Southwest Virginia Energy Research and Development Authority

2022-23 Annual Report

SWVA Energy

Issued October 1, 2023

Table of Contents

Introduction

Southwest Virginia has a legacy of driving energy production and manufacturing with its key role in the extractive economy. Metallurgical coal helped build America, while wells drilled over 60 years ago still produce natural gas today. As the United States moves toward carbon-neutral energy and our traditional industries decline as a result, Southwest Virginia has the opportunity to continue to be a leader in energy. We will get there by leveraging the region's valuable assets and competing nationwide for entrepreneurs while focusing on innovative, clean and renewable projects.

These "big idea" projects will help maintain Southwest Virginia's leadership position and support a public-private approach in the pursuit of investment-rated opportunities — sustainable, renewable models that can generate returns and ultimately deliver jobs and investment for the region:

- *Project Energizer* employs pumped-storage hydro technology on a small, affordable scale and provides an opportunity for Southwest Virginia to leverage its topography and be an innovator in renewable resources.
- *Evolve Central Appalachia is exploring harvesting the industrial, environmental and economic potential of rare earth elements, critical minerals and high-value, nonfuel, carbon-based products – all out of waste coal.*
- *Project Veer* is leveraging the advanced manufacturing legacy of Southwest Virginia to explore entry points for the region's manufacturers into the onshore and offshore wind supply chains.
- *Project Oasis* validates Southwest Virginia as a location of choice in the Commonwealth for data centers based on power and broadband infrastructure as well as the use of innovative energy applications unique to our region. Building on the region's competitive advantage, Southwest Virginia boasts the use of 52-degree mine pool water for HVAC cooling as a significant cost and energy-saving tool.
- *Project Innovation* determined a business model to accelerate innovative energy research moving at the speed of business while directing funds to the implementation of projects, not excessive overhead. As a result, Governor Youngkin announced the Energy DELTA Lab as a driver of the 2022 Virginia Energy Plan's goals — a public-private multi-site energy testbed located in Southwest Virginia leveraging previously-mined land as a proving ground for the commercialization and deployment of energy technologies.

With each of these projects, this Authority's work can help diversity Southwest Virginia's economy and help the Commonwealth of Virginia achieve its energy goals, and we'll do that with Southwest Virginia leadership and ingenuity as well as support, expertise and funding from key private sector, government, education and community partners.

Purpose

The Southwest Virginia Energy Research and Development Authority was established in 2019 for the purposes of promoting opportunities for energy development in Southwest Virginia, creating jobs and economic activity in the region consistent with the Virginia Energy Plan, and positioning Southwest Virginia and the Commonwealth as a leader in energy workforce and energy technology research and development.

Delegate Terry Kilgore and the late Senator Ben Chafin patroned legislation during the 2019 General Assembly session creating the Authority. Their plan called for a project-focused entity that would show quick progress toward identifying a vision for the region and taking concrete steps toward capitalizing on the opportunity for Southwest Virginia to redefine itself in the new energy economy.

The enabling legislation, which was updated during the 2023 General Assembly session, had the following goals in mind:

1. Leverage the strength in energy workforce and energy technology research and development of the Commonwealth's public and private institutions of higher education;
2. Support energy development projects generally, including pump storage hydropower, energy storage, hydrogen production and uses, carbon capture and storage, geothermal energy, and advanced wind and solar energy;
3. Promote energy development projects on closed power plant sites, brownfield sites, former coal mine sites, reclaimed coal mine sites, abandoned mine lands, and lands adjacent thereto;
4. Promote energy workforce development and energy supply chain development;
5. Assist energy technology research and development by, among other actions, promoting the development of a Southwest Virginia Energy Park;
6. Identify and work with the Commonwealth's industries and nonprofit partners and, through mutually agreed collaborations, the Commonwealth's research and development partners, in advancing efforts related to energy development in Southwest Virginia; and
7. Promote the capture and beneficial use of coal mine methane from active, inactive, and abandoned coal mines as a low-carbon intensity feedstock for manufacturing and energy generation projects located in Southwest Virginia.

Who We Are

Membership

The Authority is composed of 11 non-legislative citizen members, who reside in VA:

- 4 members appointed by the Governor
- 4 members appointed by the Speaker of the House
- 3 members appointed by the Senate Committee on Rules

Members are subject to the standards of conduct set forth in the State and Local Government Conflict of Interests Act and the provisions of the Virginia Freedom of Information Act.

Term

Appointments are for terms of 4 years each. No member is eligible to serve more than 2 successive terms. After expiration of initial terms of 3 years or less, 2 additional 4-year terms may be served. Any appointment to fill vacancy of unexpired term does not constitute a term in determining eligibility for reappointment.

Members

- Mr. Mike Quillen — Chair
- Dr. Kris Westover — Vice Chair
- Mr. Steve Breeding
- Ms. Amanda Cox
- Mr. Jasen Eige
- Dr. March Hernick
- Dr. Mike Karmis
- Mr. Brad Kreps
- Mr. Duane Miller
- Mr. Dan Poteet
- Ms. Lydia Sinemus

Authority Director: Mr. Will Payne — Managing Partner, Coalfield Strategies, LLC

Meetings

September 13, 2022

Southwest Virginia Higher Education Center (Rooms 103-104)
1 Partnership Circle, Abingdon, VA 24210

Agenda

10:00 – 10:02	Call to Order
10:02 – 10:04	Approval of Minutes from June 14, 2022
10:04 – 10:14	Public Comments
10:14 – 10:44	Speaker: PJM Interconnection LLC
10:44 – 11:14	Listening Session: Virginia Energy Plan
11:14 – 11:24	Project Updates (Closed Session if necessary)
11:24– 11:29	Other Business / Announcements • 2022 Meeting Schedule (SWVA Higher Education Center) • December 13, 2022 at 10:00 a.m. • March 14, 2023 at 10:00 a.m. • May 9, 2023 at 10:00 a.m. • September 12, 2023 at 10:00 a.m. • December 12, 2023 at 10:00 a.m.
11:29 – 11:30	Adjournment

Minutes

Authority members present: Mr. Michael Quillen (Chair), Dr. Kristen Westover (Vice Chair), Mr. Steven Breeding, Ms. Amanda Cox (virtual), Mr. Jasen Eige, Dr. Marcy Hernick, Dr. Michael Karmis, Mr. Brad Kreps, Duane Miller, Mr. Dan Poteet and Ms. Lydia Sinemus.

Authority members not present: None.

Advisors present: Mr. Will Payne.

Speakers present: Mr. Will Clear (Deputy Director of the Virginia Department of Energy), Mr. Asim Haque (VP, State & Member Services of PJM) and Mr. Ken Seiler (VP, Planning of PJM).

On September 13, 2022, the Authority convened a quorum at 10:03 a.m. in person at the Southwest Virginia Higher Education Center.

Mr. Quillen requested a motion to approve the draft minutes from the June 14, 2022 meeting. The motion to approve was made by Dr. Hernick, seconded by Mr. Eige and approved unanimously by a voice vote of the Authority.

Mr. Quillen asked if there were any comments from the public in attendance. No comments were made.

Mr. Quillen called on Mr. Haque to introduce the PJM team and discuss the organization's role in the energy market and specifict engagement with Virginia projects.

Mr. Haque discussed a top priority for PJM being preserving reliability while advancing the clean energy transition through innovation. He also addressed the current initiative to refine the interconnection queue process via a forthcoming Federal Energy Regulatory Commission plan. Discussion followed the presentation.

Mr. Quillen called on Mr. Clear to give an update on the 2022 Virginia Energy Plan.

Mr. Quillen asked for a motion for the Authority to convene in closed session for the following purposes: discussing prospective business no previous announcement has been made as to locating in the region pursuant to Virginia Code Section §2.2-3711.A.5; discussing the investment of public funds where competition is involved, where, if made public, the financial interest of the governmental unit would be adversely affected pursuant to Virginia Code Section §2.2-3711.A.6; and discussing information subject to the exclusion in subdivision 3 of Virginia Code section 2.2-3705.6 related to economic development pursuant to Virginia Code Section §2.2-3711.A.39. The motion was made by Dr. Westover, seconded by Dr. Hernick and approved unanimously by a voice vote of the Authority.

The Authority reconvened in open session. Dr. Westover moved adoption of the resolution certifying that the closed session was held in compliance with the Freedom of Information Act. The motion was seconded by Dr. Hernick and approved by roll call vote of the Authority conducted by Mr. Payne (on file with the Authority).

Mr. Quillen reminded members about the December 13, 2022 meeting and the 2023 meeting schedule.

There being no further business, Mr. Quillen adjourned the meeting at 11:36 a.m.

December 13, 2022

Southwest Virginia Higher Education Center (Rooms 103-104)
1 Partnership Circle, Abingdon, VA 24210

Agenda

10:00 – 10:01 **Call to Order**
- Mike Quillen, Chair

10:01 – 10:03 **Approval of Minutes from September 13, 2022**
- Mike Quillen, Chair

10:03 – 10:05 **Agenda Overview**
- Mike Quillen, Chair
- Will Payne, Director

10:05 – 10:15 **Annual Report**
- Will Payne, Director

10:15 – 10:25 **Welcome**

10:25 – 10:50 **Virginia Energy Plan + Energy DELTA Lab**
- Chelsea Jenkins, Deputy Secretary of Commerce & Trade
- Will Clear, Deputy Director, Virginia Department of Energy

10:50 – 11:50 **Advanced Nuclear Reactor Technology: A Primer**

- April Wade, Director, Virginia Nuclear Energy Consortium
- Patrick White, Nuclear Innovation Alliance

11:50 – 12:15 **Water: Southwest Virginia's Competitive Advantage**

- Will Clear, Deputy Director, Virginia Department of Energy
- Daniel Kestner, Manager of Economic Development, Virginia Department of Energy
- Will Payne, Director

12:15 – 12:40 **Advanced Hydrogen Technologies: Leveraging Coalfield Assets**

- Dr. Mike Karmis
- Will Clear, Deputy Director, Virginia Department of Energy

12:40 – 1:00 **Public Comments (sign-up required)**

1:00– 1:05 **Other Business / Announcements**

1:05 – 1:07 **Adjournment**

- Mike Quillen, Chair

Minutes

Authority members present: Mr. Michael Quillen (Chair), Dr. Kristen Westover (Vice Chair), Mr. Steven Breeding, Ms. Amanda Cox, Dr. Marcy Hernick, Dr. Michael Karmis, Mr. Brad Kreps, Mr. Duane Miller and Ms. Lydia Sinemus.

Authority members not present: Mr. Jasen Eige and Mr. Dan Poteet.

Staff/advisors present: Mr. Will Payne.

Speakers present: Mr. Will Clear (Acting Director of Virginia Department of Energy), Mr. Brent Hughes (Virginia Department of Energy), Mr. Victor Ibarra (Nuclear Innovation Alliance), Chelsea Jenkins (Deputy Secretary of Commerce & Trade), Daniel Kestner (Manager of Economic Development for Virginia Department of Energy), The Honorable Israel O'Quinn (Virginia House of Delegates), April Wade (Executive Director of Virginia Nuclear Energy Consortium), Patrick White (Nuclear Innovation Alliance),

On December 13, 2022, the Authority convened a quorum at 10:03 a.m. in person at the Southwest Virginia Higher Education Center.

Mr. Quillen requested a motion to approve the draft minutes from the June 14, 2022 meeting. The motion to approve was made by Ms. Sinemus, seconded by Mr. Breeding and approved unanimously by a voice vote of the Authority.

Mr. Quillen welcomed Authority members and those from the public joining in person and virtually. Mr. Quillen then reviewed the agenda, including an overview of the Virginia Energy Plan and the Energy DELTA Lab, a primer on advanced nuclear reactor technology, a discussion of underground water as a competitive advantage and an introduction to various hydrogen technologies.

Mr. Quillen called on Mr. Payne to offer four updates, including a review of the 2023 meeting schedule: March 14, May 9 (in lieu of June), September 12 and December 12. Mr. Payne indicated that the Office of the Attorney General is assisting with updates to the Authority's bylaws to include an electronic meetings policy that will be considered at the March 2023 meeting. Mr. Payne reminded Authority members that annual financial disclosure statements will be due on February 1, 2023. Finally, Mr. Payne said that he was working with the Office of the Attorney General on providing an overview of the Freedom of Information Act (FOIA) and the Conflict of Interests Act (COIA) at the March 203 meeting.

Mr. Payne then gave a brief overview of the Authority's 2021-2022 Annual Report, which detailed project highlights including: pumped storage hydro, critical mineral extraction, the wind industry supply chain, geothermal cooling, and the innovative energy testbed concept, or what we now call the Energy DELTA Lab. Mr. Quillen requested a motion to approve the Annual Report. The motion to approve was made by Dr. Hernick, seconded by Dr. Westover and approved unanimously by a voice vote of the Authority.

Mr. Quillen introduced Delegate Israel O'Quinn to offer an update on the upcoming General Assembly session.

Mr. Quillen called on Mr. Clear and Ms. Jenkins to give an update on the 2022 Virginia Energy Plan and the launch of the Energy DELTA Lab in October 2022.

Mr. Quillen introduced Ms. Wade, who discussed the Virginia Nuclear Energy Consortium. Ms. Wade introduced Patrick White and Victor Ibarra from the Nuclear Innovation Alliance, who gave an

overview of advanced nuclear energy technologies and update on the industry's nationwide landscape.

Mr. Quillen introduced Mr. Clear, Mr. Hughes and Mr. Kestner to update the Authority on Southwest Virginia's vaster underground water resources and the role water plays in attracting clean energy projects.

Mr. Quillen called on Dr. Karmis to discuss hydrogen projects undergoing due diligence in Southwest Virginia.

Mr. Quillen asked if there were any comments from the public in attendance. No comments were made.

There being no further business, Mr. Quillen adjourned the meeting at 12:25 p.m.

March 14, 2023

Southwest Virginia Higher Education Center (Room 103)
One Partnership Circle, Abingdon, VA 24201

Agenda

10:00 – 10:01	Call to Order • Mike Quillen, Chair
10:01 – 10:03	Approval of Minutes from December 13, 2022 • Mike Quillen, Chair
10:03 – 10:18	FOIA update • Eric Lansing, Office of the Attorney General
10:18 – 10:33	Electronic Meetings Policy update to bylaws • Eric Lansing, Office of the Attorney General
10:33 – 10:48	General Assembly legislative update • Mike Skiffington, Virginia Department of Energy

10:48 – 11:03	Nuclear industry legislative update • April Wade, Virginia Nuclear Energy Consortium
11:03 – 11:18	GOB coal update • Will Clear, Virginia Department of Energy
11:18 – 11:33	Public Comment
11:33 – 11:48	Closed Session
11:48– 11:50	Other Business / Announcements
11:50 – 11:51	Adjournment • Mike Quillen, Chair

Minutes

Authority members present: Mr. Michael Quillen (Chair), Dr. Kristen Westover (Vice Chair), Ms. Amanda Cox, Mr. Jasen Eige, Dr. Michael Karmis, Mr. Duane Miller, Mr. Dan Poteet and Ms. Lydia Sinemus.

Authority members not present: Mr. Steven Breeding, Dr. Marcy Hernick and Mr. Brad Kreps.

Staff/advisors present: and Mr. Will Payne.

Speakers present: Mr. Will Clear (Virginia Department of Energy), Mr. Eric Lansing (Office of the Attorney General), Mr. Mike Skiffington (Virginia Department of Energy), Ms. April Wade (Virginia Nuclear Energy Consortium)

On March 14, 2023, the Authority convened a quorum at 10:08 a.m. in person at the Southwest Virginia Higher Education Center.

Mr. Quillen requested a motion to approve the draft minutes from the December 13, 2022 meeting. The motion to approve was made by Ms. Cox, seconded by Dr. Westover and approved unanimously by a voice vote of the Authority.

Mr. Quillen welcomed Authority members and those from the public joining in person. Mr. Quillen then reviewed the meeting agenda.

Mr. Quillen called on Mr. Lansing with the Office of the Attorney General to provide an overview of the Freedom of Information Act (FOIA). Mr. Payne indicated that he would email Authority members regarding an optional virtual FOIA training course.

Mr. Lansing then offered an overview of the Commonwealth's new electronic meetings policy. Mr. Lansing worked with Mr. Payne since the Authority's March 2023 meeting on incorporating the new policy into the Authority's bylaws. Mr. Quillen requested a motion to approve the Authority's updated bylaws. The motion to approve was made by Mr. Poteet, seconded by Dr. Karmis and approved unanimously by a voice vote of the Authority.

Mr. Quillen welcomed Mr. Skiffington with the Virginia Department of Energy to present an update on the 2023 General Assembly session.

Mr. Quillen welcomed Ms. Wade with the Virginia Nuclear Energy Consortium to discuss nuclear energy industry-specific legislation considered during the 2023 General Assembly session.

Mr. Quillen welcomed Mr. Clear with the Virginia Department of Energy to discuss the gob coal study legislation introduced by Senator Travis Hackworth during the 2023 General Assembly session.

Mr. Quillen asked if there were any comments from the public in attendance. No comments were made.

Mr. Quillen indicated that there were two items for closed session regarding projects under development and yet to be announced. As a result, Mr. Quillen asked for a motion for the Authority to convene in closed session for the following purposes: discussion or consideration of the investment of public funds where competition or bargaining is involved, where, if made public initially, the financial interest of the governmental unit would be adversely affected pursuant to Virginia Code Section § 2.2-3711.A.6; and information relating to the negotiation and award of a specific contract where competition or bargaining is involved and where the release of such information would adversely affect the bargaining position or negotiating strategy of the public body pursuant to Virginia Code Section § 2.2-3705.1.12. The motion was made by Dr. Westover, seconded by Mr. Eige and approved unanimously by a voice vote of the Authority.

The Authority reconvened in open session. Dr. Westover moved adoption of the resolution certifying that the closed session was held in compliance with the Freedom of Information Act. The motion was

seconded by Dr. Karmis and approved by roll call vote of the Authority conducted by Mr. Payne (on file with the Authority).

Mr. Quillen reminded members about the upcoming May 9, 2023 meeting in lieu of June as well as the remaining 2023 meetings (September 12 and December 12).

There being no further business, Mr. Quillen adjourned the meeting at 11:43 a.m.

May 9, 2022

Southwest Virginia Higher Education Center (Room 103)
One Partnership Circle, Abingdon, VA 24201

Agenda

10:00 – 10:01 **Call to Order**
- Mike Quillen, Chair

10:01 – 10:03 **Approval of Minutes from March 14, 2023**
- Mike Quillen, Chair

10:03 – 10:13 **Public Comment**

10:13 – 10:18 **Nuclear Industry Update**
- April Wade, Virginia Nuclear Energy Consortium

10:18 – 10:43 **Appalachian Power Company Generating Fleet Transition**
- Will Castle, Appalachian Power Company

10:43 – 11:08 **An Update on Balancing the Supply of Reliable, Affordable and Clean Electricity to Dominion Energy's Customers**
- Emil Avram, Dominion Energy

11:08 – 11:23 **Discussion**

11:23 – 11:33 **Closed Session (if necessary)**

11:33– 11:35 Other Business / Announcements

11:35 – 11:36 Adjournment

- Mike Quillen, Chair

Minutes

Authority members present: Mr. Michael Quillen (Chair), Dr. Kristen Westover (Vice Chair), Mr. Steven Breeding, Ms. Amanda Cox, Mr. Jasen Eige, Dr. Marcy Hernick, Dr. Michael Karmis, Mr. Brad Kreps, Mr. Duane Miller, Mr. Dan Poteet and Ms. Lydia Sinemus.

Authority members not present: None

Staff/advisors present: Mr. Will Payne

Speakers present: Mr. Emil Avram (Dominion Energy), Mr. Will Castle (Appalachian Power Company), Mr. Will Clear (Virginia Department of Energy) and Ms. April Wade (Virginia Nuclear Energy Consortium)

On May 9, 2023, the Authority convened a quorum at 10:01 a.m. in person at the Southwest Virginia Higher Education Center.

Mr. Quillen requested a motion to approve the draft minutes from the May 9, 2023 meeting. The motion to approve was made by Mr. Bill, seconded by Mr. Poteet and approved unanimously by a voice vote of the Authority.

Mr. Quillen asked if there were any comments from the public in attendance. No comments were made.

Mr. Quillen welcomed Authority members and those from the public joining in person. Mr. Quillen then reviewed the meeting agenda.

Mr. Quillen welcomed Ms. Wade with the Virginia Nuclear Energy Consortium to discuss nuclear energy industry-specific legislation considered during the 2023 General Assembly session. Ms. Wade also discussed planned community outreach in Southwest Virginia and an upcoming training course hosted my MIT entitled, “Nuclear Energy in a Low-Carbon Future.”

Mr. Quillen welcomed Mr. Castle with Appalachian Power Company to discuss the utility's transition of its generation fleet.

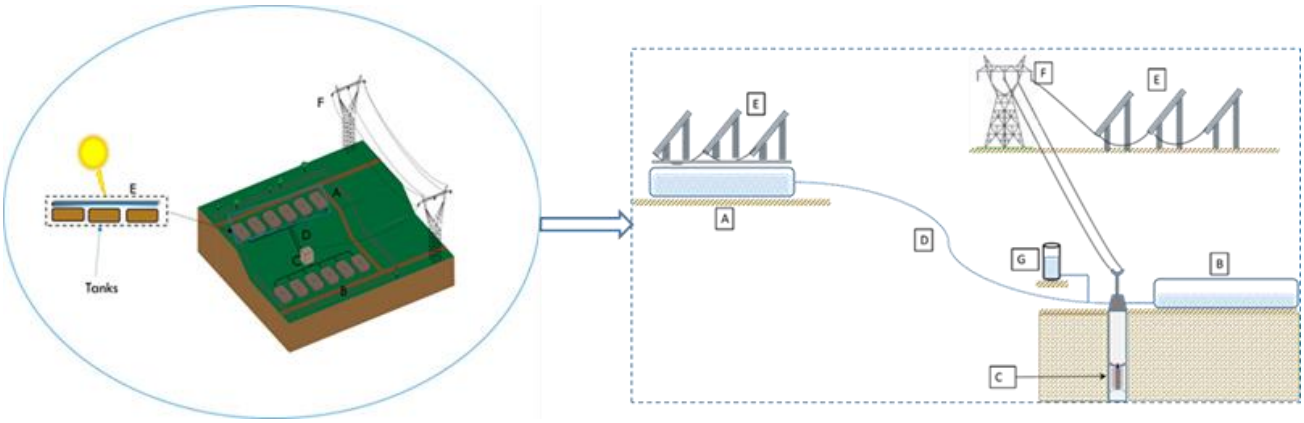
Mr. Quillen welcomed Mr. Avram with Dominion Energy to discuss the utility's efforts to balance the supply of reliable, affordable and clean electricity to customers.

Mr. Quillen reminded members about the upcoming remaining meetings of the year: September 12 and December 12.

There being no further business, Mr. Quillen adjourned the meeting at 11:16 a.m.

Project Highlights

Pumped Storage Hydro



Project Energizer, an InvestSWVA initiative, is taking a disruptive approach to an older technology. Traditional pumped storage hydro (PSH) projects have always been large scale and required significant civil works and land disturbance. Even though the technology is proven and often more affordable per unit than battery technology, overcoming scale for deployment particularly with more distributed generation is problematic. Dr. Thomas Eldredge and Dr. Hector Medina, both professors at Liberty University, have developed a small-scale, modular PSH system that can be deployed with very little land disturbance made from off-the-shelf components. By pairing this system with wind and solar power generation, GO Virginia Region One has the potential of deploying a small-scale, affordable and proven base-load renewable energy solution for local high-tech and industrial applications.

PSH was originally developed to allow power shifting from low-demand times to high-demand times. The concept is simple. During times of low-power demand, excess electricity is used to pump water from a water source located at a lower altitude point to storage in a reservoir at a higher altitude point. When power demand begins to peak, water is released from the reservoir down through a power house and back to the original water source, generating electricity along the way. The action can be repeated daily depending on power demand.

Drs. Eldridge and Medina have developed an idea of creating a self-contained system that can be constructed on the surface to contain the same PSH action without civil disturbance. The system will incorporate off-the-shelf containment bladders that will be used as upper and lower reservoirs. Standard high-density polyethylene piping will be connected above ground to move water up and

down the device. A bi-directional pump house will be installed at the base of the system that will not only pump water up but also generate power as the water is released. The system is completely scalable up to 10 megawatts and offers a relatively low cost of approximately $2,400 per kilowatt of installed capacity. The design provides an exciting opportunity to affordably complement this technology with other renewable energy generation in a base-load solution.

Southwest Virginia is uniquely positioned to take advantage of this technology. There is one asset that Region One has that is necessary for effective deployment of these systems: topography relief. In order for the technology to generate power, 700 feet of drop, or head, is required to create the necessary force to generate power. Southwest Virginia has many locations that meet this critical site characteristic. Furthermore, the region has an inventory of previously disturbed properties that have been reclaimed from surface mining and could serve as locations for the PSH system. These sites also offer co-location opportunities for wind and solar. Region One has the necessary assets to be a leader in the deployment of this technology, which would be a significant tool to attract high-tech business prospects seeking affordable renewable power.

The project team, which includes: Liberty University School of Engineering, LENOWISCO Planning District Commission, Virginia Department of Energy (Virginia Energy), U.S. Department of Energy, Coalfield Strategies and Dominion Energy, seeks to validate this opportunity for Southwest Virginia by researching two topics: Identifying optimal areas within the region that can serve as locations for deployment of these systems and performing materials testing and analysis. The team will draw on recent Virginia Energy-led research that identified areas for renewable deployment by extending that search to include areas with viable relief. That will ensure the ability to co-locate other renewable generation assets. Additionally, because the proposed materials that will be used to build the system were not made specifically for PSH, testing has to be completed prior to deployment in order to ensure that the materials will hold up to operating stress.

Furthermore, this disruptive technology would help define Southwest Virginia as a hotbed for energy innovation for a number of reasons, including its ease of deployment, minimal land disturbance, low cost relative to other competitive battery applications and ability to pair with other renewable energy sources.

This project is funded with support from Coalfield Strategies via Dominion Energy funds ($10,000), Virginia Energy via U.S. Department of Energy funds ($37,500), GO Virginia ($50,000), the National Renewable Energy Laboratory ($100,000). The LENOWISCO Planning District Commission serves as the fiscal agent.

In August 2020, OnPoint Development Strategies was awarded the contract to perform location vetting and will partner with Virginia Energy. The teams kicked off their respective tasks beginning in September 2020 and completed their work by February 2022. For more information, visit: https://www.energydeltalab.org/project-energizer.

Critical Mineral Extraction

EVOLVE CAPP

A team of nearly 50 public, private, academic and business professionals announced an initiative on March 16, 2022 to identify a path to the creation of a brand-new industry in central Appalachia, rooted in Virginia's southwest region. Evolve Central Appalachia (Evolve CAPP) focuses on harvesting the industrial, environmental and economic potential of rare earth elements (REE), critical minerals (CM) and high-value, nonfuel, carbon-based products – all out of waste coal. It launched today from its new laboratory in the Virginia Highlands Small Business Incubator in Abingdon, Virginia, provided for by the Washington County Industrial Development Authority.

Managed principally by Virginia Tech, through the Virginia Center for Coal and Energy Research (VCCER), Evolve CAPP has assembled academic, industry and policy experts in processing, geology, mining, infrastructure, waste and impoundments, carbon products, environment and economic development. The participants seek to leverage a decades-long legacy of Appalachian leadership in energy to generate a new industry and to create better environmental conditions in the Appalachian basin by accelerating waste coal clean up. Additional benefits include economic growth and job creation. Evolve CAPP will initiate the harvesting and processing of REE and CM from coal, coal sediments, coal ash, coal refuse and impoundments, acid mine drainage and other basin-specific resources in central Appalachia. At the same time, the initiative will connect these processes to the advancement of American competitive strength in the manufacturing, energy and climate sectors.

The initiative has identified *seven* objectives in this regard:

- Determine the quantity and distribution of resources in the region.
- Formulate strategies to utilize coal waste streams to produce useful fuels and materials.
- Evaluate regional infrastructure and identify industries that may benefit from REE and CM production.

- Develop strategies to encourage business development.
- Guide research and development of new technologies.
- Frame plans to establish technology innovation centers.
- Implement stakeholder outreach and education initiatives.

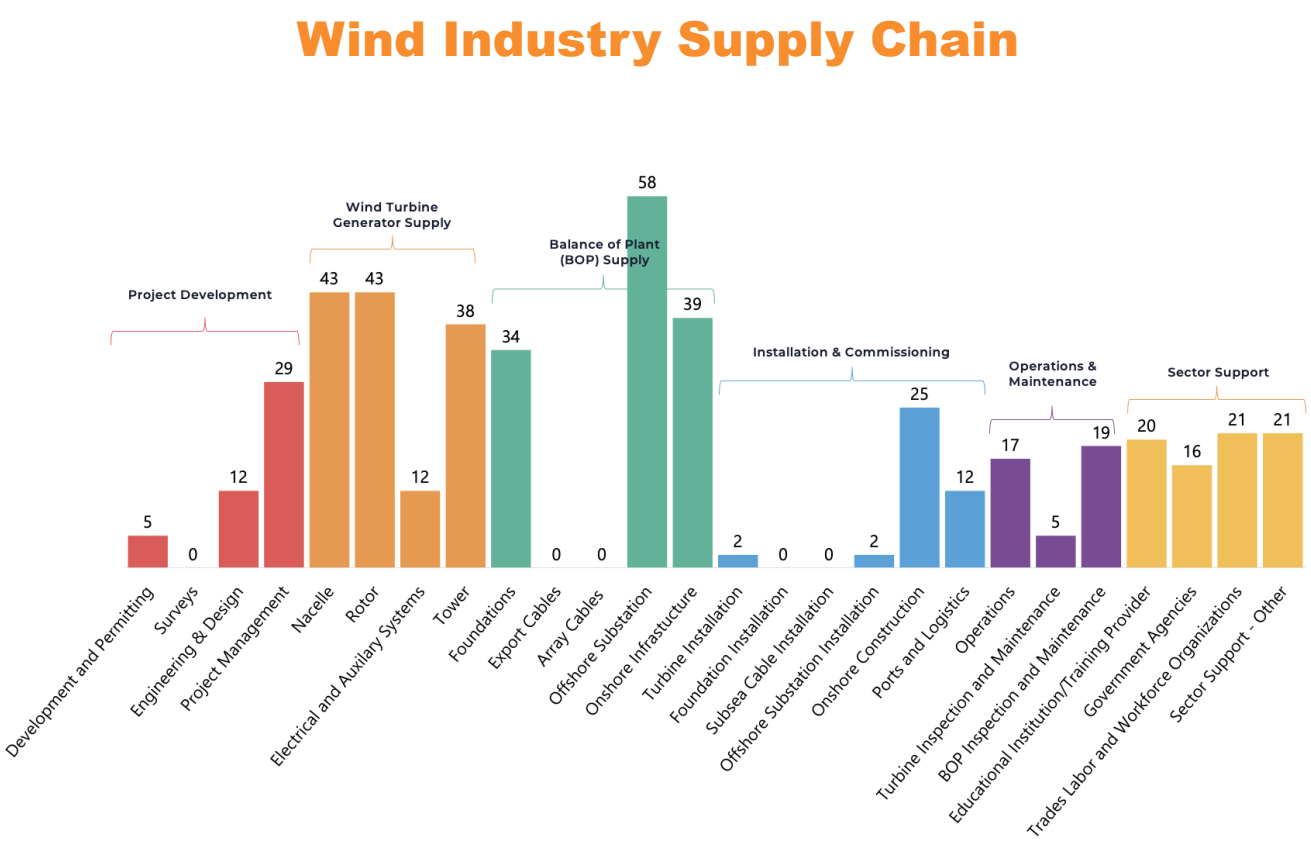
The Team

The U.S. Department of Energy provided the initial funding of $1.499 million to VCCER, and the Virginia Department of Energy provided a contract geologist to serve as an administrator of the project. The Virginia Tech team is led by Richard Bishop and Dr. Michael Karmis, and it includes Wencai Zhang (processing), Kevin Andrews and Gus Janson (geology), Nino Ripepi and Zach Agioutantis (mining), Danny Gray (waste and impoundments), Parans Paranthaman (carbon products), and Will Clear (economic development).

- Academic partners: West Virginia University, the University of Kentucky and Virginia's Mountain Empire Community College.
- Government research partners: the Virginia Department of Energy, the U.S. Geological Survey and Oak Ridge National Laboratory.
- Private research partners: Marshall Miller & Associates, Advanced Resources International, Crescent RI, Gray Energy Technologies and Southern States Energy Board.
- Economic development partners: InvestSWVA, Coalfield Strategies, LENOWISCO Planning District, Southwest Virginia Energy Research and Development Authority, the Virginia Highlands Small Business Incubator, the Industrial Development Authority of Washington County, Virginia, and Wise County, Virginia.
- Private technology partners: Ramco Carbon, Separation Technologies, Carbon Technology Company and Alios Pty Ltd.
- Power producing partners: Dominion Energy, Tennessee Valley Authority and American Electric Power.
- Energy producing partners: Alpha Metallurgical Resources, American Consolidated Natural Resources, Blackhawk Mining, Consol Energy, Coronado-Buchanan Minerals, EnerVest, Metinvest-United Coal Company, Ramaco Resources, Natural Resource Partners, Harrison-Wyatt & Buchanan Energy and Kentucky River Properties.
- Stakeholder advisors: Leon Boyd of Rocky Mountain Elk Foundation, Jason De La Cruz of Dominion Energy, Kevin Elkins of Buchanan Minerals, Joseph Fawbush, Mayor of the City of Norton, Frank B. Harrington of Alpha Metallurgical Resources, Neil Mosely of Blackhawk Mining, LLC, Will Payne of Coalfield Strategies, and Thomas Pruitt of Mineral Owners.

The Landscape

Today, it is actually less expensive to insource critical minerals than to produce them in the U.S. Countries that do not have the environmental or worker safety regulations, or may not be aligned with U.S. interests, still can get the minerals into the U.S. at less cost. Getting to critical minerals stateside is clearly an industrial priority, and because it will require facilities, a transportation network and a skilled workforce, a significant investment is warranted. The research already shows that the collateral benefit of cleaning up waste coal is a key aspect of a return on any investment extracting critical minerals from it. Besides satisfying the need to clean up waste coal, otherwise known as "gob", Southwestern Virginia's location in central Appalachia is perfect for domestic sourcing and shipment by rail and road to ports on the U.S. eastern seaboard.



Project Veer is leveraging the advanced manufacturing legacy of Southwest Virginia to explore entry points for the region's manufacturers into the onshore and offshore wind supply chains. The project team, which includes global energy consulting firm Xodus Group, is collaborating with industry experts, utilities Appalachian Power and Dominion Energy, public sector partners and GO Virginia Region One's economic and workforce development organizations as well as local companies poised

to enter this new market. Region One is the only GO Virginia region with energy and minerals as a target industry in its Growth and Diversification Plan. Project Veer builds on this priority by connecting the new energy economy to Southwest Virginia's manufacturers in search of ways to expand their businesses. In addition, Project Veer complements robust efforts currently underway by the Commonwealth of Virginia and the Hampton Roads Alliance to develop the U.S. East Coast offshore wind supply chain.

Background

While the project addressed both onshore and offshore wind supply chain needs, the offshore wind industry remains the priority, given the pipeline of projects in place along the East Coast. For this burgeoning industry, the American Wind Energy Association estimates up to 30,000 MW of capacity, 83,000 jobs, and $25 billion of annual economic output by 2030.

When fully constructed in 2026, Dominion Energy's Coastal Virginia Offshore Wind (CVOW) project off the cost of Virginia Beach will deliver up to 9.5 million megawatt hours per year of clean, renewable energy to the grid, powering up to 660,000 Virginia homes and avoiding as much as 5 million tons of carbon dioxide annually. The 2.6-gigawatt wind farm will be the largest offshore wind project in the United States. It will include up to 176 turbines and builds off of the current two-turbine pilot project which serves as the first installed in federal waters and the only one developed and owned by an electric utility.

The CVOW project also serves as a catalyst for a new domestic supply chain that will serve the U.S. East Coast wind industry, creating hundreds of good-paying clean energy jobs, millions in tax revenues and hundreds of millions in economic benefits. Additionally, Avangrid's 2.5-gigawatt Kitty Hawk Wind project off the cost of North Carolina helps create critical mass for Virginia's Hampton Roads region to serve as a strategic hub.

Furthermore, the Commonwealth of Virginia has set a goal of 30% by 2030 and 100% by 2050 for its electric energy to be provided by renewable sources. This creates a generational opportunity for Virginia to create a new workforce to support this industry. As the renewable energy goals will displace traditional sources of energy, the opportunity to upskill the workforce, drive diversity, equity and inclusion and create economic opportunity in GO Virginia Region One is paramount. Understanding the supply chain for renewable energy, where the gaps are and how to close those gaps will drive this development. Focused, organizationally-sound initiatives will come out of Project Veer's analysis to serve as an economic development roadmap.

Renewable energy developers need local partners to build out the industry and support projects. Developers and original equipment manufacturers look to local suppliers for a wide range of products and services, from highly technical components to services such as transportation in support of project delivery. There is a willingness by developers and their major suppliers to help local companies enter the industry and work with stakeholders to implement workforce development programs. Local support lowers risk and helps ensure the timely delivery of projects. It is important to note that inclusion in the supply chain may result in a local partner being involved in numerous projects, not just those in the Commonwealth.

Funding for Project Veer was made possible with funding from the GO Virginia Region One Council, the Virginia Tobacco Region Revitalization Commission and Coalfield Strategies with support from Appalachian Power and Dominion Energy.

Potential Identified

Xodus Group kicked off its work in December 2021 and delivered an interim report to the Authority on March 8, 2022 that offerered positive news for the region. The firm identified nearly 200 companies in Southwest Virginia as potential suppliers to the burgeoning offshore wind (OSW) industry supply chain. While major component manufacturing (nacelle, blades, towers, etc.) is not possible in the region due to scale and mass of structures, because water access is necessary for transportation, the region is well-positioned geographically and experientially to participate in the production of other, smaller components that can be delivered over roadways and railways.

Recommendations

Xodus Group presented its final report to the Authority on March 30, 2022. Detailed information can be found here: https://www.investswva.org/project-veer. Chief recommendations include the following:

1. Identify a major tier company to act as an anchor and an exemplar of the region, helping pave the way to relationships with global original equipment manufacturers (OEMs).
2. Launch a firm collaboration between the region's community colleges to focus on worker training and upskilling.
3. Form a partnership with the Hampton Roads Alliance (HRA), a Virginia entity and one of the nation's most prominent OSW business and investment attractors.
4. Designate a regional entity for positioning Virginia's Southwest and for acting as a single point of entry for the OSW opportunity.
5. Coordinate an approach for retaining the next generation of workers, including building awareness of the career potential in OSW.

Workforce Development Coalition

The presidents of four community colleges in Southwest Virginia today signed a memorandum of understanding (MOU) to collaborate on training and development actions in the offshore wind energy (OSW) manufacturing supply chain. This agreement fulfills one of the recommendations presented to the region by the Xodus Group, which performed research commissioned by InvestSWVA.

The MOU signifies that Mountain Empire Community College, Southwest Virginia Community College, Virginia Highlands Community College and Wytheville Community College will work together to promote, develop and expand the preparation of workers to enter the employ of regional supply chain manufacturers in the offshore wind energy generation sector.

