2022

Virginia Nuclear Energy Consortium Authority

2022 ANNUAL REPORT

COMMONWEALTH OF VIRGINIA |
DEPARTMENT OF ENERGY
1100 Bank St., 8th Floor
Richmond, VA 23219

Contents

EXECUTIVE SUMMARY

Charge and Responsibilities

In 2013, the General Assembly created the Virginia Nuclear Energy Consortium Authority (the Authority) as a political subdivision of the Commonwealth for the following purposes:

- Making Virginia a national and global leader in nuclear energy, science and technology;
- Serving as an interdisciplinary study, research and information resource for nuclear energy in Virginia; and
- Establishing the Virginia Nuclear Energy Consortium (the Consortium), a non-stock corporation responsible for conducting activities to achieve these goals.

This, the Authority's 2022 Annual Report, details its activities over the last year and offers strategic recommendations to advance nuclear energy in Virginia in 2023 and beyond.

Authority Activities in 2022

Since its establishment and organization in 2013, the Authority has worked diligently to:

- Set goals and define the responsibilities for the Authority and the Consortium;
- Recruit members to the Consortium, securing commitments from companies and higher education institutions;
- Maintain an annual inventory of nuclear education and industry assets in Virginia, illustrating that the nuclear sector is helping drive Virginia's economy in every region, with high skilled jobs, research and technology development and generation of revenue at both the state and local level;
- Provide technical support and policy recommendations to the development of the Virginia Energy Plan and its biennial status updates;
- Provide information and expertise to stakeholders, elected and non-elected officials, and policymakers at all levels of government; and

- Establish the Authority as a convening body for information on the current state of the nuclear industry in the Commonwealth, nationwide and globally.

Following the 2019 "Virginia is Nuclear" Summit, the 2020 General Assembly approved several pieces of legislation that highlighted many of the goals the Authority hoped to achieve. Key legislation included the passing of SB 828 defining carbon-free and clean energy that included nuclear. Additional legislation, SB 817 and HB 1303, tasked the Authority and VNEC to work in conjunction with the Virginia Department of Energy and the Secretaries of Commerce and Trade and Education to develop a strategic plan for nuclear energy as part of the Commonwealth's overall goal of carbon-free energy.

In 2020 as a response to the direction from the Legislature the Strategic Plan for Nuclear was developed. The strategic recommendations included in the plan are the roadmap for action in the Commonwealth through 2024. They remain relevant as the process for implementation moves forward.

In 2021, Virginia took a significant step forward in pursuit of the strategic activities with the inclusion of the Virginia Nuclear Energy Consortium Planning Grant for the purpose of developing a proposal to create a nuclear research and innovation hub in Virginia- continuing to pursue recommendations from the strategic plan to ensure Virginia maintains its leadership position in nuclear technology.

In 2022, Governor Youngkin signed HB 894 directing the industry to "convene a stakeholder work group to identify strategies and any needed public policies, including statutory or regulatory changes, for promoting the development of advanced small modular reactors in the Commonwealth." VNECA tasked VNEC to take the lead in bringing together participants from across the nuclear industry to develop objectives and recommendations to promote and develop advanced nuclear technologies in the Commonwealth. The Working Group kicked off in July to set strategic direction.

Strategic Recommendations for 2023 and Beyond

The Authority and the Consortium recommend the Governor and the Legislature support the following actions in 2023:

1. **Support for Small Modular or other Advanced Reactors**
In line with the "moonshot" goal included the Virginia Energy Plan the legislature should consider any and all ways to support deployment of a new nuclear reactors in Southwest Virginia within 10 years and additional suitable locations to follow.

2. **Workforce Development and Innovation**
To ensure that education and training programs are providing the necessary educational and work-based knowledge required to meet the demands of tomorrow's nuclear energy workforce. This should include support for the

Virginia Innovative Nuclear Hub.

3. **Carbon Roadmap**

Developing a roadmap for deployment of economical and technically feasible electricity sources needed to meet actual electrical demand profiles and carbon-fee energy plan targets.

4. **Generation Targets**

Establishing a nuclear energy generation target if it is in the interest of the Commonwealth's long-term clean energy goal.

5. **Promote Diversity and Inclusion**

Promote diversity and inclusion in STEM Disciplines in order to shift the patterns of representation – addressing ways to change the STEM culture to be more welcoming and inclusive of diverse cultures and backgrounds.

INTRODUCTION

Virginia is home to tremendous nuclear energy assets. The Commonwealth's commitment to reliable, clean, low-cost nuclear energy is a significant economic and workforce driver, promoting cutting-edge research and development; employing thousands of highly skilled, well-paid workers; and expanding higher education programs for a stronger future in every corner of Virginia.

To capitalize on these existing strengths, the General Assembly in 2013 created the Virginia Nuclear Energy Consortium Authority (Authority) as a political subdivision of the Commonwealth for the purpose of establishing Virginia as a national and global leader in nuclear energy and providing an interdisciplinary study, research and information resource for nuclear energy in Virginia. The Authority was also charged with establishing the Virginia Nuclear Energy Consortium (Consortium), a non-stock corporation responsible for collaborative activities in pursuit of these goals.

As required by Code of Virginia § 45.2-2104, the Authority submits this 2022 annual report including a summary of its activities and strategic recommendations for the support and expansion of the nuclear energy industry in Virginia, to the Governor and the Chairmen of the House Appropriations Committee, the Senate Finance Committee and the House and Senate Commerce and Labor Committees.

