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Clean Is the New Green: Clean Energy Finance and Deployment Through Green Banks

Whitney Angell Leonard*

INTRODUCTION	198
I. THE GREEN BANK MODEL	200
A. <i>The Need for Green Banks</i>	201
B. <i>Central Principles of Green Banks</i>	204
1. The Value of Loans	205
2. Innovative Financing Mechanisms	206
3. “Win-Win” Benefits of Green Banks	208
II. COMPARATIVE ANALYSIS OF CONNECTICUT AND NEW YORK GREEN BANKS.....	209
A. <i>Connecticut’s Clean Energy Finance and Investment Authority</i>	209
1. Model and Structure	209
2. Flagship Financial Products	211
3. Success Metrics.....	214
4. Lessons Learned	215
B. <i>New York Green Bank</i>	217
1. Model and Structure.....	217
2. Lessons Learned	219
III. POLICY LESSONS FOR GREEN BANK EXPANSION	221
A. <i>Objective Function</i>	221
B. <i>Standardization</i>	223
C. <i>Administrative Flexibility</i>	224
D. <i>Partnerships</i>	225
E. <i>Highlighting Economic Benefits</i>	227
CONCLUSION	228

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INTRODUCTION

One need not look far to find predictions of the heavy toll that climate change will take on the global economy, public health, and the environment. The latest Assessment Report by the Intergovernmental Panel on Climate Change, for instance, projected that escalating climate change will increase the risk of “severe ill-health and disrupted livelihoods for large urban populations due to inland flooding,” “[s]ystemic risks due to extreme weather events leading to breakdown of infrastructure networks and critical services,” “mortality and morbidity during periods of extreme heat,” and “food insecurity and the breakdown of food systems,” among other threats.¹ The U.S. Department of Defense echoed these conclusions in a recent report on climate-driven instability, finding that “[r]ising global temperatures, changing precipitation patterns, climbing sea levels, and more extreme weather events will intensify the challenges of global instability, hunger, poverty, and conflict.”² Not mincing words, the Pentagon went on to add that likely impacts include “food and water shortages, pandemic disease, disputes over refugees and resources, and destruction by natural disasters in regions across the globe.”³

Climate science makes it clear that our society and our economy—and those around the globe—must make a radical shift toward clean energy if we are to avoid the worst of these climate impacts without sacrificing standards of living. An aggressive shift toward renewable energy and other low-carbon energy sources could limit average warming to less than two degrees Celsius (3.6 degrees Fahrenheit), likely avoiding some of the most severe impacts and tipping points.⁴ Making this shift would require widespread adoption of clean-energy technologies, including not only carbon-free energy sources but also energy efficiency technologies that reduce energy demand. A McKinsey & Company study projected, for instance, that widespread deployment of energy-efficiency measures could decrease U.S. energy demand by as much as 23 percent by 2020.⁵ And, if cost-competitive, renewable energy technologies such as solar panels, wind turbines, and geothermal energy systems have the technical potential to

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1. Christopher B. Field et al., *Summary for Policymakers, Climate Change 2014: Impacts, Adaptation, and Vulnerability*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 13 (2014), http://ipcc-wg2.gov/AR5/images/uploads/WG2AR5_SPM_FINAL.pdf.
 2. Chuck Hagel, *Foreword to 2014 Climate Change Adaptation Roadmap*, U.S. DEPARTMENT DEF. 2 (2014), <http://www.acq.osd.mil/ie/download/CCARprint.pdf>.
 3. *Id.*
 4. Field et al., *supra* note 1.
 5. Shannon Bouton et al., *Energy Efficiency: A Compelling Global Resource*, MCKINSEY & CO. 4 (2010), www.mckinsey.com/~media/McKinsey/dotcom/client_service/Sustainability/PDFs/A_Compelling_Global_Resource.ashx.

provide the United States with far more electricity than the quantity we currently use.⁶

But large-scale deployment of clean energy technology can only succeed if clean energy achieves competitive pricing. Fossil fuels have traditionally been able to provide cheaper energy than low-carbon or carbon-neutral sources; longstanding subsidies for fossil fuels, combined with the lack of a price on carbon emissions, have tilted the playing field in favor of fossil fuels like oil and coal. While subsidy elimination and carbon pricing have proven politically difficult, it may be possible to level the playing field, instead, by boosting clean energy investment and reducing the cost of clean energy. One relatively new means of spurring investment in clean energy has shown early success and is showing increasing promise for expansion: green banks.