Geothermal Cooling

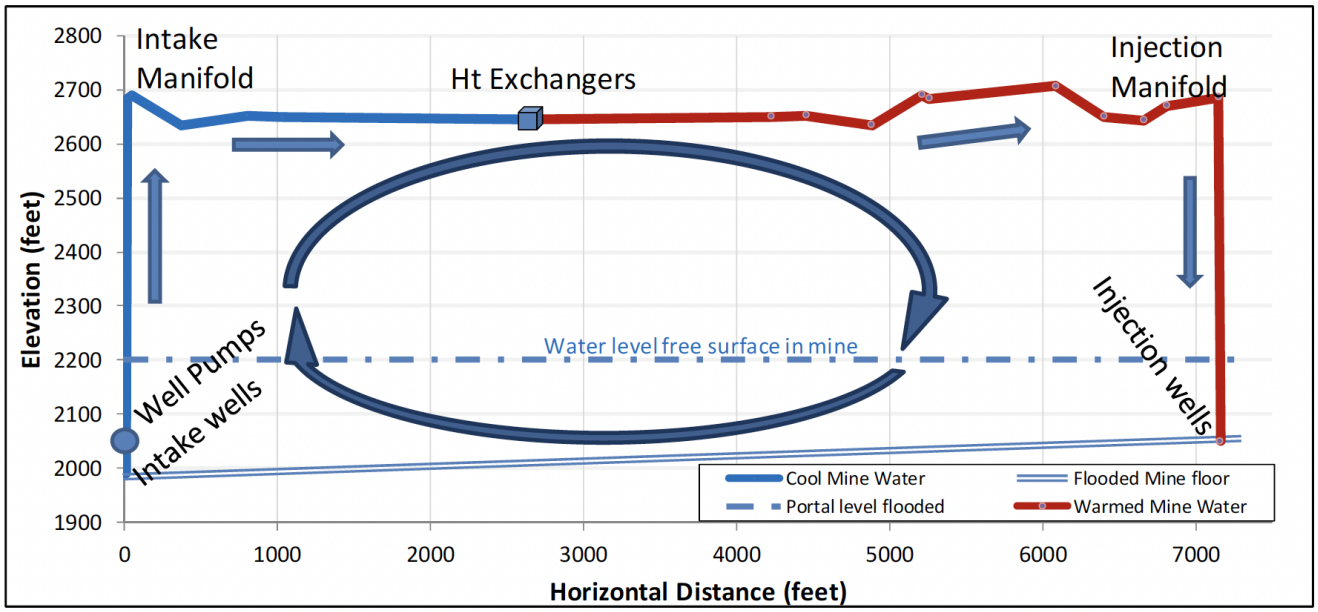


Figure 10: The hydraulically-closed system requires less pumping head

First introduced at an August 2019, Project Oasis identified and studied data center opportunities across GO Virginia Region One, particularly on previously mined land. The purpose of this InvestSWVA initiative was to provide third-party validation for the region to become the location of choice in the

Commonwealth for data centers based on power and broadband infrastructure as well as the use of innovative energy applications unique to Southwest Virginia.

The Virginia Department of Mines, Minerals and Energy played a strategic role in helping study the use of 52-degree mine pool water for HVAC cooling as a significant cost and energy-saving tool. We had the country's foremost geothermal experts on our team — PCCI out of Alexandria, Virginia — validating that concept along with the engineering firm, Marshall Miller & Associates.

This project assembled a data center "Dream Team" of Virginia experts with extensive backgrounds in site readiness, power assets, broadband, economic analysis and resiliency:

- Kent Hill of On Point Development Strategies was the project lead working with InvestSWVA. Hill is well known in the industry, having led Dominion Energy's economic development efforts many years;
- Fletcher Mangum and David Zorn of Mangum Economics;
- Vinay Nagpal of InterGlobix, our fiber expert; and
- Phillip Sandino of Data Energy Consulting, who served as Virginia's point person for COVID-19 response measures for the data center industry.

The Northern Virginia Technology Council and the Data Center Coalition offered guidance throughout the analysis. Furthermore, many other public and private organizations throughout the region stepped up in significant ways, including Appalachian Power, Dominion Energy, Old Dominion Power, Point Broadband, Scott County Telephone Cooperative, Tennessee Valley Authority and our regional and local economic developers.

This project was funded with support from Virginia Energy via non-state generated dollars ($50,000) and GO Virginia ($50,000). The LENOWISCO Planning District Commission served as the fiscal agent.

OnPoint Development Strategies was awarded the contract to perform a market analysis as well determine ideal locations in which to site projects with the assistance of Virginia Energy. PCCI partnered with Marshall Miller & Associates to determine the feasibility of mine pool water circulation used to augment data center cooling and calculate the impact of water circulation stress on mine stability. The team kicked off their respective tasks beginning in October 2019 and announced their findings on October 5, 2020.

Senators Mark Warner and Tim Kaine secured $1.5 million in the U.S. Senate Appropriations spending bill in 2022 to assist in accelerating this concept with the deployment of a demonstration loop at the Energy DELTA Lab's Data Center Ridge site. An update will be provided at a later date.

Summary

The Project Oasis study found that Southwest Virginia is well-positioned for data centers because of land availability, geothermal cooling opportunities unique to the region, and workforce readiness and development. It also outlined policy and infrastructure changes that could be made by the region and state to make Southwest Virginia more attractive for data centers. The full report can be downloaded here: https://www.energydeltalab.org/project-oasis. Highlights from the study's executive summary are below:

Economic Impact

The economic and fiscal impact analysis that was conducted for Project Oasis estimated that a large data center locating in the region would result in over 2,000 jobs created during construction, 40 direct and 59 additional permanent jobs, $233 million in economic activity during construction, and over $50 million in economic activity annually once operations begin.

Land and Geothermal Cooling

As data center suitable real estate becomes increasingly scarce and extremely expensive in Northern Virginia, other parts of the state with abundant power and fiber infrastructure have seen increased interest from data center developers.

Data centers have unique site and infrastructure requirements. There are multiple sites within GO Virginia Region One that could be suitable for a large data center. An assessment of available publicly controlled sites in the region of 25 acres or larger was conducted utilizing current data center industry site selection criteria.

Six sites met the general criteria for a large 36 MW hyperscale data center, and four additional sites could be suitable for a smaller data center of up to 10 MW. Two of the sites have opportunities for geothermal cooling through utilization of 51-degree mine water contained in vast pools below the surface of previously mined properties. An additional site has underground space that provides a consistent 55-degree temperature. Both conditions maximize water utilization and make data center operations more sustainable.

The annual savings for a geothermal cooling system would be over $1 million annually in reduced electric costs and municipal water purchases. Factoring in savings for avoided maintenance and other costs for a conventional system, the mine water system would provide a favorable return on

investment and result in net annual savings for the data center operator. Coalfield Strategies, InvestSWVA's project development team, is currently working on a pilot project with the Southwest Virginia Energy Research and Development Authority utilizing available grant funding that could be presented to data center companies with significant sustainability goals.

The region provides a low-risk option from natural and man-made disasters and meets distance requirements for disaster recovery and back up from primary data center locations such as Ashburn, Richmond, and Boydton, VA (Microsoft). The electric transmission network that supplies the region has three transmission providers and is electrically diverse from data center hubs in Northern Virginia, Richmond, and North Carolina.

Sustainability

Most new renewable energy projects for data centers in the current market utilize solar energy, which requires a large land area (6-10 acres per MW). Southwest Virginia has ample previously mined properties suitable for solar development.

The availability of solar development potential, cost-effective geothermal cooling, and the region's desire to transform itself from a coal producing area to an innovative renewable energy hub, provides a compelling case for data centers who are increasingly mandating new facility locations that allow sustainability goals to be met.

Workforce

There is a reasonable pool of workers in the region with skills and training that are potentially transferrable to a data center environment. Wages for IT workers such as network architects and information security analysts are 17% less in GO Virginia Region One than the national average. Strong IT training programs and resources exist with the community colleges in the region and the University of Virginia at Wise.

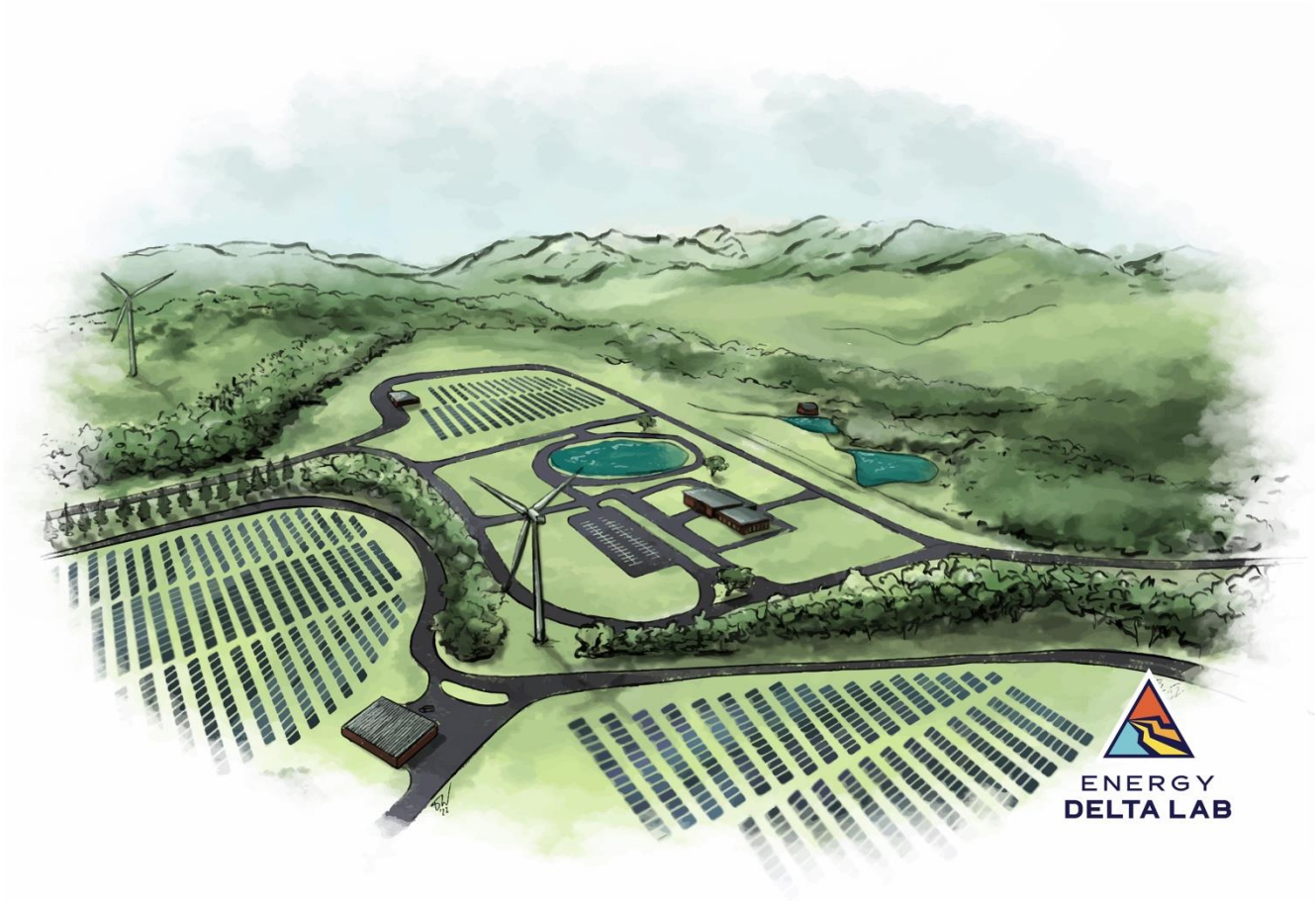
State and Local Incentives

In addition to Virginia's competitive statewide incentives, the Commonwealth allows a separate property tax rate to encourage investment (i.e. property tax on data center equipment). Prior to this analysis, no localities in GO Virginia Region One had a data center specific taxation class. However, discussions with local government officials in the region indicated a strong willingness to review tax structure for potential future changes that would make them more competitive. A tax rate and depreciation schedule that is competitive with localities such as Henrico County and Chesterfield

County was deemed necessary to make the region a cost-effective alternative for this capital-intensive industry. As a result, the Southwest Virginia member localities of the Lonesome Pine Regional Industrial Facilities Authority (Lonesome Pine RIFA), including Dickenson County, Lee County, City of Norton, Scott County, and Wise County, announced on March 2, 2021 an agreement on what is the Commonwealth of Virginia's lowest regional property tax rate on data center equipment. The regional partnership implemented a tax rate of $0.24 per $100 of assessed value with a favorable depreciation schedule, taking into account the capital cost of equipment and frequency of server replacement. This unified approach strengthens the region's business case and opens up the opportunity for revenue sharing.

A Construction Employment Tax Credit of 20% of wages paid for construction workers for a data center or similar capital-intensive project located in underserved and rural areas should be evaluated.

Innovative Energy Testbed



The Energy Discovery, Education, Learning and Technology Accelerator Lab, or Energy DELTA Lab (DELTA Lab), is a multi-site energy testbed over four years in the making that was introduced in the Virginia Energy Plan on October 3, 2022. The initiative, led by Authority chair Mike Quillen, is a collaborative effort by the Virginia Department of Energy, the Southwest Virginia Energy Research and Development Authority and its business development partner InvestSWVA. Lead private partners include Appalachian Power and Dominion Energy Virginia.

Background

The DELTA Lab's initial concept was designed by Dr. Michael Karmis, former director of the Virginia Center for Coal and Energy Research. Further study of the "lab" concept under the codename Project Innovation, including operations and site planning, was made possible by the LENOWISCO Planning District Commission via grants provided by the GO Virginia Region One Council and the U.S. Economic Development Administration.

With more than 100,000 acres of previously mined property, more than 9,000 gas wells, numerous mine cavities, and boundless water supplies, the region's diverse terrain, mineral and underground resources provide the ideal setting for the research and development as well as commercialization and deployment of new, burgeoning energy technologies, including hydrogen, mine-based geothermal, small modular reactors, innovative solar generation and advanced energy storage, including pumped-storage hydro.

At its core, the DELTA Lab is an economic development strategy to drive growth and diversify Southwest Virginia's economy. In the role of a broker, the Lab is working on $12B worth of projects, connecting energy companies with private landowners, assisting with siting and due diligence. The work that goes into these projects and the resulting energy assets will bring new opportunities to a region that has been significantly impacted by the downturn of fossil fuel production. This activity will ultimately create new career pathways for the region's workforce.

The DELTA Lab's initial testbed site in Wise County, which received a $975K AMLER grant, will be located on property currently owned by the Cumberland Forest Limited Partnership and managed by The Nature Conservancy. Governor Youngkin announced the Lab's second site in Wise County near the Town of Appalachian in October 2022 as part of a $2M AMLER grant. Other sites are under development.

Origin Story

During the 2019 General Assembly session, Delegate Terry Kilgore and the late Senator Ben Chafin patroned legislation creating the Southwest Virginia Energy Research and Development Authority. The Authority was established for the purposes of promoting opportunities for energy development in Southwest Virginia, to create jobs and economic activity in Southwest Virginia consistent with the Virginia Energy Plan and to position Southwest Virginia and the Commonwealth as a leader in energy workforce and energy technology research and development. The Authority's enabling legislation included six goals, including: "Assist energy technology research and development by promoting the development of a Southwest Virginia Energy Park." (Virginia Code: 45.2-1717 – 45.2-1724).

Business Model Analysis

The "Energy Park" referenced in the Authority's enabling legislation — now referred to as the "Energy DELTA Lab" — has been incubating for several years thanks to the vision and leadership of internationally known energy scientist Dr. Michael Karmis, Authority member and former director of the Virginia Center for Coal and Energy Research.

Building on the work of Dr. Karmis and given the mission of the Authority, InvestSWVA worked with the Virginia Department of Energy and the LENOWISCO Planning District Commission in 2020 to undertake 'Project Innovation' in order to determine a sustainable operational model and identify lab sites around the region. The U.S. Economic Development Administration provided $100K in matching dollars to the GO Virginia Region One Council's $100K commitment.

The team set out to determine a business model that demands flexibility, accountability and lean operations. University research parks/labs in Virginia can and do charge a ~65% fee on grants for administration. That practice is wrong and counter to the goals of the DELTA Lab. For model to be successful, the team must accelerate research moving at the speed of business while directing funds to the implementation of projects, not excessive overhead.

Therefore, the team concluded that the DELTA Lab, set up as a 501c3 nonprofit organization, allows for a model that leverages strategic partnerships with minimal overhead in order to conduct business with expediency and appropriate oversight. There would be no bloat or long-term liabilities that would otherwise exist in a public body. As a 501c3, the DELTA Lab is governed by board of directors. The operations team includes:

- As chair of the board of directors, Mike Quillen provides strategic director and lends credibility and expertise, given his storied energy and educational legacy in the Commonwealth.
- Will Payne, managing partner of Coalfield Strategies, LLC, serves as Executive Director, leading operations and business development.

- Dr. Michael Karmis, former director of the Virginia Center for Coal and Energy Research, serves as senior technical advisor.
- Will Clear, Deputy Director of the Virginia Department of Energy, serves in an advisory capacity. His extensive private industry background in accounting, finance and business development in the natural gas industry has proved invaluable.

For more information, visit: https://www.energydeltalab.org/.

Appendix A — Code of Virginia

Article 6. Southwest Virginia Energy Research and Development Authority.

§ 45.2-1717. (Effective until July 1, 2029) Definitions.
As used in this article, unless the context requires a different meaning:

"Authority" means the Southwest Virginia Energy Research and Development Authority established pursuant to this article.

"Coal mine methane" means methane gas captured and produced from an underground gob area associated with a mined-out coal seam that would otherwise escape into the atmosphere.

"Developer" means any private developer of an energy development project.

"Energy development project" means any activity that generates, produces, or stores energy, any energy efficiency system, and any supporting ancillary activities located within Southwest Virginia and includes interests in land, improvements, and ancillary facilities and research, development, commercialization, and deployment activities designated by the Authority to the nonprofit collaborative.

"Nonprofit collaborative" means a multi-site nonprofit innovative energy technology testbed established as a collaborative effort of the Department of Energy, the Authority, and the Authority's business partners to support the Authority's purpose through energy technology research, development, commercialization, and deployment.

"Southwest Virginia" means the region of the Commonwealth designated as Southwest Virginia in § 22.1-350.

"Southwest Virginia Energy Park" means the nonprofit collaborative.
2019, cc. 555, 556, § 67-1600; 2021, Sp. Sess. I, c. 387; 2023, cc. 720, 721.

§ 45.2-1718. (Effective until July 1, 2029) Southwest Virginia Energy Research and Development Authority established; purpose.
The Southwest Virginia Energy Research and Development Authority is established as a political subdivision of the Commonwealth. The purposes of the Authority are to promote opportunities for energy development in Southwest Virginia, create jobs and economic activity in Southwest Virginia

consistent with the Virginia Energy Plan prepared pursuant to Article 4 (§ 45.2-1710 et seq.), and position Southwest Virginia and the Commonwealth as a leader in energy workforce and energy technology research and development. The Authority may also consult with research institutions, businesses, nonprofit organizations, and stakeholders as the Authority deems appropriate. The Authority shall have only those powers enumerated in this article.

2019, cc. 555, 556, § 67-1601; 2021, Sp. Sess. I, c. 387.

§ 45.2-1719. (Effective until July 1, 2029) Membership; terms; vacancies; expenses.

A. The Authority shall have a total membership of 11 nonlegislative citizen members appointed as follows: four 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.

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.).

2019, cc. 555, 556, § 67-1602; 2021, Sp. Sess. I, c. 387.

§ 45.2-1720. (Effective until July 1, 2029) Powers and duties of the Authority.
In addition to the 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, including executing contracts and all other instruments and agreements that the Authority deems necessary with the nonprofit collaborative;

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 its political subdivisions and with lenders and enter into loans with contracting parties for the purpose of conducting research and development, energy project development, and planning, regulating, and providing for the financing or leasing or assisting in the financing or leasing of any project;

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

11. Leverage the strength in energy workforce and energy technology research and development of the Commonwealth's public and private institutions of higher education;

12. Support energy development projects generally, including pump storage hydropower, energy storage, hydrogen production and uses, carbon capture and storage, geothermal energy, and advanced wind and solar energy;

13. Promote energy development projects on closed power plant sites, brownfield sites, former coal mine sites, reclaimed coal mine sites, abandoned mine lands, and lands adjacent thereto;

14. Promote energy workforce development and energy supply chain development;

15. Assist energy technology research and development by, among other actions, promoting the development of a Southwest Virginia Energy Park;

16. Identify and work with the Commonwealth's industries and nonprofit partners and, through mutually agreed collaborations, the Commonwealth's research and development partners, in advancing efforts related to energy development in Southwest Virginia; and

17. Promote the capture and beneficial use of coal mine methane from active, inactive, and abandoned coal mines as a low-carbon intensity feedstock for manufacturing and energy generation projects located in Southwest Virginia.

2019, cc. 555, 556, § 67-1603; 2021, Sp. Sess. I, c. 387; 2023, cc. 720, 721.

§ 45.2-1721. (Effective until July 1, 2029) Annual report.
On or before October 15 of each year, beginning in 2020, 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.

2019, cc. 555, 556, § 67-1604; 2021, Sp. Sess. I, c. 387.

§ 45.2-1722. (Effective until July 1, 2029) 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 energy 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.).

2019, cc. 555, 556, § 67-1605; 2021, Sp. Sess. I, c. 387.

§ 45.2-1723. (Effective until July 1, 2029) 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 article, 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.

2019, cc. 555, 556, § 67-1606; 2021, Sp. Sess. I, c. 387.

§ 45.2-1724. (Effective until July 1, 2029) Sunset.
The provisions of this article shall expire on July 1, 2029.

2019, cc. 555, 556, § 67-1607; 2021, Sp. Sess. I, c. 387.

Appendix B — Bylaws

Updated 3/14/23

ARTICLE I. APPLICABILITY.

Section 1. General.

The provisions of these Bylaws are applicable to all proceedings of the Southwest Virginia Energy Research and Development Authority (the Authority) to the extent that the same are not inconsistent with the Code of Virginia or Executive Orders applicable to these proceedings. Whenever the provisions of these Bylaws are in conflict with the provisions of the Code of Virginia or an applicable Executive Order, the latter shall control.

Section 2. Authority and Limitations.

The Authority is constituted under Section 45.2-1717 et seq. of the Code of Virginia as a body corporate and a political subdivision of the Commonwealth of Virginia. The Authority is specifically charged with the duties and responsibilities set forth in Title 45.2, Chapter 17, of the Code of Virginia, primarily for the purposes of promoting opportunities for energy development in Southwest Virginia, to create jobs and economic activity in Southwest Virginia consistent with the Virginia Energy Plan prepared pursuant to Chapter 17 (§ 45.2-1710 et seq.), and to position Southwest Virginia and the Commonwealth as a leader in energy workforce and energy technology research and development.

ARTICLE II. MEMBERS AND STAFF.

Section 1. Membership.

The Authority shall be composed of 11 nonlegislative citizen members appointed as follows: Four members shall be appointed by the Governor, four members shall be appointed by the Speaker of the House of Delegates, and three members shall be appointed by the Senate Committee on Rules. All members of the Authority shall reside in the Commonwealth.

Section 2. Terms.

Except as otherwise provided herein, 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.

Section 3. Vacancies.

Vacancies arising in the Authority 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.

Section 4. Reimbursement.

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 Va. Code §§ 2.2-2813 and 2.2-2825. Such expenses shall be paid from such funds as may be appropriated to the Authority by the General Assembly.

Section 5. Staff.

The Authority may appoint an Executive Director responsible for the administration and management of the Authority as provided by the Bylaws and other duties as prescribed by the Authority. The Authority may formalize this role either by contract or memorandum of agreement.

ARTICLE III. OFFICERS

Section 1. Election of Chair and Vice Chair.

The Authority shall elect a Chair and Vice Chair at the beginning of its first meeting to serve for two-year terms.

Section 2. Vacancies.

Vacancies in the position of Chair or Vice Chair shall be filled for the remainder of the term by voice vote or roll call vote of the Authority at the next meeting following the resignation of the former incumbent.

ARTICLE IV. MEETINGS.

Section 1. Meetings.

The Authority shall meet three times per calendar year and may meet more frequently at the call of the Chair. No business requiring a vote or final decision of the Authority may be conducted in the absence of a quorum, as defined below.

Section 2. Annual Meetings.

The regular meeting held in the fourth quarter of the calendar year shall be designated as an annual meeting. Elections of officers shall be held at the Annual Meeting.

Section 3. Committee Meetings.

The Authority may establish committees from time to time as needed to carry out the work of the Authority; provided, however, that all meetings of a committee consisting of more than two members of the Authority are open to the public and be preceded by the notice requirements set forth in Va. Code Section 2.2-3707 of the Virginia Freedom of Information Act, Va. Code Sections 2.2-3700 et seq.

Section 4. Special Meetings.

The Chair or any three members of the Authority may call a special meeting for specific purpose or purposes. No business shall be transacted at such special meeting except that expressly sent out in the notice of the special meeting.

Section 5. Notice of Meetings.

In all cases, the public shall be notified of meetings of the Authority at a time and in a manner consistent with the requirements of the current Freedom of Information Act, Va. Code Section 2.2-3707.

Section 6. Quorum.

For any meeting of the Authority, a majority of the members of the Authority shall constitute a quorum. If a quorum has not been achieved, the meeting of the Authority may proceed; provided, however, that voting on matters before the Authority shall be postponed until a meeting of the Authority at which a quorum is present.

Section 7. Conduct of Meetings.

The Chair of the Authority shall conduct the meetings of the Authority and shall rule on the interpretation and application of the Va. Code and these Bylaws.

The Vice Chair of the Authority shall preside over meetings of the Authority in the absence of the Chair. In the event that neither the Chair nor the Vice Chair of the Authority shall be in attendance at a meeting where a quorum is nonetheless present, any member of the Authority may call the meeting to order, and the members present shall elect a Chair pro tempore to preside over the meeting.

All actions and decisions of the Authority shall be made upon the motion of a member, duly seconded by another member and approved by a majority of the members who are present and voting.

The Chair shall put the question submitted to the Authority for a voice vote and shall call for a vote only after determining that there are no more Authority members who wish to speak or upon approval of a motion to close debate.

Any member who may not participate in the Authority's consideration of a matter under the Virginia Conflict of Interest Act must comply with the disclosure requirements of the Act and not participate in the discussion or vote on the matter.

If it appears to the Chair, upon the voice vote being taken, that the members of the Authority are divided on any question, the Chair shall determine the vote of the members by roll call. A tie vote on any matter defeats the motion or issue upon which the vote is taken. At the conclusion of the vote on the motion, the Chair shall announce whether the motion has been adopted or defeated.

Section 8. Agenda.

The proposed agenda for any meeting shall be determined by the Chair in consultation with the Authority's staffing entity. In addition, any members of the Authority may suggest items to be included on the agenda.

The agenda for regular meetings of the Authority will normally include the following: (1) review and approval of the last minutes of the Authority; (2) a status report on the work plan and action items agreed to by the Authority; (3) a status report on projects; and (4) other information of interest to the Authority.

An opportunity shall be provided at each meeting of the Authority for public comment. Any person who desires to speak will be asked to provide his or her name and the matter to be addressed prior to each meeting at which the public is able to comment.

Section 9. Authority Requests for Staff Assistance.

Any Authority member may request assistance from the Authority's staffing entity, provided the request has been coordinated through the Chair or Vice Chair of the Authority.

Article V. ELECTRONIC MEETINGS POLICY – GENERAL PROVISIONS.

Section 1. Authority and Scope.

A. Authority. This Electronic Meetings Policy (the "Policy") consisting of Articles V through VII of these Bylaws is adopted pursuant to the authorization of Va. Code § 2.2-3708.3 and is to be strictly construed in conformance with the Virginia Freedom of Information Act (VFOIA), Va. Code §§ 2.2-3700—3715. This Policy supersedes any prior policy of the Authority on remote participation in Authority meetings.

B. Distinction from States of Emergency. This Policy shall not govern an electronic meeting conducted to address a state of emergency. Any meeting conducted by electronic communication means under such circumstances shall be governed by the provisions of Va. Code § 2.2-3708.2.

Section 2. Definitions.

As used in Articles V through VII comprising this Electronic Meetings Policy, unless the context requires a different meaning:

"All-virtual public meeting" means a public meeting conducted by the Authority using electronic communication means during which all members of the public body who participate do so remotely rather than being assembled in one physical location, and to which public access is provided through electronic communication means, as defined by Va. Code § 2.2-3701.

The terms "Authority," "Chair," and "Vice Chair" have the meanings attributed to them in Section 3 of this Article whenever this Policy is used for remote participation in a committee meeting or an all-virtual meeting of a committee.

"Committee" includes any group of members of the Authority, however labeled or designated, created to perform delegated functions of the Authority or to advise the Authority, regardless of where or how the committee meets, whether or not votes are cast in any meeting of the committee, or how many Authority members are part of the committee. The term "committee" includes subcommittees.

"Meeting" means a meeting as defined by Va. Code § 2.2-3701.

"Notify" or "notifies," for purposes of this policy, means written notice, such as email or letter. Notice does not include text messages or communications via social media.

"Remote participation" means participation by an individual member of the Authority by electronic communication means in a public meeting where a quorum of the Authority is physically assembled, as defined by Va. Code § 2.2-3701.

Section 3. Committees.

A. Committee Meetings to Be Public. Committees of the Authority (however labeled or designated) are public bodies under the Virginia Freedom of Information Act; and therefore, committee meetings (like meetings of the Authority itself) must be publicly noticed, publicly accessible, and memorialized by the taking of minutes, as required by § 2.2-3707 of the Code of Virginia.

B. Remote Participation in Committee Meetings. Pursuant to § 2.2-3708.3(D), Article VI (Remote Participation of Individual Members) and Article VII (All-Virtual Meetings) of these Bylaws both apply to committees, as well as to the Authority itself. When a committee meets virtually, or when any member of a committee participates remotely, the term "Authority" (as used in Article VI or Article VII shall be deemed to refer to the committee, and the terms "Chair" and "Vice Chair" shall refer to the Chair and Vice Chair of the committee.

ARTICLE VI. REMOTE PARTICIPATION OF INDIVIDUAL MEMBERS.

Section 1. Physical Quorum Required.

Regardless of the reasons why a member is participating in a meeting from a remote location by electronic communication means, no member shall participate remotely under this Article unless a quorum of the Authority have been physically assembled at the primary or central meeting location.

Section 2. Process to Request Remote Participation.

A. On or before the day of the meeting, and at any point before the meeting begins, the requesting member must notify the Chair (or the Vice Chair if the requesting member is the Chair) that the member is unable to physically attend a meeting due to:

1. a temporary or permanent disability or other medical condition that prevents the member's physical attendance;
2. a family member's medical condition that requires the member to provide care for such family member, thereby preventing the member's physical attendance;
3. the member's principal residence location being more than 60 miles from the meeting location; or
4. a personal matter, the nature of which is identified with specificity by the member.

B. The requesting member shall also notify the Authority's staff liaison of their request, but their failure to do so shall not affect their ability to remotely participate.

C. If the requesting member is unable to physically attend the meeting due to a personal matter, the requesting member must state with specificity the nature of the personal matter. Remote participation due to a personal matter is limited each calendar year to two meetings or 25 percent of the meetings held per calendar year rounded up to the next whole number, whichever is greater. There is no limit to the number of times that a member may participate remotely for the other authorized purposes listed in (1) through (3) of Section 2.

D. The requesting member is not obligated to provide independent verification regarding the reason for their nonattendance, including the temporary or permanent disability or other medical condition or the family member's medical condition that prevents their physical attendance at the meeting.

E. The Chair (or the Vice Chair if the requesting member is the Chair) shall promptly notify the requesting member whether the member's request is in conformance with this policy, and therefore approved or disapproved.

Section 3. Process to confirm approval or disapproval of participation from a remote location.

When a quorum of the Authority has assembled for the meeting, the Authority shall vote to determine whether the Chair's decision to approve or disapprove the requesting member's request to participate from a remote location was in conformance with this policy.

For the purpose of assuring compliance with this Article, the Authority may adopt a resolution approving the remote attendance of the requesting member. A template form of such resolution is included as Annex A to the Bylaws. Likewise, if the Chair disapproves the remote attendance of the requesting member (or if the Authority fails to ratify the Chair's decision), then the Chair should certify such decision using the form on Annex B. The Executive Director to the Authority is directed to bring copies of Annex A and B to all meetings of the Authority, so that these forms may be filled out when necessary.

Section 4. Recording in Minutes.

A. If the member is allowed to participate remotely due to a temporary or permanent disability or other medical condition, a family member's medical condition that requires the member to provide care to the family member, or because the member's principal residence is located more than 60 miles from the meeting location, the Authority shall record in its minutes (1) the Authority's approval of the member's remote participation; and (2) a general description of the remote location from which the member participated.

B. If the member is allowed to participate remotely due to a personal matter, such matter shall be cited in the minutes with specificity, as well as how many times the member has attended remotely due to a personal matter for that calendar year, and a general description of the remote location from which the member participated.

C. If a member's request to participate remotely is disapproved, the disapproval, including the grounds upon which the requested participation violates this policy or the Virginia Freedom of Information Act, shall be recorded in the minutes with specificity.

Section 5. Closed Session.

If the Authority goes into closed session, the member participating remotely shall ensure that no third party is able to hear or otherwise observe the closed meeting.

Section 6. Strict and Uniform Application of this Policy

A. This Policy shall be applied strictly and uniformly, without exception, to the entire membership, and without regard to the identity of the member requesting remote participation or the matters that will be considered or voted on at the meeting.

B. Staff shall maintain the member's written request to participate remotely and the written response for a period of one year, or other such time required by records retention laws, regulations, and policies.

ARTICLE VII. ALL-VIRTUAL MEETINGS.

Section 1. When an all-virtual public meeting may be authorized.

An all-virtual public meeting may be held only when:

a. The Authority has not had more than two all-virtual public meetings, or more than 25 percent of its meetings rounded up to the next whole number, whichever is greater, during the calendar year; and
b. The Authority's last meeting was not an all-virtual public meeting.

Section 2. Process to Authorize an All-Virtual Public Meeting.

The Authority may schedule its all-virtual public meetings at the same time and using the same procedures used by the Authority to set its meetings calendar for the calendar year. Alternatively, if the Authority wishes to have an all-virtual public meeting on a date not scheduled in advance on its meetings calendar, and an all-virtual public meeting is authorized under Section 3 above, the Authority Chair may schedule an all-virtual public meeting provided that any such meeting comports with VFOIA notice requirements.

Section 3. All-Virtual Public Meeting Requirements

The following applies to any all-virtual public meeting of the Authority that is scheduled in conformance with this Policy:

a. The meeting notice indicates that the public meeting will be all-virtual and the Authority will not change the method by which the Authority chooses to meet without providing a new meeting notice that comports with VFOIA;
b. Public access is provided by electronic communication means that allows the public to hear all participating members of the Authority;
c. Audio-visual technology, if available, is used to allow the public to see the members of the Authority;
d. A phone number, email address, or other live contact information is provided to the public to alert the Authority if electronic transmission of the meeting fails for the public, and if such transmission fails, the Authority takes a recess until public access is restored;

e. A copy of the proposed agenda and all agenda packets (unless exempt) are made available to the public electronically at the same time such materials are provided to the Authority;
f. The public is afforded the opportunity to comment through electronic means, including written comments, at meetings where public comment is customarily received; and
g. There are no more than two members of the Authority together in one physical location.

Section 4. Recording in Minutes.

Minutes shall be taken, as required by VFOIA, and must include the fact that the meeting was held by electronic communication means and the type of electronic communication means used.

Additionally, pursuant to Virginia Code § 2.2-3707(H), minutes shall also include:
a. the identity of the members of the public body who participated in the meeting through electronic communication means;
b. the identity of the members of the public body who were physically assembled at one physical location; and
c. the identity of the members of the public body who were not present at the location identified in clause (b) but who monitored such meeting through electronic communication means.

Section 5. Closed Session.

If the Authority goes into closed session, transmission of the meeting to the public will be suspended until the public body resumes to certify the closed meeting in open session.

Section 6. Strict and Uniform Application of this Policy

This Policy shall be applied strictly and uniformly, without exception, to the entire membership, and without regard to the matters that will be considered or voted on at the meeting.

ARTICLE VIII. BYLAWS.

Section 1. Effective Date.

These Bylaws shall take effect immediately upon adoption by the Authority.

Section 2. Amendments.

The Bylaws of the Authority may be amended at any regular meeting of the Authority at which a quorum is present by a majority vote.

