

LEVERAGING STATE FUNDS FOR CLEAN ENERGY: LESSONS FROM NEW YORK STATE

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The COVID-19 pandemic is creating extraordinary financial challenges for state governments. Tax revenues are plummeting and social service expenses increasing, leaving budget shortfalls projected to exceed \$750 billion over the next three years.¹ For state governments to continue playing important roles in promoting clean energy, they will need to adopt strategies that leverage their limited funds.

This commentary proposes four principles to guide state governments in spending limited funds to promote clean energy and discusses recent programs that applied those principles in New York State. One of the authors, Richard Kauffman, played a central role in the development of those programs as New York State “Energy Czar” from 2013 to 2019 and continues to serve as Chair of the New York State Energy Research and Development Authority (NYSERDA).

1. Introduction

Almost 90 years ago, US Supreme Court Justice Louis Brandeis described states as “laboratories of democracy.”² Today, states are laboratories of clean energy. With heat-trapping gases accumulating steadily in the atmosphere, climate disasters abounding and the US federal government unable or unwilling to mount an effective response, state governments are playing important roles in promoting clean energy and responding to climate change.

This dynamic is not solely the result of the Trump administration. Although President Donald Trump and his appointees have sought to use the federal government to slow and in some cases reverse the transition to clean energy,³ problems predate President Trump and will continue after he leaves office. The US federal government was designed to move slowly.⁴ High levels of consensus are required before significant action can be taken. Incumbent interests have considerable power to block change. These attributes and others make it exceedingly difficult to enact federal legislation sufficient in scale and ambition to respond to climate change.

State governments have stepped into the breach. California has a cap-and-trade program for heat-trapping gases. Connecticut has established a green bank. Texas is building long-distance transmission for wind farms. Indiana is replacing coal-fired power with renewable power to cut costs. Other examples abound.⁵



Yet state resources are limited, even in the best of times. The total budgets of all state governments combined are less than half the federal budget.⁶ Balanced budget requirements and concerns about debt ratings significantly limit state spending options, especially during recessions. Although many state clean energy programs are financed “off budget” through collections on customer utility bills, these generally cannot be increased without significant political controversy. To be effective in helping promote clean energy, state governments must leverage the limited public funds at their disposal.

This commentary suggests a strategy for addressing these issues. In the next section, we provide an overview of state clean energy programs in the United States. We then propose four principles to help state governments maximize the impact of their limited funds in promoting clean energy—principles that will be especially important as the United States recovers from the COVID-19 recession. In the section following that, we describe several New York State clean energy programs from recent years that applied those principles, evaluating the results. We also highlight two programs—Solarize and Green Banks—that were developed outside of New York and have been adopted by other states. While better known than those described in the commentary, these programs reflect the same principles we put forth. We close by considering lessons learned and ways these principles could be used more broadly.

2. State Clean Energy Programs

Virtually all states have clean energy programs. These programs support large-scale renewable energy generation, smaller-scale distributed energy resources, energy efficiency, electric vehicle deployment and more.

One of the most widespread state clean energy programs is the renewable portfolio standard (RPS), under which electric utilities are required to purchase minimum amounts of electricity from renewable sources. Thirty states and the District of Columbia have enforceable RPS's. (Seven other states have voluntary goals for renewable energy purchases.) In connection with RPS's, many state governments offer grants, subsidies or other incentives to help regulated entities comply and promote renewable energy deployment.⁷

Other state clean energy programs address building energy efficiency, vehicle fuel efficiency and a range of other topics.⁸

State clean energy programs are in general quite popular. In recent years popular support for clean energy programs has grown, driven by concerns over air quality, economic development and climate change.⁹ However, despite that support and a long track record of state government support for clean energy, market penetration of clean energy technologies remains modest in most states.

Many state clean energy programs are funded as a surcharge on utility bills. As states have increased their renewable and other clean energy programs, some stakeholders have objected to this funding mechanism.

- First, some consumer advocates have expressed the concern that utility surcharges are regressive and therefore disproportionately paid by lower-income households, while



some benefits (such as support for solar rooftops) go disproportionately to higher-income homeowners.

