Virginia Solar Energy Development and Energy Storage Authority

2024 Annual Report

Virginia Solar Energy Development and Energy Storage Authority
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2024 Annual Report of the Solar Energy Development and Energy Storage Authority

A. OVERVIEW OF THE AUTHORITY AND THEIR ACTIVITIES

UPDATE ON AUTHORITY ACTIVITIES

The Authority held four meetings in 2024. During these meetings, industry leaders and experts presented information on issues impeding solar and storage development and deployment in the Commonwealth.

Authority members heard presentations covering local permitting issues, interconnection, the PJM market, and EV deployment. The Authority also spent time discussing the purpose and impacts of its past and future annual reports.

LOCAL PERMITTING FOR SOLAR PROJECTS

Joe Lerch, Director of Local Government Policy for the Virginia Association of Counties (VACO) provided some perspectives on solar energy and energy storage and the impacts being faced by different counties. He addressed how the amount of land being taken up by large solar projects has become a growing concern to VACO's member counties. He also described how counties typically choose to regulate solar projects and the process which the local planning commissions review projects and typically produce a report and recommendations to the County Board of Supervisors to approve or deny the permit request.

Authority members spent time asking questions about policy standards and local ordinances. There was also significant discussion about Virginia's growing energy demand and the growing pressure on rural localities to site projects to meet this demand.

PJM UPDATES ON INTERCONNECTION REFORMS AND THE CAPACITY MARKET

Scott Baker, Senior Lead Business Solutions Analyst of PJM presented to Authority members about various topics (interconnection reforms, capacity market, etc.) that are helping to ensure a reliable energy transition throughout the region. The Authority received a comprehensive overview of the primary roles of PJM and key data points about energy generation and reliability within the PJM region. Authority members asked question about interconnection queue reforms occurring at PJM aimed at reducing current interconnection backlogs.

ISSUES IMPACTING DEPLOYMENT OF EVS AND EV CHARGERS

Glenn Skutt, CTO of Fermata Energy presented to Authority members about the opportunities related to EV charging. Fermata is a maker of bi-directional EV charging platforms and Dr. Skutt discussed the current state of this technology and challenges to implementing widespread deployment. He also addressed general issues that may impede the deployment of EVs and EV chargers.

DISCUSSION OF VSEDESA ANNUAL REPORTS

The Authority also spent time discussing the purpose of the annual report and the statutory status of the Authority. The Authority engaged with leadership of the Virginia Department of Energy and the Office of the Attorney General to seek clarification on this matter. The Authority ultimately determined that it had the ability to draft and submit its own annual reports.

B. UPDATE ON SOLAR AND ENERGY STORAGE DEPLOYMENTS IN VIRGINIA

The Authority continues to track solar energy and energy storage deployments in Virginia.

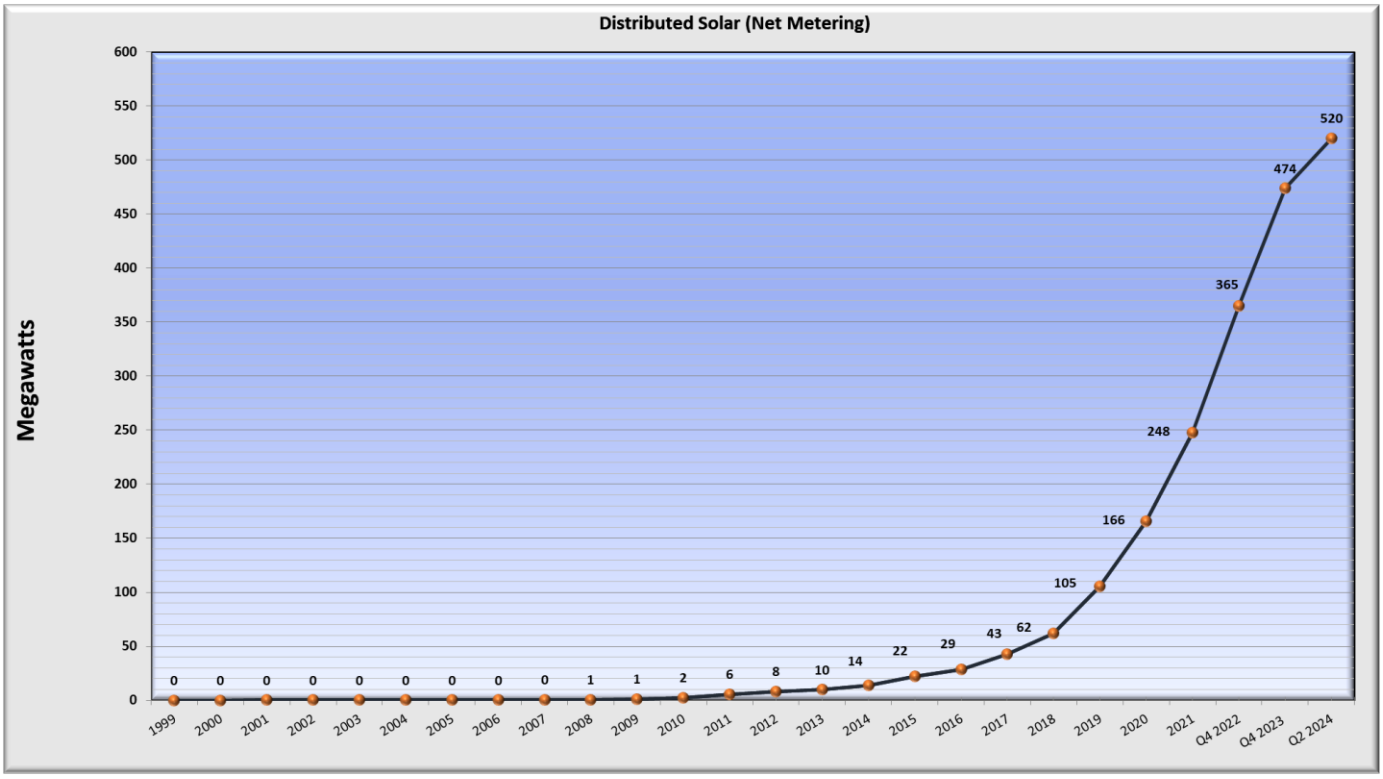
Solar Deployment

Based on EIA data on net generation, solar energy accounted for 7.17% (7,031 MWh) of all energy generated in Virginia from Q2 2023 to Q2 2024.[1] EIA's 860M inventory of operating generators as of August 2024 indicates there is approximately 4,000 MW of installed capacity of solar facilities (non-net-metered) in Virginia.[2]

Additionally, according to the SCC's *Annual Report on Construction of New Solar and Wind Projects,* the total capacity of solar facilities constructed by IOUs, electric cooperatives, and third-party developers since July 1, 2018, was 2,594 MW (as of June 30, 2023). Additionally, 11,020 MW of solar facilities were under development by IOUs, electric cooperatives, and third-party developers (as of June 30, 2023).[3] An updated report will be published by the SCC on December 1, 2024.

In addition to large-scale solar facilities, distributed (net metered) solar installations increased from 46,992 installations totaling 435 MW in Q2 of 2023 to 56,921 installations totaling 520 MW in Q2 2024. The chart below illustrates the steady growth in distributed net metering facilities in recent years in Virginia.

[1] https://www.eia.gov/electricity/monthly/
[2] https://www.eia.gov/electricity/data/eia860m/
[3] https://rga.lis.virginia.gov/Published/2023/RD682/PDF



Energy Storage

EIA's 860 Monthly inventory of operating generators as of August 2024 indicates there is approximately 71 MW of installed capacity of battery storage facilities in Virginia. At present 480 MW of commercial-scale energy storage is either complete, under construction, or in the engineering and procurement stage listed in the PJM New Services Queue in Virginia. This capacity does not include storage systems connecting at distribution-level voltages that are not required to go through the PJM approval process. To date, it has been challenging to assess the total capacity of commercial-scale energy storage systems and the quantity of behind-the-meter distributed energy storage systems at homes and businesses. Authority staff continues to look for methods to acquire this data.

Additionally, in operation since 1985, Dominion Energy operates the Bath County Pumped Hydroelectric Storage facility, one of the largest pumped hydroelectric storage facilities in the world. This 3,003 MW long duration energy storage facility is jointly owned by Dominion Energy Virginia, Bath County LLC, and Allegheny Power Systems , and is an essential resource in supporting reliability and integrating increasing amounts of renewable energy into the grid.

PJM Interconnection Delays

After announcing its interconnection process reform in November 2022, PJM began to transition to its new process on July 10, 2023. Throughout 2024, PJM has

worked to start clearing the queue by reviewing up to 300 projects totaling 26 GW through the fast-track process. In Mid-2025, PJM will begin to implement Transition Cycle 1 to review an additional 46 GW of mostly solar and other renewables in the queue. That will be followed by Transition Cycle 2 before fully transitioning to the new interconnection process in 2026.

PJM expects 162 projects totaling 19,012 MW of nameplate capacity to clear the interconnection process in Virginia in 2024 and 2025. This is the highest of any state in the PJM region, with Virginia projects representing over 25% of the projects expected to clear the interconnection process. Throughout PJM, of the projects expected to clear the interconnection process in 2024 and 2025, 50.8% of the capacity is solar, 14.1% is solar + storage, and 12.7% is storage.

Grid Enhancing Technologies and Vehicle-to-Grid

Grid Enhancing Technologies (GETs) are tools that make our power grid more flexible, reliable, and efficient and can safely, swiftly help increase the grid's capacity to integrate more clean energy resources. Some examples of GETs include: Dynamic Line Ratings, which determine the true, real-time capacity of power-lines so grid operators and avoid problems before they occur; Power Flow Controllers, which allow operators to reroute power to lines with available capacity and increase the overall amount of power in the system; and Topology Optimization, which helps identify bottlenecks and prevent lines from becoming too congested. As demand for electricity grows on Virginia's grid, GETs can help operators meet that demand reliably within the existing footprint of the system - providing time to build additional transmission without slowing economic development. And as Virginia works to meet its VCEA goals, and bring new clean generation into the grid, GETs can help manage this transition.

As more and more Virginia families and businesses switch to electric vehicles (EVs), the need to effectively manage EV charging, and the opportunities to store energy and support the grid utilizing EV batteries come into greater focus. Vehicle to Grid (V2G) technology represents a significant advancement in managing energy storage and distribution by leveraging electric vehicles (EVs) not only as transportation solutions but also as mobile energy storage units. This technology allows EV batteries to discharge electricity back into the power grid.

The potential benefits of V2G are multifaceted:

- Energy Efficiency: By using EV batteries as temporary energy storage, V2G can help stabilize the grid during demand spikes, making energy use more efficient.
- Enhanced Grid Resilience: V2G technology can provide emergency power during outages, enhancing grid reliability.

