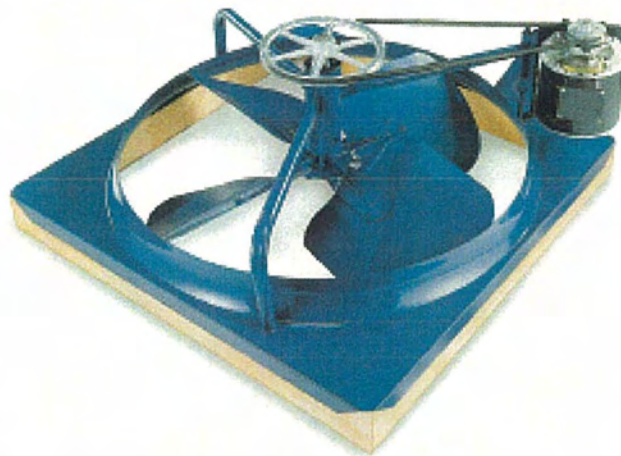
**A.** With today's airtight, energy-efficient homes, it is nice to bring in cool outdoor air whenever possible and accomplish this without driving up your utility bills. Using a whole-house fan is probably the most effective and efficient means to quickly cool your home when the outdoor temperature drops overnight or on moderately warm days.

Pulling fresh outdoor air into your house not only lowers the temperature indoors, but it creates a gentle breeze similar to a ceiling paddle fan. With the air moving throughout your home and across your skin, you can feel five to 10 degrees cooler than in still air at the same temperature. Actually, just the sound of the moving air can have the psychological effect of making you feel cooler.

A whole-house fan is a large exhaust fan that is usually mounted in the attic floor. It is often located in a hallway ceiling to draw air from the entire house without creating drafts in the rooms. Since it is most often used at night, this location almost minimizes the noise level in the bedrooms. The fan draws outdoor air in through opened windows and exhausts the air into the attic area and out the attic vents.

A secondary benefit of using a whole-house fan is that the airflow from the house into the attic helps to quickly cool the attic and the roof. A hot attic and roof can radiate heat down through the attic insulation to the living areas below. This will occur all day long and, without a fan, well into the evening until the roof and attic structure slowly cool down.

Using reflective attic foil stapled underneath the roof is a good combination with a whole-house fan. The foil will block the heat from the super-hot roof during the daytime when the whole-house fan is not often used. When you switch the fan on in the evening, the air is exhausted up between the foil and the roof to cool it.



**For larger houses that require a higher airflow capacity to cool them, a belt-drive model is often used. With this design, the motor is mounted on the corner of the housing frame.**

Running a whole-house fan uses about 80 to 90 percent less electricity than operating a central air conditioner. Using one can easily save more than \$100 per year on your electric bills. Since your air conditioner is used less time, less maintenance is needed and its life will be longer.

Whenever the outdoor air temperature drops to about five degrees lower than your thermostat setting, running the whole-house fan should comfortably cool your house and create air movement indoors. This means you may run your central air conditioner during the daytime and run the whole-house fan at night.

There are many whole-house fan designs with various features from which to choose. For most average-sized homes, a direct-drive design is a good and easy-to-install choice. It has the motor located in the center of the housing with the fan blades attached directly to the motor shaft. The quietest models use special vibration-blocking rubber hubs and

sound-absorbing air-flow shrouds to reduce the noise level to a whisper.

For larger houses that require a higher airflow capacity to cool them, a belt-drive model is often used. With this design, the motor is mounted on the corner of the housing frame. A belt runs from a pulley on the motor to a pulley on the fan-blade hub. With

the motor out of the airflow path and a larger unobstructed blade diameter, the airflow can be greater. These often use a steeper blade pitch and run at a lower speed to further reduce the noise level.

When sizing a whole-house fan, a good rule of thumb is the airflow rating in cubic feet per minute should be three times the house size in square feet. If you choose a model with two or variable speeds, you can install a larger, higher-capacity fan. This will allow you to run it on high speed initially to quickly cool your house and then set it to the correct continuous speed for your house size.

For the greatest convenience, choose one with a built-in timer, thermostat or humidistat for automatic operation. Some automatically switch from high to low speed after 30 minutes. Most models offer air-sealing shutters to seal off the fan when it is not running. Motorized insulated shutters, to block winter heat loss more effectively, are also available on some efficient two-motor models.

Write for (or instantly download — [www.dulley.com](http://www.dulley.com)) Utility Bills Update No. 641— buyer's guide of eight whole-house fan manufacturers (28 models) listing diameters, airflow capacities, speeds, drive types, wattages, features, prices, and do-it-yourself instructions. ■

*Send your questions and Utility Bills Update requests to James Dulley, c/o Living, 6906 Royalgreen Dr., Cincinnati, OH 45244. When requesting a Utility Bills Update, please include \$3 and a business-size, self-addressed, stamped envelope and indicate update number. To rush delivery or read all previous columns, go online to <http://www.dulley.com>.*



## Lighten Up with an Energy-Efficient Sunroom



*I would like to add a bright, efficient sunroom to my house for an "outdoors" feeling during the winter and to help heat my home. What reasonably priced sunroom options do I have and can I expect one to provide solar heat for my house? — Peg N.*



There is a vast array of sunroom options that would probably fit your needs even if you are on a fairly tight budget. These designs range from low-cost kits using aluminum frames and acrylic glazing to elaborate decorative ones using curved wood frames and super-efficient glass. Some models are designed to be do-it-yourself kits while others are delivered to your home already completely assembled or built only by authorized contractors.

It is possible to use your new sunroom to capture solar heat and reduce your overall heating bills, but this will affect the basic design, materials and usable interior floor space. For the typical, reasonably priced sunroom kit used primarily as additional living space, a reasonable efficiency goal is to just make it energy self-sufficient during the winter.

To use a sunroom to assist with the heating of your house, it needs the proper orientation to the sun, much thermal mass and a method to move the solar heat into your house. The orientation should be within 15 degrees of true solar south. This is different than the compass south and varies depending on your location in the country. Your local weather service should be able to tell you how many degrees true solar south varies from compass south in your area.

When attempting to provide heat for your house, you want the sunroom to capture as much solar heat as possible. Without heavy thermal mass to absorb this heat, the sunroom can overheat and much of the heat is lost back outdoors. Typical thermal mass materials are masonry (bricks, concrete, stone) and water in drums. The masonry thermal mass can be built into a wall or floor and can actually be an attractive addition to the sunroom. Warm air ducts are a

common way to move the solar-heated air into your house.

The newer do-it-yourself sunroom kits, thanks to computer-aided design and manufacturing procedures, have a professionally built look when completed. I built a sunroom kit on the concrete patio of my house, and although it took me a month to do it, it



**Thanks to computer-aided design, the newer do-it-yourself sunroom kits have a professionally built look when completed.**

looks very nice. Even the few manufacturers that sell only through authorized contractors who build it for you often allow you to assist in building it to lower the overall cost.

Sunrooms are classified as three-season (not winter usage) or year-round models. You probably want a year-round model since you want to try to help heat your home with it. A year-round model will have double-pane thermal windows and a wood or thermally broken aluminum frame for efficiency. The thermal breaks are more important in colder climates, especially to control condensation since people often have many plants in sunrooms. Three-season sunrooms typically have just single-pane windows and screens to be opened like a porch during the non-heating seasons.

The simplest design to build yourself uses an aluminum frame with double-pane clear acrylic windows. During the summer, its

specially designed windows can be removed to create an open screened porch. The windows are self-storing beneath the screens. The clear roof is made of tough double-pane polycarbonate (bulletproof glass).

Most sunroom kits, whether contractor-built or do-it-yourself, bolt together like a huge erector set. All of the color-coded components, hardware and fasteners are included for easy assembly. If you order one of the completely assembled sunrooms that bolts down over a foundation or patio, you can be using it within three hours after delivery. Large models are delivered in several preassembled sections.

Models using frames with a curved transition from the front to top are the most attractive, but more difficult to build. These often use wood frames instead of no-maintenance aluminum. If you want curved eaves and an attractive interior with no maintenance, choose a kit with composite framing (wood interior and aluminum exterior).

During the summer, sunrooms often overheat in the afternoon sun. Adding some type of shading device and ventilation is imperative. Exterior shading systems, such as solar screening, are most effective and attractive from the indoors. Most sunroom kits have optional shading systems specifically designed for them.

Another option for more openness is to install just a large, screened, folding window wall. Its efficient, hinged thermal-glass panels open accordion-style on tracks to expose the screening and entrance door.

Write for (or instantly download at [www.dulley.com](http://www.dulley.com)) Utility Bills Update No. 640 — buyer's guide of 12 efficient sunroom/kit manufacturers listing styles, frame/glazing materials, ventilation/shading options, features and passive solar heat-producing tips. ■

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## Caulking Your Way to a Tighter Home

**Q** It seems to be drafty in my home whenever it is windy outdoors. I have noticed some caulk around the windows is dry and hard. Where should I check for areas to caulk and what is the best caulk to use?

— Karen H.

**A** If the caulk feels dry and hard, it is probably time to replace it with new caulk. Even though you may not see noticeable cracks and gaps, the caulk is probably not adhering to the window frame or walls. If you dig in it with the tip of a screwdriver, sections of it may fall out.

A house seems to be a strong, rigid structure, but the forces from wind and temperature changes throughout the day and from season to season making it move quite a bit. The purpose of caulk is to be flexible so it remains attached to the housing materials and continues to stop air leakage.

One simple method to find areas that need to be caulked is to hold the back of your hand near windows and doors on windy days. You will be able to feel serious air leaks. Also, move a lighted stick of incense around all the windows and doors and watch the trail of smoke. Even a small air leak will make the thin smoke trail move.

Windows and doors are the most obvious locations for air leakage into a home, but they are not always the worst culprits. The sill area, where the walls rest on the foundation, is often the area of greatest air leakage. In particular, the top of a concrete foundation can be quite uneven leaving many gaps between it and the lumber sill plate.

Check for gaps around the wiring where the main electrical service enters your home. Do the same where the telephone and cable lines come indoors. Holes for plumbing penetrations for outdoor faucets are often much

bigger than the diameter of the water pipe.

Check around any penetrations in the ceilings for recessed lights, vent fans, ceiling paddle fans, etc. You will probably have to get up into your attic and move some of the insulation away to check these. While you are up there, also check for gaps where the plumbing vent

Kitchen and bath caulk has special additives to fight mildew. These will be effective any place there is a high moisture level, not just on bathtubs and sinks.

For indoors, where there are not great temperature changes, any latex caulk will be effective. It will have a life of about 20 years or more. It is also paintable. Instead of painting the caulk, kits are available to mix the paint with the latex caulk to tint it for a perfect match. This is an advantage where you want matching caulk between two materials that are not going to be painted, for example, such as natural wood, tile or aluminum.

The most common type of caulk used by homeowners is acrylic latex with silicone added. It costs a dollar or two more per tube than plain acrylic latex, but it lasts about 10 years longer and is more durable. The addition of silicone makes the caulk more flexible and it adheres better to more materials. It is still paintable and cleans up with soap and water.

Silicone caulk is best used where high flexibility is required, often outdoors. Most silicone is not paintable, so it is available in several colors. It is a bit more difficult to lay a smooth bead with silicone caulk, it has an odor as it cures, and cleanup is more difficult.

For large gaps, expandable urethane foam caulk is a good choice. It also adds some insulation value to the gap. It is available in low- and high-expansion formulas. The low-expansion type is better for most applications.

Write for (or instantly download at [www.dulley.com](http://www.dulley.com)) Utility Bills Update No. 937 — buyer's guide and properties of 10 common types of caulk materials, list of 15 manufacturers of caulk and special tools, and tips on how and where to

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**There is a vast array of caulking materials, including many specialty types for specific applications. Simple, inexpensive caulking tools can make the job much easier.**



pipes pass through the attic floor.

When you visit your home-center-store caulk aisle, you may be overwhelmed by the vast array of different caulking materials. There are many types of specialty caulking materials for specific applications, but you should be able to get by with just several different types.

Also check out the inexpensive caulking tools. Some of these simple tools, for removing the old caulk and for applying a smooth layer of new caulk, can make the job much easier. Since the old caulk is hard and brittle, it probably was not silicone so a caulk remover (softener) chemical should make it easier to remove the caulk. These chemical removers are not as effective on silicone.

Two main categories of caulking materials are "kitchen and bath" and others.





## Old Sliding-Glass Doors Often Big Energy Wasters

Q.

*I should replace my old sliding-glass patio door this winter. I can feel a draft and hear road noise through it, it sweats, doesn't slide smoothly, and probably is not secure. What features should I consider in a new one?*  
— Ted K.

A.

An old sliding-glass patio door, even if it has standard double-pane glass, can be one of the biggest energy wasters in a home. Just sit by the door on a cold winter evening and you will probably feel how inefficient it is. Air leakage around the door is often the worst culprit. This is also true during the summer when warm moist air leaks indoors.

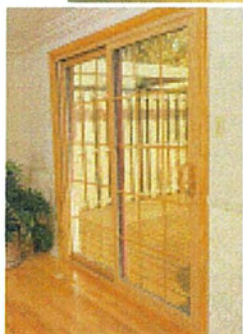
A sliding-glass door is basically a huge hole in the insulated walls that enclose your house. Your old door may have an insulation level of R-2 at the best. When you sit near the sliding-glass door at night, heat from your body radiates to the cold outdoors causing you to feel colder than the room temperature. This often makes you turn the thermostat up a little, wasting energy.

You will be surprised at all the new efficiency features and many styles of sliding-glass doors available. The highest energy-efficient glass for the sliding doors is as high as R-10. This super-efficient glass has triple panes, low-emissivity (low-e) coatings on two of the glass surfaces with krypton gas in the gaps between the panes. The krypton gas is very dense, which also reduces the outdoor-noise transmission through the large glass panes.

The airtight seals are also better on the new door designs. Keep in mind, a sliding-glass door has a lot of mating joints that must be sealed with weather-stripping. Much of the joint's area is a sliding seal, not compression as on a casement window or a hinged door. As your new door ages, keep an eye

on the condition of the weather-stripping and replace it when it is worn. The manufacturers offer replacement kits.

Much recent design attention has been given to the styling of sliding-glass doors. French (Freedom)-style patio doors are increasingly popular in new homes and for replacements. These



**There are several attractive, energy-efficient options for replacing an old sliding-glass door.**

have wider rails and stiles on the door frame to simulate the appearance of double-hinged doors. Optional matching grilles can be added over the glass for additional style.

Sliding-glass doors cover a large span, so the strength of the frame is critical. Typical frame-material options for replacement sliding-glass doors are aluminum, fiberglass, vinyl, wood and vinyl, or aluminum-clad wood.

Fiberglass is one of the best low-maintenance materials for sliding-glass door frames. I use this type in my home. The frames are made with a pultruded (process, which is different from how fiberglass boat hulls and car bodies are produced. Pultrusion combines long glass fibers with strong resins to create an almost indestructible frame.

A fiberglass frame expands and contracts with temperature changes (hot summer sun to cold winter nights) at a similar rate as the glass panes. This reduces stresses within the door frame and along the seals where the

glass panes rest in the frame. For a natural wood appearance, select one with a real oak veneer bonded over the indoor surface of the fiberglass frame.



Vinyl is another low-maintenance frame material to consider. Its color goes completely through the frame, so it looks good even with small scratches. Look for fusion-welded corners, metal reinforcement inside the frame and ball-bearing steel or nylon rollers. Vinyl or aluminum cladding over a wood frame minimizes its outdoor maintenance. All-aluminum frames should have a plastic thermal break between the outdoor and indoor surfaces.

The type of glass is key to energy efficiency. The triple-pane R-10 glass may be outside the budget for many homeowners. As a minimum, select double-pane, low-e glass. For hot climates, you may prefer to have tinted panes. In very cold climates, the R-10 glass may make economic sense or choose less-expensive R-6 triple-pane glass.

There are several options that can make your sliding-glass door more secure. Multi-point lock and foot lock features require a thief to take more time to pry the door open. This is particularly true with a strong frame material such as fiberglass or aluminum-clad wood. If you are really concerned about security, select double swinging or tilt/turn (swings on hinges or tilts in at top for ventilation) doors instead. Some closely resemble sliders and they are more difficult to force open.

Write for (instantly download at [www.dulley.com](http://www.dulley.com)) Update Bulletin No. 939 — buyer's guide of 15 fiberglass, vinyl and wood sliding/hinged patio door manufacturers listing sizes, glass options, colors, decora-

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# SMART THERMOSTATS *Make \$ense*

**Q** We are trying to keep our utility bills low by setting the thermostat lower at night, but we hate waking up to cold bedrooms. Are the new smart thermostats easy to install and program for comfort? – Meg T.

**A.** Setting your thermostat lower at night during winter (higher during summer) will save a tremendous amount on your utility bills. It is a common misconception that it takes more energy to reheat or cool your house after a temperature setback or setup. Whenever your house temperature is closer to the outdoor temperature, less heat is lost or gained. This means your furnace or air conditioner has to run less overall and you save money.

By installing a “smart” thermostat, you can go to bed and wake up to a comfortable house and never know the thermostat changed itself overnight while you slept. The change in the indoor temperature overnight is very gradual, particularly in an energy-efficient house, so your body does not sense the changing temperature.

Most new smart thermostats from your heating contractor or from a home-center store allow you to set different temperatures during four periods throughout the day and night. You can set the time periods to your family’s schedule. Just as it saves energy at night when the thermostat is set lower, it saves additional energy to have the thermostat set lower while you are gone at work or at school.

A weekday winter schedule for the typical family might be 70 degrees from 6 to 8 a.m. When everyone leaves for school or work, it is set back to 58 degrees. When the kids get home at 3 p.m., it is already back up to 68 degrees. At 11 p.m., when everyone goes to bed, it starts dropping to 60 degrees overnight.

Smart thermostats have followed the lead of other electronic items and are now smarter and easier to program and use. Some of them sense both the indoor and outdoor temperatures and the indoor and outdoor humidity levels. This data, along with memory of how

long it took to warm up the house on previous mornings, allow the thermostat to determine the precise time to start the furnace to meet your schedule. Your bedrooms will be warm when your alarm goes off in the morning no matter how cold it is outdoors.

Smart thermostats are available with several simple programming methods that even the digitally challenged person can han-



Smart thermostats come in a variety of sizes.

dle. For additional convenience, some smart thermostats have internal power storage so you can snap them off the wall base and program them in your easy chair. They include a generic preprogrammed time/temperature schedule so you can use them immediately and program your personal schedule at a later time.

If this still sounds too challenging, select one of the new smart thermostat designs that resemble a tiny touch-screen computer display on the wall. The entire programming process is menu driven by touching its screen, so there are no complicated owner’s manuals or multi-use buttons to contend with. It is backlit to make it easy to see and make changes in the dark.

When shopping for a smart thermostat, you will see designation of 7, 5+2 or 5+1+1 on the packaging. These designations refer

to the programming flexibility of the thermostat. A seven-day thermostat allows you to program a different temperature schedule for every day of the week. These are ideal if your at-home schedule varies. With the prices more reasonable now, this type is generally your best choice for future flexibility. A 5+2-day thermostat allows you to program one schedule for every weekday and another schedule for the weekend. A 5+1+1-day model is the same except you can set different Saturday and Sunday schedules. For many families, these are adequate and require less programming time than having to program each day.

You can find these smart thermostats at most home-center and hardware stores. Most thermostat wiring is safe, low-voltage and color-coded, so the wiring instructions should be easy to follow for do-it-yourself installation. A heat pump thermostat has several more color-coded wires to attach. These are for the reversing valve (switching between heating and cooling) and the backup/emergency heating (often electric resistance heat).

If you have a newer heat pump with a variable-speed blower, as I do in my own all-electric home, select a smart thermostat with a humidity control. During summer,

when your house is comfortably cool, but too humid, the blower motor slows down so the air moves slowly over the cooling coils. This increases dehumidification for better comfort and efficiency.

Write for (or instantly download at [www.dulley.com](http://www.dulley.com)) Utility Bills Update No. 425 – buyer’s guide of the 11 smart thermostat manufacturers (25 models) listing temperature/time schedules, programming options, comfort/convenience

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# Seek the SEER and the HSPF, AFUE and EF!

**Q.** I am trying to live my life as efficiently as possible to save money and the environment. There seem to be so many different efficiency ratings. How can I evaluate which appliances are most efficient? — Bob M.

**A.** Using the most efficient appliances and products in your home can significantly cut your utility bills. It will also reduce air pollution, damage to the environment from exploration for and transportation of fuels, and stretch our finite fossil fuel supplies for your children's future needs.

When comparing the efficiency of many new products for your home, particularly smaller appliances that use electricity, it often takes the quick use of a calculator to determine which are most efficient. The wattage rating listed on the label indicates how fast it uses electricity.

Luckily, the government and the manufacturers' associations have made it easier to compare efficiencies of the highest-energy-use items commonly used in homes. They either show energy-efficiency ratings or estimated annual energy use.

Heating and cooling are the greatest consumers of energy in most homes. All furnaces, heat pumps and central air conditioners will have one of the efficiency ratings discussed below. A higher number indicates higher efficiency. Keep in mind, more efficient models usually cost more initially, so have the contractor do a payback analysis for your home. Just because your neighbor has a particular model, don't just assume it also is the best one for your home.

HSPF (heating seasonal performance factor) — this is a heating-efficiency rating that compares the seasonal electricity use of heat pumps. SEER (seasonal energy efficiency ratio) — this is a cooling-efficiency rating that compares the seasonal electricity use of heat pumps or central air conditioners.

Heat pumps and central air conditioners are unique appliances in that, as the outdoor temperature changes, so do their efficiencies. This is because a heat pump, which is basically a central air conditioner running in reverse during the winter, must draw its heat energy from outdoors.

This is easy to do when it is 50 degrees outdoors, so the heat pump operates very

(energy factor). Water heaters also have a yellow energy guide label on the tank that lists the estimated annual operating cost. You can also use the yellow energy label to compare refrigerator/freezer and clothes-washer efficiencies.

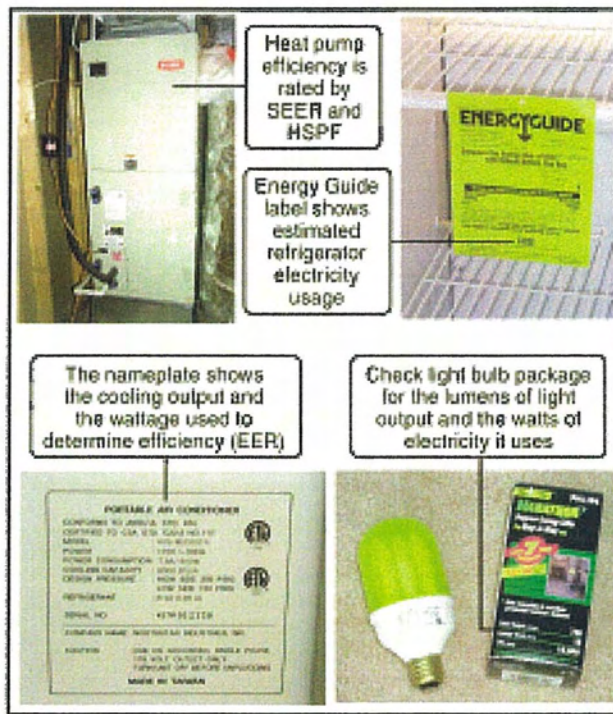
Visit the Association of Appliance and Equipment Manufacturers' Web site ([www.gamanet.org](http://www.gamanet.org)) to find efficiency ratings

and output capacities of these heating appliances (includes electric water heaters). Efficiency ratings of heat pumps and air conditioners can be found at the Air Conditioning and Refrigeration Institute site ([www.ari.org](http://www.ari.org)). There are thousands of models listed by manufacturer in downloadable PDF format.

Lighting is another significant electricity consumer. Generally, compact fluorescent bulbs are going to be much more efficient than standard incandescent bulbs. Even though they are quite a bit more expensive to purchase initially, their long life and high efficiency make them a good buy.

Various wattage bulbs, particularly with incandescent, have different efficiencies. A higher-wattage bulb is often more efficient than a lower-wattage one. To compare them, read the packaging for the amount of light output in lumens. Take your calculator and divide this by the bulb wattage. This tells you how much light output you get for the amount of electricity being used.

Energy Star ([www.energystar.gov](http://www.energystar.gov)) is another excellent source when selecting energy-efficient home products. Products that meet their high-efficiency standards are listed in many categories. You will also often see the Energy Star label on the most efficient products in appliance dealer showrooms. ■



Determine the most efficient items for your home

efficiently. When the outdoor temperature drops to 10 degrees, the efficiency and heat output of the heat pump drop substantially. There are also inefficiencies when the heat pump starts and stops, and the HSPF and SEER take this into account.

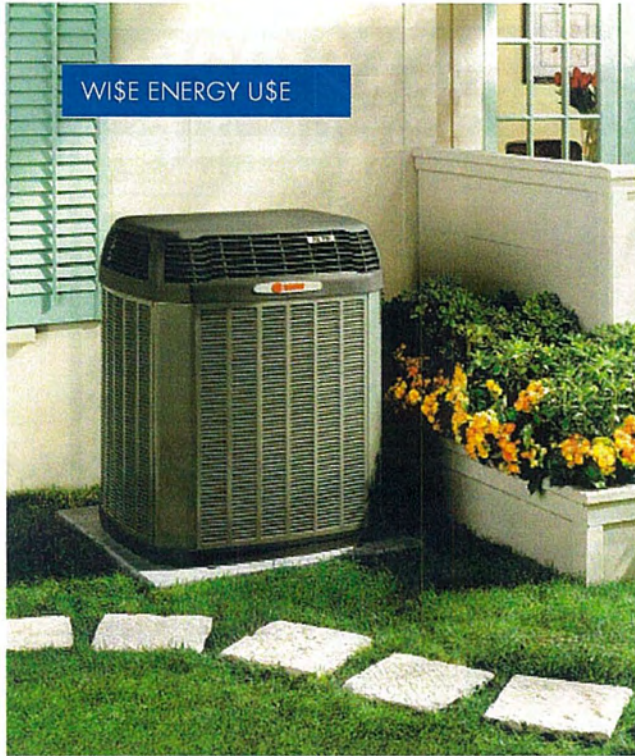
EER (energy efficiency ratio) — this is the cooling-efficiency rating that compares the electricity use for window and portable air conditioners. It is a less accurate comparison than SEER because it uses just a steady-state (highest efficiency) operation.

AFUE (annual fuel utilization efficiency) — this is the heating-efficiency rating that compares the fuel use of natural gas, propane and oil furnaces.

Heating water is another major energy consumer in most homes. Water-heater efficiency can be compared by its EF

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**Q.** *I want to install the most efficient heat pump for lower electric bills. I am also concerned about getting one that provides the best year-round comfort. What features should I look for in a new heat pump? — Bob M.*

**A.** With the new minimum energy-efficiency requirements for 2006, there have been improvements in heat pumps that make them an excellent choice for almost any home. The price of fuels, such as natural gas, oil and propane, are at record highs, so using a heat pump may be the least expensive home heating and cooling option. Heat pump efficiency in the cooling mode is rated by SEER (seasonal energy efficiency rating) similar to a central air conditioner. In the heating mode, the efficiency is rated by the HSPF (heating seasonal performance factor). Generally, the

*continued on pg. 40*

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to maximize energy dollars, find out  
**WHAT'S HOT** in  
**HEAT PUMPS**

*The latest improvements in heat pump technology make them an excellent choice for almost any home, in almost any climate.*

by James Dullely, Contributing Columnist



This diagram of a heat pump's outdoor unit shows interior components and the red insulation covering the compressors. Notice the electronic controls and circuits.

# FURNACE ENVY

Today's fossil fuel furnaces and air conditioners are experiencing an inferiority complex. No matter how efficient they try to be, they simply can't measure up to the **unprecedented performance** of the new Envision geothermal comfort system from WaterFurnace.

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Envision by WaterFurnace— it's the new vision for energy efficiency for today's environment.

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<b>Charlottesville</b> Airflow Systems (434) 979-4328	<b>Lorton</b> Trademasters Service Corp. (703) 644-6400	<b>Richmond</b> Town & Country Mechanical (804) 271-2700	<b>Warrenton</b> Appleton-Campbell Inc. (540) 347-0765
<b>Churchville</b> Bird's Heating & Air Cond. (540) 337-6689	<b>Lyndhurst</b> R.S. Boyers Htg. & A/C (540) 949-7639	<b>Spotsylvania</b> Garnett Refrigeration (540) 898-6461	



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**WISE ENERGY USE** continued from pg. 38

ones that are most efficient at cooling your home are also the most efficient at heating. If you now have an old heat pump with a SEER in the 8.0 range, installing one of the most efficient (SEER of 19) new ones could cut your utility bills by more than 50 percent.

**HYBRID HEATING**

Many of the HVAC (heating, ventilation, air-conditioning) manufacturers are starting to recommend hybrid heating, even in colder northern climates. Hybrid heating refers to installing a heat pump, instead of just a central air conditioner, along with a fossil-fuel furnace.

During mild weather, the heat pump can be less expensive to operate than even the most efficient fossil-fuel furnace. When the outdoor temperature drops, the furnace takes over. A heat pump of the same capacity, efficiency and features may cost only about \$400 to \$500 more than the equivalent (cooling only) central air conditioner.

As a brief background, a heat pump is basically a central air conditioner with a reversing valve. When switching from the cooling to the heating mode, the reversing valve reverses the direction of the refrigerant. The hot gases flow through the indoor blower coil to heat the air inside your home. The wall thermostat takes care of automatically switching the reversing valve depending upon whether you need heating or cooling.

**TWO-STAGE EFFICIENCY**

A two-stage heat pump is your most efficient option and it also provides the best comfort. The heat pump has two different output levels when heating and when cooling. This allows the heat pump to be sized to handle some of the coldest or hottest days, yet also be effective during milder weather. Depending upon the compressor design, the heat pump lower-output level will be from 50 percent to 67 percent of the maximum higher-output level. A third stage is the backup electric-resistance, oil or gas furnace.

This is a great advantage because the heat pump runs in longer, more efficient cycles when it is operating in the lower-output level. Even though it is running longer, the compressor is using less electricity in this lower-output level so the overall electricity usage is reduced. By running longer

and slower, there is less indoor blower and air-flow sound, and indoor temperatures remain more constant.

The majority of the HVAC manufacturers have switched to using a two-stage scroll compressor with R410A refrigerant instead of R-22 (commonly called Freon). R410A is much more environmentally friendly than R-22 and it operates at slightly higher pressures. This requires more stout tubing, so the noise level from the outdoor unit is less noticeable. By 2010, manufacturers will no longer be allowed to produce units using R-22.

Over the past several years, there has been quite a design push to make the outdoor unit run more quietly. This is accomplished by insulating the compressor motors, using more sound-damping mounts and redesigning the fins, fan blades and housing for quieter air flow. Most of the manufacturers can provide you with sound-level ratings for their various models. Sound level does vary by size and compressor type.

**VARIABLE-SPEED BLOWER**

Most two-stage heat pumps use a General Electric variable-speed ECM blower motor in the indoor air handler. This efficient motor varies its speed depending upon the heat pump stage currently running and the air-flow resistance in the ductwork. Heat pump efficiency and indoor comfort depends upon matching the outdoor unit, the indoor coil and the blower speed (air flow).

One of the key advantages of the variable-speed blower, when used with the proper thermostat, is in controlling the indoor humidity level. This affects comfort and common allergens such as mold spores and dust mites. By varying the indoor air flow, the ratio of cooling to dehumidification can be controlled. This is ideal for humid climates.

Write for (or instantly download at [www.dulley.com](http://www.dulley.com)) Update Bulletin No. 763 - buyer's guide of the 21 most efficient, comfortable heat pumps listing number of stages, efficiency, compressor, refrigerant, size, blower speeds, and a savings/payback chart. Please include \$3 and a business-size SASE ■

Send questions to James Dulley, Cooperative Living inquiry, 6906 Royalgreen Dr., Cincinnati, OH 45244 or visit [www.dulley.com](http://www.dulley.com).

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WISE ENERGY USE



PHOTO COURTESY OF MILES KIMBALL

# LIGHTEN YOUR LOAD

Energy-efficient LED lights help keep electric bills from casting a shadow on your holidays.

by James Dulley, Contributing Columnist

**Q.** I told my children we would use fewer holiday lights to save energy, but they threw a fit. Are there any efficient large lights I can get, and do you have any tips for decorating efficiently? — Becky B.

**A.** It definitely is fun for families to decorate their homes during the holiday season, but it can increase your electric bill much more than most people realize; including the cost of bulbs, the five-year cost (typical life of many



A C7 bulb with three LEDs inside is as bright as a standard C7, but uses only 0.15 watts of electricity. The bulbs are also safer, as they are plastic and do not get hot.

bulbs) for using standard colored bulbs during the holidays can be up to \$150.

Obviously, the best alternative to consuming all this energy is using non-electric decorations or fewer lights. Although, as you may have found with your own family, the holidays are a special time for children and they will resist this option. It would help to talk with your children, and explain to them the long-term benefits of energy conservation during the holidays and year-round. You might be surprised by how receptive they are.

When you compare standard holiday colored lights at the store, you will see designations such as C9, C7 and mini-bulbs. C9 bulbs are the largest ones, and each bulb can use up to 10 watts of electricity. C7 bulbs are slightly smaller and typically use about five watts per bulb. The mini-bulbs use just a fraction of a watt, but they are not nearly as bright as C9 or C7 bulbs.

The newest technology in energy-efficient lighting is an LED (light-emitting diode). This is a solid-state device that does not create light by heating an element inside the bulb. Most of the electricity they use ends up as light, instead of heat, as with standard incandescent bulbs. The red numerals on a digital alarm clock use efficient LED technology.

To create energy-efficient larger colored holiday bulbs, several LEDs are mounted inside of one bulb. This bulb has a standard base to screw into your existing holiday fixtures. A colored C7 bulb with three LEDs inside of it will be as bright as a standard C7 bulb, but it uses only 0.15 watts of electricity.

These colored C7 LED bulbs have the same shape as regular holiday lights, so you cannot distinguish them from standard colored bulbs. In addition to the electricity savings, the colored shell is made of durable plastic instead of glass. Also, with LED technology, they do not get hot, so they are safer around children and on a dry tree.

The only drawback to these colored LED bulbs is the initial higher cost. You can purchase individual bulbs and screw them into an existing string or purchase ready-to-use string and bulb sets. With a life of more than 60,000 hours, you will likely never have to replace them in your lifetime. Considering this long life and the electricity savings, they should pay back the higher initial cost.

Another efficient option is using standard or LED mini-bulbs wherever possible.

continued on pg. 36

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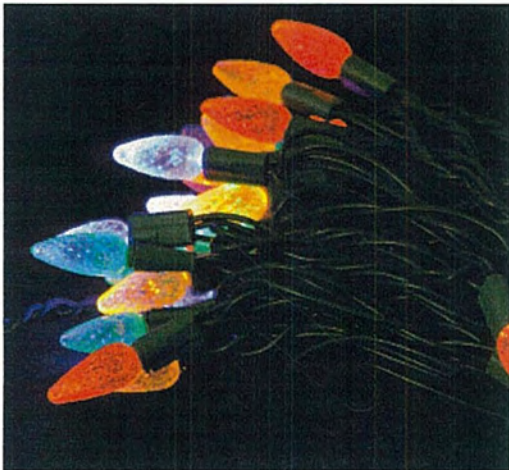
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WISE ENERGY USE *continued from pg. 35*

ble. Both use much less electricity than standard colored lights and are relatively inexpensive to buy. As with the larger LED bulbs, the LED mini-lights last for years and do not get hot.

If you already have your larger C7 and C9 bulbs and do not want to purchase new LED bulbs right now, consider installing fiber-optic converters on the bulbs. These converters snap over the bulbs and have many protruding fiber-optic fibers extending out from the bulbs. These fibers carry the light to the ends and create a large bright cluster around each bulb.

The best energy-efficiency tip is to use fewer bulbs and light them for a shorter time period each night. Perhaps you can negotiate with your children for a two- or three-hour time period for the lights to be on each night. Plug them into a timer so you do not forget to turn them off. Also, check the maximum wattage rating of the timer so you do not exceed it. This is particularly good for outdoor lights. In my neighborhood, some homeowners still leave their outdoor lighted decorations on all night long.

Use as many reflective ornaments as possible to multiply the effect of fewer lights. Decorating around mirrors is an effective method to accomplishing this. Small and large mirrored globe ornaments hanging near lights on a tree are particularly effective. If you make ornaments yourself, use reflective metallic threads that are available at most craft shops.

The following companies offer efficient holiday lights and decorations:

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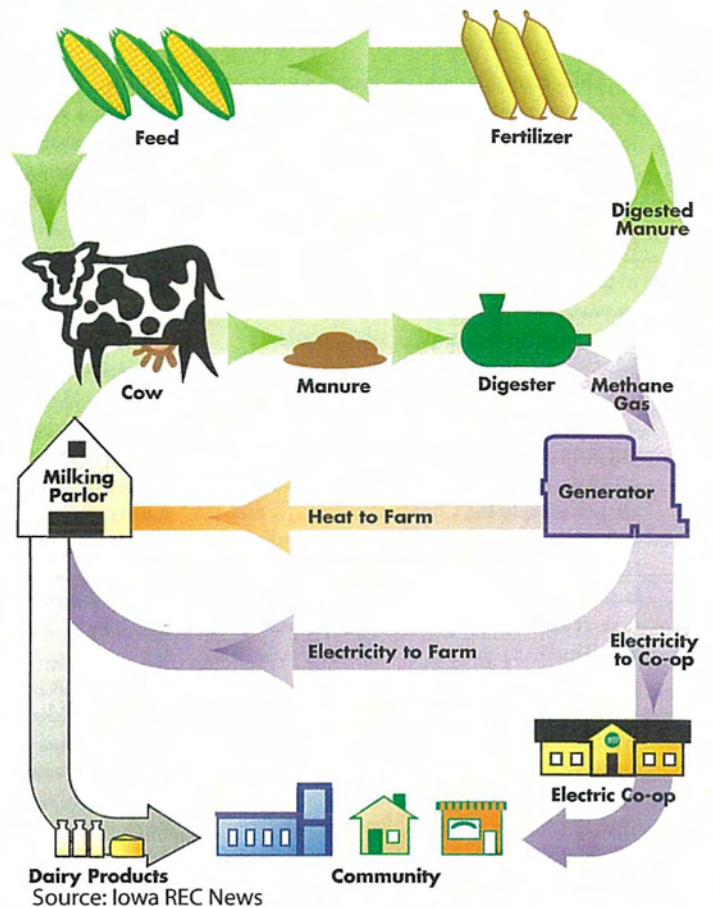
# Renewable Energy Is No 'Waste' of Time

by Laura Emery, Field Editor

It's often the subject of jokes and classroom giggles. Stepping in it is annoying, and its odor can be offensive. But there's more to litter and manure than meets the eye, and farmers and agricultural industry representatives are beginning to think outside of the barn when it comes to waste and nutrient management.

For more than 240 Virginia farmers and agriculture industry representatives at the Innovative Environmental Technologies Symposium (IETS), it truly was much ado about manure and litter. The event, held February 22 in Harrisonburg at the Rockingham County Fairgrounds, was planned and conducted by the Waste Solutions Forum and endorsed by more than 22 corporate sponsors, including Old Dominion Electric Cooperative (ODEC).

During the symposium, several waste-management issues were discussed, including using innovative technologies to address environmentally friendly nutrient-management practices, waste storage and handling, and the use of manure and litter as renewable energy sources.



Dairy Products Source: Iowa REC News

The Waste Solutions Forum (WSF), the group that hosted the symposium, is focused on implementing sustainable and cost-effective solutions for nutrient management. "Nutrient management is very important to restoring water quality and sustaining agriculture in the Shenandoah Valley," says Kathy Holm, co-chair of the WSF.

Loaded with nutrients like phosphorous and nitrogen, animal waste has historically been used as fertilizer. But as the significant quantities of animal waste originating from burgeoning livestock operations have piled up, so have the environmental and social concerns raised by the general public, conservationists, farmers and industry experts. These concerns are about the proper storage, handling, and environmentally sound management of this nutrient-rich byproduct.



## Making the Case for Recycled Waste:

Symposium participants included (LEFT) Dale Gardner, executive secretary of the Virginia State Dairyman's Association; (LOWER LEFT) Gary Wegner of Circu8 Systems;



(CENTER, L-R) Eric Bendfeldt, Virginia Cooperative Extension specialist and WSF co-chair; David Smith, director of environmental, health and safety services for ODEC; Kathy Holm, coordinator of the Shenandoah Resource Conservation & Development Council and WSF co-chair; (RIGHT) Hobey Bauhan, president of the Virginia Poultry Federation.



LAURA EMERY PHOTOS



Even after dispersal of this copious compound to fertilize the fields, there is often excess manure or litter that has to be stockpiled or sold off the farm. Because of this, there is a growing realization that these valuable organic, nutrient-rich resources could be put to better use as a renewable energy source – or, at the very least, managed in a more environmentally friendly manner.