- Second, business owners, particularly those that compete with businesses in other states and countries, worry that increasing charges will make their businesses less competitive.
- Third, a number of legislatures have lost enthusiasm for these programs, given that many have their origins, funding and execution through executive branch actions, with minimal legislative oversight or control.
- And finally, regulated utilities have likewise raised a variety of issues, including the burden of administering clean energy programs without financial incentive and cost shifting as some customers take advantage of clean energy programs while others do not. A good example of the former is the requirement on distribution utilities in restructured markets to procure renewable energy (and thereby take on contractual risk) without being allowed to own renewable assets.

In those states where clean energy is funded through the state budget without a utility surcharge, overall financial constraints and other budget priorities make expanding programs difficult as well. Trying to square this circle—of increased public interest in expanding clean energy programs against a variety of stakeholders objecting to its means and magnitude of funding—has created a dilemma for policy makers.

3. Principles for Leveraging State Funds for Clean Energy

We propose four principles for leveraging limited state funds for clean energy.

First, harness markets where possible.

Current program approaches that rely principally on grants are not achieving scale. In part, that is because public dollars are limited and will never be sufficient for large-scale transformation of the energy sector. The most promising way to achieve mass deployment of clean energy technologies is to harness markets. To achieve change at the scale and pace needed, states must find new ways to do so.

In the United States, almost all energy assets are owned and operated by the private sector. The scale of investment in those assets dwarfs state government budgets. With strategies that rely on grant support for projects, state governments will never be able to make more than a marginal impact on the clean energy transition. Strategies that help create, shape or develop markets for clean energy technologies have much more promise.

Governments have a variety of ways to stimulate markets: changing rules and regulations, convening market actors and providing financial support. All these tools have a role. State governments can often have the most impact on clean energy by helping to build self-sustaining markets. Those markets are essential for clean energy products and services to scale.

Second, focus on soft costs.

Clean energy projects have both “hard costs” (the equipment) and “soft costs” (everything else,



including expenses incurred for customer acquisition, development, financing and permitting). Soft costs often represent a large percentage of total projects costs. In a typical US residential solar project, for example, soft costs make up more than 65 percent of overall costs.¹⁰

Few, if any, states have the market power to meaningfully influence hard costs in clean energy projects. Equipment manufacturers set prices based on input costs, shipping costs, target profit margins, market demand and customer willingness to pay. State governments are almost always price takers with respect equipment for clean energy projects.

In contrast, state governments can meaningfully reduce soft costs in clean energy projects. State governments can generate information critical to potential suppliers, perform pre-development work, stimulate and aggregate demand, create an economic prize for the private sector and provide financing through green banks. These steps and others can have significant impacts on soft costs and, as a result, play an important role in building and sustaining clean energy markets.

When a state government gives a one-time grant to a project, some of the funds effectively go to hard costs, over which the state government has no control. Soft costs in contrast can be directly influenced by state programs. Governors and state agencies should focus on soft costs, where they can make the most difference.

Third, use project-specific subsidies sparingly.

Project-specific subsidies can be an important part of a state government's clean energy toolkit. In some cases such subsidies can help make first-of-a-kind projects economic, providing critical support to help innovative project types scale. (As a general rule, first-of-a-kind projects cost more than projects that reflect prior learning or experience.)

But project-specific subsidies should be used sparingly. Such subsidies often strain state resources, yet rarely accelerate cost reductions in clean energy technologies in a meaningful way. Project-specific subsidies should be used in limited situations only—as a bridge to a self-sustaining market and as part of a broader strategy for helping clean energy scale. The “first money in” from state governments should be to reduce soft costs. If additional costs reductions are needed and there is a line of sight to a self-sustaining market, state governments should consider project-specific subsidies as the “last money in.” But project-specific subsidies risk significant financial burdens for state governments, without achieving scale.