Appendix C — In the News

The Authority and its work appeared in the following news stories
(listed chronologically with full articles below)

New Energy Innovation Project Coming To Wise County
By David McGee, *Bristol Herald Courier, October 4, 2022*

Former Mine Sites In Southwest Virginia To Be Labs For Energy Technology Testbed
By Susan Cameron, *Cardinal News, October 4, 2022*

Energy Technology Testbed Will Be Developed In SW Virginia
By Pat Thomas, *WDBJ7,* October 4, 2022

Governor Glenn Youngkin Announces Energy Technology Testbed Will Be Developed In Southwest Virginia
Press Release, *Office of the Governor,* October 4, 2022

Gov. Youngkin Aims To Funnel Millions Into Southwest Virginia For Nuclear Energy Plan
By Murry Lee, Clarice Sheele, *WJHL, October 14, 2022*

Gov. Youngkin Reconfirms Goal Of Investing In Nuclear Energy
By Ashley Hoak, *WCYB,* October 14, 2022

Governor Glenn Youngkin Announces $10 Million Virginia Power Innovation Fund for All of the Above Energy And Nuclear Advancement
Press Release, *Office of the Governor,* October 14, 2022

Youngkin To Propose Funding For Small Modular Nuclear Reactors
By Charlie Paullin, *Virginia Mercury*, *October 15, 2022*

Expert: Virginia Is Well Positioned To Be A Leader In Nuclear Energy
By David McGee, *Bristol Herald-Courier,* October 23, 2022

Virginia Tech's Mock Mine Gives Students Experience Working With Minerals
By Adiah Gholston, *Cardinal News,* November 25, 2022

Gov. Youngkin Continues Push To Bring First SMR In The Nation To Southwest Virginia
By Ashley Hoak, *WCYB, November 28, 2022*

Why Youngkin And Nuclear Proponents Say Now Is The Time To Bring A Small Modular Nuclear Reactor To Southwest Virginia
By Susan Cameron, *Cardinal News*, November 29, 2022

SWVA Could Serve As Hydrogen Production Hub
By David McGee, *Bristol Herald Courier,* December 13, 2022

Dominion Energy Plans To Deploy Small Modular Nuclear Reactors Statewide By 2032
By Marcus Schmidt, *Cardinal News,* December 15, 2022

Energy Innovation Lab Eyes New Types Of Economic Development For Previously Mined Lands
By Charlie Paullin, *Virginia Mercury,* December 22, 2022

Advances In Nuclear Technology Could Hold Significance For Central And Southwest Virginia
By Joe Dashiell, *WDBJ7, December 28, 2022*

Southwest Virginia Could Get Small Modular Nuclear Reactor
By Beth Jojack, *Virginia Business,* December 29, 2022

Youngkin's Nuclear Initiative Would Make Virginia An Energy Innovator
By Jerry Bischof, *Cardinal News,* January 4, 2023

[Opinion] Data Centers Welcome In Southwest Virginia
By Will Payne, Cardinal News, February 13, 2023

Filling The Steel Gap: Australian Coal Producer Expands In Buchanan County
By Beth Jojack, *Virginia Business,* February 27, 2023

The Oasis Is Still Here: LENOWISCO, Member Localities Still Recruiting For Data Center Prospects
By Mike Still, *Times-News,* March 5, 2023

Youngkin: Bills Target Energy Future Of Region, State
By David McGee, *Bristol Herald Courier,* March 23, 2023

Youngkin Doubles Down On Quest To Put Nation's First Commercial Small Modular Nuclear Reactor In Southwestern Virginia
By Susan Cameron, *Cardinal News,* March 23, 2023

Gov. Youngkin Signs Measures Focused On All-American, All-of-the-Above Energy Plan Goals
By Ashley Hoak, *WCYB,* March 23, 2023

Sen. Warner Tells Southwest Leaders They Should Unite Around A Single Proposal For A Regional Technology Hub
By Dwayne Yancey, *Cardinal News,* April 14, 2023

On Cloud Nine: Virginia Is World's Data Center Capital, Reaping Billions
By Emily Freeling, Virginia Business, April 27, 2023

Westward Ho! SWVA Inland Port Plain Gains Momentum
By Beth Jojack, *Virginia Business*, April 27, 2023

Some Of Southwest Virginia's Tech Hub Ideas Don't Meet Requirements
By Dwayne Yancey, *Cardinal News,* April 28, 2023

Dominion Official Touts Potential Of SMRs
By David McGee, *Bristol Herald Courier*, May 10, 2023

Commerce Department Opens Bids For Regional Tech Hubs. Are We Ready?
By Dwayne Yancey, *Cardinal News*, May 12, 2023

Study: SW VA Prime Site For Small Nuclear Reactors
By Jeff Keeling, *WJHL*, May 22, 2023

Southwest Virginia Is A 'Competitive Hosting Ground' For Small Modular Nuclear Reactors, Study Finds
By Susan Cameron, *Cardinal News,* May 22, 2023

Southwest Virginia Ideal For Small Nuclear Reactors, Study Says
By Robyn Sidersky, *Virginia Business,* May 22, 2023

SMR Site Feasibility Study Yields Good News For Southwest Virginia
By Staff, *Tri-City Business Journal,* May 24, 2023

Regional Partnerships Powering Economic Resilience in Coal Country
By National Association Of Development Organizations, June 7, 2023

Coal Community Leaders From 10 States Visit Southwest Virginia To Learn From Energy Projects
By Susan Cameron, *Cardinal News,* June 10, 2023

BRECC Visits Southwest Virginia Counties
By Eric Pages, *National Association of Counties,* July 3, 2023

Lynchburg-Based Team Prepares Nuclear-Focused Tech Hub Proposal
By Matt Busse, *Cardinal News,* July 25, 2023

Quest For Rare Earth Elements And Critical Minerals In Central Appalachia Gets New Boost
By Dwayne Yancey, *Cardinal News,* August 7, 2023

Youngkin Recommends Approval Of Arc Grants Totaling $7.3 Million, Including Money For Barter Theatre Renovations
By Susan Cameron, *Cardinal News,* August 11, 2023

'A Pivotal Role: Youngkin Recommends Projects For Arc Funding
By David McGee, *Bristol Herald-Courier*, August 14, 2023

Two Tech Hub Bids Seek To Boost Virginia's Nuclear Industry
By Matt Busse, *Cardinal News*, August 21, 2023

Gathering Power: Energy-Related Startups Benefit From Renewables Push
By Elizabeth Lake and Richard Foster, *Virginia Business*, August 30, 2023

New Energy Innovation Project Coming To Wise County

By David McGee
Bristol Herald Courier
October 4, 2022

Southwest Virginia will host an energy technology project designed to promote innovation, Virginia Gov. Glenn Youngkin announced on Tuesday.

The Energy DELTA Lab's initial site will be located in Wise County near the town of Pound, according to a written statement. Current plans call for the potential development of additional testbed sites around the region.

The Energy DELTA [Discovery, Education, Learning & Technology Accelerator] Lab initiative is a collaborative effort by the Virginia Department of Energy, the Southwest Virginia Energy Research and Development Authority and its business development partner, InvestSWVA.

"Since announcing the Virginia 2022 Energy Plan, I am pleased to announce this Energy DELTA Lab project which delivers on our vision to define Virginia as a force in energy innovation," Youngkin said in the statement. "No other project like it exists in the United States. With this energy testbed, we see a commitment to transformation, encouragement for startup enterprises and support for the development of promising careers in exciting new fields."

The initial will be located on property owned by the Cumberland Forest Limited Partnership and managed by The Nature Conservancy. A second site will be identified in the near future.

The Energy DELTA Lab initiative was developed through a previously announced $975,000 grant from the federal Abandoned Mine Land Economic Revitalization program, which works to support economic and community development goals in regions impacted by the downturn of coal production, according to the statement.

The funding, subject to final approval by the U.S. Office of Surface Mining Reclamation and Enforcement, will be used to acquire access to previously-mined land and for infrastructure improvements necessary to deploy clean energy projects.

"This project is one more embodiment of our vision for reimagining Southwest Virginia's economic competitiveness," said Del. Terry Kilgore, R-Gate City and Majority Leader of the Virginia House of Delegates and InvestSWVA co-chair. "Energy is a business we know. On behalf of the region's entire

legislative delegation, I can say we believe that this research effort linked with economic development will create new opportunities for the entire region."

The Energy DELTA Lab is an economic development strategy to drive growth and diversify Southwest Virginia's economy, according to the statement. The work that goes into these projects and the resulting energy assets can bring new opportunities to a region that has been significantly impacted by the downturn of fossil fuel production.

"The Energy DELTA Lab is a concept becoming reality in the most logical place for it to happen," said Mike Quillen, chair of both the Energy DELTA Lab and the Southwest Virginia Energy Research and Development Authority. "Our work in being part of the global energy story is entering another chapter, encouraging a fresh look at energy production and what it means — and requires — to enjoy a successful career in the industry."

The project was endorsed by the presidents of both Appalachian Power and Dominion Energy as both firms are partners in the project and U.S. Senators Mark Warner and Tim Kaine and 9th District Rep. Morgan Griffith.

"The Energy DELTA Lab concept aligns with local, regional, state, federal and international goals," the two U.S. Senators wrote in a joint statement. "Many of us have worked hard over many years to spark new economic opportunities in Southwest Virginia. This initiative is a promising step forward because it leverages Southwest Virginia's diverse and unique terrain to position the region as a leader in clean energy research and development."

Griffith, R-9th, who played an instrumental role in Virginia's participation in the federal AMLER program, called the project "groundbreaking."

"The Energy DELTA Lab is a groundbreaking initiative that draws on Southwest Virginia's resources and technical knowledge," Griffith said. "It will keep our region at the forefront of exciting developments in the energy sector that will one day power the world."

Former Mine Sites In Southwest Virginia To Be Labs For Energy Technology Testbed

By Susan Cameron
Cardinal News
October 4, 2022

A first-of-its-kind “energy technology testbed” that will turn some of the 100,000 acres of former coal mining sites in Southwest Virginia into laboratories to promote energy innovation will be developed, Gov. Glenn Youngkin announced Tuesday.

“The Energy DELTA Lab delivers on our vision to define Virginia as a force in energy innovation,” Youngkin said in a news release. “No other project like it exists in the United States. With this energy testbed, we see a commitment to transformation, encouragement for startup enterprises and support for the development of promising careers in exciting new fields.”

The announcement came the day after the governor rolled out a new energy plan that called for innovation in energy technologies.The plan mentioned the Energy DELTA project.

The initial site will be near the town of Pound in Wise County on property owned by the Cumberland Forest Limited Partnership and managed by the Nature Conservancy.

The site will be used as a lab for advanced solar and energy storage, according to Will Payne, managing partner of Coalfield Strategies, the firm leading business development for the Energy DELTA Lab and InvestSWVA.

The first site will likely not be up and running for at least two years, he said.

A second site, also in Wise County, will be announced later this month, he added.

“We currently have a number of projects in the due diligence phase related to both sites worth over a billion dollars,” Payne said Tuesday.

Plans call for possible additional sites around the region.

DELTA, which stands for discovery, education, learning and technology accelerator, has been four years in the making. It is a collaborative effort by the Virginia Department of Energy, the Southwest Virginia Energy Research and Development Authority, and its business development partner InvestSWVA.

The DELTA initiative was developed through a $975,000 grant from the federal Abandoned Mine Land Economic Revitalization Program, which supports economic efforts by regions impacted by the downtown in the coal industry.

Payne said DELTA will serve as a hub between landowners, prospects, utilities and broadband companies. He emphasized that the purpose of the effort is not just research and development, but job creation and economic development.

He added that the land and its assets above and below the ground will be the lab – there will not be a traditional lab or classroom involved.

Mike Quillen, who founded and was CEO of Alpha Natural Resources, is chair of the Energy DELTA Lab and the Southwest Virginia Energy Research and Development Authority.

“The Energy DELTA Lab is a concept becoming reality in the most logical place for it to happen,” Quillen said. “Our work in being part of the global energy story is entering another chapter, encouraging a fresh look at energy production and what it means – and requires – to enjoy a successful career in the industry.

Payne called Quillen the “godfather of Southwest Virginia,” and said he lends credibility to the project.

The initial concept for the project was designed by Michael Karmis, former director of the Virginia Center for Coal and Energy Research, based on what Germany has done with its mine sites, Payne said.

Further study of the concept was led by InvestSWVA and the LENOWISCO Planning District Commission through grants from the GO Virginia One Council and the U.S. Economic Development Administration.

The region is ideal for research and development of energy technologies because in addition to the former coal mining sites, it has more than 9,000 gas wells, a number of mine cavities and water supplies, diverse terrain, mineral and underground resources, the release states.

“The Energy DELTA Lab’s focus on leveraging legacy energy assets to develop new and innovate energy technologies can only happen in Southwest Virginia,” Payne said. “This is just the beginning of the work we must do together to deliver on our vision to build a new, diversified economy in the region. And, with the Energy DELTA Lab as our vehicle, we can define Virginia as a hub of energy innovation in America.”

The energy technologies mentioned include hydrogen, mine-based geothermal, innovative solar generation and advanced energy storage, including pumped-storage hydro. Also mentioned were

small modular nuclear reactors, one of which the governor said Monday he hopes to deploy in Southwest Virginia over the next 10 years.

Energy Technology Testbed Will Be Developed In SW Virginia

By Pat Thomas
WDBJ7
October 4, 2022

Governor Glenn Youngkin has announced the launch of what he calls a first-of-its-kind energy technology testbed in Southwest Virginia that will "provide land as laboratories and scientific assistance to promote energy innovation."

The Energy DELTA Lab's initial site will be in Wise County near the Town of Pound, and current plans call for the potential development of additional testbed sites around the region, according to the governor.

The Energy DELTA (Discovery, Education, Learning & Technology Accelerator) Lab initiative is a collaborative effort by the Virginia Department of Energy, the Southwest Virginia Energy Research and Development Authority and its business development partner InvestSWVA.

"Since announcing the Virginia 2022 Energy Plan, I am pleased to announce this Energy DELTA Lab project which delivers on our vision to define Virginia as a force in energy innovation," said Governor Youngkin. "No other project like it exists in the United States. With this energy testbed, we see a commitment to transformation, encouragement for startup enterprises and support for the development of promising careers in exciting new fields."

"As the United States moves toward new forms of energy production and use, Virginia's southwest region has the opportunity to redefine itself as a leader in energy innovation," said Caren Merrick, Virginia Secretary of Commerce and Trade. "The Energy DELTA Lab testbed project highlights our determination to push Virginia's energy leadership position to new heights."

"This project is one more embodiment of our vision for reimagining Southwest Virginia's economic competitiveness," said Delegate Terry Kilgore (R-1), Majority Leader of the Virginia House of Delegates and InvestSWVA co-chair. "Energy is a business we know. On behalf of the region's entire legislative delegation, I can say we believe that this research effort linked with economic development will create new opportunities for the entire region."

"The Energy DELTA Lab is a concept becoming reality in the most logical place for it to happen," said Mike Quillen, Chair of the Energy DELTA Lab and the Southwest Virginia Energy Research and Development Authority. "Our work in being part of the global energy story is entering another chapter, encouraging a fresh look at energy production and what it means – and requires – to enjoy a successful career in the industry."

"The Energy DELTA Lab is an investment Southwest Virginia's future," said Chris Beam, Appalachian Power president and chief operating officer. "It is an opportunity for Appalachian Power to actively engage in next generation research and development in energy on the ground and in a place that makes sense for our customers."

"Dominion Energy Virginia is pleased to join a strong group of partners in the Energy DELTA Lab endeavor," said Ed Baine, President of Dominion Energy Virginia. "This is a significant development for Southwest Virginia, and it will help to ensure the ongoing contribution of the Commonwealth of Virginia to the global conversation about energy."

"The Energy DELTA Lab concept aligns with local, regional, state, federal and international goals," said U.S. Senators Mark Warner and Tim Kaine (D-VA). "Many of us have worked hard over many years to spark new economic opportunities in Southwest Virginia. This initiative is a promising step forward because it leverages Southwest Virginia's diverse and unique terrain to position the region as a leader in clean energy research and development."

"The Energy DELTA Lab is a groundbreaking initiative that draws on Southwest Virginia's resources and technical knowledge," said U.S. Representative Morgan Griffith (R-9). "It will keep our region at the forefront of exciting developments in the energy sector that will one day power the world."

"The Energy DELTA Lab's focus on leveraging legacy energy assets to develop new and innovative energy technologies can only happen in Southwest Virginia," said Will Payne, Managing Partner of Coalfield Strategies, the firm leading business development for the Energy DELTA Lab and InvestSWVA. "This is just the beginning of the work we must do together to deliver on our vision to build a new, diversified economy in the region. And, with the Energy DELTA Lab as our vehicle, we can define Virginia as a hub of energy innovation in America."

Read on for more about the project from Governor Youngkin's Office:

As a country, we are undergoing a transformative period that is challenging how we create, transport, store and use energy. New energy technologies are emerging every day requiring vetting to ensure

that they not only meet commercialization potential but also provide the low-cost, clean energy demanded by the marketplace. The Energy DELTA Lab is the culmination of four years of work to establish a vehicle in Southwest Virginia that can lead this research geared toward commercialization and deployment. The initial testbed site in Wise County will be located on property owned by the Cumberland Forest Limited Partnership and managed by The Nature Conservancy. Lead private industry partners include Appalachian Power and Dominion Energy Virginia.

The Energy DELTA Lab initiative was developed through a previously announced $975,000 grant from the federal Abandoned Mine Land Economic Revitalization (AMLER) Program, which works to support economic and community development goals in regions impacted by the downturn of coal production. The funding, subject to final approval by the U.S. Office of Surface Mining Reclamation and Enforcement, will be used to acquire access to previously-mined land and for infrastructure improvements necessary to deploy clean energy projects.

The initiative builds upon Southwest Virginia's unique legacy. With more than 100,000 acres of previously mined property, more than 9,000 gas wells, numerous mine cavities, and boundless water supplies, the region's diverse terrain, mineral and underground resources provide the ideal setting for the commercialization and deployment of new, burgeoning energy technologies, including hydrogen, mine-based geothermal, small modular nuclear reactors, innovative solar generation and advanced energy storage, including pumped-storage hydro.

At its core, the Energy DELTA Lab is an economic development strategy to drive growth and diversify Southwest Virginia's economy. The work that goes into these projects and the resulting energy assets will bring new opportunities to a region that has been significantly impacted by the downturn of fossil fuel production. This activity will ultimately create new career pathways for the region's workforce.

The innovative project has strong support from Southwest Virginia's delegation in Congress.

The Energy DELTA Lab's initial concept was designed by Dr. Michael Karmis, former director of the Virginia Center for Coal and Energy Research. Further study of the concept under the codename Project Innovation, including operations and site planning, was led by InvestSWVA and the LENOWISCO Planning District Commission via grants provided by the GO Virginia Region One Council and the U.S. Economic Development Administration.

Governor Glenn Youngkin Announces Energy Technology Testbed Will Be Developed In Southwest Virginia

Press Release
Office of the Governor
October 4, 2022

RICHMOND, VA — Governor Glenn Youngkin today announced the launch of a first-of-its-kind energy technology testbed in Southwest Virginia that will provide land as laboratories and scientific assistance to promote energy innovation. The Energy DELTA Lab's initial site will be located in Wise County near the Town of Pound, and current plans call for the potential development of additional testbed sites around the region. The Energy DELTA (Discovery, Education, Learning & Technology Accelerator) Lab initiative is a collaborative effort by the Virginia Department of Energy, the Southwest Virginia Energy Research and Development Authority, and its business development partner InvestSWVA.

"Since announcing the Virginia 2022 Energy Plan, I am pleased to announce this Energy DELTA Lab project which delivers on our vision to define Virginia as a force in energy innovation," said Governor Glenn Youngkin. "No other project like it exists in the United States. With this energy testbed, we see a commitment to transformation, encouragement for startup enterprises and support for the development of promising careers in exciting new fields."

"As the United States moves toward new forms of energy production and use, Virginia's southwest region has the opportunity to redefine itself as a leader in energy innovation," said Caren Merrick, Virginia Secretary of Commerce and Trade. "The Energy DELTA Lab testbed project highlights our determination to push Virginia's energy leadership position to new heights."

"This project is one more embodiment of our vision for reimagining Southwest Virginia's economic competitiveness," said Delegate Terry Kilgore (1st District), Majority Leader of the Virginia House of Delegates and InvestSWVA co-chair. "Energy is a business we know. On behalf of the region's entire legislative delegation, I can say we believe that this research effort linked with economic development will create new opportunities for the entire region."

"The Energy DELTA Lab is a concept becoming reality in the most logical place for it to happen," said Mike Quillen, Chair of both the Energy DELTA Lab and the Southwest Virginia Energy Research and Development Authority. "Our work in being part of the global energy story is entering another chapter, encouraging a fresh look at energy production and what it means – and requires – to enjoy a successful career in the industry."

"The Energy DELTA Lab is an investment Southwest Virginia's future," said Chris Beam, Appalachian Power president and chief operating officer. "It is an opportunity for Appalachian Power to actively

engage in next generation research and development in energy on the ground and in a place that makes sense for our customers."

"Dominion Energy Virginia is pleased to join a strong group of partners in the Energy DELTA Lab endeavor," said Ed Baine, President of Dominion Energy Virginia. "This is a significant development for Southwest Virginia, and it will help to ensure the ongoing contribution of the Commonwealth of Virginia to the global conversation about energy."

"The Energy DELTA Lab concept aligns with local, regional, state, federal and international goals," said U.S. Senators Mark Warner and Tim Kaine. "Many of us have worked hard over many years to spark new economic opportunities in Southwest Virginia. This initiative is a promising step forward because it leverages Southwest Virginia's diverse and unique terrain to position the region as a leader in clean energy research and development."

"The Energy DELTA Lab is a groundbreaking initiative that draws on Southwest Virginia's resources and technical knowledge," said U.S. Representative Morgan Griffith (9th District), who played an instrumental role in Virginia's participation in the federal AMLER program. "It will keep our region at the forefront of exciting developments in the energy sector that will one day power the world."

"The Energy DELTA Lab's focus on leveraging legacy energy assets to develop new and innovative energy technologies can only happen in Southwest Virginia," said Will Payne, Managing Partner of Coalfield Strategies, the firm leading business development for the Energy DELTA Lab and InvestSWVA. "This is just the beginning of the work we must do together to deliver on our vision to build a new, diversified economy in the region. And, with the Energy DELTA Lab as our vehicle, we can define Virginia as a hub of energy innovation in America."

As a country, we are undergoing a transformative period that is challenging how we create, transport, store and use energy. New energy technologies are emerging every day requiring vetting to ensure that they not only meet commercialization potential but also provide the low-cost, clean energy demanded by the marketplace. The Energy DELTA Lab is the culmination of four years of work to establish a vehicle in Southwest Virginia that can lead this research geared toward commercialization and deployment. The initial testbed site in Wise County will be located on property owned by the Cumberland Forest Limited Partnership and managed by The Nature Conservancy. Lead private industry partners include Appalachian Power and Dominion Energy Virginia.

The Energy DELTA Lab initiative was developed through a previously announced $975,000 grant from the federal Abandoned Mine Land Economic Revitalization (AMLER) Program, which works to support economic and community development goals in regions impacted by the downturn of coal

production. The funding, subject to final approval by the U.S. Office of Surface Mining Reclamation and Enforcement, will be used to acquire access to previously-mined land and for infrastructure improvements necessary to deploy clean energy projects.

The initiative builds upon Southwest Virginia's unique legacy. With more than 100,000 acres of previously mined property, more than 9,000 gas wells, numerous mine cavities, and boundless water supplies, the region's diverse terrain, mineral and underground resources provide the ideal setting for the commercialization and deployment of new, burgeoning energy technologies, including hydrogen, mine-based geothermal, small modular nuclear reactors, innovative solar generation and advanced energy storage, including pumped-storage hydro.

At its core, the Energy DELTA Lab is an economic development strategy to drive growth and diversify Southwest Virginia's economy. The work that goes into these projects and the resulting energy assets will bring new opportunities to a region that has been significantly impacted by the downturn of fossil fuel production. This activity will ultimately create new career pathways for the region's workforce.

The innovative project has strong support from Southwest Virginia's delegation in Congress.

The Energy DELTA Lab's initial concept was designed by Dr. Michael Karmis, former director of the Virginia Center for Coal and Energy Research. Further study of the concept under the codename Project Innovation, including operations and site planning, was led by InvestSWVA and the LENOWISCO Planning District Commission via grants provided by the GO Virginia Region One Council and the U.S. Economic Development Administration.

For more information, visit energyDELTAlab.org.

Gov. Youngkin Aims To Funnel Millions Into Southwest Virginia For Nuclear Energy Plan

By Murry Lee, Clarice Sheele
WJHL
October 14, 2022

Virginia Governor Glenn Youngkin made several stops through Southwest Virginia on Friday, beginning the day in Norton.

While there, Youngkin announced his intent to propose $10 million in the state's upcoming budget to create the "Virginia Power Innovation Fund." The fund would allow for the development of energy technology, including nuclear power.

Youngkin, Griffith hope to secure $10.6 million for Southwest Virginia projects
"Today, I am pleased to propose a $10 million investment in the upcoming budget to turn Virginia into a leader in energy innovation," said Youngkin. "With technologies like carbon capture and utilization, and resources like critical minerals, hydrogen, and nuclear, we will make Virginia the epicenter for reliable and affordable energy innovation."

Half of that proposed amount would go toward growing Virginia's nuclear industry. The Virginia Nuclear Innovation Hub was first made known to the public earlier in October, when Youngkin released the state's energy plan. The plan made mention of plans to install Small Nuclear Reactor (SMR) technology in Southwest Virginia.

Youngkin spoke to media at a former mine site in Norton and said the location is just one example of a possible location for an SMR or other form of energy facility. Southwest Virginia is dotted with abandoned mines and former coalfield locations, which Youngkin said will make prime spots for potential energy sites.

"I have proudly represented the people of Southwest Virginia in the General Assembly for nearly 30 years, and I know the promise that exists in our towns, hills, and valleys. Governor Youngkin's Energy Plan recognizes this promise and envisions a future for Southwest that capitalizes on our talents and history to place Southwest Virginia on the cutting edge of the energy future," said House Majority Leader Delegate Terry Kilgore in a news release.

State leaders say the Nuclear Innovation Hub will both create new business and education opportunities as local colleges will have the means to train students in the use and study of SMRs and other forms of energy.

An exact location of the hub has not been announced yet, but Southwest Virginia appears to be the prime place to house it, in the eyes of state officials.

"Here's a fact: Southwest Virginia has been and always will be about energy," Kilgore told News Channel Friday morning.

One aspect of Youngkin's energy plan involves a partnership with the Virginia Nuclear Energy Consortium Authority.

Youngkin said Friday that the entirety of the plan is predicted to take 10 years to complete, but he believes it could be in effect sooner.

“I’ve heard from some friends that that 10-year timeline’s one that we can beat, and I’m looking forward to setting milestones that beat it,” Youngkin said.

Gov. Youngkin Reconfirms Goal Of Investing In Nuclear Energy

By Ashley Hoak
WCYB
October 14, 2022

Gov. Glenn Youngkin is reconfirming his goal of investing more into nuclear energy. Southwest Virginia could become home to the nation's first small modular reactor, or SMR, due to the aggressive plan from Youngkin.

Just 11 days after announcing the goal in the 2022 Virginia Energy Plan, Youngkin made a new announcement Friday morning in Wise County -- saying now is the time to ramp up nuclear energy.

"As we press forward on not a march, a sprint -- a sprint to win -- it's time for Virginia to lead, and we can lead in the development of power technologies for our power future."
SMRs harness thermal energy to generate electrical power -- with officials saying the units are small, more economical, and safe in nature.

Will Payne, of Invest SWVA, says this is a prime area, due to the region's coal-mining roots.

"Virginia and Southwest Virginia has always been about energy, it always will be about energy, the governor said that."

Youngkin says this is part of a $10 million investment in the Virginia Power Innovation Fund, to help establish the Virginia Nuclear Innovation Hub that will bring together stakeholders, universities and more to complete the project.

"This collaborative effort in order to accomplish the goal, is going to require lots of participants and lots of opportunity."
Virginia Delegate Israel O'Quinn adds this will also result in an economic boost.

"You're looking at the company that ultimately owns the reactor, you're looking at the utility that taps into that, there's going to be tons of construction jobs, lots of long-term jobs as well."
As for the next steps, Youngkin says benchmarks are already set when it comes to the SMR development.

"I've heard from some friends that the 10-year timeline is one we can beat. I'm looking forward to setting milestones that meet it, because I think targets should be set, and then beat."
But this isn't the only highlight for Southwest Virginia -- Youngkin and Congressman Morgan Griffith also announced 8 new projects to be recommended for funding from Virginia's Abandoned Mine Land Economic Revitalization Grant Program.

Projects include industrial sites, infrastructure, workforce development and immediate job creation.

Governor Glenn Youngkin Announces $10 Million Virginia Power Innovation Fund for All of the Above Energy And Nuclear Advancement

Press Release
Office of the Governor
October 14, 2022

Governor Glenn Youngkin announced on Friday he will propose $10 million in the upcoming budget to create the Virginia Power Innovation Fund for research and development of innovative energy technologies, including nuclear, hydrogen, carbon capture and utilization, and battery storage. The Governor also announced $5 million of this funding will advance the goal laid out in the recently released “all-of-the-above” Virginia Energy Plan, to grow Virginia’s nuclear energy industry by establishing a Virginia Nuclear Innovation Hub (Hub). These funds will also include grants for higher education institutions to study Small Modular Nuclear Reactor (SMR) technology, funding for nuclear workforce development, and additional money for SMR site exploration, including in Southwest Virginia.

“Today I am pleased to propose a $10 million investment in the upcoming budget to turn Virginia into a leader in energy innovation,” said Governor Glenn Youngkin. “With technologies like carbon capture and utilization, and resources like critical minerals, hydrogen, and nuclear, we will make Virginia the epicenter for reliable and affordable energy innovation.”

"Governor Youngkin's Energy Plan and his vision as articulated today represent a bright future for the people of Southwest Virginia and the whole Commonwealth. Bringing these new, innovative energy industries into Virginia will go far in attracting new jobs, investment, and growth to the Commonwealth while also ensuring Virginians have access to reliable energy now and in the future," said Attorney General Jason Miyares.

The Commonwealth's funds are part of an intergovernmental effort with Virginia's federal representatives to utilize state and federal resources to turn Virginia into a leading energy innovator. Governor Youngkin recognized Representative Morgan Griffith's partnership in these efforts to bring resources included in the Abandoned Mine Land Economic Revitalization program and other federal programs into Virginia, especially Southwest.

"I am thrilled to work with Governor Youngkin to bring federal funds back to the hardworking folks of Southwest Virginia. With these new efforts, Southwest can seize its potential and become the leading energy region in the United States," said Representative Morgan Griffith, a senior member of the House Energy and Commerce Committee.

The Governor made the announcement at a reclaimed mine site in Norton, Virginia in the heart of Southwest Virginia's coalfield region. The mine selected is an example of a possible location for an SMR or other energy facility. Southwest Virginia includes hundreds of similar locations ready for development as potential energy and economic development sites.

"I have proudly represented the people of Southwest Virginia in the General Assembly for nearly 30 years, and I know the promise that exists in our towns, hills, and valleys. Governor Youngkin's Energy Plan recognizes this promise and envisions a future for Southwest that capitalizes on our talents and history to place Southwest Virginia on the cutting edge of the energy future," said House Majority Leader Delegate Terry Kilgore.

Southwest Virginia is home to abundant energy resources in addition to traditional energy sources like coal and natural gas. Abandoned underground mines contain billions of gallons of water and naturally seep methane which can be captured and used to create hydrogen to heat homes, fuel industrial processes, and generate electricity.

Carbon capture and utilization technologies offer an opportunity to reduce carbon emissions by capturing CO2, storing it in abandoned mines and coal seams, and using it in industrial and chemical processes like concrete and paint manufacturing.

Southwest also has substantial deposits of minerals critical to America's domestic industry, including manganese and metallurgical coal necessary to successfully onshore industrial supply chains and expand America's battery manufacturing to support clean energy like wind and solar. This wealth of energy resources is what inspired the establishment of the Energy DELTA Lab in Pound, Virginia, which is a first-of-its-kind energy technology testbed that will provide laboratories and scientific assistance to promote energy innovation.

"Southwest Virginia boasts dozens of reclaimed coal mine sites that have robust power and water assets along with topography and geology – all key land attributes that are essential to our pursuit of becoming a hub of energy innovation in America," said House Deputy Majority Leader Israel O'Quinn. "Our competitive advantage is our land position, and we look forward to leveraging the expertise of the Energy DELTA Lab to support the work of the Virginia Innovative Nuclear Hub."

"I'm proud to work with a governor who understands the importance of an all-of-the-above energy strategy and Southwest Virginia's role in meeting Virginia's need for reliable and affordable energy," said Senator Todd Pillion. "Governor Youngkin's goal to deploy a small modular reactor in Southwest Virginia demonstrates our shared commitment to innovation and building upon the region's legacy — and future — as the energy capital of the commonwealth. Our newly launched Energy DELTA Lab will serve as a strategic partner in supporting the work of the Virginia Innovative Nuclear Hub while helping define our region's competitive advantages."

"Today's announcement validates the concept of our energy testbed announced by Governor Youngkin that Southwest Virginia is a strategic location in which to deploy innovative energy assets," said Mike Quillen, Chair of the Energy DELTA Lab and the Southwest Virginia Energy Research and Development Authority. "Our team looks forward to supporting the Virginia Innovative Nuclear Hub by coordinating on-the-ground efforts throughout Southwest Virginia."

The mission of the Virginia nuclear innovation hub will be to support innovation in advanced nuclear technologies by identifying technological needs, supporting research by Virginia's colleges and businesses, identifying nuclear workforce gaps, bolstering workforce training and education, and identifying supply chain gaps and filling those gaps with Virginia-made products.

The Virginia Nuclear Energy Consortium Authority (VNECA) will facilitate the Hub and its activities to maximize their effectiveness. Established by legislation in 2013, VNECA was established to seize on the Commonwealth's nuclear advantage and make Virginia a leader in the nuclear energy industry. Under VNECA, the Virginia Nuclear Energy Consortium (VNEC) was created to represent and bring together stakeholders across the nuclear energy industry including state government, colleges and

universities, nuclear energy companies, suppliers, and other organizations that support the advancement of nuclear energy industry. VNEC's website can be found here.

"This is a proud day for the Virginia Nuclear Energy Consortium. The nuclear industry here in Virginia has always led the way in energy innovation. The Virginia nuclear innovation hub will unite academic research and the public and private sectors to leverage the Commonwealth's tremendous nuclear capability in pursuit of next generation advanced nuclear technologies," said VNEC Co-Chair and Founder Alireza Haghighat.

Youngkin To Propose Funding For Small Modular Nuclear Reactors

By Charlie Paullin
Virginia Mercury
October 15, 2022

Within two weeks of rolling out a Virginia energy plan that included a push for new nuclear development, Republican Gov. Glenn Youngkin announced plans for a multimillion dollar investment in the energy source.

Youngkin said Friday he will include in his budget proposal at the end of the year $10 million for a new Virginia Power Innovation Fund, with half of it earmarked for the development of a small modular nuclear reactor (SMR) in Southwest Virginia within 10 years.

The General Assembly must approve any budget proposals from the governor.

"This is our moment to lead," Youngkin said. "So let's get to work."

The funds would go toward making Southwest Virginia a nuclear innovation hub, Youngkin said, including investments in research and development efforts. The money specifically for SMR development would be available for researching the technology, building a workforce for it and exploring sites where it could be developed.

SMR technology is designed to be a "plug and play" type of nuclear reactor that can be manufactured at a facility and then installed at a particular site, according to an August report prepared for the National Association of Regulatory Utility Commissioners.

If developed, the Southwest Virginia SMR would be the first of its kind in the country, Youngkin said.

The push for nuclear energy expansion was introduced in Youngkin's "all of the above" four-year energy plan that he announced in Lynchburg on Oct. 3, which also called for revisions to the landmark 2020 Virginia Clean Economy Act. The VCEA sets dates for fossil fuel retirements and requires increasing amounts of utilities' energy to be sourced from renewables as the state aims to reach a zero-carbon electric grid by 2050. It also includes mandates for the development of wind, solar and energy storage by Dominion and Appalachian Power Company.

Alongside those calls, Youngkin requested the State Corporation Commission, which regulates Virginia's electric utilities, to conduct a cost analysis that compares renewable energy technologies with available alternative technologies.

Youngkin spoke of the potential for alternative technologies such as nuclear, carbon capture, hydrogen and battery storage on Friday. For example, captured carbon could be used in concrete and paint manufacturing, manganese and metallurgical coal could be harvested for battery storage development, and water and met from underground mines could be used for hydrogen energy production, Youngkin said.

But several groups said the announcement of the innovation fund came with no input from local stakeholders.

"Project development processes that leave out community voices is the wrong way to build support for a proposal," said Rebecca Shelton, director of policy and organizing for the Appalachian Citizens' Law Center. "Time and again the way residents learn about a new project is through a press announcement."

House Speaker Todd Gilbert, R-Shenandoah, also unveiled Thursday a partnership with West Virginia Republican House Speaker Roger Hanshaw to promote nuclear development.

The only full-scale new nuclear plant to be built in the U.S. in decades is the Vogtle plant in Georgia, which has been under construction for a decade, with costs ballooning to around $30 billion.

Expert: Virginia Is Well Positioned To Be A Leader In Nuclear Energy

By David McGee
Bristol Herald-Courier
October 23, 2022

The idea of establishing a nuclear reactor in Southwest Virginia to generate baseload electricity may sound like science fiction, but the pieces are in place that could make it a reality.

Gov. Glenn Youngkin announced “our moonshot” effort earlier this month, specifically calling for adapting the technology of small modular reactors, or SMRs — the kind used to power submarines and aircraft carriers — to generate electricity at a site in Southwest Virginia.

While small reactor technology has been around for decades, applying it in that way would be revolutionary.

Recent federal legislation, signed into law by President Joe Biden, calls for an infusion of federal dollars to invest in clean energy including SMRs in rural areas and areas around coal mine sites.

The U.S. Department of Energy has issued multi-year cost-share funding since 2018 to support “innovative, domestic nuclear industry-driven concepts that have high potential to improve the overall economic outlook for nuclear power in the United States. This funding opportunity will enable the development of existing, new, and next-generation reactor designs, including SMR technologies.”

To date the department has awarded more than 40 projects including one in Lynchburg. BWX Technologies received $5.4 million for the “establishment of an integrated advanced manufacturing and data science-driven paradigm for advanced reactor systems,” according to the department.

Asked last week about the impact of federal funding, Gov. Youngkin said it would be “substantial” for the future of this project.

Alireza Haghighat, director of the nuclear engineering program at Virginia Tech, said Virginia is well positioned because of its existing nuclear assets.

“Virginia truly is the leader in nuclear technology. The interest is very strong. We have companies. We have reactors and provide all kinds of services,” Haghighat said. “There is no other state that has all aspects of this. We can utilize this existing capability toward the next level and I think we are in a position. It’s just a matter of wanting to do it, and I think we have the leadership. I don’t have any doubt we can do it.”

Locally, the Southwest Virginia Energy Research and Development Authority has been working to assess potential sites, infrastructure needs and other aspects. Chair Mike Quillen recently told the

Herald Courier this region has three outstanding assets: ample numbers of workers with energy sector experience, available land and a robust power infrastructure once used for coal mining.

“This is competitive. There are other parts of Virginia that want this,” Quillen said.

Just over a week ago, Youngkin traveled to Wise County to announce his budget would include a $10 million Virginia Power Innovation Fund, with $5 million dedicated to advancing research to move the nuclear effort forward.

The funds would be used to expand Virginia’s nuclear energy industry by establishing a Virginia Nuclear Innovation Hub. These will include grants for higher education to study small modular nuclear reactor technology, funding for nuclear workforce development and additional money for SMR site exploration, including in Southwest Virginia, according to a statement from the governor.

The hub’s mission will be to support innovation in advanced nuclear technologies by identifying technological needs, supporting research by Virginia’s colleges and businesses, identifying nuclear workforce gaps, bolstering workforce training and education and identifying supply chain gaps and filling those gaps with Virginia-made products, according to the statement.

It will be overseen by the Virginia Nuclear Energy Consortium Authority, which was established in 2013 to promote nuclear industries, research, technology and education across the state. The authority brings together institutions including Virginia Tech, the University of Virginia, Virginia Commonwealth University, Liberty University and businesses Dominion Energy, General Electric-Hitachi Newport News Shipbuilding and Lightbridge, a Reston-based nuclear fuel technology company.

“Virginia has one of the strongest nuclear industries in the nation, particularly for commercial, defense and manufacturing. The companies in Virginia are global companies,” Haghighat, founder and vice chair of the consortium’s board of directors, said.

During remarks at Youngkin’s Oct. 14 press conference, Haghighat said expanding nuclear is essential to meet the governor’s goals of affordable, reliable power.

“We hope that this entity can bring together the industries, educational institutions and focus on design, deployment, licensing, operation and advance of nuclear technology. We are in a unique position that we can make Virginia the leader in advanced and next generation nuclear technology in the United States and beyond,” Haghighat said. “This is an ambitious goal of building the first in

United States in 10 years ... As a nuclear engineer, I'm waiting for that; to build the reactor because we really — as a society — need this technology to prosper."

Challenges

This venture contains multiple challenges topped by the fact it hasn't been built yet.

"We haven't built one," Haghighat said in response to a question. "The first thing is licensing — regulation and licensing. There is, for example, one other company already has gone to certification of their design. That is a major step. If the decision is made to go with this company then they are in a position that the [Utah] utility can prepare licensing documentation which includes this design and submit to NRC [Nuclear Regulatory Commission], the commission for licensing the reactor. That process takes time and that is a big part of the 10 years — it might be four to five years. After that comes construction."

Utah is several years into efforts to adapt the technology and the U.S. Nuclear Regulatory Commission has approved an SMR design by NuScale Power, a publicly traded Portland, Oregon-based firm that designs and markets small modular reactors.