In May 2006, the WSF was awarded a \$1 million National Fish & Wildlife Foundation Targeted Watershed Grant to pilot a variety of innovative approaches to utilizing and exporting Shenandoah Valley manure and litter in order to reduce surface and groundwater nutrient pollution to the Chesapeake Bay. “It not only encourages environmentally friendly waste solutions, but it also gives options to the farmer who has excess litter and manure and doesn’t know what to do with it,” points out Eric Bendfeldt, co-chair of WSF and extension specialist for Virginia Cooperative Extension.

Stephen McCorkle, CEO of Agricultural Waste Solutions and speaker at the symposium, says that runoff from agricultural operations (primarily from fertilizers produced from the wastes of animal farming) has been identified by the U.S. Environmental Protection Agency as the single most significant contributor to U.S. waterway pollution.

It’s also long been known that these heaps of animal waste release harmful methane and nitrous oxide gases into the atmosphere. Nathan DeBoom, consultant with AgConcepts and a guest speaker at the IETS, says, “Whether you believe in global warming or not, there’s a whole lot of talk about it right now – and how waste management contributes to it.”

### POWER FROM POULTRY LITTER

Oren Heatwole, Jr., farmer and owner of Poultry Specialties in Rockingham County, saw the symposium as an opportunity to acquire knowledge. “The symposium was very informative, and I’m very interested in seeing poultry litter be a resource instead of a waste product, and an asset instead of a hindrance.”

Dr. Foster Agblevor, associate professor at Virginia Tech, addressed this issue during the symposium’s afternoon session. He spoke about the conversion of poultry litter to value-added resources by pyrolysis, the chemical and physical change of a material resulting from application of extreme heat. “This pyrolysis technology,” Agblevor explained, “can convert poultry litter into a generated bio-oil, which is being researched for its suitability for space heating of poultry houses.”

Bio-oil can be refined further and used as diesel-like fuel. Biodiesel fuel is biodegradable and non-toxic, and typically produces about 60 percent less net carbon dioxide emissions than petroleum-based diesel – thus opening up the option for carbon credits. Carbon credits create a market for reducing greenhouse emissions by giving a monetary value to the cost of polluting the air. This means that carbon becomes a cost of business and is seen like other inputs such as raw materials or labor.

Through the process of pyrolysis, poultry litter is heated to 400-500 degrees Celsius, at which temperature it is liquefied and forms three products: condensable vapor, non-condensable gases, and a solid charcoal residue. This charcoal ash residue contains high levels of phosphorous, potassium, calcium, and nitrogen, and can then be used as a slow-release fertilizer. The concentrated form of fertilizer reduces pollution from pathogens and nutrients in the poultry litter, and allows farmers to sell or use the fertilizer without fear that it will harm groundwater, streams or migratory fish.

The pyrolysis technology, although still being piloted and researched for on-farm use, can have a major impact on the poultry and dairy industries because of its ability to con-



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vert poultry litter from a waste into a valuable fuel and fertilizer. But it also benefits farmers because of its ability to condense the volume of the litter. When poultry litter is burned to produce electricity, the volume of the ash residue produced is only a fraction of the original litter. This means it is cheaper to transport and can be sold as a concentrated, nutrient-rich fertilizer.

### MANURE TO METHANE

In addition, anaerobic manure digestion can be used to produce methane for electricity by converting organic carbon into methane gas. The manure is pumped into a large digester tank and heated to about 100 degrees F. This process speeds the action of beneficial bacteria in the tank, which occurs in two stages. The volatile solids in manure are initially broken down to a series of fatty acids, and then a highly specialized group of bacteria, called methane formers, convert the acids to methane gas and carbon dioxide. As bacteria break the manure down, the methane gas collects under the tank cover. After three weeks in the digester, the manure empties into a storage lagoon for later application to the farm's cropland. Meanwhile, the captured methane can be burned for energy.

As Nathan DeBoom, consultant for Ag-Concepts explained it, "Wind is seasonal and solar is diurnal, but manure is produced 24 hours a day and seven days a week. Local municipalities, energy companies, and consultants are starting to get this and make investments into it."


David Smith, director of environmental, health & safety services for ODEC and a member of the WSF steering committee, says, "Old Dominion Electric Cooperative is supportive of using animal waste for fuel. The use of animal waste as a fuel instead of conventional carbon-based fuels reduces the amount of greenhouse gases in the environment and provides for a renewable source of energy."

### ALSO TAKING THE MICROPHONE

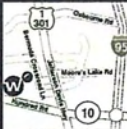
During the symposium, Gary Wegner, farmer and owner of Circul8 Systems, also shared his thoughts on how to get maximum benefit out of farm nutrients and Dick Waybright, farmer and owner of Mason Dixon Farm, talked about the role of innovation and synergy on the dairy farm. Waybright said, "This symposium is an educational and informative confidence-building opportunity for farmers. I started out with 12 cows, so I understand the small farmer and I want to help improve their viability." Waybright gave attendees a detailed game plan for success. "New concepts," he said, "are put into practice by

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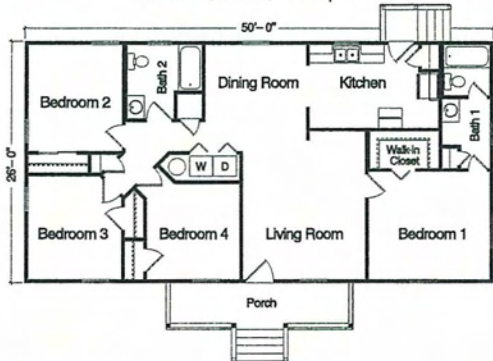


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people who allow themselves to ask the question, "Why do we do things this way?"

For Wegner, it's about using his passion to help his fellow farmers. "It's about providing an economic return to the dairy farmer who wants to enhance the soil in order to protect the future. We're not talking about disposing of waste. We're talking about maximizing nutrient recovery."

Among the attendees were Hobey Bauhan, president of the Virginia Poultry Federation, and Dale Gardner, executive secretary of the Virginia State Dairyman's Asso-

ciation. Says Gardner of the symposium, "Hopefully, we'll find waste solutions that work and new ideas that stimulate and interest farmers." Bauhan believes there is a lot of promising technology for utilizing poultry manure as an energy source. He says, "This symposium was a great opportunity to bring farmers together and come up with solutions through innovative technologies."

Said one symposium attendee, jokingly, "The symposium definitely wasn't a 'waste' of my time." ■





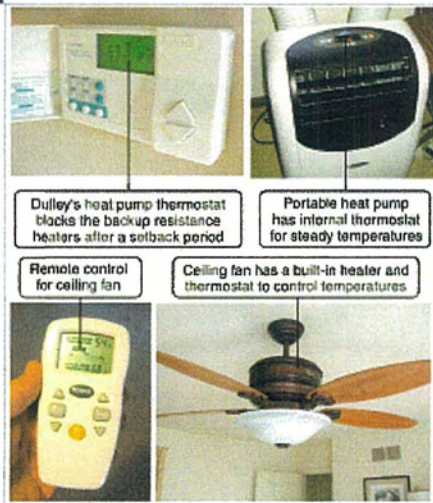
PHOTOS COURTESY OF JAMES DULLEY

## WISE ENERGY USE

# DIALING FOR DOLLARS

Adjusting thermostat settings can go a long way towards saving energy dollars.

by James Dulley, Contributing Columnist



**Q.** I hear how important it is to lower my thermostat setting during winter. It seems it would just take more energy to reheat the house each morning. What is the best thermostat setting for the most savings? - Don G.

**A.** Selecting the proper temperatures throughout the day and night can be a bit confusing. You want to balance comfort with energy (and dollar) savings. It is surprising how comfortable you can be at a lower indoor temperature once you become acclimated to it. Thereafter, you find yourself uncomfortable at a higher indoor temperature that used to seem normal.

It actually does save energy overall if you lower the temperature setting on your central furnace or heat pump thermostat. The actual amount of dollar savings depends primarily upon how low you set the thermostat, how long you have it set back and, to a lesser degree, your climate.

There are also other advantages to lowering the thermostat setting during winter. If your house temperature is lower, it requires less moisture indoors to keep the indoor air at a given relative humidity level. The fact that your furnace or heat pump runs less at a lower indoor temperature means the equipment will last longer and need fewer repairs.

If you look at setback savings charts, don't be confused by the fact that the percentage savings are actually higher in milder climates than in colder climates. This is because the total amount of energy used to keep a house comfortably warm in a cold climate is much greater than in a

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warm climate. This makes the base number larger in cold climates so the percentage savings are less, even though the dollar savings are greater.

It is a common myth that it takes as much energy to reheat a house, in the morning for example, as was saved during the temperature setback period overnight. The amount of heat a house loses through its walls, ceilings and floors is directly proportional to the difference between the indoor and the outdoor temperatures. Air leakage into and out of your house also increases with larger temperature differences.

When the indoor temperature is set lower, the indoor-to-outdoor temperature difference is smaller so less heat is lost from your house. During the summer, the same is true in reverse. If less heat is lost from your house, your furnace has to use less gas, oil or electricity to create the heat to replace it. The amount of heat used to reheat the house, therefore, is less than the amount saved over the temperature setback period.

The only time a temperature setback may not be wise is if you have a heat

pump with backup electric-resistance heat and an old thermostat. When it is time to reheat the house and you set the thermostat higher again, the expensive backup electric-resistance heater may come on. For a long, eight-hour setback, you will likely still save overall, but not for just a short, couple-hour setback.

If you have a heat pump, install a special setback thermostat, designed for heat pumps. These heat pump thermostats have electronic circuitry to keep the backup resistance heating elements off after the setback period. My own heat pump thermostat works this way and it also allows me to block out the resistance heating when the outdoor temperature is above a certain temperature. I have mine set at 20 degrees.

There is not a "best" thermostat setting for all homes and climates. The lower you set it, the greater the overall savings will be. The amount of savings per degree for each nighttime eight-hour setback period ranges from 1 to 3 percent. Since many people are also out working during the daytime, the temperature can be set lower for about 16 hours per day. Unless there are some health problems in your family,

62 degrees is comfortable if you are wearing long sleeves or a sweater.

In moderate climates, let your comfort dictate how low you initially set the furnace or heat pump thermostat. As you get used to the lower temperatures and wear a sweater, you will be able to gradually lower it more. In colder climates, excessive window condensation often limits how low the indoor temperature can be set. In order to set the temperature lower, you will have to reduce the indoor humidity level.

Use smaller, room-heating appliances with built-in thermostats to keep just a room or two warmer if you like. Reiker ([www.buyreiker.com](http://www.buyreiker.com)) makes ceiling fans with a built-in heater and remote digital thermostat. Soleus ([www.soleusair.com](http://www.soleusair.com)) makes a very efficient portable heat pump with a thermostat and remote control. Many inexpensive electric space heaters also have thermostats for zone heating. ■

Send questions to James Dulley, Cooperative Living inquiry, 6906 Royalgreen Dr., Cincinnati, OH 45244 or visit [www.dulley.com](http://www.dulley.com).





PHOTO COURTESY OF BROAN

Q.

We are in the planning stages of remodeling our kitchen and we want to make it convenient to use, yet energy efficient. What are some design, product and usage tips for an efficient kitchen? – Marjorie H.

A.

In most homes, the kitchen area consumes the most energy, after the utility room. Water usage, both hot and cold, is also quite substantial in the kitchen. Creating an efficient kitchen does not require any sacrifices and can actually make it more convenient to use.

The four primary components to an efficient kitchen are design, appliance selection, appliance usage, and general efficiency habits. If you are not going to completely remodel a kitchen, you can still incorporate some of the same concepts to help manage energy use.

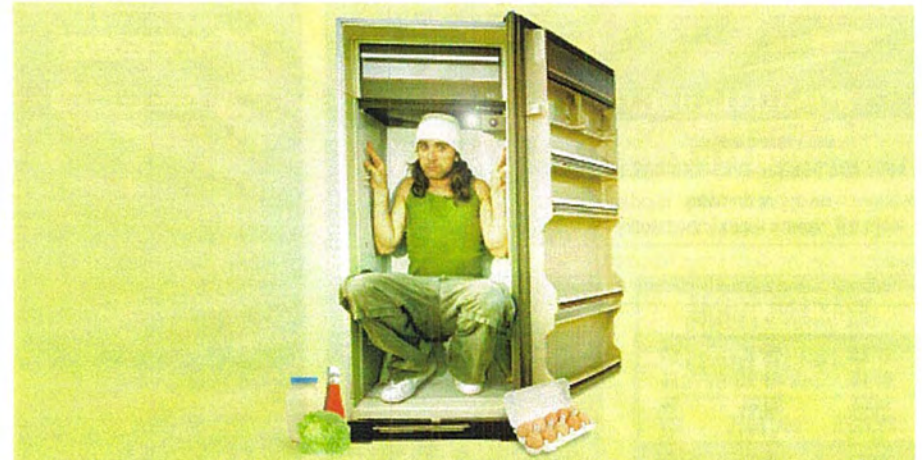
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WISE ENERGY USE

# the efficient KITCHEN

Both products and layout are important considerations in designing for convenience and energy efficiency.

by James Dulley, Contributing Columnist



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WISE ENERGY U\$E continued from pg. 36

Start with the kitchen-design layout and relative location of major workstations. The most accepted kitchen design utilizes the concept of a "kitchen triangle." The goal is to have no more than eight feet between the center of any two of these: the range, the refrigerator and the sink.

These appliances should also be located in a fairly even triangle for the most convenient use. Increased convenience results in less time in the kitchen, less lighting, less hot water running down the drain, and more efficient cooking. Also consider the traffic patterns through your kitchen so you are not trying to dodge children as you are cooking or cleaning. Fifteen inches of free work space around appliances is usually adequate.

Refrigerator/freezers require adequate air flow through the condenser coils to operate efficiently. Often the refrigerator is tucked tightly against a wall or under cabinets. This saves floor space, but it is best to locate it with more clearance to accommodate air-flow patterns. Also avoid locating the refrigerator in direct sunlight.

The range, whether gas or electric, can be located almost anywhere to create the desired kitchen triangle. If you use natural ventilation from windows during summer, avoid locating the range near a window. A breeze from the window can carry away heat from the electric elements or gas burners and the cooking utensils. This increases cooking time, wastes energy and makes the rest of your kitchen uncomfortably warm.

Locate movable cabinets on outside walls if possible to create an additional thermal buffer from a cold wall. Since the kitchen temperature fluctuates more than other rooms, install a thermostatically controlled ceiling fan with a built-in heater. Insulated window shades also save energy and improve comfort.

Once you have your kitchen layout completed, you must select energy-efficient major appliances, which are the refrigerator, dishwasher and range. Of these, the refrigerator is most important because it is operating 24 hours each day. All refrigerators have an energy label showing the amount of electricity they use.

There are some general guidelines for selecting a refrigerator. Although a side-by-side model may be the most convenient to use, it is the least-efficient design because of the extra door-gasket length. Models with the freezer on the bottom are the most efficient, with top-freezer models not far behind. Also, smaller is better than larger, so give some thought to how many cubic feet your family actually needs.

Depending on the size of your family and how many loads of dishes you do, the dishwasher can be a significant energy consumer. Select a model that has its own preheater so you can set the main water-heater-tank thermostat lower. Designs that have two small internal pumps instead of one large reversing pump generally consume less water. Dishwasher energy labels have two operating-cost figures – one for a gas and one for an electric water heater.

There are no energy labels on ranges to guide your decision. There are some differences in the cooktop-element technologies that affect how fast they heat a pot of water and the precision of tem-

perature control. Induction elements provide the most precise temperature control on an electric range. Select an oven with convection option. This feature circulates the air to reduce roasting and baking times.

Once you have your appliances and your kitchen is complete, use them in an efficient manner. Check temperatures in the refrigerator and freezer portions. They should be about 40 degrees and 0 degrees, respectively. If they are colder, it wastes electricity, and if they are warmer, foods don't stay fresh. Periodically clean dust off the condenser coils so they transfer heat efficiently. Switch off the condensation-reducing door-seal heating elements.

Use your dishwasher only for full loads. If it has an automatic sensor to determine the best wash cycle, use it. For just a few dishes, wash them by hand. During winter, leave the hot, soapy water in the sink until it cools. Cover pots when you are boiling water and use small countertop ovens and appliances instead of the range oven whenever possible. ■

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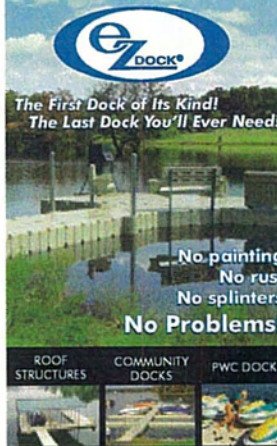


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## WISE ENERGY USE

by James Dulle, Contributing Columnist

# AWNINGS SAVE ENERGY

Studies show that window awnings can reduce cooling-energy needs by more than 20 percent!

**Q.** *I have always liked the appearance of window awnings. The salesman told me installing them can also save a lot of energy. Do they really save much energy, and what awning choices are best? — William B.*

**A.** The awning salesman was not just blowing smoke to get a sale. Installing window awnings can significantly reduce the cooling energy usage in your home. There are also other benefits such as reduced fading of furniture, drapes, and carpeting, as well as protection of primary windows from the

sun and severe weather. The same UV rays that fade your furniture also slowly degrade window-frame materials over time.

The reduction in air-conditioning electricity use results from the blocking of the direct radiant heat from the sun through windows. Studies by the University of Minnesota found installing window awnings can reduce cooling-energy needs by 21 percent in Phoenix, 17 percent in St. Louis, and 24 percent in Boston.

Even though the percentage savings is highest in a northern area such as Boston, the total dollar savings is greater in a warm climate because the overall air-conditioning costs are much higher. The actual savings you realize depends upon the overall energy efficiency of your specific home, the amount of natural shading from trees, orientation of the windows to the sun, etc.

Energy savings generated by awnings are greatest during the hottest hours of the afternoon, when the sun is most intense. Awnings can reduce the peak electric load for the utility company's electric generation, so there is less chance of a brownout or other problems from excessive electricity demand.

Cutting peak electricity demand can also reduce long-term electricity rate increases by delaying the need for building new generating plants. For many businesses, their utility rate depends somewhat on their peak energy use. By reducing this peak, their electric bills can be reduced substantially. In the future, I believe some homeowners' rates may also be dependent upon their peak electricity use.



PHOTO BY AWNTech



PHOTO BY ARISTOCRAT® AWNINGS BY CRAFT-BILT

continued on pg. 32

WISE ENERGY USE *continued from pg. 30*

There are many window-awning options available. The first decision to make is if you want fixed or adjustable awnings. They both are equally effective during the summer to reduce your peak electricity use in mid-afternoon. The advantage of adjustable awnings is the level of shading can be changed throughout the day and various seasons. Fixed and adjustable ones are available in all aluminum or fabric over an aluminum frame.

Adjustable fabric awnings offer better protection from severe weather because some can be lowered to be almost flat over the window opening. They can also be raised to expose most of the window glass. The maximum projection from the wall for an adjustable aluminum awning is fixed by the frame and the down-arm length. To open them, the aluminum awning slats roll up above the frame and the hinged arms swing upward. The advantage of aluminum is its strength and its resistance to degradation from the sun's UV rays.

Sideless awning designs, called Venetian awnings, are effective for true south-facing windows because the most intense sun's rays come from overhead. Actually, just a relatively short flat board over the window, such as a large roof overhang, is effective at blocking the sun over these windows. If you need to block the late afternoon sun at those south-facing windows, install hood-style awnings with sides. For casement windows, hip-style awnings provide clearance for the window sash to swing open outward.

Proper sizing (projection length from the house wall) is important for blocking the summer sun and for allowing the winter sun to shine through windows for free passive solar heating. This is particularly true if you install fixed awnings, because their shading cannot be changed. The orientation of the

window to the sun also affects the proper awning sizing because the sun is lower in the sky during early morning and late afternoon.

If you still remember some of your high school geometry, you should be able to calculate the size of awning needed for various windows. The latitude angle for your area determines how high the sun is in the sky and its angle of incidence on your windows. The sun's height also varies throughout the day and seasons. You can find the sun location for various regions, seasons, and times of day in most basic solar-energy books. If you are not a math wiz, just make some test awnings with cardboard to determine the proper size.

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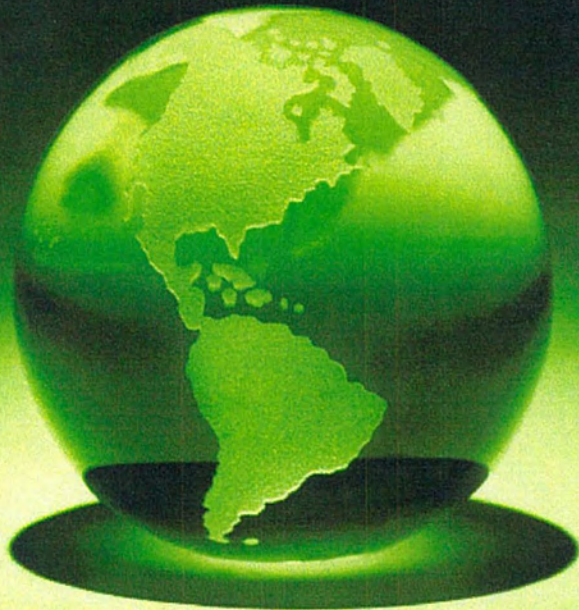
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# EARTH-FRIENDLY ENERGY

Story and photo by Bill Sherrod, Editor

Electric cooperatives are working toward a "greener" tomorrow.

**A**s Kermit the Frog once famously proclaimed, it's not easy being green.

But it seems that green is where the world's headed. At least, in an environmental sense, we here in the U.S. are moving inexorably toward a profound awareness of and concern with things green, in everything from power generation to laundry detergent.

The idea, simply, is to do what we can to help Mother Earth, by reducing carbon emissions, by helping to keep the air and water clean – in general, making the world a better place for future generations.

And of course, while we're at it, we have to ensure that there's an adequate supply of electricity to meet our burgeoning demand for games, gadgets and all things electric.

So what does this mean for you, as a member-owner of an electric cooperative utility in the Commonwealth of Virginia?

## WHAT IS GREEN POWER?

"Green power" typically refers to a source of energy produced by a renewable type of fuel," says Lisa Johnson, senior vice president of power supply for Old Dominion Electric Cooperative (ODEC). Twelve electric cooperatives, including 10 of Virginia's 13, receive their wholesale power supply from ODEC.

Renewable fuels, Johnson continues, can be grown, such as wood, switch grass, or other "biomass" materials; they can occur naturally in the environment, such as sun, wind or tides; or they can come from recycling waste, such as the methane gas created naturally in landfills and animal waste.

And why is green power important? What about green power makes it something that we should pursue?

"If you can find sources of fuel that are renewable, you can decrease the need to dip into finite resources," notes Johnson. "Plus, people who oppose burning fossil fuels contend that if you're not burning them, you'll reduce certain point-source

emissions like nitrogen oxide, sulfur dioxide and mercury."

Finally, Johnson adds, "Renewable resources are things we can find around us that can help us move away from reliance on foreign energy sources."

Pete Gallini, director of power supply for ODEC, adds that additional benefits may result from expanded use of green-power fuel sources. For example, one effect of planting trees and other flora to produce biomass might be that even more carbon dioxide is removed from the atmosphere, by the very plants that are being cultivated as biomass fuel sources.

## RENEWABLES POSE CHALLENGES

"It's a challenge to find these sources of fuel in every part of the country," Johnson points out. And there are complex variables involved in determining the real value of a fuel source.

For example, wind and solar power are good fuel sources, but they only happen when they happen. If the wind's not blowing or the sun's not shining, there's no electricity being generated.

"One of the big challenges with renewables is finding consistency," Johnson continues. "A forest fire can deplete the supply of wood waste (from a cutover tract) after a contract has already been made to use that same wastewood as a renewable fuel resource. Some of these renewable resources have significant risk as a constant, reliable fuel supply."

And according to Gallini, "The reason many of these fuel resources aren't used more right now is that they're more expensive than traditional fuel sources. But the cost of some of these alternative fuel forms has been coming down the past decade, so their use has become more common."

About half of the power that ODEC's 12 member cooperatives require is provided by generation assets it owns, including a 50-percent interest in the coal-fired Clover Power Station and an 11.6-percent interest in North Anna Nuclear Power Station. ODEC also owns gas-fired peaking turbines in Louisa County, Fauquier County, and Cecil County, Md.

For the portion of its members' power requirements that it does not own, ODEC negotiates contracts from various suppliers in the energy market. Some of these suppliers are "green," and more green power is becoming available.

In addition to a small amount of hydro-electric energy the Virginia electric cooperatives receive from Southeast Power Administration dams, ODEC purchases some of its power from a landfill gas generator in Northern Virginia, and in the past has had some wastewood generation, according to Johnson.

"We're currently exploring opportunities for energy produced from wastewood, animal waste, landfill gas, switch grass (biomass), and additional conventional hydro power," she adds. "Our challenge is in balancing cost and reliability with the value of the green resource."

## ANOTHER REASON TO 'BUY LOCALLY'

Physical proximity is a very important consideration in developing reliable "green" energy resources. "Most of the project developers we're talking to are in our area," notes Gallini.

It's important, for many reasons, to try and buy locally when looking at renewable energy resources, Johnson adds. For example, using a local renewable resource – such as wastewood from a cutover tract near a wastewood-burning generator – means that you don't have to pay as much for transporting the renewable resource from farther afield; plus, you save a finite resource, the fuel needed to transport the wastewood. And there is a reduction in emissions from transportation when the source is nearby.

"Biomass as a 'green' fuel resource probably makes the most sense for us," Johnson adds. "Wastewood, switch grass, landfill gas, and animal waste – much of this fits right in with the agricultural profile of many of our co-ops' members," she notes.

"We're also looking at the concept of participating in a national renewable-energy cooperative," Johnson continues.

And every cooperative in Virginia is actively working toward improving its energy-efficiency profile, from encouraging use of compact-fluorescent lamps and energy audits to promoting peak-demand energy reduction through use of water-heater-switch programs, Johnson adds.

"If we're doing our job and fulfilling the cooperative mission, we have to consider reliability, environmental balance, and cost effectiveness in everything we do relative to power supply," Johnson says.

And since there isn't an easy, perfect solution for balancing these three elements, "Our job is ensuring that we have the best possible pieces of all three of these for our members," Johnson says.

Kermit's famous lament – his amphibian angst – may indeed be true in today's world: it's not easy being green. But it's a worthy goal, and one that Virginia's consumer-owned electric cooperatives are actively pursuing. ■

**"IF WE'RE DOING OUR JOB AND FULFILLING THE COOPERATIVE MISSION, WE HAVE TO CONSIDER RELIABILITY, ENVIRONMENTAL BALANCE, AND COST EFFECTIVENESS IN EVERYTHING WE DO RELATIVE TO POWER SUPPLY."**



Lisa Johnson, senior vice president of power supply for ODEC.



## CO-OP CURRENTS

### Heat Pumps and Geothermal Systems: Ways to Save Energy for Homeowners

Heating your home in the winter and cooling it in the summer is often the largest energy cost the typical homeowner faces. The bad news is that the cost of energy, from fossil fuels to electricity, has risen dramatically and will probably continue to go up for years to come.

The good news is that there are steps homeowners can take to help keep heating and cooling costs down by better insulating their homes and installing more energy-efficient systems. In fact, according to the U.S. Department of Energy (DOE), if your heat pump is 10 years old or older, replacing it with a new ENERGY STAR-rated model could save enough in energy costs to pay for itself in a just a few years.

Before replacing your old heat pump, the Department of Energy cautions that homeowners should thoroughly research and calculate the size and capacity of the replacement unit they need. "The most common sizing mistake is in oversizing," according to the DOE. "This not only makes the new system more expensive to install, but also forces it to operate inefficiently, break down more often, and cost more to operate."

On new heat pumps, check out the SEER (Seasonal Energy Efficiency Ratio) number. This is the rating of the unit's cooling efficiency. A rule of thumb is that the higher the SEER, the higher the cost of the unit. However, the energy savings from a unit with a higher SEER will pay off in the long run as it will use much less electricity to provide the same amount of cooling as a unit with a lower SEER. For peak efficiency, the DOE recommends a heat pump with a SEER between 14 and 18. In many localities, building codes now have requirements that replacement units have minimum SEER numbers. You or your HVAC contractor should check these codes before replacing your unit.



For more energy-saving ideas online, visit [touchstoneenergysavers.com](http://touchstoneenergysavers.com)

Another type of heating and cooling system that is gaining popularity is the geothermal heat pump. In use since the 1940s, geothermal units use the constant temperature of the earth, or of a water source such as pond or well, instead of the outside air. Geothermal heat pumps are nearly twice as efficient as conventional heat pumps and use much less energy.

Geothermal systems do require that the homeowner have a large enough lot to install the necessary underground pipes for the system to operate. The cost to install a geothermal system is also several times that of installing a conventional system of equal cooling and heating capacity. However, the DOE estimates that a homeowner can recoup these additional costs in energy savings in 5-10 years — plus the estimated life for a geothermal system and its inside components is 25 years or more.

If you own a fairly new heat pump and are not planning to replace it in the near future, there are still many ways to make sure it is operating at peak efficiency. Maintaining your system properly can result in energy savings of 10-25 percent. While it is recommended to have a professional technician inspect and service your unit at least once a year, here are some do-it-yourself tips every homeowner should perform regularly:

- Clean or change filters once a month or more often if necessary.
- Clean the coils of the outside unit by spraying with a water hose every few months.
- Cut and remove vegetation and clutter around the outside unit that may block airflow.

- Check your ductwork for leaks and obstructions at least once a year, and make sure that ducts in unheated parts of your home, such as attics, basements or crawl spaces, are properly insulated.

Whether you are considering replacing your old heat pump with a new, more efficient model, are interested in a geothermal unit, or just want to make sure your present unit is operating as efficiently as possible, take time to do research. Talk to the energy-efficiency experts at your local cooperative and check their Web site for tips. For detailed information on heat pumps, geothermal heating systems, check out the DOE Web site: [www.eere.energy.gov](http://www.eere.energy.gov).

—Jeb Hockman

### Saving Energy Dollars (As Well As Souls) in Church

Since most houses of worship rely on small or non-existent budgets for capital projects, low- or no-cost measures that reduce energy consumption generally produce the best results. Some simple steps involve changing the way congregants and staff use the building. Big-ticket items, such as replacing heating and cooling systems with more energy-efficient units, may not be practical until existing equipment reaches the end of its useful life.

A comprehensive energy audit remains the best way to identify cost-effective efficiency improvements in a church. Below are some suggestions for reducing energy consumption:

- Turn off the lights when not in use. While occupancy sensors can be cost-effective, posting reminders to ensure that the lights are turned off often does the trick. Timers are useful in lobbies, entries, and vestibules to ensure that lights stay off during daylight hours.
- Replace incandescent lightbulbs with compact fluorescent lightbulbs (CFLs).
- Control "plug loads," such as microwaves, computers, and televisions that continue to draw power even when turned off. Unplug these appliances when finished using or before leaving the building.
- Heat and cool during occupied hours only. Make sure that heating and cooling controls are set at minimum levels or are switched off during periods of no use.

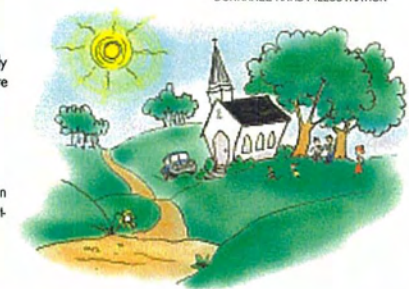
- Turn down water heater thermostats. Bathrooms and kitchens used primarily during worship services are good targets for lowering water temperatures.

- Change filters. Filters should be changed on a monthly basis — more often if the congregation is located next to a highway or construction site.

- Clean condenser coils. Condenser coils should be washed thoroughly at the beginning and end of the cooling season.

- Check cabinet panels. Ensure that panels to rooftop air-conditioning units are attached with all screws in place, and make sure gaskets are intact to prevent air leaks. This check should be performed on a quarterly basis.

- Direct airflow. Close registers in any unused rooms to direct air where it is needed. If some rooms overheat while others are too cool, call a qualified heating and cooling contractor.



DONNAREE HARDY ILLUSTRATION

- Close vents. In place of air conditioning, many older buildings have natural ventilation systems to remove hot air in the summer. Be sure to close these vents in the winter.
- Seal gaps. Use caulk and weather stripping to seal gaps around windows, doors, chimneys, and other structural elements, including the foundation.
- Insulate hot water pipes with pipe insulation. Fix leaky faucets, pipes, and toilets.

Sources: E Source, ENERGY STAR, U.S. Dept. of Energy. ■

## THE GREEN SCENE



### TURN OFF THE DRYER & PUT YOUR LAUNDRY ON LINE

Up until 20 years ago, there were two things most every home had: a TV antenna on the roof and a clothesline in the backyard. While the rooftop antenna is gone — the victim of cable and satellite television — the clothesline is making a comeback.

An electric clothes dryer can cost up to \$100 or more a year to operate. Plus, in the summer months, the heat a dryer generates makes your air conditioner work harder and can boost your electric bill even more.

Save money and be more environmentally friendly by going "on line" and hanging your laundry outdoors to dry. Not only will air-drying your clothes save energy, experts claim that your clothes will last and look better longer, have fewer wrinkles and air-drying eliminates static cling.



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# THE GREEN SCENE

## Energy-saving tips for home computers



### PUT YOUR PC TO SLEEP —

To save energy, configure your computer monitor and hard drive to turn off after 20-30 minutes of inactivity. Whenever possible, turn off your PC, monitor and printer. If you use a power strip, switch it off or unplug it from the wall outlet.

### TRADE UP AND POWER DOWN —

Today's PCs, monitors and printers can do much more, but use much less energy than older models. New Energy Star-qualified models use up to 60 percent less energy. When trading up, consider a notebook or laptop instead of a desktop model, or a flat-panel LCD instead of a CRT monitor and enjoy even more energy savings.

Source: [www.energystar.gov](http://www.energystar.gov)

CO-OP CURRENTS *continued from pg. 12*

serves as home for numerous social service and non-profit organizations. Additionally, the Smyths were cited "for their compassion and concern for the less fortunate" through their leadership roles in providing low-cost housing through the Nelson County Community Development Foundation and programs for senior citizens through the Jefferson Area Board for the Aging.

A native of Pottsville, Pa., Gordon Smyth earned a B.S. in industrial engineering at Lehigh University. Mary Beth Smith, who was raised in Martinsville, Va., graduated from Mary Baldwin College with a B.A. in English. The couple met in Waynesboro, Va., where Gordon had accepted a position with E.I. DuPont de Nemours & Company and Mary Beth was teaching seventh grade. The Smyths moved seven times as Gordon assumed new positions with DuPont. He retired as senior vice president for employee relations in 1990 after a 42-year career.

The Smyths' love for Nelson County began when they purchased a condominium at the Wintergreen Resort in 1979. Upon Gordon's retirement, the Smyths built a home at Wintergreen and began living there full time. Recently, the Smyths relocated to Westminster-Canterbury of the Blue Ridge in Charlottesville.

*continued on pg. 16*

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# EFFICIENT OUTDOOR LIGHTING

by James Dulley, Contributing Columnist

Q.

*There were some break-ins in my neighborhood this past year, so I want to install some outdoor security lighting which can also be used when entertaining. What are my options and which are most efficient? – Ann.J.*

A.

Installing outdoor lighting is one method to reduce the possibility of nighttime break-ins. Talk with your local police department about what types and the amount of lighting they recommend for your home. Based upon crime statistics for your area, the police can also recommend the appropriate on-time for your security lights. Obviously, the

less time they are on, the less electricity you have to pay for.

Keep in mind though, outdoor lighting should be used in moderation. It consumes large amounts of electricity, contributes to global warming, and creates problems for wildlife that navigate at night. Also, in major cities, outdoor lighting makes it almost impossible to see the stars at night. If you have ever been on Pike's Peak in Colorado on a clear night, you know how many stars there really are to be seen.

When comparing lights and determining how many you need, compare their light-output lumens ratings. This is listed on the packaging. The wattage refers to how much electricity a bulb uses, not its light output. The actual light intensity on your house or the ground is rated in lux (lumens per square meter).

The keys to energy and environmentally efficient outdoor lighting is selecting the proper type of bulb, light-fixture design and shortest on-time



A tall die-cast metal landscaping light brightens a large area to double as a security light. The large-diameter top limits light pollution of the night sky.

*continued on pg. 36*



period. Using just two 150-watt floodlights at night can increase your electric bills by up to \$100 per year. With several fixed floodlights around your house, would-be thieves can often figure a way to get around them without being seen.

In areas where you will not need the lighting for entertaining, install motion-sensing fixtures or add-on motion-sensing switches. You can find these at most home-center stores. Motion-sensing lights greatly reduce the amount of on-time and increase the bulb life. Since the light is not on when the intruder arrives, they would not know to avoid it until it switches on from their movement and they are caught in a lighted area. This generally will frighten a would-be intruder. Better-quality models provide for adjustable distance sensitivity and on-times.

For areas where you want the outdoor lighting for both security and entertaining, select fixtures that direct the lighting downward in the specific areas needed. This minimizes light pollution in the night sky and may allow you to use lower-wattage bulbs to save electricity. Add-on shields are available for existing floodlights you already have. Other complete outdoor shielded fixtures, with a mirrored interior for efficiency, are available ([www.theglabuster.com](http://www.theglabuster.com)).

As you would do indoors, use fluorescent tubes and CFLs (compact fluorescent lights) in your outdoor lighting fixtures. Some may not operate well at very cold temperatures, so check with the lighting manufacturer before selecting them for cold climates. Fluorescent lights are four times more energy efficient than standard incandescent bulbs and last 10 times longer. The light quality from the newer CFLs is similar to standard incandescent bulbs. For whiter light, select full-spectrum CFLs.

If you find a problem with CFLs outdoors during winter, use halogen bulbs. Although these are not as efficient as CFLs, they are still 15 percent more efficient than standard incandescent bulbs. Halogen bulbs produce a very white light that is excellent when entertaining, and it may enhance the appearance of your landscaping. Halogen bulbs can get very hot, so pay attention to the maximum wattage allowed for each light fixture. Mercury vapor bulbs also produce a very pleasing light.

Although they are substantially more expensive to install, LPS (low pressure sodium) outdoor lighting fixtures are very energy efficient. These are the type of fixtures used in most commercial parking lots. They use less than 15 percent as much electricity as incan-

descent bulbs. The only drawbacks are they take a short time to heat up to full brightness and the light is a monochromatic yellow.

Some of the newest fixtures use clusters of white LEDs (light-emitting diodes). These are solid-state devices, not actual bulbs, which produce a white/bluish light. LEDs are extremely efficient and they last almost forever, up to 100,000 hours. The brightness of the light output is limited, so they are best for lighting a specific small area. They are often installed in groups to light a larger area.

The following companies offer efficient outdoor lighting:

Adjusta-Post, (800) 321-2132  
[www.adjustapost.com](http://www.adjustapost.com)

Energy Focus, (800) 327-7877  
[www.energyfocusinc.com](http://www.energyfocusinc.com)

Hadco, (800) 331-4185,  
[www.hadco.com](http://www.hadco.com)

Idaho Wood, (800) 635-1100,  
[www.idahowood.com](http://www.idahowood.com)

Kim Lighting, (626) 968-5666  
[www.kimlighting.com](http://www.kimlighting.com) ■

Send questions to James Dulley, Cooperative Living inquiry, 6906 Royalgreen Dr., Cincinnati, OH 45244 or visit [www.dulley.com](http://www.dulley.com).

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You've probably heard about energy audits. Many firms offer them to help homeowners cut down on energy usage and save money, but have you considered an eco-audit? In addition to helping you save on home energy costs, an eco-audit can also help you lessen your home's environmental footprint, and you don't have to spend a fortune to make an impact, either.

While eco-audits haven't really hit the mainstream in the U.S. yet, there are a handful of firms in Virginia that offer them. Cville-Enviro in Charlottesville is one of them. General Manager Russell Edwards says you don't have to be a tree hugger to have an interest in an eco-audit. "Our clients range from being ultra-sensitive to the health environment of their home to those who are just interested in energy efficiency and want a payback," he says.

Cville-Enviro, like many organizations offering energy and eco-audits, is relatively new, having started as an outgrowth of Artisan Construction four years ago. "Clients of our construction firm were interested in green building," Edwards explains, "but we saw a need for a service to existing buildings as well."

Whereas an energy audit generally focuses on the technical aspects of a building, an eco-audit is more expansive and

includes the way you live in your home. While improving your home's energy efficiency may require some one-time steps to fix problem areas, becoming more eco-friendly often requires some lifestyle adjustments, too. But it's not as intimidating as it sounds. Small fixes can often lead to big dividends. As Edwards points out, just sealing up leaky ducts in a home could increase an HVAC unit's efficiency by as much as 30 percent.

Terry Logee, technology development manager with the U.S. Department of Energy, says the biggest environmental footprints homeowners make come from heating and cooling systems and air infiltration.