Despite its potential, V2G technology faces several challenges that must be addressed to realize its full potential:

- Infrastructure Needs: Significant investment in grid infrastructure and EV charging stations is required to facilitate widespread adoption of V2G.
- Regulatory Frameworks: Clear policies and regulations need to be established to manage the interactions between EV owners, utility companies, and grid operators.
- Technology Standardization: Developing standard protocols for V2G integration across different EV models and charging systems is essential for scalability.

The Virginia Solar Energy Development and Energy Storage Authority is encouraged to further investigate V2G technologies, exploring partnerships with academic institutions and industry leaders to pilot programs that will showcase the benefits and feasibility of this innovative technology.

C. ACTIVE REGULATORY TOPICS RELATED TO SOLAR ENERGY AND ENERGY STORAGE IN 2024

Net-metering

-***Solar Leasing***: *SB 271*/*HB 1062* (Effective July 1, 2024)

Net-metering customers are now allowed to enter into lease agreements with a third party to own and maintain an electrical generating facility within the net energy metering program.

-***Review of Net-Metering Programs***: *PUR-2024-00047* (Ongoing)

Va. Code § 56-594(E) requires that the SCC conduct proceedings to review the net-metering programs of Appalachian Power Company and Dominion Energy Virginia. ApCo was required to file a net-metering proposal by 9/2/2024. Dominion Energy is directed to file a proposal by 5/1/2025.

-***Appalachian Power Company Net-Metering Proposal***: *PUR-2024-00161* (Ongoing)

Pursuant to PUR-2024-00047, ApCo filed its proposed changes with the SCC for its net-metering program. A public hearing is scheduled for 5/20/2025.

Interconnection

***-Review of Utility distributed energy resource (DER) interconnection-related issues**: PUR-2022-00073* (Ongoing)

In January 2024, the SCC published the report of the DER interconnection working group which included several recommendations to make the process more efficient and cost-effective. In August 2024, the SCC issued an order to (1) create a separate proceeding to study direct transfer trip (DTT) requirements, (2) require Dominion Energy to conduct a pilot targeted cluster study approach for interconnection requests, and (3) require specific improvements to the interconnection process of all Virginia Electric Utilities. These improvements include requiring publishing: an application checklist, a DER interconnection guide, and a unit cost guide.

*-**Revising the Regulations Governing Interconnection of Small Electrical Generators:** PUR-2023-00069: (Ongoing)*

The SCC initiated rulemaking to explore changes the regulations for interconnection of DERs. This process is ongoing and is related to several other studies and reviews of interconnection that are currently ongoing.

*-**Dominion Energy's Interconnection Parameters for Net Metering Distributed Energy Resources**: PUR-2023-00097, PUR-2023-00069, PUR-2023-00198, PUR-2024-00150 (Ongoing)*

A group of solar developers and advocates known as the Virginia Distributed Solar Alliance have challenged Dominion's interconnection parameters for net-metered projects ranging from 250 kW to 1 MW. On several occasions the Alliance has filed complaints with the SCC seeking injunctive relief from the parameters. The focus of the complaints are on direct-transfer-trip (DTT) and other interconnection requirements.

Shared Solar

***-Shared Solar Program Expansion**: HB 106, HB 108, SB 253, SB 255 (Effective July 1, 2024)*

Legislation expanded Dominion Energy's shared solar program from an aggregate capacity of 150 MW to 200 MW. The same legislation conditioned a further 150 MW expansion, which would bring the program's aggregate capacity to a total of 350 MW, on an SCC determination that at least 90% of the initial 200 MW tranche has been subscribed and that project construction is substantially complete. Separate legislation provided for creation of a program in Appalachian Power territory with an aggregate capacity of the lesser of 50 MW or six percent of the utility's peak load.

***-Establishment and Revision of Shared Solar Rules**: PUR-2024-00122 (Ongoing)*

The SCC is working to update the program rules for Dominion Energy and to create rules for Appalachian Power. Discussion and determination of the minimum bill and bill credit rates is upcoming in 2025.

Energy Storage

***-Dominion Energy Pilot Program for Battery Storage**: PUR-2023-00162 (Approved May 6, 2024)*

Dominion Energy was approved by the SCC to develop three different long-duration battery storage technologies. This includes an iron-air battery system (4.94 MW) and a zinc-hybrid system (4 MW) at the Darbytown Power Station and a metal-hydrogen system (1.5 MW) at Virginia State University. The approval of the projects brings the aggregate capacity of all Pilot Programs approved by the SCC to 28.34 MW.

***-Appalachian Power Request to Construct a Battery Energy Storage System**: PUR-2024-00001 (Ongoing)*

Appalachian Power made its first request to the SCC for the approval of a battery energy storage system as part of its 400 MW requirement for the VCEA. ApCo is proposing two sites totaling 7.5 MW and 30 MWh that utilize Lithium-ion storage technology.

***-Customer-Owned Battery Storage Systems**: SB 271/HB 1062 (Effective July 1, 2024)*

Eligible customers participating in net-metering that have onsite battery service may participate in demand response, energy efficiency, or peak reduction programs.

Grid Enhancing Technologies

-Integrated Resource Plans and Grid Enhancing Technologies: HB 862

This legislation requires Virginia's regulated electric utilities to include a comprehensive assessment of the potential application of GETs in their integrated resource plans (IRPs) and, should they opt not to utilize such technologies, a detailed explanation of why not.

Permitting

***-Small Renewable Energy Projects Permit Regulation Modifications** (HB 206): Ongoing*

The Department of Environmental Quality has proposed modifications to the permit regulations for small renewable energy projects. These changes are to meet the requirements from HB 206 (2022). The public comment period will end on the proposed regulations on 12/6/2024. It is expected that these regulations will go into effect in early 2025.

C. RECOMMENDATIONS

Virginians want reliable, safe, affordable, and clean energy. Still, localities' barriers to solar and storage development and interconnection barriers at both the transmission and distribution levels make that transition challenging. If enacted, these recommendations will help Virginians access preferred clean energy and create the economic and health benefits associated with transitioning to a clean energy economy in the Commonwealth without compromising safe, reliable and affordable energy delivery in the Commonwealth.

2024 Recommendations:

- **The Authority recommends the following for promoting the development of utility-scale and distributed-scale solar and energy storage at the local government level to meet VCEA goals and respond to market demand for solar and battery storage.:**
    - That the Governor requests an official advisory opinion per Virginia Code §2.2-505 to clarify the authority of local governments to regulate large-scale solar and energy storage developments AG Opinion No. 12-102, issued January 11, 2013, found that only reasonable zoning measures could be placed on oil and gas exploration and that "a local governing body cannot ban altogether" the practice. The Attorney General should consider the following as it relates to solar and energy storage development:
        - Local ordinance requirements that result in a de facto moratorium on solar and energy storage development.
        - Acreage caps and density restrictions that prohibit solar development beyond a certain threshold.
        - Repealing or refusing to institute an ordinance to allow consideration of solar or energy storage developments.
    - That the Governor instructs the Virginia Department of Energy Director to develop and promulgate ordinance recommendations for localities to govern the siting and development of solar and energy storage facilities.
    - That the Governor support the Virginia Department of Energy in dedicating more time and resources to coordination policy and facilitating the development of energy storage assets across Virginia.
    - That Virginia Energy creates educational resources for localities, landowners, and the general public on permitting, regulations, and safety best practices for solar and storage development. Eliminate barriers to the implementation of VCEA goals and respond to market demand for solar and battery storage.

- **The Authority recommends the following for promoting the development of solar and energy storage at both the transmission and distribution level:**
    - Promote policies that expand access to distributed generation and storage resources under compensation methods that reasonably assign cost and benefits.
    - Advance policies to streamline the distribution interconnect process and address unnecessarily burdensome rules that make distribution-level projects cost-prohibitive.
    - Policymakers should consider methods to shorten the current PJM Interconnection queue that is delaying projects trying to connect to the grid at the transmission level.
        - The legislature should direct Virginia utilities to use existing grid capacity creatively, considering, for example:
            - Replacing scheduled to be retired fossil assets with solar and energy storage.
            - Using Grid Enhancing Technologies (GETs – including storage as transmission, dynamic line rating, power flow control and topology optimization) in the transmission and IRP planning processes and justify if a GETs solution is not used.

- **The Authority recommends the following to ensure the continued advancement of solar panel technology and recycling in Virginia.**
    - Ensure state and local government policies and ordinances are technology agnostic and can adapt to industry advancements overtime
    - That Virginia Energy disseminates information on solar panel technologies that permitting authorities may consult to prevent the baseless discrimination against certain accepted panel technologies.
    - Work with appropriate state agencies, including Virginia Energy to conduct an analysis of the recyclability of solar panel technologies and make their findings public.

- **The Authority recommends the following given the challenges that remain in solar and storage development as well as the July 1, 2025 sunset of the VASEDESA**
    - That the legislature renew the VASEDESA Charter for an additional 5 years.

The Authority believes that adopting these recommendations is critical to enabling a just, clean energy transition for Virginians and increasing the desirability of Virginia as a preferred location for economic development.

D. CONCLUSION

The Authority stands ready to engage with the Administration and General Assembly leaders and welcomes opportunities to participate in policy discussions impacting solar and storage development.

The Authority will also continue to track solar energy and energy storage deployment and will focus on identifying methods to improve utility-scale and distributed energy resources. As part of this effort, the Authority will seek to solicit input from localities enacting policies to govern the siting and operation of solar and energy storage assets within their jurisdiction.

APPENDIX A

Enabling Legislation

Enabling Legislation (Amended 2017)

§ 45.2-1902. (Effective October 1, 2021; Expires July 1, 2025) Virginia Solar Energy Development and Energy Storage Authority established; purpose.

The Virginia Solar Energy Development Authority is continued as the Virginia Solar Energy Development and Energy Storage Authority. The Authority constitutes a political subdivision of the Commonwealth. The Authority is established for the purposes of (i) facilitating, coordinating, and supporting the development, either by the Authority or by other qualified entities, of the solar energy and energy storage industries and solar energy and energy storage projects by developing programs that increase the availability of financing for solar energy projects and energy storage projects; (ii) facilitating the increase of solar energy generation systems and energy storage projects on public and private sector facilities in the Commonwealth; (iii) promoting the growth of the Commonwealth's solar and energy storage industries; (iv) providing a hub for collaboration between entities, both public and private, to partner on solar energy projects and energy storage projects; and (v) positioning the Commonwealth as a leader in research, development, commercialization, manufacturing, and deployment of energy storage technology. The Authority may also consult with research institutions, businesses, nonprofit organizations, and stakeholders as the Authority deems appropriate. The Authority has only those powers enumerated in this article.