Government-owned or -affiliated green banks offer innovative clean energy finance mechanisms that reduce risk and help “normalize” investment in clean energy, and thus leverage a limited amount of public or ratepayer funds to attract much higher amounts of private capital. The core of the green bank model is using a variety of loan structures—rather than traditional government subsidies—to invest in projects that attract private capital and that also earn a positive return on the public funds that are invested. In doing so, green banks not only aid the transition away from fossil fuels but also create economic opportunity by helping grow the clean energy sector, creating “green collar” jobs, boosting domestic manufacturing of clean energy products, reducing energy costs for American consumers, and supporting the shift to energy independence. Importantly, these *economic* benefits may appeal to segments of the population who might not otherwise be enticed by the *environmental* benefits of clean energy. Green banks thus succeed at attracting significant investment in clean energy and can also garner political support in a time of tight budgets and deep partisan divides on climate change.

In the United States, state governments have led the green bank movement, with Connecticut’s Clean Energy Finance and Investment Authority (CEFIA) founded in 2011⁷ and the New York Green Bank (NYGB) established in 2013.⁸ The success of these programs, along with other emerging state green banks, has spurred increasing enthusiasm for a federal green bank, and a legislative proposal for such a bank was recently reintroduced in Congress.⁹ Internationally,

6. Anthony Lopez et al., *U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis*, NAT’L RENEWABLE ENERGY LABORATORY 20 (2012), <http://www.nrel.gov/docs/fy12osti/51946.pdf>.

7. *Who We Are*, CLEAN ENERGY FIN. & INV. AUTH. [hereinafter CEFIA], <http://www.ctcleanenergy.com/Default.aspx?tabid=62> (last visited May 30, 2014).

8. *About NY Green Bank*, N.Y. GREEN BANK, <http://greenbank.ny.gov/About.aspx> (last visited May 30, 2014).

9. H.R. 4522, 113th Cong. (2d Sess. 2014); S. 2271, 113th Cong. (2d Sess. 2014).

the United Kingdom's Green Investment Bank¹⁰ and Australia's Clean Energy Finance Corporation¹¹ operate under a similar model. This Note explores the potential for green banks to make clean energy technology competitive in the marketplace, in particular by bridging the financing gap that often prevents these technologies from achieving broad deployment. The Note argues that, in today's political and economic climate, using public resources to leverage private investment has the potential to provide an effective, efficient, and—perhaps even more importantly—politically palatable means of supporting clean energy deployment. State and federal leaders should expand vehicles for such financing, through mechanisms like the burgeoning state green bank programs, and should eventually expand this model to the federal level.

To fulfill the potential of the green bank model, new green banks should adopt best practices that have emerged from early experience with the Connecticut and New York green banks, including standardization of loans and data collection, a nimble institutional structure, and strong partnerships across sectors. Furthermore, this Note argues that policy leaders should focus on “selling” green banks to the public based on their benefits for clean energy jobs, domestic energy investment, cost savings, and energy independence—relying less on rhetoric that is heavily focused on greenhouse gas reductions. Connecticut and New York have followed this approach, and the proposed federal green bank legislation also generally follows these ideas. Leaders of emerging green banks in other states should consider following this path, even as they adapt their arrays of projects to the specific economic conditions and energy markets in their own states.

I. THE GREEN BANK MODEL

The green bank model was designed to address a longstanding challenge to the expansion of new energy technologies, namely the difficulty of financing deployment into the commercial market. Green banks support technologies that are already proven to be effective but, for a variety of reasons, may be harder to finance than conventional energy projects. Residential rooftop solar panels, for instance, or municipal power plants using new clean energy technology, will reduce fossil-fuel use but may require high upfront costs or uncertain pay-back times, and thus may not be likely candidates for a conventional bank loan.