Other big draws on energy, often overlooked, include old appliances. "If you have a refrigerator that's more than 10 years old, you'll see a significant reduction on your energy bill if you update," says Thomas Thompson, manager of the Virginia Energy Management Program with the Department of Mines, Minerals, and Energy in Richmond. Refrigerators and freezers can use up to 20 percent of a home's electricity.

But you don't necessarily have to hire a certified "eco-auditor" or seek out the advice of the experts to make changes that will help you save money and better protect the environment. Following is a checklist of things you can do in your home (and maybe even on your way to work) to help preserve our natural resources and decrease your carbon footprint.

## ECO-AUDIT Checklist

### ENERGY CONSERVATION

- ✓ Is your HVAC system 10 years old or older? If so, you might benefit from replacement with a more energy-efficient model. Heating and cooling can use one-third to one-half of your home's energy.
- ✓ Is your attic insulated and sealed? You can lose a lot of warmth and coolness through the roof. For the best energy efficiency, attics should have R-49 insulation, walls R-19, and crawl spaces R-25.
- ✓ Have you sealed up the space between your foundation and cladding? This is a much overlooked space for air leaks.
- ✓ Make sure there are vapor barriers on the ground underneath your crawl space and over the insulation in the attic. Moisture can reduce insulation's effectiveness.
- ✓ Is air infiltrating around your windows and doors? Purchasing replacement energy efficient windows can be a big expense, but you can get low-E storm windows. You may also be able to cut down on air infiltration by sealing up the gaps with caulk or foam and hanging up heavy curtains or window shades.
- ✓ If drafts are coming in through electrical outlets and switches, you've got a leaky wall. Pull out the electrical boxes and insulate behind them.
- ✓ Check for old and deteriorating weather stripping and caulk around exterior trim, doors, and windows. Replace where it's not holding up anymore.
- ✓ Replace old appliances with new ENERGY STAR models. If you can't afford new appliances, make sure you only wash clothes and dishes with full loads. Don't use hot water to wash. Keep your refrigerator and freezer full, as they run most efficiently this way. And get rid of that old deep freeze in the basement!
- ✓ Check the air filters in your heating and cooling equipment. Dirty filters can substantially cut down on the unit's efficiency. Check and/or clean them at least once a month.
- ✓ Replace your incandescent light bulbs with compact fluorescents or LEDs. They last five to 10 times longer and will save you anywhere from 30 to 75 percent on your electric bill in the long term.
- ✓ Invest in a programmable thermostat that will automatically adjust the temperature of your home when you're away or sleeping. At the very least, keep the thermostat at 70 degrees or lower in winter and layer your clothing. Try to keep it 78 degrees or higher in summer. You can save up to 3 percent on heating and cooling costs for every change in degree on the thermostat.

**SAVE  
30-75%**

Replacing incandescent bulbs with CFLs or LEDs can reduce electric bills from 30 to 75 percent over bulb life.



- ✓ Get your electric meter wired to provide a read-out in your house so you can monitor your electric usage and see what appliances and activities are draining the most electricity. This will help you modify your usage.
- ✓ Turn off the lights, computers, television, and other small appliances when not in use.
- ✓ Take advantage of the sun. Use natural light to illuminate workspaces and provide warmth during winter days through south-facing windows. In summer, make sure west-facing windows have covering to keep out the sun's heat.
- ✓ Cover wall- or window-mounted air conditioners when not in use so cold air from outside won't infiltrate the home.
- ✓ Get a blower-door test to determine just how much air leakage is occurring in your home.

- ✓ Make sure your water heater is insulated, particularly if it is an unconditioned space. Also, insulate hot-water pipes in unconditioned spaces.
- ✓ Lower the temperature of your water heater as much as is comfortable, trying around 120°F.

#### WATER CONSERVATION

- ✓ Install low-flow showerheads and low-flow toilets.
- ✓ Collect rainwater for irrigating your lawn and garden. This can be as simple as providing for your gutter system to empty into a cistern.
- ✓ If you must water the lawn, install an in-ground sprinkler system on a timer that waters early in the morning or in the evening so water doesn't have the chance to evaporate. And, water deep

so plants and grass establish strong, deep, root systems that can withstand the stress of summer droughts.

- ✓ Cut your lawn less frequently. Letting it get a little taller keeps it healthier, which translates into less watering, and will also save you on fuel costs for the lawnmower.
- ✓ Plant more flowerbeds, and reduce your lawn space. Use native plants that are acclimated to your climate and won't require extra watering.
- ✓ Don't buy multi-showerhead systems. They often use more water than a bath.
- ✓ If you have the space, line-dry clothes outdoors.
- ✓ Check for leaky toilets by putting food coloring in the tank. If you see the dye in the bowl, you've got a leak, and you can save hundreds of gallons of water a day by fixing it.

#### HEALTHY LIVING

- ✓ Don't overseal your home. Ventilation is necessary for air quality, so don't get into a caulking frenzy and seal underneath lap siding for example (unless there are really large gaps), and make sure you have ventilation in your attic and crawl spaces to prevent moisture build-up and mold formation.
- ✓ Use environmentally friendly cleaning supplies. White vinegar and baking soda, for example, can do wonders for cleaning up and removing stains.
- ✓ Keep lots of house plants, as they help clean the air and remove toxins. Large pots also add beneficial thermal mass.
- ✓ Use native plants and grasses for landscaping, so you don't have to rely on noxious chemicals to maintain a healthy lawn.

- ✓ On do-it-yourself projects around the house, be sure to use low- or no-VOC paints. Lots of materials for the home also have harmful formaldehyde-based adhesives, too — including carpeting, cabinets, and plywood/OSB. If you're replacing any of these items or building, seek out healthier options and look for the GreenGuard seal.

#### GREEN LIVING

- ✓ Are you recycling? If not, start separating out your glass, plastic, paper, and other recyclables.
- ✓ Remember that transportation is a big consumer of energy. Car pool or use the public transportation system. Ride a bike or walk to work if it's close by.
- ✓ Compost household waste like food scraps to prevent the amount of material going into landfills.

- ✓ If you're remodeling or building, use Forest Stewardship Council-certified lumber or buy locally harvested wood. FSC certification means the wood has come from sustainably harvested forests.
- ✓ Use building materials made from recycled products to reduce waste. This might include kitchen countertops of recycled glass or carpet made from recycled carpet fibers.
- ✓ Buy locally whenever possible, whether it's building materials or vegetables. The farther products have to travel to get to you, the more fuel and energy is consumed.

Edwards advises homeowners not to get overwhelmed by the details. "Most of our clients don't fix everything at once," he says. "They work on them over the long-term." The best thing is to start with a few simple

*continued on pg. 30*



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COVER STORY *continued from pg. 17*

changes, then gradually add more changes as time and money allow. It's not that hard to do some basic scouting out of your home's eco and energy friendliness. "Stick your head in the crawl space and see what's going on in there," Edwards advises. "Does it smell musty? What condition is the ductwork in?"

Thompson agrees that small steps can make a difference, even something as simple as turning off the water heater when you go on vacation. He's been involved in helping the Commonwealth of Virginia work on energy improvements at state facilities over the course of the last three years. "As a result," he says, "we're seeing millions of dollars of savings a year."

#### GREEN BUILDING

The green building movement is catching on across Virginia and the nation. Scott Sleeme, president of Mitchell Homes, notes that the movement's ultimate goal is energy-efficient homes built with environmentally friendly products, employing building practices that promote sustainability.

Energy-efficient and sustainable building products are integral to this building process. What are some of these products and practices?

Advanced technologies like low-emittance (low-E) glass coatings in windows and doors keep heat inside during the winter and outside during summer months, according to Sleeme. Laminate flooring mimics scarce hardwoods and is longer-lasting than any hardwood, vinyl, or carpet flooring. The use of vinyl siding and vinyl porch railing saves money on installation and maintenance.

House wrap is breathable, but acts as an air barrier to make the home more energy efficient, while also blocking rain from soaking the walls, which can lead to mold and rot. ENERGY STAR-rated appliances save on energy bills and help reduce greenhouse gas emissions. Other green-building features range from ultra low-flow toilets and advanced shower and sink faucets that reduce water to front-loading washing machines that use about 40 percent less water, Sleeme adds.

Engineered roof and floor trusses allow for more efficient use of raw materials by utilizing small-dimension lumber that might have otherwise gone to waste, Sleeme continues. This protects old-growth forests. Engineered trusses also eliminate the need to cut additional wood at the jobsite, further reducing waste. Oriented strand board (OSB) is another engineered product that does not require large trees for its manufacture. OSB also enhances durability and is used to sheathe subfloors, exterior walls and roofs, according to Sleeme. Use of increased R-value and sprayed cellulose insulation is a cost-effective way to save energy and help reduce costly heating and cooling bills, which account for at least half of all energy used in a home.

Sleeme will be one of the first builders in the country to earn the National Association of Home Builders Certified Green Professional (CGP) designation. The designation recognizes builders, remodelers and other industry professionals who incorporate green building principles into their homes without driving up the cost of construction.

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#### RESOURCES FOR MORE INFO

Your local rural electric cooperative publishes its own list of energy-saving tips. For access to your member cooperative and ideas for saving energy and protecting the environment, visit the Virginia, Maryland & Delaware Association of Electric Cooperatives online at:

[www.vmdaec.com](http://www.vmdaec.com)

The Virginia Department of Mines, Minerals and Energy, whose mission is to enhance the development and conservation of energy and mineral resources in a safe and environmentally sound manner, offers *The Virginia Energy Savers Handbook* online at:

[www.dmme.virginia.gov](http://www.dmme.virginia.gov)

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy geared towards helping consumers save money and protect the environment through energy-efficient products and practices. ENERGY STAR's home-improvement guidelines are available online at:

[www.energystar.gov](http://www.energystar.gov) ■

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# A New Light on Virginia State Parks



Virginia's electric cooperatives bring a new light to our state parks in the name of energy efficiency.

Gov. Timothy M. Kaine has announced a donation by Virginia's electric cooperatives that can cut energy usage and save the Commonwealth money for years to come. The co-ops are donating 4,200 compact fluorescent lights (CFLs), allowing the state to replace all existing incandescent light bulbs in Virginia's 35 state parks.

"Replacing the old lighting in cabins, visitor centers and other structures throughout the park system will be a major step in helping achieve our administration's goal of reducing energy consumption and greenhouse gas emissions outlined in our Renew Virginia initiative," says Gov. Kaine. "I applaud Virginia's electric cooperatives and their nearly half-million consumer-members throughout the state for making this possible."

The Virginia, Maryland & Delaware Association of Electric Cooperatives (VMDAEC) and power supplier Old Dominion Electric Cooperative (ODEC) donated the 4,200 bulbs, valued at \$18,000.

According to estimates from General Electric, manufacturer of the donated bulbs, replacing the old lights with CFLs could reduce overall energy consumption from more than 320 kilowatts per year to less than 80, saving state parks more than \$56,000 annually, based on current usage data. They would also reduce carbon dioxide or "greenhouse gas" emissions by more than one-million pounds per year.

"This is the equivalent of removing 94 cars per year from Virginia roads or adding 134 acres of forested land," says Virginia Secretary of Natural Resources L. Preston Bryant Jr.

At the cooperatives' request, the Virginia Department of Conservation and Recreation provided a list of the number and types of electric bulbs required throughout the Virginia State Park sys-

tem. These included an assortment of standard 40-, 60- and 100-watt incandescent bulbs, 60-watt bug lamps, 120-watt spot lamps and other specialty bulbs. Each of these will be replaced by an equivalent energy-efficient CFL fixture. For example, 100-watt incandescent bulbs will be replaced with CFLs that use just 26 watts to provide the same amount of light.

"If every Virginia family replaced just one incandescent bulb in their home with a CFL, the energy savings would be significant," notes Jack Reasor, president and CEO of VMDAEC and ODEC. "It is the hope of Virginia's not-for-profit electric cooperatives and our consumer-members that by demonstrating the dramatic energy savings that can be achieved by installing CFL fixtures at our state parks, we can encourage all of our fellow citizens to do the same."

Reasor said that many of Virginia's state parks are located in rural areas of the Commonwealth where Virginia's 13 electric distribution cooperatives are the primary energy providers. "This is why we felt it was a natural fit for our cooperatives to give back to our communities and continue our program of reminding all Virginians to be more energy efficient."

The donation was made possible through the auspices of the state's 13 local not-for-profit electric cooperatives plus cooperative power supplier Old Dominion Electric Cooperative, which provides electricity to nine of these cooperatives.

Virginia's electric cooperatives are A&N Electric Cooperative, Tasley; BARC Electric Cooperative, Millboro; Central Virginia Electric Cooperative, Arrington; Community Electric Cooperative, Windsor; Craig-Boyetourt Electric Cooperative, New Castle; Mecklenburg Electric Cooperative, Chase City; Northern Neck Electric Cooperative, Warsaw; Northern Virginia Electric Cooperative (NOVEC), Manassas; Powell Valley Electric Cooperative, Jonesville; Prince George Electric Cooperative, Waverly; Rappahannock Electric Cooperative, Fredericksburg; Shenandoah Valley Electric Cooperative, Mt. Crawford; and Southside Electric Cooperative, Crewe. ■



CENTER: Pocahontas State Park Ranger Perry DeMay and Virginia Secretary of Natural Resources L. Preston Bryant Jr. demonstrate the power of working together for positive change.



# Energy Efficiency:

Honor the Old, Embrace the New



by Jody Horton, Contributing Writer • Illustrations by Gil Adams

Some home improvement investments — the ones that reduce your utility bills — are more important than ever. It's pretty clear to see that the age of excess is over. We are all on our way to becoming smart energy users — if not outright misers. Our aim here is to provide a brief overview of projects, designs and products for increasing home efficiency and comfort. We'll look at old and new ideas, as well as some emerging technologies that we hope to see on the market in the near future.

continued on pg. 17

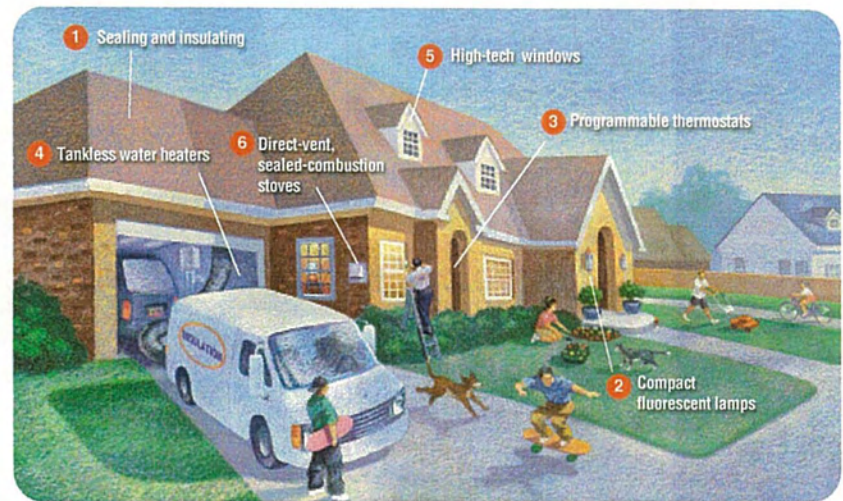
## Some Things Old



Your grandparents and great-grandparents knew what they were doing. The design and orientation of their homes was crucial in creating a comfortable living space before the advent of centralized heating and cooling. Thanks to the current trend in green building, attention has again been placed on these time-tested methods. Homes designed around the conditions in which they are built not only use less energy, but also are more comfortable. Consider some basic principles of design and orientation from the following examples:

- 1 Homes designed for warmer regions emphasize shading and passive ventilation. They are long and narrow, minimizing exposures from the east and west where the sun is most direct. Homes designed for colder regions (not shown) work to passively collect and preserve heat. They are traditionally more compact in shape to minimize exterior surface area, retain heat and reduce overall heating needs. Windows are minimal on these sides for the same reason.
- 2 Porches and deep roof overhangs offer protection against the harsh summer sun.
- 3 Awnings shade windows and walls in warm climates. To passively capture heat in cold climates, windows are placed on the south side of the house and aren't shaded by awnings or overhangs.
- 4 Deciduous trees shade the east and west walls in warm climates. In winter, when trees lose their leaves, houses benefit from the sun's warmth. In cold climates, evergreen trees are planted as a windbreak on the north/northwest side.
- 5 Higher ceilings allow heat to rise above occupants in warm climates. In cold climates, ceilings are lower to keep heat where it is needed.
- 6 Light exterior colors reflect the sun's heat. Dark exterior colors absorb the sun's heat.

## Some Things New



- 1 Sealing and insulating are not exactly new, but they remain the most important step in improving a home's efficiency. Use weatherstripping around windows and doors and caulks and spray foams around window frames, pipes, fixtures and other gaps. Attic floor insulation is typically the most cost-effective investment whether you do it yourself or hire someone to do it for you. Don't forget to seal and insulate ductwork as well. For the benefit of your health, consider using sealants that are low in volatile organic compounds (VOCs) and a form of formaldehyde-free insulation. VOCs are emitted as gases from certain solids or liquids and include a variety of chemicals, some of which may have short- and long-term adverse health effects.
- 2 Compact fluorescent lamps (CFLs) are profoundly more efficient than traditional incandescent lightbulbs, which waste up to 90 percent of the electricity they consume in creating heat. An estimated \$25 to \$45 can be saved per CFL over its lifetime. The newest generation of CFLs is finally coming of age and even includes dimmable bulbs. Stick with 2700K (Kelvin) lights — Kelvin, a unit increment of temperature, measures the color temperature of light sources — for interiors to best match the warmth of incandescent bulbs.
- 3 Programmable thermostats offer one of the easiest and most affordable ways to save energy at home. They can save almost \$200 per year by reducing household heating and cooling at times when it's not needed.
- 4 Tankless water heaters save energy by operating only when hot water is needed. They have the added benefit of taking up much less space, allowing homeowners to partly reclaim closets taken up by bulky, traditional tanks. A low-cost alternative is to add a tank "blanket" to existing water tanks so they will lose less heat.
- 5 High-tech double- and triple-pane windows with low-emissivity (low-E) coatings — virtually invisible layers of metal or metallic oxide that reduce the amount of heat that passes through the glass — are vastly more efficient than single-pane windows.
- 6 Advanced direct-vent, sealed-combustion stoves have revolutionized fireplaces in homes. Unlike conventional fireplaces, which can actually lose more energy than they generate by drawing interior air up the chimney, this new breed of stoves reaches about 90 percent efficiency. Since the stoves are vented directly to the outside through a hole in an exterior wall, there is no need to construct a chimney or run a freestanding flue above the roofline. These stoves are available as inserts for existing fireplaces and can be fueled by gas, wood or pellets.



## Some Things Future



**1** Advanced metering devices — Many co-ops currently use digital metering to record electricity use and locate problems on lines. Some meters have two-way communication. In the future, such electronic communication tools will be more sophisticated so customers can determine when they use the most electricity and where they might reduce consumption. Time-of-day metering or rebates will probably be in effect to discourage electricity use during peak hours. Appliances will be programmable for use in non-peak hours.

**2** Light-Emitting Diodes (LEDs) — Home applications of LEDs now are found mainly in flashlights and task lights. With a lifespan of approximately 60,000 hours — as compared to CFLs' 10,000 hours and incandescent bulbs' 1,500 hours — LEDs are a product with a great future. The market is waiting for costs to decrease.

**3** Thin-film solar photovoltaics (PVs), like conventional PVs, convert sunlight into electricity. They improve on conventional PVs by being lightweight, flexible and, most importantly, far cheaper to produce. Expect to see a variety of home-related products from several manufacturers in the next two to three years. Many believe that the greatest advancements in future solar technology will involve the use of quantum dots — tiny semiconductors that use the unique light-harvesting properties of nano-sized crystals. The science is complicated, but the result is a theoretical doubling in efficiency (estimations are as high as 65 percent) for quantum-dot solar cells — as compared to today's most efficient cells. Preliminary experiments suggest that quantum dot cells could be produced with relatively low material costs.

**4** Smart windows work a lot like those funny eyeglasses that tint in the sun

and then change back to clear indoors. In the case of electrochromic windows — electronically tintable glass that can be switched from clear to darkly tinted, and vice versa — the glass responds to an electrical current that can be controlled by a switch, light sensors, thermostats or even a motion sensor. New designs — including ones that use integrated solar cells to produce power — promise greater efficiency. Thermo reflective windows are activated only by heat, and, according to the manufacturer, they are superior in stopping heat from entering a building. Because they respond only to heat, the windows let in more heat (and light) in cold weather and block it in warm weather. The manufacturer uses a similar approach toward managing heat with an advanced thermo reflective wall or cladding technology that can be "programmed" at the time of manufacture to reflect heat at a specific temperature.

Some investments pay off better than others. The first step in deciding what's feasible for your home is to get an energy audit or learn to perform an audit yourself. We'll say it again: Get an energy audit. Many cooperatives do energy audits or will guide you to other professionals who do them. Audits vary in scope, but their primary intent is to identify your problems and come up with solutions.

Often, some of the greatest savings involve relatively low-cost repairs. This especially is the case with older homes. For expenditures of \$2,000 or less on weatherization, some households can save more than \$1,000 annually on electricity costs, experts say.

Before beginning weatherization or any other improvement project, check with your co-op, local conservation officials and state energy office. They can provide advice on local contractors and suppliers and information on incentives and rebates available in your area. ■

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Virginia, Maryland & Delaware Association of Electric Cooperatives





Project	Requirements	Incentive	Fine Print
Exterior windows & doors, skylights	Meets International Energy Conservation Code (IECC) or ENERGY STAR-qualified product. U factor (heat loss) $\leq$ 0.30 SHGC (block solar heat) $\leq$ 0.30	Tax credit equal to 30% of cost, up to \$1,500 for all improvements combined.	Installation costs not included. Does not apply to new home construction. Not all ENERGY STAR models qualify.
Storm windows & doors	In combination with approved wood door or window	Tax credit equal to 30% of cost, up to \$1,500 for all improvements combined.	Installation costs not included. Does not apply to new home construction.
Metal roofs, asphalt roofs	ENERGY STAR-qualified roof expected to last 5 years or have a 2-year warranty.	Tax credit equal to 30% of cost, up to \$1,500 for all improvements combined.	Installation costs not included. Does not apply to new home construction.
Insulation	Primary purpose must be to insulate. Must be expected to last 5 years or have a 2-year warranty.	Tax credit equal to 30% of cost, up to \$1,500 for all improvements combined.	Installation costs not included. Does not apply to new home construction.
Central A/C	Split Systems: Energy Efficiency Ratio (EER) $\geq$ 13 Seasonal Energy Efficiency Ratio (SEER) $\geq$ 16 Package Systems: EER $\geq$ 12 SEER $\geq$ 14	Tax credit equal to 30% of cost, up to \$1,500 for all improvements combined.	Does not apply to new home construction. Not all ENERGY STAR models qualify.
Air source heat pumps	Split Systems: HSPF $\geq$ 8.5 EER $\geq$ 12.5 SEER $\geq$ 15 Package Systems: HSPF $\geq$ 8 EER $\geq$ 12 SEER $\geq$ 14	Tax credit equal to 30% of cost, up to \$1,500 for all improvements combined.	Does not apply to new home construction. Not all ENERGY STAR models qualify.
Geothermal heat pump	All ENERGY STAR geothermal heat pumps will qualify.	Federal tax credit equal to 30% of cost. Not subject to \$1,500 cap.	Place in service by Dec. 31, 2016. OK for second homes.
Water heater (electric heat pump)	Energy factor $\geq$ 2.0.	Tax credit equal to 30% of cost, up to \$1,500 for all improvements combined.	Does not apply to new home construction.
Water heater (solar)	At least half of the energy generated by the solar water heater must come from the sun. Water must be used in dwelling. Must be certified by the Solar Rating Certification Corporation (SRCC).	Federal tax credit equal to 30% of cost. Not subject to \$1,500 cap.	Place in service by Dec. 31, 2016. Federal credit does not apply to swimming pools or hot-tub heaters.
Biomass stoves	Uses any plant-derived renewable fuel (wood, farm products, etc.) to heat home or water. Thermal efficiency rating $\geq$ 75%.	Tax credit equal to 30% of cost, up to \$1,500 for all improvements combined.	
Photovoltaic (solar electric) systems	Must provide electricity for the residence and meet fire and electrical code requirements.	Federal tax credit equal to 30% of cost. Not subject to \$1,500 cap.	

## COVER SERIES

# Go Green, Save Green

## With these Federal Energy-Related Tax Incentives

Investing in renewable energy and energy-efficient home improvement projects may help stimulate our economy and earn you some energy-related tax breaks. The 2009 Recovery and Reinvestment Act signed in February extended and added to many of the incentives existing before. These incentives go into effect this year.

A tax credit is generally more valuable than an equivalent tax deduction because a credit lowers your taxes dollar-for-dollar, while a deduction lowers your taxable income.

The table at left reflects a summary of available federal tax credits for energy-efficiency projects or purchases. For more detailed information on federal energy-related tax incentives, visit [www.energystar.gov](http://www.energystar.gov).

### A FEW GUIDELINES:

- Unless otherwise noted, the tax credit includes cost of equipment and original installation costs.
- Must be for taxpayer's principal residence.
- Maximum for 2009 and 2010 for all improvements combined is \$1,500 (except geothermal heat pumps, solar water heaters, solar panels, fuel cells and wind power systems, see table).

*continued on pg. 20*



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COVER SERIES continued from pg. 18

- For tax purposes, the Manufacturer's Certification Statement and receipt are generally required. For Energy Star products, save the label.
- New home construction cannot claim credits for windows, doors, insulation, roofs, HVAC (except geothermal), non-solar water heaters.
- Verify all tax-related information with a tax advisor.

**Do you qualify for the Federal Weatherization Assistance Program?**

The U.S. Department of Energy (DOE) says weatherization — the process of sealing air leaks and properly insulating a home — can produce an average energy savings of \$358 per year. Most people would like to save energy dollars by making their home more efficient, but not everyone can afford the improvements.

As a result of the federal stimulus package, DOE's Weatherization Assistance Program is expanding with a goal of weatherizing 1 million low-income homes per year. Households with incomes at or below 200 percent of the national poverty level are eligible. For a family of four, that's an income limit of \$44,100.

Each house has different needs; the stimulus bill allows an average of \$6,500 to be spent on each home. Program participants receive professional energy consultation that analyzes energy bills, a blower-door test to locate air leaks and advice on how to be more efficient. Workers then arrive to make energy upgrades like insulating walls and roofs, sealing air leaks, and installing more efficient heating and cooling systems. For details, visit [www.eere.energy.gov/weatherization](http://www.eere.energy.gov/weatherization).

Information is also available from the Virginia Department of Housing and Community Development. Visit [www.vhcd.virginia.gov](http://www.vhcd.virginia.gov), or call Nancy Palmer at (804) 371-7000. ■

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PHOTOS BY INSULSURE

## ENERGY \$\$\$ GOING THROUGH THE ROOF?

*Insulating your attic door can significantly reduce home heat loss in winter and heat gain in summer.*

**Q.** *I just stored some items up in the attic. I realize there is no insulation on the access door in ceiling, nor did it seal well. Is there much energy lost through there and what can I do about it? — Dan W.*

**A.** People seldom think about it, but the attic access opening can account for a significant loss of heat from your home during winter.

This loss is a combination of heat-flow through the uninsulated cover and warm-air leakage where it rests on the molding. The attic-access opening is usually located in a hallway or closet, so air leakage into and out of it is not readily noticeable.

During summer, heat from the roof radiates down into your home through the uninsulated access cover. With adequate attic ventilation, during the summer, a slightly negative pressure exists inside the attic area. If you air-condition, a leaky access cover draws cool air from your house and forces your air conditioner to run longer. If you do not air-condition, the air leakage actually can help to ventilate your home naturally by effectively creating a solar chimney.

When I moved into my home, the attic cover was just a 20- by 22-inch piece of thin plywood resting on uneven wood molding around the access opening. To correct this gap, I first stuck thick adhesive-backed closed-cell foam weatherstripping on the top of the molding. I cut each of the four lengths slightly longer than each side of the molding because it may shrink over time. Also, it may have been stretched somewhat when it was pulled off the roll.

Next, I nailed a layer of old drywall over the plywood to give it enough weight so the cover would compress the weatherstripping for a tighter seal. Drywall is better to use than just a piece of lumber because the drywall creates a fire-resistant barrier in case a fire would start in the attic. House fires from a creosote-filled chimney can often start in the attic where the chimney passes through it.

I glued several layers of rigid foam insulation on top of the drywall to provide an insulation level as high as the rest of the attic floor. Finally, I covered the rigid foam insulation with a layer of aluminum foil. The foil helps block the radiant-heat transfer from the hot roof during summer so less heat gets through to my bedroom.

The above method works well for a small access opening, but not necessarily for a large one. It may be dangerous trying to lift a large,

heavy cover while you are standing on top of a ladder. For this, or if you have a standard large access opening with pull-down folding stairs or a ladder, install a deep cover that fits over the stairs and still seals against the floor. The bottom cover of typical folding stairs may not seal well against the ceiling, nor does it provide much insulation value.

There are several products designed specifically for large access openings or ones with folding stairs. For any of these, install plywood on the attic floor around the opening. This provides a flat surface so a cover seals well and a safe place to step when you enter the attic.

Battic Door offers a reasonably priced, simple design that is basically a very strong cardboard box sized to fit over the opening and the stairs. You attach your own fiberglass batt insulation to the top and sides of the box. The box is delivered collapsed to your home. It is simple to open it and to glue or staple the insulation over the outside surface.

Another option is an insulated, zippered-opening cover by Insulsure. This cover is flexible and is attached to plywood on the attic floor around the opening for a good seal. To enter the attic, use a stepladder or pull down folding stairs, climb up, unzip the top of the

cover, and fold it back. The cover is made of a flexible material filled with one-half inch of microfiber urethane insulation for R-3.2 insulation value. There is an optional reflective foil top to block the radiant heat from the hot roof during summer.

The third option, by Atticap, is a domed molded-foam cover made of expanded polystyrene (similar to a foam cooler), designed to fit over the stairs and opening. It is 60-by-30 by nine inches high and weighs only about eight pounds, yet has an insulation value of R-12. You can easily lift and move it to the side when you enter the attic.

The following companies offer attic-entrance products:

Atticap, (888) 292-2229  
www.draftcap.com

Battic Door, (508) 320-9082  
www.batticdoor.com

InsulSure, (877) 660-5640  
www.insulsure.com. ■

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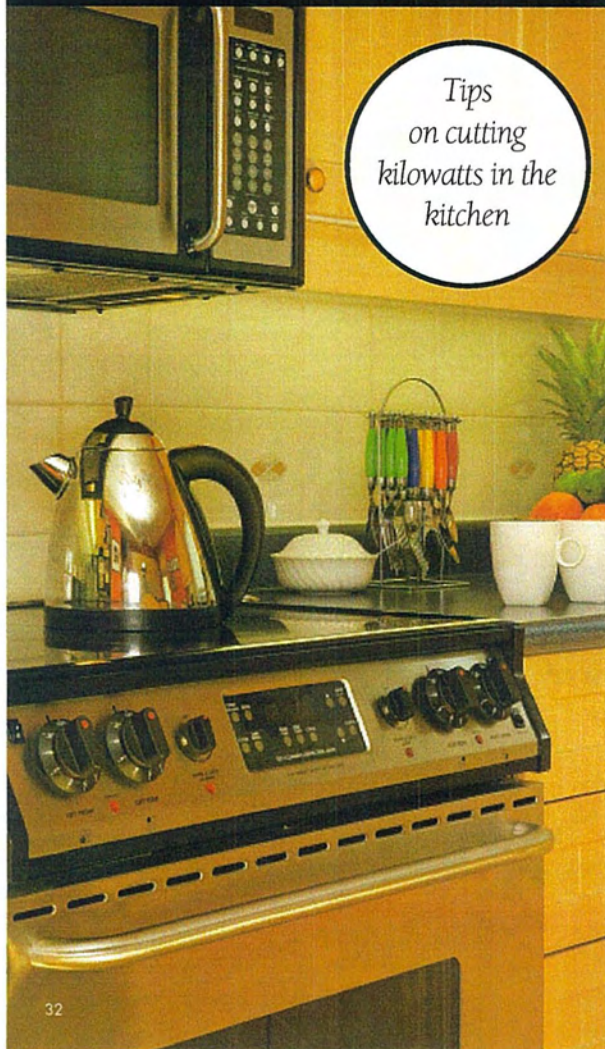


WISE ENERGY USE

# The ENERGY-EFFICIENT CHEF

by James Dulley, Contributing Columnist

Tips on cutting kilowatts in the kitchen



**Q.** Is it more energy efficient to use small kitchen appliances instead of an electric range? How do I determine how much it costs to use kitchen appliances? — Richard W.

**A.** Large electric cooking appliances in the kitchen can consume a lot of electricity. The electric range, oven, refrigerator, and dishwasher are the primary electricity consumers in most kitchens. New refrigerators have become much more energy efficient over the past decade, which is important because the refrigerator is the only one of these major appliances that you have little choice but to use continuously.

By using the other kitchen energy-guzzlers efficiently and doing smaller jobs with smaller appliances, you can help keep electric bills in check.

### SOME SIMPLE CALCULATIONS

It is fairly simple to determine how much an electric appliance costs to use, but you'll need a calculator. The nameplate on each appliance lists the wattage or amperage it consumes. If wattage is listed, multiply that number by the amount of time the appliance is used (in hours per use, per week, or per month), and then divide this by 1,000. This gives you the kilowatt-hours used. Multiply this number by the electric rate listed on your bill (in dollars per kilowatt-hour) and you'll see how much the appliance costs to operate. If the nameplate lists amperage, multiply it by 120 to get watts and start your calculations.

Keep in mind that this calculation is an estimate, because many cooking appliances are thermostatically controlled — meaning on low setting, the heating elements are off most of the time. On high, they may be on all the time. Use your best judgment to estimate how long they are on for personal cooking settings.

Large quantities of food are usually most efficiently cooked on the range or in the oven. Most newer self-cleaning ovens have heavy wall insulation so they bake and roast fairly efficiently. A good rule of thumb is to use the smallest cooking appliance possible for the amount of food. If you're just cooking servings for two, a countertop oven is ideal. If you plan on preparing multiple servings, choose the large range oven.

Another consideration when selecting your cooking appliance is how many consecutive items you have to cook. If you are going to bake a cake, roast some meat and then bake some potatoes, using the large range oven is best. The mass of the oven will hold heat from cooking one food item to the next. This eliminates the preheat cycle and provides more even cooking. Using a high-quality, well-insulated slow cooker can also be an energy saver. For

fast cooking, a pressure cooker dramatically reduces cooking time.

Small countertop convection ovens are efficient. Convection ovens have a small fan to circulate the heated air around food to cook it faster. Reducing cooking time reduces the total kilowatt-hours consumed and the heat generated in your kitchen. Some foods cook better without the convection air, but they will take longer. Of course, using a microwave oven saves electricity because the cooking times for small quantities are very short.

Using countertop kitchen appliances can often result in less electricity use overall, but not always. Many factors, including the time of the year and your HVAC (heating, ventilation, air-conditioning) system determine this overall electricity use.

For example, if you air-condition your house and use the kitchen range during the summer, the heat from cooking makes the air conditioner run longer — the cost of cooking is effectively increased. The moisture given off from cooking also increases the air-conditioning load. If you do not air-condition, the cost of cooking is just the electricity the appliance uses. Whenever possible, use countertop cooking appliances outdoors, or use a solar cooker for rice and steaming vegetables.

Things are reversed during the winter. All of the electricity used for cooking ends up heating your house and reducing the heating load on your heat pump or furnace. Cooking is basically similar to resistance heating, so you get one Btu of heat into your house for each Btu you pay for on your monthly utility bill.

If you have a standard electric furnace or base-board heating, the heat from cooking costs the same, making the added heat a cost-effective advantage. But if you use a heat pump for heating your house, you may be getting up to three Btu of heat for each one you pay for. The heat you gain from cooking costs you more than that from your heat pump, so it is not as advantageous.

### TAKE TIME TO PULL THE PLUG

As for other household electric appliances, especially those that produce heat (like a hairdryer), use them as little as possible. Be sure to unplug chargers for cell phones and other small gadgets that draw power when they are not in use. Power strips and surge protectors can shut off power to televisions, computers, and peripheral equipment at the flick of one switch; Monster Cable offers a new outlet strip that senses when the television or computer is switched off and automatically switches off power to all the peripheral equipment.

Keep these pointers in mind when in the kitchen (and beyond); you'll keep your food hot, your guests happy, and your electric bill lower. ■

Send questions to James Dulley, *Cooperative Living* inquiry, 6906 Royalgreen Dr., Cincinnati, OH 45244 or visit [www.dulley.com](http://www.dulley.com).

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## WISE ENERGY USE

# Save Energy & Effort on LIGHT DUTY

by James Dulley, Contributing Columnist

Central lighting control systems allow you to program special light levels for reading or watching movies.

Many central lighting systems can be operated via remote control.

**Q.** My electric bills are high, and I think some type of central lighting control might help me use fewer lights. Would this save electricity or cost more to operate the controls? — Andre F.

**A.** Lighting can account for a substantial portion of your monthly electric bill, not to mention the cost to periodically replace lightbulbs and the cost of the fixtures. In many homes, the lighting wattage consumed in the kitchen exceeds the electricity used by a microwave oven. There's also a secondary energy cost to lighting. Nearly all of the electricity used by incandescent lightbulbs ends up as heat in a room. Having several lightbulbs on can be equivalent to running an electric space heater on a low setting. During summer, this extra heat in your house makes the air conditioner run longer. During winter, the heat from lights helps heat your house, but at a much less-efficient rate than a heat pump.

No doubt you've heard about compact fluorescent lightbulbs (CFLs). By replacing incandescent light bulbs with CFLs, your lighting produces 75 percent less heat, uses less than one-third of the energy, and lasts eight to 10 times longer.

As you mentioned, Andre, central lighting controls are another efficient way to reduce lighting costs. The potential energy savings from installing even a simple central lighting control system are more than most people realize. Just count the lights in a typical home. If a lighting control system allows you to conveniently switch lights on only when needed, your total lighting use reduces greatly. Most lighting control units use very little electricity themselves.

In addition to energy savings, the safety and security of your home improves with a central light control system. For example, a system allows you to switch on exterior and interior lights from your car as you pull into your driveway. Variable timers switching lights on and off while you're away at night can make a would-be thief think someone's home.

Some lighting control systems allow you to select which indoor lights turn on when you walk inside a dark house at night. With this feature, there's no need to keep several interior lights on when you leave home during the day and don't plan to return until evening. Keeping interior lights on for hours while you're gone doesn't avoid break-ins anyway. Anyone noticing the same lights on for hours will realize the house is empty.

Central lighting systems also group various lights and brightness settings, a great and efficient convenience. Most systems include light-dimming features for lamps. For example, for reading in the evening, program a "reading" button to provide brightness where you are sitting, dimming the lights elsewhere — an ideal feature for second-floor bedroom areas. If you plan to watch movies in a room, program a "movie" button. This turns off and dims other lights for the best view of your television.

Built-in timer controls allow you to program the timing of lighting changes, or you can make changes manually. For example, you may want to have the lights slowly brighten in the morning at a certain time instead of being awakened by a loud alarm. Some experts claim this method of waking minimizes SAD (seasonal affective disorder) symptoms during winter.

### HOW DOES IT WORK?

So how does this all work? Many of the do-it-yourself central lighting controls use Z-Wave technology to communicate with individual lighting control modules throughout your house. The central control often runs on batteries. The lighting modules plug into standard wall outlets, with lamps and appliances plugging into the module. Z-Wave wall switch modules are available to replace standard wall switches.

If you use CFLs, make sure your lighting controls work with them. Some controls require standard incandescent bulb filaments to operate properly. For lights that are only on for short periods of time or need to be dimmed often, incandescent bulbs may work best.

Simple control options include IntelliSight by Lightolier, an occupancy sensor that switches on lights when it detects someone in a room. Easy to install, IntelliSight includes dimming features. Another option, the Intermatic InTouch Z-Wave system, makes setup easy as well.

The following companies offer efficient lighting controls:

Intermatic, (815) 675-7000,  
[www.intermatic.com](http://www.intermatic.com)  
Jasco Products, (800) 654-8483,  
[www.jascoproducts.com](http://www.jascoproducts.com)  
Lightolier, (214) 647-7880,  
[www.lolcontrols.com](http://www.lolcontrols.com)  
Lutron, (610) 282-3800,  
[www.lutron.com](http://www.lutron.com)  
Wayne-Dalton, (800) 827-3667,  
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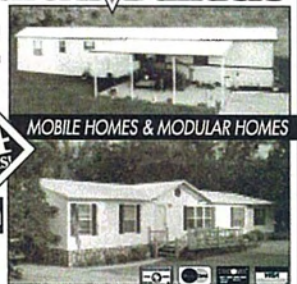
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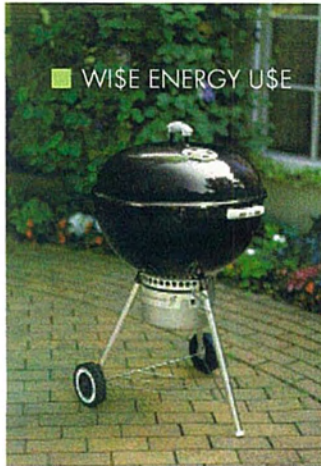
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## LOWER YOUR COSTS without LOSING YOUR COOL

Some simple measures to  
help cut cooling costs

by James Dulley, Contributing Columnist

**Q.** I want to try to use less energy this summer. I know I will have to air-condition less, but I like it comfortably cool in my house. What things can I do to make me feel cooler with less air-conditioning? — Linda L.