In 2020, Utah Associated Municipal Power Systems was awarded $1.35 billion by the U.S. Department of Energy to develop it.

"Significant technology development and licensing risks remain in bringing advanced SMR designs to market and government support is required to achieve domestic deployment of SMRs by the late 2020s or early 2030s,"according to the U.S. Department of Energy's website.

An SMR could be constructed at one location, transported by truck and set up at another site. And an SMR site doesn't require hundreds of acres like existing nuclear power plants.

"The design I'm referring to is very similar to existing reactors," Haghighat said. "We do not need new equipment. We understand the physics of the process. It's a new system. We feel, based on what we know about the technology, it actually should [develop] relatively fast."

Another challenge the effort faces — in Virginia or anywhere else — is a workforce unfamiliar with the nuances of nuclear power.

"In the United States, we haven't built reactors, which means we don't have people. That is actually one of the major issues," Haghighat said. "If you look at when we built 104 reactors in a period of 20

years — 1970 to 1990 —we built 100 reactors [in the U.S.]. Why? Because we had the people. We had the companies, we had trained workers. So now we have to go back. We've got to retrain these people.

"Nuclear has a lot of unique requirements. That's why the governor says we need new investment. If government doesn't invest it cannot happen. Industry would not do that, it is the role of the government," Haghighat said. "With Gov. Youngkin's initiative, if we work together — all of the stakeholders — we can achieve it. I really believe we can do it. It's really a matter of having the resources."

Working with West Virginia

Virginia Speaker of the House Del. Todd Gilbert, R-Shenandoah, announced an Oct. 13 agreement with his counterpart in West Virginia to try and attract federal funds to Appalachia.

"No two states are better positioned to work together on incentivizing and locating next generation nuclear power facilities than West Virginia and Virginia," Gilbert said in a written statement. "The unique nature of our rural areas once fully dependent on the coal industry are now ready for a high-tech, clean energy transformation."

West Virginia recently repealed its ban on development of nuclear energy sources.

"Virginia has been a beneficiary of nuclear power for many years," Gilbert said in the statement. "Nothing works harder, longer, safer, or more reliably than a nuclear power plant. Small nuclear reactors are the next wave of energy technology, and Virginia needs to be an East Coast hub for its development and deployment.

"It is important that rural and economically challenged areas, and the commonwealth of Virginia as a whole, benefit from the innovation, jobs and investment small modular nuclear technology will bring to the electric grid," Gilbert said.

Nuclear assets

Dominion Energy operates four traditional reactors in the commonwealth. The North Anna nuclear generating station is about an hour north of Richmond near the town of Mineral. The Dominion Surry power station operates on the James River near Williamsburg.

The North Anna location includes two units which combine to produce nearly 2,000 megawatts or 17% of the state's electricity — enough to power 450,000 homes, according to the company's website. The entire facility occupies 1,000 acres in Louisa County.

The Surry power station also has two units which generate more than 1,600 megawatts and supply power to 420,000 homes, or about 14% of the Virginia's total power demand. The facility covers 840 acres, according to the company.

In addition to providing about 95% of Virginia's carbon-free power, these four units collectively employ more than 2,000 workers at an average salary of above $80,000 per year, according to information from the Virginia Secretary of Commerce and Trade.

Virginia is also home to seven companies described as "global leaders" in the nuclear energy sector. They include three in Lynchburg: BWX Technologies, Framatome Inc., and NovaTech; Bechtel and Lightbridge, both based in Reston; Dominion Energy in Richmond and Newport News Shipbuilding in Newport News.

BWX Technologies has been selected by NuScale Power to conduct the design for engineering work for NuScale's small modular reactor nuclear power module.

Additionally, the U.S. Navy's fleet of submarines and surface ships represent a large collection of nuclear reactors. They are based at the Norfolk Naval shipyard and Newport News Shipbuilding.

Another federal facility, NASA's Langley Research Center, is actively involved in research and development of nuclear technology.

The colleges of engineering at Virginia Tech, University of Virginia, Virginia Commonwealth University and Old Dominion University offer nuclear engineering degree programs and nuclear research opportunities.

And that is nothing new.

Virginia Tech previously operated a small research reactor on its campus from 1962 to 1981 as part of a program to teach nuclear physics. In the aftermath of the Three Mile Island incident, interest in nuclear waned and the reactor was decommissioned and later removed, according to the university.

Nuclear research also occurred at the University of Virginia which had two small reactors. One was shut down in 1988 and the other in 1998, according to information on the university's website.

Virginia Tech's Mock Mine Gives Students Experience Working With Minerals

By Adiah Gholston
Cardinal News
November 25, 2022

When Virginia Tech's Holden Hall was being redesigned, Mining and Minerals Engineering department head Erik Westman believed his mining students deserved better conditions than what the 1940 building could offer — conditions that would enhance his students' ability to research, test and host robotics competitions.

In September, Holden Hall 2.0 was unveiled. The $73.5 million renovated Holden Hall was 102,000 square feet of A/V-equipped classrooms, high-tech computational facilities and labs — one of these labs being the Center for Autonomous Mining, also known as the Mock Mine.

The 1,200-square-foot, two-story center features three rectangular pits, similar to sand pits on a playground, which encompass the bottom level. On the outside of Holden Hall, a glass garage door leads directly to the center so minerals can be dumped seamlessly into the pit, with the goal to simulate a real mine. The largest of the three pits lies directly in front of the garage door, while two smaller pits are laid to the right of the larger pit. The pits are around four feet deep.

The second level holds a glassed-in area, where students can observe tests being conducted within the mine space. A wall also hosts a projector screen to display information for lessons.

The Mock Mine is being used minimally right now, but the plan is for students to conduct experiments and projects dealing with operating and testing autonomous mining equipment and drones to learn the fundamentals of robotics and sensors within the mining space.

"As the industry becomes more autonomous, with more robots involved, it's important for our engineers to learn how all of that works and even to be able to write some Python [code] and understand the data collected," said Westman.

Student groups like Virginia Tech's Astrobotics team, a team of students aiming to design an autonomous Mars mining bot that is able to extract water-containing gravel, will use the space to prepare for their competitions, such as the NASA Lunabotics Competition.

“For Astrobotics, we used to have to go to the volleyball pit that was all around campus and dig around the sand in there, ” said Justin Hartman, Virginia Tech Mining and Minerals engineering Senior and Astrobotics member. “So, just having a centralized indoor pit will allow us to have tests in all kinds of weather, and we can actually get a standard procedure going.”

Brennan George (from left), Hunter Stanley, and Chris Keesee work to construct a remote-operated vehicle for use in the new Virginia Tech Center for Autonomous Mining in the Department of Mining and Minerals Engineering. Photo by Tonia Moxley for Virginia Tech.
Brennan George (from left), Hunter Stanley, and Chris Keesee work to construct a remote-operated vehicle for use in the new Virginia Tech Center for Autonomous Mining in the Department of Mining and Minerals Engineering. Photo by Tonia Moxley for Virginia Tech.
Throughout the year, students will work on different kinds of small robots, eventually working up to assembling a small haul truck at the end of the year.

Currently, “we have the tiny stuff, truck wise, ” said Virginia Tech Mineral and Mining engineering fifth-year senior Adam Guzauckas. “I’m interested in trying to build something a little bigger, actually trying to move gravel, ’cause the stuff we have now can only move little glass beads at a table.”

Prior to the Mock Mine, learning and testing in a real field would be difficult due to students potentially taking up time, space and money of an active operating mine. The mine would allow for an accessible testing environment.

“It’s needed so we can test things out in a controlled landscape situation,” Westman said. “If you go to an actual operating mine, they’re running a business, they have employers to pay, so you can’t always get the conditions you need. Here, we can quiet everything down and set the conditions that we want without having to worry about everything that occurs at an operating mine.”

Justin Hartman, and Mason Tincher work on constructing a remote operated vehicle for their data analytics and automated systems class in the Department of Mining and Minerals Engineering. The class met in the first-of-its-kind Center for Autonomous Mining in the newly-renovated Holden Hall. Photo by Tonia Moxley for Virginia Tech.

Justin Hartman and Mason Tincher work on constructing a remote-operated vehicle for their data analytics and automated systems class in the Department of Mining and Minerals Engineering. The class met in the first-of-its-kind Center for Autonomous Mining in the newly renovated Holden Hall. Photo by Tonia Moxley for Virginia Tech.

Westman notes how the state of the mining industry has changed dramatically over the past 30 years, shifting from manual, labor-intensive jobs to digital procedures. These digital, autonomic systems are used in machinery, such as haul trucks, where they can be programmed to go from one point to another. This innovation provides the efficient skills needed within the industry.

Carter Machinery Company, a Southwest Virginia-based Caterpillar equipment dealer, serves mines throughout Southwest Virginia by selling them autonomous and semi-autonomous construction equipment. Throughout the past five years, Carter and Virginia Tech have had a strong research relationship and plan to continue this relationship through collaborative research in the Mock Mine space. One of these research projects is bringing the autonomous haul fleet to the Appalachian region.

Haul trucks have successfully been used in places such as Wyoming or Western Australia, places whose geographical features run more on the flat side. The mountainous terrain of Southwest Virginia makes it more difficult to navigate these trucks; operators have to program the trucks to maneuver through narrow, windy roads and also have to ensure strong communication between the operator and truck. However, it's an obstacle Carter and Virginia Tech aim to overcome in the next five years or so.

"From a Carter machinery perspective, we've got deep, deep ties with Virginia Tech," said Carter Machinery Performance Services Manager Jason Threewitts. "Some of our very, most important customers that we have in our territory are centered around mining and quarries and aggregates. So it just makes sense to be deeper, embedded, and aligned with the mining engineering department. The mining engineers that are coming out of that program, they're either going to go work for one of our customers, or they're going to come work for us. So all the more reason why we should be walking side by side developing this kind of technology and making it a reality."

Additionally, good equipment managers have been harder to hire over the past couple of years, especially because of the scaling down of apprenticeships and skilled labor education in schools, commercial construction and manufacturing not completely recovering from the 2008 global recession, and misunderstandings and stereotypes about the trade.

"It's harder to hire good equipment managers," Westman said. "So with these experts retiring, there is this opportunity to bring more advanced technologies."

Carter Machinery Company has a technician apprenticeship program that is committed to training future mechanics, electricians, equipment operators, and Westman and Threewitts see the potential of using Mock Mine for this program.

"[Students in the program] go to community colleges, get training and then they work in those trades, that works really well," Westman said. "We can definitely see this space being used to help train them."

Alongside Carter Machinery, entities such as Luxstone, Vulcan Materials and more will potentially collaborate with Virginia Tech to conduct research in the Mock Mine space. These collaborations will allow researchers to study a myriad of topics, including looking at how to optimize production and how to lower greenhouse gas emissions.

Virginia Tech is also exploring opportunities between Mock Mine and one of their research projects, Evolve Central Appalachia (Evolve CAPP). This project aims to discover critical minerals for the green economy within central Appalachia and to see if mining such minerals are economically feasible. One research possibility between the entities is using Mock Mine as a lab-scale test facility for sensors to find minerals in rocks more effectively.

"We're limited in critical minerals and heavy metals, " said Mike Quillen, chair of the Southwest Virginia Energy Research and Development Authority and chair of the newly announced Energy DELTA (Discovery, Education, Learning & Technology Accelerator) Lab. "If you look at the growth projected in the world over the next 20 years and how the world is trying to move to renewables, the amount of these critical minerals that everybody's going to need, [the United States doesn't] have them. We're nowhere near in line to produce the magnitude that we're going to need over the next decade to 20 years."

The Southwest Virginia region has repeatedly been nominated as a potential energy industry breeding ground. The region's rich coal mining past means infrastructure, land and labor are already present, such as the region's large electricity capacity, that can potentially be transitioned for the use of the energy infrastructure.

The organizations Quillen chairs, the Energy DELTA Lab and Southwest Virginia Energy Research and Development Authority, aim to promote the development, commercialization and economic activity of energy infrastructure by conducting research such as testing the feasibility of using mine water for data cooling.

"Our primary goal is to one, use the history and the technology and the talent that's been here from being in the energy business for centuries to find ways to use that talent, to create jobs in the new energy fields, and hopefully have them here," Quillen said.

Quillen points out how the research conducted in Virginia Tech's Mock Mine will help this effort through their automation research, helping to improve the overall safety of mining these minerals, and research to make automation mining more efficient.

"We've got great relationships with the universities and colleges that do theoretical research, medical research, " Quillen said. "[Energy DELTA Lab's] goal is to go to that next level to actually take a lot of what knowledge is out there now and expand it to in-the-field practices and basically prove out the economic viability. It's not uncommon for researchers to have an idea but when you look at it, it doesn't pass the business model test because it's not economics. We look at ourselves as being the second step in the process, this evolution to a new energy world."

Gov. Youngkin Continues Push To Bring First SMR In The Nation To Southwest Virginia

By Ashley Hoak
WCYB
November 28, 2023

Initial steps are now in place to secure funding for a project that would bring nuclear power to Southwest Virginia.

"Competition for this technology really matters today, and other regions are vying for this just as much as Southwest Virginia is," said Will Payne, of Invest SWVA.

Gov. Glenn Youngkin continues to reconfirm his goal of investing more into nuclear energy, with an aggressive plan to make Southwest Virginia the home of the nation's first small modular reactor, or SMR, within 10 years.

"The capabilities are extraordinary," said Youngkin. "It's a really, really exciting time for Southwest Virginia and the world of energy."

Officials say SMR's harness thermal energy to generate electrical power, adding the units are small, more economical, and safe in nature.

Now, Youngkin says the next steps are underway to make the project a reality.

"We are just working on all the appropriate amendments and submissions that have to go in to the budget amendments in December."

It's all part of Youngkin's comprehensive energy program, making up a portion of his first budget slated to be presented to the General Assembly during next year's session.

"What is exciting about Southwest Virginia and what gives us a competitive advantage is the legacy of energy assets that we have on the ground," added Payne.

Payne told News 5, the region is a prime area, because of its coal-mining roots. Adding it's important for multiple entities to work together.

"It's really important that we have our local leaders, our legislative delegation, Gov. Youngkin -- his administration has put their full weight behind this."

"I'm excited," added Youngkin. "I think that Southwest Virginia can be such an epicenter for not just Virginia's development, but the future of power of the nation and world."

Why Youngkin And Nuclear Proponents Say Now Is The Time To Bring A Small Modular Nuclear Reactor To Southwest Virginia

By Susan Cameron
Cardinal News
November 29, 2022

Virginia has a long and successful history with nuclear energy and nuclear assets that make it ideally suited to launch a small modular nuclear reactor to generate baseload electricity, nuclear experts and state officials have said in recent weeks.

Their remarks followed the announcement Oct. 3 by Gov. Glenn Youngkin that he wants to deploy the nation’s first commercial SMR on a site somewhere in Southwest Virginia within 10 years.

Since then, environmental groups and some residents have begun to ask questions about the plan and say they’ve been left out of the process.

Alireza Haghighat, a professor and director of the Nuclear Engineering Department at Virginia Tech and a big supporter of the governor’s plan, said Virginia has one of the strongest nuclear industries in the nation.

The state has two nuclear power plants, each with two nuclear reactors, North Anna in Louisa County and Surry in Surry County. Both are operated by Dominion Energy. (Disclosure: Dominion is one of our donors but donors have no say in news decisions; see our policy).

Virginia's nuclear reactors have operated safely for more than 40 years, according to the Virginia Nuclear Energy Consortium (VNEC).

The state also has a license to build another traditional reactor, according to the U.S. Nuclear Regulatory Commission (NRC).

About 30 percent of Virginia's power is nuclear, though the state is far from the top of the list of states with the highest amount of electricity generated by nuclear power. According to the NRC, Virginia is 12th on that list, with Illinois being the top state and Tennessee coming in eighth.

Virginia also has some of the largest nuclear-related businesses. There is a nuclear hub in Lynchburg that includes BWX Technologies, one of the largest nuclear manufacturing and engineering companies across the globe; Framatome, also considered a leading nuclear company in the world; and NovaTech, which provides design, engineering and manufacturing for nuclear organizations.

Other nuclear-related businesses include Lightbridge Corp. and Bechtel Corp., in Reston, and Virginia Dominion Energy in Richmond.

Virginia's nuclear industry. Courtesy of the Virginia Nuclear Energy Consortium Authority.
Virginia's nuclear industry. Courtesy of the Virginia Nuclear Energy Consortium Authority.
Haghighat, who is also a founding chair of the VNEC, said the state's nuclear industry "serves both commercial, defense and manufacturing in the state and beyond. Actually, the (nuclear) companies in Virginia not only serve their state, they are global companies."

Virginia is also home to Newport News Shipbuilding, and there are six universities plus community colleges that have nuclear-related training.

Rex Geveden, president and CEO of BWXT, said there is a "big nuclear footprint across the state of Virginia" that's stronger than most states.

He pointed to Newport News Shipbuilding, which he said integrates the nuclear reactors that BWXT makes into submarines and aircraft carriers.

In addition to the major nuclear businesses, he noted that the state has a couple of large uranium deposits that could be sourced for fuel if the state reverses its moratorium on uranium mining.

April Wade, executive director of the VNEC, said the "projected growth of the nuclear industry, combined with Virginia's existing industry leadership — in terms of both expertise and infrastructure — positions the commonwealth as a prime location for the first domestic SMR. Southwest Virginia's existing energy infrastructure, developing energy workforce, and long legacy and knowledge in the energy industry makes it an ideal location for such a project."

Why locate the SMR in Southwest Virginia?
Ask the governor or other state officials why they want to build an SMR in Southwest Virginia and you get two reasons – the abundant availability of abandoned coal mine land and the need for jobs and economic development for an area significantly impacted by the downturn in the coal industry.

Geveden said that Southwest Virginia residents would benefit because nuclear plant-related jobs provide high-paying, secure jobs that last for decades. According to the VNEC, nuclear energy facilities pay 36 percent more than average salaries in the local area.

As for a site, there are 100,000 acres of former coal mine land in Southwest Virginia. This land is perfect for an SMR, according to Will Clear, deputy director of the Virginia Department of Energy, because the needed infrastructure is already there.

"Coal is a very energy-intensive operation so there is a pretty robust transmission and distribution network of electric lines" left behind when a site is abandoned, he said.

Clean water is also plentiful, he added.

"Most of these underground mines fill up with water and the water is extremely clean due to the geology," Clear said.

Another factor in Southwest Virginia's favor is the cost of land, which is relatively cheap compared to other areas of the state, he added.

The Department of Energy will be involved in selection of a site because it has an "exhaustive" inventory of all the former coal mine sites so it's aware of any issues that would prevent a site from being used for an SMR, he said.

During an Oct. 26 appearance in Bristol, Youngkin said there has been an "enormous amount of work" done toward bringing an SMR to the region.

In an interview with Cardinal News, the governor was asked to elaborate on those efforts, but he offered no specifics.

"What's been happening behind the scenes is a number of organizations have already been thinking about the future of nuclear energy, particularly in Virginia, and that includes the Virginia Nuclear Association, and it includes a collaboration of efforts in order to bring up funding for site development."

He pointed to the academic emphasis on nuclear power in the state and businesses like BWXT and Framatome. He added that there are "tremendous capabilities" with Naval Station Norfolk and Newport News Shipbuilding.

Why now?

Four factors have converged to make it the right time to rely more on nuclear energy, according to Geveden with BWXT.

The first is the invasion earlier this year of Ukraine by Russia, which led the U.S. to think more about national security, a big part of which is energy security, he said.

Russia controls the natural gas pipeline into Europe and "could create economic coercion by trying to withhold that energy source," Geveden said.

"So, I think the globe is thinking a lot more about energy security right now and nuclear should be a centerpiece of an energy security policy because of its availability, because of its stability, because of the ability to run a local grid off of it and not have to import natural gas or oil or any other kind of thing to power it," he said.

The second factor is the move toward decarbonization of the power grid, which has become more of a mainstream priority, according to Geveden.

He and Haghighat agree that if the state wants a clean energy grid, nuclear power needs to be the baseload component.

The need for "dispatchable power" is the third factor, he said.

In the case of renewables like solar and wind, “the sun goes down, the wind doesn’t always blow or certainly doesn’t blow predictably, and so utility customers have to have the belief that when they flip on that light switch, the lights are going to come on,” he said.

The final factor is that the “political demonization,” and fear of nuclear energy, have lessened so public opinion seems to be changing, according to Geveden.

“It feels to me like the time is now for nuclear, and there are a number of converging forces that I think lead many people to the conclusion,” Geveden said. “By the way, all you have to do is look at the investment capital formation around the nuclear industry to see that’s true.”

Funding

To make the SMR happen, Youngkin has said he will work with U.S. Rep. Morgan Griffith, R-9th, to leverage available federal funding.

Recent federal legislation signed into law included money for clean energy projects, including SMRs.

The 2021 Infrastructure and Jobs Act had $2.5 billion earmarked for advanced nuclear through the Department of Energy’s Advanced Reactor Demonstration Program.

The 2022 Inflation Reduction Act included tax credits for production and investment for advanced reactors. The credits are based on the kilowatt base rate, but energy communities, including coal communities, receive an additional 10 percent credit, according to Griffith’s office.

Also, since 2018, the DOE has had a multi-year cost-shared funding opportunity to support innovative, domestic, nuclear industry-driven concepts that have high potential to improve the economic outlook for nuclear power in the U.S.

“This funding opportunity will enable the development of existing, new, and next-generation reactor designs, including SMR technologies,” the DOE states on its website.

Will Payne, managing partner of Coalfield Strategies, the firm leading business development of the Energy DELTA Lab and InvestSWVA, said competition for the federal funding will be intense.

“Highly competitive doesn’t begin to describe accessing the federal dollars, but Virginia has gone from 0 to 60 in a blink of an eye, so I feel confident that a combination of these funding opportunities

with traditional incentives along with state and federal funding geared toward R&D and deployment put Virginia in a competitive position," he said.

Eleven days after his SMR announcement, the governor followed up with a visit to Norton, where he said he will seek $10 million for research and development of innovative energy technologies. Half of that money would be used to establish a nuclear innovation hub and fund the research necessary to establish an SMR in Southwest Virginia.

Questions and concerns

One person who has a lot of questions about the governor's push for an SMR is Robert Kell, the new economy program manager at Appalachian Voices, an environmental agency. And he says he's not the only one.

"We were taken by surprise when the governor showed up in our backyard," he said. "We have an office in Norton, and he made this huge announcement without inviting any of the nonprofit folks, environmental justice folks, economic development folks. He showed up on a mine site with just politicians behind him telling us what he was going to do for our region and sort of told us we're just going to accept it, so we don't have an official stance on SMR technology. We just have a bunch of questions."

Kell wants to know how safe SMRs are given that they are new, what happens to the waste streams and whether former coal mine land is suitable as a site. And he wants to know why Youngkin hasn't spoken to any local citizens, economic development officials or environmental groups.

Kell said he hears regularly from local residents who say they are concerned and some who say they're going to fight it.

Likewise, Sharon Fisher, president of The Clinch Coalition, said the agency is hearing from residents who have an "overwhelming sense of concern that Southwest Virginians are not being given a meaningful seat at the table as SMR projects are being planned for our communities. Residents of the coalfields have for generations been asked to disproportionately bear the social and environmental costs of energy development. Learning about plans to locate reactors in our region through news reports and surprise visits by elected officials is a troubling sign that we are once again being excluded from complex decisions that will affect our people for generations to come."

She added that it's difficult for the organization to develop a position on the proposed SMR because it lacks the basic information necessary to weigh the costs and benefits.

To help educate local residents, Appalachian Voices has organized a panel of nuclear experts that will be held at 2 p.m. on Dec. 15.

The virtual event will be open to anyone interested and information about how to register will be announced soon. (Update: Here's the registration link).

The panel will consist of Cale Jaffe, director of the Environmental Law and Community Engagement Clinic at the University of Virginia School of Law; David Schlissel, director of resource planning analysis for the Institute for Energy Economics and Financial Analysis; and Edwin Lyman, a physicist and director of nuclear power safety with the Union of Concerned Scientists.

SWVA Could Serve As Hydrogen Production Hub

By David McGee
Bristol Herald Courier
December 13, 2023

While talk of a nuclear reactor in Southwest Virginia generated more buzz, a regional hydrogen project appears much closer to becoming reality.

On Tuesday the Southwest Virginia Energy Research and Development Authority heard updates on both, plus some additional insight on Gov. Glenn Youngkin's energy plan that will be part of the budget he submits to the General Assembly.

"The technology for hydrogen is simpler; the permitting is simpler," Chair Mike Quillen said after the two-hour meeting. "Hydrogen has kind of surprised us. The transportation industry is really looking at that. For example, the railroads are big into this because they don't know if batteries will work or not and tractor trailers aren't going to line up waiting to recharge. We think there will be demand for hydrogen."

There will also be competition.

"There will be competition between hydrogen for transportation, hydrogen for the agricultural segment and other uses," Quillen said. "That is driving all this interest … We will be making some announcements on that."

Mike Karmis, professor emeritus from Virginia Tech, outlined an effort currently underway in Buchanan County to produce a “green” hydrogen.

Ninety percent of hydrogen is currently created by using methane gas and used in industrial processes, including petroleum refineries, Karmis told the authority. However it creates significant emissions of CO2.

“We have developed a concept of producing ‘green’ hydrogen in Southwest Virginia using a waste product stream. We’re going to clean mine water to a super clean level that can be used for electrolysis then use green power from the electrolysis to produce green hydrogen,” Karmis said.

A reverse osmosis facility already exists in Buchanan County but must be modified to completely clean the water, he said. The project is expected to take 18 months to get up and running and they hope to initially produce hydrogen on a small scale, Karmis said.

From there they hope to ramp up production.

“In addition, we’re looking at three other projects. This area has been a real attractor for some of these projects — access to water, access to great transportation, you can be at most of the population centers on the east coast in a day’s drive, access to natural gas and access to viable carbon capture,” Authority Director Will Payne said. “We have it all here and the result, I believe, can be a substantial hydrogen production hub … I believe Southwest Virginia can eventually be a production hub.”

The authority also heard more about small nuclear reactors from Patrick White, project manager at Nuclear Innovation Alliance, a Washington, D.C.-based think tank and advocacy group.

White said public-private partnerships are accelerating the “demonstration and deployment” of advanced nuclear reactors — the kind Gov. Youngkin has set as a goal for Southwest Virginia to establish by 2032.

Four different reactor projects are currently underway. One is expected in 2026, another in 2027, 2028 and 2029.

“Kairos Power is looking to build and deploy their first test reactor in Oak Ridge, Tennessee, in 2026,” White said. “The idea of these three reactors is they will provide the data and information and testing necessary to show commercialization of their technology moving forward. In 2026 and 2027, we see the two flagships of the U.S. Department of Energy’s reactor demonstration program.”

One is being built in Washington state and the other at a former coal facility in Wyoming.

“These will be funded heavily by the U.S. Department of Energy through a 50-50 cost share and the idea is this will be a full-scale demonstration for these novel advanced reactor technologies and will set the stage for commercialization in the late 2020s and into the 2030s,” White said.

Quillen said this shows the widespread interest in adapting different types of technologies to generate electric power.

“The talk is about new technology and that nobody is doing this. What we heard today is there a lot of people doing this. All over the country you’ve got projects in certain stages that are moving forward. It is further along than maybe some people have projected,” Quillen said. “The issue has got to be economics. Dominion and AEP have to provide economic power, so it’s got to pass that test.”

Dominion Energy Plans To Deploy Small Modular Nuclear Reactors Statewide By 2032

By Marcus Schmidt
Cardinal News
December 15, 2022

When Gov. Glenn Youngkin rolled out his energy plan in October, stating that Virginia must be “all in” on nuclear energy and that he wants to deploy a small modular nuclear reactor (SMR) somewhere in Southwest Virginia within 10 years, Dominion Energy, the state’s largest utility company, was already one step ahead of the game.

“In our own planning process, we have already been evaluating various technologies and sites across the commonwealth, and we envision that we could be in a position to place the first SMR in service within the decade,” Todd Flowers, Dominion’s director of business development, said in an interview with Cardinal News on Tuesday.

(Disclosure: Dominion is one of our donors but donors have no say in news decisions; see our policy.)

While Dominion has not publicly disclosed any potential sites in Southwest Virginia, it considers the region as an “ideal location,” given the access to the area’s electric power transmission system and the ability to “transition the local fossil fuel workforce that has provided energy for decades” to support SMR deployment, Flowers said.

Meanwhile, Appalachian Power Company is also considering advanced nuclear technology on its path to meet its goal of net zero carbon dioxide emissions by 2045. The company has formed an internal team that is studying SMR options, the utility told Cardinal News in a statement Wednesday.

Dominion, however, is further ahead in its efforts than their competitor from Southwest Virginia. The utility currently serves the most densely populated metropolitan areas of the commonwealth, including Richmond, Hampton Roads, Charlottesville and Northern Virginia. But it also owns land in Tazewell County, where it is studying hydroelectric pump storage, and Wise County, the location of the Virginia Hybrid Energy Center, a power station in St. Paul that burns waste coal.

“We are looking in Southwest Virginia, and we certainly are looking at other facilities that either have operating fossil fuel plants or fossil fuels plants to be retired,” Flowers said, adding that Dominion also has excess land at the company’s existing nuclear facilities – North Anna Power Station in Louisa County and Surry Power Station in Surry County – that could be potential locations for SMRs. He said that an SMR could serve as a substitute for the third conventional reactor that has been licensed for North Anna but hasn’t been built.

“We are looking at multiple options across the commonwealth, and given the siting flexibility and the small footprint of SMRs, we believe there is a lot of opportunity to place these in several different locations across the state,” Flowers said, adding that more than one unit could be deployed to the same location due to a single unit’s small footprint.

The utility’s plan aligns well with that of the Youngkin administration, which is asking the General Assembly for $10 million in the upcoming budget to create the Virginia Power Innovation Fund for research and development of innovative energy technologies – including nuclear, hydrogen, carbon capture and utilization, and battery storage.

Youngkin also announced that $5 million of this funding would advance the goal laid out in the recently released “all-of-the-above” Virginia Energy Plan, to grow Virginia’s nuclear energy industry by establishing a Virginia Nuclear Innovation Hub. These funds would include grants for higher education institutions to study SMR technology, funding for nuclear workforce development, and additional money for SMR site exploration, including in Southwest Virginia.

“With technologies like carbon capture and utilization, and resources like critical minerals, hydrogen, and nuclear, we will make Virginia the epicenter for reliable and affordable energy innovation,” Youngkin said during an event at a reclaimed mine site in Norton, in the heart of Southwest Virginia’s coalfield region, which his administration considers “an example of a possible location for an SMR or

other energy facility," according to a news release. "Southwest Virginia includes hundreds of similar locations ready for development as potential energy and economic development sites," the statement said.

Flowers said this week that Dominion has reviewed Youngkin's Virginia Energy Plan, including the governor's vision of having SMRs in the commonwealth in service within a decade, and has been communicating with the administration. But the company's exploration of new SMR technologies predates Youngkin's interest in the subject, and Dominion envisions that any new power generation facility it will build and operate will be part of its own regulated utility.

"In 2022, for the first time in the company's history, we included SMRs as an available resource in our strategic planning process," Flowers said, referring to an updated version of Dominion's Integrated Resource Plan, which is usually released once a year and provides the road map of the latest technologies that may be deployed in the future.

"We are a public utility with an obligation to serve our customers and to ensure that we produce energy to meet the load requirements of our customers. If you truly want to get to a zero-carbon grit, we think that nuclear has got to be a part of the solution," Flowers said.

According to the updated Integrated Resource Plan, Dominion anticipates SMRs "could be a feasible supply-side resource as soon as the early 2030s," and the company has thus included SMRs as a "supply-side option starting in December 2032" in all alternative plans. The plan also states that Dominion assumes that one 285-megawatts SMR facility could be built per year. "For some light-water SMR designs that utilize current nuclear fuel technologies with an available supply chain, the commercial availability may be even sooner," the plan states.

SMRs are a new class of nuclear fission reactors that are smaller than conventional nuclear reactors. Unlike the latter, which on average generate about 1 gigawatt of power per plant, small modular reactors can produce up to 1,000 megawatts, but typically around 300 megawatts.

The term SMR refers to the unit's size, capacity and modular construction, not to the reactor type and the nuclear process that is applied. In essence, SMRs function much like their much bigger counterparts, but are smaller and more compact. Each unit can be built at a factory, to be shipped, commissioned and operated at a separate site.

"When you fabricate these modules in that factory setting you allow for those components to be built and constructed in a very controlled environment, and these components can be replicated almost in

an assembly line fashion, so the cost of fabrication goes way down," Flowers said, without disclosing the latter.

"We're working with the SMR vendors to kind of finalize and fine-tune those cost estimates. But we do anticipate that SMRs will be economically advantageous when compared to other zero-carbon technologies that can deliver around-the-clock energy," Flowers said.

According to the International Atomic Energy Agency, there are only four SMRs currently under construction worldwide – one in Argentina, one in China, and two in Russia. Each of Russia's reactors generates less than 75 megawatts. Canada recently started site preparation for an SMR in Ontario.

Because of their small footprint – one SMR requires about 50 acres of land – they provide for more site flexibility, allowing them to be operated at previously used locations such as retired fossil fuel plants, existing nuclear sites or other industrial areas.

"They are certainly reliable and the only source today of zero-carbon electricity where you can provide energy around the clock," Flowers said. "If you look at other zero-carbon technologies, like solar energy, you really need to overbuild those facilities, because the sun doesn't shine 24-7."

For example, in order for a solar power plant to generate 300 megawatts – the average amount created by one SMR – it would require a facility with a footprint of about 3,000 acres, Flowers said.

"But you also need to factor in that the capacity factor for solar energy is only about 25 percent, so it's only generating electricity 25 percent of the time," Flowers added. "If you really want to produce energy around the clock, you may need to build not 300 megawatts of solar, but 1.2 gigawatts of solar, so those 3,000 acres may be 12,000 acres," he said. "The footprint is just tremendous in comparison to SMRs. And the biggest advantage of SMRs is what I'd call energy density, the amount of energy that's generated on a very small footprint."

Del. Terry Kilgore, R-Scott County, the House Majority Leader, in October heard a presentation on SMRs by a panel of experts who appeared before the Commerce and Energy Committee. And earlier this month, he toured Dominion's North Anna Power Station in Louisa County. These experiences left him convinced that SMRs are clean, safe and reliable.

Del. Richard "Rip" Sullivan, D-Fairfax County, and House Majority Leader Terry Kilgore, R-Scott County, tour the North Anna nuclear power plant. Photo by Markus Schmidt.

"I think that SMRs are going to be the future," Kilgore said in a phone interview Wednesday. "The federal government is going to fund a lot of the research in this area going forward, and I think it's going to be proven safe."

Kilgore also highlighted the "many economic opportunities" that he hopes will benefit the region because of SMR technology, especially in the manufacturing area. "A lot of the materials are going to have to be manufactured, like building some of the machinery, and hopefully that will be done in Southwest Virginia," Kilgore said.

Del. Israel O'Quinn, R-Washington County, underscored that both Dominion and Appalachian Power are exploring to deploy SMRs across Southwest Virginia.

"Ultimately, I think that's a good thing. Appalachian is already here, they are the incumbent provider in most of Southwest Virginia, and certainly Dominion does have a large investment in Virginia City, so I think the fact that they are both interested is good, especially as it relates to the goals and objectives that the governor has laid out."

O'Quinn said he, too, believes that SMRs will be a safe and efficient way to generate zero-carbon electricity.

"These things have been used on naval watercraft since the 1950s, people in Hampton Roads drive by them every single day, and an SMR can be shut down much faster than a larger nuclear plant, but still has the capability of powering a lot of homes and businesses," O'Quinn said. "It's a very interesting technology, zero emission, and I think it's probably the way of the future, and this is where energy is headed in the long term."

But not every lawmaker from Southwest Virginia is convinced that SMRs will be the right fit for the region. Del. Marie March, R-Floyd County, last month expressed her concern with the new technology.

"I prefer that SWVA isn't used as the lab rat," March wrote on her Facebook page. "For too long NOVA (Northern Virginia) harvests our taxes and our land. Now they want to use us to harvest power. Right now a Nuclear power plant is being targeted in Ukraine to be bombed.

Look at the impact of a nuclear meltdown on generations of people and the ecosystem. We don't need Geiger counters in SWVA!"

And on Thursday at 2.p.m., the nonprofits Appalachian Citizens' Law Center and Appalachian Voices, which both have been critical of plans to deploy SMRs in Appalachia without seeking public input, will be hosting a virtual panel discussion about this issue.

The panel includes Cale Jaffe, the director of the Environmental Law and Community Engagement Clinic at the University of Virginia School of Law; David Schlissel, director of Resource Planning Analysis for the Institute for Energy Economics and Financial Analysis; Edwin Lyman, a physicist and Director of Nuclear Power Safety with the Union of Concerned Scientists; and Mary Cromer, Deputy Director at Appalachian Citizens' Law Center.

According to a news release, the panel "will discuss the safety, financial and political outlook of developing a small modular nuclear reactor in Virginia's coalfield region."

But Flowers said SMR technology is considered safe, has no negative environmental impact, and that the amount of nuclear fuel produced by a single unit is expected to be similar to that of Dominion's existing facilities, where fuel is stored on site.

"Today we manage used nuclear fuel very effectively, in fact I'd say nuclear power operations is really the only technology that captures 100 percent of its waste stream," Flowers said. "If you take Surry and North Anna as an example, we are safely storing a relatively small amount of used nuclear fuel from decades of power generation on a very small footprint. We can manage the nuclear fuel from SMRs in the same manner."

Flowers also hailed the opportunities for job creation in Southwest Virginia once SMRs are being deployed. Depending on the technology, for a single unit Dominion anticipates the full-time staffing to be about 100 personnel – a number that would double with two SMRs at a single site.

"There are a lot of different types of roles – welders, machinists, electricians, instrumentation and control specialists, operation staff, security personnel," Flowers said. "A lot of those jobs are similar to the same roles that you'd have in a traditional coal fired plant. That allows us to transition to a nuclear workforce utilizing staffing that may have come from the coal producing industry."

Flowers said that instead of recruiting employees from outside the state, Dominion plans to collaborate with community colleges and universities in Virginia to train the workforce that will operate the SMRs.

"Given the timeframe of deployment, we have a decade before we anticipate the first SMR being placed in service, and we are already discussing strategically how do we partner with the community

colleges of Southwest Virginia to develop that workforce, such that when these facilities do come online, there is a workforce that we can lean on," Flowers said.

Shannon Blevins, Vice Chancellor for Administration, Government Relations, and Strategic Initiatives at UVA Wise, said that as with all economic development projects in Southwest Virginia, UVA Wise and its community college partners "stand ready to assist" with the talent needs of the employers in the region. "We work to understand those needs and then collaborate on a strategy to assist them with developing talent pipelines," Blevins said in an email.

Kristen Westover, the president of Mountain Empire Community College in Wise County and the vice chair of the SWVA Energy Research and Development Authority, said that she, too, has been "paying close attention to what it will take to educate a workforce" around nuclear energy and SMRs.

"MECC currently has an Energy Technology degree program with numerous specializations within it, including HVAC, solar and electricity. A specialization in nuclear energy could be offered in the same manner," Westover said.

As with other emerging technologies, such as unmanned aerial systems, cybersecurity and smart-farming, the college is working with experts and existing and potential employers in the field to determine and build a curriculum that meets the needs of the industry and employers within the nuclear industry, Westover said.