§ 45.2-1903. (Effective October 1, 2021; Expires July 1, 2025) Membership; terms; vacancies; expenses.

A. The Authority shall have a total membership of 15 non-legislative citizen members appointed as follows: eight members to be appointed by the Governor; four members to be appointed by the Speaker of the House of Delegates; and three members to be appointed by the Senate Committee on Rules. All members of the Authority shall be citizens of the Commonwealth. Members may include representatives of solar businesses, solar customers, renewable energy financiers, state and local government solar customers, institutions of higher education who have expertise in energy technology, and solar research academics.

B. Except as otherwise provided in this article, all appointments shall be for terms of four years each. No member shall be eligible to serve more than two successive four-year terms. After expiration of an initial term of three years or less, two additional four-year terms may be served by such member if appointed thereto. Appointments to fill vacancies, other than by expiration of a term, shall be made for the unexpired terms. Any appointment to fill a vacancy shall be made in the same manner as the original appointment. The remainder of any term to which a

member is appointed to fill a vacancy shall not constitute a term in determining the member's eligibility for reappointment.

C. The Authority shall appoint from its membership a chairman and a vice-chairman, each of whom shall serve in such capacity at the pleasure of the Authority. The chairman, or in his absence the vice-chairman, shall preside at each meeting of the Authority. The meetings of the Authority shall be held on the call of the chairman or whenever a majority of the members so request. A majority of members of the Authority serving at any one time shall constitute a quorum for the transaction of business.

D. Members shall serve without compensation. However, all members may be reimbursed for all reasonable and necessary expenses incurred in the performance of their duties as provided in §§ 2.2-2813 and 2.2-2825. Such expenses shall be paid from funds appropriated to the Authority by the General Assembly.

E. Members of the Authority shall be subject to the standards of conduct set forth in the State and Local Government Conflict of Interests Act (§ 2.2-3100 et seq.) and may be removed from office for misfeasance, malfeasance, nonfeasance, neglect of duty, or misconduct in the manner set forth therein.

F. Except as otherwise provided in this article, members of the Authority shall be subject to the provisions of the Virginia Freedom of Information Act (§ 2.2-3700 et seq.).

§ 45.2-1904. (Effective October 1, 2021; Expires July 1, 2025) Partnerships.

A. The Authority may establish public-private partnerships with entities pursuant to the Public-Private Education Facilities and Infrastructure Act of 2002 (§ 56-575.1 et seq.) to increase the number of solar energy generation systems on or located adjacent to public and private facilities in the Commonwealth. Any partnership established pursuant to this section shall stipulate that the Authority and the developers shall share the costs of the installation and operation of solar energy facilities and equipment.

B. The Authority may provide a central hub for appropriate entities, both public and private, to enter into partnerships that result in solar energy generation projects being developed in the Commonwealth. The Authority may act as a good faith broker in such matters to facilitate appropriate partnerships, including public-private partnerships.

§ 45.2-1905. (Effective October 1, 2021; Expires July 1, 2025) Federal loan guarantees.

A. The Authority, on behalf of the Commonwealth, may apply to the US Department of Energy for federal loan guarantees authorized or made available pursuant to Title XVII of the federal Energy Policy Act of 2005, PL 109-58; the federal American Recovery and Reinvestment Act of

2009, PL 111-5; or other similar federal legislation to facilitate the development of solar energy projects.

B. Upon obtaining a federal loan guarantee for a solar energy project pursuant to subsection A, the Authority, subject to any restrictions imposed by federal law, may allocate or assign all or any portion thereof to a qualified third party on terms and conditions the Authority finds appropriate. Any action of the Authority relating to the allocation and assignment of such loan guarantee shall be exempt from the provisions of the Administrative Process Act (§ 2.2-4000 et seq.) pursuant to subdivision B 4 of § 2.2-4002. Any decision of the Authority pursuant to this section shall be final and not subject to review or appeal.

§ 45.2-1906. (Effective October 1, 2021; Expires July 1, 2025) Powers and duties of the Authority.

In addition to other powers and duties established under this article, the Authority has the power and duty to:

1. Adopt, use, and alter at will an official seal;

2. Make bylaws for the management and regulation of its affairs;

3. Maintain an office at any place within the Commonwealth it designates;

4. Accept, hold, and administer moneys, grants, securities, or other property transferred, given, or bequeathed to the Authority, absolutely or in trust, from any source, public or private, for the purposes for which the Authority is established;

5. Make and execute contracts and all other instruments and agreements necessary or convenient for the exercise of its powers and functions;

6. Employ, in its discretion, consultants, attorneys, architects, engineers, accountants, financial experts, investment bankers, superintendents, managers, and any other employees and agents necessary and fix their compensation to be payable from funds made available to the Authority;

7. Invest its funds as permitted by applicable law;

8. Receive and accept from any federal or private agency, foundation, corporation, association, or person grants, donations of money, or real or personal property for the benefit of the Authority, and receive and accept from the Commonwealth or any other state, from any municipality, county, or other political subdivision thereof, or from any other source, aid or contributions of either money, property, or other things of value, to be held, used, and applied for the purposes for which such grants and contributions may be made;

9. Enter into agreements with any department, agency, or instrumentality of the United States or of the Commonwealth and with lenders and enter into loans with contracting parties for the purpose of planning, regulating, and providing for the financing or assisting in the financing of any project;

10. Do any lawful act necessary or appropriate to carry out the powers granted or reasonably implied in this article;

11. Identify and take steps to mitigate existing state and regulatory or administrative barriers to the development of the solar energy and energy storage industries, including facilitating any permitting processes;

12. Enter into interstate partnerships to develop the solar energy industry, solar energy projects, and energy storage projects;

13. Collaborate with entities, including institutions of higher education, to increase the training and development of the workforce needed by the solar and energy storage industries in the Commonwealth, including industry-recognized credentials and certifications;

14. Conduct any other activities as may seem appropriate to increase solar energy generation in the Commonwealth and the associated jobs and economic development and competitiveness benefits, including assisting investor-owned utilities in the planned deployment of at least 400 megawatts of solar energy projects in the Commonwealth by 2020 through entering into agreements in its discretion in any manner provided by law for the purpose of planning and providing for the financing or assisting in the financing of the construction or purchase of such solar energy projects authorized pursuant to § 56-585.1;

15. Promote collaborative efforts among the Commonwealth's public and private institutions of higher education in research, development, and commercialization efforts related to energy storage;

16. Monitor relevant developments in energy storage technology and deployment nationally and globally and disseminate relevant information and research results; and

17. Identify and work with the Commonwealth's industries and nonprofit partners in advancing efforts related to the development and commercialization of energy storage.

§ 45.2-1907. (Effective October 1, 2021; Expires July 1, 2025) Director; staff; counsel to the Authority.

A. The Director shall serve as Director of the Authority and shall administer the affairs and business of the Authority in accordance with the provisions of this article and subject to the policies, control, and direction of the Authority. The Director may obtain non-state-funded

support to carry out any duties assigned to the Director. Funding for such support may be provided by any source, public or private, for the purposes for which the Authority is established. The Director shall maintain and is custodian of all books, documents, and papers of or filed with the Authority. The Director may cause copies to be made of all minutes and other records and documents of the Authority and may give certificates under seal of the Authority to the effect that such copies are true copies, and any person dealing with the Authority may rely on such certificates. The Director also shall perform other duties prescribed by the Authority in carrying out the purposes of this article.

B. The Department shall serve as staff to the Authority.

C. The Office of the Attorney General shall provide counsel to the Authority.

§ 45.2-1908. (Effective October 1, 2021; Expires July 1, 2025) Annual report.

On or before October 15 of each year, the Authority shall submit an annual summary of its activities and recommendations to the Governor and the Chairmen of the House Committee on Appropriations, the Senate Committee on Finance and Appropriations, the House Committee on Labor and Commerce, and the Senate Committee on Commerce and Labor.

§ 45.2-1909. (Effective October 1, 2021; Expires July 1, 2025) Confidentiality of information.

A. The Authority shall hold in confidence the personal and financial information supplied to it or maintained by it concerning the siting and development of solar energy projects and energy storage projects.

B. Nothing in this section shall prohibit the Authority, in its discretion, from releasing any information that has been transformed into a statistical or aggregate form that does not allow the identification of the person who supplied particular information.

C. Information supplied by or maintained on any person or entity applying for or receiving an allocation of any federal loan guarantee, as well as specific information relating to the amount of, or the identity of the recipient of, such distribution, shall be subject to disclosure in accordance with the Virginia Freedom of Information Act (§ 2.2-3700 et seq.).

§ 45.2-1910. (Effective October 1, 2021; Expires July 1, 2025) Declaration of public purpose; exemption from taxation.

A. The exercise of the powers granted by this article shall be in all respects for the benefit of the citizens of the Commonwealth and for the promotion of their welfare, convenience, and prosperity.

B. The Authority shall be deemed to be performing an essential governmental function in the exercise of the powers conferred upon it by this chapter, and the property of the Authority and its income and operations shall be exempt from taxation or assessments upon any property acquired or used by the Authority under the provisions of this article.

§ 45.2-1911. (Effective October 1, 2021; Expires July 1, 2025) Sunset.

The provisions of this article shall expire on July 1, 2025.