**A.** Using a central air conditioner or heat pump during summer can significantly increase your utility bills. In today's economic climate, most everyone is trying to reduce their housing budget in every way possible. Using less air-conditioning, especially during the hottest summer weekday afternoons, can save you money on electric bills while helping your electric cooperative reduce peak demand. This helps hold down future rate increases because less investment will be needed for additional electric generating plants.

It's not too difficult or uncomfortable to get by with much less summer air-conditioning or none at all. After all, up until just a couple of generations ago, residential air-conditioning did not even exist — and we have all survived. I recall when I was a child we had a window fan and a floor fan for a family of four. It got a little warm and we perspired, but we just accepted that in the summer, one perspires.

### FOUR GOOD METHODS

But summers don't have to be all about perspiration these days. There are four good methods to keep comfortable without air-conditioning: bringing in cooler outdoor air when possible; increasing the air velocity inside your house; minimizing the indoor humidity level; and blocking heat transmission into your house. Using all of these methods or a combination of a few can make a significant improvement. Once you become accustomed to the warmer ambient temperature, being in highly air-conditioned spaces will feel chilly.

Installing a whole-house fan accomplishes two of these methods. At night, it typically brings in cooler air and exhausts the hot air from your house. A large whole-house fan can also create quite a pleasant breeze throughout your house. A typical unit uses just a small fraction of the electricity a central air conditioner does.

By installing a solar chimney, the sun itself can be used to create a breeze throughout your house using no electricity. A solar chimney is a tall chimney with standard lumber. Two sides of it are covered with clear acrylic sheets and the inside is painted flat black.

An opening at the base of the solar chimney is ducted through your house wall. When the sun shines through the acrylic onto the black

interior, it gets hot and heats the air inside the chimney. Since hot air rises, it comes out the top and draws air in the bottom from inside your house to create a breeze indoors. To make it more effective, mount a turbine vent over the top outlet opening. A solar window heater with a summertime outdoor vent flap is another option.

Increasing the velocity of the indoor air can make a room feel 5 to 10 degrees cooler than still air at the same temperature. This is the theory behind using ceiling paddle fans. They use very little electricity and they can create a comforting effect — even though they actually make the room air slightly warmer.

### REVERSE CEILING FAN DIRECTION

During summer, set the ceiling fan blade rotation so it blows the air downward (turning counterclockwise as you look up) and run it on medium or high speed for the most comfort. During winter, reverse the blade rotation so the air blows upward (turning clockwise as you look up) and run it on low speed. This will gently move the warm air at the ceiling out to the walls and down. Since it is on low speed, it will not create a draft that could feel chilly during winter.

If you plan to rely on natural ventilation through windows to use no electricity, hopefully you have casement windows. When the sash projects out from the house, it tends to catch and direct the natural breezes into your house more than vertical or horizontal slider windows.

If you do have sliders, all is not lost. Fully open the windows on the downwind side of your house. There is usually a slight lower pressure on this side so some air will be drawn out. Open the windows just a bit less on the windward side. This creates a faster air flow in through these partially opened windows, making you more comfortable if you sit near them.

Need a few more quick tips for keeping things cool? Run your kitchen and bathroom vent fans whenever you are cooking or bathing to remove the moisture. Use the summer weather as an excuse to grill outside more often and reduce the cooking heat in your kitchen. Make sure the clothes dryer vent duct is not leaking and allowing hot, humid air to stay indoors or better yet, use a clothesline. Block heat from entering your windows and glass doors with curtains, awnings, and window film. Install reflective foil under the attic rafters to block radiant heat from a hot roof. And make sure you have adequate attic ventilation and that insulation is not blocking soffit vents.

By following some of these steps, you'll be saving money while keeping cool in no time. ■

Send questions to James Dulley, Cooperative Living Inquiry, 6906 Royalgreen Dr., Cincinnati, OH 45244 or visit [www.dulley.com](http://www.dulley.com).

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# An Energetic Agenda



JMU professor and energy management and policy expert Dr. Maria Papadakis (above) spreads the gospel of energy efficiency as part of a four-pronged approach to solving future energy challenges. Having saved thousands of dollars as the result of a lighting experiment conducted by Papadakis, Shenandoah Valley poultry farmer Chuck Horn (right) is a believer.

by Bill Sherrod, Editor



Imagine a future where you could plug your fully charged electric car into a receptacle to help supply the national grid.

Imagine a future where your appliances would know when not to run to avoid building a peak demand that would overtax the available supply of electricity.

Imagine a future where wind turbines and solar technology provide a heapin' helpin' of your daily energy consumption.

Imagine a future — to borrow a recent campaign concept — bathed in the warm, glowing balm of idealistic electric-energy change.

Foolish optimism? Not really. Change in the way we produce and use electrical energy is inevitable. It's as certain as the fact that demand for electric power will continue to increase.

Yes, on the way to that distant, beckoning destination of a changed world — as we perfect better ways to manufacture electricity and more efficient ways to use it — we'll continue to need increasing amounts of the crackly magic stuff. We will still get up in the morning, eat breakfast, take hot showers and go to do jobs where electricity is a necessity that we hardly think about until it's not there.

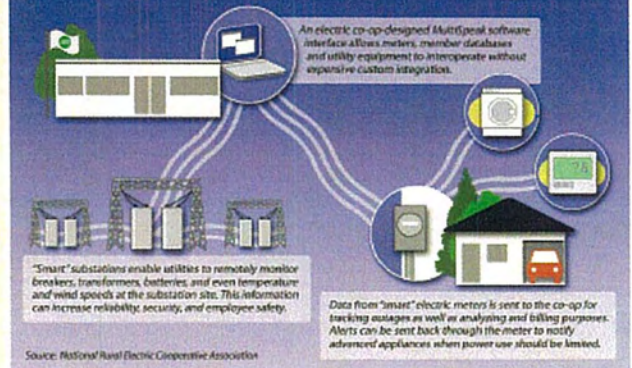
In recent months, influences ranging from the presidential campaign to looming rate increases have sharpened awareness of all things electric. Talk of energy efficiency, alternative fuels and carbon footprints has become part of the common lexicon. Virginia is blessed with a guru of sorts, an unassuming expert quietly conducting research and working toward solutions to tomorrow's energy challenges. This guru is Maria Papadakis, a James Madison University professor and specialist in energy management and policy.

## HOKIE CLASS SPARKS INTEREST IN ENERGY

Born in Virginia, Papadakis grew up in Indiana but returned to her native state to attend college at Virginia Tech. While a Hokie, she took an energy engineering course, and the die was cast. "That's where my interest began," she notes. After graduating from Tech, Papadakis earned a Ph.D. in political science at Indiana University. Her energy expertise evolved from more than 20 years of work in technology assessment. She settled in the Shenandoah Valley to teach at JMU 14 years ago.

## The Smart Grid

By enabling both new and existing electric grid components to communicate with each other, electric cooperatives can better monitor conditions, collect information, and remotely control devices over a distribution network. Often called the Smart Grid, this system can use various technologies, as shown here.



About a year and a half ago, Papadakis began conducting agricultural-energy research on the economics of energy-efficient, dimmable compact-fluorescent lamps (CFLs) in Shenandoah Valley poultry houses.

"We did a study on possible savings comparing dimmable CFLs and traditional bulbs," notes Papadakis. "The study showed considerable savings."

Since then, she has been working with the Shenandoah Resource Conservation and Development Council and the Dept. of Mines, Minerals and Energy to develop a farm energy-audit pilot program to identify future energy needs and energy-savings opportunities for the state's agriculture sector.

Energy-savings opportunities are central to what Papadakis sees as the course to our energy future. "The reality is that we consume an extraordinary amount of electricity. And every energy-supply choice has an environmental consequence."

According to Papadakis, a good energy strategy has four points, all equally important:

- Very good energy-efficiency and conservation programs for electricity end-users;
- The cleanest base-load power that we can get;
- The addition of new renewable-energy generating sources; and
- An improved electric power grid.

"The buzz these days is on the 'smart-grid' concept," says Papadakis. "This idea is tied to the nature of the electric power that comes into the grid, and how decentralized it is."

## THE SMART GRID

A smart grid would manage variable-power input coming from sources such as solar panels and wind-power generators. A smart grid would also accommodate demand-control for smart appliances, to reduce demand during peak power-use periods.

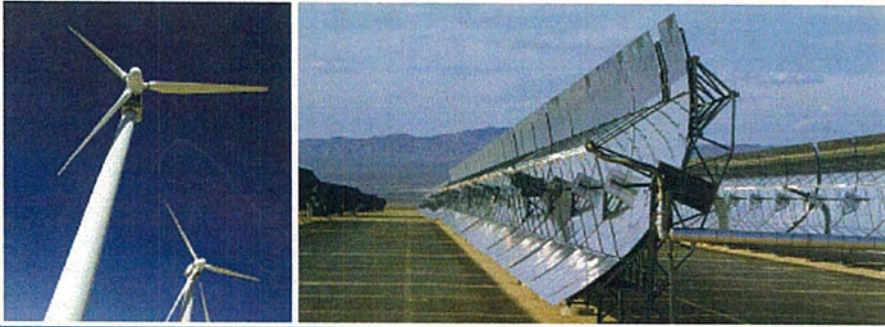
"The grid is a real-time system, meaning the amount of electricity coming onto the system is roughly the same as the amount going out," says Papadakis, "so we try to match power generation to the amount being used."

The amount being used is the big variable, one that utility forecasters can predict. What can't always be predicted are the unexpected peaks because of, for example, unseasonably hot days. The grid has to be able to meet these demand peaks.

Demand-control programs, such as the water-heater switches used by many electric cooperatives, are used to reduce peak demands. "A smart grid can enhance the utility's ability to do these types of demand control," Papadakis says.

One interesting smart-grid possibility would involve use of plug-in hybrid vehicles. "The mathematical modeling is being done now," notes Papadakis. In principal, the





Use of variable energy sources like wind and solar power as base load will require new technologies.

hybrids would be plugged into the grid for recharging at night, during the off-peak period. Potential vehicle-to-grid technology would allow such vehicles plugged in during the day to give some of their stored power back to the grid. Basically, the hybrid cars would act as a huge aggregate battery-storage system for the grid.

#### **BASE-LOAD GENERATION: THE POWER BEHIND THE POWER**

"Base load is power generation that is constant — it's running all the time, at full capacity, to ensure that the grid always has enough electricity to keep things going," says Papadakis. "The only time it's not at full capacity is when it's shut down for maintenance or repair." Because of its nature, base-load power must be the cheapest available. Historically, coal, nuclear and, where available, hydroelectric power have been the primary sources of base-load energy.

Base-load energy generators are not responsive to small changes in demand: "You typically can't turn a base-load generator on and off — it's not efficient," says Papadakis. "To supplement base-load, utilities have generators that can respond more quickly. These tend to be powered by natural gas, and when you turn them on, you get electricity in a hurry." These intermediate or peaking-power generators are typically up to 160-megawatt sources, while base-load generators are typically 800- to 1,500-megawatt sources of electricity.

"These sources of power — base load and intermediate — have very predictable and stable output," says Papadakis.

"The renewable sources are where things start to get complicated. Wind and solar power are intermittent and variable — not

continuous sources of energy. The electric grid doesn't 'like' a variable energy supply. It likes stable current," she adds. This is where development of a "smart grid" would help. We're headed in that direction, but patience is required.

"To most effectively use large amounts of variable energy, we need technology to help stabilize it. Right now, we don't have the technology to use wind and solar power as 'base load' or intermediate load. Large-scale battery storage is the focus of much research, as is renewable 'firming power,' such as solar and hydropower. A basic amount of electric power needs to be on all the time as a predictable and continuous supply — our grid cannot function without base load."

The Department of Energy estimates that in 20 years, 14 percent of our energy will come from renewable sources, meaning that 86 percent will still be from traditional types of generators.

"We'll still add gigawatts of base load from mostly coal and nuclear sources," she says. "Building base load takes a long time, five to 10 years for design, permitting and construction. So you have to plan today for what's projected as need 15 years from now. And the planning has to use technology that is available today. For those concerned with the environment, we need to think about slowing down the need for base load. This requires effective economic incentives and public policies that will promote that outcome."

It's critical for utilities to assess the cost-effectiveness of efficiency and conservation programs versus construction of new facilities, according to Papadakis.

Building smaller plants as opposed to one large base-load facility is another possi-

bility for future power supply, she adds. "Small-plant advantages are that you can get the plant closer to the load center, so you don't lose power shipping it long distances over transmission lines. And small plants can potentially produce electricity with less pollution; so there are economic gains as well as environmental advantages."

New coal-fired base-load plants use the latest environmental-protection technology and are more efficient and cleaner compared to those of 20 or 30 years ago, Papadakis adds. "And there's a lot of renewed interest in nuclear power as a source for base-load energy," she notes.

Other fuels available for base-load generation on a limited basis range from biomass to landfill methane.

"A utility has to consider its customers' needs a decade or more into the future," says Papadakis. "And construction costs are a very sensitive component of these models."

In the final analysis, a sound plan for ensuring an adequate supply of electric power will involve a variety of approaches which, when condensed, define the essence of Papadakis' four-point strategy.

"There's simply no 'magic bullet' to solve our energy challenges for the future," she concludes.

For more information, see the following online resources:

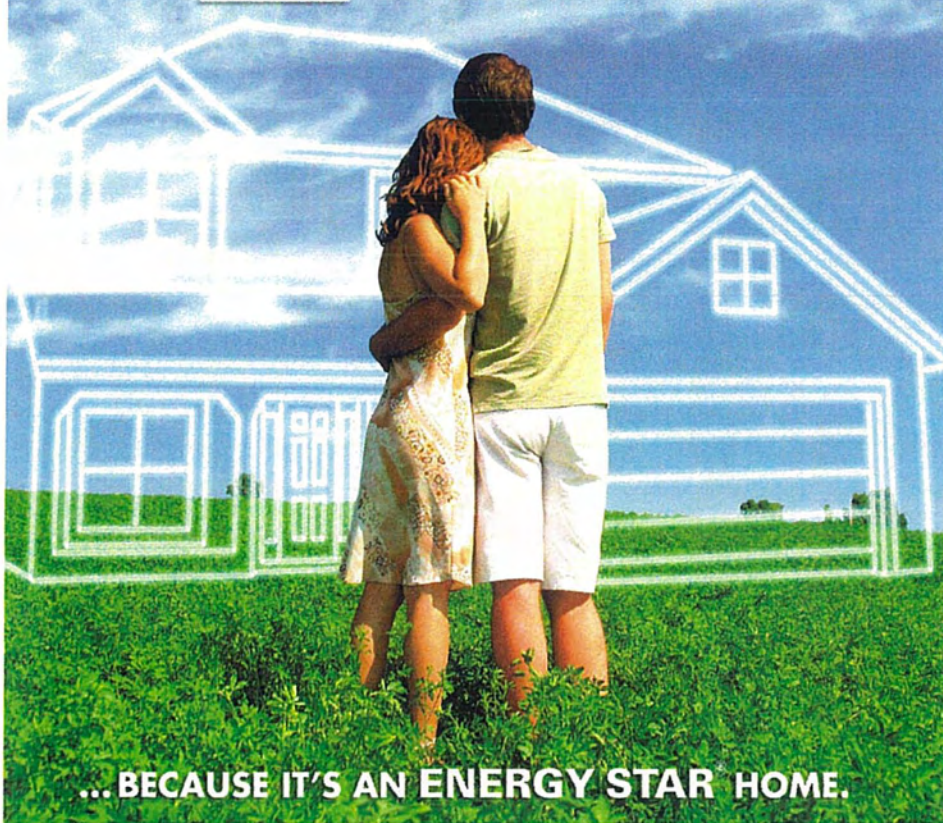
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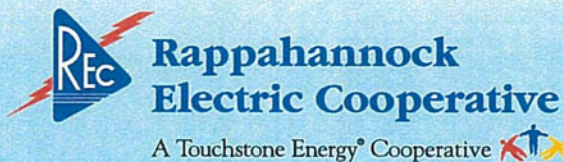
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## **SAVINGENERGY**

*Controlling your energy dollar*





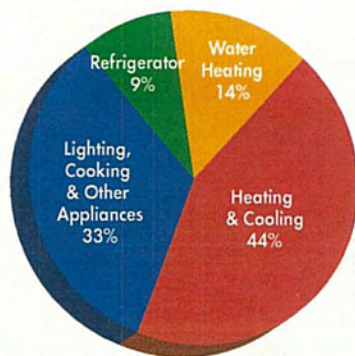


## Low-cost and no-cost ways to save

1. Set your thermostat comfortably low (68° F) in the winter and comfortably high in the summer (78° F). Install a digital thermostat that will give you better control and accuracy of the temperature in your home.
2. Use compact fluorescent light bulbs
3. Air dry dishes instead of using dishwasher's drying cycle
4. Turn off your computer and monitor when not in use
5. Plug home electronics, such as TVs and DVD players, into power strips; turn the power strips off when the equipment is not in use (TVs and DVD players in standby mode still use several watts of power)
6. Lower the thermostat on your water heater to 120° F
7. Take short showers instead of baths
8. Wash only full loads of dishes and clothes
9. Caulk around windows and doors to seal cracks
10. Replace air filters regularly

## How we use energy in our homes\*

The largest portion of a utility bill for a typical house is for heating and cooling.



\*Based on national averages

## Savings by room

Lifestyle makes a difference. You have complete control over how you use your electricity by choosing the ingredients that are necessary for you to maintain your standard of living. Let's take a look around the house for a few energy-saving tips.

### The Attic

- Proper attic ventilation is necessary for both the heating and cooling efficiency of your home. Consider installing an attic fan to lower the attic temperature.
- Close foundation/crawl space vents in the winter and open them in the summer.
- Visually inspect your duct system in the crawl space or attic of your home to see if air is escaping. Repair air leaks with quality UL metal tape or mastic sealant.

### The Bathroom

- Take shorter showers and install water-saving shower heads.
- Turn off faucets tightly and fix leaky faucets promptly. A leak of one drop per second wastes more than 250 gallons of water a month, and the energy used to heat it.

### The Den

- Keep your fireplace damper closed when there's no fire in the fireplace. If you have glass fireplace doors, keep them closed as well.
- Turn off television sets, stereos and other electric appliances whenever you're not using them.

### The Kitchen

- Use stove exhaust fans that vent to the outdoors as little as possible during the winter to limit sending heated air outdoors.
- Keep your refrigerator and freezer stocked. Both operate at peak efficiency when they are full.

- Run your garbage disposal with cold water.
- Cook in oven-safe glass or ceramic pans when you can. They allow you to set your oven temperature 25 degrees lower than the recipe calls for.
- Keep external refrigerator and freezer coils free from dust and lint. A clean refrigerator coil doesn't have to work as hard.

### The Laundry Room

- Use warm or cold water settings on the washing machine. Limit hot water use to heavily soiled clothes. Each load of laundry washed in cold water saves enough energy to power a television for up to 34 hours.
- Wash and dry full loads of laundry. It costs an average of \$.18 to wash a load of laundry. For a family of four, this cost could add up to nearly \$45.50 a month.
- Keep lint filters and vent hoses clean.

### The Living Room

- Move furniture away from heating and cooling registers or radiators. Blocking or restricting airflow makes heating and air conditioning systems work harder.
- Choose light-colored, translucent lampshades. Many lampshades, while decorative, can actually reduce light or send it somewhere you don't need it.

## Don't forget the outside of your home

- Turn off any outdoor lights that are not needed for security.
- Eliminate outdoor circulation pumps for ponds.
- Evergreens are effective for blocking wind. Plant them in a staggered or double line to the northwest of your home. The U.S. Bureau of Statistics reports that a line of evergreens can reduce heat loss and winter fuel bills by up to 20%.



## The important filter

The filter is the most important item for which the home owner is responsible. This is also the most neglected item and is the cause of many high energy bills. Your filter collects dust particles that otherwise would clog your indoor coil. When your filter is not cleaned or changed periodically, you run the risk of substantially increasing energy consumption, reducing comfort and causing equipment damage.

You should clean or replace your filter every month. The filter is located in the indoor unit or the return air grille. If you cannot find your filter, call a heating contractor, manufacturer of the unit or REC for assistance.

## Proper air flow

Air that has been heated or cooled is distributed throughout your house by the duct system. Conditioned air is distributed through registers located in each room. Proper air flow is critical for efficient heat pump operation: do not close off more than two registers in your home and do not block a register's air flow or deflect its direction.

Proper air flow is also important for the outdoor unit. Keep grass, shrubbery, leaves and dust away from the unit for unobstructed air flow.

## Winter power outages

If you experience a power outage lasting longer than 30 minutes in the winter, switch your thermostat to emergency heat. When power is restored, allow the heat pump to heat your house for about one hour in the emergency setting. This will allow the compressor heater to warm up any refrigerant that may be in the compressor.

After an hour has passed, you may switch your thermostat back to normal heating. (On many newer heat pumps, this procedure is not required; ask a heating contractor to be sure you know what steps, if any, are required for your unit.)

## When to call a technician

Other than changing the filter, maintenance must be performed by a qualified technician. Call a heating contractor when you experience one of the following problems:

- Unusual sounds or noise
- Thermostat indicator light always lit
- Unit constantly operating in mild weather
- Outdoor unit continually iced over
- No air flow out of registers

Your heat pump is like any machine: you must know how to operate it correctly to maximize its performance. Now that you know how best to operate your heat pump, you will be able to maximize its ability to heat and cool your home efficiently.

If you have questions, or need more information, please call REC's Customer Services Department at 800-552-3904.

### Heat Pump Manufacturers

Amana .....	800-843-0304
Bryant .....	800-428-4326
Carrier .....	800-227-7437
Heil/Tempstar .....	877-591-8908
Lennox.....	800-953-6669
Rheem/Ruud .....	800-432-8373
Trane/G.E./American Standard....	903-581-3200
Whirlpool .....	800-253-1301
York/Coleman/Luxaire .....	877-874-7378



# HEAT PUMP EFFICIENCY TIPS

*Operating your heat pump*

REC-HP 200707

[www.myrec.coop](http://www.myrec.coop)



**Rappahannock  
Electric Cooperative**

A Touchstone Energy® Cooperative 



## How your heat pump works

Heat pumps have been around for a long time. Any appliance that takes heat from one area and moves it to another, such as your refrigerator, is a heat pump. The heat pump in your home works on the same principle as your refrigerator but on a larger scale.

Most heat pump installations involve what is called a split system. The outdoor unit contains the compressor and a heat exchange, called a coil. The indoor unit contains another coil, a fan that blows air through your duct system and electric heating elements.

The outdoor and indoor units are connected by two copper tubes. These two tubes do not move air; instead, they move a gas refrigerant (such as Freon) that carries the heat between the indoor and outdoor coils. The refrigerant has the ability to absorb heat from the air, even at very low temperatures.

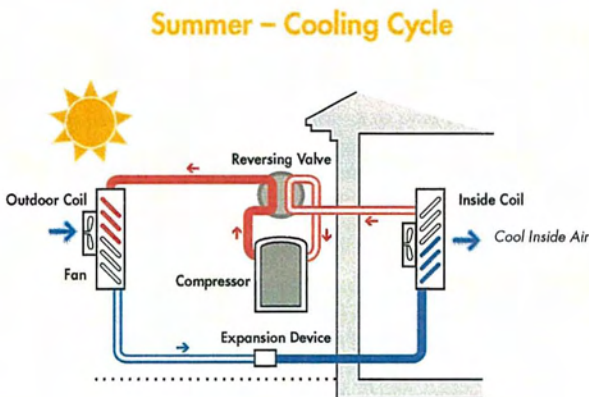
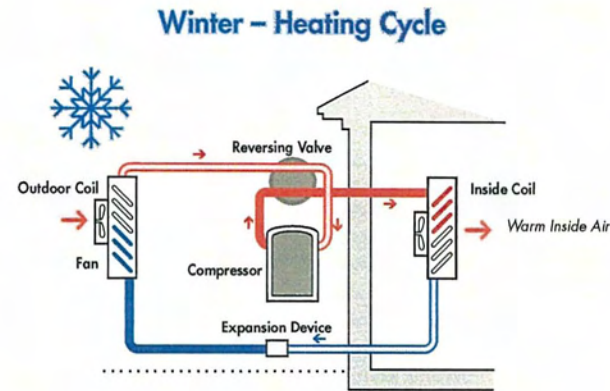
In the winter, when you are heating your home, the refrigerant absorbs heat from the outdoor air drawn across the outdoor coil. The refrigerant becomes hot, but is made even hotter (well over 140° F) by going through the compressor.

This hot gas travels through a copper tube to the indoor coil. The fan draws air through your return grille and pushes the air across the indoor coil. The hot gas transfers its heat to the air drawn across the coil and into the duct system.

In the summer, when you are cooling your home, your heat pump simply reverses the flow of refrigerant. Now the refrigerant absorbs heat from room air blown across the indoor coil. In this manner, heat and humidity are removed from the air, and cool, dry air is distributed throughout your home by way of the duct system.

The absorbed heat is carried by the refrigerant through the copper tube to the outdoor unit. Here the refrigerant goes through the compressor then moves through the outdoor coil, which transfers the absorbed heat to the outdoor air.

## Components of an Air-source Heat Pump



## Thermostat operation

In the winter, when the outdoor temperature drops below 32° F, your heat pump may need assistance in heating your home. Electric heating elements will come on automatically to help heat your home during severe weather.

Many thermostats have an indicator light that tells you when the electric back-up heat is on. It may be labeled emergency or auxiliary. Generally, you should see this light on only during very cold days. The light may also indicate a problem with your heat pump, such as a clogged air filter.

Setting your thermostat to the lowest comfortable temperature is the best approach to conserving energy and saving money. Frequent or drastic changes to your thermostat may cause you to use more energy. Avoid increasing your thermostat more than one degree at a time. A change in setting greater than 1-1/2 degrees at one time will cause your electric back-up heat to come on. Whenever your electric back-up heat comes on unnecessarily, you will be wasting energy.

In the summer, when your heat pump is operating in the cooling mode, there is no back-up system like there is with your back-up heat. You can adjust your thermostat setting up or down without worrying about additional systems coming on. For economical operation, however, you should aim for the highest comfortable temperature when selecting your thermostat setting.

There are many types of thermostats; some are quite confusing to operate, others are very simple. Please feel free to contact REC or a heating contractor to discuss the proper operation of your existing thermostat or the selection of a new, energy saving thermostat.



# Rappahannock ck CURRENTS

## MANAGING ENERGY EFFICIENCY: *REC Leads the Industry in Smart Meters*

**N**ew technologies are sweeping across the utility landscape and in many cases the nation's electric co-ops are leading the way with innovative systems. Using the latest technology means that electric co-ops, like Rappahannock Electric Cooperative (REC) have put a high priority on helping member-owners control costs by managing their energy use.

A recent assessment by the Federal Energy Regulatory Commission found that electric co-ops have the highest deployment of automated meter reading technology of any group of utilities in the nation. "Smart" meters are revolutionizing the utility business. Daily meter readings, or even 15-minute interval readings, provide the opportunity for innovative billing and rate options while making it easier for the co-op member to get involved in managing energy use in the workplace and at home. Since December 2002, REC has been automatically reading members' meters through its Automated Metering Infrastructure (AMI).

With AMI smart-meter technology, for example, an REC customer services representative can answer billing questions easily and accurately, as well as connect or disconnect a service without sending a serviceman to the property. Automated meter reading, however, saves more than just time and fuel for trucks. REC started using AMI for meter readings, but quickly found how useful it is for helping members

understand their bills and energy-use patterns. Other benefits of AMI include outage detection, resolving power-quality issues, monitoring end of line voltage, and helping with engineering and system planning—all contributing to the standard of reliable service members expect from their Cooperative.



"In the future, more information about electricity use will begin to flow directly to members," says Oliver Price, director of district customer services. "Time-of-use rates and automated load-control programs are benefits we are looking into," he said. "Emphasis will increase on using these systems for demand response and energy-efficiency programs."

The age of cheap, abundant energy is over. The industry has a lot of educating to do about the true economic and environmental costs of energy. AMI bridges the communications divide between co-ops and the people they serve.

"REC recognizes that AMI is a way to introduce new efficiencies in reading meters, identifying and resolving outages more quickly and providing equal levels of service to remote rural members," continued Price. "When your members are neighbors, friends and community businesses, service and reliability are high priorities. You want to give them your best and create the greatest value. Member satisfaction is a top priority at the Cooperative."

REC is finding innovative ways to combine the power of AMI with other technologies such as geographic information systems, outage restoration and even account management. What's next? "We see the advent of smart energy homes where members can allow REC to reduce consumption to particular devices during critical peak periods to avoid a blackout, or simply to save money. Customer signaling via the Web or an in-home display will help members take advantage of cost-saving and conservation programs. They may choose to purchase power when it is most abundant and least expensive. Everybody wins," he concluded. ■



# Rappahannock CURRENTS

## ARE YOU INVITED?

If you have central air conditioning in your home, you may be eligible for a pilot program offered to selected Rappahannock Electric Cooperative (REC) members this spring. REC will be conducting a study to evaluate the benefits of a new Air Conditioning Load Management Program. Randomly selected members will receive an invitation to participate in the study through the mail.

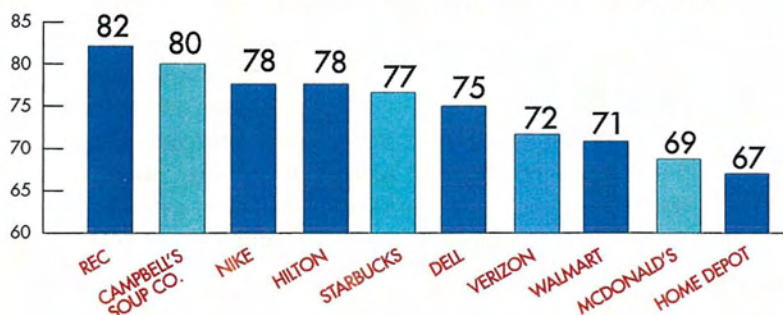
The program allows Cooperative members an easy way to do their part to help reduce power consumption during periods of high demand. Reductions from load management programs help keep wholesale power costs down by avoiding the need to purchase expensive power on the open market. These reductions may also help delay the need to build new power plants in the future. Load management programs are just another way your Cooperative works to keep electric rates affordable while being good stewards of the environment.

This is a scientific study, and participants will be randomly selected. The only way to participate at this time is to receive an invitation in the mail. If you are selected, simply respond to the direct mail invitation. Doing your part is easy.



## MEMBERS RANK REC ABOVE NATIONAL AVERAGE

**American Customer Satisfaction Index (ACSI)**



Rappahannock Electric Cooperative (REC) scored 82 out of 100 in the most recent American Customer Satisfaction Index (ACSI). Approximately 80,000 Americans are surveyed annually to determine their satisfaction with the goods and services they consume.

ACSI is a powerful economic indicator for companies, industry trade associations and government agencies. It provides a uniform and independent measure of consumer experience with over 200 of the leading corporations in America. The fundamental principle, "The more satisfied your customers are, the more successful your company is going to be," proves true.

REC has participated in the survey for the past six years, and the results have been outstanding. Last year's score of 83 was 10

points higher than the average of the top energy industries in America. That score put us in an elite group of customer-friendly companies.

As you can see from the chart above, REC rated higher than large companies with a reputation for providing top service in their respective industries.

President and CEO Kent Farmer said, "We never forget that we are here to serve our members by providing them with safe and reliable electric service. We take great pride in providing outstanding customer service to those who own this Cooperative."

We would like to thank all of you who participated in the random survey. Your opinion of the Cooperative and the service we provide is important to us. ■

### Correction:

In the February issue of *Cooperative Living* we misidentified Region VI as IV in the *Directors' Nomination Process Begins* article.

The four Board of Directors' positions that will be filled during the August 2009 election are: Regions III, VI, IX and At-Large.





## TAKE THE WORRY OUT OF PAYING YOUR MONTHLY ELECTRIC BILL

This winter we have experienced some of the coldest temperatures in over three decades. And as the year began, many of us faced some of the hardest economic times we have ever had.

History shows us that significantly lower temperatures and fewer daylight hours usually result in higher electricity usage during the winter months. When you combine increased usage with increasing energy costs, your electric payment could be significantly higher than it has been in previous months.

Rappahannock Electric Cooperative (REC) wants you to know that we understand how difficult it may be for you to pay your electric bill this month. That's why REC has several options that may help you. Follow the "Easy Phone Guide" directions, found on this page, to quickly be connected to the service you need.

Payment extensions can be scheduled for members who are able to make their payment in full, but need a couple more days before being able to send in the payment. Members who are unable to make a full payment will need to speak with a customer service representative for additional options. REC will also work with members who have recently suffered a high electric bill due to faulty equipment that has been repaired. Please call and let a customer service

representative know your situation, so that a payment extension may be scheduled.

If you are a member who is experiencing an unusually high electric bill, our customer service representatives can help assist you in understanding how you are using your home's electricity. Members can choose to receive the guides for completing a do-it-yourself home energy audit. REC can also offer to temporarily monitor your daily usage in order to locate trends that may uncover faulty equipment, as well as solutions to help you manage your electricity usage.

Another option is our Budget Billing program. Budget Billing is a payment plan that establishes a preset payment amount for each billing period. That preset amount is determined by averaging your bill totals for the 12 months prior to enrollment in Budget Billing. Part of the ease and convenience of this service is that registration is free. To sign up for Budget Billing, your account must have a zero balance.

## EASY PHONE GUIDE

If you need to contact REC concerning your electric bill payment, follow these options:

In the event of an emergency ALWAYS press **1**

Payment Extension **2-1-3**: Use this option if you are able to make your payment in full, but need to extend your due date.

To make a payment, **2-1-2**

Customer Service Representative **2-1-0**: Use this option to connect to a customer service representative if you are unable to make your payment in full; are having difficulty making a payment; if you need assistance with an unusually high electric bill; or for additional help.

Hours of operation and directions, **2-5**

### Energy Saving MONTHLY TIPS



- Keep the refrigerator away from heating appliances, windows, and heating ducts. Direct exposure to heat forces the unit to use more energy.
- Regularly defrost manual-defrost refrigerators and freezers; frost buildup decreases the energy efficiency of the unit.
- Reduce drying time and energy use by setting your dryer timer carefully. Over-drying your clothes uses more energy than necessary.

Whenever you know you are unable to meet your payment due date or are unable to make your payment in full, call in to verify that funds are coming or to schedule a payment extension. By calling in and explaining your situation, you can avoid additional charges to your account and avoid having a representative visit your home for collection or disconnection. Take advantage of the options REC has to help you schedule an extension or make your payment so you can keep the power on. ■



# Rappahannock ck CURRENTS

## REC PARTNERS WITH ENERGY STAR

### *The Power to Protect the Environment Through Energy Efficiency*

ENERGY STAR is the government-backed symbol for energy efficiency and in January, Rappahannock Electric Cooperative (REC) partnered with the ENERGY STAR for New Homes program.

“As a partner in the ENERGY STAR for New Homes program, we will be able to give our members a third-party guarantee that their new home is as energy efficient as possible,” said Sterling Schoonover, director of customer services. “We can work with our members to find an ENERGY STAR builder. For members who utilize one or more of our HomeResources products and services, we will offer a discount for the fees associated with the ENERGY STAR certification.”

ENERGY STAR for New Homes can reduce energy demand while improving the comfort, quality, durability and affordability of your

new home. By purchasing an ENERGY STAR-qualified home, you can have all the features you desire, plus better performance and lower utility bills.

Homes that earn the ENERGY STAR can typically be 20 to 30 percent more efficient than standard homes. ENERGY STAR builders achieve this high efficiency for you by incorporating a variety of features:

- **TIGHT CONSTRUCTION AND DUCT WORK**

Advanced techniques for sealing holes and cracks in the home’s “envelope” and in heating and cooling ducts help reduce drafts, moisture, dust, pollen, pests and noise. A tightly sealed home improves comfort and indoor air quality, while lowering utility and maintenance costs.

- **EFFECTIVE INSULATION**

Properly installed and inspected insulation in floors, walls and attics ensures even temperatures throughout the house while using less energy. The result is lower utility costs and a quieter, more comfortable home.

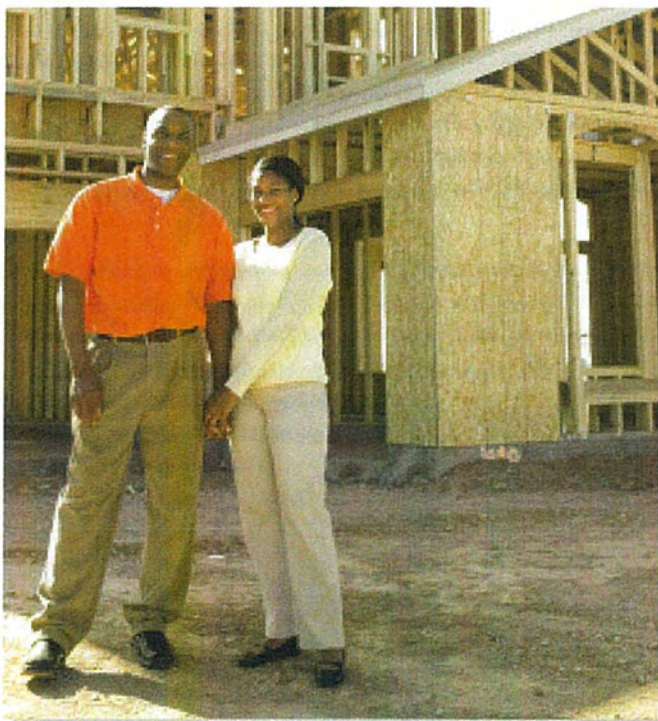
- **EFFICIENT HEATING AND COOLING EQUIPMENT**

An energy-efficient, properly installed heating and cooling system uses less energy to operate, which reduces your utility bills. This system can also be quieter, reduces indoor humidity and improves the overall comfort of your home.

- **HIGH-PERFORMANCE WINDOWS**

Energy-efficient windows employ advanced technologies, such as protective coating and improved frame assemblies, to help keep heat in during the winter and out during the summer.

*continued on pg. 24*





## Youth Tour Applications Available

Attention high school juniors: Applications are now available for the Electric Cooperative Youth Tour of Washington, D.C. Applications must be received by March 23. Visit [www.myrec.coop](http://www.myrec.coop) to apply today or go to [www.youthtour.coop](http://www.youthtour.coop) for more information.

## LEARN Scholarship Applications Available

Applications are now available for the Literacy, Education and Rural Networking (LEARN) scholarship. Through the LEARN program, scholarships are awarded each year to qualified high school seniors seeking to advance their career goals by attending a college or trade school.

To be eligible for a scholarship through the LEARN program, an applicant must:



- Have parents or guardians who are members of Rappahannock Electric Cooperative.
- Be a graduating high school senior.
- Be planning to enroll in an accredited education or training institution in the fall of 2009.

Applications are available at [www.myrec.coop](http://www.myrec.coop) and must be returned by 5 p.m. on April 6, 2009. For additional information, contact Brian Wolfe at 540-891-5914.

## Energy Saving MONTHLY TIPS



- Turn off all appliances such as computers and monitors, electric blankets, TVs and stereos when not in use.
- Unplug battery chargers when not needed. This includes your cell phone chargers.
- Have your heating system serviced each year by a certified technician.

continued from pg. 22

### • EFFICIENT PRODUCTS

Your home may also be equipped with ENERGY STAR-qualified products; lighting fixtures, compact fluorescent bulbs, ventilation fans and appliances that offer additional energy savings.

### • INDEPENDENT TESTING

While it is easy to claim that homes are energy efficient, ENERGY STAR builder partners back that up with verification by an independent Home Energy Rater. REC will have the rater conduct on-site inspections and testing to verify the performance of energy-efficiency features in your home.

“As we move into 2009, our energy management advisors will become qualified to complete ENERGY STAR inspections, which will be another added benefit to our members,” said Sterling Schoonover. “At REC, we are always looking for ways to offer our members energy-efficiency tools and resources. The ENERGY STAR for New Homes program will offer homebuyers all the features that they want in a new home, plus energy-efficient improvements that deliver better performance, greater comfort and lower utility bills.” ■

## WHY ARE MY CLOCKS BLINKING?

Coming home to a flashing digital clock is an annoyance at best. It is a sign that your power has been interrupted, even if for less than a second, but at least it indicates that the electrical system is working properly. It may be a small consolation, but it is highly likely that the power “outage” lasted only as long as it takes a tree limb to touch a power line while swaying in the breeze.