Since its creation in 2013, the Authority has worked diligently to

1) Set goals and define the responsibilities for the Authority and the Consortium;
2) Recruit members to the Consortium, securing commitments from several companies and higher education institutions;
3) Produce an annual inventory of nuclear education and industry assets in Virginia;
4) Provide technical support and policy recommendations for the development of the Virginia Energy Plan and its biennial status update;
5) Provide information and expertise to stakeholders, elected and non-elected officials, and policymakers at all levels of government.

MISSION AND PRIORITIES

The Authority's mission is to establish the Commonwealth as a national and global leader in nuclear energy; to serve as an interdisciplinary study, research, and information resource for the Commonwealth on nuclear energy, science and technology issues; and to establish the Virginia Nuclear Energy Consortium (Consortium) to facilitate private sector activities and partnerships with our higher education institutions to advance these goals. The Authority evaluated and allocated responsibilities and priorities to either the Authority or the Consortium, as appropriate.

Responsibilities

The Authority is the public body responsible for communicating with the state government, the Governor's Office, and the General Assembly; providing direction for the Consortium; and receiving reports and progress updates from the Consortium. The Consortium is a non- profit entity for responding to commercial, research and education needs and interests of the industry. It is overseen and directed by the Authority and is the entity that conducts day-to-day activities to promote and advance Virginia's nuclear industry.

The statute passed by the General Assembly enumerated various charges for the Authority and the Consortium.

The Authority has the following responsibilities:

1) Develop strategic recommendations to guide activity from year to year.

2) Provide direction to the Consortium established by the Authority.

3) Facilitate, where possible, public information and communication about nuclear energy and related educational and job opportunities.

4) Develop and maintain an inventory of Nuclear Assets Justifying Position of Leadership.

    a) Workforce
    b) Private Entities
    c) Research and Federal Labs
    d) Public Universities and Educational Programs

5) Serve as an expert voice for Government.

a) Notification of Congressional Delegation of Board and Resources
b) An information resource for policy makers at all levels

The Authority assigned the following responsibilities to the Consortium:

1) Promote and facilitate agreements among public and private institutions of higher education in the Commonwealth and other research entities to carry out research projects relating to nuclear energy, science and technology;

2) Identify and support, in cooperation with Virginia's nuclear entities and the public and private sectors, the development of education programs related to Virginia's nuclear industry;

3) Develop a policy regarding any interest in intellectual property that may be acquired or developed by the Consortium;

4) Facilitate the collaboration of members toward the attainment of grants and the expenditure of funds;

5) Encourage, facilitate, and support the application, commercialization, and transfer of new nuclear technologies;

6) Provide advice, assistance, and services to institutions of higher education and to other persons providing services or facilities for nuclear research or graduate education; and

7) Foster innovative partnerships and relationships among the Commonwealth, the Commonwealth's public institutions of higher education, private companies, federal laboratories, and not-for-profit organizations to accomplish the purposes set out by this chapter.

The statute also provides for communication of nuclear-related information and research results. The Authority believes that the two organizations should share this responsibility.

2022 GOALS AND ACTIVITIES

The Authority identified several specific goals as priorities for their 2022 activities:

1) Continue to enhance strategic priorities to serve as a roadmap for future activity that has culminated in the drafting of the 'Virginia is Nuclear' 2020-2024 Strategic Plan as directed in § 67-1700 of the Virginia Code.

2) Continue to stress the importance to the Commonwealth of nuclear energy as a major source of zero carbon generation.

3) Continue to expand existing coordination and identify new opportunities for collaboration and support between VNECA and VNEC.

4) Support efforts to retain existing nuclear assets and investments in Virginia.

   a) Support positive regulatory climate to preserve existing assets

   b) Support public policy initiatives to enable investments needed to preserve existing and new nuclear assets

5) Provide technical expertise and promote greater awareness amongst policymakers of the role nuclear energy can play in the Commonwealth's environmental and energy initiatives.

   a) Utilize the Authority platform to bring increased information sharing opportunities about the state of the nuclear industry.

6) Provide advice and guidance to pursue specific aspects of the Virginia is Nuclear Strategic Plan.

Key Activities Conducted in 2022

Asset Inventory

To better understand and communicate the significant impact of the nuclear industry on Virginia's economy and workforce, the Authority maintains an inventory of nuclear assets in Virginia including private industry, utilities, educational institutions, and federal research laboratories. The Authority reviews the inventory quarterly.

The key findings from the asset survey are highlighted by the following summary. The full database of nuclear energy assets, including company employment and annual revenue figures, can be found in Appendix A.

The Critical Role of Nuclear Energy in Virginia's Economy

Virginia is a leader in clean energy production with nearly 32% of the Commonwealth's power coming from zero emission nuclear power. Operating at more than 95% capacity, nuclear generation provides reliable, inexpensive electricity to Virginia consumers and helps keep our energy costs low, making Virginia a competitive location for existing and new business. However, that is only the beginning of the story of nuclear energy in Virginia's economy. A recent preliminary economic asset survey, produced by the Authority, reveals:

- The nuclear energy sector is driving Virginia's economy in every region, offering highly skilled jobs, supporting research and technology advancement and generating revenues at the state and local level.