APPENDIX B

Virginia Solar Energy Development and Energy Storage Authority Members

Virginia Solar Energy Development and Energy Storage Authority Members

Member/Organization	Appointed By	Term Expires	Attended 1/9/24 Meeting?	Attended 7/10/24 Meeting	Attended 10/7/24 Meeting?	Attended 11/30/24 Meeting?
Paul Duncan MPR Associates, Inc.	Governor	6/30/25	Yes	Yes	Yes	Yes
Skyler Zunk Energy Right	Governor	6/30/26	Yes	Yes	Yes	Yes
Jo Anne Webb General Partner, Scott Timberland Co., LP	Governor	6/30/26	Yes	Yes	Yes	Yes
Rumy J. Mohta CEO, ATLAS Branding and Commercial Financing	Governor	6/30/25	No	No	Yes	No
Colleen A. Lueken, PhD Market Development Director, AES	Governor	6/30/24	Yes	Yes	N/A	N/A
Michael Walsh Partner, Shearman & Sterling LLP	Governor	6/30/25	Yes	No	No	Yes
Robert Birdsey Managing Director, Green Front Energy	Governor	6/30/27	Yes	Yes	No	Yes
Colin Kelly Retired Vice President of Construction, CPV Inc.	Governor	6/30/28	N/A	N/A	Yes	Yes
Brad Viator CEO, B Strategic Solutions, LLC	Governor	6/30/27	N/A	N/A	Yes	Yes
Harrison (Harry) Godfrey Executive Director Virginia Advanced Energy Economy	Speaker of the House	6/30/25	Yes	No	Yes	Yes
Gregory D. Habeeb Partner, Gentry Locke	Speaker of the House	6/30/27	Yes	Yes	No	Yes
Vacant	Speaker of the House					
Vacant	Speaker of the House					
Katharine Bond Founder, iliox	Senate Committee on Rules	6/30/27	Yes	Yes	Yes	Yes
Michael Herbert Co-Founder/Managing Partner Delorean Power	Senate Committee on Rules	6/30/24	Yes	No	No	Yes
Morgan Quicke Senior Manager of Local Affairs, Strata Clean Energy	Senate Committee on Rules	6/30/27	N/A	No	No	Yes

APPENDIX C

Presentations

Ensuring a Reliable Energy Transition in PJM

VA Solar/Storage Development Authority

July 10, 2024

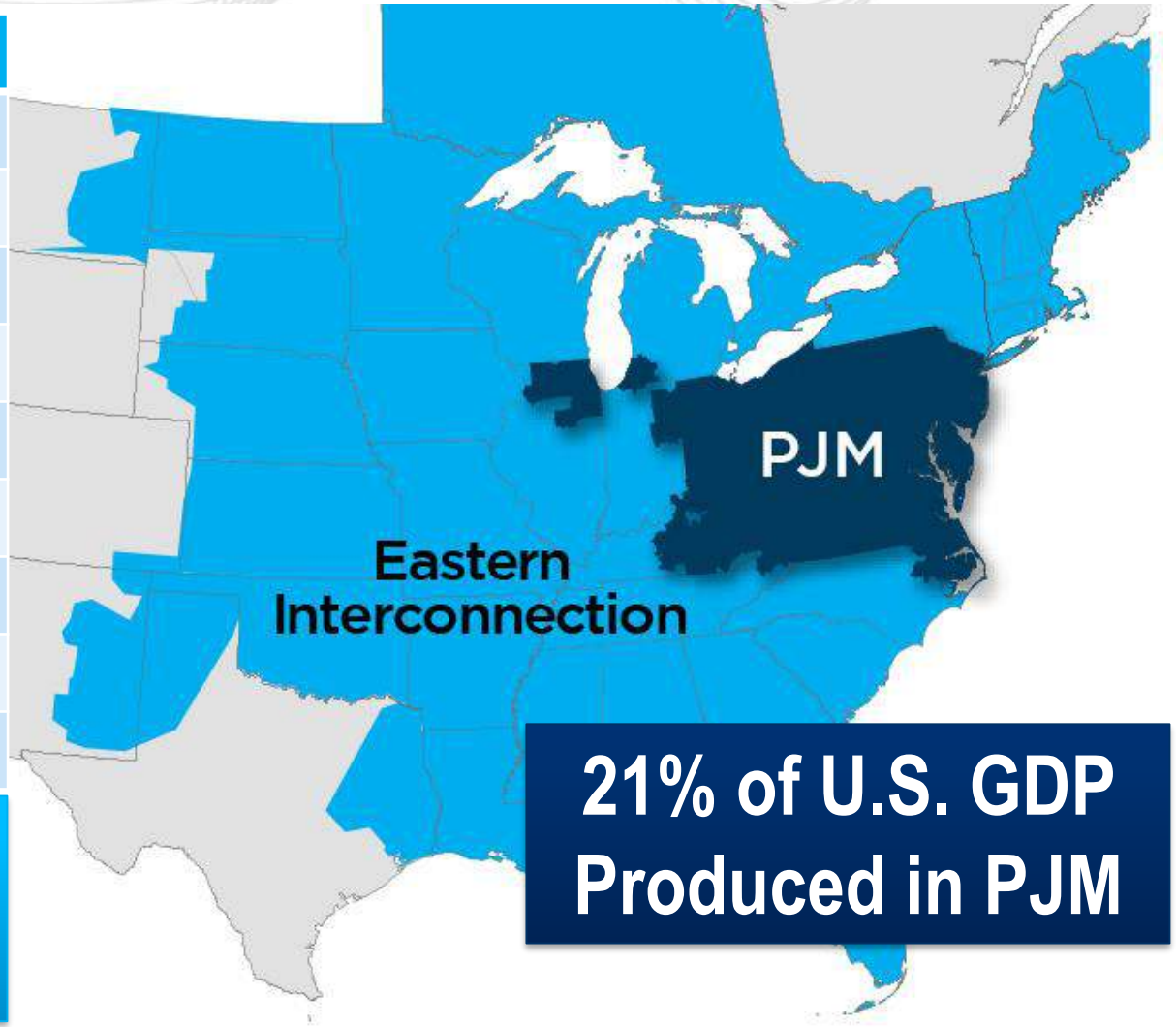
Scott Baker, Scott.Baker@pjm.com

Sr. Lead Business Solutions Analyst

PJM as Part of the Eastern Interconnection

Key Statistics	
Member companies	1,090
Millions of people served	65+
Peak load in megawatts	165,563
Megawatts of generating capacity	180,785
Miles of transmission lines	88,185
Terawatt hours of annual energy	770
Generation sources	1,439
Square miles of territory	368,906
States served	13 + DC

- 26% of generation in Eastern Interconnection
- 25% of load in Eastern Interconnection
- 20% of transmission assets in Eastern Interconnection



As of 2/2024

Primary Focus

RELIABILITY

PJM's Role as a Regional Transmission Organization

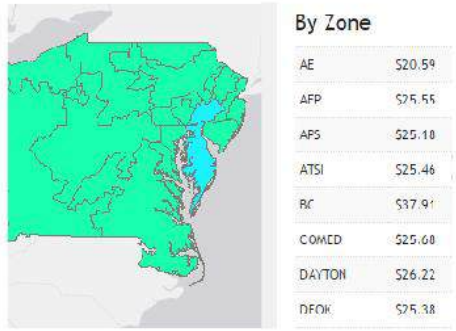
PLANNING

Planning for the future like...

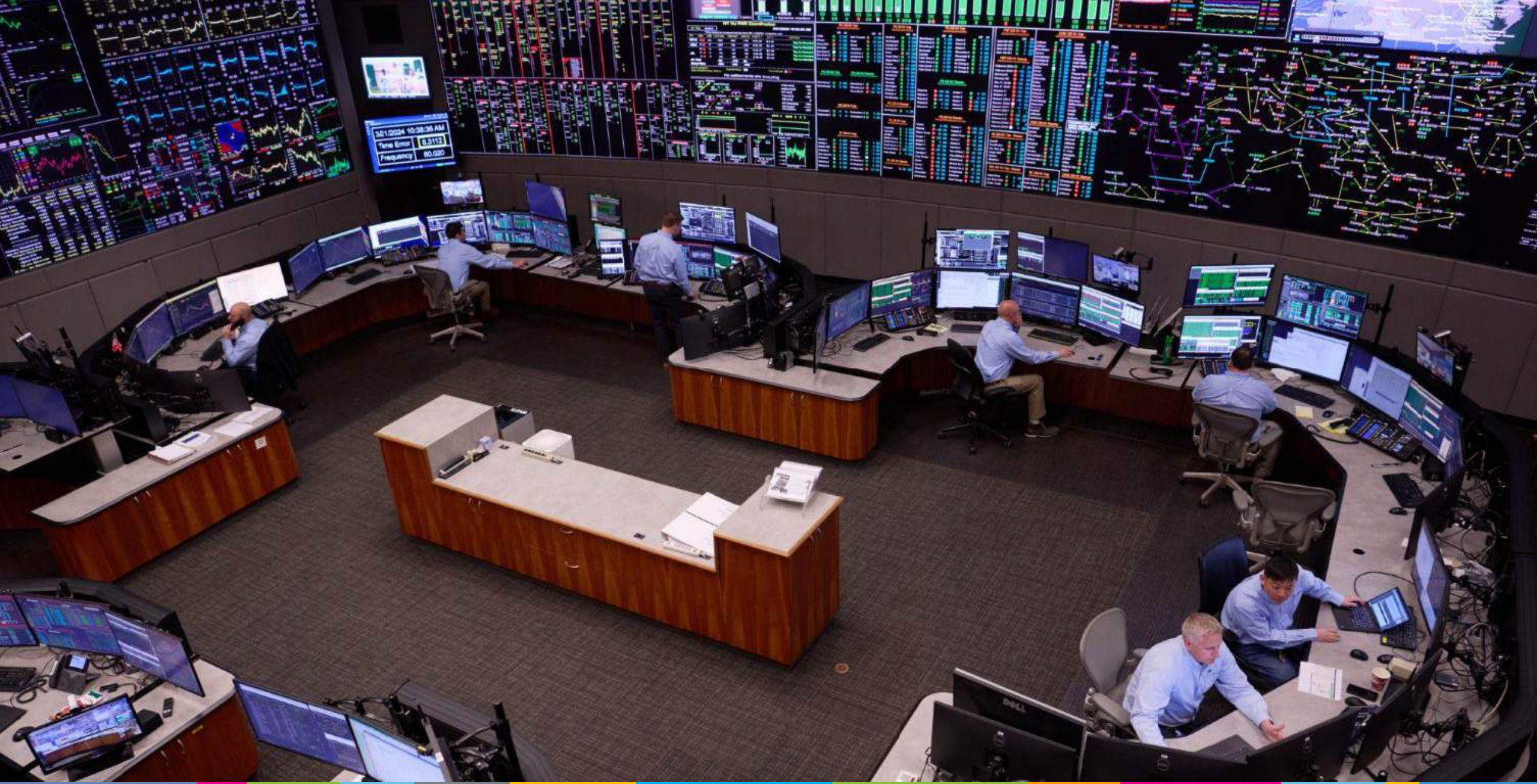
OPERATIONS

Matches supply with demand like...