If a fault or short circuit happens on a power line, a device called an oil-circuit recloser (OCR) opens to stop it and then quickly closes back in. Although the process is fast and usually temporary, it may cause your lights to blink, making it necessary to reset digital clocks and appliances with digital displays. The OCR is essentially a breaker, functioning much like a breaker in the electrical panel in your home. It permits power to continue flowing through the line with only a brief interruption of service, rather than causing an extended power outage. If the short circuit continues, the OCR will operate or “trip” several times before eventually stopping the flow of electricity and causing a power outage. This process protects the lines from damage and protects REC personnel and the public from danger, cutting off power to the affected section of the line and isolating the problem until it can be repaired.

Although the weather and nature’s creatures are beyond our control, you can reduce the effects and inconvenience of “blinks” when they occur. When purchasing small appliances such as digital clocks, consider purchasing models with a battery backup. And don’t forget to check the battery regularly. You may also want to install

meter-base surge protection as added protection for the major appliances in your home. Contact us to learn more about REC’s HomeGuard surge protection system. ■



# Change a **Light**, Change the **World**

**C**ompact fluorescent lights (CFLs) use 75 percent less energy and last up to 10 times longer than traditional light bulbs. If every home in America replaced just one incandescent light bulb with a CFL, we would save enough energy to light more than three million homes and prevent greenhouse gas emissions equivalent to that of 800,000 cars, according to ENERGY STAR®. And even though CFLs contain a small amount of mercury that could ultimately end up in the environment, that amount is significantly less than the amount of mercury avoided as a result of the energy savings.

ENERGY STAR also says that an average of four milligrams of mercury is contained in each CFL and no mercury is released when the bulbs are intact or in use. The Environmental Protection Agency

(EPA) recommends that consumers take advantage of available local recycling options for compact fluorescent light bulbs. Currently Home Depot stores located throughout the Fredericksburg and Richmond areas offer CFL recycling and disposal.

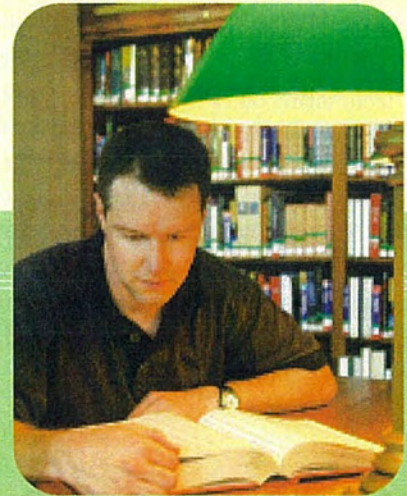
For information on how to recycle or dispose of CFLs visit REC's Web site, click on Save Energy and review Energy Saving Tips. The average CFL is designed to last 8,000 hours — more than seven years based on typical household use. That's long enough to watch your first grader transform into a teenager! If you haven't already made the switch to CFLs, now is the time. Take advantage of savings offered through a \$2.50 CFL coupon received with your September electric bill. ●

**75% LESS ENERGY – 10 TIMES LONGER!**

## SAVE MONEY AND ENERGY WITH THESE LIGHTING TIPS

- Turn off lights when not needed. One 100-watt bulb left on all night costs about \$25 over 12 months.
- Controls such as pre-set or automatic timers help you manage your electricity. Dimmers save electricity when used to lower light levels. Be sure to select products that are compatible with CFL bulbs.
- Because outdoor lights are usually left on a long time, using CFLs in these fixtures will save energy. Most CFLs can be used in enclosed fixtures that protect them from the weather.
- CFLs are also available as flood lights. These models have been tested to withstand the rain and snow and can be used in exposed fixtures.

Source: Environmental Protection Agency and ENERGY STAR®





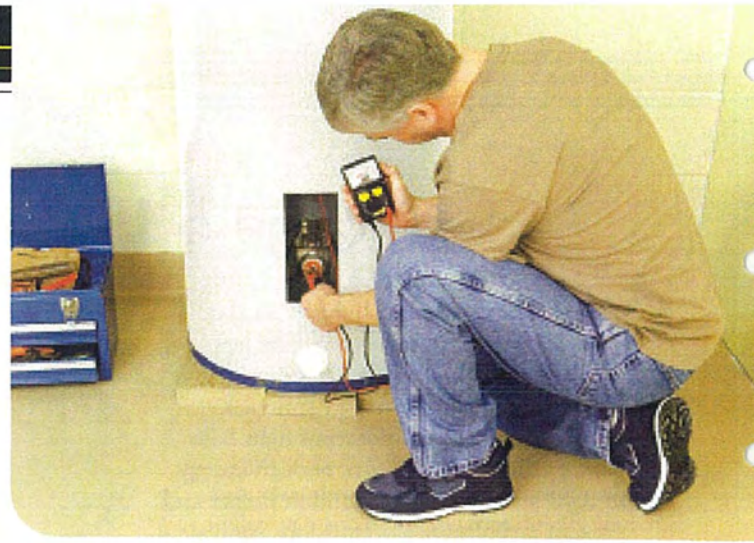
# HELP US HELP YOU

## Free Water Heater Repairs

**W**hen you participate in REC's Free Water Heater Repair program you will help us manage the price we pay for electricity. In exchange for allowing REC to control your electric water heater during peak times, we will provide you with FREE repairs on the electrical components of your water heater. Demand-response programs like this one delay the need for new power generation, and help your Cooperative control the price it pays for electricity. By shifting the load we are delaying the need to build additional coal-fired power plants and reducing CO<sup>2</sup> emissions. This is just one of the ways REC works to maintain affordable electric rates for its members.

Throughout each day there are times when electricity is in peak demand. For example, electricity is of a higher use early in the morning while people are getting ready for work or school and then later in the evenings as people return home. By participating in a demand-response program such as our Free Water Heater Repair program, you are enabling REC to control the flow of electricity to your water heater during times of high usage by large numbers of people.

Controlling your water heater starts when a trained REC technician comes to your home and installs a load management switch on your water heater. The switch detects signals sent from your Cooperative through the power lines. These signals tell the switch when to turn off the flow of electricity to the water heaters and when to return it to normal operation. The average electric water heater holds 50 gallons of preheated water that usually provides enough hot water for use during the control period.

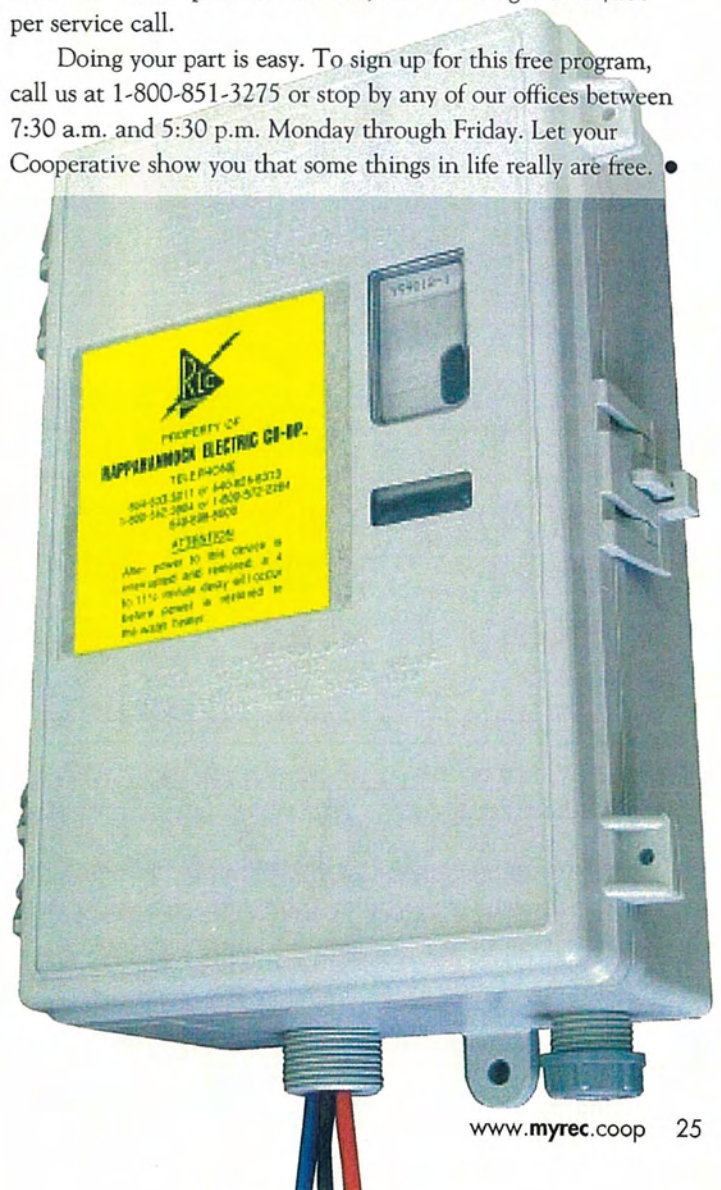


Since 1987 REC has made free water heater repairs available to thousands of our members. Each month REC visits members' homes due to cold water complaints and 98 percent of those complaints are directly related to a water heater problem. Our technicians are able to perform the free repairs to the electrical components of the water heater for members enrolled in this program. This service can save them the cost of plumber services, which averages over \$100 per service call.

Doing your part is easy. To sign up for this free program, call us at 1-800-851-3275 or stop by any of our offices between 7:30 a.m. and 5:30 p.m. Monday through Friday. Let your Cooperative show you that some things in life really are free. ●

## WATER HEATER TIPS

- **Lower the thermostat on your water heater;** water heaters sometimes come from the factory with high temperature settings, but a setting of 120°F provides comfortable hot water for most uses.
- **Insulate your electric hot-water storage tank,** but be careful not to cover the thermostat. Follow the manufacturer's recommendations.
- **Although most water heaters last 10–15 years,** it's best to start shopping now for a new one if yours is more than 7 years old. Doing some research before your heater fails will enable you to select one that most appropriately meets your needs.





# Get To The Bottom of Your High Bill

**W**e all get an unpleasant utility bill once in a while, right? Like the time the well pump malfunctioned. Or when you really got the holiday bug and decided to light up every inch of your house.

Aside from such obvious culprits, weather-related and lifestyle changes also contribute to high electric bills. So if you are surprised by an unexpectedly high bill, pull out your detective cap and start searching for the cause.

Weather-related causes are fairly easy to spot – long hot or cold spells, higher-than-normal humidity and so forth. Make sure you have taken the proper maintenance and weatherization steps to prepare your home and its energy-consuming systems to handle the tough weather.

Lifestyle changes are harder to pin down and may affect how you use your energy. Some classic problems include kids coming home from college with a semester's worth of dirty clothes and a desire to take long, hot showers several times a day. Other issues with the return to the nest include more television, PC and stereo use, lights left on and more people in and out of the house, releasing conditioned air.



For holidays, have you added a lot of decorative lights? Have you entertained above your normal practices? Cooking, serving and cleaning up for a party consume a lot of energy. Have you purchased a new refrigerator or freezer and kept the old one for another use? Older appliances are much less efficient and keeping them adds to your consumption.

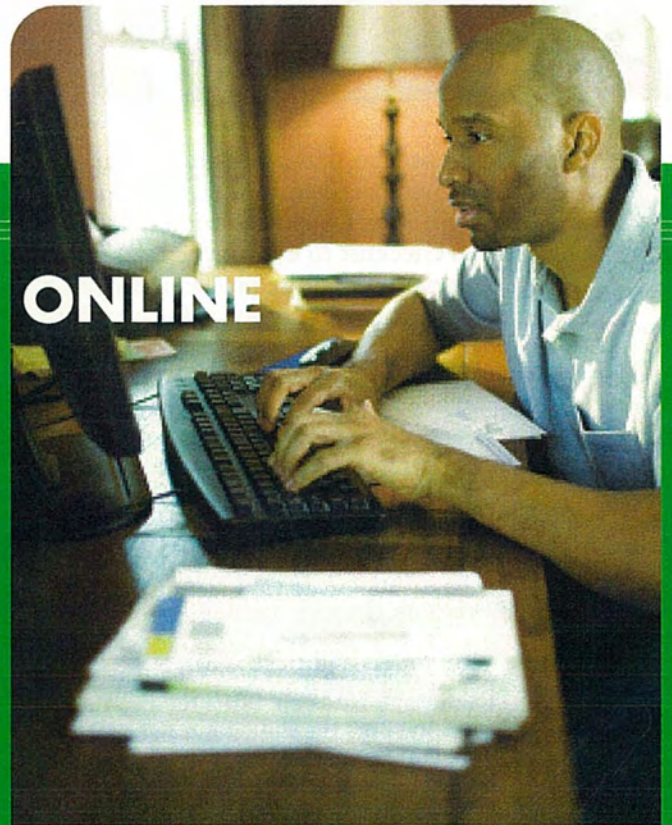
If your detective work doesn't turn up anything out of the ordinary, try our online energy audit. You may just find it's time to upgrade your existing systems to more current and efficient models. If you are still unable to determine the cause of a high electric bill, contact a customer service representative at 800-552-3904 to determine if they can help identify the cause. ●

## ACCESS YOUR ACCOUNT ONLINE

**REC** provides members online access to their account through Web Self-Service. Currently, over 4,700 members have logged on to Web Self-Service to view their account information. Web Self-Service is a secure area of the REC Web site that delivers current account information, electronic copies of past bills and the ability to update some of your contact information.

Registration for Web Self-Service is a simple, three-step process that only takes a few minutes to complete. Use the "Log In" link at the top of the page of our Web site to access the registration page. Once you've registered, you'll have access to these features:

- The Account Summary page provides current account information.
- The Billing History page gives you access to your last 13 REC bills.
- The Manage Accounts page allows you to add multiple accounts to your Web Self-Service "view."
- The My Profile page offers members a way to manage their personal contact information. ●



Visit our Web site at [www.myrec.coop](http://www.myrec.coop) to begin enjoying the benefits of online access.



# Prepare Your Home

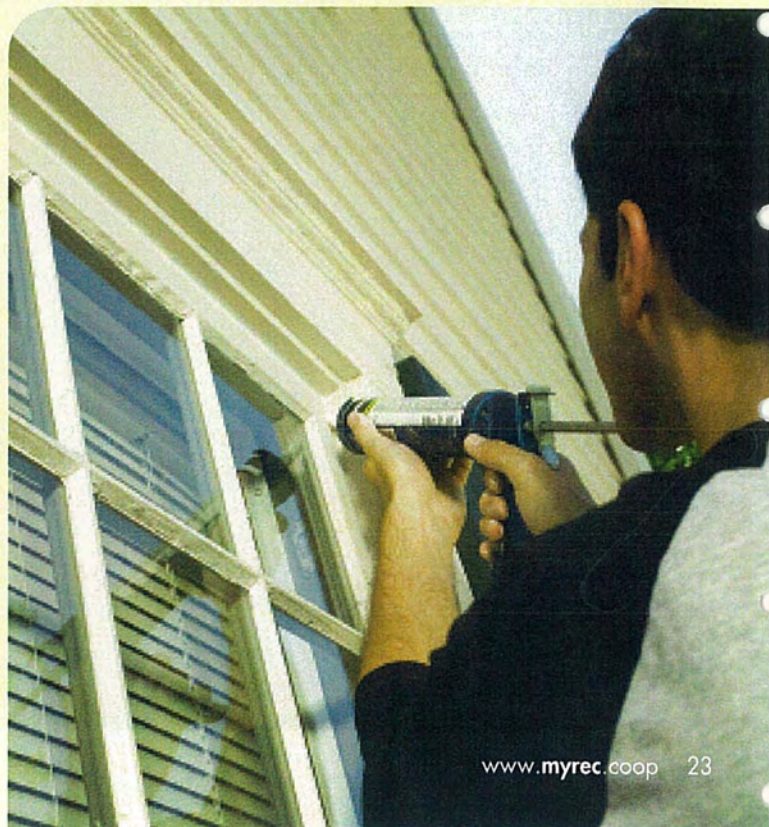
*For Winter and The Holidays*



**T**here is no question that preparing for the rigors of winter weather can seem like a distraction. But this is a job that will save you money and energy at the same time. Use this checklist to ensure you take the steps you need to prevent potential problems and keep your home warm, dry, comfortable and safe this winter.

- **Contact a service technician to conduct seasonal maintenance on your heating and cooling system.** Make sure that you change the filter in your system regularly to more efficiently heat or cool your home.
- **Check your chimney.** If you haven't used your fireplace in a while, it's a good idea to have it checked for animals, debris and leaves. Consider installing a screen over your chimney opening.
- **Clean your gutters and ridge vents.** When gutters are clogged, rainwater backs up. If the temperature drops below freezing, the standing water freezes causing the gutters to expand and crack. The ridge vents need to be cleaned in order to allow the house to "breathe" correctly. Otherwise, air will stagnate and create an unhealthy environment.

- **Make sure your smoke alarm and carbon monoxide detectors are in working order.** Check the batteries regularly. If your alarms or detectors emit a light to signal they are working, make sure the light is on.
- **Check the caulking around your doors and windows.** If the caulk is cracking and peeling away, it allows your home's heat to escape. In addition, ensure that the doors and windows shut tightly and no cold air is coming in.
- **Turn down the thermostat.** With a full house and a hot kitchen, your house will be too steamy at its usual setting.
- **Replace your light bulbs with compact fluorescent light (CFL) bulbs.** Your guests won't notice a difference in lighting, but you'll see a difference in your energy bill.
- **Don't just stuff the turkey – stuff the oven.** As long as your oven will be running all day, make the most of it by cooking several dishes at once. A variation of 25 degrees in either direction from the recommended cooking temperature will still produce the desired result.
- **Cook at least one dish from start to finish in the microwave.** Microwaves are faster than the oven and use about a third of the electricity.
- **Keep cleanup easy.** Load the dishwasher completely full. With a mountain of dinner plates, using the dishwasher will be more efficient than hand washing.
- **Don't rush to put hot leftovers in the refrigerator** because it will have to work harder to cool. ●





# ENERGY -EFFICIENCY INITIATIVES FOR REC MEMBERS

**A**t REC, we are focused on energy-efficiency initiatives for members. These innovative programs enable members to conserve energy and manage their monthly energy costs.

Since 1978, REC members have voluntarily participated in our Load Management program by having a switch installed on their water heaters. To date over 29,000 members have load management switches installed, allowing us to remotely turn off the power to their water heater during times of peak demand. Through this program we have been able to save over \$65 million on our wholesale power costs, which results in affordable electricity prices for our members.

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**TO DATE OVER 29,000 MEMBERS HAVE LOAD MANAGEMENT SWITCHES INSTALLED, ALLOWING US TO REMOTELY TURN OFF THE POWER TO THEIR WATER HEATER DURING TIMES OF PEAK DEMAND.**

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REC began an Air Conditioning Load Management Pilot program this spring similar to our water heater program. Power will be remotely turned off of selected member's air conditioning units to determine the wholesale power cost savings benefit for REC.

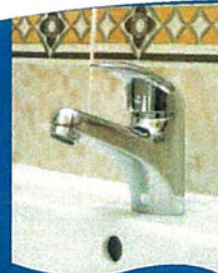
In January 2009, REC introduced the ENERGY STAR for New Homes Program. A home that earns the ENERGY STAR is significantly more efficient than a standard home. By purchasing an ENERGY STAR qualified home, members can have the features they desire, plus better performance and lower utility bills—all while helping reduce greenhouse gas emissions. Local contractors have partnered with REC to help homeowners build these energy-efficient homes.



Information on the ENERGY STAR for New Homes Program, as well as additional tools such as our online energy audit tool can be found on our Web site at [www.myrec.coop](http://www.myrec.coop). Our online energy audit tool can be used to calculate home energy consumption, customize energy improvements for your home and help you lower your energy bills.

For more information on our energy-efficiency programs and services, please call us at 800-552-3904 or email our energy expert at [energyexpert@myrec.coop](mailto:energyexpert@myrec.coop). ■

## Energy Saving MONTHLY TIPS



- Install a water-saving showerhead. They use one-third to one-half the water that regular showerheads use.
- Repair leaky water faucets. Thirty drops of water a minute can waste as much as 50 gallons of water a month.
- If you use a dishwasher, wash only full loads. It costs exactly the same to wash one dish as a whole load.



## INCLUDE HOME ENERGY SAVINGS IN SUMMER VACATION PLANS

If you are going on vacation this summer, REC advises you to make sure your home's energy use takes a vacation as well. Simple tips can help you control your energy usage while you are away.

### AIR CONDITIONING

Set the thermostat to 85 degrees. If it is a programmable thermostat, use the "hold" or the "vacation" setting to keep it at that temperature.

### ELECTRONICS

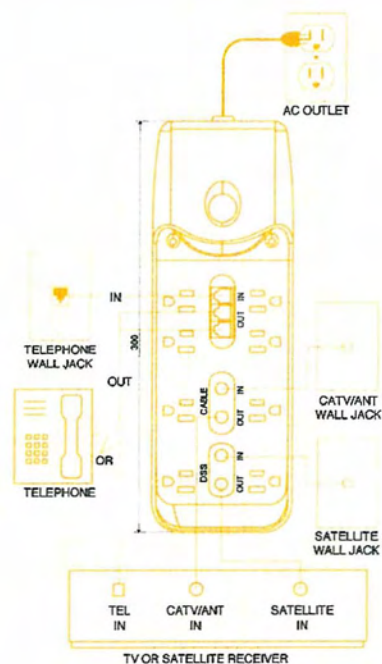
Computers, CD/DVD players, TVs, and VCRs – these and other electronic appliances use electricity, even when they are not turned on. Unplug them before leaving.

### LIGHTING

You can improve your energy savings, and your home's security, by using timers to operate lights each night. And by installing CFLs in those lamps, you will be saving more energy, up to 66 percent less in each lamp, and the bulb will last approximately 10 times longer than a regular incandescent bulb. ■



## PROTECT YOUR ELECTRONICS WITH HOMEGUARD®



Consumer Reports calls surge suppressors like the HomeGuard® system a sensible form of insurance. That's because extreme power bursts are tough on today's sensitive electronic equipment such as your DVD player, stereo, TV and computer. HomeGuard offers a unique two-stage system that protects your electronic equipment from transient surges both at the meter and at the outlet. Like any insurance policy, you need to know the terms of coverage.

There are two different types of disturbances that require two different technologies for protection. An "overvoltage" is defined as an increase in the AC voltage, at the power frequency, for durations greater than a few seconds. Your home's circuit breaker or fuse protects against that type of disturbance.

REC's HomeGuard system is effective against the other power disturbance known as a "transient"—a very brief but extreme burst of extra energy. It can occur on AC power lines, signal, and telephone or data lines. A transient can also be referred to as a "spike" or a "surge." Transients are a natural result of any electrical activity. They are generated every time wires, motors or electrical elements are energized or de-energized.

Should a transient surge damage any of your properly connected equipment, HomeGuard offers a repair or replace warranty. To ensure that your appliances and electronics are covered by the warranty, make certain that all of your devices and the HomeGuard system are installed correctly and you have filed your equipment registration. The diagram, to the left, illustrates how to install a surge protector properly.

Please note that HomeGuard *protects against transient voltages only*. The HomeGuard Surge Protection System cannot protect against sustained overvoltage situations. For more information on HomeGuard or any of REC's products and services, visit [www.myrec.coop](http://www.myrec.coop) and click on the services tab or contact us at 800-851-3275. ■





## REC Bylaws Amended

**A**mendments have been made to REC's Bylaws to better serve its member-owners. At the July Board meeting REC's Board of Directors voted to approve the changes. As a result, new members are no longer required to complete a membership application to become a member of the Cooperative. Instead, acceptable proof of identity must be provided, and the new member must agree to be bound by the applicable rates and terms and conditions of service of REC. In addition, the nonrefundable membership fee of \$5 that was previously paid by all members is not required of new REC members. Article I, section 1, of the amended Bylaws is included on this page. Section 5 was removed, and the remaining sections renumbered. For more information, please contact a customer services representative at 800-552-3904 or visit our Web site for a complete copy of the Bylaws.

## Go Back to School With Energy Savings

*Share these helpful tips with your children*

**K**ids need energy to power so many back-to-school activities: using computers to write their papers and shining lights later in the evening, especially as the days get shorter. Resolve to conserve energy as your kids head back to their classrooms this fall – and you might even save a few dollars along the way. Here are three energy-saving and environmentally friendly back-to-school tips:

- Teach your children to shut down their computer when they are not using it, even if they plan to return to it later. Electronics in sleep mode continue to use electricity.
- In the market for a new computer? Choose a model with an ENERGY STAR® rating, which will use 70 percent less electricity than those without; and ENERGY STAR monitors draw 90 percent less energy.
- Desk lamps and other task lights create a productive work environment without wasting excess light. Replace the halogen or incandescent light bulbs in desk lamps with compact fluorescent light bulbs. CFLs produce less heat and use 90 percent less electricity than traditional light bulbs.

### ARTICLE I MEMBERSHIP

#### SECTION 1: Requirements for Membership

Any person, firm, association, corporation, or body politic or subdivision thereof, or other legal entity who is able to enter into a legally binding contract will become a member of Rappahannock Electric Cooperative (hereinafter called the "Cooperative") upon receipt of electric service from the Cooperative, provided that he or it has first:

- a. Provided acceptable proof of identity and agreed to be bound by the applicable rates, terms and conditions of service;
- b. Agreed to purchase from the Cooperative electric services as hereinafter specified, and
- c. Agreed to comply with and be bound by the Articles of Incorporation and Bylaws of the Cooperative and any rules and regulations adopted by the Board of Directors.

As used in these Bylaws, electric services refers to Distribution Service, which is the delivery of electricity to the customer through the distribution facilities of the Cooperative, and may also include Electricity Supply Service, which is the provision of the electricity delivered to the customer. Cooperative members must use the Distribution Services of the Cooperative for delivery of electricity to locations within the Cooperative's service area. Cooperative members may choose to receive Electricity Supply Service from other providers according to applicable laws, rules and regulations of the Commonwealth of Virginia and those adopted by the Board of Directors.

No member may hold more than one membership in the Cooperative, and no membership in the Cooperative shall be transferable, except as provided in these Bylaws.

### MORE ENERGY-EFFICIENCY TIPS FOR KIDS

**Turn off lights, TV and other electronics** when you're done with them. Don't waste energy on an empty room – save it!

**Don't leave the water running** when you brush your teeth. Water is precious, and it takes energy to clean it, so don't waste it!

**Don't leave doors to the outside open** longer than necessary. Hot and cool air escape quickly. Don't let it get away!



# Virginia's ENERGY STAR® Tax Holiday Coming in October

The Virginia ENERGY STAR Sales Tax Holiday will take place this year on Friday, Oct. 9, through Monday, Oct. 12. During the holiday, Virginians will be exempt from paying the state and local sales tax (5 percent) on the following ENERGY STAR- and WaterSense-qualified products (that cost \$2,500 or less):

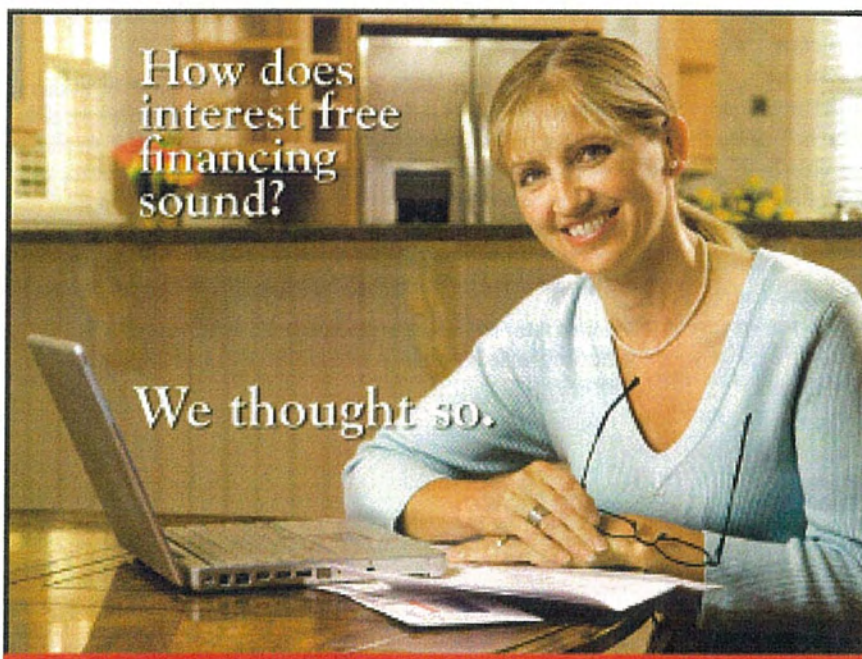
### ENERGY STAR-Qualified Products

- Air conditioners
- Ceiling fans
- Compact fluorescent light bulbs
- Dehumidifiers
- Dishwashers
- Programmable thermostats
- Refrigerators
- Washing machines

### WaterSense-Qualified Products

- Bathroom sink faucets
- Faucet accessories
- Toilets

*NOTE: Used items affixed with the ENERGY STAR and WaterSense label qualify for the exemption.*



My Account Services Save Energy Community Public Safety

## HomeResources Solutions you can rely on

Receive up to 36 months, interest free, to pay for your purchase of a new water heater through REC.\* One phone call takes care of removal and recycling of your old water heater, a new energy-efficient unit installed by a licensed and insured plumber...plus convenient payment options to fit your budget. Ask about our FREE Water Heater Repair service. For details visit [www.myrec.coop](http://www.myrec.coop) and click on Services or call 800-851-3275.

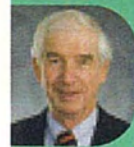


800.851.3275  
[www.myrec.coop](http://www.myrec.coop)

\*Financing offered to REC members only and subject to credit approval.



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# Easy Fixes for Drafty Windows

**W**indows provide our homes with light, warmth and ventilation. But when winter sets in they can have a downside. Placing your hand against a window pane on a chilly fall morning proves the point: If the pane feels cold, it's a good bet you can reduce energy costs by either insulating your existing windows or installing new, energy-efficient upgrades.

Insulating with draperies is a low-cost quick fix to drafty windows and can reduce heat loss from a room up to 10



percent. And they're just as helpful in hot summer months by blocking sunlight. White plastic-backed drapes can reduce heat gain by up to 33 percent.

Interior storm window panels are another low-cost fix (available at most hardware stores), and consist of flexible or rigid plastic installed over or adhered to existing window panes. Installation is fairly simple, and panels are either taped on or mounted with Velcro, magnetic strips or snap-in seals. Use panels in the fall and remove them in spring to reduce winter heat loss by up to 50 percent.

If you're in the market for new windows altogether, be sure to choose energy-efficient models that will shave heating, cooling and lighting costs year-round. ENERGY STAR® has established a set of energy performance ratings tailored to four climate zones across the United States to guide you in selecting windows perfect for your home. These performance ratings are broken into several categories, although the two most basic are U-Factor and Solar Heat Gain Coefficient (SHGC), which can be found on window stickers or packaging.

In simple terms, U-Factor measures how easily heat can flow through a window, not counting direct sunlight. The lower the number, the more energy efficient the window.

SHGC measures how much heat from sunlight can be absorbed by the window. A high number means the window remains effective at collecting heat during winter. A low number provides greater shading ability and may be best for southern climates.

In REC's service territory, windows for the North Central climate zone are best. Look for a U-Factor of  $\leq 0.40$  and a SHGC of  $\leq 0.55$ . You can also visit [www.energystar.gov](http://www.energystar.gov) for more details on our climate zone and other criteria to consider when shopping for new windows. ●

## What makes a **window** energy efficient?

### IMPROVED FRAME

Wood composites, vinyl, and fiberglass frames reduce heat transfer and insulate better.

### LOW E GLASS

Special coatings reflect infrared light, keeping heat inside in winter and out in summer. They also reflect damaging ultraviolet light, protecting interior furnishings.

### GAS FILLS

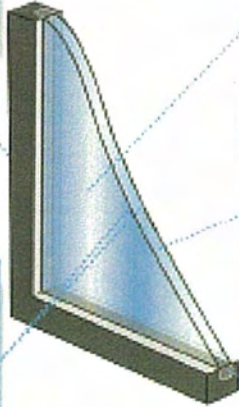
Some windows have argon, krypton, or other gases between the panes. These odorless, colorless, non-toxic gases insulate better than regular air.

### WARM EDGE SPACERS

A spacer keeps a window's glass panes the correct distance apart. "Warm edge" spacers made of steel, foam, fiberglass, or vinyl reduce heat flow and prevent condensation.

### MULTIPLE PANES

Two panes of glass, with an air or gas-filled space between, insulate much better than a single pane. Some include three or more panes for greater efficiency, impact resistance, and sound insulation.




## Weatherize Windows for Winter

- Install tight-fitting, insulating window shades on windows that feel drafty after weatherizing.
- Close your curtains and shades at night; open them during the day.
- Keep windows on the south side of your house clean to let in the winter sun.
- Install exterior or interior storm windows; storm windows can reduce heat loss through the windows by 25% to 50%. Storm windows should have weatherstripping at all movable joints; be made of strong, durable materials; and have interlocking or overlapping joints. Low-e storm windows save even more energy.
- Repair and weatherize your current storm windows, if necessary.





 **Rappahannock Electric Cooperative**  
A Touchstone Energy® Cooperative 

If every home in America replaced just one incandescent light bulb with an ENERGY STAR® Compact Fluorescent Light we would save enough energy to light more than three million homes for a year.

**CHECK OUT THE VALUABLE CFL COUPON ON REVERSE SIDE.**

MANUFACTURERS COUPON EXPIRES MAY 31, 2009

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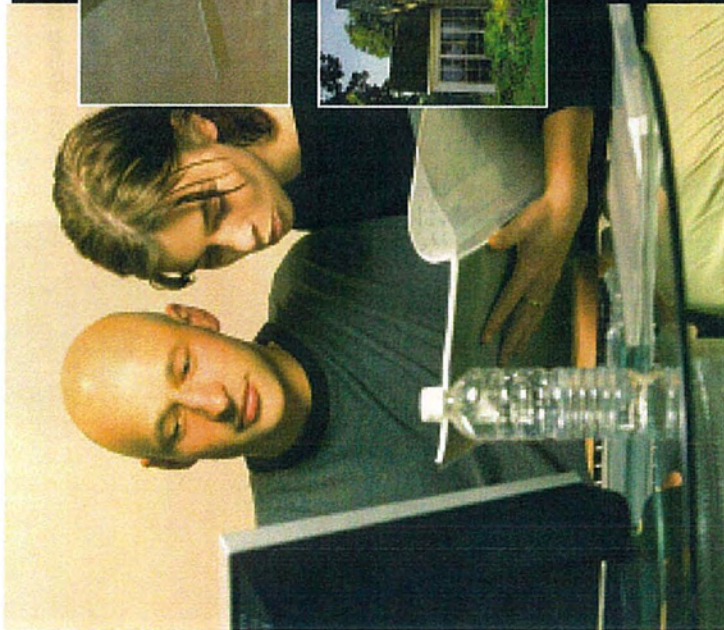
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REC200902A





The average family  
pays 44% of their  
utility bill on  
heating and cooling.



## Keep cool this summer and manage your energy usage with these tips:



- Program your thermostat to automatically turn your AC up at night or while at work;
- Set your thermostat as high as comfortably possible in the summer—the smaller the difference between the indoor and outdoor temperatures, the lower your overall cooling bill will be;
- Avoid setting your thermostat at a colder setting than normal when you turn on your AC—it will not cool your home any faster and could result in excessive cooling and, therefore, unnecessary expense;
- Consider using an interior fan with your window AC to spread the cooled air more effectively through your home without greatly increasing your power use; and
- Avoid placing lamps or TV sets near your thermostat—the thermostat senses heat from these appliances, which can cause the AC to run longer than necessary.



WITH REC IT'S FREE TO GO GREEN.



HomeResources

Solutions you can rely on

Join more than 30,000 REC members who are already doing their part to reduce the carbon footprint and the demand for electricity. Sign up for a FREE electric water heater load management switch from REC.

On days when the demand for electricity is high, and the most expensive, REC manages the energy use to your water heater, reducing the demand for electricity. Most water heaters hold 50 gallons of water which usually provides enough hot water for use during the control period. Such programs help delay the need for new power generation.

As a bonus for having a switch installed, you will receive FREE service calls and repair on the electrical components of your water heater!

*So join the crowd and go green...for free.*

Call **800-851-3275** or visit [www.myrec.coop](http://www.myrec.coop) for more information.

## I WANT TO LEARN MORE ABOUT REC'S **FREE WATER HEATER REPAIR PROGRAM.**

*To enroll or learn more, fill out the reply card  
and return it with your electric payment.*

- Please have a customer service representative call me with more details or to schedule my enrollment in the program
- I do not have an electric water heater

NAME \_\_\_\_\_

ACCOUNT # \_\_\_\_\_

PHONE \_\_\_\_\_

BEST TIME TO REACH YOU \_\_\_\_\_  AM  PM

SIGNATURE \_\_\_\_\_

EMAIL \_\_\_\_\_

[www.myrec.coop](http://www.myrec.coop) 100-204  
REC 200910A



## MANAGE YOUR BUSINESS'S ENERGY USAGE:

### Implement These No Cost/Low Cost Energy Tips

- Locate water heaters for most efficient delivery of water and make sure water heaters are insulated.
- Ensure that the heating temperature is correct based on local requirements and control water heaters based on actual periods of need during the day.
- Be familiar with your state's Board of Health requirements before making any changes that could affect hot water delivery temperatures.



- Keep exterior doors closed as much as possible. Don't heat or cool the outdoors. Schedule shipments and deliveries for early morning in the summer and late afternoon in the winter to avoid losing conditioned air in the hottest or coldest time of the day.
- Replace air filters regularly and follow maintenance schedules for furnace and air-conditioning equipment. Replacing a dirty air filter reduces the amount of electricity needed to run a blower motor because there is less resistance to airflow with a clean filter.
- Use reflectors to increase the effectiveness of a fluorescent lighting fixture by about 10 percent. Reflectors combined with energy-efficient fluorescent lamps and electronic ballasts can reduce lighting energy costs by as much as 70 percent.
- Clean heat exchangers and perform routine maintenance on refrigerating equipment. Be sure your heat exchangers are energy efficient and in top operating condition.
- Turn off machines and equipment when not in use. Don't overlook the energy savings you can get by turning off unused computers, monitors, printers and copiers. Most computers include power management programs that can be set to automatically reduce power consumption when the computer is idle.
- Encourage employees to be energy conscious. Employee efforts can make or break your no cost/low cost energy savings practices. Consider offering a small reward or incentive for employees who take an active role to save energy.



- Adjust thermostats. Turn down the building's heating thermostat set point and turn up its cooling set point, especially when the building is not occupied.
- Install programmable thermostats. No need to remember to change thermostat settings every time you open or close your business doors. These devices give you the ability to control your building's heating and cooling needs, even when you're away.



- Use compact fluorescent lamps instead of incandescent light bulbs where lights are on the majority of the time.
- Install automatic room lighting controls. These devices automatically turn lights on or off, depending on occupancy or time of day. You can also install sensors and timers as well.

## QUESTLINE®

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### EXPERT RECOMMENDATION: SAVE ENERGY AND MONEY

Despite the notion that it is expensive to go green, there are cost-saving benefits for companies that implement efficient processes and environmentally sensible and economically sound operations. While many companies have come to the realization that sustainable practices must be implemented, planning the most prudent way to begin such programs can become considerable issues to tackle without the proper resources.

Improving the wrong processes and operations or making haphazard upgrades can be time consuming and costly. The Rappahannock Electric Cooperative (REC) Questline® newsletter offers tools to generate advice to help your business focus on increasing efficiency where it is actually needed and in areas that will have the greatest impact. Gain access to segment-tailored recommendations to lower energy costs and improve efficiency. Simply select either

the Commercial Energy Efficiency or Industrial Energy Efficiency tool, found in the Tools You Can Use section of the navigation menu of every newsletter.

This service is offered to all Questline newsletter subscribers at no cost, and it delivers individualized advice to help your facility meet its specific goals. Use the Energy Efficiency Recommendation tools to increase your bottom line with innovative yet easily implemented ideas.

If you are not currently signed up to receive Questline, visit the commercial section of the REC Web site at [www.myrec.coop](http://www.myrec.coop). Select the Economic Development tab in the blue navigation bar and choose Questline under Business Resources. Once you are on the Questline page, simply click the link at the bottom to sign up. ■

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Power Connection is your free source of information about energy conservation and management, energy services, technology trends, government and regional economic development.

