Union of Concerned Scientists

FACT SHEET

Green Banks: Transforming Clean Energy Finance in Virginia

By encouraging private-sector investment in renewable energy and energy efficiency, while reducing the need for public subsidies, green banks and other clean energy financing programs are playing an important role in the United States and other countries. Green banks have also been effective in facilitating conversations with key industry stakeholders, educating lenders on technological options, and providing underwriting support.

In these ways, a green bank could help Virginia comply with the Clean Power Plan of the U.S. Environmental Protection Agency (EPA). Based on the experiences of existing green banks and clean energy lending programs elsewhere, the Union of Concerned Scientists (UCS) has analyzed a potential green bank in Virginia, finding that it would enable the state to leverage an initial capitalization of $90 million into a $2.8 billion investment in renewable energy and energy efficiency over the next 15 years.

By 2030, this clean energy investment could:

- Support the deployment of 575 megawatts (MW) of new wind and solar power capacity and generate or save the equivalent of 3.4 percent of Virginia's 2013 electricity sales.
- Save homes and businesses $220 million on their annual electricity bills by investing in efficiency.
- Reduce power-sector carbon dioxide emissions by more than 2.8 million tons per year—equivalent to taking 545,000 cars off the road—or 22 percent of the emissions reduction that Virginia must achieve to comply with the Clean Power Plan.

A promising pathway for clean energy finance

Green banks are state-level financial institutions that provide a suite of financial products to support clean energy project development; they also help raise the public's and the financial sector's awareness of clean energy technologies and their benefits. Green banks have been successfully implemented in New York and Connecticut to aid the transition from governmental clean energy incentives to financial products funded primarily with private-sector capital. Many more states, such as Kentucky, Iowa, and Pennsylvania, have developed locally based loan programs for efficiency and renewable energy.[1]

Green banks seek to leverage a pool of public-sector funds in order to garner a larger pool of private-sector investments in renewable energy and energy efficiency. A green bank's performance in this regard is typically measured by its ratio of public-sector to private-sector funds. In Connecticut, for example, the bank has achieved a leverage ratio of 1:10 (CGC 2015). By increasing green banks' leverage ratios, policy makers aim to establish programs that eventually reduce or eliminate the need for government incentives and that create self-sustaining clean energy markets.

Green banks represent a viable strategy for helping states reduce their emissions rates substantially, comply with the Clean Power Plan, and foster economic growth and competitiveness, particularly in renewable energy and energy efficiency products and services. For example, jobs in the solar industry have eclipsed the total in coal mining (173,807 vs. 93,185, respectively, nationwide in 2014). Given the distributed nature of solar installations, these impacts tend to be local, thereby representing an opportunity for coal industry workers to transition to jobs in the clean energy economy (TSF 2014). In essence, green banks can help states achieve not only climate goals but economic development goals as well.

> ***By displacing fossil fuels, these energy efficiency and renewable energy investments in Virginia would eliminate by 2030 more than 2.8 million tons of carbon dioxide emissions each year—equivalent to taking 545,000 cars off the road.***

Building on existing clean energy programs in Virginia

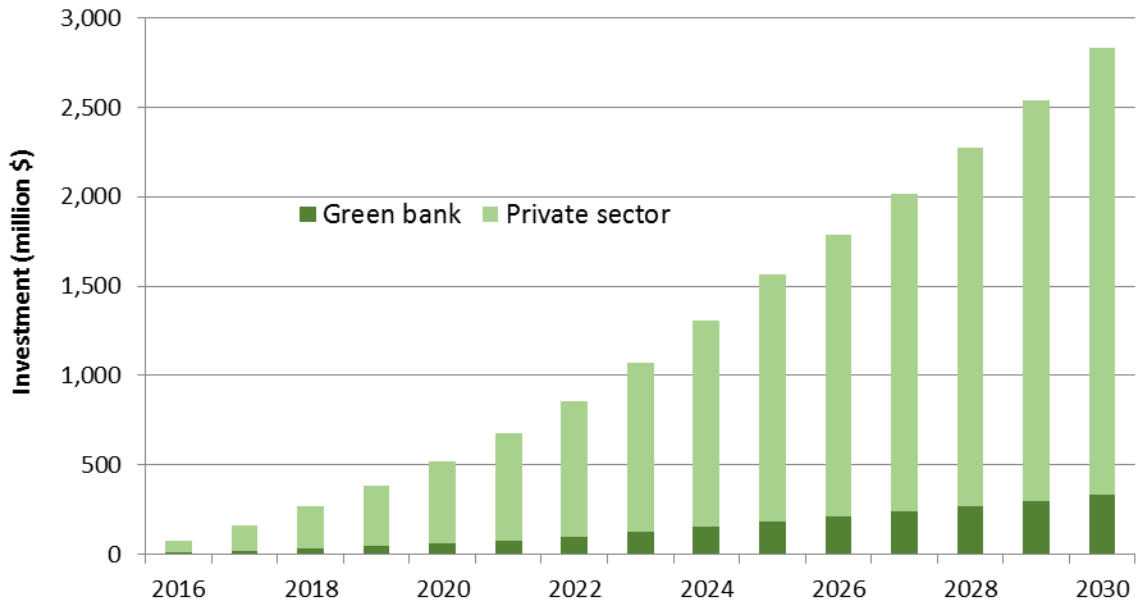
Virginia already has a number of financing programs, administered by a variety of local and state entities, to support renewable energy and energy efficiency investments. Also,