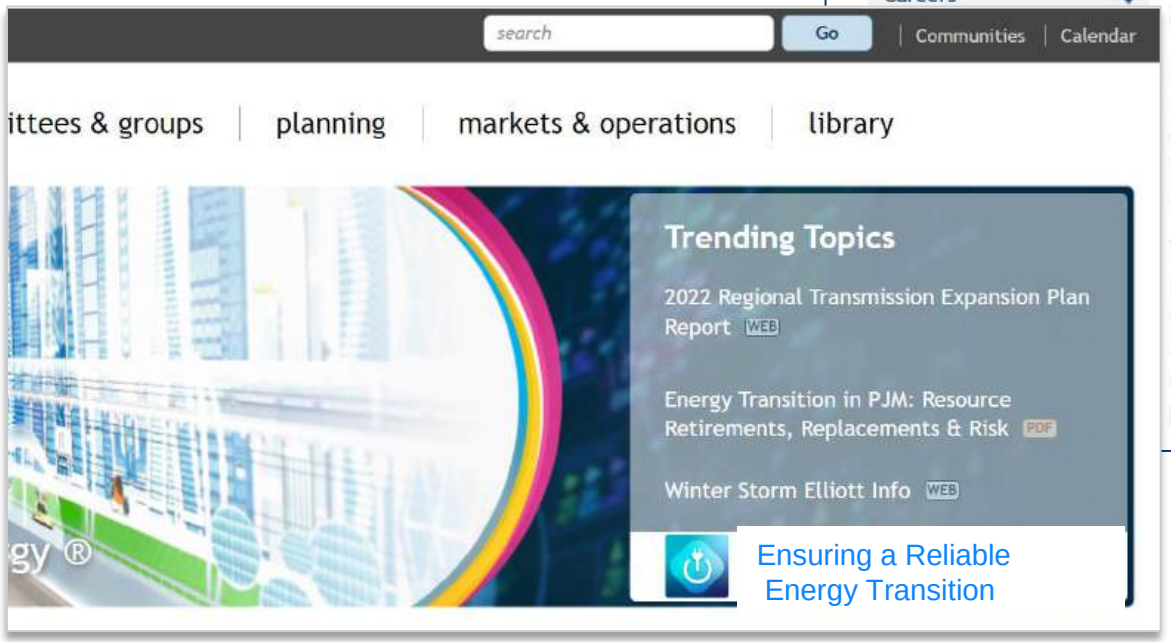
MARKETS



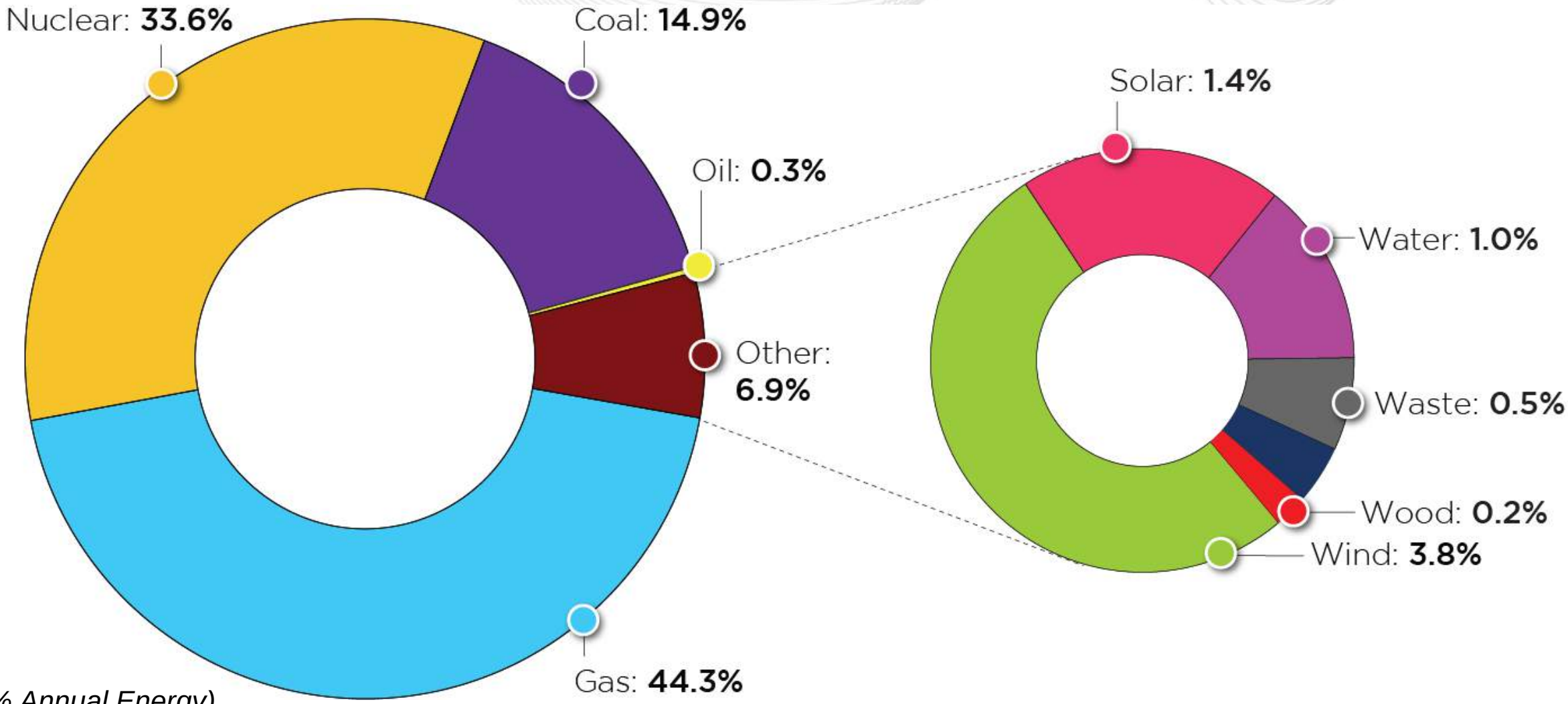
Energy Market Pricing like...



Ensuring a Reliable Energy Transition



2023 PJM Fuel Mix



(% Annual Energy)

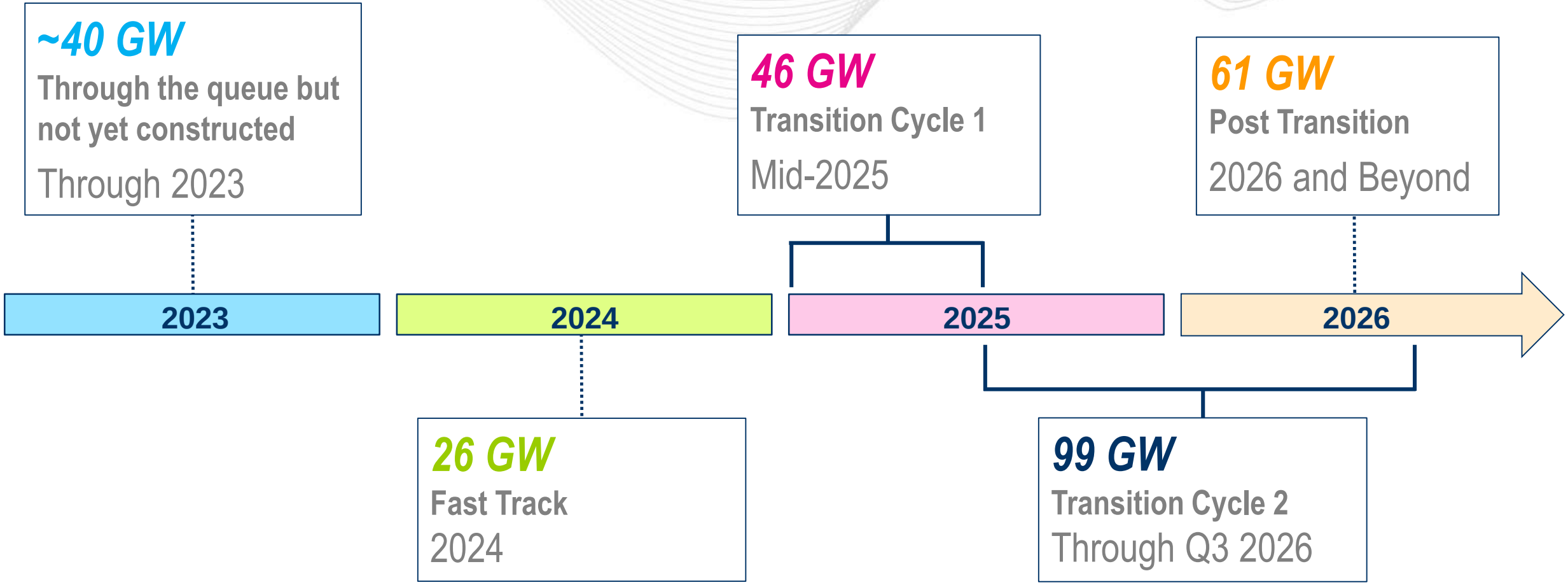
Ensuring a Reliable Energy Transition

The Immediate Concern:
Support Resource Performance

The Near-Term Concern:
Ensure Resource Adequacy

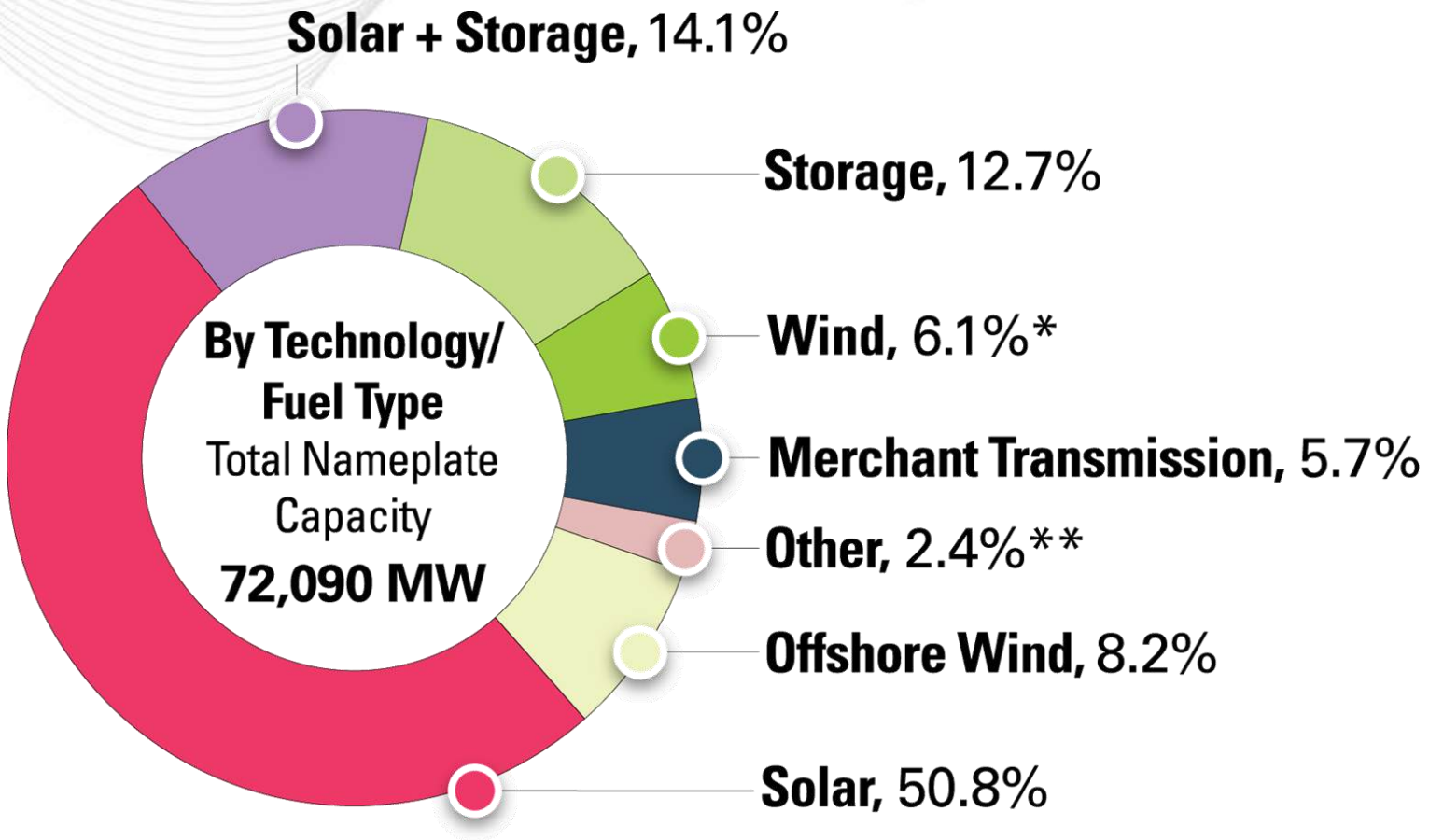
The Upcoming Concern:
Maintain & Attract Essential Reliability Services