"We then work with local K-12 systems and employers to educate a trained workforce to support the industry," she added. "Colleges and universities recognize that SMRs and nuclear technology require a strong STEM foundation, and we will continue to work with our regional K-12 partners to ensure that students have the necessary STEM essentials to be able to enter post-secondary educational programs and compete in the workforce in these emerging technologies."

And Adam Hutchinson, the president of Virginia Highlands Community College, said he was already aware of Dominion's initiative regarding SMRs.

"We agree with Governor Youngkin and Delegates Kilgore and O'Quinn that Southwest Virginia is an excellent candidate for this type of energy technology, given our strong history of energy innovation, the region's cohesive focus on economic development, and a talented workforce," Hutchinson said.

Virginia Highlands, along with its neighboring community colleges, already provides post-secondary education and training in many of the applicable fields, such as industrial maintenance, automation,

electrical systems and welding, Hutchinson said. “Our colleges are ready to develop and deploy new programs to meet the emerging workforce demands of this technology.”

Whether it’s nuclear, hydrogen, clean coal, wind, solar or some yet-unknown technology, the energy industry recognizes the economic development opportunity in Southwest Virginia, Hutchinson added.

“There’s widespread support and collaboration on these initiatives, and the stakeholders – businesses, legislators, educators, investors, et cetera – are working together to make sure these opportunities are safe, sustainable, and profitable for the entire region. We look forward to being a part of what comes next,” Hutchinson said.

Energy Innovation Lab Eyes New Types Of Economic Development For Previously Mined Lands

By Charlie Paullin
Virginia Mercury
December 22, 2022

Southwest Virginia’s efforts to reclaim its status as a U.S. energy capital intensified with the announcement this fall of a new energy technology testbed initiative.

The Energy Discovery, Education, Learning & Technology Accelerator, or DELTA, Lab began earlier this year with its first location in Wise County.

As the name suggests, the lab is a way for researchers to test innovative energy technologies as emerging electricity generation sources and storage become more prevalent.

But the lab isn’t just getting creative with technology. It’s also experimenting with new ways to develop previously mined lands that are different from traditional economic development projects using public industrial sites and prevent them from remaining vacant.

Backers see the DELTA Lab as a way to generate economic activity in a region that has struggled economically as coal use declines.

“The role of the lab is as a broker connecting energy companies and prospects, assisting with siting what location is best,” said Will Payne, managing partner of Coalfield Strategies, an economic development consultancy that is one of several organizations involved in the effort.

The lab has also earned the endorsement of the Virginia Economic Development Partnership, which has been vocal about the state's lack of "business ready" sites, a designation meaning that land is immediately ready to be built on. If a site isn't business ready, breaking ground can take months because of the need to conduct environmental studies to mitigate soil damage or deal with past contamination.

"Previously mined lands can require significant work for new development," VEDP President and CEO Jason El Koubi said. "This seems to be an innovative and effective position to advance clean energy on land that was previously contaminated."

Republican Gov. Glenn Youngkin has also pushed for greater commitments to site readiness. In a budget proposal unveiled last week, he requested an extra $450 million for site development, to be added to a previous $150 million included in this year's budget.

The DELTA Lab

The inspiration for DELTA Lab is derived from what Germany has done to redevelop mine sites, said Payne, although that country's efforts have been located more near population centers. In Southwest Virginia, the lab is envisioned as a network of testbed sites that will be located on lands without any plans for buildings, eliminating another need of traditional economic site development.

Instead of the traditional "bench" modeling conducted by universities to develop technologies, the testbed sites will provide power companies a chance to see how their ideas play out in real time. Companies will be able to experiment with their technologies in certain topography types and will have access to the robust power and water sources that are already available at previously mined sites. By creating new sites for this kind of experimentation, local governments will also be able to keep their main industrial parks free for more traditional development.

"We're capturing a moment right now" by capitalizing on incentives for new energy generation technologies in the Virginia Clean Economy Act, Payne said. He said he's not aware of a similar testbed initiative in the country.

"We've got to be very intentional and careful with how we do this," said Will Clear, deputy director of the Virginia Department of Energy. "Energy is a natural fit for what we're really doing. We've got the workforce. We've got the infrastructure."

Announced in October, DELTA Lab's first initiative will be Project Innovation, a test site located on property owned by the Cumberland Forest Limited Partnership and managed by the Nature

Conservancy. Project Innovation will hone in on four key areas of research: electricity generation, with a focus on renewables; "geoenergy," or energy from the earth such as geothermal, "eco-friendly coal" or natural gas; energy delivery systems; and options for reusing renewable energy components and the remains of the fossil fuel industry.

The second concept is Project Oasis, in which data centers will be cooled using water from pools that have collected on previously mined properties. One underground site will provide a consistent 55-degree temperature.

Third, the lab will host Project Energizer, a small-scale pumped-storage hydroelectric system that generates power by transferring water between reservoirs sited at different elevations in the region's extremely mountainous terrain. Unlike most hydroelectric plants, Project Energizer will cause minimal land disturbance by using "off-the-shelf" components.

Currently in the works is another project in Wise County that would connect "islands" of smaller parcels to form a 1,300-acre site.

"Over the next 10 years, I think we can see a dozen locations" that are part of DELTA Lab, Payne said.

VEDP on board

The Virginia Economic Development Partnership is primarily focused on the development of parcels that are 250 acres or larger. As sites get larger and require more work to get up to snuff, their availability shrinks.

According to VEDP's site search tool, 44 of 901 total sites available for business development in Virginia are 250 or more acres.

Youngkin has said the lack of business-ready sites has lost Virginia 55,000 jobs and $124 billion in capital investments to surrounding states since 2016.

"We have to do so much more," Youngkin said at the Virginia Economic Summit and Forum on International Trade.

El Koubi said efforts like DELTA Lab to repurpose previously mined sites "would complement much of what" VEDP is doing elsewhere in the state.

The partnership has a business-ready site program that provides grants to localities to develop parcels of lands that are 100 acres or more. But for the Allegheny Highlands and Southwest Virginia region, the program provides funds for similar projects of 50 acres or less.

VEDP says it has helped create 200 jobs in the region since 2021 but Moody's forecasts project the area will lose almost 1,200 jobs by the end of 2027.

Projects with a similar scope to those of DELTA Lab can make a difference in the vitality of the region, El Koubi said.

"A handful of projects like this each year could position rural regions to consistently create jobs on a net basis for their citizens," he said.

Advances In Nuclear Technology Could Hold Significance For Central And Southwest Virginia

By Joe Dashiell
WDBJ7
December 28, 2022

Major advances in the development of nuclear technology are expected during the next decade. And that work will hold significance for central and southwestern Virginia.

A number of companies and research institutions are now working on Advanced Nuclear Reactor Technology. That covers a number of different applications, but many represent a new type of nuclear reactor that's smaller, more versatile and less expensive than a traditional nuclear power plant.

Governor Glenn Youngkin touted an all-of-the-above approach when he unveiled his energy plan during a visit to Lynchburg in October.

He said the Commonwealth should be "all in" on nuclear power, building the world's leading nuclear energy hub here and achieving what he described as a moonshot for southwest Virginia.

"Virginia will launch a commercial small modular reactor that will be serving customers with base load power demand in southwest Virginia within the next ten years," Youngkin said.

Earlier this month, an expert with the Nuclear Innovation Alliance explained some of the benefits to the Southwest Virginia Energy Research and Development Authority.

"They essentially represent a smaller capital investment and also represent a smaller project that may be easier for companies to help ensure are going to be operated easily," Patrick White told members of the authority.

White noted that universities including Virginia Tech, the University of Virginia and Virginia Commonwealth University, and companies such as Framatome and BWXT in Lynchburg, are involved in the development of Advanced Nuclear Technology.

"And I think this is really an interesting opportunity to think about what role Virginia can play, both in the deployment of this technology to meet its energy needs, and then also think about how it can be part of the supply chains or the larger manufacturing eco-system for advanced nuclear energy across the U.S.," White said.

Discussion of nuclear energy raises questions about the potential impact on the environment and on public safety.

White made the case that these advanced technologies address those concerns in a positive way. And he said the supply of uranium from friendly nations should be sufficient, without requiring more domestic uranium production.

Southwest Virginia Could Get Small Modular Nuclear Reactor

By Beth Jojack
Virginia Business
December 29, 2023

In early October, Gov. Glenn Youngkin announced his goal of developing a small modular nuclear reactor (SMR) in Southwest Virginia within 10 years, part of a plan to make the region an epicenter of energy innovation.

Not long after, Youngkin said he planned to allocate $10 million to create the Virginia Power Innovation Fund, with $5 million going toward development of the proposed SMR.
An emerging technology, SMRs are being designed to generate up to 300 megawatts per unit, about one-third of the capacity of conventional nuclear reactors. Supporters see SMRs as a solution to the

climate crisis because they don't emit greenhouse gases. Unlike wind or solar energy, nuclear reactors aren't dependent on the elements and don't require battery storage, but critics have safety concerns.

Doug Lawrence, vice president of nuclear operations and fleet performance for Dominion Energy Inc., describes SMR as a "clean, reliable source of energy that is always on and not dependent on weather conditions."

There are more than 70 commercial SMRs in development worldwide, but only one in Russia is operational. The U.S. Nuclear Regulatory Commission approved an SMR design from Oregon-based NuScale Power Corp. in summer 2022.

In a 2022 update to Dominion's integrated resource plan, the utility said it could add an SMR to its fleet by 2032, with the potential to build one 285-megawatt SMR each year after that.
Critics of the technology claim SMRs are not cost effective and express concern about radioactive waste that could be generated by SMRs, as well as the danger of nuclear accidents. A 2022 study published in the Proceedings of the National Academy of Sciences found that SMRs would likely create more nuclear waste, by a factor of up to 30, than conventional reactors.

Nevertheless, this isn't a case of Richmond lawmakers trying to dump dangerous but needed technology in a rural part of the state, says Will Payne, director of economic development initiative InvestSWVA. "There are … other regions that want to have SMRs throughout Virginia," Payne says. "It's highly competitive."

It's too early to know how many jobs an SMR could create or the economic impact a small reactor could have on Southwest Virginia, says Duane Miller, executive director of the LENOWISCO Planning District Commission.
By spring, Miller hopes to have a needs assessment explaining what SMR developers seek in a site location. The next step, he says, would be to identify sites in the region that meet those criteria.

Youngkin's Nuclear Initiative Would Make Virginia An Energy Innovator

By Jerry Bischof
Cardinal News
January 4, 2023

Governor Youngkin's recently released Virginia Energy Plan offers a bold new direction for Virginia. He embraces one of the cleanest, most reliable sources of energy in the world: nuclear.

As a recent Dominion Energy retiree who worked in the nuclear group for 37 years, I have seen firsthand the immense benefits and potential of nuclear power. The governor's "moonshot" would put our commonwealth, especially rural localities in Southwest Virginia, in the driver's seat yet again for an emerging source of energy innovation. (Disclosure: Dominion is one of our donors but donors have no say in news decisions; see our policy).

Leaders from both political parties have recognized new and existing nuclear technologies must play a central role in securing America's clean energy goals and maintaining grid security and reliability.

Governor Youngkin acknowledged this during his recent visit to Southwest Virginia where he toured the Energy DELTA Lab site and met with stakeholders to discuss how nuclear and other clean energy solutions can be placed there. He also discussed his desire to work with private industry partners to capitalize on existing technology to produce nuclear generated electricity in Southwest Virginia in the next ten years.

Thankfully, we are fortunate in Virginia to be home to some of the most experienced companies in the nuclear industry, including Framatome, BWX Technologies, and the Norfolk Naval Station — all of which have been operating for decades. Dominion Energy has also safely operated the North Anna and Surry nuclear power stations for over 40 years. The two plants are the largest supplier of emission-free electricity in Virginia, emitting no greenhouse gases and combined provide the commonwealth with nearly a third of our electrical supply.

While opponents have been quick to cite the disposal of spent nuclear fuel as a major concern, I can attest the problem with storing it is not a technological problem – it's political. Employees undergo countless hours of training and are well-equipped to carry out their duties with military-like precision.

After all, nearly 20 percent of nuclear utility employees are veterans. These workers store the spent fuel safely and securely in concrete and steel casks primarily on the grounds of operating reactors, and it poses no threat.

With these benefits in mind, I applaud the Governor for not just saying nuclear is important but for proposing a plan to expand Virginia's nuclear portfolio by building small modular reactors (SMR).

These advanced reactors are just as safe as larger plants but have smaller physical footprints, allowing them to be constructed in areas unsuitable for large reactors, like abandoned mine lands in

Southwest Virginia. With his continued support, we can take advantage of existing clean energy technology to enhance our already impressive nuclear industry that employs an estimated 100,000 people and provides billions in revenue in Virginia.

From both an economic growth and human welfare perspective, our commonwealth's nuclear energy supply is essential to our future. Virginia is currently a net importer of energy. With a Governor intent on bringing back jobs and growing Virginia's population, we can expect our energy consumption to continue to rise.

Expanding our nuclear energy capabilities is the only way to ensure we maintain the clean, reliable, affordable energy grid that the market demands.

I hope the public and the rest of our elected leaders will also embrace nuclear energy innovation and the countless benefits that come with it.

[Opinion] Data Centers Welcome In Southwest Virginia

By Will Payne
Cardinal News
February 13, 2023

As the demand for digital services grows exponentially among individuals and organizations, the need for data centers to process all this online data also continues to expand. Recent reports out of Loudoun and Prince William counties, traditional hotbeds for data center construction, have highlighted growing challenges with future development in Northern Virginia.

At InvestSWVA and with our spinoff Energy DELTA Lab, we've laid out a vision that includes Southwest Virginia becoming a location of choice for data centers and other high-tech companies looking to grow. As the data center industry faces continuing constraints in other parts of the Commonwealth, we hope they'll look to Southwest Virginia as their next home.

Why data centers?

Data centers bring growth. Northern Virginia hosts the largest concentration of data centers in the United States, exceeding the next five largest U.S. markets combined in 2021, according to the Northern Virginia Technology Council (NVTC). This concentration has brought with it tremendous infrastructure development, including a more reliable electric grid, fiber-optic cable bundles, and

important new undersea cables connecting Coastal Virginia to Europe, Africa and South America. Virginia's data center industry is outpacing the rest of the country, growing more than twice as fast as the next-fastest growing area, Dallas-Fort Worth, NVTC reports.
Data centers bring investment and jobs. Over the past two decades, tech firms have invested some $126 billion to build data centers in Northern Virginia, and the sector now employs some 5,400 workers statewide—not counting more than 10,000 engaged in data center construction. 5,400 jobs is not that many in a state of 8.5 million, but these aren't just any jobs, and data centers aren't just any business. Average annual salaries for data center jobs in Virginia were $134,300 per year in 2020. Perhaps more impressive still, data center operational investment amounts to roughly $1 million per data center employee per year: some $5.4 billion in 2021 alone.

Data centers cost local governments relatively little while generating substantial returns. In Northern Virginia, data centers return $13.20 to local government coffers for every $1 generated as a result of their presence. In Loudoun County, for example, existing data center development represents less than 1.5% of total land area in the County, but the industry contributes approximately 30% of the General Fund budget.
Data centers require reliable electricity, access to water for cooling, and large fiber-optic cabling to carry the data from thousands of servers around the globe. These are advantages we have or can support in Southwest Virginia, and the benefits to all of us will be enormous. In fact, our Project Oasis has created the blueprint for arguably the most innovative and sustainable data center hub in the world, leveraging vast tracts of land that can provide on-site clean energy generation and abundant 52-degree water contained in former underground coal mine sites. Furthermore, we just received a $1.5 million earmark in the federal budget to accelerate this first-of-its-kind technology.

The late House Speaker Tip O'Neill famously said "all politics is local." Never is that more true than when it comes to taxes. This is really the heart of the issue. Local jurisdictions, not the state, reap most of the benefit from businesses resident in their territories. That's true whether we're talking about data centers or automobile factories. The sums are stunning.

In Virginia, the total local taxes generated by data centers, either directly or indirectly, topped $1 billion in 2021, according to NVTC. Imagine if our region could get a piece of that pie. That's new money to fund improvements in schools, community colleges, libraries, parks, roads, police and fire, health and social services. It's a way to raise the bar and be more competitive with wealthier counties to the north and west.

There's more to being a good neighbor than paying taxes, however. The large tech companies that build and operate data centers are also good corporate citizens, contributing funds and volunteer hours to their communities to support a variety of causes. That might mean helping to fund cabling

that brings high-speed internet to more families, supporting education initiatives, and contributing to other community needs.

Amazon Web Services (AWS) has donated millions to Northern Virginia schools through its Right Now Needs fund. Google pledged $200,000 in grants to support STEM programs, teacher training, and classroom materials in Loudoun and Fauquier Counties. Data center companies like Equinix and QTS partner with public schools in Loudoun and Prince William Counties to provide internships and promote career paths leading to jobs in the data center industry. Employees from other data center companies volunteer at community farms, prepare and pack meal kits for food insecure families, participate in blood drives, and raise money for local charities. These are the kinds of neighbors we want to have. And Google recently announced an initiative to provide free high speed wi-fi in sections of Purcellville in order to "open opportunities for learning, connection, and growth."

Data center companies have also forged ties with Northern Virginia Community College (NOVA), developing programs to help data centers meet local staffing needs. The college created a two-year Associate of Applied Science degree to train Datacenter Operations Technicians. And AWS teamed with NOVA to offer paid apprenticeships through the school. There are opportunities to do the same at all four of Southwest Virginia's community colleges that already collaborate so well today.

As other regions of our Commonwealth are grappling with capacity issues that challenge future development of data centers, Southwest Virginia has an opportunity to compete for that business. With cheaper land, available workers, the lowest regional data center equipment tax rate in the Commonwealth and solar and geothermal cooling assets that will help data cetners meet their sustainability targets, we hope data centers will look to our part of the state for their future growth. When they do, we should welcome these data centers and the many improvements they will bring.

Will Payne is managing partner of Coalfield Strategies, LLC and leads clean energy project development for InvestSWVA and Energy DELTA Lab.

Filling The Steel Gap: Australian Coal Producer Expands In Buchanan County

By Beth Jojack
Virginia Business
February 27, 2023

Metallurgical coal may be an unknown to the general population, but it's very important to the manufacturing of steel and also valuable in the current economy.

In August 2022, Australia-based Coronado Global Resources Inc., which produces metallurgical coal, announced a $169.1 million expansion of its Buchanan Mine Complex in Buchanan and Tazewell counties, expected to create 181 jobs.

Metallurgical coal is used to generate coke, a fuel used in blast furnaces to make steel. “That’s what we’re focused on,” says Bob Cline, Coronado’s vice president of business development and engineering.

Thermal coal, by contrast, is used to generate power — and also has generated an image problem due to its contribution to climate change.

“I would make the argument that Coronado is not an energy company; rather, it is more aptly defined by its role in the manufacturing, infrastructure and construction sectors,” says Will Payne, managing partner of consulting firm Coalfield Strategies LLC and head of business development for InvestSWVA, a public-private business attraction and marketing campaign for Southwest Virginia.

Prices for metallurgical coal hit historic highs in the last part of 2021 and the first part of 2022, according to Ben Beakes, president of the Metallurgical Coal Producers Association.
Halfway into 2022, the metallurgical coal market began to “settle,” according to Beakes. “However, the market is still fairly strong.”

Expanding the Buchanan Mine Complex in Buchanan and Tazewell counties is necessary for Coronado to remain “competitive in the international coal markets for many years,” Cline explains. The company also has active mines in Queensland, Australia, and West Virginia.
Over the next 20 years, extracting coal from the Buchanan mine will require digging out more rock than previously required. “The expansion will allow Buchanan to not only maintain current production levels but also increase the saleable tonnage produced annually,” Cline says.
As of early December, workers had begun construction at the Buchanan Mine Complex on a second set of skips, which carry raw coal from underground to the surface. “We are well on our way to getting started,” says Brett Holbrook, vice president of U.S. operations for Coronado.
The expansion will also include storage space for 60,000 to 70,000 tons of raw coal, as well as a new coal preparation plant. “The preparation plant separates the coal from the rock, thus generating a saleable clean coal product,” Cline says. Additionally, the expansion will increase the size of the coal storage stockpile facility. This will mean fewer trucks hauling coal offsite for storage and later hauling it back for shipping, he adds.

Several factors contributed to the current demand for metallurgical coal. Coming out of the pandemic, construction projects that had been put on hold suddenly received green lights, which led to a clamoring for steel. Then Russia invaded Ukraine, and Europeans looking to wean themselves from Russian coal, including metallurgical coal, began shopping for it elsewhere.
Another factor impacting demand: China's relations with Australia began deteriorating a few years ago. That caused China also to shop around for its metallurgical coal needs. "The United States benefited quite a bit from that shift," says Michael Quillen, founder of Abingdon-based coal producer Alpha Natural Resources and chair of the Energy DELTA Lab and the Southwest Virginia Energy Research and Development Authority.

As part of its plan to satiate some of that demand, Coronado had hired about 40 of the promised new workers as of December 2022, bringing the total number of employees at the Buchanan complex up to 615, according to Cline. The company plans to fill an
additional 141 positions over four years.

The expansion plan for the mine complex came together quickly over the summer of 2022, according to Payne, who collaborated closely with Coronado executives and state and local officials on the expansion. "Zooms and phone calls every … day for 10 weeks," Payne recalls.
Gov. Glenn Youngkin approved a $3.5 million grant from the Commonwealth's Opportunity Fund to Buchanan and Tazewell counties for the expansion. The money will be used primarily to relocate less than a mile of Route 632 to make room for expansion, according to Cline.
Payne describes Youngkin and Virginia Secretary of Commerce and Trade Caren Merrick as being "incredibly hands-on" during negotiations. "They closed the deal."

The Oasis Is Still Here: LENOWISCO, Member Localities Still Recruiting For Data Center Prospects

By Mike Still
Times-News
March 5, 2023

The Mineral Gap Data Center in Wise County's Lonesome Pine Technology and Business Park is still a testimony to Southwest Virginia's viability as a location for new centers, according to LENOWISCO Planning District Executive Director Duane Miller.

Miller has worked with state legislators and with economic development marketing organization InvestSWVA in the past three years to highlight the region's advantages over areas like Northern

Virginia with plenty of existing data centers but a shrinking catalog of suitable, low-cost sites for new centers.

“We’ve been working diligently to attract new data center operations,” said Miller, “but it takes time to recruit any new business to an area.

Key to those recruitment efforts, said Miller, was Project OASIS about three years ago. InvestSWVA worked with experts and development officials in the LENOWISCO, Cumberland Plateau and Mount Rogers planning districts to compile a list of locations that could accommodate the electric power and equipment cooling requirements for data centers.

Those requirements included:

- Access to relatively low-cost and redundant electric power networks
- Proximity to underground mine sites with water for equipment cooling
- Proximity to telecommunications and Internet connection hubs
- Low risk of weather events or other natural disasters
- Favorable business/taxation conditions
- Ability to be developed rapidly
- Quality of life for employees

Two of the sites are in the LENOWISCO district: Lonesome Pine Technology and Business Park in Wise County and the Sunbright Mine site in Scott County.

With LENOWISCO supporting the operations of the Lonesome Pine Regional Industrial Facilities Authority, another site — Dickenson County’s Red Onion mine site — is near Wise County and falls within LPRIFA’s revenue sharing purview.

The Mineral Gap center has also demonstrated how alternative energy sources can benefit new center operations, Miller said, with an adjoining solar panel farm to supplement the center’s connections to electric utilities.

Southwest Virginia's access to several underground mine sites and their reserves of water also means a potentially cheaper way to cool large plants of computer and storage equipment than with air conditioning plants requiring more electricity.

Miller said the Virginia General Assembly's move in the past two years to reduce sales taxes on equipment purchased by data centers has helped make LENOWISCO one of the lowest-tax regions in the state for that purpose. The sales tax benefit comes into play because data center operations typically upgrade and replace computer equipment to remain competitive, he added.

"Data center recruiting has been as heavy as the real estate becomes more scarce in areas like Northern Virginia," Miller said. "I believe most of the people in Southwest Virginia would welcome data centers. Even with lower tax rates for those centers, they still would add to the region's tax base."

Youngkin: Bills Target Energy Future Of Region, State

By David McGee
Bristol Herald Courier
March 23, 2023

Virginia Gov. Glenn Youngkin returned to Southwest Virginia on Thursday to sign legislation aimed at accelerating this region's role in energy research and development.

Surrounded by members of the region's legislative delegation and others, Youngkin signed 10 bills recently approved by the Virginia General Assembly, during a ceremony at the Energy DELTA Lab at the Virginia Highlands Small Business Incubator.

"With these policies we're going to advance research. We're going to advance research gaps in wind and solar and we're going to advance research in hydrogen and nuclear, carbon capture and all of the other elements that go into an all-of-the-above plan," Youngkin told a crowd of about 200. "With that we open up options. We open up opportunity and we close specified, perceived, mandated outcomes for 25 to 30 years in the future when we don't know if that's the right answer or not."

Youngkin said the energy policy brings "common sense" to the table.

"We're positioning this region to surge in energy production and surge as the landing ground for energy supply chains of the present and the future," he said.

The governor said his announcement last fall about a plan to harness small modular nuclear reactors to generate energy for the power grid has generated “extraordinary interest from the world” about what can happen in this region.

“Since our announcement last fall we have been inundated by companies that believe they are the next generation of this. We’ve also been inundated by researchers so our universities are seeing great interest and it’s all going to happen here,” Youngkin told the news media after the program. “I laid out a 10-year moonshot and I think we can beat it.

“Part of Virginia’s unassailable advantage here is the infrastructure that already exists, a tremendous workforce and our academic opportunities. This is all about innovation. Between the great universities we have and community colleges, we are building a future research, training and development capability that really is second to none,” the governor said, acknowledging it won’t be easy as other states are also working on the technology.

Among bills Youngkin signed are to start the development of innovative energy technologies in Virginia and begin the process of creating a Virginia nuclear innovation hub. The Nuclear Education Grant Fund will award competitive grants to Virginia colleges and schools for the creation of employment and training pathways in the nuclear power industry, including nuclear engineering and welding. And the Southwest Virginia Energy Research and Development Authority is empowered to promote energy projects on former coal sites, develop Southwest Virginia’s energy workforce and supply chains and advance Southwest Virginia’s energy industry.

All three were carried by Del. Israel O’Quinn, R-Bristol, in the House with last one carried by Sen. Travis Hackworth, R-Tazewell, in the Senate.
O’Quinn pledged that historic energy sources coal and natural gas would remain a part of the region’s energy future, while embracing emerging technologies.

“This will allow us to grow our economy through new jobs and new tax revenue streams. It also allows us to collectively create a strong and resilient power grid that can serve Southwest Virginia for decades to come,” O’Quinn said. “These bills position our region to be a leader for the entire Commonwealth.”

Hackworth was equally upbeat about the potential of this combination of legislation.
“This means millions of dollars coming to Southwest Virginia. It is economic development,” Hackworth said after the event. “We fought hard for expanding the authority of the Research and

Development Authority because that now allows them to go for federal funding. That could be nuclear, hydrogen; all of those. ... It's going to be game-changing for Southwest Virginia."
A bill that would have provided $10 million to initiate research on adapting SMR technology from military ships and submarines to the power grid passed both the House and Senate but died in a conference committee. Asked by a reporter, the governor said there could be another funding solution.

"You might see that in my budget amendments," Youngkin said. "We've got a tough negotiation still. Part of our negotiation is we've got a $3.6 billion surplus coming our way. There is plenty of money. We can have $1 billion in tax cuts and $2.6 billion investment in our priorities — one of which is our innovation fund."

Asked about a timetable for completing the budget, Youngkin said that is up to the budget negotiators but "Virginia shouldn't wait."

Another bill signed Thursday declares it state policy to encourage the "capture and use of coal mine methane in Virginia's energy supply, and directs the Virginia Department of Energy to research beneficial uses of coal mine methane." It was carried by Hackworth and House Majority Leader Del. Terry Kilgore, R-Gate City.

"Coal bed methane is an issue for the mines. You've got to do something with it. With the research that is going on right now with that at Virginia Tech and some other institutions it's an opportunity for us to use this as energy," Kilgore said. "It can be used as energy. And this is something we had bipartisan support on, which is amazing this day in time. It can help the environment and help supplying energy needs for the Commonwealth and for others."

Youngkin Doubles Down On Quest To Put Nation's First Commercial Small Modular Nuclear Reactor In Southwestern Virginia

By Susan Cameron
Cardinal News
March 23, 2023

During one of two stops in Southwest Virginia on Thursday, Gov. Glenn Youngkin doubled down on a pledge he made here in October that the state will build the nation's first commercial small modular nuclear reactor and place it in the coalfields of Southwest Virginia.

"I can't wait until I watch that first small modular reactor turn on, and hospitals flip switches for their NICU units and senior living facilities turn the air conditioning on in the summertime, when it's so hot. And yeah, parents and children turn the light on in the early morning, when it's dark outside and have breakfast together. That's going to be pretty awesome," he said.

The governor, accompanied by first lady Suzanne Youngkin, drew a standing-room-only crowd Thursday afternoon to the Energy DELTA lab space at the Virginia Highlands Small Business Incubator in Abingdon.

Since Youngkin announced his intention to deploy an SMR within 10 years, he said Thursday, the state has been inundated by leading companies from around the world who want to be involved and researchers who want to come to Virginia, plus he said there has been great cooperation from the state's utilities.

SMRs are smaller, simpler versions of traditional nuclear reactors and would produce about a third of the power produced by the big reactors.

Asked what happens next, he said the state's budget must be approved.

But he said he thinks that "may take a little while. I'm patient. I'm in Richmond all summer. I'm happy to meet with them when they're ready, but I don't think Virginia should wait. There's too much to do. There's no reason for us to be waiting. We have plenty of money. We can cut taxes. We can make important investments. We can go right now."

The gathering included most of the senators and delegates who make up the Southwest Virginia delegation plus local officials, education leaders from a number of colleges and community colleges as well as students.

The purpose of the visit was to sign six bills approved during the session of the Virginia General Assembly that ended in late February, and the governor and the rest of those attending seemed to be in a celebratory mood.

Youngkin said the legislation will help him deliver on his "All-American, All-of-the-Above" Energy Plan priorities.

"We can, in fact, make Virginia energy more reliable, affordable and clean while creating jobs and spurring innovation and today is a testament to that. We're not just making Southwest Virginia the

energy capital of the commonwealth, we're unleashing our rich, limitless potential to deliver for all. This is just the beginning," he said.

The signed bills will:

Create the Virginia Power Innovation Fund to develop innovative energy technologies.
Create the Nuclear Education Grant Fund, which will award competitive grants to Virginia colleges and schools for the creation of employment and training pathways in the nuclear power industry.

Empower the Southwest Virginia Energy Research and Development Authority to promote energy projects on former coal sites, develop Southwest's energy workforce and supply chains, and advance Southwest Virginia's energy industry.

Encourage the capture and use of coal mine methane in Virginia's energy supply and direct the Virginia Department of Energy to research beneficial uses of coal mine methane.
Add coal mine methane extraction to the jobs eligible to receive green and alternative energy job creation tax credits.

Not every nuclear-related bill the governor wanted passed. The General Assembly failed to pass a bill that would have declared establishing a small modular reactor to be official state policy. A Senate committee also defeated a bill that would have set up a revenue-sharing program among Southwest Virginia localities for any revenues derived from nuclear reactor.

Gov. Glenn Youngkin and first lady Suzanne Youngkin talk to the media after the discussion on the deadly drug fentanyl led by the governor at Virginia High School in Bristol. Photo by Susan Cameron.

The governor emphasized that the state will also "innovate" uses for coal, which he called the "quintessential all American power source" that is needed to make steel. The downturn in the coal industry in recent years shut down a number of coal mines in the region and put many miners out of work.

Another bill that was signed states that funds included in the Coal and Gas Road Improvement Fund may go toward flood mitigation efforts in Southwest Virginia. In 2021 and 2022, the Hurley and Whitewood communities of Buchanan County were devastated by flooding.

Earlier in the day Thursday, the governor visited Virginia High School in Bristol, where he led a discussion on the deadly drug fentanyl, a powerful opioid that is up to 50 times stronger than heroin and 100 times stronger than morphine.

Youngkin said fentanyl has resulted in an "epidemic of despair" and is a difficult problem for which there are no simple solutions.

He said he hasn't met a single person in Virginia who hasn't been touched by substance use disorder and mental health challenges and noted the number of fentanyl overdoses in the state doubled from 2019-2021.

Youngkin said the supply chain must be interrupted, and that starts with securing the southern border. The supply chain, dealers and distributors must then be held accountable by making sure they face "far stiffer penalties," he said.

Some of those in the crowd at Virginia High School in Bristol at the discussion on fentanyl led by Gov. Glenn Youngkin on Thursday. Photo by Susan Cameron.
And the state must continue to invest in law enforcement, which is stretched too thin, he said.

The governor added that he's proud that Sen. Todd Pillion and Del. Israel O'Quinn, both Republicans from Washington County who were on stage with the governor, were involved with a team that passed legislation that made fentanyl a weapon of terrorism.

He added that one measure he hoped would be approved but wasn't was legislation that would have made it a felony homicide when a dealer knowingly distributes fentanyl and that person dies. He said he will again support that bill and hopes it will pass next time.

Gov. Youngkin Signs Measures Focused On All-American, All-of-the-Above Energy Plan Goals

By Ashley Hoak
WCYB
March 23, 2023

Gov. Glenn Youngkin touted energy innovation plans during a visit to Southwest Virginia on Thursday.

Youngkin signed nearly a dozen bills into law at the Energy Delta Lab in Abingdon, as part of his All American, All-of-the-Above Energy Plan.

The bills focused on various energy facets, like advancing research when it comes to nuclear education, encouraging the capture and use of coal mine methane energy supply, and more.

Youngkin says he believes Virginia can set the standard when it comes to energy innovation.

"Southwest Virginia's got such an extraordinary opportunity to lead, not just Virginia, but the nation," said Youngkin. "I am excited to help bring it to fruition and to continue to cheer and support as we lead."

During the visit, Youngkin also continued to push his plan of bringing a small modular reactor, or SMR, to Southwest Virginia.

"It's all going to happen here," added Youngkin. "I laid out a 10 year moonshot, and I think we can beat it. It's really exciting to see the focus of this next generation of baseload power that is affordable and is reliable and clean, come right here to Virginia, particularly Southwest Virginia."
Governor Youngkin signed the following bills on Thursday:

HB2386, patroned by Delegate Israel O'Quinn and SB 1464, patroned by Senator Jill Vogel, creates the Virginia Power Innovation Fund to jump start the development of innovative energy technologies right here in Virginia and begins the process of creating a Virginia nuclear innovation hub.

HB 1779, patroned by Delegate Israel O'Quinn, creates the Nuclear Education Grant Fund to award competitive grants to Virginia colleges and schools for the creation and employment and training pathways in the nuclear power industry, including nuclear engineering and welding.

HB 1781, patroned by Delegate Israel O'Quinn and SB 1116, patroned by Senator Travis Hackworth, empowers the Southwest Virginia Energy Research and Development Authority to promote energy projects on former coal sites, develop Southwest Virginia's energy workforce and supply chains, and advance Southwest Virginia's energy industry.

HB 1643, patroned by Leader Terry Kilgore and SB 1121, patroned by Senator Travis Hackworth, declares that the policy of the Commonwealth is to encourage the capture and use of coal mine methane in Virginia's energy supply, and directs the Virginia Department of Energy to research beneficial uses of coal mine methane.
HB 2401, patroned by Delegate Will Morefield and SB 1468, patroned by Senator Travis Hackworth, provides that funds included in the Coal and Gas Road Improvement Fund may go toward flood mitigation efforts in Southwest Virginia.

HB 2178, patroned by Delegate Will Morefield, adds coal mine methane extraction to the jobs eligible to receive green and alternative energy job creation tax credits.

Sen. Warner Tells Southwest Leaders They Should Unite Around A Single Proposal For A Regional Technology Hub

By Dwayne Yancey
Cardinal News
April 14, 2023

Behind closed doors in Blacksburg on Wednesday, U.S. Sen. Mark Warner, D-Virginia, delivered a strong and clear message to a group of economic development leaders from across Southwest and Southside.

Immediately after that, in an interview with me — which he sought — Warner delivered the same strong and clear message, although I suspect I may have gotten a milder version than what he said in private.

That message was this: This side of the state would be better off if it united around a single proposal for a regional technology hub — and if that proposal were focused on a clear theme, not a grab-bag of ideas.

Before I go further, I should explain for those of you just joining us what this regional technology hub is all about. In last year's CHIPS and Science Act — which Warner sponsored along with Sen. John Cornyn, R-Texas — Congress approved $280 billion of funding designed to boost domestic technology in the face of competition from China. The centerpiece of the bill, as the name implies, was aimed at boosting U.S.-made production of microchips, aka semiconductors. Included in the bill, though, was authorization for the Commerce Department to designate 20 or more "regional technology hubs," which the federal government would shower with money. The goal is to "spread the digital wealth" so that the nation's technology sector is not so concentrated in a small handful of mostly coastal cities — 73% of the nation's tech jobs are in just five places, or four if you consider adjacent San Jose and San Francisco all part of the same larger metroplex. The others are Washington, Boston and New York. Furthermore, there's no sign that the free market will change that on its own: Bloomberg says nearly 70% of the nation's investment capital goes to just five places, all on the coasts: San Francisco, New York, Boston, San Jose and Los Angeles, in that order.

That's what the regional tech hub concept is designed to change. The act spelled out certain rules: The bill calls for at least three hubs in each of the six Economic Development Administration zones; that means three between Virginia and Maine. The act also goes on to say that "no fewer than one-

third" of these hubs should "significantly benefit a small or rural community." The definition of "small or rural community" is "a noncore area, a micropolitan area, or a small metropolitan statistical area with a population of not more than 250,000." That rules out the Roanoke (314,496) and Lynchburg (262,258) metro areas but rules in the New River Valley (165,293) and virtually all of Southwest and Southside. There are some other rules, but those are the big ones that matter for the moment.

Since then, I've written multiple columns looking at our likely competition and making the case that a bid from somewhere in the western third of the state would likely have a good shot at winning. I'm obviously not the only one thinking this way. Virginia Tech has been looking at putting together a bid on behalf of a region whose geography has yet to be determined. So has the InvestSWVA economic development group in far Southwest Virginia. A group in Pulaski County has been pitching that community, and there are others who are interested, even if things may not have reached a formal proposal stage yet. (For one thing, the Commerce Department hasn't opened the bidding process yet; it's still writing the rules that will govern the competition.)

On Wednesday, Warner gathered about two dozen leaders from Lynchburg to the Lenowisco Planning District in Southwest Virginia together at the Virginia Tech Corporate Research Center and delivered what was, by all accounts, a blunt message: Don't compete with one another. Participants I talked to described Warner's remarks as "direct" and "crystal clear." Warner himself described the meeting as "a frank and candid exchange," which is usually a polite way of describing a no-holds-barred discussion.

Before the meeting, Warner's office asked if I'd like to talk with the senator one-on-one afterwards. Naturally, I said yes. I've been around politics long enough to understand the things that sometimes aren't said; I assume Warner wanted to make sure his message was heard beyond the people in that room. His message to me was sure clear.