several related policies have recently been implemented or approved. These programs and policies include:

- In August 2015, the Funding Working Group of the Virginia Governor's Climate Change and Resiliency Update Commission proposed a green bank, called the New Virginia Bank, with funding scenarios based on existing resources and a more comprehensive approach similar to those of New York and Connecticut (GCCRUC 2015). The existing-resources scenario suggests an initial capitalization of $56.5 million. The $90 million program assumed in this analysis is similar to New York's green bank, on a per capita basis, but lower than Connecticut's.
- In March 2015, Virginia's legislature passed a bill that created the Solar Energy Development Authority, which will be administered by the Department of Mines, Minerals, and Energy (Virginia General Assembly 2015).
- The City of Charlottesville has launched a clean energy loan program, in partnership with the University of Virginia's Community Credit Union and the Local Energy Alliance Program (LEAP), to support commercial investments in energy efficiency and renewable energy (UVA Credit Union 2015).
- In July 2015, Virginia approved Property Assessed Clean Energy (PACE) financing. This program will allow repayment of efficiency and renewables investments, through a property tax lien, over longer terms and at lower interest rates than traditional lending programs. Stakeholders are working now to develop PACE's underwriting criteria (Johnson and Doyon 2015).
- A group-purchase program for renewable energy, called Solarize, has been successful in lowering the cost of residential solar projects, by means of bulk discounts, throughout the state (LEAP 2015).

These programs could potentially be expanded, enhanced, or supplemented by a central green bank. One plausible candidate for this role is the Department of Mines, Minerals, and Energy, which hosts the Solar Energy Development Authority and is leading the effort to develop underwriting criteria for PACE loans. Another possibility is co-administration of the green bank by LEAP and the City of Charlottesville, given their successful development of a revolving-loan facility for renewable projects. In any case, green bank products and

FIGURE 1. Cumulative Clean Energy Investment Leveraged by Virginia Green Bank



The estimated 15-year investment potential demonstrates that a Virginia green bank could leverage an initial capitalization of $90 million into a $2.8 billion investment in renewable energy and energy efficiency through 2030.

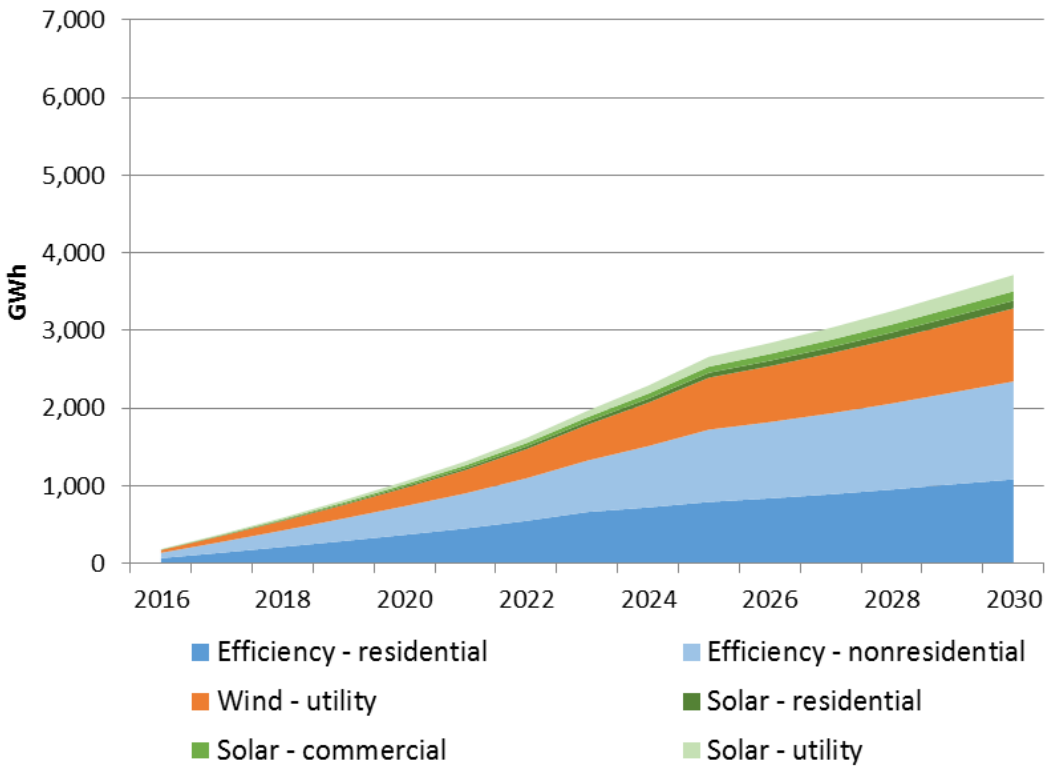
Solar energy projects such as this one at Eastern Mennonite University in Harrisonburg, Virginia are being built across the state. A state green bank would support additional deployment at the utility, commercial, and residential scale. Credit: Wikimedia Commons/Dyoder