Interconnection Queue Breakdown and Timeline



Projects To Clear Interconnection Process in 2024 and 2025

By State	Number of Projects	Total Nameplate Capacity (in MW)
DE	5	1,184
IL	82	13,798
IN	69	13,475
KY	39	4,125
MD	6	1,288
MI	8	887
NC	25	1,775
NJ	25	1,528
OH	72	8,613
PA	108	5,055
VA	162	19,012
WV	15	1,350
Total	616	72,090



*Includes one combined Wind & Solar facility of 199 MW
**Other: Natural Gas (1,647 MW, 2.3%) and Hydro (51 MW, 0.1 %)

Replacing Thermal Generation and Meeting Load Growth

Effective Load Carrying Capability compares resources “apples to apples”

ELCC Class	2026/ 27	2027/ 28	2028/ 29	2029/ 30	2030/ 31	2031/ 32	2032/ 33	2033/ 34	2034/ 35
Onshore Wind	35%	33%	28%	25%	23%	21%	19%	17%	15%
Offshore Wind	61%	56%	47%	44%	38%	37%	33%	27%	20%
Fixed-Tilt Solar	7%	6%	5%	5%	4%	4%	4%	4%	3%
Tracking Solar	11%	8%	7%	7%	6%	5%	5%	5%	4%
Landfill Intermittent	54%	55%	55%	56%	56%	56%	56%	56%	54%
Hydro Intermittent	38%	40%	37%	37%	37%	37%	39%	38%	38%
4-hr Storage	56%	52%	55%	51%	49%	42%	42%	40%	38%
6-hr Storage	64%	61%	65%	61%	61%	54%	54%	53%	52%
8-hr Storage	67%	64%	67%	64%	65%	60%	60%	60%	60%
10-hr Storage	76%	73%	75%	72%	73%	68%	69%	70%	70%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Commonwealth Issues that May Impede Deployment of EVs and EV Chargers

VSEDESA monthly meeting

Glenn Skutt, PhD
CTO Fermata Energy

July 10, 2024

Commonwealth Issues that May Impede… …OR Speed Deployment of EVs and EV Chargers

Agenda

- The Policy Context (Background)
- The Four Pillars of V2X Market Formation
- Regulatory Challenges & Opportunities
- Conclusions/Recommendations

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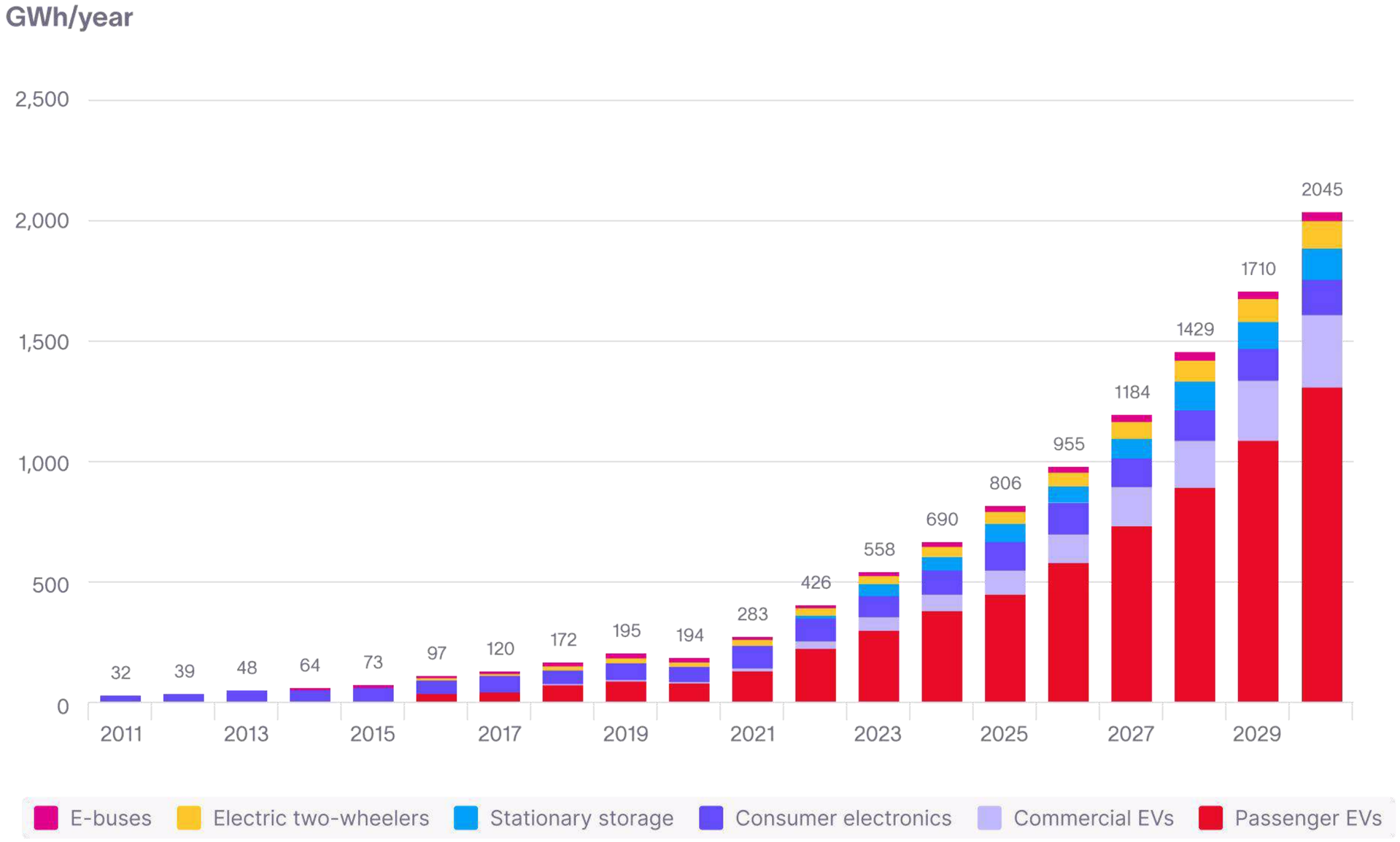
90% of Batteries Manufactured through 2030 will be in EVs



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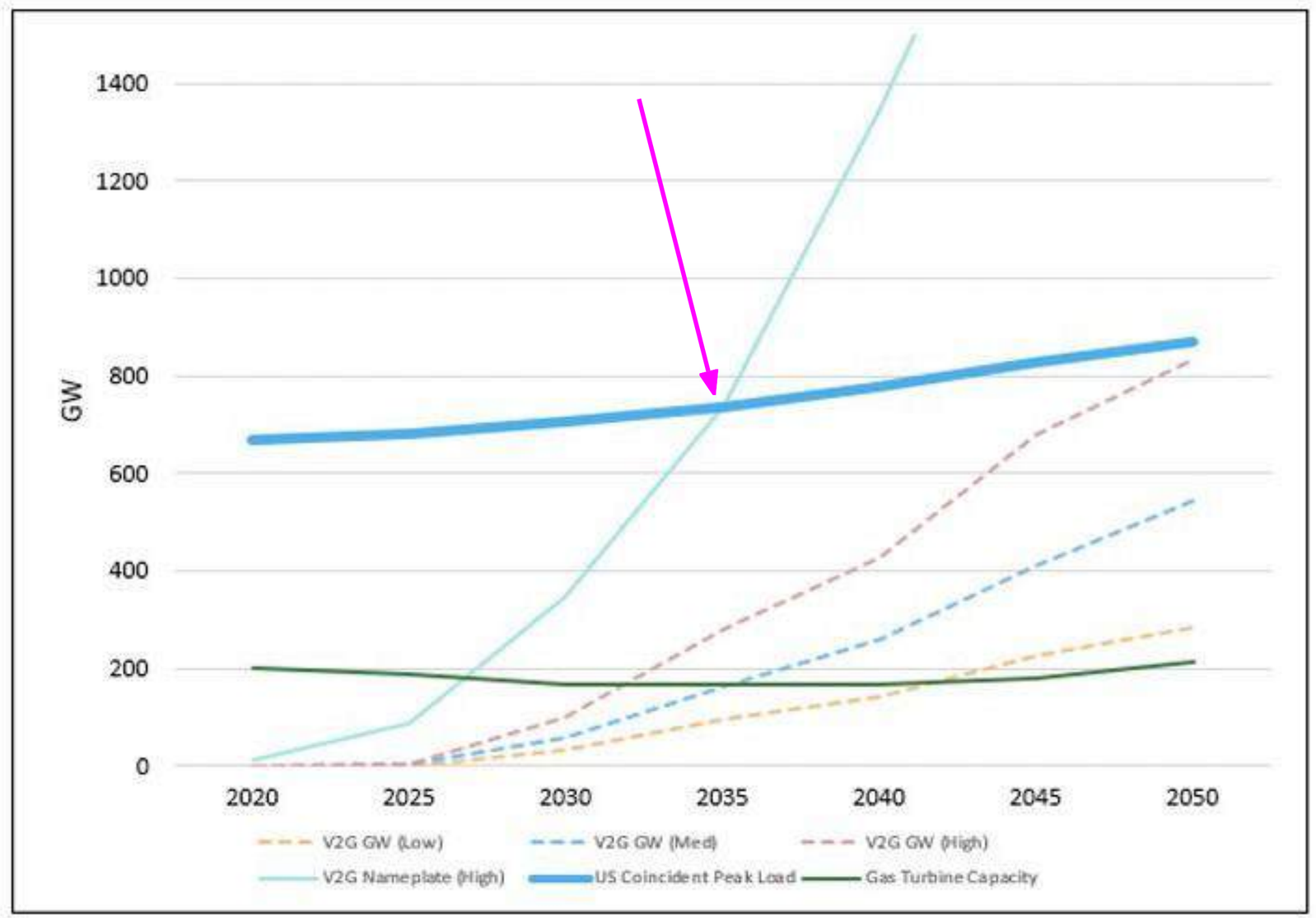
Nationwide EV nameplate load/capacity will exceed peak US electricity demand in 2035[1]