"Since the CHIPS bill was my idea with John Cornyn, I want to make sure we come out a winner on this, come hell or high water," he told me.

He expressed disappointment that Virginia wasn't better positioned to take advantage of the semiconductor company announcements that have come about as a result of the bill. In October, Micron Technologies announced it would build a $20 billion chip factory outside Syracuse, New York. In December, TSMC announced plans to expand its chip plant in Arizona, raising the investment from $12 billion to $40 billion. Since then, two other companies have announced separate plants in Kansas, and Texas Instruments has announced an $11 billion plant in Utah.

"I'm really disappointed," he said. "We in Virginia just weren't ready." On the other hand, he points out, Virginia hasn't shelled out the kind of incentives that some of these companies got. New York promised $5.5 billion in tax credits to Micron if it located in the state. Virginia didn't go that high even for Amazon; the Old Dominion's incentive package there was $750 million. "We're not used to having multibillion-dollar incentive packages," Warner said. "Because I didn't feel Virginia was fully ready for the CHIPS bill when it came out, I'm a bit obsessed about making sure we get a tech hub."

He said the main interest in such a hub — perhaps the only formal interest — has come from the western side of the state. "I've not been contacted about some other active proposal," he said. That doesn't surprise him, he said, since the intent of the bill is to direct tech investment to less prosperous regions. "I think there would be appropriate howls of protest if Northern Virginia got a tech hub or Cambridge [Massachusetts] got a tech hub or Palo Alto [California] got a tech hub," he said.

That's why he wants to make sure whatever bid comes out of this side of the state is as strong as it can be — and he had some thoughts on how it should be structured. For the meeting Wednesday, "we had people from the coalfields, people from Lynchburg, Danville," plus representatives from Virginia Tech and the Roanoke and New River valleys, he said. "My belief is if you wind up with four, five, six proposals, that's fine, I can be supportive, but if we wind up with one proposal, we can be much more engaged."

That's what Warner told me in public. What he said in private was apparently more direct. "Mark was pretty clear: If the hub is located in Blacksburg, he's not sure it's going to win because Blacksburg doesn't need more economic support, so he wonders if it should go further south," said Pulaski County entrepreneur Steve Critchfield, who was part of the meeting.

Warner didn't say that directly to me but he did strongly intimate that, as an author of the bill, his intent was for tech hubs to benefit less affluent regions. "I think there will be a desire coming out [of the Commerce Department] to really jump start or benefit less prosperous communities," Warner said. He didn't say it because he didn't have to but in the context of the western part of Virginia, Montgomery County looks pretty affluent. The Census Bureau lists the county's median household income as $60,666. In Dickenson County, it's $33,905. If the Commerce Department is looking at an application and benefiting "less prosperous communities" is the goal, which looks better on the application?

The problem is there is no consensus on which specific localities should be pitched for a tech hub, or what the tech involved should be, or who should do the pitching. I was told the number of ideas floated was "too many to text." InvestSWVA is pushing an energy initiative through its DELTA Lab

project to create research parks for energy companies on old mine sites. Critchfield and others have been pushing Pulaski as a center for controlled environment agriculture — i.e., indoor agriculture. Lynchburg, home to several nuclear companies, naturally has an interest in that. Virginia Tech pitched a transportation-focused proposal as part of the separate competition for Build Back Better grants last year — and lost. Tech representatives spent part of the meeting Wednesday pitching transportation again. However, by multiple accounts, Warner told the group that he didn't think that was likely to be a winning entry for a tech hub, either. "He was very clear that some of the things we talked about were not the intent of Congress," Critchfield said.

So what is? Will Payne, who leads InvestSWVA, is convinced that far Southwest Virginia is the best place for a tech hub, on the theory that the strongest bid is one that focuses on a region's unique assets — and an energy-focused proposal out of coal country would do that. Others worry that any energy bid out of Virginia would get beaten out by an energy-related bid by West Virginia, which has been far more coal-dependent.

Payne did seem to suggest a possible coalition with the ag tech proposal coming out of Pulaski. Critchfield is the president of the Pulaski-based MOVA Technologies, a climate tech company whose technology is aimed at capturing contaminants in the air that can be recycled and sold for other uses. MOVA has historically been described in terms of carbon capture — a technology that has fascinated the coal business — but he's also now partnered with an indoor ag startup in Pulaski that will use the same technology to help grow crops indoors. Payne is wonders if that might be a good mix — "energy and agriculture are an intriguing option." That indoor ag company is Vegg, led by Cody Journell and Luke Allison. Their unique angle: They're looking at using abandoned schools as growhouses because gyms and auditoriums are the right height, their brick structure means they're usually well-insulated, and historic tax credits help lower the cost to make the project affordable. My unsolicited advice: Coal country has a lot of former schools. Indeed, in 2018, then-state Sen. Ben Chafin, R-Russell County, and then-Del. (now Sen.) Todd Pillion, R-Washington County, sponsored a bill that allows localities to designate abandoned schools as special low-tax zones to encourage their conversion into economic development projects. If the idea that Vegg is promoting works, Southwest Virginia could offer a lot of sites for expansion.

Warner didn't express an interest in any specific proposal but instead pushed the group to coalesce around one.

"He made that pretty clear to the powers that be," Critchfield said.

"He came in that role of dealmaker," Payne said. "Here are your parameters — you go figure it out."

What Warner told me: “I’m going to make sure we have our best chance possible to get a tech hub,” he said. “I think those chances go up if we can bring all the power of the delegation to bear on a well-thought-through proposal.”

So who should lead this? And which localities should, in effect, step back? These are touchy questions that have no answers yet. “It was a spirited conversation,” Warner said. “I think a lot of honest things were said that needed to be said.” That’s definitely polite language.

“All cards were on the table for everybody in the room,” Payne said.

From where I sit (outside that room), the challenge is getting all these communities to work together when some of them don’t have any real history of doing so — and when everyone thinks they have the most logical proposal.

There are also conflicting views about the role that Virginia Tech should play; Tech has been doing most of the work to put together a proposal on that transportation initiative that Warner wasn’t keen on but there was a lot of sentiment in the room that Tech should step back and let others put together a proposal that doesn’t focus on the New River Valley.

“Does Tech lead? Does the private sector lead and Tech support?” Critchfield asked. “That needs to be figured out.” Tech is certainly accustomed to leading; it led that Build Back Better proposal, for instance. However, Invest SWVA’s DELTA Lab proposal has gone forward without any university involvement. The bill, though, indicates a preference for communities that partner with a research university. Reading between the lines, Warner seemed to suggest a compromise: “I think the value add that Virginia Tech can bring in a proposal presentation is large but that doesn’t mean it has to be on the university focus,” he said. Here’s how I translate that: Maybe Tech shouldn’t be the lead dog on this. Still, who has the convening power to get everyone on board? And, once again, what should that proposal be? Warner cautions about trying to put everything in a proposal just to please everyone. “I’m thinking of a relatively discrete area with a discrete focus,” he said. “It needs to be around a core idea.”

Whatever the final proposal is, Warner emphasized that the purpose of the tech hub initiative is to create jobs, so any bid has to be focused on job creation, not simply research. “This is clearly about economic development,” he said. In the context of the meeting, that seemed a clear message to academics at Virginia Tech that a proposal focused on research whose potential commercialization is years away won’t fly.

Warner also cautioned that time is tight. Sometime this summer, the Commerce Department will announce the rules and open bidding. Summer will be here before we know it; will all these disparate regions be able to work out their differences and agree on a plan by then? Since there were strong feelings among some that Virginia Tech shouldn't lead the proposal, who should then? "It's not forever before they need to decide whether there's a consensus behind a single proposal," Warner said.

The clock is ticking.

On Cloud Nine: Virginia Is World's Data Center Capital, Reaping Billions

By Emily Freeling
Virginia Business
April 27, 2023

In 2007 — the same year that Apple unveiled the iPhone and Netflix introduced the idea of "streaming" movies — Buddy Rizer started aggressively targeting an industry that many of the people he worked for in Loudoun County didn't yet fully comprehend.

"It was not an easy story to tell at first," Rizer recalls of his early years pursuing data centers as Loudoun's executive director of economic development. "I remember a couple of public hearings sweating through my suit as I was getting grilled by our [board of supervisors]. One of the supervisors said, 'Mr. Rizer, if everything is going to the cloud, why do we need data centers?'"

Sixteen years later, more than 70% of the world's internet traffic comes through Data Center Alley — six square miles in Loudoun's Ashburn area.

Northern Virginia is the epicenter of the world's data landscape. In 2022, the region accounted for 64% of the total new data center capacity brought online in primary markets across the U.S., according to the North American Data Center Trends Report by CBRE.

Data centers are huge tax generators — Loudoun County officials predict data centers will pump around $570 million in personal property taxes into county coffers next year alone.

But the blistering pace of development is drawing scrutiny from residents, environmentalists and local officials who worry about the industry's high electricity demands and the centers' impact on neighborhoods. Northern Virginia's experience holds lessons and opportunities for other areas of the state that stand poised to cash in on the demand for data center sites.

Big data

In 2022, 21% of all new economic development investment in the commonwealth announced by the Virginia Economic Development Partnership — a total of
$951 million — was from new and expanding data centers. That number represents a significant decline from 2021, when VEDP announced $6.8 billion in new data center investments — 62% of an overall statewide total of more than $10.9 billion in economic development investments that year, and 2020, when data centers accounted for 81%, or $7.9 billion, of about $9.8 billion in investments announced by VEDP.

Data centers will contribute an estimated $570 million in Loudoun County tax revenue next year.
Photo by Will Schermerhorn
But the January announcement of Amazon Web Services' plan to invest $35 billion in Virginia data centers by 2040 proves the market for data center sites remains robust. AWS is the world's largest cloud computing provider, and its expansion reflects its efforts to stay ahead of rivals Microsoft Azure and Google Cloud Platform in the business of selling offsite data storage infrastructure to businesses.

"Our internal research tells us that the demand for the infrastructure is going to exceed the supply for probably the next decade," says Rizer. "There is a long runway."

The world's need for data storage has grown exponentially in recent years, along with the number of gadgets, apps and services upon which consumers and businesses increasingly rely.

Massachusetts-based market intelligence firm International Data Corp. predicts that the global datasphere — all the data that exists in the world — will more than double in size from 2022 to 2026, driven by data-intensive technologies such as artificial intelligence, autonomous vehicles and the fact that everything from the refrigerator in your kitchen to the traffic signal down the street can now transmit data.

But all the documents, financial records, photos, texts and entertainment content that we access every hour of the day from the cloud aren't exactly virtual. This data is stored on servers housed in data centers — giant structures strategically located for their proximity to fiber optic networks and electric transmission lines.

Data Center Alley shows the progression of data center architecture over the past decade. Older data centers are one-story boxy industrial concrete blocks. Newer structures are multistory buildings — some over 1 million square feet — with windows added to make them look like office buildings. Security gates and yards packed with diesel backup generators are common features on these properties.

Power hungry

Powering the millions of servers housed in data centers requires a robust supply of electricity. Those servers generate heat and can't perform optimally if the building temperature rises too far above 80

degrees. So even more electricity is needed to run the HVAC systems that regulate data centers' air temperature.

Data Center Alley — which represents 6% of Loudoun's entire land mass — consumes the same amount of electricity as all of the homes that Dominion Energy Inc. serves in Virginia Beach, Chesapeake, Newport News and Norfolk combined, according to Katharine Bond, Dominion's vice president for public policy and state affairs.

Alan Bradshaw, Dominion's vice president for strategic partnerships, says no other industry comes close to the power demands of data centers, which represent 21% of the utility's Virginia power sales.

"These are big facilities in a dense area, and they are very unique, even compared to large industrial facilities like steel mills or shipyards," he says.

Bradshaw says Dominion works closely with data center customers to understand their growth plans, and for the past few years it has provided a 15-year data center forecast to grid operator PJM.

PJM's 2023 forecast calls for the PJM Dominion zone, which includes Central Virginia, Northern Virginia and Hampton Roads, to experience 5% annual growth in summer peak power loads for the next 10 years. This projected growth is 30% greater than what PJM was predicting two years ago, and it dwarfs the growth rate in any other utility zone PJM tracks, which includes Washington, D.C., and 13 states in the mid-Atlantic and Midwest. The next highest rate is 0.8%.

"That is exponential," Bradshaw says. "One percent growth is large for a utility. It is all due to data center growth."

While the capital costs of upgrades to power transmission and generation across Dominion's system are shared by all ratepayers, Dominion officials point out that as such large customers, data centers are paying a proportionally large share of the cost needed to keep up. (Dominion, however, says it is unable to supply an amount for how much data center customers pay per year in Virginia.)

Bond says Dominion has partnered with data center operators on several Virginia solar projects that have been built specifically for the data centers' use, at the expense of the data center operators. The industry's aggressive sustainability goals also help support Dominion's systemwide transition to clean energy sources, she says.

Crossing county lines

Prince William County saw $101.4 million in tax revenue from data centers last year. It benefits from proximity to Loudoun and a skilled workforce, says Christina Winn, Prince William's executive director of economic development. Photo by Stephen Gosling
After Dominion announced last summer that it was temporarily suspending new service connections for data centers in Data Center Alley to ensure its transmission infrastructure could handle the added

load, county officials had to readjust revenue projections to reflect later buildout dates for data centers. Rizer says county officials expect power to be fully restored by the end of 2025.

Meanwhile, the data center industry is still growing in the county — just not as rapidly as in recent years, Rizer says.

“It certainly hasn’t dampened the appetite for real estate in our community,” he says, adding that prices have climbed to between $2 million and $3 million per acre for data center properties. “It has delayed us somewhat, but it hasn’t stopped anything. No one has pulled out, and no one has said, ‘If I can’t get power in two years, I’m out.’”

Industry reports such as CBRE’s reference power constraints as a factor driving data center operators to examine other markets, both in Virginia and in other states. One of the areas that is seeing increased interest is neighboring Prince William County.

Christina Winn, Prince William’s executive director of economic development, says her county isn’t seeking to be as big a data hub as Loudoun, but data centers are a revenue-rich piece of the diversified industrial base Prince William wants to build. “We are not out actively recruiting data centers and marketing for them,” she says, but Prince William’s proximity to Loudoun and its skilled workforce have drawn the industry’s attention.

Prince William County currently has 39 data centers totaling 6.9 million square feet (with an additional 4.8 million square feet under development), compared with Loudoun’s more than 200 data centers that make up more than 26 million square feet (with at least 4 million more in development).

That level of development has grown Prince William’s data center tax revenues by a multiple of 15 over the past 10 years, from $6.2 million in 2012 to $101.42 million in 2022.

The Prince William Digital Gateway project, approved by county supervisors in November 2022 after months of debate and a 14-hour public meeting, creates a 2,100-acre technology corridor in a now-rural area near Gainesville. The project was spearheaded by individual property owners who wanted to bundle more than 200 parcels to market to data centers. Operators QTS Data Centers and Compass Data Centers announced proposals to build campuses in the corridor in the months leading up to the vote.

County officials estimate the development will bring in up to $400 million in annual tax revenue when built out, but not everyone wants to see Prince William’s data center presence grow so drastically.

In December 2022, a group of residents sued the supervisors over the vote, claiming that the board failed to consider the development’s impact on nearby Manassas National Battlefield Park, in addition to environmental impacts, noise and “visual blight.”

In January, Bob Weir, a vocal critic of the supervisors' Gateway decision, won a special election for the Gainesville seat on the board (vacated by a supervisor who owns land within the Gateway project area). Weir had advocated for data centers to be kept away from residences and schools due to concerns about noise and data centers' visual and environmental impact.

Growing pains

Residents have been vocal about the impact of recently opened data centers.

When Amazon opened a new Manassas data center last year, Planning Commissioner Tom Gordy began receiving complaints from residents of a neighboring subdivision about noise from the HVAC units that sit atop the data centers.

"Some people are literally having to live in their basements to get away from the noise," he says of the neighborhood, where a tree buffer of a few hundred feet separates homes from data center buildings.

Kathryn Kulick, a leader of the HOA Roundtable of Northern Virginia, a citizen group formed largely in response to the data center issue, says it's becoming clear that data centers should be kept away from schools and residences. "I had one homeowner text me in the middle of the night — it was 2 a.m. — saying, 'I was just woken up by the noise and the walls of my home thrumming,'" she says.

Prince William County is trying to address these concerns, Winn says. The Board of Supervisors recently amended its noise ordinance to cover HVAC units, changed design standards and set up a community group to look more closely at data center impacts going forward.

"We are definitely hearing what residents are saying," she says.

Josh Levi, president of the Data Center Coalition, a Loudoun-based industry advocacy group, says the hum from data center air handlers is a new issue limited to facilities like the Manassas center that are located just a few hundred feet from housing, and the industry is responding.

"You are seeing a lot more due diligence and intensity around the sound studies on the site-planning portion of the data center project to ensure you don't have a problem going in, as opposed to having to mitigate something after the fact," he says.

Kulick calls it a cautionary tale for other localities about the need for solid and careful land use planning before data centers are approved.

"It doesn't mean everywhere there's a power line, there should be a data center," she says.

Northern Virginia state legislators Del. Danica Roem, D-Prince William, and Sen. Chap Petersen, D-Fairfax County, filed five bills during the 2023 General Assembly session seeking more limits and

oversight on data center development — all of which were defeated. Only one — Petersen's Senate bill commissioning a study on the industry's environmental impact — made it out of its originating chamber, but it was tabled by a subcommittee in the House of Delegates.

In recent months, other localities have experienced angst over data center development.

In Warrenton, a Feb. 14 Town Council meeting lasted until 2:30 a.m. before council members voted 4-3 to approve Amazon Data Services' request for a special-use permit to build a 220,000-square-foot data center. More than 100 residents spoke about the proposal, with many — including Academy Award-winning nonagenarian actor and Fauquier County resident Robert Duvall — saying the development would harm the town's rural character.

The council's decision is being challenged by a lawsuit filed in March by the nonprofit conservation group Citizens for Fauquier County and 10 local residents.

Outside NoVa

"Not in my backyard" concerns over data centers are less of an issue in Southwest Virginia, where an economic development team wants to turn a 4,000-acre reclaimed Wise County coal mine site into a data center campus.

"We can be a solution to the challenges the industry is facing in Northern Virginia," says Will Payne, director of InvestSWVA, a public-private partnership created to market the region.

Payne and his team are meeting with data center developers, and two projects are in "serious due diligence," he says.

A major selling point is tied directly to the site's past. The underground cavities leftover from mining hold 6.5 billion gallons of 52-degree water. The reserve is sufficient to circulate water to cool 10 to 12 large data centers, Payne says.

Paired with renewable energy projects underway in the region, available land for onsite solar power development, and the fact that the region's localities in 2021 lowered their data center equipment taxes to 24 cents per $100 — the lowest rate in Virginia — Payne is optimistic.

Wise is already home to the 65,000- square-foot Mineral Gap Data Center, which opened in 2017. Owner DP Facilities built the secure data center to serve government agencies, but it is also marketed to commercial clients.

"This is a transformational industry for this region," Payne says.

Assets abandoned by departing industries also played a role in suburban Henrico County's development as a Central Virginia data hub. Henrico's first data center came in 2011 when QTS Realty

Trust Inc. bought the 1.3 million-square-foot White Oak Semiconductor (later Qimonda AG) plant, which closed in 2009.

Henrico officials want to capitalize on QTS' network access point (NAP) in Henrico. It was the first inland facility to connect to several new high-speed subsea internet cables that land in Virginia Beach, connecting Virginia to France, Brazil and Spain. A cable connecting to South Africa and India is planned to be completed later this year, and a fifth "confluence" cable will connect various cities along the East Coast.

"If you are doing business with Europe, Africa and soon to be Asia, the fastest connectivity is going to run through Henrico," says Henrico Economic Development Authority Executive Director Anthony Romanello.

Henrico's profile continues to grow. Facebook parent company Meta Platforms Inc. has so far spent more than $1 billion building its 2.5-million-square-foot data center complex in the EDA's White Oak Technology Park. Meta purchased another 475 acres from the EDA in November 2022 for $35.3 million to expand its footprint. And QTS last year bought another 226 acres within the technology park to expand its Henrico data center campus by an additional 1.5 million square feet — more than doubling its initial footprint.

Romanello notes that data center tax revenues to the county have grown from about $2 million in 2017 to over $10 million in 2022.

Including available land in the EDA's technology park and privately held land in the eastern part of the county, Romanello estimates Henrico now has about 1,300 acres suitable for data center development.

"That puts us in a position to continue to grow," he says.

Westward Ho! SWVA Inland Port Plain Gains Momentum

By Beth Jojack
Virginia Business
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Southwest Virginia's leaders feel confident their region will be home to the state's next inland port.

"The planets are aligning for us right now," says state Sen. Todd Pillion, R-Washington County. "Our localities are excited about it. The state seems to be excited about it."
During the Virginia General Assembly's regular session, Pillion and two Southwest delegates requested a total of $65 million in state funding to acquire land and build an inland port in the Mount

Rogers Planning District, which ranges from Bristol, Virginia, to Wytheville. If built, it would be the state's second inland port, joining the Port of Virginia's Virginia Inland Port in Warren County.

The General Assembly adjourned in February without amending the state's biennial budget, and it was unclear whether legislators would come to an agreement on the budget before reconvening in April. Nonetheless, lawmakers from Southwest Virginia feel confident the final budget will include funds for establishing an inland port, an intermodal terminal where sea cargo moves by road or rail to inland destinations.

As of February, the state Senate's proposed budget included $10 million for the Southwest inland port, while the House of Delegates' budget added $55 million to cover preliminary engineering and design for the inland port, as well as property acquisition and construction and equipment costs.

"I think everyone is committed to putting enough money into it so that we can get as far as we can get before the end of the biennium," and then allocate enough money to finish the project in the 2024-25 budget, says Del. Israel O'Quinn, R-Washington County.

The only question now, according to O'Quinn, will be whether the state's budget conferees pick a number closer to $10 million or $55 million in the amended budget presented to the full General Assembly. Gov. Glenn Youngkin spoke positively about the idea of a second inland port last fall.

First in nation

Virginia was the first U.S. state to build an inland port, when it opened the Virginia Inland Port on 161 acres near Front Royal in 1989. Sitting next to Norfolk Southern Corp.'s Crescent Corridor railway and near the intersection of interstates 66 and 81, VIP is owned by the Virginia Port Authority and connects to the Port of Virginia's marine terminals in Hampton Roads by 220 miles of rail.
The VIP handled 31,282 containers in fiscal year 2021, and its total economic impact that year was $1.3 billion, with over $360 million in labor income from almost 6,000 indirect workers, according to a report released by William & Mary's Raymond A. Mason School of Business in 2022. These are small numbers next to the Port of Virginia's total economic impact of $100.1 billion in 2021, but the inland port is nonetheless an economic driver in the Shenandoah Valley, and a similar facility in Southwest would be, too, proponents hope.

In Front Royal, numerous distribution centers for companies like Home Depot Inc., Family Dollar Stores Inc. and Red Bull have opened near the inland port, and Harrisonburg-based InterChange Group Inc. has built a healthy business providing warehouses to national corporations.

Supporters of inland ports tout how the facilities alleviate highway traffic and increase capacity at busy coastal ports.

By enabling freight to travel further by train instead of trucks, “the emissions will be less and you will also reduce congestion on the roads,” points out Ricardo Ungo, director of Old Dominion University’s International Maritime, Ports & Logistics Institute.

Since 1989, numerous other U.S. cities, from Dillon, South Carolina, to Dallas, have followed Virginia’s lead in establishing their own inland ports in hopes of spurring economic development, but not every U.S. inland port has been a success story. The elephant in the room is the $32 million Heartland Intermodal Gateway in Prichard, West Virginia, which opened in 2015. One study promised the port would create between 700 and 1,000 jobs. Instead, the facility shut down in 2019 due to lack of demand.

Moving freight

Local officials haven’t always embraced the logistics industry in Virginia. In 2008, Montgomery County sued to stop Norfolk Southern from building an intermodal freight terminal in Elliston, arguing that the facility didn’t fit with its long-term goals for smart growth and high-tech jobs. The state had agreed to pay 70% of the $35.5 million price tag.

The Virginia Supreme Court ultimately ruled against the county, but by then market conditions had changed, and Norfolk Southern hasn’t moved forward.

In recent years, state lawmakers asked for funding to study whether an area on U.S. Route 58 near Danville or somewhere in the Roanoke and New River valleys could work as sites for inland ports, but those bills failed to make it out of the General Assembly.

In 2022, though, legislators approved funding for a state study to determine feasibility of a new inland port in Southwest Virginia or the Lynchburg region.
Robert Martinez, vice president for freight and economic development at global advisory firm Moffatt & Nichol, found while conducting the study that the idea of establishing a port in the Mount Rogers Planning Region had statewide support.

“There does seem to be quite a good echo in the General Assembly, including from folks who are not in Southwest Virginia, who say, ‘That’s kind of a good idea for Virginia,’” Martinez says.
Moffatt & Nichol’s data, used by the port authority and the Virginia Economic Development Partnership to complete the report, showed that the Lynchburg area didn’t “currently have the demand to justify the development of an inland port,” but Southwest Virginia meets “enough market-driven and physical conditions to warrant additional assessment.”

A new inland port could help entice businesses that have previously bypassed Virginia for ports further south, points out Will Payne, managing partner of consulting firm Coalfield Strategies LLC and head of business development for InvestSWVA, a business-attraction campaign for the region.

"The real coup would be grabbing freight business from northeast Tennessee that currently heads to Charleston," he says. "Virginia's port simply offers a better business proposition. We just need to convince [company executives] of that."

The study confirmed what O'Quinn already understood.

"We've known all along that we are in a really good location for transportation and logistics," the delegate says. "We're a day's drive from 60% of the United States. We're less than two hours from five different interstates. We're in a pretty sweet spot here." continued on page 6
Thoughtful planning

Moffatt & Nichol selected two locations where an inland port would work in Southwest Virginia but did not identify the sites in the study. According to Pillion, one of the sites is Washington County's Oak Park Center for Business and Industry, a 338-acre property along U.S. 11. He declined to name the second location, other than to say it's in Wythe County.

The nation's first inland port, Virginia Inland Port was established in 1989 in Warren County. Photo courtesy Port of Virginia

In January, Washington County's Industrial Development Authority voted to "donate all acreage necessary" in Oak Park for the new inland port. Later in the month, Washington County supervisors passed a resolution in support of establishing an inland port in the county.
It may be too soon to plan a groundbreaking ceremony, though. Devon Anders, president of Mount Crawford-based InterChange Group Inc. and a board member for the Virginia Maritime Association, cautions that careful planning will be key to building a successful inland port in Southwest Virginia.

"It's worthwhile to continue to pursue [it]," he says, but "I would not just go there and put one in just because it looks like it's a good location on Interstate 81."

Will Fediw, vice president of industry and government affairs for the Virginia Maritime Association, agrees with Anders' assessment. "The VEDP and the port authority will now basically have to figure out the best way to thoughtfully move forward with some sort of study in partnership with some of their stakeholders — like the railroad [and] their customers who are moving cargo — to figure out exactly what's the right design," he says. "When is the right time for this type of potential inland port?"

The feasibility study noted that an inland port would need to make at least 20,000 freight transfers per year for the port to succeed. In the Mount Rogers area plus the broader geographic market of Giles and Pulaski counties and northeastern Tennessee, the study's authors say, an inland port in Southwest Virginia could generate that volume.

Spokespersons from both the Port of Virginia and VEDP declined to comment for this story.

O'Quinn says VEDP and the port authority are currently identifying companies that would use a Southwest port, as well as whether they'd provide enough business to make the port cost-effective. As for Pillion and himself, O'Quinn says it's time for action on a state level.

"We actually just said flat-out to some people, 'I'll tell you one thing we're not going to do and that is study this again, because here it is. The information is fresh. It's going to work.'"

Some Of Southwest Virginia's Tech Hub Ideas Don't Meet Requirements

By Dwayne Yancey
Cardinal News
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Supreme Court justices argue over "originalism." What did the founders mean when they wrote such-and-such into the Constitution? Or can that meaning change over time? We will not settle that question today. In fact, we won't even take it up. But I raise the concept as an entry point into the second part of my two-part examination of the prospects of Southwest Virginia making a bid for one of the 20 regional technology hubs that the federal government intends to designate – and then reward with lots of cash.

As I've pointed out in previous columns, there are conflicting interests among some of those in the region. Virginia Tech wanted to lead a bid based on transportation technology, for instance. U.S. Sen. Mark Warner, D-Virginia, doesn't think transportation is a strong pitch — and he was co-sponsor of the legislation, so he ought to know. Others don't necessarily want Virginia Tech leading any bid; they fear it would be based too much on academic research, and not on creating jobs in the community. Warner has effectively sided with those: The point of the legislation isn't to raise Virginia Tech's standing as a research university, it's to grow additional technology hubs around the country. With that in mind, let's look at the law in light of some of the questions surrounding Southwest Virginia's possible bid.

We need a group to make a bid

The law says that "eligible consortia" may apply (more on what makes a group eligible to come below). The law says that one of the purposes of the legislation is to "encourage new and constructive collaborations among local, State, Tribal, and Federal government entities, institutions of higher education, the private sector, economic development organizations, labor organizations, nonprofit organizations, and community organizations that promote broad-based regional innovation initiatives." The clear meaning seems to be that no one group can or should "go it alone." The law wants to see wide-ranging alliances.

It's hard to imagine a winning proposal without Virginia Tech.

The law says that a consortium must include at least one of the following (and I'm abbreviating here) five entities:

1. An "institution of higher education."

2. State or local governments, or some other configuration of government entities.

3. "Industry or firms in relevant technology, innovation or manufacturing sectors."

4. "Economic development organizations or similar entities that are focused primarily on improving science, technology, innovation, entrepreneurship, or access to capital."

5. "Labor organizations or workforce training organizations."

My read on this: While a consortium only needs one of these things to be eligible, it's probably safe to assume that a bid would be stronger if it included more than one. Given Virginia Tech's prominence in the region, it's hard to imagine a bid without Virginia Tech being involved. If I were a Commerce Department official looking at a bid from Southwest Virginia and Virginia Tech wasn't involved, I'd sure want to know why.

We'd be better off if a bid included a lot of very specific partners
The law also lists 13 other things that a bid "may" include:

1. Economic development organizations "with relevant expertise."

2. "Organizations that contribute to increasing the participation of underserved populations in science, technology, innovation and entrepreneurship."

3. "Venture development organizations."

4. "Organizations that promote local economic stability, high-wage domestic jobs, and broad-based economic opportunities, such as employee ownership membership associations or state or local employee ownerships and cooperative development centers, financial institutions and investment funds."

5. Elementary schools and secondary schools, including career and technical education schools.

6. Any of the Energy Department's 17 national laboratories.

7. Federal laboratories.

8. Manufacturing extension centers.

9. Manufacturing USA institutes.

10. Transportation planning organizations.

11. Cooperative extension services.

12. "Organizations that represent the perspective of underserved communities in economic development initiatives."

13. Institutions receiving awards under the CHIPS and Science Act.

Now, the operative word here is "may." There's no requirement that any of these 13 entities be partners. However, I have to wonder if this is akin to your spouse asking you to take out the trash. It may be phrased as a question but it's not really a question. If I were giving advice here — which I suppose I am — I'd be looking for some partners that fit some of these categories. Some we don't have (national energy labs, for instance). Others are easy (cooperative extension services). Without treading too far into politics, I'd just point out item 12 — organizations that represent "underserved communities." We're dealing here with a Democratic administration; this may not be boilerplate language but something we ought to take seriously. To some extent, all of Southwest Virginia is an underserved community but that may be a broad definition that Washington won't buy. So who in Southwest Virginia fits that criteria — and are they on board?

We need a bid to fit one of 10 technology sectors

The law also lists 10 "key technology focus areas" that tech hubs are intended to promote. They are (and these definitions are taken straight from the text of the law):

1. Artificial intelligence, machine learning, autonomy, and related advances.
2. High performance computing, semiconductors, and advanced computer hardware and software.
3. Quantum information science and technology.
4. Robotics, automation, and advanced manufacturing.
5. Natural and anthropogenic disaster prevention or mitigation.
6. Advanced communications technology and immersive technology.
7. Biotechnology, medical technology, genomics, and synthetic biology.
8. Data storage, data management, distributed ledger technologies, and cybersecurity, including biometrics.
9. Advanced energy and industrial efficiency technologies, such as batteries and advanced nuclear technologies, including but not limited to for the purposes of electric generation (consistent with section 15 of the National Science Foundation Act of 1950 (42 U.S.C. 1874).
10. Advanced materials science, including composites 2D materials, other next-generation materials, and related manufacturing technologies.

This is likely why Warner didn't think Virginia Tech's transportation pitch would be a good bid; transportation isn't one of these 10 areas. Maybe things under that transportation umbrella would fit — batteries under advanced energy, or the robotics, automation and advanced manufacturing section — but transportation itself isn't part of this bill. Pulaski County has been pushing controlled-environment agriculture, i.e., indoor agriculture, but agriculture isn't listed either. As with transportation, you'd have to fit that under another heading; would that really work for this?

So what do we have that fits? We certainly have biotech companies in the Roanoke and New River valley but Warner seems to think a bid from a less affluent area would do best. We have nuclear technology in Lynchburg. We have coal country looking at a wide range of energy options — including nuclear. No wonder that the delegation from InvestSWVA felt their energy-focused interest would be the strongest bid.

Those are the original sources. The next best thing is to see what the people actually administering the program have to say. For that, we have at least three clues:

The Commerce Department wants to see 'rapid, self-sustaining growth.'
The department hasn't released the formal rules for bids yet – that is expected this summer – but it did recently put out a one-page sheet describing the program. It's hard to tell if those words mean anything or not. Again, let's err on the side of caution and assume they do. The department says: "The program seeks to propel high-potential regions throughout the U.S. into rapid, self-sustaining growth." Here's a reality check for any proposal: Is the region "high potential"? And will the proposal lead to "rapid, self-sustaining growth"?

Commerce Department also talks about metro areas, not rural areas.

A separate one-page fact sheet from the Commerce Department emphasizes once that again "only consortia are eligible" but then goes on to say "For the Tech Hubs Program, EDA defines a Hub's geography as a single Metropolitan Statistical Area (MSA). Consortia may include assets or members outside that MSA — e.g., in nonmetro rural areas or distant but tightly integrated organizations — that support the consortia's strategy and benefit the Hub."

So does this mean an application must include an MSA? Or could a application be put together entirely by a rural area that included no MSA? I've asked the Economic Development Administration for a clarification but the response back didn't answer the question; a spokesman just said that the final rules would be published sometime in May. These questions seem important. If the application must include an MSA, then we're talking either Roanoke, Lynchburg, the New River Valley or Bristol-Kingsport. Three of those four are over the 250,000 population cap for the small community category so that would put us into competition with Buffalo and such. The only one lower is the New River Valley, and Warner is concerned that its relative affluence would not help a bid.

'Distressed communities' aren't good candidates for a tech hub

I found a potentially telling interview that Alejandra Castillo, the assistant Secretary of Commerce for economic development, gave recently to the Federal News Network. She had some things to say that might be sobering for some of those in Southwest and Southside. She seemed to make it clear that the Commerce Department isn't looking to grow tech hubs from scratch, it's looking to accelerate the growth of what's already there. "We're looking at regions that have an array of assets that can actually be, in some ways, futuristic, if you will," she said. "Because these are industries that are still in a phase that with a certain level of infusion of resources and capital, they can get to that next level of growth and scalability."

Interviewer Tom Temin described parts of the country that sound a lot like parts of this side of Virginia. "There are areas of the country that once had hubs, maybe not Tech Hubs, but maybe it was textiles, maybe it was shoe manufacturing. All of these industries that are pretty much gone for the most part. And yet, you have an area and you still have people, but you don't have those Tech Hub, maybe ingredients. There's no famous engineering school nearby. Is it the sense of commerce? Your sense that investments can be made for where there is only the willingness and the workforce. But yet, somehow, spawn the other ingredients needed to have a really vibrant hub that has sustainability."

The question there is more implied than actual: Can one of those communities that once were a hub for a particular industry but don't have "a famous engineering school" nearby be considered for a tech hub?

Castillo, in her answer, turns the conversation to a different program the Commerce Department is administering, the Recompete Act, that would direct funds to such communities. They'd be better suited for those funds than putting in a bid for a tech hub. "It's important to note we're working on Tech Hubs where there may be some ingredients, some assets, some elements that can actually spring up a technology of the future," Castillo said. "It would be irrational to think that a community that has been distressed for 30, 40 years is all of a sudden going to become a Tech Hub."

So . . . what does that mean for those pushing Virginia's coal country? Are they wrong? Is Warner wrong when he suggests that a Southwest Virginia bid shouldn't be anchored in Montgomery County because it's already gifted with Virginia Tech? What would Castillo think? Would she see coal country as "a community that has been distressed for 30, 40 years" or a community that has "some ingredients, some assets, some elements that can actually spring up a technology of the future"? Or would she see the New River Valley as more likely to have what it takes to have "rapid, self-sustaining growth"? Or does it matter what she thinks if Virginia has one of the co-authors of the bill lobbying for a particular community? These are questions we need to think through carefully.

Also of note, Warner pointed out in his interview with me that the legislation was meant to spread the nation's technology sector around the country. "I think there would be appropriate howls of protest if Northern Virginia got a tech hub or Cambridge [Massachusetts] got a tech hub or Palo Alto [California] got a tech hub," he said. However, Castillo, the assistant secretary, recently gave an interview in which she said Washington, D.C. metro — sometimes called DMV for District, Maryland

and Virginia — might make a good tech hub. In an interview with Technical.ly, she was asked specifically about that. She said: "When we look at the DMV area, you could see how potentially the DMV area could have those economic drivers to come together and maybe go after a tech hub designation and funding," Castillo said. This is in direct contradiction to what Warner said — and, it would seem, the spirit of the law. So whose view will prevail here?

Last fall, he was in Chattanooga, where he praised that city's efforts. "Chattanooga regionally could be a big contender to be one of these regional hubs," Khanna told the Chattanooga Times Free Press.

Khanna was instrumental with this legislation on the House side. If Southwest Virginia is serious about a tech hub bid, maybe some of those community leaders who met with Khanna in Blacksburg last summer should renew that acquaintance and seek his help, as well? It sounds as if Chattanooga might be doing just that.

In the course of researching these last two columns, I came across examples of other communities prepping themselves to bid for tech hubs. Fortunately, from our point of view, some of these are outside our EDA zone so they're not direct competitors, but we might still learn something from them.

In Buffalo, which would be one of our competitors because it's in the same Economic Development Administration zone, the head of the city's economic development agency says "we're prepared to submit an application as soon as we know what we're applying for."

In Chattanooga, the mayor seems to be leading the bid – at least he's one quoted most prominently in the local news media about the subject.

In Cincinnati, the city's economic development agencies seem to be leading the process.

In Montana, U.S. Sen. Jon Tester convened a roundtable in February to talk about ways that Missoula — home to the University of Montana — could make a bid. He followed up with a letter to the Secretary of Commerce urging that Montana be selected.

Here's my takeaway: In all four places, it's clear who's in charge. That's not the case in Southwest Virginia — at least not yet. We thought it was (Virginia Tech) but that got swatted down. So if it's not Virginia Tech, who has the convening power to get the right parties at the table? Is it some configuration of state legislators? Is it U.S. Rep. Morgan Griffith? Is it Governor Glenn Youngkin? Or does Warner need to take an even stronger hand than what he's done so far (which felt pretty strong-handed to some in that initial meeting)?