- Dominion operates four nuclear units in Virginia: two at the North Anna Power Station in Louisa County, and two at Surry Power Station in Surry County. In addition to their substantial contribution to Virginia's energy mix, these four units collectively employ more than 2,000 professionals at an average salary of more than $80,000 per year. These four units supply the majority of Virginia's carbon free electricity and are substantial economic drivers for their host regions.

- Virginia is home to facilities and operations of half a dozen global leaders in the nuclear energy sector. They include Framatome Inc. (Lynchburg), BWX Technologies, Inc. (Lynchburg), NovaTech (Lynchburg), Bechtel (Reston), Dominion (North Anna and Surry) and Newport News Shipbuilding (Newport News).

    - In June, BWX Technologies, Inc. (BWXT) announced that it had been awarded a contract to build the first advanced microreactor in the United States. BWXT was selected by the Department of Defense's (DoD) Strategic Capabilities Office (SCO) to build a full-scale transportable microreactor prototype that will be completed and delivered in 2024 for testing at the Idaho National Laboratory.

    - SCO is partnering with the U.S. Department of Energy to develop, prototype, and demonstrate a mobile microreactor that can provide resilient power needs for the DoD for various operational needs. Consistent with its independent

safety and security regulator role, the Nuclear Regulatory Commission provides SCO with additional technical expertise and information on regulatory and licensing processes for advanced reactors to ensure a safe, secure, and innovative design. Such reactors offer the opportunity to make the DoD's domestic infrastructure more resilient to an electric grid attack while fundamentally simplifying energy logistics and delivery for forward operating bases without increasing carbon emissions.

- Two major federal facilities located in Virginia – NASA Langley and the Norfolk Naval Shipyard – are active in research, development and the use of nuclear technology. Between the Naval Shipyard and Newport News Shipbuilding, the nation's nuclear-powered Navy has its home in Virginia.

- Dozens of other companies, located all across Virginia, provide services, supplies and support to these major Virginia facilities. Testing services, materials andsupplies, security, engineering services and much more are provided to the industry by Virginia businesses.

- These companies operate and employ Virginians in towns as diverse as Abingdon, Alexandria, Arlington, Ashland, Chantilly, Charlottesville, Chester, Colonial Beach, Fairfax, Goochland, Hampton, Lynchburg, McLean, Mechanicsville, Roanoke and Virginia Beach to name but a few.

- Because many of these Virginia businesses have operations around the country and the world, it is difficult to determine total jobs and revenue numbers for Virginia alone, but it is likely the number exceeds 100,000 jobs across the Commonwealth and tens of billions of dollars that are tied directly to the nuclear energy sector. These generate substantial state and local tax dollars.

- Virginia Tech, Virginia Commonwealth University (VCU), the University of Virginia (UVA) and Old Dominion University have established degree programs and research relationships to train the next generation of expertise and leadership needed to support the nuclear energy sector in the U.S. and around the world.

- The universities, labs and industrial base in Virginia are involved in cutting-edge, nuclear-related research and development that will drive the Virginia nuclear economy of the future.

- Virginia's existing nuclear assets and capabilities make it a prime location for next generation reactors, and the Commonwealth and industry should work together to attract investment in those technologies.

Additionally, the Authority performed a survey of nuclear engineering degrees, programs and related fields of study at Virginia public and private universities (Appendix A). In addition to the established degree programs at Virginia Tech, VCU, UVA and Old Dominion, many institutions, such as Virginia Military Institute and Central Virginia Community College, offer numerous nuclear energy, nuclear medicine and other related programs, degrees and research.

The Authority in concert with the VNEC Board provided this information and additional key market input during the development of the Virginia Energy Plan.

2022 Authority Meeting Activities

The Authority held five meetings in the past fiscal year (December 2, 2021, February 22, 2022, March 29, 2022, June 21, 2022 and September 28, 2022). Over the course of the year, the group considered several activities on which to focus their work efforts, including:

- Completion of the Virginia Innovation Nuclear Hub proposal
- Contribution to the 2022 Virginia Energy Plan
- Completion/submission of the 2022 Virginia Nuclear Energy Consortium Authority Annual Report to the Governor and members of the General Assembly.
- The Authority is working closely with the new Administration to champion Virginia as a nuclear innovation leader
- The continued promotion of nuclear energy as a vital component in zero emissions electricity generation in the combat against global climate change.
- Communicating the importance of having a diverse energy portfolio that is flexible and resilient is key to sustainable energy and a strong economy
- Continued efforts on educating members via technical and informational presentations, or engaging in advocacy work to focus on nuclear as a vital component of Virginia's energy mix; and
- Updates on nuclear energy policy in other States that may serve as an example for or have an impact on nuclear energy activity in Virginia.

Presentations

On February 2022, Sama Bilbao y Leon, Director General, World Nuclear Association provided a summary of the World Nuclear Association's purpose and activities, discussed the current state of nuclear energy globally, its potential role in decarbonization and energy

development efforts, and recommended policy and financial actions necessary to support the global nuclear industry and meet energy policy priorities.

On March 29, the Board heard from Jeff Navin, Director of External Affairs, TerraPower and partner and co-founder of Boundary Stone Partners. Topic of discussion focused on TerraPower's advanced reactor demonstration program (ARDP) award project in Wyoming that is sited on a former coal site and will demonstrate the Natrium reactor, a sodium cooled fast reactor. Thanks to new technologies, states viewpoint towards nuclear is changing to encourage the deployment of nuclear power to help resolve the dual challenges of global energy poverty and climate change.