Broad, systemic state policies such as RPSs and renewable energy credit (REC) programs are important, in part because of the lack of federal policies (such as a carbon price) to internalize the costs of traditional energy generation. But funding an expensive project with the idea that it will somehow lead to others or create “economic development” is a poor use of public resources. Without a comprehensive policy to develop a market, these sorts of project-specific subsidies become one-of-a-kind rather than the first-of-many. Nor is there any incremental economic development since the project support involves transferring financial resources from one part of a state to another. Put simply, project-specific subsidies are expensive and often have limited impact. They should be used in exceptional circumstances only.



Fourth, promote environmental justice.

People who live in low-income communities face a number of challenges related to energy. First, many power plants are located in these communities--a major factor in the high incidence of asthma and other respiratory illnesses. Second, the housing stock in low-income communities is often energy-inefficient and uncomfortable in winter and summer, contributing to poor health. Third, energy bills as a percentage of household income are often much higher in these communities. Fourth, rate payer surcharges to support clean energy programs can be regressive, adding costs. Finally, many people in low-income communities may not be eligible to receive benefits from programs funded by these surcharges. (As an example, until the advent of community solar programs, only homeowners, not renters, were eligible for solar grants.)

Addressing environmental justice must be a priority for state energy policies. The three principles above can play an important role. Harnessing markets and focusing on soft costs can help deliver energy services and cut costs in low-income communities. But there are limits. In some cases, purchasing power may be insufficient in these communities for clean energy programs to have an impact. In these cases, subsidies may be essential for achieving clean energy and economic development objectives. Such subsidies can take numerous forms, including grants for retrofits and reduced utility rates. This is one important instance in which state government subsidies may be important for program design.

4. Recent Examples from New York State

New York is the fourth most-populous state, with a population of almost 20 million people. Its electricity comes mostly from natural gas (roughly one-third), nuclear power (roughly one-third) and hydropower (roughly one-quarter). Solar and wind power provide a small but growing percentage (roughly 5 percent). New York consumes less total energy per capita than any other state except Rhode Island.¹¹

Clean energy policy within New York State is managed principally by the New York State Energy Research and Development Authority (NYSERDA). In Fiscal Year 2020–2021, NYSERDA’s budget for energy efficiency and renewable energy programs was \$1.3 billion—about half the FY20 appropriations for the Office of Energy Efficiency and Renewable Energy at the US Department of Energy.¹²

NYSERDA has funded innovative energy technologies and development projects for decades. Since 1991, NYSERDA supported over 1,300 innovative products, more than 500 of which were commercialized. From 2014–2019, these products generated \$314 million in revenues.¹³

Historically, most of these funds went to one-time grants. Results were good, but not good enough to achieve scale. NYSERDA’s residential energy efficiency program, for example, was supporting the retrofit of roughly 14,000 units per year with individual grants. At that pace, retrofit of New York State’s housing stock would take around 300 years.¹⁴

As a result, NYSERDA has changed its approach in recent years, applying the four principles above to its programs. The results have been promising. Below we describe four such



programs. We also describe (in sidebars) two clean energy programs adopted in many states that also reflect these principles.

Offshore Wind: Using Public Funds to Lower Development Costs

New York State has significant offshore wind resources. The US Department of Energy estimates a net technical energy potential of roughly 300 TWh/year—enough electricity for more than 27 million average US homes.¹⁵

Previous efforts to develop offshore wind resources in the United States have typically involved state governments funding single projects. One such effort—the Cape Wind project off the coast of Massachusetts—ultimately failed due to local opposition and high costs. Another—the 30 MW Block Island Wind Farm off the coast of Rhode Island—succeeded in producing the nation’s first offshore wind project. But direct project funding involves great effort and high costs, with few incentives for significant follow-on scale-up.

In light of this, the New York State government adopted a different approach, reflecting the four principles above. Starting in 2016, NYSERDA began working to establish a market that would attract investment in the offshore wind industry and reduce soft costs.

NYSERDA’s strategy involved several steps.