My original column after Warner's meeting concluded with "the clock is ticking." It still is. Commerce Department Opens Bids For Regional Tech Hubs. Are We Ready?

Dominion Official Touts Potential Of SMRs

By David McGee
Bristol Herald Courier
May 10, 2023

Virginia's largest power producer views modular nuclear reactors as a potential way to meet forecast increases in baseload demand.

On Tuesday Emil Avram, vice president of business development for Dominion Energy, discussed his company's new long-term plan and the state of the current energy market during a meeting of the Southwest Virginia Energy Research and Development Authority at the Higher Education Center.

"We are currently developing advanced nuclear facilities here in Southwest Virginia, working with the state government and others," Avram told the authority board.
Its plans include a mixture of natural gas, oil, nuclear, renewables, coal and purchased power with phasing out of the carbon sources over a period of years.

He said Dominion expects to deploy 33,000 new megawatts of total generation in the next 25 years.

"This is a tremendous task, a lot of work to do here. You can imagine the jobs, the tax benefits, the economic development opportunities. This will bring manufacturing and services companies to Virginia to meet this demand. It's a great opportunity for our state and represents tens of billions of dollars of investment over this plan horizon."

Dominion currently operates traditional nuclear power plants in eastern Virginia but is looking at the SMR — smaller reactors used to power nuclear submarines and aircraft carriers.
"We are exploring SMRs," Avram told the Bristol Herald Courier after the meeting. "That typically is in the range of 250 to 450 megawatts. Our traditional nuclear stations generate about 900 megawatts per unit."

Last fall, Gov. Glenn Youngkin issued a challenge for Virginia to become the first state to adapt that SMR technology to land use to provide electricity for the power grid and to site the first one in Southwest Virginia.

Since that time multiple bills emerged from the General Assembly to fund education and promote development of the technology

Avram listed some advantages that the SMRs offer.
"They're more compact, they're modular so a lot more can be built in the factory — which reduces costs — and because of the smaller footprint and the way the technology is being developed, they have a much smaller impact on land use and surrounding communities," he said. "There are a lot more opportunities to site them in more places so it's an exciting opportunity."

Dominion operates two reactors at its North Anna power station which produce about 1,800 megawatts and occupies about 750 acres.

"An SMR facility would only take about 50 to 75 acres," he said. "You can probably operate an SMR facility with about 100 full-time employees. At our North Anna station, we're approaching 1,000 employees. That's a cost savings but still a fair amount of high tech, well-paying jobs that can be added to our fleet."

Dominion's new plan submitted to the State Corporation Commission on May 1, forecasts "dramatically higher" power load demand in the years ahead, almost exclusively due to new data centers in northern Virginia.

"The type of customers causing that load growth are data centers. Those are always on — at full output — full demand essentially," Avram said. "That's why new nuclear is a nice complement to that because it is always on."

Dominion is also presently developing the largest offshore wind energy facility in America off the coast of Virginia, but its "all-in" energy plan includes natural gas, renewables and purchased power. However, the winter storm last Christmas caused utility officials to review and revise plans because that demand was abnormally high and sustained over a period of more than two days.

Two options in Dominion's plans forecast dramatic increases in energy storage capacity and incremental nuclear capacity additions over the next 15 and 25 years.
"The reason everyone is looking at nuclear is it can be based here — they can project what the cost is going to be versus being in a lottery for peak demand when you have to buy power," authority Chair Mike Quillen said. "The utilities don't want to put themselves in that position. There is no clear pathway right now and there is a lot of work to be done."

Commerce Department Opens Bids For Regional Tech Hubs. Are We Ready?

By Dwayne Yancey
Cardinal News
May 12, 2023

The great philosophers Mick Jagger and Keith Richards once wrote an obscure song that went like this: "Once in a while, let's get our act together." The Rolling Stones never recorded it but Ronnie Woods did on one of his solo albums and, beware, the rest of the song is NSFW, as they say.

Regardless, that's our theme song for today — at least that particular line.

I've been writing for more than a year now about the opportunities presented by the regional tech hub concept, which last year's CHIPS and Science Act authorized. The short version goes like this: The nation's technology sector is driving the technology but is concentrated in just a handful of places. "Almost 80% of American venture capital is invested in just three regions: the San Francisco Bay area, the Northeast Corridor and Southern California," says U.S. Secretary of Commerce Gina Raimondo. Over the past decade, 90% of technology jobs have gone to just five metro areas: the San Francisco-Silicon Valley area, Seattle, New York, Boston and Los Angeles.

One of the goals of the CHIPS Act is to spread that economic growth around by designating at least 20 "regional technology hubs" that the federal government would shower with funds. By law, at least three must be in each Economic Development Administration region, which, for our purposes, means at least three between Virginia and Maine. It further specifies that no fewer than one-third significantly benefit a "small or rural community," which it defines as "a noncore area, a micropolitan area, or a small metropolitan statistical area with a population of not more than 250,000." I've written more times than I can count why some part of Virginia west of Charlottesville would seem to stand a good chance of winning one of these designations.

U.S. Sen. Mark Warner, left, and Blacksburg attorney and former Warner aide Jeff Mitchell, after the meeting at the Virginia Tech Corporate Research Center. Photo by Dwayne Yancey
U.S. Sen. Mark Warner, left, and Blacksburg attorney and former Warner aide Jeff Mitchell, after the meeting at the Virginia Tech Corporate Research Center. Photo by Dwayne Yancey.
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I'm obviously not alone in thinking this. Virginia Tech had been leading an effort to put together a bid based on transportation technologies. However, last month U.S. Sen. Mark Warner, D-Virginia and one of the authors of the enabling legislation, made it clear that he didn't think the New River Valley would be the best candidate for a tech hub bid — that a proposal rooted in a less affluent part of the state would be looked upon more favorably by the Commerce Department. That would seem to tilt things toward a potentially rival bid led by the Bristol-based InvestSWVA economic development group that's focused on energy. Warner also made it painfully clear that the region, broadly defined, would be better off if there were a single bid and not multiple ones.

That has left some economic development groups in a quandary. At the recent meeting of the GO Virginia Region 2 board, which covers the New River Valley to Lynchburg, there were questions about whether anyone in that region would put together a bid and who would lead it. However, there are divisions within that geographic area. Some in the New River Valley appear to remain interested in a bid focused on transportation, despite Warner's admonition; Volvo in Pulaski County is now producing electric trucks and Virginia Tech has a large transportation research institute, all part of a regional transportation cluster. Meanwhile, InvestSWVA has been talking with Lynchburg officials, hoping to bring them into their proposal on the theory that Lynchburg's nuclear industries fit naturally with an energy bid.

(The working theory behind this possible Southwest-Lynchburg marriage is that the Energy DELTA Lab project in Southwest Virginia is assembling large tracts of land — often former coal mines — for energy research. That research could well include the small modular nuclear reactors that Gov. Glenn Youngkin is pushing — and that might conceivably get built in Lynchburg. For more on the Energy DELTA Lab, see the column I wrote last fall. For more on those small nuclear reactors, see our FAQs and our previous coverage.)

In any case, there's the potential for multiple bids from this part of the state, which is not the unity that Warner had sought, although the momentum seems to be with that Southwest Virginia energy bid just based on the amount of work that group has put in already. Blacksburg attorney Jeff Mitchell, a former Warner aide, has been working to line up regional support behind that proposal. I'm certainly not privy to all the conversations that are taking place, but from what I've been able to determine, there is a keen desire on the part of the InvestSWVA folks to show how a bid centered on the Energy DELTA Lab has implications far beyond coal country, from startups at the Virginia Tech Corporate Research Center to the big nuclear firms in Lynchburg (and potentially beyond). From my outside perspective as a political observer, it seems that the energy bid is in the better position right now to put together a bigger coalition.

Meanwhile, the application clock has started.

On Friday, the U.S. Commerce Department issues its formal "Notice of Funding Opportunity" and begins taking formal applications. The deadline is Aug. 15.

In anticipation of this, Raimondo and other Commerce Department officials held a virtual news briefing Thursday to go over the program. Four news organizations showed up to ask questions: ABC News, CBS News, Politico … and Cardinal News. (If you like this kind of reporting, please remember that we exist only by virtue of donations, so here's your opportunity to support more journalism for Southwest and Southside Virginia.)

Here are the main takeaways from that briefing:

1. There will be winners — and then there will be some big winners.

Sometime this fall, the department will announce the "at least 20" sites called for in the legislation. Each will get a planning grant of approximately $500,000. After that the Commerce Department will invite those sites to apply for implementation funding. Out of those "at least 20" initial winners, the department expects to award $50 million to $75 million across "five to 10" sites. It's unclear what happens to the sites that make the "at least 20" list but aren't in that final "five to 10." Maybe they can qualify for funding later, if Congress appropriates it. Not every winner in this first round, though, wins the grand prize. That would seem to turn up the pressure to come up with a strong bid — because not only does a region need to get into that "at least 20" group, it needs to make it to a final "five to 10" round.

2. A region has to have something to build on.

Put another way, you can't put in a bid to build something from scratch. Well, you can, but it won't get very far. "Let's say your region has a fairly strong presence in the medical device areas," Raimodo said, with companies making and selling them and a local research institution doing research into the field. "Your application would have to bring together the companies, the research institution and stakeholders and together you'd apply for a tech hub grant." The goal, she said, is "to take your region from being a player to being a global leader. So we are aiming to supercharge an existing innovation foundation and make big investments." The question, then, for anyone in our part of the state considering a bid is this: Does that application build on "an existing innovation foundation"?

3. You don't necessarily need to have a metro area as part of a bid.
This information comes from the question I asked, and here's why it's important. A fact sheet the Commerce Department issued recently referred to hubs being built around Metropolitan Statistical Areas, which is a formal designation. In the western part of the state, the Lynchburg area, the Roanoke Valley, the New River Valley and Bristol (joined with Kingsport on the Tennessee side) are MSAs. If tech hubs are restricted to MSAs, that would make it more difficult for the InvestSWVA bid because the land for the Energy DELTA Lab isn't in any MSA.

Assistant Secretary Alejandra Castillo answered my question by saying the department would accept an MSA "or a similar area including micropolitan areas." That's much better news for the Southwest Virginia bid, because Dickenson County, Wise County and Norton are part of the Big Stone Gap Micropolitan Area (think of that as a smaller version of an MSA). The first two sites picked to be part of the Energy DELTA Lab are both in Wise County. If the Southwest Virginia proposal includes Lynchburg, that brings in an actual MSA. "We're asking applicants to define their regions — to tell us what their region looks like," Castillo said. The key thing she said that department officials will be looking for: "We're looking for a concentration of those assets."

4. Winning regions should emphasize "equity."

Castillo said that "our No. 1 priority is equity with those underrepresented in technology and innovation" and that the department wants to make sure that tomorrow's technology "is built by today's ever-growing diverse population." That's not a particularly helpful formulation for Southwest Virginia, which doesn't have a lot of racial diversity. (The Census Bureau lists Dickenson County as 98.1% white. By contrast, Wise County at 91.9% white is a veritable melting pot.) That means a Southwest bid will have to frame equity in a different way — that here's a rural area that's been left behind by a changing economy but nonetheless has the assets necessary for a new economy based on innovative energy technologies that would turn a carbon energy capital into a decarbonized energy capital.

So where do we stand? Kevin Byrd, executive director of the New River Valley Regional Commission, says "as for the NRV proposal, it is premature to discuss publicly at this point. The economic

developers in the region met last Friday and have another meeting scheduled for this Friday. So, we're continuing to discuss and will know more about our direction once we are able to review the guidelines from EDA."

Meanwhile, Will Payne of InvestSWVA says this: "We took Senator Warner's guidance seriously and are finalizing a draft concept that builds on four years of the Energy DELTA Lab's work. The Lab relies on the more efficient private sector to lead innovation, which allows for more private investment. That lean model eliminates unproductive spending including administrative overhead."

One of the subtexts at Warner's recent meeting with regional officials to talk about tech hubs is that many were unhappy with Virginia Tech being the lead partner because they think Tech takes too much of the money. However, the enabling legislation for tech hubs requires affiliation of some sort with higher education. No doubt with that in mind, Payne goes on to say: "Universities and community colleges will be critical to our project's success. We just want to be the best stewards of public dollars, which will result in more innovation. We are already executing on our concept of leveraging former mines lands and assets for clean energy projects, so the hub funding would only accelerate our efforts. The Lab's work will continue regardless. And, if I heard Senator Warner correctly, the point of the hub is to scale what is already working. The DELTA Lab and its public and private partners are working a large portfolio of clean energy projects across the spectrum of power generation and related industrial co-location opportunities. Clean energy workforce training, supply chain development and deployment are critical to transforming Southwest Virginia's economy. We have the tools and the talent, and now we can build a broad coalition including communities across the Commonwealth with established energy industries like Lynchburg and Newport News."

I wouldn't normally use such a long quote but I suspect there are some coded messages in there to someone, so in the spirit of being the messenger, I will pass on the full message for whoever wants or needs to hear it.

So, bottom line, here's what we know: The Commerce Department starts taking applications Friday. The New River group is meeting Friday. A group interested in the Southwest proposal is meeting Monday. How many applications will we wind up with and how strong will they be? We'll know the answers to that come fall.

Study: SW VA prime site for small nuclear reactors

By Jeff Keeling
WJHL
May 22, 2023

At least seven large sites in Southwest Virginia would compete well in a bid to host one or more small "modular" nuclear reactors, a just-released feasibility study shows.

Dominion Engineering Inc. (DEI) of Reston, Va.'s 116-page study was completed for partners that have been pushing for economic growth inside the formerly coal-dominated LENOWISCO Planning District. Grants from Virginia Energy and GO Virginia Region 1 helped fund the study, which suggests the region that's been hard-hit economically could gain a huge economic boost if one or more small modular reactors (SMR) were located there.

"On a variety of factors, socioeconomic, proximity to existing infrastructure, safety … I think the main takeaway is that this community is extremely attractive for one of these facilities," DEI President Mike Little said at a news conference at LENOWISCO headquarters. Lenowisco covers Lee, Wise and Scott counties and the city of Norton.

Several of the sites are on abandoned mine lands, including a huge one, the Bullitt Mine Complex west of Big Stone Gap, where area leaders envision the potential for several modes of clean energy production including potentially multiple SMRs.

LENOWISCO Planning District Executive Director Duane Miller said the study results show the potential for job and income-generating projects in an area that has been hard-hit by the coal industry's decline.

"Small Modular Reactors have the potential to provide a source of safe, stable, and sustainable energy, enabling transformational economic growth, improving quality of life and complementing the region's existing energy generating portfolio," Miller said.

The study found all the sites met basic Nuclear Regulatory Commission (NRC) requirements for SMRs, which are estimated to create 40-60 permanent jobs each along with hundreds of construction jobs. The reactors typically produce about 300 megawatts of electricity, which is enough to power about 150,000 homes.

DEI's Little said similar feasibility studies are occurring around the country but that the seven regional sites — DEI also reviewed four sites outside the region — were strong in every major important category including:

"When we look across the country at the projects where this has been looked at, this particular community ranked as high or higher than almost any other project that's currently either under consideration or under construction," Little said.

Virginia Delegate Terry Kilgore (R-Gate City), the House majority leader, said the study is timely given Gov. Glenn Youngkin's October 2022 promise that Virginia would "launch" an SMR in Southwest Virginia within 10 years.

"To know that we're in the game, that we have the opportunity to be in the game, I think that says it all," Kilgore said.

He said Southwest Virginia can help the Commonwealth as it moves toward a clean energy economy.

"We have a lot of the brownfield sites here in Southwest Virginia, we've got a lot of folks that … already have those skills that are necessary to move these jobs forward," Kilgore said.

Two large energy companies that operate in Virginia, Dominion and AEP, both have shown strong support for nuclear power as part of their energy portfolios, with Dominion projecting one per year could be built starting in 2034, the study found.

Each SMR could provide up to $100 million in new local tax revenue over an 18-year period, the study found. The SMR plants, which have a design life of 60 years, provide about half their jobs to people who don't have a bachelor's degree.

"It's really a generational anchor for the economy," DEI's Chuck Marks said.

The rise of large data centers, which use huge amounts of power, make it likely that some will co-locate near SMRs and be among their main customers. The Bullitt Complex site covers several thousand acres and is also being studied for potential data center locations as well as other alternative energy production such as wind and solar, InvestSWVA's Will Payne said.

He said sites like the Bullitt Complex have billions of gallons of water underground in the abandoned mines that is a constant 52 degrees Fahrenheit and could be used to create a closed-loop system for cooling both data centers and SMRs.

InvestSWVA, Energy DELTA Lab and the Southwest Virginia Energy Research and Development Authority all were involved in the project.

Southwest Virginia Is A 'Competitive Hosting Ground' For Small Modular Nuclear Reactors, Study Finds

By Susan Cameron
Cardinal News
May 22, 2023

A feasibility study that identifies seven potential sites has determined that far Southwest Virginia has the capabilities to be a "competitive hosting ground" for small modular nuclear reactors, officials with the LENOWISCO Planning District Commission announced Monday.

"This particular community ranks as high or higher than almost any other project that's currently either under consideration or under construction toward putting one of these facilities in place — so

very high marks in that regard," said Mike Little, president of Dominion Engineering Inc. of Reston, which was hired to conduct the study. (Dominion Engineering is not related to Dominion Energy).

The study also suggests that a small nuclear reactor, or SMR, be developed along with a data center because they are "synergistic industries." An SMR needs a customer for its power and data centers need clean, reliable energy, the study states.

A news conference announcing the results of the study was held Monday at the LENOWISCO office in Duffield and via Zoom.

The analysis took place over three months and looked at technical feasibility, safety considerations, economic viability and preliminary sites in the LENOWISCO area of Lee, Wise and Scott counties and the city of Norton, plus Dickenson County.

It was funded by the Virginia Department of Energy and GO Virginia Region One.

"We are thrilled to have completed this study, which holds great promise for transforming the energy landscape not only in Southwest Virginia but throughout the Commonwealth of Virginia," Duane Miller, LENOWISCO's executive director, said in a news release. "Small Modular Reactors have the potential to provide a source of safe, stable, and sustainable energy, enabling transformational economic growth, improving quality of life and complimenting the region's existing energy generating portfolio."

Last October, Gov. Glenn Youngkin announced he planned to put an SMR in Southwest Virginia as part of his new energy plan within 10 years. He said that it would be an economic boon for an area hit hard by the downturn in the coal industry, and that former coal mine land could be used for an SMR site.

SMRs are smaller, simpler versions of traditional nuclear reactors that produce about a third of the power produced by the big reactors. They can be built in a factory and shipped to a site, which saves construction time, reduces the risks and is cheaper.

A week after the governor's announcement, LENOWISCO officials got busy raising money for the study so they could be prepared, Miller said.

The region is in a "prime position to attract new industries with inexpensive brownfield sites, mine water for cooling, existing right of way to transmissions infrastructure and existing rail infrastructure," the study found. Because there are a number of vacant mining operations in the area, it also has the people needed and the infrastructure needed for "large civil construction projects," according to the study.

The seven potential sites involved in the study were:

Bullit Mine complex in Wise County
Limestone Mine, Scott County
Lee County abandoned mined land site near the Wise County border
Mineral Gap-Lonesome Pine Park in Wise County
Project Intersection in Norton
Red Onion in Dickenson County
Virginia City Hybrid Energy Center in Wise County

A variety of diverse sites were included in the study as representative of what's available in the area: some larger, some smaller, some nearer to population areas and others with better connectivity. However, Miller said there are more than 100,000 acres of abandoned mine land in the area and other sites may be found and considered.

Selection of a site is a formal and lengthy process dictated by the Nuclear Regulatory Commission and it can take a year or two, said Chuck Marks with Dominion Engineering.

He added that it's possible that half a dozen SMRs will be operating in far Southwest Virginia in 20 years as this country makes an energy transition toward cleaner power.

"Even one of these plants, let alone multiple plants coming to a region like this, can serve as an economic anchor for generations," Marks said, adding that many of the jobs won't require a college education and those that do won't have to be nuclear engineers.

The study also looked at the competition — prospective SMR sites that are outside Southwest Virginia:

The next step will be seeking community involvement so everyone can learn more about SMRs, with Virginia Energy likely taking the lead role in community engagement and outreach, according to the study. There will also be close collaboration with stakeholders, including the public, local businesses and community leaders, Miller said.

Marks said the feasibility study released Monday represents the "very early stages of, does this region have what it takes to site one of these reactors, successfully deploy and successfully operate. And the answer is overwhelmingly yes."

Southwest Virginia Ideal For Small Nuclear Reactors, Study Says

By Robyn Sidersky
Virginia Business
May 22, 2023

Sites in Dickenson, Lee, Scott and Wise counties and the city of Norton would be “ideal” for installing small modular nuclear reactors (SMRs), according to a state-funded feasibility study released Monday.

Examining the technical feasibility, safety considerations and economic viability of locating small reactors in Southwest Virginia, the study conducted by Reston-based Dominion Engineering Inc. deemed Southwest Virginia a “competitive hosting ground for SMRs.”
The region is “in a prime position to attract new industries with inexpensive brownfield sites, mine water for cooling, existing right of way to transmission infrastructure and existing rail infrastructure,” according to the $150,000 study, which was commissioned by the LENOWISCO Planning District Commission and funded by the Virginia Department of Energy and GO Virginia Region One.

“The main takeaway,” said Dominion Engineering President Mike Little, “is that this community is extremely attractive for one of these facilities. It’s not just one … factor that makes it attractive. It’s broadly distributed across all of those categories. … There’s existing infrastructure here.”

The state-funded study bolsters Virginia Gov. Glenn Youngkin’s push for nuclear energy to be part of the state’s green energy framework, the Virginia Clean Economy Act, which was passed by the General Assembly in 2020. In October 2022, Youngkin announced a goal of bringing a small nuclear reactor to Southwest Virginia within 10 years — despite the fact that the only currently operational SMR is in Russia. The idea of nuclear energy being a bridge between fossil fuels and renewable solar and wind energy sources has support from both Republicans and Democrats.

Last fall, Youngkin proposed allocating $10 million to create the Virginia Power Innovation Fund, with $5 million going toward the development of an SMR, but the legislature isn’t completely on board. A bill to establish a small nuclear reactor pilot program failed in the General Assembly this session, but nuclear energy is still a hot topic among state energy stakeholders.

“The study affirms the governor’s initiative to deploy SMRs in Southwest Virginia and their advantage in the region,” Youngkin’s spokeswoman, Macaulay Porter, said this week. “As the governor has said, the Southwest has a talented, generational energy workforce, a best-in-class training pipeline through local colleges and community colleges, and a unique geography that makes it among the best locations for research and development of advanced nuclear technologies.”

The seven potential SMR sites identified by the study are:

Bullitt Mine Complex, Wise County
Vacant limestone mine, Scott County
Abandoned mine land site, Lee County near Wise County border
Mineral Gap/Lonesome Pine Regional Business and Technology Park, Wise County
Project Intersection (188-acre surface coal mine site at U.S. 23 and U.S. Alt 58), Norton
Red Onion Industrial Park, Dickenson County
Virginia City Hybrid Energy Center power station, St. Paul

In a statement Monday, Virginia House Majority Leader Terry Kilgore, R-Gate City, called the site and feasibility study "the next step in making Gov. Youngkin's 'moonshot' goal of making Southwest Virginia the home of the nation's first SMR within 10 years a reality."

The two major utilities providing power in Virginia — Richmond-based Dominion Energy Inc. and American Electric Power Inc. (AEP) — have expressed support for developing nuclear projects in the region, according to the study. In a plan released in January, Dominion stated that it "anticipates SMRs could be a feasible supply-side resource as soon as the 2030s."
At least 70 commercial SMRs are in various stages of development worldwide, but only one in Russia is operational. In the United States, the U.S. Nuclear Regulatory Commission approved just one SMR design, from Oregon-based NuScale Power Corp., in summer 2022.
SMRs are designed to generate up to 300 megawatts per unit, about one-third of the capacity of conventional nuclear reactors, such as the North Anna and Surry power stations owned by Dominion Energy Inc. in Virginia, which power nearly 900,000 homes.

Supporters see SMRs as a solution to climate change because they don't emit greenhouse gases, unlike gas- and coal-fueled power plants. And unlike wind or solar energy, nuclear reactors aren't dependent on the elements and don't require battery storage. However, critics say that large nuclear plants are too expensive to build and maintain, and it will take too long for SMRs to address climate change, as well as prompting safety concerns about radioactive waste and accidents.

A May 2022 study led by a Stanford University scientist published in the Proceedings of the National Academy of Sciences found that SMRs would likely create more nuclear waste — by a factor of up to 30 — than conventional reactors. However, a second study released in November 2022 by the Argonne and Idaho national labs said the amount of nuclear waste produced by SMRs would be about the same as waste produced by large light water reactors.
Virginia's study on the viability of Southwest Virginia as a future home for SMRs "gives us third-party validation that Southwest Virginia is in the running, based on the land attributes necessary for deployment of SMRs," said Will Payne, managing partner of consulting firm Coalfield Strategies LLC and head of business development for InvestSWVA, a regional business attraction campaign that focuses on adapted reuses for abandoned mine land.

"Southwest Virginia has and always will be an energy community," Payne said, "and we believe that our land position makes us more competitive than other energy communities around the country."

The primary reason many Southwest Virginia stakeholders are keen on SMRs is the economic impact such a project could have on the region. With the decline of coal mining jobs in Appalachia, the Southwest region has lost good-paying jobs and seen its population numbers decrease as a result.

"It's fair to say deploying one SMR will absolutely transform this region's economy because of the significant capital investment," Payne said.

A 300-megawatt SMR would be expected to require a capital expenditure of about $1 billion, creating 40 to 60 permanent jobs and hundreds of temporary construction jobs, according to the study, and would provide more than $100 million in new local tax revenue over about 20 years. However, the report also confirmed that it could take 10 years for the first SMR to be operational in the region.

“We are thrilled to have completed this study, which holds great promise for transforming the energy landscape not only in Southwest Virginia but throughout the commonwealth of Virginia,” LENOWISCO executive director Duane Miller said in a statement. “Small modular reactors have the potential to provide a source of safe, stable and sustainable energy, enabling transformational economic growth, improving quality of life and complementing the region’s existing energy generating portfolio.”

SMR Site Feasibility Study Yields Good News For Southwest Virginia

By David Ongie
Tri-City Business Journal
May 24, 2023

Duane Miller, Executive Director of the LENOWISCO Planning District Commission, said a feasibility study into whether his sector of Southwest Virginia spanning the counties of Lee, Wise, Scott and the City of Norton had competitive hosting sites for Small Modular Reactors (SMR) was a step into the unknown.

When the results of that study were announced on Monday, however, seven sites in the area were deemed feasible to house SMRs, which are designed to deliver safe, reliable and clean nuclear energy on a smaller scale. The study, which was funded by the Virginia Department of Energy and GO Virginia One, was commissioned in response to Virginia Glenn Youngkin’s announcement of his “moonshot” goal last fall of having the first SMR up and running in Southwest Virignia within a decade.

“This region ranks as high as any in the nation that is pursuing or has SMRs already,” said Mike Little with Dominion Engineering, Incorporated (DEI), the Reston, Virginia-based company that completed the study. DEI assessed factors such as population size and existing energy infrastructure.

The direct benefits of having a 300 MW SMR located in Southwest Virginia were outlined in the study. A typical SMR of that size has a 40-year lifespan and creates approximately 40-60 jobs, not counting the hundreds of construction-related jobs that would be created. Furthermore, the United Staes Department of Energy estimates that a 300 MW SMR would provide over $100 million in new local tax revenue over an 18-year span.

But Miller and representatives from DEI say the benefits of housing a 300 MW SMR in Southwest Virginia is likely to create a positive economic ripple effect that would reach well beyond the reactor site. Several existing initiatives would likely receive a boost from a reactor being located in the area.

The report indicated the Energy DELTA Lab that was recently established near Norton would gain synergy with the development and deployment of SMR technologies. The lab, through Project Oasis, is developing methods of utilizing 52-degree water contained in underground mine pools to help cool the SMRs. Representatives from DEI added that Northern Virginia was already known as the data capital of the world, and the availability of billions of gallons of cool, clean mine water will also be attractive to data centers that need to keep their servers cool.

Representatives from DEI added that Southwest Virginia's long history with the coal mining industry gives the region some built-in advantages other regions of the country don't have when it comes to attracting an SMR and other new industries. For example, many of the prospective sites that showed great promise for housing an SMR were former mine properties. According to DEI, previously mined land is tailor-made for adding new industrial features without much prep work.

Additionally, the infrastructure in place to move coal out of the region – by highway and by rail – is another advantage. Applying for right-of-way for rail or highways can be a major headache. Finally, the human capital in place – a proven workforce – is perhaps Southwest Virginia's greatest asset.

As for next steps, Miller said the LENOWISCO Planning District Commission expects to make an announcement soon regarding an SMR supply-chain study. Meanwhile, Virginia Energy is a likely candidate to take the lead on community engagement and outreach.

Landing an SMR in Southwest Virginia promises to be a long process. Both Dominion Energy and AEP have expressed support for the project, but Nuclear Regulatory Commission approvals prior to construction means it will likely take 10 years before the first SMR is operational.

Miller understands the race ahead is a marathon, but he is thrilled with the head start provided by the cooperation that has already taken place between Lee, Wise and Scott counties, the City of Norton and the stakeholders located within that geographic footprint. "We hit the ground running with this study," Miller said.

Regional Partnerships Powering Economic Resilience in Coal Country

By National Association Of Development Organizations
June 7, 2023

On June 7-9, 2023, 18 local and regional leaders from coal communities across the nation convened in the Southwest Virginia (SWVA) region for a peer-learning journey. This Coalition was launched through the Building Resilient Economies in Coal Communities (BRECC) Community of Practice

initiative, supported by the U.S. Economic Development Administration (EDA) and led by the National Association of Counties (NACo). This was the first of four peer-learning site visits planned for the Coalition over the next two years to provide a platform for coal community leaders to learn and share strategies for economic diversification, resilience, and revitalization. Will Payne, Director of InvestSWVA, is a Coalition member and served as host for this first interactive visit.

"It's an honor to host leaders representing coal communities from all around the country who are equally focused on diversifying their region's economies. I'm proud that we could showcase what Southwest Virginia is getting right," said Will.

Regional planning, partnerships, and collaborative action emerged as key themes for success in rural economic development and resilience.

The Southwest Virginia region is located in the Appalachian Mountains where the far southwest tip of Virginia meets Tennessee, Kentucky, West Virginia, and North Carolina. The rural region has faced economic challenges due to the decline in the coal economy, coupled with declines in tobacco, textiles, and manufacturing. However, SWVA has embarked on a collaborative, regional approach to economic diversification which has sparked success and momentum across a variety of future-forward development projects that were showcased to the national cohort.

Driving collaboration into action and implementing this regional vision in the SWVA coalfields are a collection of innovative entities, including: InvestSWVA, a regional public-private business attraction and marketing entity; LENOWISCO Planning District Commission (PDC), the region's Economic Development District (EDD); and the Lonesome Pine Regional Industrial Facilities Authority(LP RIFA), a unique partnership created to pool resources and share development revenues across four counties and one city and administered by LENOWISCO PDC.

Mineland redevelopment turns unusable liabilities into regional assets.

Reclamation and redevelopment of previously coal mined land has been a major strategy for the region and the peer-exchange showcased project sites in Wise County and the City of Norton, each in different phases of development and targeting different focus areas of investment.

New Energy Technology

The first solar energy development on former coal mined land in Virginia is powering a data center at the Lonesome Pine Regional Business & Technology Park. Attraction of data centers is also major pursuit for development in SWVA.

Energy DELTA Lab, the first-of-its-kind energy technology testbed in the region, will provide former mineland as laboratories to promote energy innovation and drive research towards commercialization and deployment of energy projects, such as hydrogen, geothermal, solar, pumped-storage hydro, and small modular nuclear reactors.

LENOWISCO PDC commissioned a 2023 feasibility study that determined SWVA has capabilities to be a 'competitive hosting ground' for small modular nuclear energy reactors identifying seven potential development sites. The study also identified SMRs and data centers as 'synergistic industries,' as SMRs need a power customer and data centers need clean, reliable energy. SMR development in SWVA was also cited in Virginia Governor Glenn Younkin's 2022 statewide energy plan.

Business Park Development

The aptly named Project Intersection is centered around developing and repurposing a 200-acre former surface coal mine located at a highly visible and heavily trafficked intersection of four-lane highways in Norton, Va. Through site acquisition, removal of a highwall mining feature, and infrastructure development, this previously unusable property is transitioning into a premier business and industrial park campus. EarthLink, a leading high-speed internet provider, will serve as the park's first tenant and will construct a 30,000-square-foot facility to 'reshore' its customer service operations back to the U.S., creating nearly 300 jobs.
Agriculture/Specialty Grains

Through Project Thoroughbred, InvestSWVA and LPRIFA are working with small, family farms to grow malting quality barley and highlight the region's potential to tap into the growing craft beverage industry. Breweries in Virginia have already piloted a variety of beers utilizing SWVA-grown grains. The redevelopment of an abandoned coal loadout facility into a grain processing, storage, and distribution terminal will serve as a regional catalyst in this sector.

Essential funding partners in making these projects come to life have been the U.S. EDA; the Office of Surface Mining's Abandoned Mine Land Economic Revitalization (AMLER) program; state funding partners such as Virginia Energy, GOVirginia, and the Virginia Tobacco Commission; and myriad other federal, local, and private partner funds.

The Coalition also learned about more ongoing regional economic diversification efforts including workforce partnerships with community colleges, telework opportunities, downtown revitalization projects, and tourism initiatives. Tourism initiatives were on full display at the event opening reception at the Birthplace of Country Music Museum in Bristol, while collaborative efforts across 19 counties and five EDDs in advancing tourism and the creative and recreation economy were featured in a panel discussion.

Coal Community Leaders From 10 States Visit Southwest Virginia To Learn From Energy Projects

By Susan Cameron,
Cardinal News
June 10, 2023

Southwest Virginia put on a show of energy and economic development projects last week for 20 officials representing coal communities in 10 states ranging from Montana and Minnesota to West Virginia and Wyoming.

All are members of the Building Resilient Economies in Coal Communities initiative launched by the National Association of Counties last November, and each is looking for ways to revitalize and diversify their own local economy.

The group spent Wednesday through Friday in Southwest Virginia, which was chosen for the first of four "peer exchange site visits" that will take place over the next two years. The trips will be hosted by coalition communities and will be designed to highlight programs and projects underway for economic diversification.

The visit was hosted by InvestSWVA, a public-private economic development initiative whose director, Will Payne, is a member of the initiative.

"It's an honor to host leaders representing 20 coal communities from all around the country who are equally focused on diversifying their region's economies," Payne said. "I'm proud that we could showcase what Southwest Virginia is getting right."

On Thursday, the group traveled by bus to the coalfields to tour some of the projects underway. The first stop was Lonesome Pine Industrial Park near Wise, which is a former coal mine site that is home to the Wise Solar Project.

When asked if there were questions, the first was about the region's interest in becoming home to a small modular nuclear reactor, or SMR. The question came from Marc Kiehna, a commissioner from Randolph County, Illinois.

Kiehna was told about Gov. Glenn Youngkin's statement last October that he wanted to put an SMR in Southwest Virginia within the next 10 years to bring clean energy to the state and jobs to an area that needs it. Local officials promised to share lots of information on the subject.

In an interview later, Kiehna said that a large power plant in his county is shutting down in 2025, which will result in the loss of a lot of jobs and tax revenue.

"I'm here this morning hearing these energy experts talk about how I might replace those revenues, how we can get a stronger tax base by putting solar or small scale nuclear in, and it makes a whole lot of sense to me," he said.

"I'm hopeful I'll come away with some information that I can take back home and let people learn about the cutting edge of what's happening. I'm here to learn about what's happening in other parts of the United States in regard to coal economies that are struggling."

The second stop was the Energy DELTA Lab site near the town of Appalachia. It is an energy testbed focused on using former coal mine land for the commercialization and deployment of innovative energy technologies.

The focus was on the lab's "portfolio approach" to developing projects that are complementary, including solar, wind, hydrogen, pumped storage hydrogen, data centers and SMRs.

Payne; Will Clear, deputy director of the Virginia Department of Energy; and others from the Energy Department talked about the possibilities for the 65,000-acre scenic site, which has one owner.

Daniel Kestner, economic development manager for the Department of Energy, said he often acts as a "matchmaker" between landowners and developers as they search for ways to repurpose the land.

One huge asset the area has is an abundance of underground mine pools filled with billions of gallons of clean water that can be used in a variety of ways, including for industrial manufacturing and a pumped storage hydro energy project, according to Kestner.

Gabe Pena, a BRECC member who is on the town council in Fayetteville, West Virginia, said he was struck by the regional collaboration that's taking place between local and state government and the Department of Energy in Southwest Virginia.

"I think that's very, very important to make significant projects happen and also to leverage resources for these communities in need of an economic boom and investments. So, it's good to see how that works and the different players and organizations and what they bring to the table," said Pena, who said his community struggles with an inability to diversify its economy, an unhealthy population, unskilled workers that make it difficult to draw employers, a lack of access to health care and quality of life issues.

The group then headed to the Big Stone Gap Visitors Center for a panel discussion on leveraging technology and telework to overcome rural barriers and attract new business. They also heard an overview of Project Fuse, the model InvestSWA developed with the Lonesome Pine Regional Industrial Facilities Authority for Lee, Wise, Scott and Dickenson counties and the city of Norton to attract tech companies to rural downtowns.

According to Payne, after InvestSWVA closed deals on expansions by eHealth Technologies and EarthLink, the Fuse model was used to close the deal for Paymerang to expand in Big Stone Gap.

The group also visited the future site of a regional grain terminal in Norton, where they learned about the Appalachian Grains initiative to grow malting-quality small grains for the craft beverage industry. Payne said that $3 million in grants have been secured from the Abandoned Mine Land Economic Revitalization Program and the Virginia Tobacco Commission to build the grain terminal for processing and storage.

Grace Blanchard, the National Association of Counties' program manager for resilient economies and communities, said Friday she was impressed by the three-day event and the instant connections that were formed between people from across the country who have a lot in common.

She added that Southwest Virginia was chosen for the first site visit "really in recognition of the innovative projects and creative partnerships and the regional collaboration that's taking place there right now. The enthusiasm and just momentum in the region is contagious."

Duane Miller, executive director of the LENOWISCO Planning District Commission, said the biggest takeaway he had from the event was how impressed others were by the widespread regional cooperation and partnerships that are taking place in Southwest Virginia.

"We had people from all over the United States come to visit our region," he said. "It was a great opportunity for us to learn from them and I think they learned a lot from us, too, particularly in regard to all these energy initiatives we're working on here."

BRECC Visits Southwest Virginia Counties

By Eric Pages
National Association of Counties
July 3, 2023

If you are looking to understand the complexities and opportunities tied to our ongoing energy transition, Southwest Virginia is a good place to start. The region has been a center of coal production since the late 1800s, and it is now serving as a testbed for new ideas related to regional economic transformation. That's why the Building Resilient Economies in Coal Communities (BRECC) Coalition, NACo's network of 20 coal community leaders, touched down recently in Wise County and the City of Bristol, Va.