Requirements of the award require reactor deployment within seven years of signing the agreement which will put the service date at 2028. The award also requires a utility partner who will own and operate the reactor- called a demonstration project, but really a first of its kind commercial reactor which will be licensed for 60 years with the potential of life extension. TerraPower will own the project until startup and the plant begins producing energy at which point ownership will be taken over by Rocky Mountain Power.

Kemmerer, Wyoming was selected as the preferred site for the Natrium nuclear power plant demonstration project. The location is near the coal-fired Naughton power plant, which is due to retire in 2025, and was chosen after an extensive evaluation process and meetings with community members and leaders. Factors considered in the selection included community support, workforce, access to existing energy infrastructure (water cooling and grid interconnection) , etc. The project is 345MWe sodium fast reactor and gigawatt-hour scale, molten salt energy storage on a 44 acre site. The heat from the reactor runs molten salt energy storage units which store 500 MW for 5.5 hours. Cost-competitive, flexible technology that supports load following energy storage heat applications.

On June 21, 2022 the board heard from Dr. Ganapati Myneni, Director VT-India Nuclear Energy Partnership who briefed the board on his work with the Virginia Advanced ^{233}U–^{232}Th Breeder Burner Subcritical Micro Reactors (ASMR) & Radio Isotope Development Center.

Also on June 21, the board heard from Christine Csizmadia, Senior Director, State Government Affairs and Advocacy, Nuclear Energy Institute who provided an overview of the Nuclear Energy Institute (NEI) - a trade association representing the nuclear industry and helps develop policy affecting nuclear technologies industry. In addition, Christine briefed the board on the current nuclear policy landscape in the United States. Trends include, Smart Modular Reactors (SMRs), tax incentives, repealing moratoriums, and nuclear's role in helping states achieve decarbonization goals.

On September 28, guest Speaker, Jeremy Harrell, Chief Strategy Officer at Clear Path, provided the board an overview of the current nuclear energy landscape in congress including the Inflation Reduction Act (IRA) and other important policies/programs focused on nuclear. Copy of his presentation will be available on the VNECA website.

AUTHORITY ADMINISTRATION

Virginia Nuclear Energy Consortium Authority Administration

The Virginia Nuclear Energy Consortium Authority Board elected the following slate of officers to lead the Board for 2022:

Chairman – Tom DePonty

Vice Chairman – Gary Tepper

Treasurer – Eugene Grecheck

Secretary – Virginia Energy

The full list of Authority Board Members is included in Appendix B.

Additionally, the Authority maintains a webpage on the Secretary of Commerce and Trade's website that serves as an information resource for nuclear energy in Virginia and the activities of the Authority. Authority Website - https://commerce.virginia.gov/initiatives/va-nuclear

APPENDIX A:

VIRGINIA NUCLEAR ENERGY ASSET INVENTORY

Nuclear in Virginia:
Educational Institutions

Updated 10/4/2022

Entity	Logo	Nature of Activity	Applicable Program(s)	Leadership	Virginia Presence	Founded	Revenue/ Funding, $1M	Employees	Website
Christopher Newport University (CNP)		Public Liberal Arts University	Applied Physics (B.S.), Computational and Applied Mathematics (B.S)	Paul S. Trible Jr, President	Christopher Newport University, 1 Avenue of the Arts, Newport News, VA 23606	1961	166.5 (total revenue FY12)	~400 faculty	www.cnu.edu
George Mason University (GMU)		Public University	Systems Engineering (B.S.), Applied and Engineering Physics (M.S.)	Ángel Cabrera, President	4400 University Dr, Fairfax, VA 22030	1957	911 budget (FY14)	1,801 (includes part-time FTE)	www.gmu.edu
Liberty		Private University	Mechanical Engineering (B.S., M.S., Ph.D.)	Jerry Prevo	1971 University Blvd, Lynchburg, VA, 24515	1971		~2,500 faculty	www.liberty.edu
University of Virginia (UVA)		Public Research University, Health System	Physics (B.S., M.S., Ph.D.); Aerospace, Electrical, Materials Science, Mechanical, and Systems Engineering (B.S., M.Eng., M.S., Ph.D.)	James E. Ryan, President	Thorton Hall, 351 McCormick Rd., Charlottesville,VA 22904-4203	1819	1,910 (academic division, FY19-20)	30,000 (incl. Health Systems)	www.virginia.edu
Virginia Commonwealth University (VCU)		Public Research University, Health System	Nuclear Engineering Concentration (B.S), Nuclear Engineering (M.S., Ph.D.), Department of Radiation Sciences	Michael Rao, President	821 West Franklin St, Richmond, VA, 23284	1838	967.4 budget (FY13-14)	20,241 (incl. medical center)	www.vcu.edu
Virginia Community College System (VCCS)		Community College Network	Engineering (AS), Engineering Technology (AAS), Nuclear Technician (AAS)	Sharon Morrison, Interim Chancellor	300 Arboretum Place, Richmond, VA, 23236	1966	1,276 (total revenue FY13)	11,000+ total faculty	www.vccs.edu
Virginia Tech (Virginia Polytechnic Institute and State University)		Public University, Research Institution	Nuclear Engineering Program (Ph.D., MS,ME)	Dr. Timothy D. Sands, President	925 Prices Fork Road, Blacksburg, VA, 24061-0002	1872	1,284.3 budget (FY13)	7,263	www.vt.edu