First, NYSERDA analyzed the size of the end market that would be needed attract investment in offshore wind power. The agency recognized it would have limited influence on turbine costs but believed that, by establishing a big enough economic prize, it could help reduce other costs including platform construction, ports, shipping and installation.

Second, NYSERDA prepared a master plan—the most comprehensive effort by a state ever to plan for large-scale offshore wind deployment.¹⁶ The master plan identified the most promising offshore areas for wind power development, estimated costs and benefits, assess infrastructure and workforce training requirements and proposed least-cost methods of procurement. The master plan also included supplemental studies—work that would otherwise have been done by developers—on recreational and commercial fishing, birds and bats, marine mammals and turtles, gravel resources, shipping, visibility, and health and safety issues.

The master plan was more than a document. NYSERDA held extensive public meetings and engaged with local community groups to address environmental and visibility concerns and to enlist local support for the economic benefits of a large-scale offshore wind industry.

Third, NYSERDA worked to mobilize the local supply chain. NYSERDA identified opportunity for local companies and connected them to major European developers and manufacturers. This work involved hundreds of companies. Establishing a line of sight from turbine to tugboat meant that developers could better assess their purchase costs and establish strategic supplier relationships in order to more finely tune their eventual bids.

Fourth, NYSERDA reached out to several Northeast states in the hopes of creating a larger regional market. The US Department of Energy funded analytic work in 2016 in support of the multistate collaborative.¹⁷



Fifth, NYSERDA worked with the US Department of the Interior’s Bureau of Ocean Energy Management (BOEM) to identify potential project sites off New York’s Atlantic Coast, a critical step in creating a strong base for long-term offshore wind development.

These efforts reached a key milestone in January 2017, when Governor Andrew Cuomo announced a commitment to 2,400 MW of offshore wind by 2030 in his State of the State address. In the months that followed, NYSERDA released its “Area for Consideration,” identifying sites that would minimize interference with shipping, fishing activity and viewsheds. In November 2018, BOEM released its “draft Wind Energy Areas” that relied on NYSERDA’s analysis.¹⁸

The results have been a dramatic success. 1,700 MW of offshore wind have been contracted at lower-than-expected prices. In part as a result, New York State has now expanded its commitment to offshore wind to 9,000 megawatts by 2035 (capable of delivering roughly 30 percent of the state’s power needs). With another procurement scheduled later this year, New York has rapidly built the largest offshore wind market in the US¹⁹ and New York hasn’t been the only state taking action. Regional market commitments are now 30,000 MW and growing.

New York’s recent awards were priced at an average of 8.4 cents per kilowatt hour (all-in cost, with premium costs at 2.5 cents per kilowatt hour). This is 40 percent lower than NYSERDA’s estimates in 2018. These lower costs are a result of large markets over which to spread fixed costs, the deployment of larger turbines and innovation in all parts of the supply chain including foundation and installation design. Offshore wind will add 73 cents per month on average to residential customers’ electricity bills.²⁰

The lesson: state policy acted to significantly reduce costs and achieve large-scale deployment by establishing a large end market that would drive industry investment and by leveraging public dollars to reduce development costs.

Multifamily Housing Energy Efficiency: Using Public Funds to Aggregate Demand

New York State has over one million multifamily residential buildings.²¹ More than 60 percent of these buildings are 60 years old or older. Almost all these buildings are very energy inefficient, with poorly functioning heating and cooling systems. Owners of these units have been eligible for NYSERDA grants, ranging from \$700 to \$3,500, for energy-related retrofits.²²

The program has been administered one project at a time and is administratively intensive for both NYSERDA and the building owner. The building owner must first select a qualified NYSERDA solutions provider, who then conducts an assessment of the building to determine the feasibility of achieving energy savings of at least a 15 percent. If such reductions are possible, NYSERDA then approves the project. Upon completion of the work, NYSERDA confirms the work and pays out a construction grant. One year later, upon a further assessment of actual energy savings, NYSERDA pays out a performance-related grant. The typical retrofit occurs when an occupant has left the unit.