efforts would need to be coordinated with Dominion Virginia Power's existing energy-efficiency rebate programs.

Under the Clean Power Plan, Virginia has a 38 percent emissions-rate-reduction target by 2030 from 2012 levels, which would cut the state's emissions rate from 1,366 lbs CO_2/MWh to 934 (E&E Publishing 2015). The EPA has given states flexibility in their approaches to achieving their emissions rate reductions, while noting that renewables and demand-side efficiency can help achieve significant progress toward those ends. Accordingly, Virginia now has a voluntary renewable energy standard of 15 percent of electricity sales by 2025, together with a voluntary energy-efficiency resource standard of 10 percent of electricity sales by 2020 (DSIRE 2015a; DSIRE 2015b). While these standards are not mandatory, many of the state's utilities are actively working toward meeting them.

The integrated resource plans proposed by the state's major utilities, Dominion Virginia Power and Appalachian Power, will also help Virginia make substantial progress on emission reductions through renewables and efficiency (Dominion Resources 2014). Dominion Virginia Power alone has pledged 400 MW from solar and 158 MW from future demand-side management programs by 2029.

FIGURE 2. Cumulative Energy-Efficiency Savings and Wind and Solar Generation Added Under the Virginia Green Bank



Over a 15 year period, investments from a state green bank would generate or save 3,700 GWh of electricity through renewable energy and energy efficiency projects. This is equivalent to 3.4 percent of Virginia's 2013 electricity sales.

A green bank could play a role in enhancing and catalyzing such clean energy investment in the state. Projects could also potentially benefit from the EPA's Clean Energy Incentive Program, which awards states matching emission credits under the Clean Power Plan for early reductions generated by wind, solar or low-income efficiency programs (Lynch et al. 2015).

Virginia green bank leverage potential

A green bank in Virginia could supply a range of financial products (Rhodes, Bloustein, and Pitkin 2013), including:

- **Credit enhancements**, which assure private lenders by the bank's offering to occupy a first loss position or by creating a loan-loss reserve fund in the case of default. Both of these actions can lower a lender's perceived risks, allow loans to be issued to a wider variety of credit ratings, or assist with funding new or emerging technologies.
- **Warehousing and securitization services**, which aggregate loans and sell the collections as securities. Proceeds are then used to further the bank's programs. The warehousing model has been used successfully by Connecticut, Pennsylvania, and New York, both for energy efficiency (WHEEL) and PACE loans (Belden, Clemmer, and Wright 2015).
- **Direct lending** involves traditional consumer or business loans for renewable energy or energy efficiency projects. An example is the Connecticut Solar Loan program for rooftop solar.
- **Structured products and other financing tools.** Examples include PACE financing, state-backed leasing programs for renewables, and performance-based incentives, grants, or other support mechanisms.