Nuclear in Virginia:
Federal Research Laboratories

Updated 12/16/2021

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, $1M	Employees	Website
Thomas Jefferson National Accelerator Facility	Jefferson Lab	Nuclear Physics Research	Stuart Henderson, Director	12000 Jefferson Ave, Newport News, VA 23606	1984	$162.1M (FY18)	700	www.jlab.org/
US Navy (Norfolk Naval Shipyward)		Manufacturing, R&D, and support for US Navy	Captain Dianna Wolfson, USN	Norfolk Naval Shipyard, Portsmouth, VA, 23709	1767	1,016 (FY11-12)		www.navsea.navy.mil/shipyards/norfolk/

Nuclear in Virginia:
Utilities

Updated 10/25/2021

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, $1M	Employees	Website
Dominion Resources		Power Generation, Transmission, Distribution	Robert M. Blue	600 E Canal St, Richmond, VA 23219	1983	13,120 (FY13)	14,500 (total)	www.dom.com
Old Dominion Electric Cooperative		Electricity Provider	Jackson Reasor, President and CEO	4201 Dominion Blvd, Glen Allen, VA, 23060	1948	842.1 (FY13)	~100	www.odec.com/

Nuclear in Virginia:
Private Industry

Updated 11/10/2022

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, $1M	Employees	Website
Abbitz Measurement, Inc.		Pressure Systems Instrumentation	Tammy Nicoll, President	1619D Diamond Springs Rd, Virginia Beach, VA, 23455	2009		~10-20	www.abbitz.com
ABZ, Inc.		Fluid Flow Consulting	Ed Abbott, President	4451 Brookfield Corporate Drive, Suite 101, Chantilly, VA, 20151	1986		~10	www.abzinc.com
Action Technology, Inc.		Staffing, Consulting, Training	Bonnie Lonon, President and CEO	3121 E. Boundary Ct., Midlothian, VA, 23112	1982	24	~250	www.action-tech.com
Advex Corporation		Machining and Fabrication	George Hill Jr, President	121 Floyd Thompson Drive, Hampton, VA, 23666	1969		180	
Aerofin		Heat transfer applications supplier	David Corell, President	4621 Murry Place, P.O. Box 10819, Lynchburg, VA, 24502	1923			www.aerofin.com
Affordable Fastener Supply Company		Hardware Supply	Carl Grunthaner, President and CEO	312-G Old York Hampton Highway, Yorktown, Virginia, 23692	2005			www.affordablefast.com
Air Systems, Inc.		Filtration, Air Systems	David Angelico, President	821 Juniper Crescent, Chesapeake, VA, 23320			42	www.airsystems.cc
AMEC		Engineering, Project Management, Consulting	Samir Brikho, CEO	14424 Albemarle Point Place, Suite 115, Chantilly, VA, 20151; 1070 West Main St, Suite 5, Abingdon, VA, 24210; 2028 Dabney Rd, Suite E-18, Richmond, VA, 23230; One Colubums Center, Suite 600, Virginia Beach, VA, 23642	1982	6,735 (FY13)	~27,000	www.amec.com
American Operations Corp.		Analysis, Consultancy, Specialist Services	L. Frank 'Smokey' Field, Chairman and CEO	14030 Thunderbolt Place, Suite 700, Chantilly, VA, 20151	1983		~200	www.aocwins.com
Applied Technical Services		Nondestructive Testing	Jim Hills, President	2312 Commerce Center Drive, Suite A, Rockville, VA 23146; 5566 General Washington Drive, Alexandria, VA, 22312; 1325-B Cavalier Blvd, Chesapeake, VA	1967		~600	www.atslab.com
Ares Security Corporation		Security Consulting and Applications	Ben Eazzetta, President	8045 Leesburg Pike, Suite 400, Tysons Corner VA 22182	2012		850+ (incl. ARES Holding)	www.aressecuritycorp.com
Axiom Quality Assurance		Consulting and Analysis		P.O. Box 328, McLean, VA, 22101				www.axiomqa.com
Bauer Compressors, Inc.		Compressors and High Pressure Systems	Tony Bayat, President	1328 Azalea Garden Rd, Norfolk, VA 23502	1946			www.bauercomp.com