This process has been slow and administratively burdensome, producing only modest energy savings in each building. There is little prospect of the state achieving its climate or economic



development objectives with such a program. The program will never achieve results at scale. Current programs do not address the economic, comfort and health conditions of lower-income people who live in these units.

NYSERDA is therefore taking a fundamentally different approach. Rather than providing traditional one-time grants, NYSERDA is using public dollars to create a market for retrofitting buildings to achieve a zero-net energy standard (meaning the homes generate as much energy as they consume). The program—RetrofitNY—is modeled after a successful Dutch program known as *Energiesprong* (“energy leap”), which encourages the development and installation of prefabricated facades, smart heating and cooling systems, and insulated rooftops with solar panels.²³

NYSERDA’s work has proceeded in three steps:

First, NYSERDA decided to start with the low-rise “garden apartment” segment of the market. It conducted market research, working with building owners to determine both design criteria and potential demand. Owners of these units include private landlords, municipal governments, local housing authorities and the State.

Second, NYSERDA made limited grant funds available to support builders to develop prefabricated panels and energy pods that met the design criteria.²⁴

Third, NYSERDA is collaborating with agencies in other jurisdictions adopting similar approaches, to help create even greater financial reward for the industry.²⁵ (California and British Columbia are developing similar programs.) By working to establish common standards, NYSERDA is creating a larger market and reducing costs through standardization.

In the Netherlands, this approach has been used to retrofit more than 5,000 homes in the past five years. Based upon the experience of the Netherlands and other European countries, RetrofitNY could improve the energy performance of tens of thousands of units per year, while providing comfort and health benefits for the tenants. Once the program achieves scale, grants will no longer be needed.²⁶

Moreover, one key benefit of this approach is that tenants do not need to move out of their units in connection with a retrofit. With a shortage of affordable housing, this is especially important. RetrofitNY is also creating a new construction-related manufacturing industry in the New York State.

Commercial Building Energy Efficiency: Using Public Funds to Address Market Gaps

In New York City, buildings are responsible for more than 70 percent of the city’s greenhouse gas emissions, with commercial and institutional buildings accounting for 40 percent of all building greenhouse gas emissions. One reason for their sizable share of emissions is their age. Many of the commercial buildings in New York City are more than 50 years old. Some were built more than a century ago.²⁷

In light of the age of these buildings, energy retrofits are highly likely to be economic. A However, in spite of economic benefits, there has been limited penetration of energy



efficiency projects in commercial buildings. Analysts have identified several obstacles.

- First, there is the split incentive problem. Tenants typically pay their own energy bills, so building owners have little interest in making investments to save tenants money on energy.
- Second, building owners have limited capital for making improvements and therefore energy efficiency projects remain largely unfunded.
- Third, information concerning energy-saving opportunities is poorly understood by tenants and building owners.²⁸

Based on these observations, NYSERDA's traditional approach to commercial building energy retrofits was to provide building owners with grants to (a) pay for an energy audit, including a technical assessment of building equipment, and (b) help pay for a retrofit, including new lighting, boilers and HVAC systems. On average, grants covered 50 percent of the cost of audit and 5–25 percent of the cost of a retrofit. Between 2010 and 2015, NYSERDA's retrofit programs typically served between 500 and 2,000 commercial and industrial buildings per year.²⁹

As part of NYSERDA's move away from one-time grants to activities that would achieve more scale, NYSERDA interviewed commercial building owners to determine why there was such anemic interest in energy retrofits. The interviews revealed three key reasons.

- First, building owners did not trust the energy efficiency forecasts promised by vendors.
- Second—and related to the first point—building owners did not consider vendors to be of high quality. In contrast to energy service company practice in the municipal, university, school and hospital (MUSH) market, vendors were not willing to offer guarantees of energy savings or shared savings contracts.
- Third, building owners had little interest in performing stand-alone energy efficiency projects. Landlords needed to put capital into building to attract tenants through upgrades in elevators, lobbies and in other common areas. Energy efficiency projects might be considered as part an overall building upgrade, but not as a discrete project.