As explored below, the contours of this financing challenge have shaped the structure of green banks. By using innovative loan structures that decrease the risk for investors, green banks can leverage public funds to attract private investment and ultimately increase the deployment of clean energy technology. Green banks thus create a win-win structure that uses limited public money,

10. *What We Do*, GREEN INV. BANK, <http://www.greeninvestmentbank.com/what-we-do/our-history.html> (last visited May 30, 2014).

11. *About Us*, CLEAN ENERGY FIN. CORP., <https://www.cleanenergyfinancecorp.com.au/about-us.aspx> (last visited May 30, 2014).

achieves a viable rate of return for the state and other investors, creates green jobs, and facilitates the transition to a low-carbon economy.

A. *The Need for Green Banks*

The primary barrier to large-scale deployment of clean energy is its cost compared to cheap, subsidized fossil fuels. One recent study found that, over the past 60 years, fossil fuels have received \$594 billion of government subsidies—or 70 percent of all subsidies for energy—while renewables have received \$74 billion, or just 9 percent of the total.¹² Thus decades of subsidies for fossil fuels, coupled with underinvestment in renewable energy, have left low-carbon and renewable energy industries struggling to develop scalable technology at a competitive price.

Green banks help reduce the cost of new clean energy technologies, but not in the way that governments have traditionally been involved in supporting energy innovation. In an effort to support the development of clean energy technology, the federal government invests significant resources in early-stage research through funding programs like the Advanced Research Projects Agency—Energy (ARPA-E) as well as research conducted by the government itself at its many national laboratories. In 2014, for instance, the Department of Energy’s (DOE) Science and Energy appropriations totaled \$8.8 billion, with \$1.9 billion of that going to its Energy Efficiency and Renewable Energy Program and \$280 million funneled to project-based innovation efforts through ARPA-E.¹³

But the government has historically done a poor job of picking winners through such funding programs. One of the most widely publicized examples was DOE’s ill-fated Solyndra investment, in which the government invested \$535 million in a solar-panel manufacturer that went bankrupt and was forced to shut down just two years later.¹⁴ More broadly, a recent Government Accountability Office report found DOE’s loan monitoring capabilities to be insufficient and ineffective.¹⁵ Specifically, for \$30 billion of loans made between

12. *60 Years of Energy Incentives: Analysis of Federal Expenditures for Energy Development*, MGMT. INFO. SERVS., INC. 1 (2011), <http://www.misi-net.com/publications/NEI-1011.pdf>.

13. *2015 Budget Request: Budget Highlights*, U.S. DEP’T ENERGY 7 (Mar. 2014), <http://energy.gov/sites/prod/files/2014/04/f14/15Highlights%20%281%29.pdf>.

14. Michael Bathon, *Solyndra Lenders Ahead of Government Won’t Recover Fully*, BLOOMBERG (Oct. 17, 2012), <http://www.bloomberg.com/news/2012-10-17/solyndra-lenders-ahead-of-government-won-t-recover-fully.html>; *Solyndra Scandal Timeline*, WASH. POST (Dec. 2011), <http://www.washingtonpost.com/wp-srv/special/politics/solyndra-scandal-timeline>.

15. U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-14-367, DOE LOAN PROGRAMS: DOE SHOULD FULLY DEVELOP ITS LOAN MONITORING FUNCTION AND EVALUATE ITS EFFECTIVENESS 5 (May 2014), <http://www.gao.gov/assets/670/662944.pdf>.

2009 and early 2014, DOE applied inconsistent or incomplete policies regarding risk management, loan disbursement, borrower bankruptcies, and loan repayment.¹⁶

Venture capital enterprises are much better suited to fill this role of betting on early-stage technologies, and venture capital firms are increasingly doing so.¹⁷ These high-risk investments are not necessarily a good use of public funds, but they are apt for venture capital enterprises because they bring the potential of high returns. Venture capital thus has a role to play in supporting technological innovation. But no amount of innovation makes a difference if these new technologies cannot get to market, and there are few financing options to help clean technologies bridge this gap. Green banks are designed to solve this problem.