Nuclear in Virginia:
Private Industry

Updated 11/10/2022

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, $1M	Employees	Website
Bechtel		Engineering, Construction	Brendan Bechtel, Chairman & CEO	12011 Sunset Hills Rd, Reston, VA, 20190	1898	37,900 (FY12)	53,000+ (total)	www.bechtel.com/
Beta Analytics International, Inc.		Access Control, Security, Fire Protection	Darden Hood, President	2677 Prosperity Avenue, Suite 400, Fairfax, VA, 22031	1979		~300	www.radiocarbon.com
Boh Environmental, LLC		Container Systems	Eric Hediger, President	14520 Avion Pkwy, Chantilly, VA 20151	1998		~15	www.bohfupsystems.com
BWX Technologies, Inc.		Nuclear design, engineering, manufacturing and services	Rex D. Geveden, President and CEO	800 Main Street, Lynchburg 2016 Mt. Athos, Lynchburg 1570 Mt. Athos, Lynchburg 109 Ramsey Place, Lynchburg 110 Ramsey Place, Lynchburg 107 Vista Centre Drive, Forest	Company history dates back to 1856	$2.1B (CY2021)	6,700 in North America	www.bwxt.com
Caliper Inc.		Staffing and Recruitment	Robert Y. Green, Jr, President and CEO	512 Central Drive, Virginia Beach, VA, 23454; 4907 Fitzhugh Ave, Suite 201, Richmond, VA, 23230; 11325 Random Hills Rd, Suite 360, Fairfax, VA, 22030	1984			www.caliper.net
CBG, LLC		Metal Disintegration & Stud Removal	Ken Guthrie, Owner	4013 Seaboard Court, Suite A-3, Portsmouth, VA, 23701	2002			www.cbgmaintenance.com
Chemetrics, Inc.		Water Testing	Bruce H. Rampy, President	4295 Catlett Rd, Midland, VA, 22728	1969		55+	www.chemetrics.com
CMC Technical		Staffing and Recruitment		502 Viking Drive, #102, Virginia Beach, VA, 23452	1978			www.cmc-jobs.com
Coastal Network of Virginia, LLC		Radiation Safety		600 Plantation Ct, Charlottesville, VA, 22903	1987		5	www.nuclearsupply.com
Communications-Applied Technology		Communication Systems Design and Manufacturing	Seth Leyman, President and Founder	11250-14 Roger Bacon Drive, Reston, VA, 20190	1982		~15	www.c-at.com
CraneTech Solutions CTS		Cranes & Lifting Equipment	Frank Hegan, President	2030 Ponderosa St, Portsmouth, VA, 23701	1958			www.ct-sol.com
Dominion Engineering, Inc.		Technical Consulting Services	Robert D. Varrin, JR, Ph.D, Principle Officer	12100 Sunrise Valley Drive, Suite 220, Reston, VA, 20191	1980		<50	www.domeng.com

Nuclear in Virginia:
Private Industry

Updated 11/10/2022

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, $1M	Employees	Website
Donley Technology		Environmental Health and Safety Information	Elizabeth M. Donley, Founder and Executive Director	P.O. Box 152, Colonial Beach, VA, 22443	1988			www.donleytech.com
DynCorp International		Security Training and Consulting	Steven F. Gaffney, Chairman and CEO	1700 Old Meadow Road, McLean, VA 22102	1946	~3,000 (FY10)	16,800 (2009)	www.intellpros.com
Eddy Current Technology, Inc.		Eddy Current Testing		201A Horace Ave, Virginia Beach, VA, 23462				www.eddy-current.com
Electric Motor and Contracting Company, Inc.		Motor repair, decontamination, refurbishment	James L. King,President CEO	3703 Cook Blvd, Chesapeake, VA, 23323	1960	~30	~200	www.emc-co.com
Excel Services Corporation		Consulting, Technical Services	Donald R. Hoffman, President and CEO	11921 Rockville Pike, Suite 100, Rockville, MD, 20852	1985			www.excelservices.com/
F.N. Anderson & Associates		Engineering Analysis and Services	Floyd N. Anderson, President	87 Braxton Lane, Forest, VA, 24551	1993		~4	www.fnaai.com
Finite Matters, Ltd.		Management Solutions, Consulting, Software	Anthony Luca, Owner	3064 River Road West, Suite B, Goochland, VA, 23063	1991		<10	www.fml.com
Flowserve		Pumps, Valves, Tubing	Mark A. Blinn, President and CEO	5114 Woodall Rd, Lynchburg, VA 24502	1997	4,954 (FY13)	15,000+	www.flowserve.com
Framatome Inc.		Engineering, Design, Manufacturing, Nuclear Services and Support	Gary Mignogna, President and CEO	Corporate Headquarters 3315 Old Forest Road Lynchburg, VA 24501 Solutions Complex 1724 Mt. Athos Road	1958	~$1 billion	2,300	www.Framatome.com
Fuji Electric America		Power Electronics Technology	Michihiro Kitazawa, President and Chairman (Fuji Global)	5115 Bernard Drive, Suite 102, Roanoke, VA, 24018 (Drives and Inverters Dept.)	1923	7,315 (consolidated sales FY12)	~25,000	www.fujielectric.com
Honeywell (Uvex Safety Frames)		Safety Products, Eye + Face Protection	David M. Cote , Chairman and CEO	690 HP Way, Chester, VA, 23836	1906	37,665 (FY12)	~132,000 (worldwide)	www.honeywellsafety.com
Huntington Ingalls		Shipbuilding, Nuclear Operations, Engineering Services	Mike Petters, President and CEO	4101 Washington Ave., Newport News, VA, 23607	2008	6,800 (FY13)	39,000+ (total)	www.huntingtoningalls.com
ICF International, Inc.		IT Services, Research, and Consulting	Sudhakar Kesavan, Chairman and CEO	9300 Lee Hwy, Fairfax, VA, 22031	1969	949 (FY13)	4,500+	www.ifci.com