As a result of this research, NYSERDA introduced its RTEM (Real Time Energy Manager) program in 2016. Under this program, NYSERDA pays a 30 percent cost share of a combination of systems and services employed to monitor and identify energy efficiency improvement opportunities in commercial buildings. The system consists of hardware, software and secure internet connectivity that continuously transmits a building's current and historical performance data to the cloud.³⁰

The RTEM system addresses each of the obstacles identified by building owners. The aggregation of data from many buildings highlights the business opportunity in retrofits to many service providers. As a result, building owners receive higher-quality proposals. And because RTEM provides real-time data, building owners can integrate energy efficiency retrofits into broader construction projects instead of undertaking such retrofits separately.



Since RTEM was launched, more than 500 buildings have participated. The data generated have highlighted the size of the potential retrofit market, leading to a significant increase in the number and quality of vendors interested in the New York commercial building retrofit market. In addition, because the system offers real-time data, vendors are able to assess building performance during different times of the day and year, and some vendors are therefore willing to offer guaranteed savings and shared savings contracts. Moreover, this real-time capability makes it easier to include energy efficiency improvements in broader upgrade projects, by providing easily accessible data to evaluate the benefits of such improvements. More than 50 vendors have used RTEM data.³¹

Studies suggest that real-time energy management systems have the potential to achieve energy savings of 15 percent to 30 percent.³² Such systems also address one of the key problems that can occur after a retrofit: the failure to maintain systems and use of manual overrides. NYSERDA's RTEM program monitors deviations from equipment's predicted performance using advanced analytics. Performance degradations are detected immediately and remedies often recommended. To improve maintenance, for example, RTEM detects conditions such as reduced airflow due to clogged filters and provides data to assist in troubleshooting. RTEM also dynamically sets equipment and plant controls to match building occupancy and weather conditions to use the least amount of energy.³³

The state policy innovation principles in RTEM reflect the same principles as the Offshore Wind and RetrofitNY programs. Rather than use traditional one-time grants, NYSERDA is using public dollars to create a new, large market. By engaging in market research with building owners in identifying obstacles to commercial energy retrofits, NYSERDA identified an intervention that has the potential to create a markets-based solution that can scale. RTEM has established a large economic prize for leading energy efficiency providers that enable the industry to better address the needs of building owners.

New York Sun: Using Public Funds as a Bridge to Self-Sustaining Markets

Before 2012, New York State supported its residential solar program with project-level grants to households. Each year the Department of Public Service determined the total annual budget and NYSERDA determined the dollar amount available per installation. As demand for home solar panels grew, the program budget was regularly exhausted before year-end, creating uncertainty in the market. Developers and homeowners were often faced with last-minute changes in the program as NYSERDA reduced dollars available per installation or funding simply ran out. Nor could developers be certain about annual budgets or amounts available per installation in future years.

In 2012, Governor Cuomo announced a different approach in his State of the State address.³⁴ Under "New York Sun" (NY Sun), annual funding cycles for residential solar grants would come to an end. Instead, the state would make a four-year commitment to solar power and double annual funding. At his State of the State address two years later, Governor Cuomo announced an expanded commitment of \$1 billion, without a set deadline for expenditure.³⁵ In addition to providing long-term market certainty for the solar industry, NYSERDA set payment levels for home solar installations that declined based on the volume installed within a region. This approach—modeled after a similar program in California—created an incentive for the solar



industry to invest rapidly in order to capture the highest incentives while they lasted. Then, having invested in local infrastructure to capture the highest incentives, the industry would find the next level of incentive profitable, which further encouraged investment, and so on.³⁶

In contrast to the prior approach, NY Sun “provides the industry with certainty and transparency on incentive levels, accounts for regional market differences, provides a clear signal to industry that New York intends to eliminate cash incentives in a reasonable time frame, and allows for the elimination of those incentives sooner in regions where the market conditions can support it.” New York Sun provides both a line of sight on an economic prize for developers and a structure of support that encourages the industry to make sufficient investments to reduce soft costs (about 65 percent of total costs for a residential solar system). Together with anticipated future declines in hardware costs, these anticipated reductions in soft costs are leading to a self-sustaining market in the state. Already, solar markets on Long Island operate without direct incentives.³⁷