Governments and investors have increasingly recognized a role for government in helping bridge the “valley of death” that technology must cross between the innovation stage and the commercialization stage. On one end of the spectrum, venture capitalists (and the federal government) provide grants that support projects during the early innovation stage but do not carry over into the commercialization and deployment phases. On the other end of the spectrum, larger banks are willing to invest in large-scale commercialized projects and proven technologies. The problem lies between these two extremes. As a Bloomberg New Energy Finance report put it, the “so-called Commercialisation ‘Valley of Death’—located somewhere between Silicon Valley VCs and Wall Street banks—poses a long-standing challenge to the clean energy sector.”¹⁸ Part of the problem is that the return on these new technologies may still be uncertain at the point between innovation and widespread commercialization, which makes investments seem risky and thus limits the availability of capital. The Bloomberg report highlights the emerging consensus that the government must help clean technologies bridge this gap: “[T]his is a challenge the private sector cannot meet on its own, given the current financing and policy tools available.”¹⁹

There is still some debate about the stage *within* the valley of death, or beyond it, at which government support would have the most impact on clean en-

16. *Id.* at 10.

17. Managing more than \$3 billion, for instance, well-known venture capitalist Vinod Khosla focuses a significant portion of his investments on clean technology. “Our willingness to fail gives us the ability and opportunity to succeed where others may fear to tread,” his website states. *About Khosla Ventures*, KHOSLA VENTURES, <http://www.khoslaventures.com> (last visited May 30, 2014). See also DANIEL YERGIN, *THE QUEST: ENERGY, SECURITY, AND THE REMAKING OF THE MODERN WORLD* 558 (2011).

18. *Crossing the Valley of Death*, BLOOMBERG NEW ENERGY FIN. 2 (June 21, 2010), <http://www.cleangroup.org/assets/Uploads/CEGBNEF-2010-06-21valleyofdeath.pdf>.

19. *Id.*

ergy technology. One of the only treatments of the issue in the legal literature, by Allison Clements and Douglass Sims, argues for a governmental Clean Energy Development Authority (CEDA) that would support emerging technologies.²⁰ The green bank proposed as part of the unsuccessful 2009 American Clean Energy and Security Act also took this approach.²¹ Clements and Sims take the position that commercially viable technologies already receive adequate government support in the form of tax incentives and that emerging technologies thus need government support more critically.²² While it is true that technologies anywhere within the commercialization gap suffer from a lack of financing and would therefore benefit from government support, Clements and Sims admit that the focus on emerging technologies still leaves the proposed CEDA “in the unenviable position of ‘picking winners’ to some extent.”²³

Other research has found that financing gaps continue to exist even for technologies that are already economically viable. A recent report from the Brookings-Rockefeller Project on State & Metropolitan Innovation describes this as a “deployment and diffusion gap” that continues to exist just past the valley of death.²⁴ This gap primarily exists due to the relatively undeveloped state of clean energy finance markets. As the New York State Energy Research and Development Authority (NYSERDA) explained in its proposal for the New York Green Bank, clean energy markets suffer from “federal policy uncertainty, insufficient data on underlying loan and technology performance, and the underdeveloped or non-existent state of publicly-traded capital markets for clean energy.”²⁵ An assessment undertaken for NYSERDA by Booz & Company similarly described the opportunity to provide government financing for “clean energy projects that are economically viable but not currently *financeable*.”²⁶