BRECC Coalition member Will Payne, managing partner of Coalfield Strategies and director of Invest SWVA, served as the group's local host. Invest SWVA is a public-private partnership that seeks to market local assets and attract new businesses and talent to a region that encompasses 13 counties and three independent cities. While traveling to reclaimed coalfields, walking main streets and listening to local leaders, this visit generated two key lessons for leaders looking to strengthen their local economy:

First, it takes a region. Southwest Virginia sprawls across a large 13-county region that is rural and mountainous. Many places have a history of local turf wars, but local leaders are putting past disputes behind them for a shared vision to help the region recover and thrive. Counties are embracing regional partnerships, like Invest SWVA and the regional Economic Development District — the LENOWISCO Planning District Commission — to receive strategic planning and grant administration support.

One example of this includes the creation of the Lonesome Pine Regional Industrial Facilities Authority (RIFA), which enables Lee, Wise, Scott and Dickenson counties to pool their resources and share development revenues. Collaborating across county lines, the RIFA funded a regional talent attraction plan for tech and remote workers, known as Project Fuse. The authority is also backing the redevelopment of an abandoned coal loadout facility into a grain processing and distribution terminal, which will resolve supply-chain barriers and contribute to the region's promising future in the craft beverage industry.

Second, effective diversification requires diverse strategies. Although the region backs a common vision, local partners are not all doing the same thing. Instead, they embrace multiple strategies and approaches such as small-town revitalization, energy innovation, outdoor recreation, sustainable forestry, entrepreneurship and many more.

In Wise County, a major coal-producing area, the BRECC Coalition viewed a range of innovative projects for transforming abandoned mine lands into new assets, such as alternative energy developments, industrial parks and data centers. This included the Energy DELTA (Discovery, Education, Learning & Technology Accelerator) Lab, where former mine land will become an energy testbed and proving ground for the commercialization and deployment of energy technologies, like solar, hydrogen, geothermal and small modular nuclear reactors.

While energy projects are sparking fresh excitement, localities are also focused on quality-of-life assets and building cultural tourism. In the small town of Big Stone Gap, revitalization efforts, like a vintage service station turned welcome center and a main street pharmacy turned business incubator/coworking space, are not only beautifying the town but also attracting new visitors and residents to the county. Bristol's Birthplace of Country Music Museum, showcasing the area's role in birthing American country music, as well as an organization called the Friends of SWVA are also nurturing a vibrant arts and culture scene.

Southwest Virginia's progress is a beacon of hope for other coal-impacted communities, showcasing the instrumental role that creativity, collaboration and enthusiastic leadership play in economic revitalization.

Lynchburg-Based Team Prepares Nuclear-Focused Tech Hub Proposal

By Matt Busse,
Cardinal News
July 25, 2023

A collaboration involving Lynchburg-area and Southwest Virginia groups will make the case that the region's nuclear industry is the right candidate to receive tens of millions of federal dollars through a new economic development program called Tech Hubs.

With a goal of boosting the domestic economy and national security, the U.S. Economic Development Administration plans to designate at least 20 regional tech hubs across the country, focusing on places that have the assets and potential to be globally competitive within 10 years in areas of "critical technologies" such as advanced energy and manufacturing. The EDA says the selection process will also consider "geographic diversity and equity."

In the program's first phase, for which the application deadline is Aug. 15, each of the 20-plus chosen applicants will get a planning grant of approximately $500,000 or will be designated as a hub but without grant money. During a second phase this fall, initial grant recipients and designees will have the opportunity to compete for at least five grants of $50 million to $75 million each to implement their strategies.

The Lynchburg Regional NITCH (for "Nuclear Industrial Technology Commercialization Hub") proposal builds on work already being done to promote the region's nuclear presence, said Megan Lucas, CEO and chief economic development officer of the Lynchburg Regional Business Alliance. Companies that call the Lynchburg area home include the large nuclear-industry firms BWX Technologies and Framatome.

"We're the leaders in nuclear energy and technology in the continental U.S.," Lucas said. "We are already blazing a trail and we've already begun to put a strategy around that. So if we can get a planning grant to help us grow that strategy, and a nuclear hub designation, giddyup — more power to us."

Tech hub applicants must be a consortium. The Lynchburg Regional Business Alliance is leading a team that includes Lynchburg's Office of Economic Development and Tourism, the Central Virginia Planning District Commission, the Virginia Nuclear Energy Consortium, the Virginia Innovative Nuclear Hub, InvestSWVA and the Energy DELTA Lab.

With that lineup, the partnership is putting forward not only the nuclear assets of the Lynchburg region but also the nuclear deployment potential of Southwest Virginia, where Gov. Glenn Youngkin has said he wants a small modular reactor in place within the next decade and where feasibility studies for such a project are already underway.

InvestSWVA is a public-private group that markets Southwest Virginia to attract new businesses. It's also a partner in the Energy DELTA (Discovery, Education, Learning and Technology Accelerator) Lab, which aims to reuse former mining land in Southwest Virginia as testing grounds for deploying new energy technology.

Will Payne, director of InvestSWVA, said collaborating with the Lynchburg region on the tech hub proposal could help accelerate the work the lab is already doing.

"One of the key requirements of the tech hub is that you're building on existing success," Payne said. "But it's a way to really scale it in a big way, in a faster way, that with this EDA designation, with the financial support, with this coordination that will come with it, that you'll be able to scale faster."

The tech hub program, authorized by last year's bipartisan CHIPS and Science Act, has a number of requirements.

One is that the 20-plus hubs must be distributed across the EDA's six regions, with at least three in each region. Virginia is on the southern edge of a region that stretches up to Maine.

Another requirement is that proposals must emphasize equity and diversity, while another says at least one-third of the initial planning grants will go to proposals that benefit small, rural communities.

Furthermore, each applying consortium must have representatives from specific categories, including government, higher education and private industry.

The Virginia Nuclear Energy Consortium Authority was created by the General Assembly in 2013. Working under the authority, the Virginia Nuclear Energy Consortium represents academic and industry stakeholders who are invested in nuclear energy. Last year, Youngkin announced the formation of the Virginia Innovative Nuclear Hub, which will be facilitated by the authority to support academic research and workforce development in the nuclear industry.

The Lynchburg-based team's inclusion of the consortium and the Virginia Innovative Nuclear Hub brings representatives from four universities — Liberty University, University of Virginia, Virginia Commonwealth University and Virginia Tech — to the table.

"You're meeting that higher education requirement with not just picking one university but a whole group that gathers together on this topic," said Marjette Upshur, director of economic development for the city of Lynchburg.

April Wade, executive director of the Virginia Nuclear Energy Consortium and acting director of the Virginia Innovative Nuclear Hub, praised the collaboration between the Lynchburg and Southwest Virginia groups on the tech hub proposal.

"It's great to see communities partner up and look at things to further Virginia in leading in the nuclear industry," Wade said.

On the private industry front, two large nuclear industry players, BWXT and Framatome, employ thousands in the Lynchburg area between them.

BWXT produces nuclear fuel and components for the military and is developing nuclear medicine and space travel technology. It's headquartered in Lynchburg and employs about 2,600 people in the area.

Framatome designs and maintains nuclear reactors. The French company has its North American headquarters in Lynchburg and employs about 1,320 locally; it is a member of the Virginia Nuclear Energy Consortium.

Lucas declined to name specific companies as being committed to the proposal, saying it was too early in the process.

“We’ve had conversations with our leading nuclear industries in this region,” she said.

But in a statement, Framatome spokesperson Denise Woernle said the company “is supporting a regional application for the tech hub grant and designation through the Economic Development Administration.”

“We agree that our region has tremendous assets well-suited to hosting a nuclear technology hub, especially as utilities operate the current fleet of nuclear power reactors for many more years and developers design and deploy new nuclear reactors to support clean energy demand for generations to come. The economic growth potential is significant and we think our region is well-positioned to be one of the technology hubs,” Woernle said.

BWXT declined to comment.

Meanwhile, the Lynchburg-based team will have some competition in the nuclear arena from a Virginia neighbor.

One of five tech hub proposals to come out of Tennessee is from a Knoxville-based consortium that also focuses on nuclear energy, with partners that include the Oak Ridge National Laboratory and the Tennessee Valley Authority.

Regardless of how the Lynchburg group fares in the tech hub competition, the regional collaboration to promote nuclear energy has already been beneficial, Upshur said.

“We are shooting to win on this, but at the same time the bigger thing is we are committed to bringing a group together to promote this in our own backyard,” she said.

Quest For Rare Earth Elements And Critical Minerals In Central Appalachia Gets New Boost

By Dwayne Yancey
Cardinal News
August 7, 2023

A project that aims to identify Central Appalachian sources of rare earth elements and critical minerals has received $500,000 in federal funding to continue for another six months.

The 17 rare earth elements — so called not because they're uncommon, per se, but because they typically occur in such low concentrations that easily extracted deposits are rare — include scandium, yttrium and a group of 15 elements collectively called the lanthanides. The 50 critical minerals identified as such by the U.S. Geological Survey are considered essential to the economy and have no viable substitutes; they include aluminum, cobalt, graphite, lithium, nickel and nearly all of the rare earth elements.

These elements and minerals are necessary for a variety of technological applications from batteries and magnets to electric cars and smartphones. The team behind Evolve Central Appalachia — or Evolve CAPP — hopes sources such as waste coal from mining operations, fly ash from coal-fired power plants or underground water brought to the surface by oil and gas wells could yield such valuable materials.

"We know we have them in certain concentrations in our backyard," Richard Bishop, a professor of practice in Virginia Tech's Department of Mining and Minerals Engineering and the principal investigator of the Evolve CAPP project, said during a project update meeting Friday in Julian, West Virginia.

"But we need to work on the technology and the identification to know exactly where we should go after first if we want to start extraction of these, or recovery of these minerals, and also uses here in the United States for those products."

Friday's meeting featured nearly a dozen speakers on topics including technical aspects of finding, extracting and processing rare earth elements and critical minerals; the economic potential of developing a rare earth elements industry in Central Appalachia; and the challenges of providing the education and skills necessary to develop a workforce in such an industry.

Evolve CAPP kicked off in October 2021, backed by nearly $1.6 million in U.S. Department of Energy funding. It originally was scheduled to run until Sept. 30 of this year, but the new half-million dollars the Energy Department awarded in July will give researchers through the end of March 2024 to collect and analyze more samples as they seek the best sources for the coveted elements and minerals.

"We're collaborating with industry partners and others to identify specific sampling areas," said Scott Peterson, senior principal geologist with the engineering firm Marshall Miller & Associates.

Among those represented on the Virginia Tech-led project's research team are the University of Kentucky, West Virginia University, Oak Ridge National Laboratory, the USGS, Richmond-based Chmura Economics, the Virginia Department of Energy and a multistate community college coalition headed by Mountain Empire Community College.

The project area covers more than 80 localities across Kentucky, Tennessee, Virginia and West Virginia. In Southwest Virginia, the project touches the counties of Buchanan, Dickenson, Lee, Russell, Scott, Tazewell and Wise, and the city of Norton.

The region has a lower-than-average labor force participation rate and higher-than-average rates of disability and poverty, said Vickie Ratliff of Mountain Empire Community College.

Health care, social assistance and retail are among the larger employment sectors in the region, and developing a skilled workforce that could potentially fill the jobs created by a growing rare earths sector comes with challenges, Ratliff said. While coal and oil jobs currently command relatively high wages there, the number of those jobs is projected to decrease in the coming years.

“Whatever we’re doing here to prepare a new industry related to the rare earth minerals, we need to figure out how to pull these folks into those categories,” she said.

Evolve CAPP’s priorities also include sourcing the materials in environmentally sustainable ways and ensuring that the work’s impact on local communities is equitable and responsible, Bishop said.

Domestic sourcing of such materials is also a geopolitical issue as a majority of global rare earths production currently comes from China. Recent congressional acts, federal funding awards and presidential executive orders have focused on ramping up U.S. production.

“I think we’re all quite aware of the green revolution underway, the transition to solar panels, wind farms,” Bishop said. “Those require minerals that we have here in Central Appalachia.”

Youngkin Recommends Approval Of Arc Grants Totaling $7.3 Million, Including Money For Barter Theatre Renovations

By Susan Cameron
Cardinal News
August 11, 2023

Barter Theatre officials hope Gov. Glenn Youngkin’s recommendation for a $700,000 grant needed to help pay for renovations and upgrades to its two theaters will result in final approval so they can move forward with the improvements this winter.

Barter’s project is one of 16 the governor is recommending for funding by the Appalachian Regional Commission, totaling $7.3 million in grants, Youngkin announced Friday.

Barter, the state theater in Abingdon, is 90 years old this year and needs a bit of a facelift. Its buildings are much older, dating back to the 1800s.

Theater officials hope to get the money, along with state grants it has applied for, to do some significant renovations to the Gilliam Stage, its main, larger theater, as well as to the Smith Theatre, which is across the street, Amy Wratchford, Barter's interim managing director, said Friday.

Among the planned improvements: replacing the seats in both theaters, including the original seats in the main theater that Barter founder Robert Porterfield salvaged from the famous Empire Theatre in New York City when it was demolished, Wratchford said. The seats have been recovered and refurbished a few times, she added. The plan is to replace the seats with ones that are as close in design to the originals as possible to keep the same look.

The carpet will also be replaced, and there will be upgrades to the stages and dressing rooms.

"It will make the space more comfortable for our patrons and support our artists in the best way possible," Wratchford said.

If the ARC grant and other funding comes through, the plan is to do the work in January, February and the first part of March 2024, when the theaters are dark and no plays are performed. Completion is expected around mid-March, just in time for the new season.

The grants are designed to support efforts to create jobs, improve infrastructure and provide workforce training in Virginia's Appalachian region, which encompasses 25 counties and eight cities. ARC will finalize approval of the project awards later this year, according to a news release from the governor.

"ARC funding plays a pivotal role in empowering Appalachian communities to address their unique challenges, capitalize on their unique assets and drive positive change," Youngkin said in the release. "These projects will create new economic opportunities, build critical infrastructure and support community development across Appalachian communities that too often go underserved."

The other 15 projects recommended for funding and the amounts are:

- Blue Grass Resource Center, Highland Inn revitalization, $700,000
- Lee County, St. Charles Monarch water line replacement, $700,000
- Lee County, Western Lee sewer system wastewater treatment plant, $700,000
- Patrick County, West Piedmont Planning District Commission 2023 universal broadband project, $700,000
- Town of Stuart, downtown revitalization, $700,000
- Wise County, Center for Workforce and Innovation in Appalachia, wastewater treatment plant, $700,000
- Bland Ministry Center, dental clinic, $500,000
- Dickenson County, Red Onion Industrial Park project revision, $500,000

- New River Valley Regional Commission, Passenger Rail Station Authority planning grant, $354,000
- Friends of Southwest Virginia, Gateways to Southwest Virginia: outdoor economy recreation plan, $300,000
- Southwest Virginia Higher Education Center Foundation, regional simulation lab for nursing and allied health, $300,000
- LENOWISCO Planning District Commission, InvestSWVA regional marketing initiative, $234,000
- 'Round the Mountain: Southwest Virginia's Artisan Network, Gateway project, $100,000
- Washington County, Mendota and Creeper Trail broadband, $100,000
- The Crooked Road, Celebrating the Crooked Road project, $64,135

'A Pivotal Role': Youngkin Recommends Projects For Arc Funding

By David McGee
Bristol Herald-Courier
August 14, 2021

Virginia Gov. Glenn Youngkin has recommended the Appalachian Regional Commission fund 16 projects totaling $7.3 million and nearly all are in Southwest Virginia.

This comes on the heels of $75,000 the ARC awarded three regional agencies earlier this month, according to separate written statements.

Virginia's Appalachian region encompasses 25 counties and eight independent cities. ARC is expected to finalize approval of these project awards later this year.

"ARC funding plays a pivotal role in empowering Appalachian communities to address their unique challenges, capitalize on their unique assets and drive positive change," Gov. Youngkin in the statement. "These projects will create new economic opportunities, build critical infrastructure and support community development across Appalachian communities that too often go underserved."

"ARC grants are aimed at supporting the goal of building a strong and sustainable asset-based economy by funding projects that serve as catalysts for bringing jobs and prosperity to Appalachian communities, all while preserving their character.

The announcement includes seven grants of $700,000 each including ones for Barter Theater campus renovation in Abingdon, a water line in St. Charles and a wastewater treatment plant in Lee County and a wastewater treatment plant in Wise County.

"ARC has been a great funding partner, allowing us to pursue projects like this that enhance quality of life and strengthen our regional assets," said state Sen. Todd Pillion, R-Abingdon. "Gov. Youngkin

recognizes the importance of these investments and how they would support our shared mission of making Virginia — especially Southwest Virginia — the best place to live, work and raise a family."

The Department of Housing and Community Development (DHCD) works with localities and stakeholders in the region to develop strategic projects, which are evaluated by DHCD and the Governor, to be recommended to the federal commission for approval. Additional information about ARC is available here.

"Working with regional, state, and federal partners to advance local projects like these is one of our top priorities as state legislators," said House Majority Leader Del. Terry Kilgore, R-Gate City. "In Southwest Virginia, we have a strong record of promoting competitive projects and we see that reflected in these recommendations related to infrastructure, broadband, workforce and economic development, as well as tourism. I applaud Gov. Youngkin for his crucial role in making these investments a priority."

Three of the largest grants, plus another, were for projects submitted by the LENOWISCO Planning District Commission, according to a document supplied by the agency.

The $700,000 for the western Lee County wastewater treatment plant, is about 10% of a $7.7 million project to serve an area between Rose Hill and Cumberland Gap with new pump stations, sewer lines and a collection and treatment system.

The $700,000 grant towards the $1.7 million St. Charles water line project would replace nearly 10,000 linear feet of water line and make other improvements.

Another $700,000 grant targets a $1.6 million Wise County project to eliminate a 40-year-old wastewater treatment facility at the former Appalachia Elementary School.

The fourth grant, for $234,000, would cover most of the cost of an InvestSWVA regional marketing grant focused on energy, agriculture and telecommunications, according to the document.

"We are extremely excited that all four projects submitted by the LENOWISCO PDC received funding," Executive Director Duane Miller, said in an email. "All four projects will provide benefit to within our footprint by either improving the infrastructure for our localities or by continuing the regional economic development success that has been achieved by our partnership with the InvestSWVA initiative. We also want to thank Gov. Youngkin, our state legislators and DHCD for seeing the value in investing in these projects."

Others include $500,000 to Dickenson County for a project to revise the Red Onion Industrial Park; $300,000 to Friends of Southwest Virginia for an outdoor economy recreation plan called Gateways to Southwest Virginia; $300,000 to the Southwest Higher Education Center Foundation to help with a simulation lab for nursing and allied health; $100,000 to the Round the Mountain Artisan Network for

an artisan gateway project, $100,000 to Washington County to extend broadband service along the Mendota and Creeper trails and over $64,000 to The Crooked Road.

“Our Friends of Southwest Virginia team, through collaboration with our partners, have been able to amplify Southwest Virginia’s robust outdoor recreation assets,” Friends of Southwest Virginia Executive Director Kim Davis said. “These projects allow us to have clear vision when planning for sustainable growth and providing a high-quality of life to our residents and the visitor experience for travelers.”

In the proposal, $300,000 is recommended for Friends of Southwest Virginia’s Gateways to Southwest Virginia: Outdoor Economy Recreation Plan. The project focuses on building strategic plans for development and sustainability in the LENOWISCO and the West Piedmont Planning District Commission regions, Davis said.

The plan expands the region’s previous Appalachian Spring initiative that has resulted in more than $5 million of public and private funding focused on strategic development projects throughout Southwest Virginia.

The Round the Mountain Artisan Network funding is to be used for the Southwest Virginia Artisan Gateway Project, a multi-faceted initiative to strengthen the creative economy of craft in Southwest Virginia through a five-pronged approach that includes a strategic plan, feasibility study for satellite artisan stores, marketing and promoting Southwest Virginia artisans, hosting a Southwest Virginia Artisan Conference, and establishing a capacity-building training program for artisans in the network, Davis said.

Earlier this month, ARC provided monies through its Ready Nonprofits program, including $25,000 to the Medical Education Consortium of Southwest Virginia to employ a grants and events manager to expand its programing.

ARC also awarded $25,000 to Clinch Valley Community Action to hire an analyst to audit the agency’s human an relations recruiting and $25,000 to Millwald Theatre in Wytheville to acquire additional audio-visual and technical equipment.

Two Tech Hub Bids Seek To Boost Virginia’s Nuclear Industry

By Matt Busse
Cardinal News
August 21, 2023

Efforts to promote the nuclear industry in the Lynchburg region and Southwest Virginia have crystallized into two separate applications to a new federal economic development program.

Both share a common goal of growing the nuclear industry, which employs thousands regionally, both directly through the large Lynchburg-area companies BWX Technologies and Framatome and indirectly through the associated supply chain.

But the two applications have some key differences as they compete with likely hundreds of others in the U.S. Economic Development Administration's Tech Hubs program, which aims to boost the domestic economy and national security by focusing on places that can be globally competitive within a decade in critical technologies.

"The two proposals are very complementary of each other. They're not competitive. Both address aspects of the industry's needs," said April Wade, executive director of the Virginia Nuclear Energy Consortium, which the General Assembly created in 2013 to represent academic and industry stakeholders who are invested in nuclear energy.

The consortium is leading a group seeking to be designated as one of at least 20 tech hubs under the program with an application called Virginia's Technology Workforce and Innovation in Nuclear Hub, or TWIN for short.

Regional proposals that earn a tech hub designation during the EDA program's first phase can then compete this fall for a handful of implementation grants of $50 million to $75 million each to bring their economic development strategies to fruition. The deadline to apply was Aug. 15; an EDA spokesperson said the agency expects to publish a roster of applicants online within the next several weeks.

The TWIN proposal focuses on workforce development, the deployment of advanced nuclear reactors and opportunities for advanced reactors to support data centers, Wade said.

Meanwhile, the Lynchburg Regional Business Alliance is leading a consortium applying for an approximately $500,000 strategy planning grant from the Tech Hubs program — a shift from its original plan to apply for both the grant and for tech hub designation.

The business alliance's proposal, called Lynchburg Regional NITCH — for Nuclear Industrial Technology Commercialization Hub — focuses on nuclear manufacturing with a workforce component, said Megan Lucas, CEO of the Lynchburg Regional Business Alliance.

Applicants to the Tech Hubs program can vie for a planning grant, designation as a tech hub, or both.

Because the Lynchburg Regional NITCH application isn't seeking tech hub designation, it won't be eligible for one of the larger implementation grants in the program's second phase, according to EDA rules.

Nonetheless, it could be eligible for a future round of funding if the program expands beyond its current plans.

"The planning grant, with or without a tech hub designation, is going to be of immense value for regional growth and development," Lucas said.

Securing a planning grant, Lucas said, would allow the NITCH consortium to hire a regional innovation officer and a consultant to manage the group's work and further develop the strategic plan to advance the nuclear industry.

Each Tech Hub program applicant must be backed by a consortium of supporters from specific categories, including government, higher education and private industry.

Lynchburg-based BWX Technologies produces nuclear fuel and components for the military and is developing nuclear medicine and space travel technology. It employs about 2,600 people in the Lynchburg area.

Because BWXT views the TWIN and NITCH proposals as complementary to each other, the company wrote letters of support for both proposals and would gladly serve as a member of either consortium, spokesperson Jud Simmons said in an email.

"The Lynchburg area and its surrounding communities in the Commonwealth have tremendous resources to help move the nation's energy imperatives forward," Simmons said.

Framatome is a French nuclear reactor design and maintenance firm that employs about 1,320 people around its North American headquarters in Lynchburg.

A company spokesperson said last month that Framatome supports the NITCH proposal and said the region's nuclear industry has significant growth potential. It's unclear whether the company also supports the TWIN application; Framatome spokespeople could not be reached for comment for this article.

TWIN's supporters include the Virginia Department of Energy, the Virginia Tech College of Engineering and Mountain Empire Community College, Wade said.

NITCH's backers include Lynchburg's Office of Economic Development and Tourism and the Central Virginia Planning District Commission, Lucas has said.

The Virginia Innovative Nuclear Hub, a group announced last year to support academic research and workforce development in the nuclear industry, supports both groups.

So do InvestSWVA and the Energy DELTA Lab, which seek to deploy energy solutions including small modular nuclear reactors, or SMRs, in Southwest Virginia.

Gov. Glenn Youngkin has set a goal of deploying an SMR in Southwest Virginia within the next decade.

A recent feasibility study showed seven potential sites in the LENOWISCO Planning District area of Lee, Wise and Scott counties and the city of Norton, plus Dickenson County, that have capabilities to be a "competitive hosting ground" for SMRs.

Officials there have secured funding to perform a supply chain study for SMR deployment, and LENOWISCO Planning Commission Executive Director Duane Miller noted that both studies received funding in part from the EDA, the same federal agency behind the Tech Hubs program.

Southwest Virginia's efforts to deploy SMRs and develop data centers — which require significant amounts of electricity — dovetail with the Lynchburg region's work to advance the nuclear industry, Miller said.

"It's a regional effort," he said of the Tech Hub program applications, "but one could almost go as far as to say it's really close to statewide, because you're hitting what we would refer to as Central Virginia, Lynchburg, Southwest Virginia, and what comes from this would certainly benefit the entire commonwealth, if not really the entire United States."

The Virginia Nuclear Energy Consortium and the Lynchburg Regional Business Alliance are members of each other's consortia, and Wade and Lucas said each organization supports the other's work.

While VNEC is seeking designation as a tech hub, it is not applying for an initial strategy development grant. Wade said previous strategic planning work for the Commonwealth of Virginia and the Virginia Innovative Nuclear Hub have made it so that "we do have a lot of things in place to move forward on these projects."

The business alliance-led consortium initially planned to apply for both the strategy development grant and the tech hub designation, but Lucas said the plan changed after discussions with Sen. Mark Warner's office and Gov. Glenn Youngkin's administration.

"We essentially split up the responsibilities," Lucas said.

Wade expressed similar sentiments.

"As we went through this whole process … we just saw that there was an opportunity for two different applications supporting the growth of the nuclear industry in Virginia," Wade said.

The Tech Hubs program was authorized by last year's CHIPS and Science Act, which Warner co-authored.

"I believe Virginia is in a strong position to earn a tech hub designation and secure some of this funding," Warner said in a statement. "I'm going to continue working to support the dual goals of the tech hub program, which are solidifying our global leadership in key technologies, and bringing tech

jobs to smaller or more rural communities, not just Silicon Valley. No one should have to leave their hometown to find a good-paying job."

Glenn Davis — a former state delegate who now is director of the Virginia Department of Energy, which is a member of the TWIN consortium — said the dual applications of NITCH and TWIN comprise a plan to "have the best of all worlds."

"Lynchburg is going after this one pathway for the strategic development grant, which would be enormously beneficial for them. VNEC has an avenue to bring the tech hub designation to the commonwealth for an advanced energy nuclear workforce, which would be hugely advantageous. I think we've actually found a very strong model to get two potential awards out of this," Davis said.

NITCH and TWIN join other Tech Hub program proposals coming from Virginia. While Tech Hubs is a nationwide program, among its requirements is that the 20-plus hubs must be distributed across the EDA's six regions, with at least three hubs per region. Virginia is in the southern end of a region that runs up to Maine.

An application from the New River Valley and Danville areas highlights additive manufacturing and advanced materials. A Richmond-area proposal focuses on artificial intelligence. And a Hampton Roads-area bid is based around autonomous systems for air, land, sea and space.

The Hampton Roads-based application covers GO Virginia Region 5 — which includes Chesapeake, Newport News, Norfolk, Virginia Beach, Williamsburg and the Eastern Shore — as well as the Delmarva peninsula of Delaware and southern Maryland.

The consortium there has a proposal called NEXUS, which is short for "National Excellence in Uncrewed Systems – Air, Land, Sea, and Space Tech Hub," said Nancy Grden, president and CEO of the Hampton Roads Executive Roundtable, a regional economic development group that is leading the consortium. It's applying for a tech hub designation but not a planning grant.

The region has a number of major companies and universities working in that space, as well as federal partners including the Department of Defense and NASA, Grden said.

Examples of practical applications of uncrewed vehicle technology include using drones to deliver medical supplies to underserved communities, assessing damage in areas struck by natural disasters where human crews can't reach, or submersible vehicles being employed in Virginia's offshore wind industry, she said.

Developing autonomous systems blends key technology areas including advanced manufacturing, cybersecurity and robotics, Grden said.

"It was a perfect mix that we thought fit very well with our region," she said.

The EDA has indicated there is heavy interest in the Tech Hubs program. For now, applicants await the announcement of which proposals will succeed in securing strategy planning grants and/or tech hub designations ahead of the competition's second phase, which is anticipated to make its debut this fall.

"It's in the lap of the federal government now and the folks that are responsible for grading and scoring," Lucas said.

Gathering Power: Energy-Related Startups Benefit From Renewables Push

By Elizabeth Lake and Richard Foster
Virginia Business
August 30, 2023

While working on a cellular tower a few years back, Kyle Mullins got what he describes as the "call of a lifetime" — an invitation to work on the first two pilot wind turbines for Dominion Energy's Coastal Virginia Offshore Wind project.

A Navy veteran who received a telecommunications technical certification from Texas A&M University, Mullins was working as a cell tower technician, a job that sometimes had him climbing towers taller than the Washington Monument, when he was recruited as a contractor for Ørsted U.S. Offshore Wind. He worked in maintenance and construction as Ørsted built the twin 6-megawatt, 600-foot-tall wind turbines for Dominion 27 miles off the coast of Virginia Beach in 2020. That in turn led him to onshore wind turbine maintenance jobs in Maryland and West Virginia for Nordex, and a stint as a line worker for Dominion.

Now, based out of Yorktown, Mullins is running his own business, Coastal Wind Services, which is focused on maintaining and inspecting massive wind turbine blades, as well as related rope-access work and certification training. He's anticipating a hurricane of business from projects like Dominion's $9.8 billion, 176-turbine offshore wind farm off Virginia Beach, slated to begin construction in 2024, and proposed offshore wind projects in North Carolina.

"Once the turbines start getting into place … hopefully business will be booming," says Mullins, who is also partnering with Virginia Beach-based Hush Aerospace on developing an autonomous aerial drone for offshore wind blade inspections.

Coastal Wind Services is one of several Virginia-based energy industry startups, many of which are capitalizing on the national drive for net-zero carbon emissions and electric grid transformation toward renewable energy sources such as wind and solar.

Virginia is one of 22 states to pass clean electricity laws in agreement with the Paris Climate Accords' aim of mitigating the impacts of climate change by eliminating greenhouse gas emissions by 2050. Passed in 2020, the Virginia Clean Economy Act (VCEA) requires all electricity in Virginia to be produced from carbon-free power sources no later than 2050. (Aimed at increasing grid reliability and reducing consumer power costs, Virginia Gov. Glenn Youngkin announced a state energy plan in 2022 that called for a rethinking of VCEA mandates to include a mix of power sources, including nuclear and natural gas.) Similarly, the Biden administration has also set a 2050 national goal for net-zero carbon emissions, including reducing U.S. government emissions 65% by 2030 and transitioning to an all-electric federal vehicle fleet by 2035. And as of last year, nearly 60% of Fortune 500 CEOs said their companies plan to reach net-zero emissions by 2050.

This push to a greener grid has kicked off an entrepreneurial drive for innovative solutions to meeting and facilitating these ambitious energy goals.

"The opportunity is kind of endless in many regards," says Braden Croy, program director of Ashland-based Dominion Energy Innovation Center (DEIC), an independent nonprofit accelerator and incubator for Virginia energy startups.

Gaps to fill

Founded as a partnership between Activation Capital, Hanover County, the Town of Ashland and the nonprofit's signature sponsor, Dominion Energy, DEIC runs an accelerator for eight to 10 energy-related startups per year that are partnered with mentors from Dominion Energy. DEIC also offers startup events, networking opportunities and space for coworking and research and development.

Virginia has some unique opportunities for energy startups, given that it has the world's largest concentration of data centers, which require vast amounts of energy.

The commonwealth "has one of the largest — if not the largest — electricity load growth projections in the United States, primarily driven by the data centers up in Northern Virginia, but also all of our heavy manufacturing and advanced manufacturing," Croy says. And "as we have more and different types of generation brought online, that poses a planning problem and management problem," but also a host of opportunities for entrepreneurs from a variety of backgrounds.

Among those is Michael Beiro, founder and CEO of Linebird, which manufactures the Osprey NPS, a nonconductive payload system that attaches to commercial drones used in aerial power-line inspections by contractors and utilities. Linebird also produces "end effectors" — swappable tools that can be used with the payload system to perform a variety of tasks on live power lines, such as conducting contact inspections of compression connectors. Likening the tools to bits for a drill, Beiro is developing end effectors that can handle jobs like removing bird nests, trimming vegetation or cutting down damaged electric lines.

Michael Beiro's company, Linebird, produces a payload system and tools used on aerial drones for power-line inspection and maintenance. Photo by Caroline Martin
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A member of DEIC's first accelerator cohort in 2020, Beiro developed the idea for Linebird out of work he was doing when he earned his bachelor's degree in mechanical engineering from Virginia Commonwealth University. "Being in the [DEIC] cohort helped us get momentum," not to mention valuable face time with Dominion Energy personnel, says Beiro, whose company is based out of DEIC's Ashland coworking space.

"Virginia has a well-developed ecosystem to support startups," says Susan Ginsburg, CEO of Alexandria-based Criticality Sciences and a member of DEIC's 2021 cohort. Her company, which provides metrics and analysis promoting the resilience of utility systems, received a $75,000 Commonwealth Commercialization Fund grant from Virginia Innovation Partnership Corp. and a $100,000 federal grant from the National Institute of Standards and Technology, with another $400,000 NIST grant pending.

A lawyer and infrastructure resilience expert, Ginsburg was a senior counsel on the 9/11 Commission and was part of the team that produced the first presidential policy directive on critical infrastructure security and resilience. "When I began reading and looking into the science of critical infrastructure protection, I saw there was a major gap to fill," says Ginsburg, noting that there are no federal standards for utility resilience.

Criticality Sciences' NetResilience platform performs analyses of systems like electric grids or public water systems, and provides metrics on resilience. It also identifies assets that are vulnerable to critical failures that can lead to events like the massive blackouts seen during the February 2021 winter storm in Texas that led to hundreds of deaths.

A member company in this year's DEIC cohort, Arlington County-based ElectroTempo announced in August that it had raised $4 million in seed funding. ElectroTempo's software platform provides

planning and intelligence data for building out electric vehicle charging networks. Lead investors in the current funding round included Buoyant Ventures, a Chicago-based, woman-owned venture capital firm focused on tech startups that help fight climate change, and Zebox Ventures, an Arlington-based fund associated with international shipping company CMA CGM Group. (ElectroTempo was in the first cohort at the Zebox America accelerator.)

“Our customer is anyone who’s investing in the infrastructure around [vehicle] electrification,” says ElectroTempo co-founder and Chief Operating Officer Patrick Finch. So far, that has included the Port of Virginia, which is using the system to support its growing fleet of electric industrial vehicles and to calculate anticipated demand. CEVA Logistics, a subsidiary of CMA CGM, is another customer.

Pearl of wisdom

It also helps a company get off the ground when the founders have industry experience. Cynthia Adams was already well-connected in Virginia’s energy sector before 2015, when she co-founded her current business, Charlottesville-based Pearl Certification, which provides third-party home energy efficiency certifications across multiple platforms, primarily for home sellers and builders. Pearl has certified more than 162,000 homes across the United States, including about 7,400 in Virginia. It also provides required third-party certification of contractors’ work for a federal rebate program for home energy efficiency upgrades passed in 2022 under the Inflation Reduction Act.

Pearl’s CEO, Adams previously co-founded the Virginia Energy Efficiency Council, a nonprofit advocacy group, and also led the nonprofit Local Energy Alliance Program (LEAP), which promotes energy efficiency in Charlottesville and Albemarle County.

After raising $250,000 from angel investors, Adams and Pearl President Robin LeBaron left their jobs to found Pearl, which has since raised about $29 million in venture capital funding and now has about 50 employees. “We’re really getting somewhere with the business and are super-excited about our future,” Adams says.

While Pearl has grown since its founding, starting an energy-related company in Virginia isn’t necessarily easy, Adams explains. Often, startups devoted to businesses such as installing solar panels may initially benefit from federal rebate programs or grants for which funding can later run out. “If the programs are super-complex, complicated, administrative-heavy and really need the rebate only to function, then I think we’ve missed an opportunity to grow businesses, we’ve missed an opportunity to lower carbon emissions, because the money will start and the money will stop,” she says.

In turn, she suggests embracing public-private partnerships to develop energy efficiency programs across the state.

“There’s a huge amount of federal dollars through tax credits. If there were ever a time for an enterprising entrepreneur to get into the energy space, it’s now,” she says. “It’s important to identify what your value [proposition] is and what pain point you are solving. But if it’s tied to energy efficiency or renewable energy, you’ve got some terrific tailwinds to kick a business off.”

Regional opportunities

Expanding the field of energy industry startups in Virginia will require “a little bit more education and startup coaching to get folks understanding that before you’re there selling, you have to go and understand the market,” says Jerry Cronin, executive director of the OpenSeas Technology Innovation Hub at Old Dominion University’s Institute for Innovation and Entrepreneurship. It’s about “getting innovators to do that upfront as opposed to immediately going into sales mode.”

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OpenSeas works with startups and small businesses to help solve problems within the maritime space. Hampton Roads’ burgeoning offshore wind industry is a major focus for the hub, which also concentrates on shipbuilding and port operations. Two of the biggest challenges in the startup energy space in Virginia, Cronin says, include attracting more businesses to the space and educating individuals about the current holes in the industry.

“One of the issues with offshore wind right now — and this is something recognized by the Department of Energy — is that it’s close on the horizon, but it’s still on the horizon,” Cronin says. “Next year, we’re going to start putting more turbines out there, but it’s still a very young industry. The Department of Energy is having issues with attracting people into that space when it’s sort of ‘hurry up and wait,’ versus something like solar, where there’s a lot going on right now.”

A state grant program announced in July, the Virginia Offshore Wind Supplier Development Grant, is aimed at encouraging existing Virginia manufacturers to develop and produce goods to support the offshore wind industry in Virginia as well as nationally. But encouraging smaller suppliers to enter the space as startups will require more targeted training efforts and funding, Cronin says.

Another region ripe for energy startup growth is Southwest Virginia, where the public-private Energy DELTA (Discovery, Education, Learning & Technology Accelerator) Lab initiative is focused on reimagining previously mined land as space to develop new energy ventures such as hydrogen production, small modular nuclear reactors, solar power generation and advanced energy storage. The initiative's partners include the Virginia Department of Energy, the Southwest Virginia Energy Research and Development Authority, InvestSWVA and utilities Dominion Energy and Appalachian Power.

The Delta Lab is "essentially a matchmaker to all local, state and federal partners, funding partners, utilities — you name it," says Will Payne, director of InvestSWVA and managing partner of economic development consulting firm Coalfield Strategies.

"Everything we do — every project that we take on — we view through the economic development lens," Payne says. "It's not just about research for the sake of research. We're about that next phase where something that needs to be deployed, needs to be a pilot and tested in the field."

While being a startup energy company in Virginia is an adventure, Mullins says, one of the biggest challenges is gaining entry to the supply chain. Organizations like DELTA Lab, OpenSeas and the Dominion Energy Innovation Center exist to help the industry thrive.

"Don't be afraid to reach," Mullins says. "Ask questions. I wouldn't be in the position I am now without the people I reached out to."

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