New York Sun also includes other activities to reduce soft costs including streamlining permitting and inspection processes, decreasing costs of installation and components other than the solar modules, training for local officials and first responders, and tools to support community solar projects, including Solarize campaigns (see box).³⁸ Community solar programs widen access to solar to residential customers who do not own their own homes or do not have roofs that can accommodate solar. Through Solar for All, lower-income New Yorkers can participate in community solar projects with no money down and can save as much as \$180 per year in electricity bills.³⁹ These are also programs which leverage public dollars more effectively than outright grants since they reduce soft costs.

Since the inception of New York Sun, the solar industry in the state has grown dramatically and now ranks as the 10th largest by installed capacity in the US.⁴⁰

In May 2020, the New York Public Service Commission approved NYSERDA’s petition to expand New York Sun’s budget by \$573 million to reach a goal of 6 GW by 2025.⁴¹



Solarize Programs

About a dozen years ago, a grassroots group in Portland, Oregon, organized to bring solar power to its community. Calling the effort “Solarize Southeast,” the initiative recognized the value that would come from aggregation of customer education and buying. The National Renewable Energy Lab (NREL) prepared a handbook to support communities interested in such programs.

Since then, Solarize campaigns have taken place in many states. New York State has set up more than 40 of them. While there are variations on the theme, Solarize campaigns involve inviting interested community members to a school or town hall where solar developers give presentations on solar power basics including how solar power works, what installation is like, how long solar power takes to install and how much it costs. Often the developers issue a challenge by providing lower prices depending on the number of installations. The town subsequently picks the developer that they like—sometimes communities have preferred a national firm that offers a lower price over a local firm, while sometimes communities prefer supporting a local operation—and sets a time frame during which homeowners can investigate details on their own installation and decide to commit.⁴²

Solarize campaigns have demonstrated that they are effective in deploying solar. First, there is the benefit of lower costs from lower customer acquisition and installation costs; second, the deadline creates urgency; and third, there is the benefit of peer pressure. Indeed, several researchers have observed that most residential solar installations occur within a few hundred meters of one another. It appears that one neighbor’s adoption of solar will encourage another to follow suit.

From a state policy standpoint, providing financial support for Solarize campaigns represents good value for limited funds, since it involves very modest funds for giving technical support for the community on education and selection of an installer, and then ensuring that the installer understands relevant state policies, including support such as net metering rules or grants to buy down costs; the alternative approach was to give a grant to customers here and there, never achieving scale.

The success of Solarize programs in reducing soft costs provided a key insight to New York State policy makers seeking ways to get more leverage on public dollars. Indeed this led to a wholesale review of New York’s principal program supporting residential solar deployments.



Green Banks

Green Banks have attracted much interest from state and local policy makers as a means of helping to deploy clean energy solutions (particularly community solar, storage and energy efficiency projects). According to the American Green Bank Consortium and Green Bank Network, there are currently more than a dozen green banks and clean-energy financing organizations across the US.⁴³

Green Banks improve the availability of financing—one of the biggest soft costs. They are an important part of state policy innovation that transitions away from one-time grants to activities that will unlock markets.

New York State's Green Bank, the country's largest, has deployed just under \$1 billion in capital. NY Green Bank does not provide subsidized financing. Instead, it lends to projects where developers face a lack of debt financing from banks. It is expensive for banks to make small loans with long maturities, especially with borrowers that are not investment grade. As a result, many smaller distributed energy projects have difficulty getting debt, even if the project can afford market-rate terms. NY Green Bank fills this gap.

NY Green Bank does not compete with or seek to crowd out private sector lenders. Indeed, by incubating financing structures, aggregating loans or providing a warehouse, NY Green Bank helps prove out business models and create sufficient scale for private lenders to take over. NY Green Bank therefore provides considerably more leverage on public funds than the one-time grants that were reprogrammed for the bulk of NY Green Bank's capitalization.