[1] Presented at an October 2022 EPRI Webex. Based on EIA projections of EV populations

Foundational Industries Aligning

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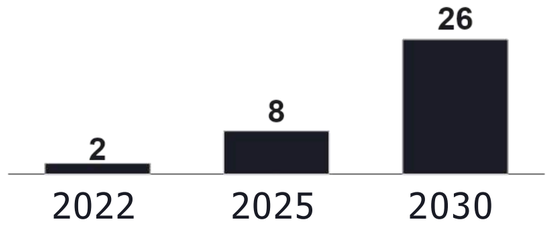
Decentralize and Decarbonize grid:
$ 1.5-2.4 T must be invested in the grid **600 GW** of renewable energy by 2030

Building Electrification & Resilience:
Electricity demand increases 17% from 2021 to 2030 and up to 39% 2021 to 2035

<u>Additional issue for Virginia:</u>
Increasing datacenter load growth, particularly in Northern Virginia, can drive capacity needs and overlaps with EV charging load growth. V2X can be significant flexible generation asset.

Transition to EVs:
EVs on the road in the US (MM)



Decarbonizing the grid and electrifying building and transportation will require 100-650 GW of new storage capacity by 2050 to balance intermittent resources.

Sources: EEI, NREL, RMI, Princeton University

State Policy–Driving the Energy Transition

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State	Year Goal Established	Target Date for 100% Clean Energy	ACCII Adoption	Advanced Clean Trucks Adoption*
California	2018	2045	Yes	Yes
Colorado	2019	2050	Yes	Yes
Maryland	2022	2045	Yes	Yes
Massachusetts	2021	2050	Yes	Yes
New Jersey	2023	2035	Yes	Yes
New Mexico	2019	2045	Yes	Yes
New York	2019	2040	Yes	Yes
Oregon	2021	2040	Yes	Yes
Rhode Island	2022	2033	Yes	Yes
Washington	2019	2045	Yes	Yes
Virginia	2020	2050	?	No

Existing Virginia Policies Related to EV Charging

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- **Grant Programs:** Virginia offers grant programs through the Virginia Department of Energy (VDOE) to support the development of EV charging infrastructure. These grants can be used by businesses, local governments, and nonprofits to install charging stations in various locations.
- **Right-to-Charge Law:** Virginia passed a "right-to-charge" law in 2020. This law prohibits homeowner and condominium associations (HOAs) from preventing residents from installing EV charging stations on their designated parking spaces, as long as certain conditions are met (e.g., proper installation, adherence to safety codes).
- **Dominion Energy Rebates:** Dominion Energy offers rebates to residential (Level 2 AC) and commercial (DCFC) customers for purchasing and installing EV charging stations.

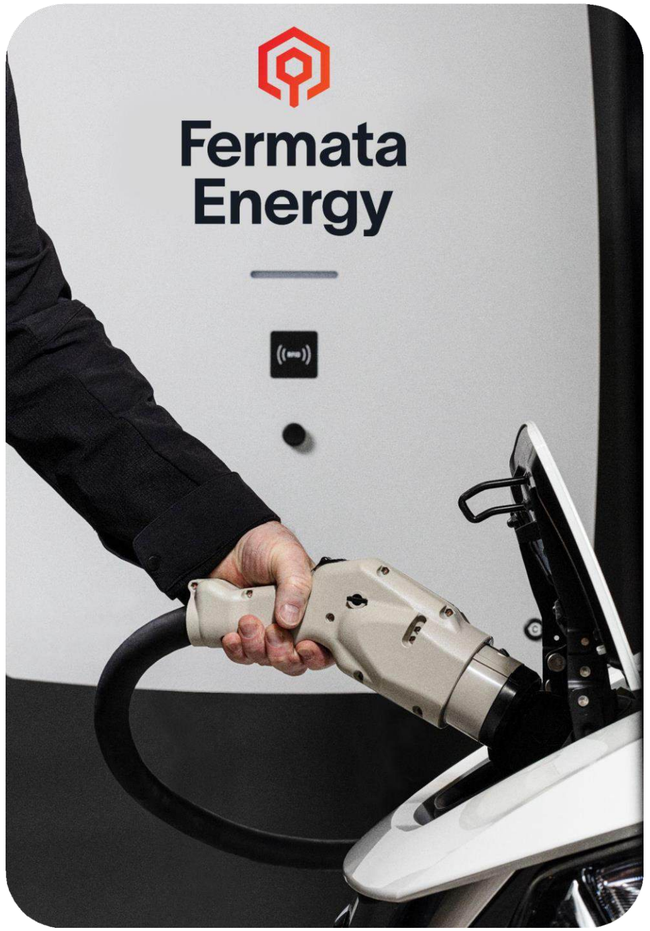
Additional Resources:

- **Virginia Department of Energy - Electric Vehicles:** https://energy.virginia.gov/renewable-energy/Transportation.shtml
- **Alternative Fuels Data Center - Virginia Laws and Incentives:** https://afdc.energy.gov/fuels/laws/ELEC?state=va
- **Dominion Energy EV Charger Rewards:** https://www.dominionenergy.com/virginia/save-energy/ev-charger-rewards

V2X Regulatory Framework

V2X Market Formation

- interconnection
- compensation
- incentives
- participation protection



V2G Interconnection Experience

Interconnected chargers BTM, separately metered, for microgrid projects and for a variety of use cases, including:

- Demand Response
- Demand Charge Management
- Frequency Regulation
- Microgrid Testbeds
- Dynamic Rates

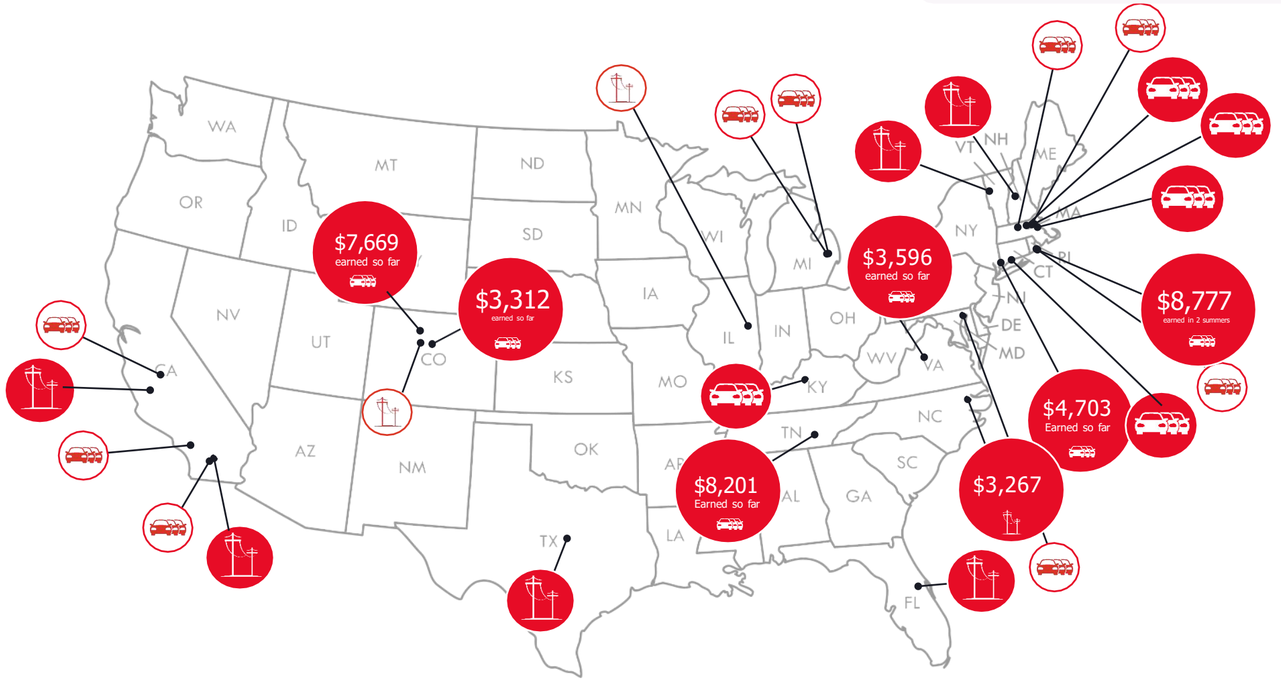
Interconnected and operating 30+ V2X sites

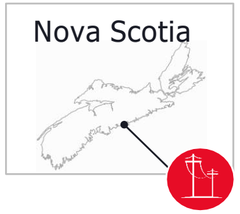
Worked with 21 utilities across 17 states and two countries to interconnect customer V2X sites

- CA, CO, CT, FL, GA, KY, MA, MI, NC, NH, NY, PA, TN, TX, RI, VA, VT, British Columbia, Nova Scotia

Verified V2G operations with

- Utilities
- Federal government
- Municipalities
- Private deployments
- Automotive manufacturers





Fleet site operating

Fleet site in development

Utility site operating

Utility site in development

V2G earning for customers

Interconnection:
Lessons Learned & Best Practices from Around the Country

- **Appropriate size thresholds** are important for “small generator or stationary storage” V2X EVSE interconnections (e.g., 15kW and 20kW)
- **Communication** should be clear and timely with explanations of the process flow and timelines for review
- **Dispute resolution process** should be used to mediate disputes via a third-party (i.e. other than the public utilities commission).
- **V2X-specific commissioning processes are needed** instead of requiring solar commissioning tests that are not applicable to batteries or V2X
- **Clearly define** whether V2X should be considered under the BESS or EV interconnection process as Utilities often do not know how to treat V2X
- **Interconnection pre-application reports** are useful to assess hosting capacity