For additional information about this publication, to suggest a topic for a future issue, or to update your name and address, contact REC at 800-920-WATT (9288) or [powerconnection@myrec.coop](mailto:powerconnection@myrec.coop)

## POWER CONNECTION

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# POWER CONNECTION

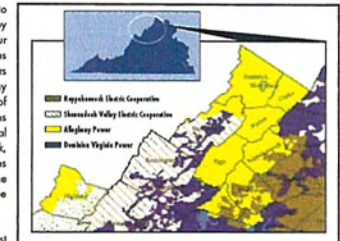
Rappahannock Electric Cooperative  
A Tidewater Energy Corporation

Business & Community Development Newsletter

Summer 2009

### REC EXPANSION TO CREATE NEW OPPORTUNITIES

Within the next year your Cooperative plans to increase its service area and customer base by approximately 50 percent. The expansion will occur as Rappahannock Electric Cooperative (REC) acquires roughly half of the service area, assets and customers of Allegheny Energy (doing business as Allegheny Power in Virginia). REC will grow to serve portions of Frederick, Clarke and Warren counties and the towns of Madison and Stanardsville, as well as additional areas in the counties of Fauquier, Rappahannock, Madison, Greene, Albemarle and Orange—localities in which the Cooperative currently operates. The remaining half of Allegheny Power's customers will be served by Shenandoah Valley Electric Cooperative.



After the expansion, REC will become the largest cooperative in the state. "This is a great opportunity that will provide many benefits," said Kent D. Farmer, REC's president and CEO. "Our members will enjoy greater rate stability, we will gain additional well-trained and highly qualified field employees, and additional jobs will be created."

Allegheny Power's administrative activities such as customer service, accounting, engineering and technical maintenance are currently performed out-of-state. Those activities will now be performed locally. The exact number and types of jobs are still being determined, but there should be many opportunities for those seeking a career in the utility industry.

"We plan to serve the additional customers with systems we already have in place, which will ultimately lower the per-customer cost for our members," continued Farmer. "Plus, expanding the not-for-profit cooperative business model means money currently flowing out-of-state will remain in Virginia and be returned to our members. If this wasn't good for everyone involved, we wouldn't be doing it."

REC serves 103,000 connections and maintains over 12,500 miles of power lines in 16 counties. The Allegheny Power service territory covers portions of 14 counties in Virginia's Northern Valley region. The company has approximately 6,000 miles of line and serves 102,000 connections, with the largest concentration in Frederick County and the City of Winchester.

The proposed acquisition must be approved by the Virginia State Corporation Commission, which regulates Virginia's electric distribution companies. The Cooperatives plan to purchase wholesale electricity for the new customers from the cooperatively-owned Old Dominion Electric Cooperative. ■


## WHAT'S INSIDE

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While everyone is in the back-to-school mode, teach kids how to be energy savers. Learning energy-saving habits while young will help kids grow up to be more savvy consumers — saving them, and you, money and natural resources.

Power   
Use it Wisely

- ◆ Turn off lights when they're not needed.
  - ◆ Turn off electronic equipment — appliances, televisions, computers, radios, and video games — when not in use.
  - ◆ Unplug phone and other device chargers.
- 
- ◆ Turn off bathroom and kitchen fans when no longer needed; they pull the heat or coolness from the house.
  - ◆ Turn off the water when brushing teeth and take shorter showers. This not only saves water, but also saves the electricity it takes to pump and heat the water.
  - ◆ During the day, open the curtains and use sunlight instead of turning on lights. Close curtains when leaving a room on hot days; window treatments will help block solar heat gain.

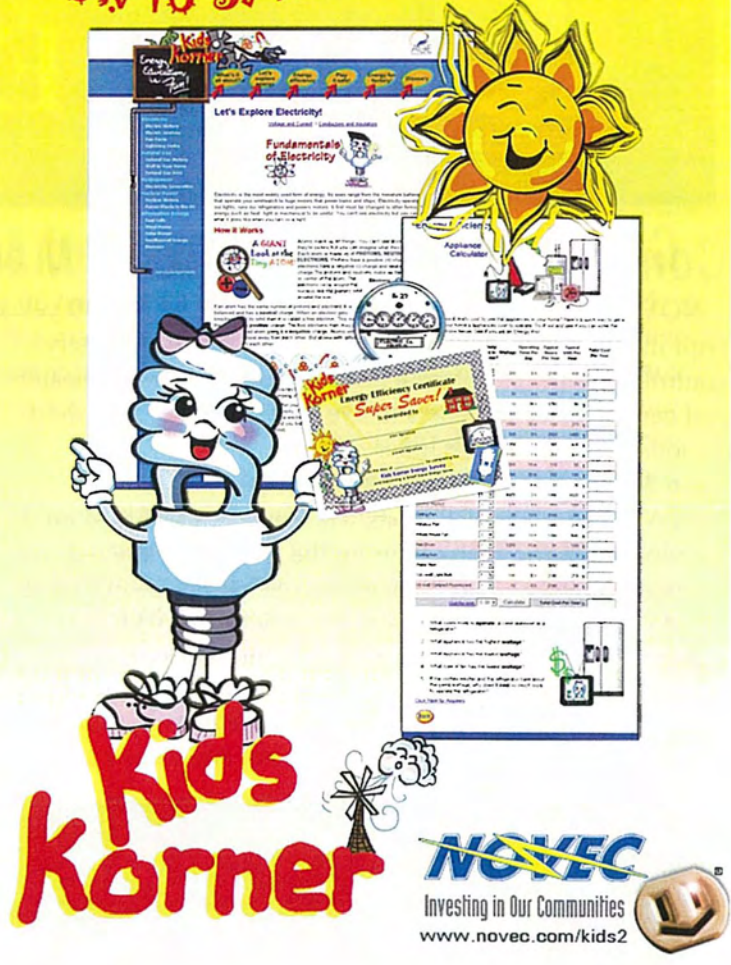
◆ Make sure outdoor lights are turned off during the day. Use motion-detector lights or timer switches.

◆ Don't leave windows or outside doors open when the heat or air conditioning is on. This makes the systems work harder to heat or cool the house.

◆ Decide what you want from the refrigerator before opening — don't waste electricity standing there with the door open.

◆ Instead of cooking, once a week have a sandwich night.

Kids: Teach your parents how to **SAVE ELECTRICITY!**



**Kids Korner**  
Energy Efficiency Certificate  
Super Saver!

**NOVEC**  
Investing in Our Communities  
www.novec.com/kids2

**MANUFACTURERS COUPON EXPIRES DECEMBER 31, 2009**

**SAVE \$2.50**

on any GE ENERGY SMART®, ENERGY STAR® qualified compact fluorescent lighting product



Consumer: Coupon valid only on your purchase of any GE ENERGY SMART®, ENERGY STAR® qualified compact fluorescent lighting product. You pay sales tax. Coupon may not be reproduced or combined with another offer and is non-transferable. Void if transferred, exchanged, sold or reproduced. Offer limited to one purchase in U.S.A., its territories and military exchanges. Retailer: GE will reimburse you the face value plus 8¢ handling provided you have accepted this coupon in accordance with GE's Coupon Redemption Policy. Void where prohibited. Cash value 1/100 of 1¢. For copy of policy and/or coupon redemption mail to: GE Consumer & Industrial Lighting Products, P.O. Box 880650, El Paso, TX 88588-0650. Coupon expires: December 31, 2009 D204042 47509

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For additional information or to submit suggestions for future articles, contact: NOVEC Public Relations, P.O. Box 2710, Manassas, VA 20108, or smarrelli@novec.com.  
www.novec.com



September 2009

# What's CURRENT



## Conserve Energy with Load Management

NOVEC has been reducing energy use for the past 30 years with its Load Management program, which uses remotely controlled switches on participating customers' water heaters and central air conditioners to cycle electricity off for short periods during peak-use times.

### Load Management Holds Down Costs

NOVEC pays charges for its wholesale power based on the amount of electricity used during the five single highest-use hours of the year. Load Management helps reduce electricity use during these critical peak times, saving NOVEC — and customers — approximately \$4.7 million each year.

During peak-use times, NOVEC activates the 43,000 switches now installed in customers' homes to turn electric water heaters off for up to two hours, and cycle central air

conditioner compressors off for about 10 minutes every half-hour. The peak-use times usually occur only a few days each month, typically between 4 and 6 p.m. in the summer, and in the winter between 7 and 9 a.m. and 4 and 6 p.m. Most customers forget the switch is installed.

### Benefits for Customers

Not only do participating customers help conserve energy, stabilize rates, and reduce the chance of power shortages, they also receive free electric water heater repairs on the electric components (water heater tanks are not covered since they are a plumbing issue) and "first call response" service evaluation on the air conditioner.

### Join Today to Help Conserve Energy

For more information or to enroll in Load Management, visit [www.novec.com/loadmanagement2](http://www.novec.com/loadmanagement2) or call 703-392-1503 or 1-888-335-0500, ext. 1503.

## Peak Managers



### You've Got the Power. Use it Wisely.

Energy is most expensive when use is the greatest. When NOVEC has to buy extra power during peak demand times, the cost is borne by our customer-owners. But there is a way to lower that cost. Our first load management switch was installed in 1979, and today more than 43,000 switches on customers' water heaters and air conditioners help neighbors do their part to improve system efficiency, and save NOVEC nearly \$4.7 million a year in peak demand charges. Turn your home into a Peak Manager by controlling energy use - and costs - now. Details at [www.novec.com/loadmanagement2](http://www.novec.com/loadmanagement2).



## \$12.8 Million CASH→BACK Return

NOVEC's board of directors approved a regular CashBack return for September. Approximately \$12.8 million in CashBack is being distributed to customers who were on the NOVEC system between 1990 and 2008. Current customers receive a credit on September bills; former customers will be mailed a check.

### What is CashBack?

As a not-for-profit business, NOVEC allocates to customers any revenue that is received over and above the cost of doing business. This extra revenue, or margins, is proportionately held in a CashBack account for each customer. NOVEC retains some of these margins to fund expansion and maintenance of the system and for extreme emergency service restoration. The NOVEC board approves CashBack returns as financial conditions permit.

## NOVEC Annual Meeting

Wednesday, Sept. 23, 2009

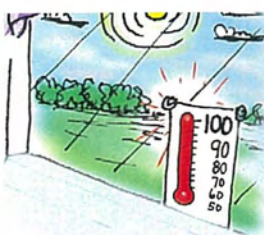
Dinner: 6 p.m. ~ Meeting: 7:30 p.m.

Inclement weather make-up date: Oct. 21

C.D. Hylton High School

14051 Spriggs Road, Woodbridge, VA 22193





## Keep Cool with Summer Weatherization Tips

**P**erforming a few simple weatherization procedures can help keep cool air in and hot air out during the summer months.

**SEAL LEAKS.** Use weather-stripping and caulk to seal air leaks around doors and windows.

**SEAL DUCTS.** In a typical house about 20 percent of the air moving through the ducts is lost due to leaks. Exposed ducts in attics, basements, crawl spaces, and garages can be repaired by sealing the leaks with duct sealant (also called duct mastic).

**ADD INSULATION.** Many older homes have less insulation than new homes, but adding insulation to a newer home may also pay for itself within a few years. Experts recommend an attic insulation level of R-49 for homes in Northern Virginia.

**CHANGE THE AIR FILTER.** Check the filter every month. If it looks dirty, change it. At a minimum, change the filter every three months. A dirty filter wastes energy by slowing air flow, causing the system to work harder to keep the house cool.

Power   
Use it Wisely

### GET AN HVAC CHECKUP.

Hiring a professional to perform an HVAC maintenance review can prevent a minor problem from turning into a major one.

### OTHER STAY-COOL TIPS

- ◆ Use the microwave or grill instead of the conventional oven.
- ◆ Close blinds or drapes to block sunlight. Direct sunlight can raise the temperature of a room by 10 to 20 degrees.
- ◆ Turn the thermostat up to 78 for optimal savings. Each degree below 78 increases energy use by 3 to 5 percent.
- ◆ Use a programmable thermostat to turn the air conditioner up or down based on when family members are home.
- ◆ Use a ceiling fan blowing down to send air through the room.

Visit [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2) for more energy-saving tips, or try the U.S. Department of Energy's consumer Web site at [www.energysavers.gov](http://www.energysavers.gov).

**Mr. and Mrs. Carmine and Lucia Delgenio of Gainesville are the most recent winners of NOVEC's quarterly new customer survey drawing. They received a \$25 Lowe's gift certificate.**

## Customers Must Observe Proper Clearances Around Utility Enclosures

**C**ustomers with a green metal utility enclosure on their property must comply with NOVEC's specific guidelines concerning landscaping and structures built around these units.

The clearance requirements are illustrated on a warning decal located on the door of each enclosure. These

clearances—5 feet away from all sides and 10 feet from each door—are necessary to ensure NOVEC crews have adequate access to maintain and safely work on the equipment. NOVEC's established easements legally protect these clearance requirements.

### Enclosure Painting Underway in Centreville

Crews are painting all NOVEC enclosures in the Centreville area during the spring and summer months. Plant material or structures not meeting the required clearances will be removed or trimmed as necessary. Customers will be notified with a door hang tag after clearing has been completed. The warning decal on all NOVEC enclosures serves as the official notification for customers to keep these boxes clear at all times.

For more information, visit [www.novec.com](http://www.novec.com) (click on "Environmental Management") or contact the right-of-way department at 703-335-0500, 1-888-335-0500, extension 1633 or 1661, or [novecrightofway@novec.com](mailto:novecrightofway@novec.com).



**We need room to work safely on this device. Please keep shrubs and structures 10 feet away from the side with doors and 5 feet from the other sides.**

**Obstructions may be damaged or removed during service restoration or maintenance.**

**NOVEC**  
Investing in Our Communities



For additional information or to submit suggestions for future articles, contact NOVEC Public Relations, P.O. Box 2710, Manassas, VA 20108 or send e-mail to: [ssmarrelli@novec.com](mailto:ssmarrelli@novec.com). Visit [www.novec.com](http://www.novec.com)



May 2009

# C What's CURRENT

**NOVEC**

Use It Wisely



## Visit [www.novec.com](http://www.novec.com) for Energy Savings



**Home Energy Calculator**

home energy use costs at your fingertips

NOVEC's new online Home Energy Calculator provides customers with an overall picture of a home's energy use as well as recommend changes to improve energy savings.

Customers can access the Home Energy Calculator at

[www.novec.com](http://www.novec.com) by clicking on "Energy-Saving Calculators." Once the onscreen form is complete, customers can click "View Report" to get a summary of the home's energy use.

The summary also provides charts showing a break-down of total annual energy use by appliance or system type, along with suggested changes to improve energy savings.

### Change Variables to Determine Increased Cost or Savings

Customers can change the variables in the calculator to determine how much an addition might increase the home's energy bill or what savings could be realized by lowering the thermostat or performing other conservation measures.

"This new tool is just one more way NOVEC is working to help customers manage their home energy costs," said Mike Curtis, vice president, public relations.

## Farm Credit Offers Loans for Residential Energy Efficiency Upgrades

Help has arrived for customers looking for ways to finance energy-saving upgrades to their homes. The Virginia, Maryland & Delaware Association of Electric Cooperatives recently joined forces with Farm Credit to offer loans for energy efficiency improvements. As a member of VMDAEC, NOVEC is participating in the program.



NOVEC customers can apply for Farm Credit loans to fund such projects as installing energy-efficient windows and doors, adding insulation, installing high-efficiency heating, air conditioning or ventilation systems, and purchasing ENERGY STAR appliances.

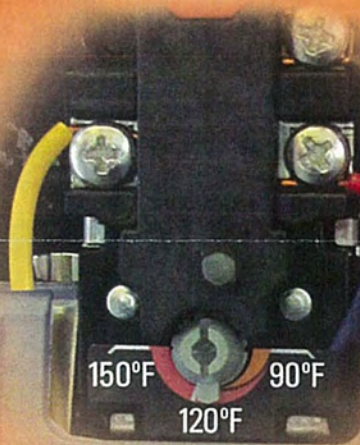
For more information, NOVEC customers can visit [www.farmcreditenery.com](http://www.farmcreditenery.com), or call 1-800-919-FARM.

**All NOVEC Offices Closed  
Monday, May 25—Memorial Day**

To report power outages,  
call 703-335-0500 or 1-888-335-0500

24 hours a day, seven days a week, even on holidays.

## Dial Down



### You've Got the Power. Use it Wisely.

Set your water heater temperature to 120°. Turn off the water heater when you are away from home for more than a few days. Dialing down your hot water use conserves energy and saves you money. We all have the power to reduce energy waste. Visit [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2) and let us show you many more ways to improve electric energy efficiency.

**NOVEC**

Use It Wisely







**Install Compact Fluorescent Light Bulbs.** CFLs use 75 percent less energy and typically last 15 percent longer than regular bulbs.

**Turn it Off and Unplug it.** Turn off lights in empty rooms. Unplug

the spare refrigerator when it's not needed—keeping those extra drinks cold adds 10 to 25 percent to the electric bill. Turn off kitchen and bath ventilating fans after they've done their job.

**Pull the Plug on Energy Phantoms.** Many electronics such as the computer, TV, VCR, and phone charger are "energy phantoms" that consume electricity even when turned off. Be sure to unplug them or use power strips to switch off several items at once.

**Put the Computer to Sleep.** Use the energy-saver mode to power down the PC when it's not in use for five to 15 minutes. When finished for the day, turn the computer off. Don't leave it in sleep mode overnight as it still uses a small amount of power.

**Insulate the Attic.** An attic insulation level of R-49 is recommended for the Northern Virginia area. Proper attic sealing and insulating can save up to 10 percent annually on energy bills.

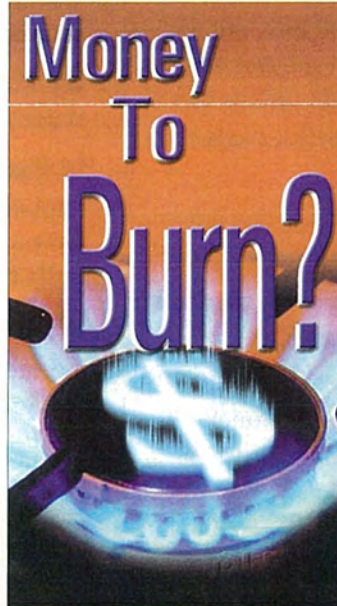
**Eliminate Drafts.** Seal drafts around door frames and windows with caulk or weather-stripping.

**Maintain Appliances.** Keep appliances clean and in good repair. Clogged air vents or worn-out parts make motors work harder, which wastes energy.

**Plant Trees.** Plant trees, shrubs, and hedges around a home to reduce the amount of sunlight that comes in, keeping the home cooler in summer.

For more energy-saving tips visit [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2) or [www.energy.gov/energytips.htm](http://www.energy.gov/energytips.htm).

*Celebrate Earth Day on April 22, 2009*



Natural gas is one of the most efficient fuels for heating water, cooking, and warming homes.

Unfortunately, when you need it the most, natural gas prices tend to increase. NOVEC Energy Solutions offers a way to keep the gas flowing to your home without cost fluctuation. NES allows you to lock in a fixed price for your supply of natural gas with our PriceOne Plan. You pay the same low price for natural gas throughout the year, no matter how volatile prices may become.

**NOVEC Energy Solutions**  
the neighborhood expert

For More Information:

[www.novecenergysolutions.com](http://www.novecenergysolutions.com) • 703-392-1677,  
1-888-627-7283 or send e-mail to [NES@novec.com](mailto:NES@novec.com)

## Spring Landscaping — Plant the Right Tree in the Right Place

30-foot wide right of way  
**No new trees allowed in this area**

Maximum height 50 feet  
Maximum height 40 feet  
Maximum height 20 feet

<b>Tall Trees (50 feet):</b>	<b>Medium Trees (40 feet):</b>	<b>Small Trees (20 feet):</b>
• Maple • Oak	• Bradford Pear	• Redbud
• Spruce • Pine	• Crab Apple	• Dogwood

Spring is an ideal time for planting since there is an abundance of moisture and sunlight to promote new root and shoot growth. Keep in mind that no trees or shrubs may be planted within NOVEC utility easements.

For more information, visit [www.novec.com](http://www.novec.com) (click on residential customers → environmental management → landscape standards). Or contact the right-of-way department at 703-335-0500, 1-888-335-0500, extension 1633 or 1661, or [novecrightofway@novec.com](mailto:novecrightofway@novec.com).

**NOVEC**  
Investing in Our Communities



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Visit [www.novec.com](http://www.novec.com)



April 2009

# C What's CURRENT

**NOVEC**  
Use It Wisely

## Bill Payment Options for Any Lifestyle

**W**ith NOVEC's wide variety of payment options, there's one to suit every customer's lifestyle.

**e-Billing** – Receive, view and pay bills online. It's fast, easy and free at [www.novec.com](http://www.novec.com). Sites such as Yahoo, banks and credit unions can also

be used, but may charge a fee. *After three months, customers no longer receive a paper bill in the mail.*

**e-CHECK** – To eliminate check writing, NOVEC can automatically deduct the bill amount each month from a bank account.

**Speedpay** – Pay bills 24 hours a day, seven days a week with credit card, check or debit card via telephone or online. Speedpay charges \$2.45 per transaction. Visa, MasterCard and Discover credit cards are accepted, along with STAR, Honor, Visa, MAC, NYCE, Magic Line and Yankee 20 debit cards.

**Levelized Billing** – Prevent drastic changes in monthly payments, even during the coldest or hottest months of the year. The monthly bill is based on a rolling 12-month average of the previous 11 months and the current month's billing amounts.

**By Mail** – Use the envelope enclosed with the billing statement and include the return portion of the bill.

**In Person** – Payments can be made during business hours at the Lomond or Minnieville offices. Most NOVEC offices also have a drop-box for payments anytime day or night (except the Balls Ford Corporate Center).

**For More Information** – Visit [www.novec.com](http://www.novec.com), send e-mail to [customerservice@novec.com](mailto:customerservice@novec.com), or call 703-335-0500 or 1-888-335-0500.

## Customers Help Neighbors Stay Warm



**C**ustomers participating in Operation Round Up helped more than 200 families in need of fuel assistance pay their 2008-'09 winter heating bills. Through ORU, customers and NOVEC contributed \$50,000 to six local social service agencies which then distributed the money to local low-income families.

Operation Round Up participants authorize NOVEC to round up their electric bills to the nearest dollar, with the extra change going to the ORU fund.

"Since NOVEC absorbs all administration expenses, every penny customers donate goes into the fund," explained Donna Snellings, ORU coordinator.

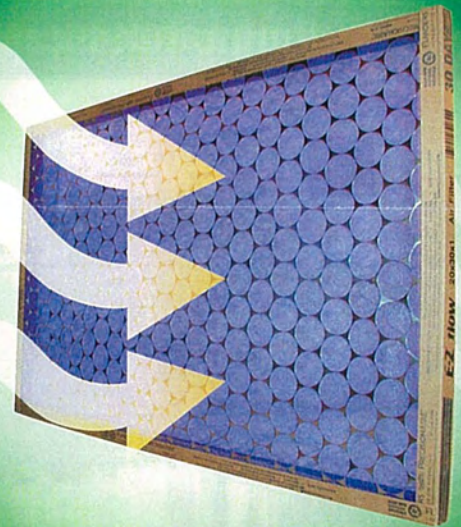
### To Join ORU:

- ✓ Log on to [www.novec.com/oru2](http://www.novec.com/oru2)
- ✓ Call the customer service center at 703-335-0500 or 1-888-335-0500, Monday through Friday, 7 a.m. to 7 p.m.

**All NOVEC Offices Closed  
Monday, May 25 – Memorial Day**

To report power outages, call 703-335-0500 or 1-888-335-0500  
24 hours a day, seven days a week, even on holidays.

## Breathe Easy



### You've Got the Power. Use it Wisely

Checking your HVAC filters monthly and cleaning or replacing them as needed does more than keep indoor air clean. It also helps your system run more efficiently. That means you'll breathe easier, conserve energy, and save money. We all have the power to reduce energy waste. Visit [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2) and let us show you many more ways to improve electric energy efficiency.

**NOVEC**  
NORTHERN VIRGINIA ELECTRIC COOPERATIVE  
Use It Wisely



## Tax Credits for Energy-Saving Upgrades

The Emergency Economic Stabilization Act of 2008 includes provisions to give homeowners federal tax credits for installing energy-efficient materials and systems in their homes in 2009.

Qualifying improvements include installation of energy-efficient windows, doors, roofs, insulation, heating and cooling systems, biomass stoves, and non-solar water heaters. Solar photovoltaic systems, among other more high-end systems, also qualify for tax credits.

To view a chart that summarizes the credits for homeowners, visit [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2). For more details about the specific tax credits, visit [www.energystar.gov](http://www.energystar.gov).

## Outdoor Electrical Safety: Look Up and Look Out!

- When using ladders, pruners or other tools, be sure to look up and look out for overhead power lines.
- When installing antennas, satellite dishes or other items on the roof, look out for power lines.
- When using a dump truck, crane or other tall equipment, steer clear of power lines.
- If tree limbs are near power lines, don't try to trim them. Call NOVEC for a free tree evaluation.
- Remember the hidden danger of underground power lines. Before digging in the yard for landscaping or doing other excavation work, call Miss Utility at 811.

## Power Use it Wisely

**W**ater heating is typically the third largest energy expense in a home, after heating and cooling, accounting for nearly 14 percent of the utility bill.

Try one or more of these energy-saving strategies to lower water heating bills.

▶ **Lower the Temperature.** Some manufacturers set water heater thermostats at 140, but most households only need them set at 120. Water heated to 140 also poses a safety hazard — scalding.

▶ **Insulate the Water Heater.** Adding insulation can reduce heat loss by 25 to 45 percent. Most water heaters less than 10 years old are insulated. If it's older than that and feels hot to the touch, consider adding insulation.

▶ **Fix Leaks.** Repair leaks in pipes, faucets or showerheads. A leak of one drip per second can cost \$1 per month. If the water heater tank leaks, it's time for a new water heater.

▶ **Use Low-Flow Fixtures.** Low-flow faucets and showerheads are available for about \$10 to \$20 and achieve water savings of 25 to 60 percent.

▶ **Purchase Energy-Efficient Appliances.** The biggest cost of washing dishes and clothes comes from the energy required to heat the water. Using energy-efficient dishwashers and clothes washers can reduce energy expenses.

## Water Heater Energy Savers



▶ **Install a Timer.** With an electric water heater, install a timer that turns it off at night when hot water use is minimal.

### NOVEC Solutions Offers Energy-Efficient Water Heaters

NOVEC Solutions offers several models of electric or gas water heaters for purchase. Considerable research was done to ensure these products meet or exceed recommended energy-efficiency standards to help save customers money.

To learn more about the products offered by NOVEC Solutions, visit [www.novec.com](http://www.novec.com), send e-mail to [novecsolutions@novec.com](mailto:novecsolutions@novec.com), or call 703-392-1503 or 1-888-335-0500, ext.1503.

### For More Information

For more energy-saving tips, visit [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2) or the U.S. Department of Energy's consumer Web site at [www.eere.energy.gov/consumer](http://www.eere.energy.gov/consumer).



### E-What's Current Now Available

Sign up to receive an e-mail version of *What's Current* at [www.novec.com](http://www.novec.com). Past issues are also available online.

For additional information or to submit suggestions for future articles, contact NOVEC Public Relations, P.O. Box 2710, Manassas, VA 20108 or send e-mail to: [ssmarrelli@novec.com](mailto:ssmarrelli@novec.com). Visit [www.novec.com](http://www.novec.com)





March 2009

# What's CURRENT

**NOVEC**  
Use It Wisely

## Keeping Warm This Winter is an Extra Challenge for the Less Fortunate



**T**he extremely cold temperatures this winter have made it even more difficult for some families to pay their electric bills. NOVEC customers can help by donating to the Operation Round Up program.

“Colder weather and the economic downturn have caused an increased number of area residents to ask for heating assistance. Unfortunately, contributions to ORU are down this year,” says Donna Snellings, NOVEC public relations liaison.

By participating in ORU, customers authorize NOVEC to round up their monthly electric bills to the next dollar. For example, if the bill is \$69.54, NOVEC rounds it up to \$70 and the extra 46 cents goes to the ORU fund.

NOVEC allocates ORU money to local social service agencies for distribution to local residents.

### To Join ORU:

- ✓ Log on to [www.novec.com/oru2](http://www.novec.com/oru2)
- ✓ Call the customer service center at 703-335-0500 or 1-888-335-0500, Monday through Friday, 7 a.m. to 7 p.m.

## Colder Temperatures = Higher Bills

**J**anuary 2009's average low was 22 degrees in Northern Virginia. Along with this extremely cold weather came increased power consumption, resulting in higher than normal electric bills for many customers. On average, NOVEC bills increased 20 to 30 percent when compared to the same time period in 2008.

“Anytime it drops below 30 degrees, heat pumps start using auxiliary electric back-up heat,” explains Bob James, NOVEC business development representative. The auxiliary mode consumes more electricity than the standard mode, resulting in higher electric bills.

Even natural gas heating systems typically use electricity for some functions, such as the fan, which may run almost continuously on very cold days.

**January's average low of 22 degrees resulted in increased bills for many customers.**

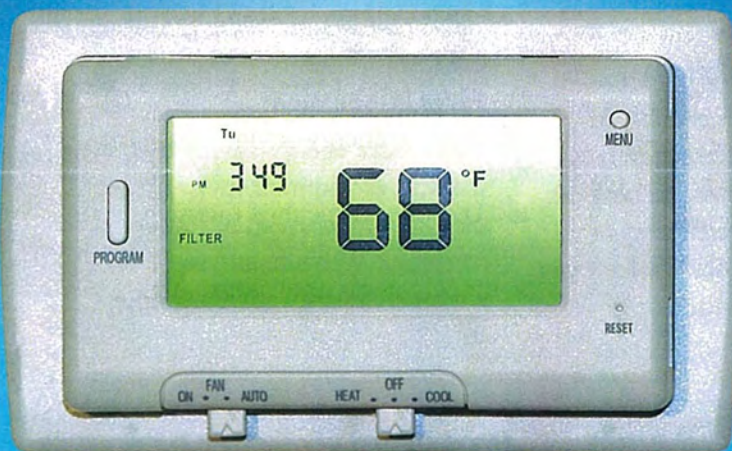
### Keep Bills Predictable with Levelized Billing

To keep electric bills more predictable, consider enrolling in NOVEC's levelized billing program. Levelized bills are based on a rolling 12-month average to prevent drastic changes in the bill amount, even in the coldest or hottest months of the year. For more information, visit [www.novec.com](http://www.novec.com).

### Energy Conservation Helps Keep Bills Stable

Energy conservation can also help keep electric bills more stable during extremely cold or hot weather. For easy to follow energy-saving tips and an online energy audit, visit [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2).

## Cool It



## You've Got the Power. Use it Wisely.

Do you know the difference between 68° and 71°? The answer isn't three. It's more like 10% off your electric bill. Lowering your winter thermostat setting to 68 will conserve energy, keep you comfortable and save money. NOVEC reliably delivers the power to run homes and businesses in Northern Virginia and reminds customers that we all have the power to reduce energy waste. Visit our Web site at [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2) and let us show you many more ways to improve electric energy efficiency.

**NOVEC**  
Use It Wisely





## Watch Those Video Games — They're Energy Hogs

All those video games the kids received over the holidays can be real energy hogs. For increased energy efficiency, be sure the kids turn

the games off when they're finished. Leaving a video console on can add \$100 to the average consumer's annual electric bill, according to the Natural Resources Defense Council.

Nationally, video game consoles consume about as much electricity every year as all the homes in San Diego. The Sony PlayStation 3 and Microsoft Xbox are particular energy hogs. "These two systems can each consume more than 1,000 kilowatt-hours per year if left on all the time, which is equal to the annual energy use of two new refrigerators," the NRDC report said.

To further reduce energy loss, use the automatic power-down feature that turns off the PlayStation and Xbox when they are left idle. Although the feature is not available with the Nintendo Wii, this system uses significantly less power than the Xbox or PlayStation, according to the NRDC.

Power  Use it Wisely!

For more energy-saving tips, visit [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2)

## Tree Trimming and Removal: Leave it to the Professionals

Nearly every day in the United States, injury or death occurs when inexperienced property owners attempt to trim or cut down trees. It's important to recognize the complexity of this work and leave it to professionals.

NOVEC employs Asplundh Tree Experts and Lewis Tree Service to perform the majority of tree-related maintenance on the electric distribution system. Both of these companies have an extensive safety and training program for employees.

### Trees Close to Power Lines? Contact NOVEC First

Customers considering tree trimming or removal must keep in mind that only NOVEC contractors are allowed to remove or trim trees that are within 10 feet of overhead power lines. It is illegal and potentially dangerous for a customer or company other than Asplundh or Lewis to conduct work in this space. Customers needing trees removed or trimmed that are within 10 feet of power lines must contact NOVEC for a tree evaluation. If the trees are potentially hazardous to the electric distribution system, NOVEC may have them removed or trimmed at no cost to the customer.

### Hire Reputable Tree Company

Before hiring a tree care company, be sure it is properly licensed, insured, and uses proper safety equipment. The company's safety equipment should include protective gear such as hard hats, gloves, safety glasses, hearing protection, and chainsaw chaps.

### For More Information

For more information or to request evaluation of a tree for potential trimming or removal, visit [www.novec.com/forms/request.cfm](http://www.novec.com/forms/request.cfm) or contact the NOVEC Right-of-Way Department at 703-335-0500 or 1-888-335-0500, extension 1633 or 1661, or via e-mail to [novecrightofway@novec.com](mailto:novecrightofway@novec.com).




Trees within 10 feet of power lines can only be trimmed or removed by NOVEC contractors



If natural gas prices have left you in a lurch, it's time to call NOVEC Energy Solutions. NES, a wholly owned subsidiary of NOVEC, offers low, one year fixed price contracts for natural gas supply. By locking in a fixed price for natural gas supply, you can avoid large fluctuations in your monthly natural gas bills.

Lock in now, and enjoy the peace of mind of knowing that no matter how volatile natural gas prices may become, you will be protected.

**NOVEC Energy Solutions**  
the neighborhood expert 

For More Information:

[www.novecenergysolutions.com](http://www.novecenergysolutions.com) • 703-392-1677,  
1-888-627-7283 or send e-mail to [NES@novec.com](mailto:NES@novec.com)

For additional information or to submit suggestions for future articles, contact NOVEC Public Relations, P.O. Box 2710, Manassas, VA 20108 or send e-mail to: [ssmarrelli@novec.com](mailto:ssmarrelli@novec.com).

Visit [www.novec.com](http://www.novec.com)





February 2009

# What's CURRENT

**NOVEC**  
Use It Wisely

## E-What's Current Now Available

About 30,000 NOVEC customers, including those who pay their electric bill online and no longer receive paper bills in the mail, are now receiving this publication via e-mail. This new service launched in December 2008.

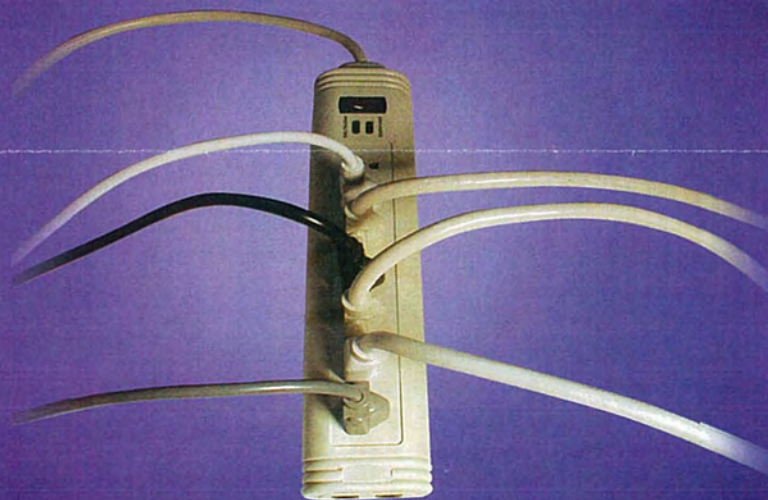
NOVEC customers can sign up to receive the e-mail version of *What's Current* and view past issues online at [www.novec.com/page.cfm?id=110](http://www.novec.com/page.cfm?id=110).

## Presidents Day Office Closing Monday, Feb. 16

To report an outage or emergency, call  
703-335-0500 or toll-free 1-888-335-0500

**Ms. Bridget Woodson of Leesburg is the most recent winner of NOVEC's quarterly new customer survey drawing. She receives a \$25 Lowe's Gift Certificate.**

## Power Drain



You've Got the Power. Use it Wisely.

Appliances and chargers in standby mode drain power even when not in use. These vampire devices continually draw energy, but you have the power to control that loss. Simply unplug or turn off electric devices when they are not in use and reduce the power drain. Northern Virginia Electric Cooperative reliably delivers power to homes and businesses. Now our customers have even more power. It's the power to reduce electric energy waste. Visit [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2) to learn many more ways to improve electric energy efficiency.

Never overload an electric circuit. Check with an electrician to determine plug safety in your home.

**NOVEC**  
Use It Wisely

## An Opportunity for High School Sophomores and Juniors

High school sophomores and juniors with an interest in government and politics who would like to visit the seats of government in Washington, D.C., and Richmond, Va., can apply for NOVEC's Youth Tour program. This all-expense-paid trip is open only to students who are NOVEC customers.

June 14-18, 2009, Youth Tour participants will visit Washington, D.C., along with more than 1,400 of their peers from across the U.S. to learn about electric cooperatives, go sightseeing, and meet their Congressional representatives.

In February 2010, Youth Tour delegates will spend a day at the Virginia General Assembly in Richmond, meeting with their local legislators, attending sessions, and listening to committee hearings.

### Three easy ways to receive an application:

- ▶ Visit [www.novec.com](http://www.novec.com) and download the application form.
- ▶ E-mail a request for application to [dsnellings@novec.com](mailto:dsnellings@novec.com).
- ▶ Write to Donna Snellings, Youth Tour coordinator, P.O. Box 2710, Manassas, VA 20108 (include name, address, phone number and NOVEC account number).

**YOUTH TOUR APPLICATION DEADLINE: MARCH 13, 2009**

## Considering a Career Move?

Visit [www.novec.com](http://www.novec.com) to learn more about NOVEC as a company, view open positions in the Careers section of the site, and submit your résumé through the online application process.

"NOVEC is a great place to work," says Marlane Parsons, vice president, organizational development. "We hope you will remember us when looking for your next job."





# Money To Burn?

Natural gas is one of the most efficient fuels for heating water, cooking, and warming homes. Unfortunately, when you need it the most, natural gas prices tend to increase. NOVEC Energy Solutions offers a way to keep the gas flowing to your home without unit cost fluctuation. NES allows you to lock in a fixed price for your supply of natural gas with our PriceOne Plan. You pay the same low price for natural gas throughout the year, no matter how volatile prices may become.



For More Information:  
[www.novecenergysolutions.com](http://www.novecenergysolutions.com) • 703-392-1677,  
 1-888-627-7283 or send e-mail to [NES@novec.com](mailto:NES@novec.com)



## Office Closing Presidents Day Monday, Feb. 16

To report an outage or emergency call  
 703-335-0500  
 or toll-free  
 1-888-335-0500

## Power Use it Wisely

# Resolutions for an Energy-Efficient New Year

*When making New Year's resolutions, be sure to include energy-efficiency changes.*

- ⇒ Service the furnace or heat pump annually by a professional.
- ⇒ During the winter, set the thermostat at 68 F when someone is home and 60 F when the house is empty or during sleeping hours. Install a programmable thermostat to do this automatically.



**CFLs use up to 75 percent less energy and last 10 times longer than incandescent bulbs**

- ⇒ Clean or change the furnace filter every month.
- ⇒ Set the water heater temperature to 120 F.
- ⇒ Install compact fluorescent light bulbs.
- ⇒ Make it a habit to turn off lights and appliances when no one is using them.

For more energy-saving tips, visit [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2)

## New NOVEC Tree Trimming Contractors

NOVEC customers may see some new tree trimming contractors working on or near their property. Lewis Tree Service joins Asplundh Tree Experts as the contractors for NOVEC's tree trimming maintenance work.

Customers are notified of tree crews working on or near their property through information on the monthly bill. Tree-trimming crews are required to trim or remove trees along NOVEC's power lines in strict accordance to their contract. Easements attached to overhead power line rights of way grant NOVEC the legal right to perform this work.

Asplundh will routinely trim trees along the 2,000 miles of NOVEC's overhead power lines during the next 3<sup>1/2</sup> years.

Lewis Tree Service will perform all off-schedule trimming, hazard tree removals, and work related to the construction or upgrade of new or existing power lines. Lewis Tree crews may be working in all areas of the NOVEC system based on



Asplundh Tree Experts and Lewis Tree Service are NOVEC's tree-trimming contractors.



specific job requirements, with no notification given to customers.

"NOVEC is confident these contractors will provide a safe, high-quality response to tree-related situations," said Rick Carpenter, NOVEC's contracted certified arborist.

For more information about NOVEC's tree trimming program, visit [www.novec.com](http://www.novec.com) or contact the Right-of-Way Department at 703-335-0500 or 1-888-335-0500, extension 1633 or 1661, or via e-mail to [novecrightofway@novec.com](mailto:novecrightofway@novec.com).



For additional information or to submit suggestions for future articles, contact NOVEC Public Relations, P.O. Box 2710, Manassas, VA 20108 or send e-mail to: [ssmarrelli@novec.com](mailto:ssmarrelli@novec.com).