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20. Allison S. Clements & Douglass D. Sims, *A Clean Energy Deployment Administration: The Right Policy for Emerging Renewable Technologies*, 31 ENERGY L.J. 397 (2010).
 21. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009).
 22. Clements & Sims, *supra* note 20, at 409-10.
 23. *Id.* at 410.
 24. Ken Berlin et al., *State Clean Energy Finance Banks: New Investment Facilities for Clean Energy Deployment*, BROOKINGS-ROCKEFELLER PROJECT ON STATE & METROPOLITAN INNOVATION 4 (2012), http://www.coalitionforgreencapital.com/uploads/2/5/3/6/2536821/bookings_paper.pdf.
 25. *Petition of the New York State Energy Research and Development Authority to Provide Initial Capitalization for the New York Green Bank*, N.Y. STATE ENERGY RESEARCH & DEV. AUTH. 1 (Sept. 9, 2013) [hereinafter NYSERDA], <http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=13-m-0412&submit=Search+by+Case+Number>.
 26. *New York State Green Bank Business Plan Development: Final Report, September 3rd 2013*, BOOZ & CO. 4 (2013) (emphasis added) [hereinafter *New York Green Bank Business Plan*], <http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=13-m-0412&submit=Search+by+Case+Number>.

While some cost-competitive solar panels exist, for instance, a customer or project developer might have difficulty securing the financing necessary to cover the high up-front cost of installing a solar-power system. This, then, is the critical gap that green banks are well-suited to fill—to leverage public funds in a way that will help “facilitate the flow of private capital to areas of the market that are not served by traditional and non-traditional lenders.”²⁷

B. Central Principles of Green Banks

In essence, green banks all aim to bridge the financing gap and reduce the cost of capital. They accomplish this goal by leveraging limited public dollars to de-risk and “normalize” clean energy investments, which helps attract the *private* capital investments that clean technology will ultimately need in order to survive without government support. In doing so, they bring to bear the discipline of the private sector in deciding which projects will receive financing, and simultaneously create the public benefit of clean energy deployment.²⁸

The guiding principle for the green bank model is that the institution should strive to maximize the amount of clean energy deployed per state dollar invested. Reed Hundt, CEO of the Coalition for Green Capital, which promotes the development of green banks, describes this goal as the “objective function” of the green bank model. He means that each green bank strives to achieve the same objective goal—maximum clean energy deployment per state dollar invested—though the methods and financial products used to achieve it will differ depending on the conditions within each state. Hundt acknowledges that there is some debate over exactly which metrics to use to evaluate progress toward this goal, but the core mission does not vary.²⁹

The green bank model is uniquely suited to maximize clean energy deployment per dollar by (1) using a loan-based model rather than a subsidy-based model, and (2) creating innovative financing mechanisms that reduce risk for private investors. Both of these characteristics also make green banks politically appealing to fiscally conservative, market-oriented voters who might not otherwise support government involvement in the clean energy sector.

27. *Id.* at 2.

28. Interview with Daniel Esty, Former Comm’r, Conn. Dep’t of Energy & Env’tl. Prot., and Professor, Yale Law School and Yale School of Forestry & Env’tl. Studies (Feb. 20, 2014).

29. Telephone Interview with Reed Hundt, CEO, Coal. for Green Capital (Mar. 17, 2014).

1. The Value of Loans

The magic of green banks lies in their shift to a finance-based model from a subsidy-based model of support for clean energy technology. Subsidies have traditionally been the other mechanism that governments have used to support clean energy, but they are not nearly as efficient as the green bank model. In addition to the problem of “picking winners,” subsidies also tend to be expensive per unit of technology deployed. While a subsidy is an expenditure that will not be paid back to the government, a loan represents an asset because it will be paid back, *and*, in the meantime, the lender can charge interest on it. In the case of government loans, both the federal government and state governments have a low discount rate³⁰ because they have relatively easy access to capital and a high certainty of being able to collect money through taxes. And as long as a state government can loan money at an interest rate that is above its own (low) discount rate, it can actually *create* value with that loan. This means that green banks affiliated with state governments can offer loans that are relatively low-cost to consumers (i.e., below a consumer’s discount rate) and value-generating for the green bank (i.e., above the state’s discount rate).