Interconnection (continued): Flexible Service Connection / Interconnection

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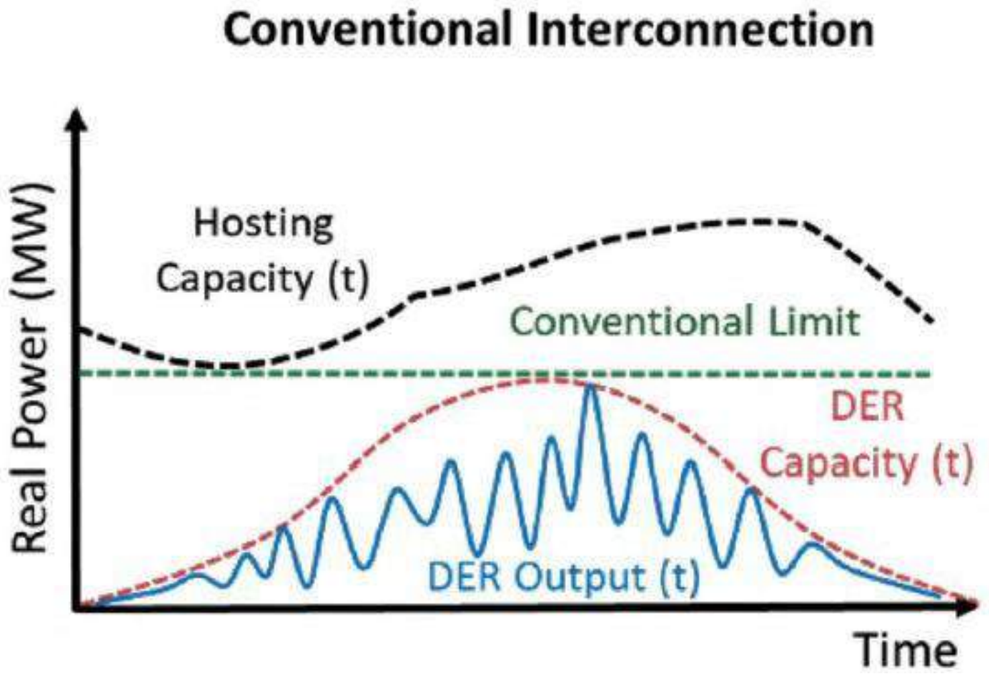
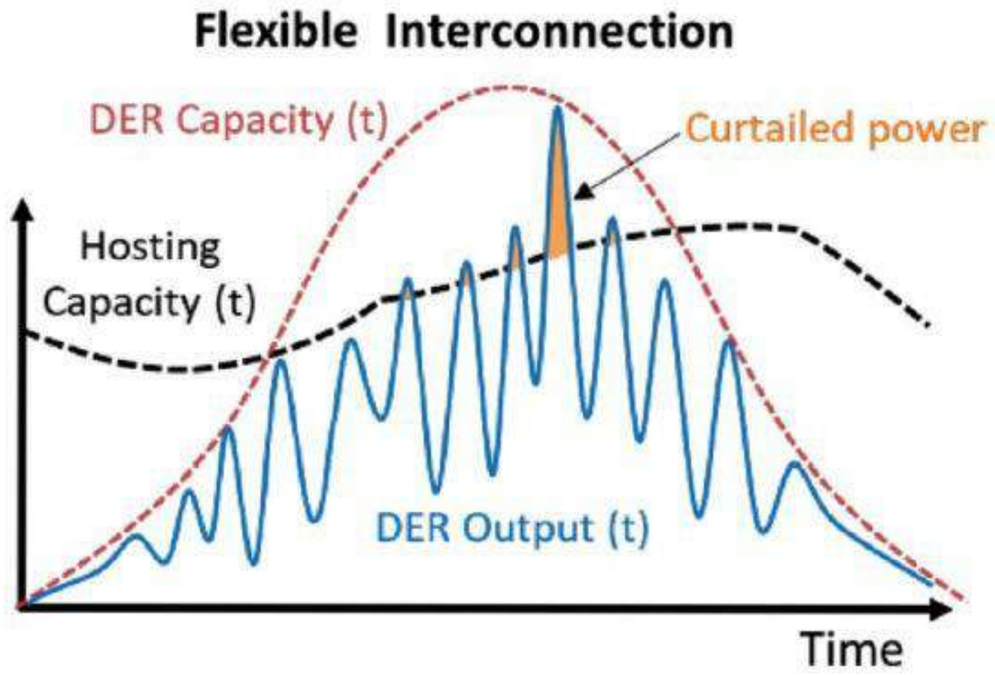
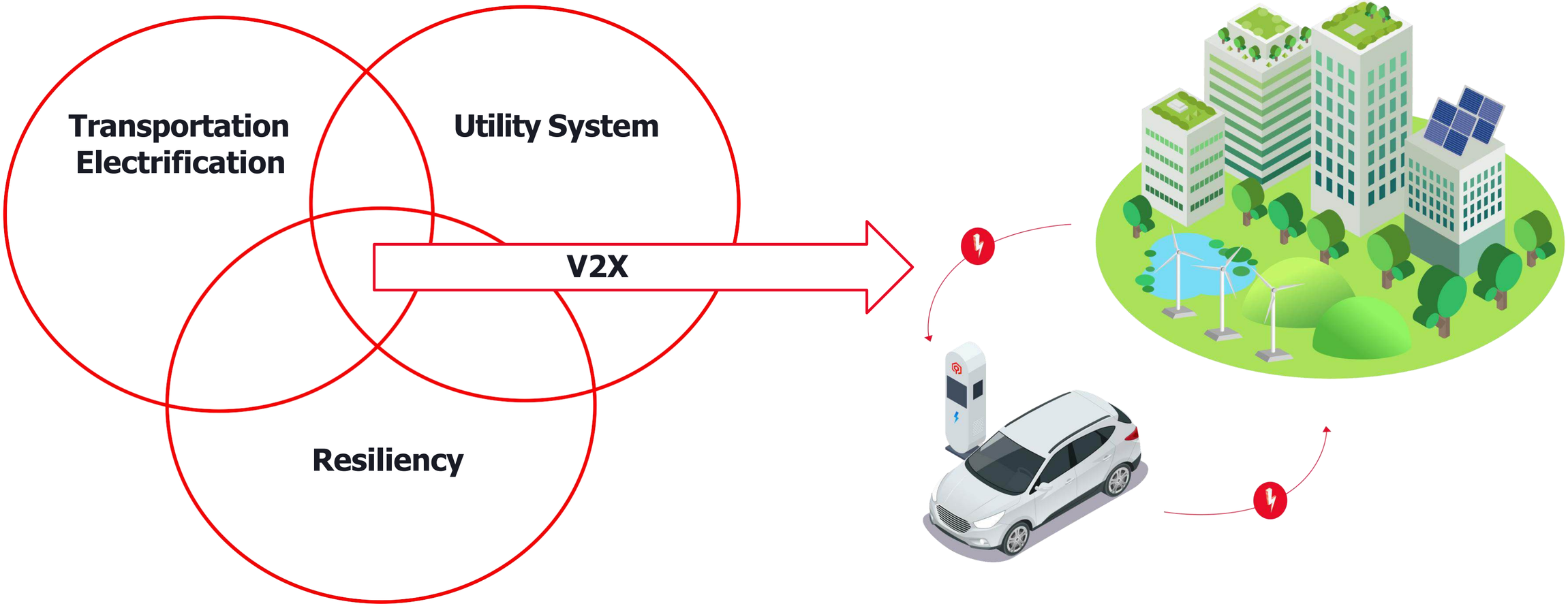




Flexible interconnection and other DER control functions have been introduced to start addressing concerns over DER variability and sourcing relative to hosting capacity and other system issues

V2X Value Creation



Compensation

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Utility System Monetization

Behind the Meter
- demand charge management
- TOU optimization
- solar self consumption

Distribution Utility
- non-wires alternatives
- demand response programs
- dynamic rates with export compensation

Wholesale Markets
- energy (day ahead / real time)
- ancillary services (day ahead / real time)
- capacity

value stacking when possible

These areas are where new policies could be helpful to maximize V2X participation in revenue creating activities.

- MD: DRIVE ACT requires utilities pilot programs for V2X distribution services programs
- CA: Emergency Load Reduction Program (ELRP, V2X included)
- New England: Connected Solutions (DR with V2X eligible)

A Recent Example of V2X Inclusion: MD DRIVE (Distributed Renewable Integration and Vehicle Electrification) Act

- Governor signed into law on 5/9/2024
- Implementation (mid-summer 2025)
  - V2X Interconnection–PC44 Interconnection Workgroup
    - Aggregator Registry
    - Aggregator Code of Conduct
  - DER Compensation–MD Energy Storage Program Workgroup
  - Collaborate with BG&E on V2G program pilot design
- Coordinating with Sunrun, SEIA, & AEU

Potential Incentive Opportunities

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Parity with Stationary Storage

- incentive programs comparable to those for stationary storage (e.g. California SGIP-like); upfront and performance-based incentives
- integrate V2X in utility planning processes
- allow V2X to value stack and “dual participate” in rates/programs

Make-Ready and EV Charging Infrastructure Funding Access

- access for bidirectional chargers to utility make-ready funding opportunities on par with V1G EVSE
- technology-neutral rebates for V2G chargers and associated equipment (Current rules may exclude V2X as DER)

Participation Protection

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- **Revenue Certainty:**
  - Grid revenue PPAs for V2X projects and other insurance tools to support bankability. (eg. Connected Solutions provides 5-yr revenue certainty)
- **Battery Wear:**
  - Address concerns regarding the potential impact of frequent charging and discharging on battery life.
  - This could include R&D on V2X impacts, warranty reforms, mechanisms to protect EV owners from misuse of battery.
- **Data Privacy and Security:**
  - Establish robust data privacy and security standards to protect the information exchanged between EVs, charging infrastructure, grid operators, and aggregators.

Conclusions/Recommendations

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For V2X to Scale:

- V2X needs to be fundamental to TE planning, not an afterthought
  [Policy option: Set an "RPS for storage" goal, including V2X]
- Need to ensure interconnection is not a barrier
  [Policy option: Clarify rules for V2X as DER]
- V2X also needs supportive policies to scale
  - Access to upfront incentives and performance-based incentives on par with stationary storage
    [Policy option: Add V2X eligibility, DC chargers not limited to DCFC]
  - Ensure access to infrastructure funding on par with V1G
    [Policy option: V2X (including DC Level 1 chargers) eligible for the same infrastructure support as AC L2 EVSE]

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Thank you.

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