- First, in contrast to grants that are paid out, NY Green Bank's loans are repaid and therefore can be relent.
- Second, NY Green Bank earns interest on its loans, which is used to pay the costs of operations and offset any losses.
- Third, NY Green Bank draws in other private capital to fund projects, seeking to mobilize a ratio of 8:1 across all NY Green Bank investments.
- Finally, once NY Green Bank demonstrates an opportunity to private sector lenders it steps back, letting the private sector take over. This further multiplies the benefit of the initial public dollars.

5. Conclusion

In spending limited funds for clean energy programs, state governments should be guided by four principles:

- First, harness markets where possible.
- Second, focus on soft costs.
- Third, use project subsidies sparingly.
- Fourth, promote environmental justice.

These principles have shaped New York State government clean energy programs in recent years. Those programs are starting to deliver results. The principles have also shaped clean energy programs and policies in other states, including state-funded green banks, solarization programs and declining solar subsidy block grants. These programs reflect increasing understanding by state policy makers that there is more leverage in using public dollars to harness markets and reduce soft costs than in funding a portfolio of one-off projects.

This change in approach can be a challenge for state government. First, activities to “unlock a market” often fail to create obvious photo opportunities for elected officials. Second, evaluating the impacts of programs to unlock markets can be more difficult than evaluating the impacts of a specific, directly-funded project. Third, finding reliable, unbiased information to shape such programs can be a challenge. Programs to unlock markets often must rely on information provided by market participants the program will benefit. This can run counter to Warren Buffett’s famous advice: “Don’t ask a barber whether you need a haircut.”⁴⁴

Another challenge in implementing this change in approach is the dominant utility business model in the United States. Utilities typically recover their costs and a rate of return on capital through rates set by regulators. Under this model, many clean energy activities sponsored by utilities—including energy efficiency programs, demand response programs and solar installations provided by third parties—are done for regulatory compliance, not as profit-making businesses. While the New York Public Service Commission has encouraged utilities to pursue energy efficiency as a business, utilities have been slow to take up the opportunity. In part, this may be due to the novelty of the business models required, involving different kinds of revenues streams than are typical in the utility industry. In part, it may be due to concerns about political risk and possible changes in future regulatory direction.

Still, the experience in New York State suggests these four principles can help maximize the impact of limited state government funds for clean energy.

Ultimately, however, state policies are not enough. There is a reason, after all, that the Articles of Confederation didn’t work. Fifty different state policies—even if based on the same principles—would still burden clean energy businesses with needless soft costs. Different state policies require developers and financiers to understand subtle differences in program design and documentation between the states, adding expense and creating delays.



The development of offshore wind in the Northeast US highlights the benefits and limitations of state-led policy. While state collaboration—and friendly competition—had the benefit of creating a large market for offshore wind industry and reducing costs, each state has imposed different requirements with regard to in-state infrastructure. As a consequence, the offshore wind industry is not being developed in the most cost-effective manner, nor is the overall regional economic development opportunity being optimized.

Ultimately the four principles above should be adopted in clean energy programs at the federal level as well. As the state government experience suggests, federal dollars could help aggregate demand to lower customer acquisition costs. Federal incentives could encourage states to harmonize programs and work together to develop common market development policies, which would also reduce soft costs. A federal green bank that required local green banks to use standard contracts and provide performance data on equipment would significantly reduce financing costs.

Especially during a period of sharply constrained state budgets due to the COVID-19 recession, the federal role in promoting clean energy is key.

Many policy ideas have been developed by states and subsequently adopted at the federal level. Much of the underlying policy framework for federal telecommunications reform grew out of deregulatory changes in California and New York, for example. Obamacare owes its roots to Massachusetts state policy.

As in other policy areas, state innovation offers benefits in clean energy. So does federal leadership. States should experiment, and the federal government should adopt the most successful approaches. Justice Brandeis' 90-year old observation about states as laboratories offers enduring wisdom for the clean energy transition—one of the great challenges of our time.

Notes

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