Visit [www.novec.com](http://www.novec.com)



January 2009

# What's CURRENT

**NOVEC**  
Investing in Our Communities

## Special **CASH**→**BACK** Refund In December

**D**espite a slowing of the Northern Virginia economy, the NOVEC board of directors authorized a special \$1.53 million CashBack refund to customers in December 2008. Current customers who were on the NOVEC system anytime between 1990 and 2007 received the CashBack as a credit on their December 2008 bills. This refund brings NOVEC's total CashBack to customers in 2008 to approximately \$26.5 million.

"The local economy is unstable, but NOVEC's financial condition is strong," says Stan Feuerberg, NOVEC president/CEO. "Our entire NOVEC team is

committed to following sound fiscal practices. We owe that to our customers. We know many are facing economic hardships. Therefore, in the spirit of the

**"...NOVEC's financial condition is strong,"**

*Stan Feuerberg, NOVEC president/CEO*

holiday season, the board of directors voted to give customers this special CashBack refund."

### **What Is CashBack?**

As a not-for-profit business, NOVEC allocates to customers

any revenue that exceeds the cost of doing business. These margins are proportionately allocated to and held in a CashBack account for each customer. Some of the margins fund the expansion and maintenance of our electric distribution system and extreme emergency service restoration.

The NOVEC board of directors approves CashBack for distribution when financial conditions permit.

## NOVEC Announces Scholarship

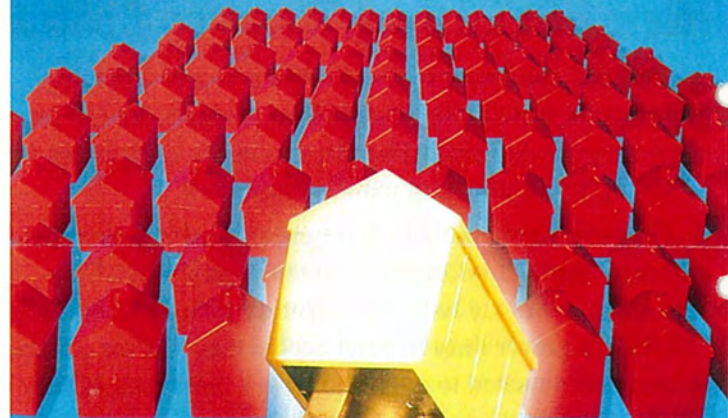
NOVEC's Dollars for Scholars program awards a \$1,500 scholarship (up from \$1,250 last year) to a college-bound senior in each of the counties where NOVEC

provides electric service — Fairfax, Fauquier, Loudoun, Prince William, and Stafford — and the City of Manassas Park. In addition, a single \$1,500 scholarship is awarded to a home-schooled or private school student. In Prince William and Fairfax counties, where the majority of NOVEC customers live, two \$1,500 scholarships are awarded. Children of NOVEC employees may also apply for a single \$1,500 scholarship. An additional \$1,500 Garber scholarship is awarded to the top outstanding student, for a total scholarship of \$3,000.

For complete scholarship requirements and application form, send e-mail to [dsnellings@novec.com](mailto:dsnellings@novec.com), call 703-392-1511 or 1-888-335-0500, ext. 1511, or visit [www.novec.com](http://www.novec.com).

Application deadline is April 3, 2009.

# It's Your Move!



You've Got the Power. Use it Wisely.

**NOVEC**  
Investing in Our Communities



## Use it Wisely

## HEAT SMARTLY TO STAY WARM AND CONSERVE ENERGY

The average family spends \$1,900 a year on energy bills, much of which goes to heating. Follow these four steps to help keep warm this winter.

**Home Sealing.** To reduce energy costs year-round, seal air leaks and add insulation. Pay special attention to the attic and basement, where the biggest gaps and cracks are often found. This will keep warm air inside where it belongs and help heating equipment perform more efficiently.

**Equipment Maintenance.** Dirt and neglect are the top two causes of system failure. Get a checkup of the heating system to ensure it's performing efficiently and safely. Clean or replace the air filter to help lower energy bills and maintain better indoor air quality.

**Ask for ENERGY STAR.** Look for the ENERGY STAR logo when purchasing light fixtures, heating and cooling equipment, windows, and more. They are the most energy-efficient products and will help save money on energy bills.

**Thermostat Use.** Install a programmable thermostat to save energy all day, especially when no one is home. When properly used, a programmable thermostat can save as much as \$150 a year in energy costs.

For more information, visit [www.novec.com/useitwisely2](http://www.novec.com/useitwisely2)

## Storm Kit ... Be Prepared!

IF YOUR LIGHTS GO OFF, have the following on hand:

- ✓ Portable battery-powered radio and clock
- ✓ Flashlights and extra batteries
- ✓ Candles and matches
- ✓ Manual can opener
- ✓ Non-perishable food such as canned meats, tuna fish, and peanut butter
- ✓ Any special dietary foods, baby food, and medicine
- ✓ As much clean water as possible stored in clean, non-breakable containers
- ✓ Blankets and sleeping bags
- ✓ Paper plates and plastic utensils

During major outages, listen for updates on local radio stations and visit [www.novec.com](http://www.novec.com) to view NOVEC's outage map.

## Holiday Office Closings

Wednesday, Dec. 24

Thursday, Dec. 25

Thursday, Jan. 1

To report an outage or emergency call  
703-335-0500  
or toll-free  
1-888-335-0500



If natural gas prices have left you in a lurch, it's time to call NOVEC Energy Solutions. NES, a wholly owned subsidiary of NOVEC, offers low, one year fixed price contracts for natural gas supply. By locking in a fixed price for natural gas supply, you can avoid large fluctuations in your monthly natural gas bills.

Lock in now, and enjoy the peace of mind of knowing that no matter how volatile natural gas prices may become, you will be protected.

**NOVEC Energy Solutions**  
the neighborhood expert

For More Information:

[www.novecenergysolutions.com](http://www.novecenergysolutions.com) • 703-392-1677,  
1-888-627-7283 or send e-mail to [NES@novec.com](mailto:NES@novec.com)

## RECYCLE HOLIDAY GREENERY AT NOVEC

Monday, Dec. 29, 2008 - Wednesday, Jan. 7, 2009

5399 Wellington Branch Road, Gainesville 20155

When the holidays are over don't throw the tree, wreath, and other greenery in the trash. Instead, bring all fresh greenery to NOVEC's Gainesville office for recycling. The greens are chipped to create wood chip mulch.

Greenery can be dropped off at the Gainesville office parking lot in the area outlined with safety cones to the right of the building.

For more information, contact NOVEC at 703-335-0500 or 1-888-335-0500, extension 1633 or 1661.



For additional information or to submit suggestions for future articles, contact NOVEC Public Relations, P.O. Box 2710, Manassas, VA 20108 or send e-mail to: [ssmarrelli@novec.com](mailto:ssmarrelli@novec.com)  
Visit [www.novec.com](http://www.novec.com)



December 2008

# What's CURRENT



## NOVEC Logo Now Visible From I-66

Commuters may have noticed the new NOVEC logos on the office building that fronts I-66 just east of the Route 234 interchange.

They identify the new NOVEC Balls Ford Corporate Center, which opened in mid-November. Located in the new facility are the Organizational Development and Public Relations divisions, part of the Customer Service Center, and executive offices.

"This is a short-term solution to our office-space and business needs, while we look for a cost-effective long-term solution," says Stan Feuerberg, NOVEC president and CEO.



Bill payments will continue to be accepted at the Manassas Lomond Drive office and Minnieville office, but there are no plans to accept payments at the Balls Ford Road office.

### Walk-in Bill Payments Accepted at:

#### Manassas Office

10323 Lomond Drive  
Manassas, VA 20109

Lobby Hours: 8:15 a.m.–5 p.m.

Drop box available/Cash payments accepted

#### Minnieville Office

14500 Minnieville Road  
Woodbridge, VA 22193

Lobby hours: 8:15 a.m.–5 p.m.

Drop box available/Cash payments accepted

### Payment Drop Boxes Located at:

#### Gainesville Technical Center

5399 Wellington Branch Road  
Gainesville, VA 20155

#### Leesburg Office

349 East Market St.  
Leesburg, VA 20176

## Green Light



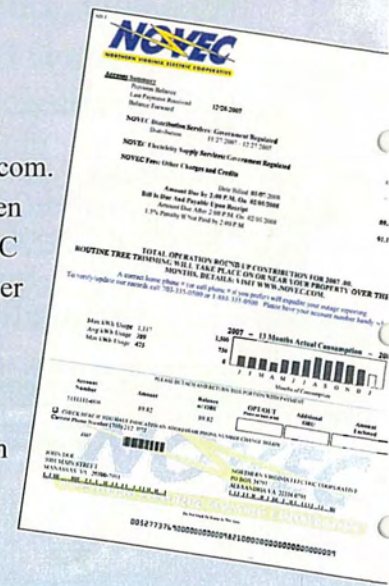
### You've Got the Power. Use it Wisely.

For 25 years NOVEC has made sure Northern Virginia has the power it needs to run a home or business. Now there's even more power for our customers. It's the power to reduce electric energy waste. CFL (Compact Fluorescent Light bulbs) are just one of many ways to use power more wisely. Visit our Web site, [www.novec.com/UseItWisely2](http://www.novec.com/UseItWisely2), and let us show you the many ways to improve your electric energy efficiency.



## NEED HELP UNDERSTANDING YOUR BILL?

To access a detailed description of how to read the monthly NOVEC billing statement, visit [www.novec.com](http://www.novec.com). Click on "Pay Your Bill," then "Understanding Your NOVEC Bill." Or contact the Customer Service Center at 703-335-0500, 1-888-335-0500, or [customerservice@novec.com](mailto:customerservice@novec.com) to request a copy of this guide.





### Stove and Oven Energy Savers

**Don't preheat:** Roasting turkey is a long, slow process, so no preheating is needed. Except for breads or pastries, there's usually no need to preheat the oven.

**Don't open the oven door:** Resist the temptation to peek. Instead, turn on the light and look through the oven window. Opening the door lowers the temperature by as much as 25 degrees, increasing cooking time and wasting energy.

**Use other appliances:** Microwave ovens use about 50 percent less energy than

conventional ovens. The microwave is most efficient for small items such as baking yams or steaming vegetables. For turkey or large items, the oven or stovetop is more efficient.

**Cook items together:** Bake several items together if there is enough space for heat to circulate.

**Cover pots and pans:** Use lids while cooking to retain heat and cook faster.

### Refrigerator Tips

**Keep the doors closed:** Leave the refrigerator and freezer doors closed as

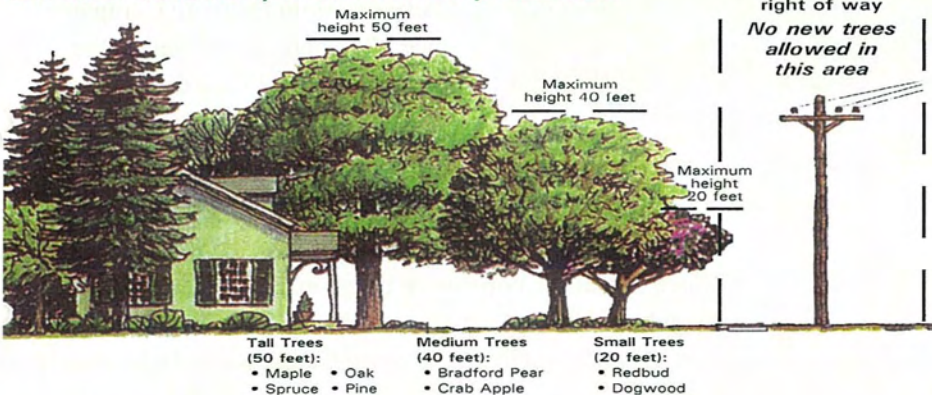
much as possible. However, keeping the door open for a longer time while taking out items is more efficient than opening and closing it several times.

**Don't keep the refrigerator too cold:** 37 F to 40 F is recommended for the refrigerator and 5 F for the freezer. Separate freezers should be kept at 0 F.



## Landscape Planning - Plant the Right Tree in the Right Place

Plant taller trees away from overhead power lines



Many experts agree that fall is an optimal time to plant trees and shrubs. Plants enter the dormancy stage during winter when no growth occurs in upper branches allowing a strong root system to develop.

**When planting trees or shrubs, keep in mind that no vegetation may be planted within utility easement**

For more information, consult the *Landscape Guidelines* brochure at [www.novec.com](http://www.novec.com) (click on residential customers → environmental management → landscape standards). Or contact the NOVEC Right-of-Way Department at 703-335-0500 or 1-888-335-0500, extension 1633 or 1661, or [novecrightofway@novec.com](mailto:novecrightofway@novec.com) to request a copy.

Khalil and Susan Askaryar of Aldie were the winners of NOVEC's quarterly new customer survey drawing. They won a \$25 gift certificate to Home Depot.

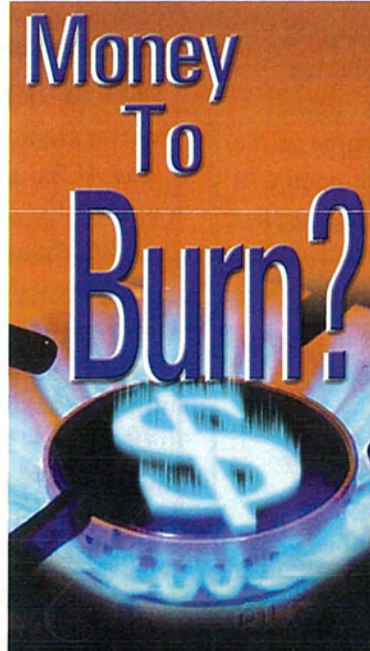
### Holiday Office Closings

Tuesday, Nov. 11  
*Veterans Day*

Thursday, Nov. 27  
Friday, Nov. 28  
*Thanksgiving*

Wednesday, Dec. 24  
Thursday, Dec. 25  
*Christmas*

To report an outage or emergency call  
703-335-0500 or  
toll-free 1-888-335-0500



Natural gas is one of the most efficient fuels for heating water, cooking, and warming homes. Unfortunately, when you need it the most, natural gas prices tend to increase. NOVEC Energy Solutions offers a way to keep the gas flowing to your home without the cost fluctuation. NES allows you to lock in a fixed price for your supply of natural gas with our PriceOne Plan. You pay the same low price for natural gas throughout the year, no matter how volatile prices may become.

**NOVEC Energy Solutions**  
*the neighborhood expert*

For More Information:  
[www.novecenergysolutions.com](http://www.novecenergysolutions.com) • 703-392-1677,  
1-888-627-7283 or send e-mail to [NES@novec.com](mailto:NES@novec.com)



For additional information or to submit suggestions for future articles, contact:  
NOVEC Public Relations, P.O. Box 2710, Manassas, VA 20108  
or send e-mail to: [ssmarrelli@novec.com](mailto:ssmarrelli@novec.com)  
Visit [www.novec.com](http://www.novec.com)



November 2008

# What's CURRENT

**NOVEC**  
The Powerful Choice



## House Elected Chairman of the NOVEC Board

At the October board of directors meeting, Wade House was elected chairman and Manley Garber vice chairman. Both of their one-year terms began Oct. 2, 2008.

"After 58 years on the board, I've decided to pass the torch," said Garber. "I will continue to serve until my term expires. I think this is a good business-continuity move. Wade has served on the board for 15 years; he is ready to lead."

**"This is a good business-continuity move. Wade has served on the board for 15 years; he is ready to lead."**

**J. Manley Garber**

"I'm honored to be elected chairman of the board," House said. "As board chairman for the past 34 years, Manley has led the Co-op extremely well, and I know his continued guidance will help with the transition. All of us on the board, as well as

NOVEC staff and customers, have benefited tremendously from Manley's leadership," he continued.

A Nokesville, Va., resident, House retired in 2007 as president of the Virginia division of APAC Atlantic, Inc., where he worked for 35 years. He has volunteered with the Manassas Volunteer Fire Company since 1972 and also served in the Virginia National Guard.

House has represented the Nokesville Haymarket, and Bull Run areas on the NOVEC board since 1993, serving as secretary, treasurer, and vice chairman.

Garber, a Woodbridge resident, was elected to the Prince William Electric Cooperative board in 1950. He continued to serve when NOVEC was formed in 1983 by the consolidation of PWEC and Tri-County Electric Cooperative. In his nearly six decades on the board, he has served in all positions. Garber represents the Woodbridge, Dale City, and Montclair areas on the board.

## Help Those in Need — Join Operation Round Up

NOVEC customers can help local needy families heat their homes this winter by joining Operation Round Up.

When customers join ORU, they authorize NOVEC to round up their monthly electric bills to the next dollar. For example, if the bill is \$69.54, NOVEC rounds it up to \$70 and the extra 46 cents goes in the Operation Round Up fund. Customers who participate donate an average of \$6 each year.

NOVEC sends the ORU donations to six local social service organizations, which in turn distribute the funds to help those in need pay their heating bills.

Last winter, ORU provided \$48,000 to nearly 300 needy families. NOVEC customers have contributed more than \$440,000 since the program's inception in 1997.

### Join ORU Today

- ▶ Visit [www.novec.com/oru2](http://www.novec.com/oru2)
- ▶ Call 703-335-0500 or 1-888-335-0500
- ▶ Send e-mail to [oru@novec.com](mailto:oru@novec.com)

*NOTE: People needing heating assistance should contact the Virginia Department of Social Services at 2-1-1 or log onto [www.dss.state.va.us/benefit/eafuel/index.html](http://www.dss.state.va.us/benefit/eafuel/index.html)*

**Customers who sign up for Operation Round Up by Dec. 5 will be entered in a drawing for one of 10 \$25 Visa gift cards.**



## OPERATION TURKEY FOOD COLLECTION

For many years, NOVEC has partnered with SERVE, Inc. and ACTS in the annual Operation Turkey food drive.

NOVEC is accepting food donations through Nov. 17 at the Minnieville and Manassas offices. After Nov. 17, customers may drop donations at SERVE or ACTS, and anyone requiring a receipt must take donations to those locations. For more details, call the Operation Turkey hotline at 703-368-2979, ext. 104, for SERVE, or 703-221-3186 for ACTS.

### Suggested Food Items

Canned vegetables and fruits, boxed or bag stuffing, instant mashed potatoes, pasta, rice.

### Drop-off Locations

**NOVEC** (8:15 a.m. – 5 p.m., through Nov. 17)

10323 Lomond Drive, Manassas, VA  
14500 Minnieville Road, Woodbridge, VA

**SERVE, Inc.**

10056 Dean Drive, Manassas, VA 20110

**ACTS**

3900 ACTS Lane, Dumfries, VA 22026







**Video:** Father and daughter begin improving home energy use  
**V/O:** After the energy audit



**Video:** man replacing a/c filter  
**V/O:** After replacing the filter



**Video:** father and daughter in kitchen  
**V/O:** after upgrading appliances



**Video:** Setting thermostat  
**V/O:** after adjusting the thermostat



**Video:** checking the attic insulation  
**V/O:** after adding insulation

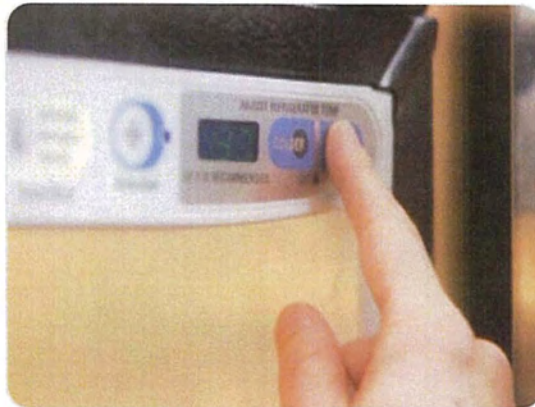


**Video:** cleaning under the fridge  
**V/O:** after cleaning the coils





**Video:** adjusting the hot water heater  
**V/O:** after adjusting the water temperature



**Video:** adjusting freezer temp  
**V/O:** and setting the refrigerator at 38 degrees



**Video:** CFL Bulb - **V/O:** after replacing the bulbs and all the other energy saving tips. Don't forget the obvious



**Video:** Child turning off the light switch  
**Child:** Dad...you forgot to turn off the lights!



**V/O:** You've got the power. use it wisely







2009 Telly Award

NOVEC - Use It Wisely  
Stan Feuerberg  
Mike Curtis  
Inia Burginger



## USE ENERGY WISELY

With the cost of energy increasing, more and more people are concerned about their rising utility bills. We are all looking for ways to control our energy use. The best way to do this is to first be aware of how much energy you use each month and how it is being used in your home.

Lifestyle makes a difference. You can have complete control over how you use your electricity by choosing the ingredients that are necessary for you to maintain your standard of living. Let's take a look around the house for a few energy-saving tips:

### THE BATHROOM

- ✓ Take shorter showers and install water-saving showerheads.
- ✓ Turn off faucets tightly and fix leaky faucets promptly. A leak of one drop per second wastes more than 250 gallons of water a month and the energy used to heat it.

### THE BEDROOM

- ✓ Use draft guards at the bottom of any doors that open into unconditioned areas.
- ✓ Use ceiling fans for cooling.

### THE DEN

- ✓ Keep your fireplace damper closed when there's no fire in the fireplace. If you have glass fireplace doors, keep them closed as well.
- ✓ Turn off television sets, stereos and other electric appliances whenever you're not using them.

### THE KITCHEN

- ✓ Run your garbage disposal with cold water.
- ✓ Cook in oven-safe glass or ceramic pans when you can. They allow you to set your oven temperature 25 degrees lower than the recipe calls for.
- ✓ Save more energy by air drying your dishes and only running full loads.

### THE LIVING ROOM

- ✓ Move furniture away from heating and cooling registers or radiators. Blocking or restricting airflow makes heating and air-conditioning systems work harder.
- ✓ Choose light-colored, translucent lampshades. Many lampshades, while decorative, can actually reduce light or send it somewhere you don't need it.

### DON'T FORGET THE OUTSIDE OF YOUR HOME

- ✓ Take this test: If a playing card fits in the crevice of an outside door or window, you need more weather stripping. Caulk and weather-strip to stop air leaks around windows, doors, exhaust fans and other places where wires or pipes pass through walls.
- ✓ Evergreens are effective for blocking wind. Plant them in a staggered or double line to the northwest of your home.



These energy saving tips are brought to you by Mecklenburg Electric Cooperative – a Touchstone Energy Partner.

## HOW TO KEEP YOUR HOME COOLER AND SAVE ENERGY THIS SUMMER

Is your home too hot in the summer? There are many ways that you can help keep heat out of your house. For example, planting trees can provide shade from the hot summer sun and is one of the best ways to help make your house cooler. It is important to take the mature height of the tree into consideration. Do not plant under power lines or in the right of way to avoid having power interruptions or the tree cut as it grows.

Two of the biggest sources of internal heat gain in your home are lights and appliances. Reducing their use during the summer will save electricity and keep your home cooler.

The high levels of humidity we experience around here during the summer make it more difficult to keep a home cool. The drier the air inside your home, the more comfortable you will feel. The extra moisture released by cooking, bathing and other activities also makes it much harder for your air conditioner to cool your home efficiently.

There are steps you can take to help your home stay cooler this summer while conserving energy and keeping down your electric usage:

- ✓ Replace standard incandescent light bulbs with compact fluorescent light bulbs. The electricity used by conventional light bulbs produces 10 percent light and 90 percent heat. Plus, compact fluorescent bulbs cost less to use.
- ✓ Schedule heat-producing chores such as baking or doing the laundry after the hottest part of the day.
- ✓ Install an insulating jacket on your water heater.
- ✓ Use kitchen and bathroom fans to remove heat and moisture during and after cooking and bathing.
- ✓ When replacing appliances, buy those with the Energy Star® label. These appliances conserve energy and release less unwanted heat.
- ✓ If you use air conditioning, set your thermostat higher. Make sure you have your unit serviced annually and change filters regularly to keep it running at peak efficiency.
- ✓ On cooler evenings, don't forget about the least-expensive cooling method of all: open your doors and windows and run window fans.



These energy saving tips are brought to you by Mecklenburg Electric Cooperative – a Touchstone Energy Partner.





## Weatherization Assistance

The Weatherization Assistance Program is funded by the U.S. Department of Energy through grants to the Virginia Department of Housing and Community Development (DHCD), as well as from funds from the Virginia Department of Social Services' Low-Income Home Energy Assistance Program (LIHEAP) Weatherization Component.

The Weatherization Assistance program provides funds to reduce the heating and cooling costs for low-income families, and to ensure their health and safety. Assistance services are available for low-income households, particularly for the elderly, individuals with disabilities, and families with children. The program provides direct installation of energy-saving measures such as:

- Sealing air-leaks with insulation, caulking, and weather-stripping;
- Installation of ventilation fans;
- Repairing leaky duct systems;
- Repairing and/or replacing inefficient or unsafe heating systems; and
- Installation of energy efficient lighting

In MEC's ongoing promotion of energy efficiency and ways for our members to save money we have listed the weatherization providers on the back of this brochure by county.

In order to take advantage of this program you need to call the number below for the county in which you live and let them know you are interested in applying for assistance. Qualifications are based on your income level and the number of people living in your home.

<u>Counties</u>	<u>Phone Number</u>
Greensville, Surry and Sussex	(804) 732-7020
Halifax and Charlotte	(434) 575-7916
Pittsylvania	(434) 432-9380
Brunswick and Mecklenburg	(434) 447-2744
Lunenburg	(434) 385-9070

If you qualify the weatherization provider will schedule an audit to help identify the best energy-saving measures that are cost effective, healthy, and safe. Once approved the work is provided at no cost to you.

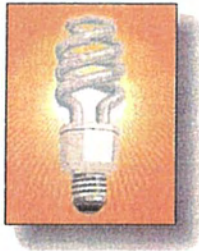
Be sure to check out the Virginia Energy Assistance option on our website at [www.meckelec.org](http://www.meckelec.org) for information about additional programs the state has to offer.

Together we have the power to make a difference.

# CFL Bulbs

There are easy ways to make your house more energy efficient. You can save money every month by using compact fluorescent light (CFL) bulbs. A CFL bulb is a type of fluorescent lamp that fits into a standard light bulb socket or plugs into a small lighting fixture.

Globally introduced in the early 1980s, CFLs have steadily increased in sales volume. When CFLs were first introduced, they cost about \$9 each and blinked when they first came on. Since then, they've come a long way. The most important advance has been the gradual replacement of magnetic ballasts with electronic ballasts. This has removed most of the flickering and slow starting traditionally associated with fluorescent lighting.



It should cost you less than \$20 to make your house more energy efficient. If you buy CFLs in the four-pack, they now cost about \$3 each. That's a small price to pay for the greatest advancement in lighting since Thomas Edison's invention of the incandescent light bulb.

We suggest you replace at least four standard incandescent bulbs with CFLs in the most used locations in your home. They are available for recessed lighting in both spotlight and floodlight designs.

## ADVANTAGES OF A CFL

First of all, the CFL uses 75 percent less electricity than an incandescent bulb producing a comparable amount of light. And since the CFL operates at a much lower temperature, it lasts much longer—in fact, CFLs can last up to 10 times longer than a standard bulb. The filaments of the hotter burning incandescent bulbs simply burn out sooner because of the heat.

Second, 90 percent of the energy of incandescent bulbs turns into heat and 10 percent goes for light. In a CFL, 90 percent of the energy goes for light and only 10 percent for heat.

Third, by simply replacing a 100-watt incandescent bulb with a 25-watt CFL, you can save electricity costs over the life of the bulb.

Fourth, CFLs do not usually fail suddenly, as incandescent light bulbs do. Symptoms of impending CFL failure may come months ahead.

## WHERE CAN YOU GET CFLS?

Many home improvement and hardware stores have them, and you can also buy them online. So do yourself a favor and make the switch.



Presented by Mecklenburg Electric Cooperative



## Energy Saving Tips for the Office



- Switch off all unnecessary lights.
- Use natural lighting or day lighting when feasible. Turn off lights near windows.
- During warm months, close or adjust window blinds to block direct sunlight.
- During winter months, open blinds on the south facing windows during the day to allow sunlight to naturally heat your work space.
- Unplug equipment that drains energy when not in use, i.e. cell phone chargers, fans, coffee makers, desktop printers, radios, etc.
- Turn off your computer and monitors at the end of the workday and on weekends.
- Turn off photocopiers at night and on weekends.
- Dress warmer in the winter months so you can set the thermostat to a lower setting on heating units. 68 degrees is recommended.



Your Touchstone Energy® Partner 

For more information, please call Brian Morris at 434-372-6209 or visit [www.meckelec.org](http://www.meckelec.org).

# Beat the Peak



Mecklenburg Electric Cooperative (MEC) is launching a "Beat the Peak" campaign with a voluntary call to action for energy awareness among members to reduce electricity usage between 4:00 p.m. to 7:00 p.m. on our hottest days in the summer and 6:00 a.m. to 9:00 a.m. on our coldest days in the winter. It is during these times that our region uses the greatest amount of electricity.

This voluntary program encourages members to conserve or limit usage during "Peak" energy times when your Cooperative may be purchasing power from the market at extremely high prices. By reducing "Peak" demand, we will be able to minimize the impact of rising generation costs to our membership.

## HOW DOES IT WORK?

The "Beat the Peak" message will be activated when our electric usage and spot market price for power are very high. This message will be sent a day in advance and say "Mecklenburg Electric Cooperative is forecasted to experience "Peak" energy usage from 4:00 p.m. to 7:00 p.m. tomorrow. Please conserve energy at this time to help keep your rates low. Thank you."

Those participating will receive a "Beat the Peak" message through radio announcements, a telephone call or email message. A message alert will be posted on our website for each visitor.

Once you receive the message, you can divert electric usage by:

- Raising Your Thermostat Three (3) Degrees
- Delay Major Appliance Usage
- Delay Hot Water Usage

Demand and energy costs for electricity are significantly increasing. During high cost "Peak" energy periods high-priced fuels are used to meet our needs. Energy produced from these sources significantly impacts the cost of your electricity as well as generates more greenhouse gas emissions during the worst period possible. The key to curbing these trends is to reduce the amount of energy we use, especially during peak times.

Your Cooperative cannot do this alone. WE NEED YOUR HELP! Together we can "Beat the Peak" by using our electricity wisely. Please visit our website for information regarding our "Peak" energy program and tips for conserving energy.



[www.meckelec.org](http://www.meckelec.org)

*Help us "Beat the Peak" by  
Signing Up Today*

Name on Account: \_\_\_\_\_

Account Number: \_\_\_\_\_

Home Telephone: \_\_\_\_\_

Email Address: \_\_\_\_\_

Mall to: MEC - P.O. Box 2451 - Chase City, VA 23924



## "Do-it-yourself" home energy audit

The first thing to do when performing your own home energy audit is to make a list of any existing problems, such as condensation and uncomfortable or drafty rooms. The next thing is to look for air leaks. They are common around electrical outlets, switch plates, window frames, baseboards, weather stripping, fireplace dampers, attic hatches, and wall or window-mounted air conditioners. When inspecting windows and doors for air leaks, if you can see daylight around the door or window frame, that is where the leak exists.

When looking at the outside of your home, examine areas where two different building materials meet. This includes exterior corners, areas where siding and chimneys meet, and places where the foundation and the bottom of the exterior brick or siding meet. Make sure to plug and caulk holes or penetrations for faucets, pipes, electric outlets, and wiring. Also, look for cracks and holes in the mortar, foundation and siding of your home and seal them with the appropriate material. Finally, check the exterior caulking around doors and windows to see if they are sealed tightly.

When performing your own home audit, make sure to examine the ceilings and walls. If these two areas are not properly insulated, you risk heat loss in the winter and cool-air loss in the summer. Check to see that the attic hatch is as heavily insulated, as well as weather-stripped and closed tightly. In the attic, determine if openings for items such as pipes, ductwork and chimneys are sealed. If you see any gaps, seal them with expanding foam caulk or another permanent sealant.

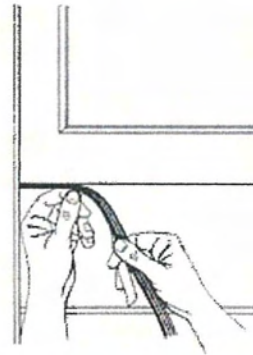
For more information on home energy audits and energy-saving techniques you can use, review Touchstone Energy's Home Energy Savings Guide.

[Home Energy Savings Guide](#)

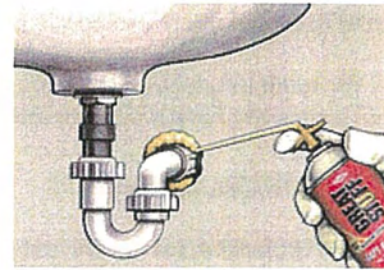
Source: National Rural Electric Cooperative Association, Touchstone Energy and the North Carolina Association of Electric Cooperatives



Download image in [JPG](#) formats  
Caulking around an exterior window



Download image in [JPG](#) formats  
Installing weather stripping



Download image in [JPG](#) formats  
Dow Chemical Company

## Professional home energy audits

Home energy audits determine how much energy your home consumes and assesses what measures you can take to make your home more efficient.

A professional home energy auditor can help you assess the energy efficiency of your home. The auditor should do a room-by-room examination of your home, as well as look at your previous utility bills. In addition, the auditor should perform a blower door test and a thermographic scan.

A blower door is a powerful fan that mounts to the frame of an exterior door. The fan pulls air out of the house lowering the air pressure inside causing the higher outside air pressure to flow in through unsealed cracks and openings. In addition to the blower door, the auditors may use a smoke pencil to help detect air leaks within your home.

The thermographic scan allows auditors to check the effectiveness of the insulations within your home. The scan uses specially designed infrared video or still cameras showing surface heat variations in your home. The resulting thermogram helps auditors determine if your home needs insulation and where the insulation should go.

However, before the auditor begins the blower door test and the scan of your home, they will first examine the outside of the home. Auditors determine the size of your home and its features, such as the wall area and number of the windows. They will also ask you questions about your home, such as what the average thermostat setting is for the summer and winter and how many people live in the house.

For more information on home energy audits and energy-saving approaches you can use, review Touchstone Energy's Home Energy Savings Guide.

### [Home Energy Savings Guide](#)

Source: National Rural Electric Cooperative Association, Touchstone Energy and the North Carolina Association of Electric Cooperatives



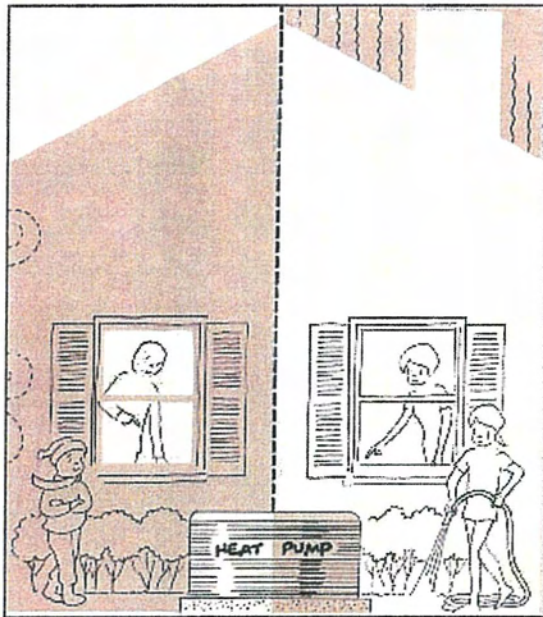
Download image in [JPG](#) formats  
The Energy Conservatory




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NH Electric Coop/Studio One



# WHAT IS A HEAT PUMP?



Your Touchstone Energy® Partner 

**Emporia**  
434-634-6168

**Chase City**  
434-372-6200

**Gretna**  
434-656-1288

[www.meckelec.org](http://www.meckelec.org)

If you use electricity to heat your home, consider installing an energy-efficient heat pump system. Heat pumps are the most efficient form of electric heating in moderate climates, providing three times more heating than the equivalent amount of energy they consume in electricity. There are three types of heat pumps: air-to-air, water source, and ground source. They collect heat from the air, water, or ground outside your home and concentrate it for use inside.

Your heat pump does not operate like other heating systems. In the heating mode, the heat pump removes heat from outside and transfers it to the inside air. In the cooling mode, the heat pump removes heat from the inside air and discharges it to the outside air. The heating or cooling mode is controlled automatically by the indoor thermostat setting.

## Heat Pump Tips

- Do not set back the heat pump's thermostat manually if it causes the electric resistance heating to come on. This type of heating, which is often used as a backup to the heat pump, is more expensive.
- Clean or change filters once a month or as needed, and maintain the system according to manufacturer's instructions.

For more information, please contact your local district office.



ten minutes of operation. It saves energy and reduces wrinkling.

- Dry only full loads.
- Clean the lint screen between loads.
- Check dryer exhaust vent periodically to make sure it operates properly and doesn't leak.

### DISHWASHER

- Automatic dishwashers used properly will consume less energy than washing dishes by hand.
- The most efficient dishwasher now on the market costs nearly half as much to run as the most inefficient dishwasher.
- When buying a dishwasher, choose one with a booster heater, air dry selection and a short cycle control.
- A booster heater will allow you to reduce your water heater setting.
- Air dry selector automatically shuts off the heat during the drying cycle thereby cutting electricity use by up to 20% (\$10 - \$15 per year).
- Short cycle selection uses less hot water and is suitable for times when dishes are not very dirty.
- Wash only full loads.

The way you use electricity at home offers great opportunities for using energy wisely. For example, did you know that you can reduce your electricity usage for lighting by 75 percent just by replacing your incandescent light bulbs with compact fluorescent bulbs? Or, that you can reduce your cooling bill by 2 percent just by raising your thermostat by 1 degree in the summer? Likewise, in the winter, lowering your thermostat by only 1 degree can reduce heating bill by 3 percent.

These are just three ways you can save energy and money! This brochure was designed to offer you more energy efficiency tips for saving on your electric bill.

Aside from your central heating system, the following ten appliances are likely to be the biggest users in your home: refrigerator, clothes dryer, clothes washer, freezer, dishwasher, water heater, range, air conditioner, T.V., and lights.

These simple, low- or no-cost tips can assist you in making your energy decisions and in gaining greater control over your electric bill. By following these tips, you will also improve the comfort and convenience of your home.

For more information, please contact your local district office.

# Energy Efficiency Tips for Your Home Appliances



Your Touchstone Energy® Partner



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434-634-6168

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434-656-1288

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## RANGES/OVENS

Ranges/ovens are not labeled with energy guide labels so you will have to look for the specific energy-efficient features.

- When buying ovens, a convection oven will lower cooking temperatures and shorten cooking times.
- Induction cooktops can reduce cooking cost by 10 - 20%.
- Use the microwave, toaster and "crock pots" rather than the oven. These smaller appliances consume 1/3 to 1/2 as much electricity as conventional ovens for cooking the same food item.
- Using a pressure cooker cuts cooking time by about 2/3, saving time and energy.
- When using your main oven, keep preheating to the shortest possible time.
- Don't be an "oven peeker."
- Cook with lids on your pots and fit the pot or pan to the size of the surface unit.
- Cook with as little liquid as possible.
- Use pots and pans with flat bottoms. Burners can be turned off a few minutes ahead of time. The hot element will continue to cook the food.

## REFRIGERATOR/FREEZERS

Refrigerator/freezers have done more

than any other commonly used invention to lengthen their life spans yet it does add significantly to our energy costs. To help reduce these costs of your refrigerator/freezers, make sure you..

- Check the temperature of your refrigerator compartment - it should be between 38 - 42 degrees Fahrenheit. The freezer compartment should be between 0 - 5 degrees Fahrenheit. A refrigerator/freezer kept 10 degrees colder than what is recommended, can increase energy consumption by 25%.
- Condenser coils should be kept clean.
- Manual defrost freezers should be defrosted regularly.
- Door seals can deteriorate - if they have, they should be replaced.

## WATER HEATER

Since your water heater is one of the largest energy users in the home, here are some useful energy saving hints:

- Lower the temperature of your hot water heater tank to 120 degrees Fahrenheit from 140 degrees Fahrenheit. For each 10 degrees reduction in your setting, you will cut water heating bills by 3 - 5%.
- Wash and rinse clothes in cold water whenever possible.
- Insulate your water heater if allowable.
- Insulate hot water pipes.

- Reduce long runs of hot water pipes by installing another water heater.
- When replacing your water heater, have it sized for your family's needs.
- Always buy an "energy saver" water heater.

## CLOTHES WASHERS

The energy use of the most inefficient clothes washer is over three times greater than the energy use of the most efficient clothes washer, so compare Energy Guide labels.

- When buying a new washer, purchase a model with water level and water temperature controls.
- When buying a new clothes washer, consider a front loading model. They use considerably less hot water than top loading washing machines.
- Use less hot water - 90% of the energy used to wash clothes goes toward heating water.