Nuclear in Virginia:
Private Industry

Updated 11/10/2022

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, $1M	Employees	Website
Innerspec Technologies		Engineering Consultant	Borja Lopez, CEO	2940 Perrowville Rd, Forest, VA 24551	1989		58	https://www.innerspec.com
Interdevelopment, Inc.		Management Consulting and Business Research	Margareta Luddemann, President and CEO	P.O. Box 15249, Arlington, VA, 22215	1967	<1	~10	www.interdevelopment.com
Invensys Eurotherm		I&C sales, support, repair	Mike Caliel, President and CEO (Invensys)	44621 Guilford Drive, Ashburn, Virginia, 20147	1952			www.eurotherm.com
ITC Learning		Industrial Skills Training	Gloria MacCorkindale, Vice President	13515 Dulles Technology Drive, Herndon, VA, 22171		~3	~40	www.itclearning.com
JGW Group		Business Development, Training, Consulting	Andrew Wilson, President	1801 Robert Fulton Drive, Suite 400, Reston, VA, 20191	1980		10 (+int'l associates)	www.jgwgroup.com
KSB, Inc.		Pumps, valves, and systems supplier	Ed Harvie, President (KSB USA)	4415 Sarellen Rd, Henrico, VA, 23231		~3,125	16,500+ (global)	www.ksb.com
Lightbridge		Fuel Cycle Consulting and Design	Seth Grae, President and CEO	1600 Tysons Blvd, Suite 550, Tysons Corner, VA, 22102	1992			www.ltbridge.com
Limitorque Corp. (subsidiary of Flowserve)		Actuators	Mark A. Blinn, President and CEO (Flowserve)	5114 Woodall Rd, Lynchburg, VA 24502	1929 (Limitorque)	4,954 (FY13) (Flowserve)	15,000+ (Flowserve)	www.flowserve.com/Limitorque
Mega-Tech Services, LLC		Tooling, Engineering Consulting	Deanna R. Bowen, President	11118 Manor View Drive, Mechanicsville, VA, 23116				www.mecha-techservices.biz
MELD Manufacturing		Manufacturing and Design		200 Technology Drive, Christiansburg, VA 24073	2018			http://meldmanufacturing.com/
Mitsubishi Nuclear Energy Systems		Vendor, Nuclear Services	Makoto Toyama, President and CEO	1001 19th St N #2000, Arlington, VA	2006		200+ (site-specific)	www.mnes-us.com/
MPR Associates, Inc.		Engineering and Management Services	Bob Coward, Principle Officer	320 King St, Alexandria, VA, 22314	1964		~200	www.mpr.com
Novatech USA		Engineering and Manufacturing Services	Mr. Richard Fl. Rochow, President	220 Jefferson Ridge Parkway Lynchburg, VA 24501	1994		35	http://novatechusa.com/industries/nuclear/

Nuclear in Virginia:
Private Industry

Updated 11/10/2022

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, $1M	Employees	Website
Nuclear Energy Support International, LLC		Staffing and Recruitment	Mary Ann Snyder, Owner	Lynchburg, VA 24501	1983			www.nesillc.com
OFI Custom Metal Fabrication		Safety Related Fabrication	Jim Clifford, President	10412 Design Road, Ashland, VA, 23005	1982			www.osfi.com
Proxtronics, Dosimetry LLC		Dosimetry Services	W. Guy Davis, President and CEO	85 S. Bragg St, Suite 400, Alexandria, VA, 22312	1990			www.proxtronicsdosimetry.com
Radiological Training Services, LLC		Radiological Training	John Duley, Producer	6538 Koziara Drive Burke, VA, 22015	1999		<5	www.radiationvideos.com/about.html
Radium, Inc.		Steam Generator Services, Products	Cam Abernethy, President and Owner	463 Dinwiddie Ave, Waynesboro, VA, 22980	2004		~10	www.radiuminc.com
River Technologies, LLC		Radiological Decontamination	Robert Kozma, COO	2107 Graves Mill Rd, Suite A, Forest, VA, 24551	2003		~10	www.rivertechnologies.biz
Robatel Technologies, LLC		Engineering Services	Teo Grochowski, CEO	5115 Bernard Drive, Suite 304, Roanoke, VA, 24018	2009 (US subsidiary)		115 (Robatel Industries)	www.robateltech.com
SC&A, Inc.		Environmental and Energy Consulting	Gregory P. Beronja, President and CEO	1608 Spring Hill Road, Vienna, VA, 22182	1981			www.scainc.com
Seaward Marine Services		Cleaning and Inspection	Edward A. Wardwell, Founder	5409 Beamon Road Norfolk, VA 23513 United States	1972			www.seaward-marine.com
TalentHunter		Recruitment and Staffing	Al Visco, Vice President	PO Box 275, Ashburn, VA, 20146	1982			www.talenthunter.com
TeamBest		Radiation Protection, Cancer Treatment	Krishnan Suthanthiran, President and Founder	7643 Fullerton Rd, Springfield, VA 22153	1977			www.teambest.com
Thermal Spray Solutions, Inc.		Thermal Spray Coatings		1105 International Plaza, Suite B Chesapeake, VA 23323				http://www.thermalsprayusa.com/
Weidmuller Inc.		IT Products and Services	Brian Schofner, President	821 Southlake Blvd., Richmond, VA, 23235	1850	~40	~100	www.weidmuller.com

Nuclear in Virginia:
Other

Updated 3/29/2021

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, $1M	Employees	Website
ANS		Not-for-profit, International, Scientific and Educational Organization	Marilyn C. Kray, President	555 North Kensington Avenue, La Grange Park, Illinois, 60526 Virginia Local Section and VCU Student Section	1954		11,000 members	www.ans.org
Center Advanced Engineering and Research		Non-profit educational and research corporation	Board of Directors, Executive Director Bob Bailey	1173 Research Way, Forest, VA 2455	2006		3	www.caer.us
Virginia Department of Energy		Governmental research and regulatory body	John Warren, Director	Washington Building, 8th Floor, 1100 Bank St, Richmond, VA, 23219	1985	13.5 State General Fund, 10.5 Federal Funds, 2.6 Fees	174	http://www.energy.virginia.gov/
Virginia Economic Development Partnership		State Authority for business advocacy, development, and support	Dan M. Pleasant, Chairman of the Board	901 East Cary Street Richmond, VA 23219	1995	17.8 (State General fund, FY2014)	~100	https://www.vedp.org/

APPENDIX B:

VIRGINIA NUCLEAR ENERGY CONSORTIUM UPDATE

The Virginia Nuclear Energy Consortium (the Consortium) was formally launched in 2015 and now has been in operation for over three years in accordance with § 45.2-2105 of the laws of the Commonwealth. The full 2022 Consortium activity report and membership roster are included as Appendix B.