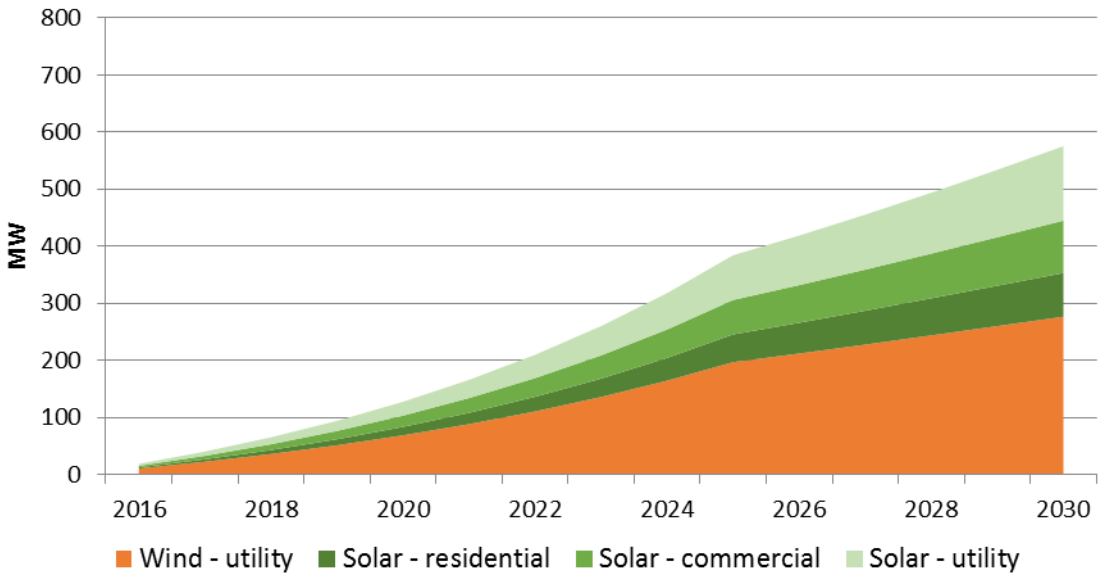
Each of the above products has its own risk and benefit profile, and an effective green bank may support different clean-energy market segments through different means of financing. In addition to offering financing products, green banks can help provide technical expertise, such as underwriting support, to traditional lenders in order to improve their knowledge of new technology investments and lower the risks.

Potential investments and emissions reductions under the Virginia green bank

In this analysis, we have assumed:

- That a hypothetical Virginia Green Bank would provide direct-lending products for solar, wind, and consumer energy-efficiency programs.

FIGURE 3. Wind and Solar Power Capacity Added Under the Virginia Green Bank



By providing a suite of financial products for clean energy projects, a Virginia green bank would support the deployment of 575 MW of wind and solar power capacity in the state by 2030.

- An initial capitalization for the Virginia Green Bank of $90 million, which was derived by applying a per-capita investment ratio similar to that of New York's comprehensive Green Bank.
- Loan terms of seven years for efficiency and 10 years for renewables, with interest rates of 5 percent
- That each dollar of green bank public funding would leverage 7.5 dollars of private-sector funding for energy efficiency and renewable energy projects.

All of these inputs were based on the experiences of existing state green banks and clean-energy lending programs elsewhere. (For a more detailed discussion, please see the companion document *Quantitative Methodology Description.*) By structuring a green bank as a revolving-loan fund, we estimate that the bank's annual impact will increase each year. Over a 15-year period, a green bank in Virginia with an initial capitalization of $90 million in public funds could lend out $333 million while strategically leveraging $2.5 billion in private-sector funding, for a total investment of more than $2.8 billion (Figure 1).

The increase in clean energy enterprises supported by Virginia green bank funding would be substantial. By 2030, the bank's investments would have escalated to the point that nearly 500 gigawatt-hours (GWh) of new energy-efficiency savings and renewable energy generation would be added *each year* (Figure 2). Over a 15-year period, the cumulative impact of these clean energy investments would be to generate or save 3,700 GWh of electricity, equivalent to more than 3.4 percent of Virginia's 2013 electricity sales. The 2,300 GWh of efficiency savings from these investments would lower homes' and businesses' electricity bills by an estimated $220 million annually by 2030, based on 2014 electricity prices.

After 15 years of green bank lending, 75 MW of new wind and solar resources would be developed using the bank's funds *each year*, with a cumulative impact of 575 MW by 2030 (Figure 3).

By displacing fossil fuels, these energy efficiency and renewable energy investments in Virginia would eliminate by 2030 more than 2.8 million tons of carbon dioxide emissions *each year*—equivalent to taking 545,000 cars off the road—or 22 percent of the emissions reduction that Virginia must achieve to comply with the Clean Power Plan.

Conclusions

Reorienting the existing Department of Mines, Minerals, and Energy toward a more robust clean-energy-financing mission is one strategy, among others, that could help Virginia establish a green bank. The new institution's financing could be applied in the state to: widen public-sector funds' impacts on developing a clean energy economy; significantly reduce the need for subsidies; help ensure compliance with the EPA's Clean Power Plan; and accelerate the state's cost-effective achievement of its renewable energy and energy efficiency targets. But before any of this can happen, a dialogue—between key stakeholders such as utilities, existing-program managers, and local lenders—must take place to set goals and priorities for the bank's programs.

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ENDNOTES

1 For more details, please see this fact sheet's companion report, which profiles financing programs in the United States and Europe (Belden, Clemmer, and Wright 2015).

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