## CLOTHES DRYERS

- Purchase clothes dryers with a moisture sensor which automatically turns the dryer off as soon as the clothes are dry. A moisture sensor typically cuts energy use by about 10 - 15%. Overdrying shortens fabric life, causes shrinkage and generates static.
- When buying a dryer, get one with a cool-down cycle. This tumbles clothes in a cooler air during the last five to





**Northern Neck  
Electric Cooperative**

® A Touchstone Energy® Cooperative 



**Beat  
the  
Peak®**

**It's Time to**

Northern Neck Electric Cooperative is asking its members to help keep the cost of electricity down. Your Cooperative is launching a "BEAT THE PEAK" campaign with a voluntary call to action for members to reduce electricity usage from 3 p.m. until 7 p.m. on "Peak" days this summer to help keep energy costs as low as possible. This voluntary program encourages members to conserve or limit energy usage during peak energy times when your Cooperative may be purchasing power at high market prices. The cost of electricity during peak times is much higher compared to times of normal electrical demand on the system. Over 70% of the Cooperative's operating cost is this purchased electricity. By limiting the amount of power purchased during these peak high-priced energy periods, the Cooperative can reduce its total power costs and minimize increases in our Energy Charge to you. When the weather is extremely hot, demand for electricity PEAKS because of the high electrical usage of air conditioners combined with other household appliances. If you receive a "Beat the Peak" e-mail alert or if the radio station announces Northern Neck Electric Co-op is experiencing a peak energy-usage day:

- Raise your thermostat 3 degrees
- Delay major appliance usage—especially in the kitchen and laundry room
- Delay hot water usage
- Turn off all unnecessary lights and appliances.

By following these 4 steps from 3 p.m to 7 p.m. on peak days, your efforts, combined with those of your fellow members, will make a BIG difference. Let us all work together to "Beat the Peak!"

To sign up for Northern Neck Electric Cooperative's "Beat the Peak" alert notification:

- go to [www.nnec.coop](http://www.nnec.coop) and click on the ebiz link under Products & Services OR
- sign up by e-mailing [info@nnec.coop](mailto:info@nnec.coop) with the name on the account and the home telephone number OR
- complete the form below and send to NNEC with your bill payment.

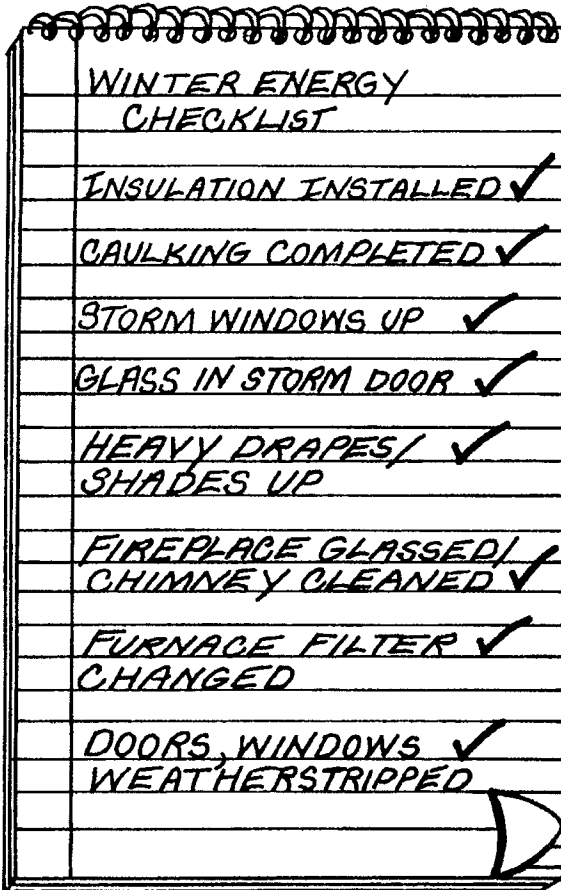
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DETACH AND MAIL

Name on Account \_\_\_\_\_  
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Home Telephone \_\_\_\_\_

E-Mail Address \_\_\_\_\_





With the cost of energy increasing, more and more people are concerned about their rising utility bills. We are all looking for ways to control our energy use. You must be aware of how much energy you use each month and how it is being used in your home.

Lifestyle makes a difference. Saving energy is as simple as flipping a switch. As much as a third of the typical monthly electric bill goes to lighting.

- Teach your family members to turn out the lights when no one is in the room.

- Remember that computers still use electricity when left on in the screensaver mode and cell phone chargers plugged into an outlet use electricity even without the phone attached.

- Electrical appliances burn energy when switched off because of the timers, clocks, memory and remote “on” and “off” switches. Satellite receivers for televisions and VCRs, among other appliances, use almost as much electricity when they are switched off as when they are on.

- Plug the most wasteful appliances into fuse-protected power strips (also known as surge protectors) that, when turned off, can disrupt the flow of electricity when the appliances aren't being used.
- Take shorter showers and install water-saving showerheads. Turn off faucets tightly and replace leaky faucets promptly. A leak of one drop per second wastes more than 250 gallons of water a month and the energy used to heat it.
- Use draft guards at the bottom of any doors that open into unconditioned areas. Use shades to insulate windows at night and open the shades on sunny days to warm the rooms.
- Use lids on pots and pans when possible to speed cooking.
- Avoid using your full-size oven. Use a microwave or toaster oven for small meals or leftovers.
- Turn down your heating system's thermostat to 68 degrees Fahrenheit during the day. Keep it lower at night and when no one is home for several days.
- Lower your water heater temperature to 120 degrees Fahrenheit and reduce hot water use by using cold water for laundry whenever possible.
- Repair any broken windows, loose siding, or missing trim to keep your home insulated.



# SVEC Eazy Pay: Convenient and Free

## Sign up now to Get Four Free CFLs



Shenandoah Valley Electric Cooperative offers you a service that is safe, secure, and best of all, **FREE: Eazy Pay**. With Eazy Pay, you no longer need to write a check, use a stamp, waste your time and gas driving in to pay your bill, or worry about a late payment.

Eazy Pay is a great program, and if you sign up now, you will receive four free compact fluorescent lightbulbs (CFLs).

To get more information about Eazy Pay, check our web site at [www.svec.coop](http://www.svec.coop), call us at 1-800-234-7832 (SVEC), or visit the district office nearest you. A form is available online for you to print out, complete, and mail in. We also have enrollment forms at our offices that can be mailed to you upon request.

Why not take advantage of "Eazy Pay" now?!

October 2008



## Our Energy, Our Future: Let Your Voice Be Heard

**Our Current Energy Situation** is politically charged, as polarized positions dominate the debate. Americans are sensitive to global climate issues, and the availability of affordable, reliable power has never been more in doubt. Each of us has a role to play in influencing this debate, as U.S. climate change policy may be voted on or even passed soon any time now that the new administration has started work for the year...we need to make sure elected representatives remember their obligations to protect the public's interest in maintaining *affordable, reliable* electricity. There are **challenges ahead**, which

include addressing the issue of greenhouse gases, increasing generating capacity, and keeping electricity affordable. What we need is leadership and sustained commitment by Congress, public-private partnerships, and our 40 million member/consumers in one unified voice demanding legislators strike a balance between our electricity needs and climate change goals.

**Our Energy, Our Future™**  
A Dialogue With America  
[www.ourenergy.coop](http://www.ourenergy.coop)

It's time to step up and let your voice be heard. Visit [www.ourenergy.coop](http://www.ourenergy.coop) today to get more information, or send a letter to your legislators through the Web site asking about our nation's energy and climate policy.

Feb. 2009

## Fuel Costs Projected to Keep Rising

Fuel costs are rising, but by reducing energy consumption, the effects of these increasing costs will be lessened. These higher fuel costs have resulted in increasing prices per kilowatt hour (kwh) on your bill. It is *only* the fuel costs driving this increase. SVEC has not had a change in its base rates since January of 2001.

The fuel adjustment portion of your bill is the cost differential between the base cost of fuel used for generation which is included in the base wholesale rates the Cooperative pays as compared to the actual cost of fuel for generation.

By reducing the amount of energy (kwh) used you can reduce the total dollar amount you pay for electric service. If you would like information about energy saving tips, visit our Web site at [www.svec.coop](http://www.svec.coop). We also have Energy Savers booklets available at our district offices that offer conservation tips.

## Conserve Energy, and You'll Save \$\$



# This Winter Season, Keep Warm Efficiently

Winter may bring chilly temperatures, but you can still make efforts to achieve energy efficiency in your home with these tips from Shenandoah Valley Electric Cooperative.

Make sure your heating system is prepared for the season. Clean or replace filters on furnaces as needed, and make sure your equipment is properly serviced. About 45 percent of your utility bill goes for the heating and cooling of your home. Set your thermostat as low as is comfortable in the winter. The use of a programmable thermostat is also a good idea, as you can adjust the times you turn on the heat

according to a pre-set schedule.

Check the insulation in your attic, ceilings, exterior and basement walls, floors, and crawl spaces to make sure it meets levels recommended for your area. Adding insulation to your attic is one of the most cost-effective ways to make your home more comfortable year-round.

Reducing air leaks in your home is another way to save money on your heating bill, and keep warm this winter. Keep warm air in, and cold air out: caulk, seal, and weatherstrip all seams, cracks, and openings to the outside.

JAN. 2008

## SVEC's Load Management Program

The load management program helps the Cooperative keep rates stable by controlling member-owners' electric water heaters during times when the demand for electricity is at its peak. SVEC installs a load management switch on its members' electric water heaters. The switch then allows SVEC to automatically operate the electric water heater during peak demand periods as a means of reducing its wholesale power costs. These switches cycle electric water heaters off during peak periods. This reduces the need for electricity and still allows you to have the hot water you need. The water heater,

being an insulated storage device, continues to keep your water hot, so most people don't even know when the Load Management system is operating.

An added value to the Load Management program is, when the switch is installed, the Cooperative will give you a FREE water heater inspection. If you have a problem, we'll diagnose it and tell you what needs to be fixed. You will also receive a FREE hot water heater blanket to help keep your water hot. Best of all, you'll be helping to keep your electric service costs affordable – something we can all appreciate!

**Members and SVEC, working together to control energy costs and help our environment.**

6/08

## Virginia Sales Tax Holiday October 10-13

The following ENERGY STAR qualified products are tax exempt on purchases that cost \$2,500 or less:

- Compact Fluorescent Bulbs (CFLs)
- Ceiling Fans
- Clothes Washers
- Dehumidifiers

Virginia  
Sales Tax Holiday  
October 10 - 13, 2008



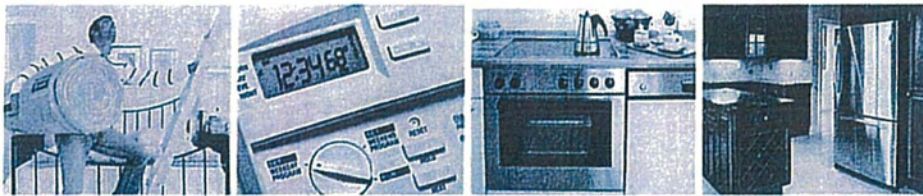
- Dishwashers
- Programmable Thermostats
- Refrigerators
- Room Air Conditioners

**ENERGY STAR = Value. Choice. Convenience. Reliability.**

Sept. 2008



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# CRAIG-BOTETOURT ELECTRIC COOPERATIVE

## Co-OP NEWS

### Invest in Your Energy Future with Energy Efficiency

*Improve Your Comfort, Save Money, and Help the Environment  
by Using Energy More Efficiently in Your Home.*

**Get more comfort for less money.** Energy efficiency doesn't mean sacrifice – feeling too cold in winter or too hot in summer. It means getting more comfort for the same or less energy, and saving money.

**Save energy, help the environment.** The U.S. accounts for 5 percent of the world's population, but uses 24 percent of its energy resources. Your energy choices affect the environment both locally and globally.

**Using energy efficiently helps the environment** by conserving natural resources and delaying the need for new power plants. It reduces emissions of gases that cause air pollution and acid rain, and reduces carbon dioxide emissions that may contribute to global

warming. These gases are released whenever fossil fuels are burned to produce energy.

**Join a national effort.** Use energy efficiently in your home – it's one of the best ways you can join the effort to solve our country's energy and environmental problems. Look for appliances and home construction that meet or exceed federal and state efficiency standards.

**Weatherizing and insulating.** Every year, the energy equivalent for all the oil flowing through the Alaskan pipeline escapes through U.S. doors and windows. Use weatherstripping, caulk, and energy-efficient glass to save.

**Efficient lighting.** 15 percent of home energy use goes for lighting. If every U.S. household replaced just one incandescent light bulb with a compact fluorescent, we would save the same amount of energy each year as is produced by two average-sized power plants.

**Heating and cooling.** 46 percent of household energy goes for heating and cooling homes. If everyone in the U.S. turned down their heating temperatures just a few degrees a day, we would save the energy equivalent of a half million barrels of oil a day.

**Your major appliances.** 15 percent of home energy use goes for refrigerators and freezers; 9 percent goes for other appliances. A new, highly efficient refrigerator/freezer uses only as much electricity as a 75-watt light bulb, constantly burning.

**Water heating.** 15 percent of household energy use goes for heating water. An electric water heater can use the energy equivalent of about 400 gallons of gasoline per year. Insulate your tank and pipes and reduce water temperature to save.

**Save money.** Improving attic insulation can save 10 to 50 percent of your heating and cooling costs. That's \$50 to \$230 a year for the typical home. **Help your environment.** CFCs (chlorofluorocarbons) found in some foam insulation can harm the ozone

layer. Look for CFC-free insulating products.

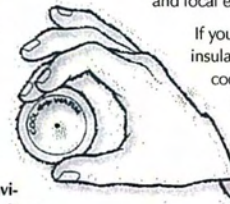
**Save money.** During winter, for every degree you lower your heat (within the range of 60° to 72°F) you save about 3 percent of your heating consumption. During summer, for every degree you raise your air-conditioner thermostat setting (within the range of 70° to 80°F) you cut cooling consumption 3 to 4 percent. **Help your environment.** Ask your appliance dealer or waste management company how to safely dispose of your old air conditioner; have coolant removed by a professional.

**Save money.** Changing to low-flow showerheads can save 40 to 60 percent of annual water heating costs for showering. That's \$25 to \$40 per year for the typical home. **Help your environment.** Low-flow showerheads and faucets not only save energy, they help you conserve water, too.

**Save money.** A new energy-efficient refrigerator uses about one-half the energy as one built more than 10 years ago, and can save the typical household about \$60-\$80 per year. **Help your environment.** If your refrigerator needs repairs, use a shop with CFC recovery equipment. CFCs released from cooling systems can harm the ozone layer.

**Save money.** Consider compact fluorescents. Replacing a 60-watt incandescent bulb with an 18-watt compact fluorescent can save the typical household more than \$32 over the life of the new bulb (about 10,000 hours). That more than pays for the \$10-\$20 purchase price. **Help your environment.** If you replace one 60-watt compact fluorescent, you'll save the energy equivalent of 400 pounds of coal – and you'll help reduce air pollution, too.

**Energy savings** are based on many assumptions. These include an average price of electricity (8¢/kwh) and natural gas (50¢/therm), and the national average household energy expenditure per year (\$1,080). Your actual savings will vary depending on your circumstances and local energy rates.



If you have inadequate sealing or insulation, inefficient heating or cooling units, or many older appliances, you may not see dramatic energy savings. **Focus on improving** these areas and in the long run energy efficiency will pay off!

It may seem strange that the people who sell you energy want to help you use less. But it actually costs less for utilities to reduce demand for electricity than to meet rising demand by building new power plants. Keeping costs down helps your Cooperative keep bills low and service high. And as the U.S. strives to conserve energy reserves and gain energy independence, every bit of saved energy helps the economic well-being of the community your Cooperative serves.

**For more information about energy efficiency, contact:**

**American Council for an Energy-Efficient Economy**  
1001 Connecticut Ave., N.W.  
Suite 801  
Washington, D.C. 20036

**Conservation and Renewable Energy Inquiry and Referral Service**  
P.O. Box 8900  
Silver Spring, MD 20907  
(800) 523-2929

**National Appropriate Technology Assistance Service**  
P.O. Box 252  
Butte, MT 59702-2525  
(800) 428-2525

**Natural Resources Defense Council**  
40 W. 20th Street  
New York, NY 10011  
(212) 727-2700

Sources: American Council for an Energy-Efficient Economy, Natural Resources Defense Council, Association of Home Appliance Manufacturers.

**Don't put your life on the line!**

**DANGER**

Overloaded electrical wiring could cause a fire in your home. Don't take chances. If fuses blow, breakers trip, or lights dim, have a qualified electrician inspect your home's wiring. It's a safety check that could save your life.

**Craig-Botetourt Electric Cooperative**





## BARC ELECTRIC COOPERATIVE CO-OP NEWS

### Heating Tips for Saving Money This Winter

Are you looking for some easy, no cost/low cost ways to save energy and cut your heating bills this winter? The U.S. Department of Energy offers these tips:

- Set your thermostat as low as is comfortable.
- Clean or replace filters on furnaces, as recommended by the manufacturer, once a month.
- Clear warm-air registers, baseboard heaters and radiators as needed. Make sure they are not blocked by furniture, carpeting or drapes.
- Bleed trapped air from hot-water radiators once or twice a season; if in doubt about the procedure, call a professional.
- Place heat-resistant radiator reflectors between exterior walls and the radiators.
- Use kitchen, bath and other ven-



tilating fans wisely; in just one hour, these fans can pull out a houseful of warmed or cooled air. Turn fans off as soon as you are done.

- Keep draperies and shades open on south-facing windows during the heating season to allow sunlight to enter your home. Close them at night.
- Close an unoccupied room that is

isolated from the rest of the house, such as in a corner, and turn down the thermostat or turn off the heating for that room or zone. However, do not turn the heating off if it adversely affects the rest of your system. For example, if you heat your house with a heat pump, do not close the vents — closing the vents could harm the heat pump.

### SAVE \$\$ ON HEATING

Lowering your thermostat from 70 degrees to 68 degrees will save 6.2 percent on your heating bill. Lowering the thermostat one degree will save you 3.1 percent. However, let's say you like to keep your home warmer in the winter; raising the thermostat to 76 degrees will increase your heating bill by 18.6 percent. Each degree you raise or lower the thermostat from 70 degrees F means you pay 3.1 percent more or less on your heating bill.



### 'What Causes My Lights to Blink?'

"What causes my lights to blink?" is a very popular question in the electric utility business. Usually, blinking lights are a result of momentary outages that occur when some type of disturbance exists on the line. This could be a lightning strike, an automobile striking a pole, or when a squirrel or tree branch comes into contact with an energized power line.

Actually, when lights blink, it is an indication that the electric co-op's equipment is operating properly. Blinking lights reflect the operation of equipment that protects the lines and keeps the power from going off for more than just a moment. The co-op's distribution system includes special devices that are called reclosers that operate whenever there is a short circuit on the line. If the short circuit is temporary, which is usually the case, the recloser permits power to continue flowing through the line with only a brief interruption of service (meaning your lights blink!).

Without this device, every short circuit, temporary or otherwise, would cause the power to be off until the co-op could send a line crew to restore service. Usually, these reclosers will operate or trip three times before stopping the flow of electricity and causing a power outage. This recloser operation protects the lines from damage.

### HOW TO COOL YOUR HOME WITH A FIREPLACE

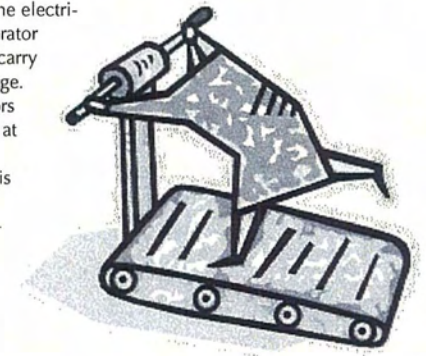
An open fireplace can needlessly cost you extra dollars. In fact, when there's no fire, it can remove up to 8 percent of the heat from your home every day. Yet, millions of fireplaces are left open all winter. So, the heat from your furnace or heat pump is going right up the chimney, cooling down your home, and making your heating system work harder. But sending heat up your fireplace chimney is very easy to avoid. The simplest way is to keep your damper closed when there's no fire. And closable, glass fire screens help, too. Make sure you're not using the fireplace for a cooling system this winter, or 8 percent of your heating dollars will disappear into thin air.



### Exercise Those Standby Generators

If you have a standby generator, now is the time to check to see that it is working properly. Start your generator and let it run; in other words, EXERCISE it now and make sure that it will be ready to use in case of an emergency. Test the generator by using the electrical devices the generator will be expected to carry during a power outage.

Standby generators should be exercised at least once a month. Also, be sure that it is in a place where it will be readily available when needed. It is also vitally important that the generator fuel tank remain filled; if you are out of fuel you are out of electricity. Be prepared, as you never know when the weather will wreak havoc with our power lines.



**BARC Electric Cooperative**  
P.O. Box 264  
Millboro, VA 24460-0264  
1-800-846-2272  
Office Hours: M-F, 8 a.m.-4:30 p.m.  
**General Manager**  
Hugh Landes



# TAB I

**EXHIBIT I: MEC AND NNEC TARIFF PAGES FOR RESIDENTIAL TIME-OF-USE RATES**



# MECKLENBURG ELECTRIC COOPERATIVE

## SCHEDULE R-TOD-U RESIDENTIAL TIME-OF-DAY SERVICE

### AVAILABILITY

Service under this schedule is available, on a voluntary and limited basis, to consumers for electric service in all territory served by the Cooperative, where the consumer takes service at one delivery point through one kilowatt-hour meter. This rate shall be limited to the availability of appropriate meters, and may be limited further by the saturation and/or impact on the Cooperative's electric system of members utilizing this rate schedule in a general area.

### APPLICABILITY

This schedule is applicable to residential consumers subject to the Cooperative's established Terms and Conditions and limitations given under "Conditions of Service" in this Schedule.

### CHARACTER OF SERVICE

Standard service under this schedule shall be 60-Hertz alternating current, single-phase, or multi-phase where available, at Cooperative's standard secondary voltages.

### MONTHLY RATE

#### I. Distribution Service:

##### Consumer Delivery Charges:

Single-Phase:		\$ 20.00 per month
Three-Phase:		\$ 43.40 per month

##### Energy Delivery Charges:

On-peak kWhs delivered	@	\$0.04960 per kWh
Off-peak kWhs delivered	@	\$0.03307 per kWh

#### II. Electricity Supply Service:

On-Peak kWhs sold	@	\$0.08740 per kWh
Off-Peak kWhs sold	@	\$0.02185 per kWh

All kilowatt-hours used are subject to adjustment for changes in cost of wholesale power and fuel under Schedule K of the Cooperative's Terms and Conditions.

### MINIMUM MONTHLY CHARGES

The minimum monthly charge for service shall be equal to the Consumer Delivery Charge.

### MINIMUM ANNUAL CHARGE FOR SEASONAL SERVICE

Consumers requiring service only during certain seasons not exceeding nine months per year may be subject to a minimum annual charge, in which case, there shall be no minimum monthly charge. The minimum annual charge shall be equal to twelve times the minimum monthly charge determined in accordance with the foregoing paragraph.

**PEAK AND OFF-PEAK PERIODS**

June – September

Peak Hours: 4:00 p.m. – 9:00 p.m., Monday – Friday  
Off-Peak Hours: All other times

October, November, March, April, May

Peak Hours: 7:00 a.m. – 10:00 a.m., 2:00 p.m. – 9:00 p.m.  
Monday – Friday  
Off-Peak Hours: All other times

December – February

Peak Hours: 6:00 a.m. – 10:00 a.m., Monday – Friday  
Off-Peak Hours: All other times

**CONDITIONS OF SERVICE**

1. Service under this schedule is limited to a maximum of 30-minute integrated demand of 50 kW.
2. In those cases where extraordinary investment is required by the Cooperative in order to serve the consumer, service will be rendered only after the consumer complies with the Cooperative's Terms and Conditions.

**BILLING**

Bills will be rendered by the Cooperative on a monthly basis, by billing cycle.

**TERMS OF CONTRACT**

Standard service shall be for an initial term of not less than one year, and shall continue in effect from year to year until terminated.

If a consumer discontinues service and requests a reconnection within less than one year, a payment equal to the minimum monthly charge for each month the service was disconnected must be made before service is reconnected.



**DETERMINATION OF BILLING DEMAND**

The On-Peak billing demand shall be the maximum kilowatt demand established by the consumer during a sixty minute interval, during On-Peak hours, within the month for which the bill is rendered, as indicated or recorded by a demand meter, and adjusted for power factor. The Maximum Monthly billing demand for the current month shall be the maximum sixty-minute clock-hour demand established by the consumer during the month for which the bill is rendered.

**PEAK AND OFF-PEAK PERIODS**

June – September

Peak Hours: 4:00 p.m. – 9:00 p.m., Monday – Friday  
Off-Peak Hours: All other times

October, November, March, April, May

Peak Hours: 7:00 a.m. – 10:00 a.m., 2:00 p.m. – 9:00 p.m.  
Monday – Friday  
Off-Peak Hours: All other times

December – February

Peak Hours: 6:00 a.m. – 10:00 a.m., Monday – Friday  
Off-Peak Hours: All other times

**MINIMUM MONTHLY CHARGES**

The minimum monthly charge shall be the greater of the following:

1. The Consumer Delivery Charge shown above or,
2. The Contract Minimum as specified in a contract for electric service.

**MINIMUM ANNUAL CHARGE FOR SEASONAL SERVICE**

Consumers requiring service only during certain seasons not exceeding nine months per year may be subject to a minimum annual charge, in which case, there shall be no minimum monthly charge. The minimum annual charge shall be equal to twelve times the minimum monthly charge determined in accordance with the foregoing paragraph.

**SERVICE AT PRIMARY VOLTAGE**

If service is furnished at Cooperative's standard primary distribution voltage and the consumer owns and operates its distribution system, a discount of two and one-half percent of the billed kWh energy and kW demand charges shall apply.

# MECKLENBURG ELECTRIC COOPERATIVE

## SCHEDULE SGS-TOD-U SMALL GENERAL TIME-OF-DAY SERVICE

### AVAILABILITY

Service under this schedule is available, on a voluntary and limited basis, to consumers for electric service in all territory served by the Cooperative, where the consumer takes service at one delivery point through one kilowatt-hour meter. This rate shall be limited to the availability of appropriate meters, and may be limited further by the saturation and/or impact on the Cooperative's electric system of members utilizing this rate schedule in a general area.

### APPLICABILITY

This schedule is applicable to consumers whose annual kW demand averages less than 50 kW per month, or whose highest monthly kW demand does not exceed 100 kW, subject to the established Terms and Conditions of the Cooperative.

### CHARACTER OF SERVICE

Standard service under this schedule shall be 60-Hertz alternating current, single-phase, or multi-phase where available, at Cooperative's standard secondary voltages. With the Cooperative's prior approval, service may be available at the Cooperative's standard primary distribution voltage.

### MONTHLY RATE

#### I. Distribution Service:

Consumer Delivery Charges:

Single-Phase:	\$ 22.00 per month
Multi-Phase:	\$ 48.00 per month

Demand Delivery Charge:

Maximum Monthly kW delivered @ \$ 2.50 per kW

Energy Delivery Charge:

All kWh delivered @ \$0.00780 per kWh

#### II. Electricity Supply Service:

Demand Charge:

On-Peak kW Sold @ \$ 14.75 per kW

Energy Delivery Charge:

All kWh sold @ \$0.02237 per kWh

All kilowatt-hours used are subject to adjustment for changes in cost of wholesale power and fuel under Schedule K of the Cooperative's Terms and Conditions.



**MECKLENBURG ELECTRIC COOPERATIVE**

**SCHEDULE MGS-TOD-U  
MEDIUM GENERAL TIME-OF-DAY SERVICE**

**AVAILABILITY**

Service under this schedule is available on a voluntary and limited basis, at the Cooperative's option, to consumers located in the territory served by the Cooperative, and on or near Seller's single and multi-phase lines for all types of usage, subject to the Terms and Conditions of Seller. This rate shall be limited to the availability of appropriate meters, and may be limited further by the saturation and/or impact on the Cooperative's electric system of members utilizing this rate schedule in a general area.

**APPLICABILITY**

This schedule is applicable to consumers with an annual kW demand that averages 50 kW or more per month or has a monthly kW demand in excess of 100 kW in any one month and averages no more than 500 kW per month. Service under this schedule is subject to the established Terms and Conditions of the Cooperative. This schedule is not available for breakdown, standby, supplemental, self-generation, or resale service.

**CHARACTER OF SERVICE**

Standard service under this schedule shall be 60-Hertz alternating current, single-phase, or multi-phase where available, at Cooperative's standard secondary voltages. With the Cooperative's prior approval, service may be available at the Cooperative's standard primary distribution voltage.

**MONTHLY RATE**

I. Distribution Service:

Consumer Delivery Charges:

Single-Phase: \$ 95.00 per month  
Multi-Phase: \$ 200.00 per month

Demand Delivery Charge:

Maximum Monthly kW delivered @ \$ 2.50 per kW

Energy Delivery Charge:

All kWh delivered @ \$0.00425 per kWh

II. Electricity Supply Service:

Demand Charge:

On-Peak kW sold @ \$ 13.60 per kW

Energy Supply Charge:

All kWh sold @ \$0.01951 per kWh

All kilowatt-hours used are subject to adjustment for changes in cost of wholesale power and fuel under Schedule K of the Cooperative's Terms and Conditions.

Effective for bills rendered on or after April 1, 2009

**DETERMINATION OF BILLING DEMAND**

The On-Peak billing demand shall be the maximum kilowatt demand established by the consumer during a sixty minute interval, during On-Peak hours, within the month for which the bill is rendered, as indicated or recorded by a demand meter, and adjusted for power factor. The Maximum Monthly billing demand for the current month shall be the maximum sixty-minute clock-hour demand established by the consumer during the month for which the bill is rendered. Both the recorded On-Peak and Maximum Monthly billing demands will be adjusted for power factor as outlined below.

**PEAK AND OFF-PEAK PERIODS**

June – September

Peak Hours: 4:00 p.m. – 9:00 p.m., Monday – Friday  
Off-Peak Hours: All other times

October, November, March, April, May

Peak Hours: 7:00 a.m. – 10:00 a.m., 2:00 p.m. – 9:00 p.m.  
Monday – Friday  
Off-Peak Hours: All other times

December – February

Peak Hours: 6:00 a.m. – 10:00 a.m., Monday – Friday  
Off-Peak Hours: All other times

**POWER FACTOR ADJUSTMENT**

The consumer agrees to maintain unity power factor as nearly as practicable. Demand charges will be adjusted to correct for power factors lower than 90%. Such adjustments will be made by increasing the measured demand 1% for each 1% by which the power factor is less than 90% lagging or leading.

**MINIMUM MONTHLY CHARGES**

The minimum monthly charge shall be the greater of the following:

1. The Consumer Delivery Charge shown above or,
2. The Contract Minimum as specified in a contract for electric service.

**MINIMUM ANNUAL CHARGE FOR SEASONAL SERVICE**

Consumers requiring service only during certain seasons not exceeding nine months per year may be subject to a minimum annual charge, in which case, there shall be no minimum monthly charge. The minimum annual charge shall be equal to twelve times the minimum monthly charge determined in accordance with the foregoing paragraph.



**SERVICE AT PRIMARY VOLTAGE**

If service is furnished at Cooperative's standard primary distribution voltage and the consumer owns and operates its distribution system, a discount of two and one-half percent of the billed kWh energy and kW demand charges shall apply.

**SPECIAL EQUIPMENT**

Whenever a consumer requests the Cooperative to furnish equipment or facilities in excess of those which the Cooperative would normally provide, and the Cooperative finds it practical, such facilities and equipment may be provided in accordance with the Cooperative's Terms and Conditions.

**BILLING**

Bills will be rendered by the Cooperative on a monthly basis, by billing cycle.

**TERMS OF CONTRACT**

The term of contract for the purchase of electricity under this schedule shall be as specified in the contract for service, but not less than one year.

# MECKLENBURG ELECTRIC COOPERATIVE

## SCHEDULE LGS-TOD-U LARGE GENERAL TIME-OF-DAY SERVICE

### AVAILABILITY

Service under this schedule is available on a voluntary and limited basis, at the Cooperative's option, to consumers located in the territory served by the Cooperative, and on or near Seller's single and multi-phase lines for all types of usage, subject to the Terms and Conditions of Seller. This rate shall be limited to the availability of appropriate meters, and may be limited further by the saturation and/or impact on the Cooperative's electric system of members utilizing this rate schedule in a general area.

### APPLICABILITY

This schedule is applicable to consumers whose annual kW demand averages 500 kW or more per month, or whose highest monthly kW demand exceeds 550 kW. Service under this schedule is subject to the established Terms and Conditions of the Cooperative. This schedule is not available for breakdown, standby, supplemental, self-generation, or resale service.

### CHARACTER OF SERVICE

Standard service under this schedule shall be 60-Hertz alternating current, single-phase, or multi-phase where available, at Cooperative's standard secondary voltages. With the Cooperative's prior approval, service may be available at the Cooperative's standard primary distribution voltage.

### MONTHLY RATE

#### III. Distribution Service:

Consumer Delivery Charge:

All Consumers: \$ 550.00 per month

Demand Delivery Charge:

Maximum Monthly kW delivered @ \$ 2.25 per kW

Energy Delivery Charge:

All kWh delivered @ \$0.00322 per kWh

#### IV. Electricity Supply Service:

Demand Charge:

On-Peak kW Sold @ \$ 12.95 per kW

Energy Supply Charge:

All kWh sold @ \$0.01863 per kWh

All kilowatt-hours used are subject to adjustment for changes in cost of wholesale power and fuel under Schedule K of the Cooperative's Terms and Conditions.

Effective for bills rendered on or after April 1, 2009



**DETERMINATION OF BILLING DEMAND**

The On-Peak billing demand shall be the maximum kilowatt demand established by the consumer during a sixty minute interval, during On-Peak hours, within the month for which the bill is rendered, as indicated or recorded by a demand meter, and adjusted for power factor. The Maximum Monthly billing demand for the current month shall be the maximum sixty-minute clock-hour demand established by the consumer during the month for which the bill is rendered. Both the recorded On-Peak and Maximum Monthly billing demands will be adjusted for power factor as outlined below.

**PEAK AND OFF-PEAK PERIODS**

June – September

Peak Hours: 4:00 p.m. – 9:00 p.m., Monday – Friday  
Off-Peak Hours: All other times

October, November, March, April, May

Peak Hours: 7:00 a.m. – 10:00 a.m., 2:00 p.m. – 9:00 p.m.  
Monday – Friday  
Off-Peak Hours: All other times

December – February

Peak Hours: 6:00 a.m. – 10:00 a.m., Monday – Friday  
Off-Peak Hours: All other times

**POWER FACTOR ADJUSTMENT**

The consumer agrees to maintain unity power factor as nearly as practicable. Demand charges will be adjusted to correct for power factors lower than 90%. Such adjustments will be made by increasing the measured demand 1% for each 1% by which the power factor is less than 90% lagging or leading.

**MINIMUM MONTHLY CHARGES**

The minimum monthly charge shall be the greater of the following:

1. The Consumer Delivery Charge shown above or,
2. The Contract Minimum as specified in a contract for electric service.

**MINIMUM ANNUAL CHARGE FOR SEASONAL SERVICE**

Consumers requiring service only during certain seasons not exceeding nine months per year may be subject to a minimum annual charge, in which case, there shall be no minimum monthly charge. The minimum annual charge shall be equal to twelve times the minimum monthly charge determined in accordance with the foregoing paragraph.

**SERVICE AT PRIMARY VOLTAGE**

If service is furnished at Cooperative's standard primary distribution voltage and the consumer owns and operates its distribution system, a discount of two and one-half percent of the billed kWh energy and kW demand charges shall apply.

**SPECIAL EQUIPMENT**

Whenever a consumer requests the Cooperative to furnish equipment or facilities in excess of those which the Cooperative would normally provide, and the Cooperative finds it practical, such facilities and equipment may be provided in accordance with the Cooperative's Terms and Conditions.

**BILLING**

Bills will be rendered by the Cooperative on a monthly basis, by billing cycle.

**TERMS OF CONTRACT**

The term of contract for the purchase of electricity under this schedule shall be as specified in the contract for service, but not less than one year.



NORTHERN NECK ELECTRIC COOPERATIVE

SCHEDULE T-1-U

NON-DEMAND TOU SERVICE

1. AVAILABILITY

Available to Customers of the Cooperative that are being served or would normally be served under Schedules R-1-U, GS-1-U or C-4-U where load is not in excess of 20 kW. Net Metering customers are not eligible for this rate.

2. TYPE OF SERVICE

Single-phase, and three-phase, where available, 60 cycles, at available secondary voltage.

3. RATE (MONTHLY)

I. Distribution Delivery Charges:

Access Charge: \$25.33 per month

Energy Delivery Charges:

All on peak kWh delivered @ \$0.01730 per kWh  
All off peak kWh delivered @ \$0.01730 per kWh

II. Electricity Supply Service Charges:

All on peak kWh delivered @ \$0.10907 per kWh  
All off peak kWh delivered @ \$0.01956 per kWh

4. DETERMINATION OF ON-PEAK AND ON-PEAK HOURS

I. On-Peak hours are: 6 AM to 8 AM and 3 PM to 8 PM

II. Off-Peak hours are: All hours not included in the "On-Peak hours" above.

5. MINIMUM MONTHLY CHARGES

The minimum monthly Distribution Delivery charge for service shall be \$25.33.

6. WHOLESALE POWER COST ADJUSTMENT CHARGE

The amount of charges calculated under the above rates are subject to increase or decrease under provisions of the Cooperative's wholesale Power Cost Adjustment Clause, Schedule "G."

7. TERM OF CONTRACT

The Term of Contract is to be not less than twelve months.



NORTHERN NECK ELECTRIC COOPERATIVE

SCHEDULE TD-1-U

DEMAND TOU SERVICE

1. AVAILABILITY

Available to Customers of the Cooperative that are being served or would normally be served under Schedules R-1-U, GS-1-U, C-4-U or LP-4-U where load is in excess of 20 kW. Net Metering customers are not eligible for this rate.

2. TYPE OF SERVICE

Single-phase, and three-phase, where available, 60 cycles, at available secondary voltages.

3. RATE (MONTHLY)

I. Distribution Delivery Charges:

Access Charge: \$93.47 per month

Demand Delivery Charges:

Basic billing demand @ \$3.42 per kW

rkVA Delivery Charge: @ \$0.09 per rkVA

II. Electricity Supply Service Charges:

Demand Charge:

On-Peak billing demand @ \$6.26 per kW

Energy Charge:

All kWh sold @ \$0.03475 per kWh

rkVA Charge: @ \$0.06 per rkVA

Effective Date: January 1, 2009

4. DETERMINATION OF BILLING DEMAND

I. For loads with a maximum demand in excess of 50 kW.

1. Basic Demand

- (a) The Basic Billing Demand will be determined as the maximum kilowatt demand established by the Customer for any period of fifteen (15) minutes during the month for which the bill is rendered, as indicated or recorded by demand meter, but not less than fifty-five percent (55%) of the highest demand established in the months of June through September of the preceding eleven months.

2. On-Peak Demand

- (a) The On-Peak Billing Demand will be determined as the maximum kilowatt demand established by the Customer for any period of fifteen (15) minutes during the peak period of the month for which the bill is rendered, as indicated or recorded by demand meter, but not less than fifty-five percent (55%) of the highest demand established in the months of June through September of the preceding eleven months.

II. For Loads with a maximum demand not exceeding 50 kW

1. Basic Demand

- (a) The Basic Billing Demand will be determined as the maximum kilowatt demand established by the Customer for any period of fifteen (15) minutes during the month for which the bill is rendered, as indicated or recorded by demand meter.

2. On-Peak Demand

- (a) The On-Peak Billing Demand will be determined as the maximum kilowatt demand established by the Customer for any period of fifteen (15) minutes during the peak period of the month for which the bill is rendered, as indicated or recorded by demand meter.



5. DETERMINATION OF ON-PEAK AND ON-PEAK HOURS

On-Peak hours are: 6 AM to 8 AM and 3 PM to 8 PM

Basic Demand hours are: All hours not included in the "On-Peak hours" above.

6. MINIMUM MONTHLY CHARGES

The minimum monthly Distribution Delivery charge for service shall be the highest one of the following charges:

- a) The minimum monthly charge as specified in the contract for service.
- b) \$360.00

7. WHOLESALE POWER COST ADJUSTMENT CHARGE

The amount of charges calculated under the above rates are subject to increase or decrease under provisions of the Cooperative's Wholesale Power Cost Adjustment Clause, Schedule "G."

8. DETERMINATION OF rkVA DEMAND

The rkVA demand shall be billed to Customers with 500 kW or more of measured demand. The billing rkVA shall be the highest average rkVA measured in any period of fifteen consecutive minutes during the month for which the bill is rendered.

9. PRIMARY SERVICE DISCOUNT

If service is furnished at the Sellers primary distribution voltage, a discount shall apply to the charges specified in the applicable rate schedule. The Seller may meter at secondary voltage and adjust for transformer losses by use of loss compensators. The discount for primary service shall be three percent (3%) of the Distribution Delivery demand and energy charges.

10. TERM OF CONTRACT

The Term of Contract shall be not less than twelve (12) months.

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