VIRGINIA NUCLEAR ENERGY CONSORTIUM

2022 Report

Overview

The Virginia Nuclear Energy Consortium (VNEC) has been in operation for over seven years in accordance with Section 67-1404 of the laws of the Commonwealth. This report provides an overview of VNEC's activities and mission.

- Current membership includes:
    1. Appalachian Power
    2. Curio
    3. Dominion Energy Services
    4. Framatome
    5. GE Hitachi Nuclear Energy
    6. Liberty University
    7. Lightbridge Corporation
    8. Newport News Shipbuilding
    9. NuScale Power
    10. University of Virginia
    11. Virginia Commonwealth University
    12. Virginia Tech University
- Officers for 2022:
    1. Chairman - John Harrell, Dominion Energy Services
    2. Vice-Chair - Alireza Haghighat, Virginia Tech
    3. Treasurer - Supathorn Phongikaroon, Virginia Commonwealth University

Activities and Mission

VNEC advocates for the nuclear industry, and our member companies, on a number of fronts. Our work includes promotion of the industry; efforts to address workforce development; initiatives to promote research and development and identify new opportunities for public-private partnerships; and advocacy on legislative and regulatory matters, as well as public awareness of nuclear's role as a carbon-free energy source capable of meeting our clean energy needs.

- <u>Promotion of Virginia's nuclear assets and capabilities</u>
    1. In accordance with the Virginia is Nuclear 2020 Strategic Plan, VNEC worked to advance nuclear energy in line with the Commonwealth's 2045 carbon-free energy goal.

2. Provided education and information regarding the nuclear industry's place as a carbon-free energy source and contribution to clean air, new technologies and innovation opportunities and general topics related to nuclear in Virginia.
3. Briefed policymakers and a variety of state agencies on industry issues.
4. Provided recommendations for the Governor's 2022 Virginia Energy Plan.

- Workforce Development
  1. Active participation with the Virginia Energy Workforce Consortium (VEWC).
  2. Participated in planning and took part in the 2022 VEWC Changing Virginia's Workforce Industry Networking.
  3. Supported university training of nuclear engineers and scientists.
  4. Ongoing support to address industry workforce needs.

- Research and Development
  1. Continued developing the proposal to create a nuclear research and innovation hub in Virginia.
  2. Participated in Governor Youngkin's announcement of support for the Virginia Innovative Nuclear Hub (VIN Hub).
  3. Promoted advanced technologies and research.
  4. Worked with Virginia state officials and business community to develop awareness and recognition of the research assets and capabilities of Virginia nuclear engineering programs.
  5. Coordinated with the Virginia research and nuclear business communities.
  6. Worked to identify public-private investment opportunities.
  7. Supported member company efforts to create new business opportunities and to advocate for nuclear issues.
  8. Supported development of new technologies & innovation opportunities including advanced manufacturing.
  9. Supported nuclear research opportunities for Virginia universities.

- Legislative and Regulatory Advocacy
  1. Supported public policies that advance the nuclear industry.
     - HB894, enacted by the General Assembly of Virginia, directs the Department of Energy to study the development of advanced small modular reactors in the Commonwealth and "*convene a stakeholder work group to identify strategies and any needed public policies, including statutory or regulatory changes, for promoting the development of advanced small modular reactors in the Commonwealth.*"
       - The working group met on July 11, 2022, to identify objectives and strategies to meet this direction.

- Developed a list of strategy and policy recommendations.

2. Supported federal legislation supporting nuclear energy and advanced technologies.
3. Proactive coordination with state and federal officials advocating for more federal research investment and manufacturing dollars in Virginia.
4. Developing legislative recommendations for 2023

Summary

We continue to make great strides in advancing the industry and helping ensure its future. We continue to follow the key guiding principles outlined in the Virginia is Nuclear 2020 Strategic Plan:

- Ensuring nuclear energy's continued contribution to Virginia's carbon-free future
- Prioritizing nuclear innovation
- Leveraging existing in-state infrastructure and identify capability gaps
- Growing related educational opportunities for the future nuclear workforce

To that end, VNEC worked to secure funding for the planning of the nuclear research and innovation hub outlined in the plan. VNEC has worked with the Youngkin administration and provided recommendations from the strategic plan for the Governors energy plan. His energy plan included pursuing an SMR in the Commonwealth, encourages developing the research hub, and makes nuclear a significant piece of Virginia's energy future.

VNEC will continue to pursue advanced demonstration projects that will promote Virginia's leadership in nuclear energy solutions for the world's pressing energy, economic, environmental, and national security needs. In 2022 and beyond, VNEC will continue implementing the recommendations provided in the strategic plan and continue its work to promote electrical generation, advanced manufacturing and service capabilities, defense, research & development and the industry workforce.