Importantly, if a customer’s discount rate is high enough, a low-cost loan may be nearly as valuable to the customer as an outright grant would be. Illustrative calculations done by Jeffrey Schub at the Coalition for Green Capital demonstrate this point. Consider a 20-year (zero coupon) loan from the state, or a state-affiliated green bank, for \$100 at 3% interest. If the state government has a 2% discount rate, this loan creates \$22 of net present value for the state. From the loan customer’s perspective, a customer with a 14% discount rate (in line with empirical estimates in the academic literature) would value the loan at \$87 net present value.³¹ Long-term, low-cost loans can therefore provide customers with almost as much value as a direct grant, while also generating value for the government. The longer the payback period, and the higher the customer’s discount rate, the closer the value of the loan comes to the value of an outright grant. Moreover, under a loan-based model, the state green bank can make up this difference by issuing loans with higher face value than the amount of subsidies it would be able to offer, giving the customer the capital needed to undertake a given project.

30. A discount rate reflects the concept of the “time value of money,” which is the idea that a person values one dollar today more than the promise of getting a dollar one year from now. A consumer is willing to take out a loan because of her discount rate: despite the fact that she will have to pay interest on the loan, she values the money she receives from the loan today more than she values the money she will have to pay back in the future. See *A Primer on the Time Value of Money*, N.Y.U. STERN SCH. BUS., http://pages.stern.nyu.edu/~adamodar/New_Home_Page/PVPrimer/pvprimer.htm (last visited Nov. 16, 2014).

31. Jeffrey Schub, *Transitioning from Grants to Loans 2* (Coal. for Green Capital, Draft Report for CEFIA, 2014) (on file with author).

Furthermore, as borrowers repay their loans, the green bank can recycle that capital and reinvest it in new projects, creating recurring cycles of investment that generate much more value than one-time subsidy expenditures. This revolving loan system should therefore be far more attractive to fiscal conservatives than a subsidy model that would require greater government outlays to generate the same amount of value.

2. Innovative Financing Mechanisms

As an extension of the loan concept, green banks can also take advantage of their status as governmental or quasi-governmental entities to create innovative financing mechanisms that reduce risk for other investors, thereby attracting much more private capital into a project. As noted earlier, a major driver of the high cost of capital for clean energy technology is the perceived risk of these investments—owing in part to the lack of data on how the investments perform. As NYSERDA explained in its petition for capitalization of the New York Green Bank,

Capital costs rise in relation to the perceived risk; feedback from market participants suggests that banks include a risk premium in many clean energy transactions because of misperceptions as to the level of risk. In these cases, the Green Bank can facilitate private sector participation by providing some form of credit enhancement . . . for the underlying transactions.³²

Thus, drawing on practices already common in other finance fields, green banks are developing a number of financing mechanisms to reduce the risk for private investors.³³ One of these financing mechanisms is the creation of loan loss reserves, by which the green bank agrees to cover a portion of the losses that private lenders incur in the event of default.³⁴ Another important mechanism is the creation of subordinated debt, by which the green bank invests in a project alongside private lenders but agrees to subordinate its tranche of debt below that of the other lenders, so the private lenders would be paid back first in the event of default or bankruptcy.³⁵ Structuring loans that can be repaid through a homeowner's utility bill ("on-bill repayment") or as part of a property tax bill ("Property-Assessed Clean Energy") also decreases investor risk because utility bills and property taxes tend to have very low rates of nonpay-

32. NYSERDA, *supra* note 25, at 5.

33. *Id.* at 1.

34. See Hallie Kennan, *Working Paper: State Green Banks for Clean Energy*, ENERGY INNOVATION 6-7 (2014), http://energyinnovation.org/wp-content/uploads/2014/01/WorkingPaper_StateGreenBanks.pdf (describing loan loss reserves and other finance mechanisms in the context of CEFIA's finance mechanisms).

35. Fin. Solutions Working Grp., *Credit Enhancement Overview Guide*, ST. & LOC. ENERGY EFFICIENCY ACTION NETWORK 4 (2014), https://www4.eere.energy.gov/seeaction/system/files/documents/credit_enhancement_guide.pdf.

ment.³⁶ Government-owned green banks not only have access to low-cost capital to provide this type of financing, but also have more flexibility in experimenting with new financing mechanisms that will yield a lower return or a return over a longer time horizon than private investors might be willing to try.³⁷

Green banks are also exploring other financing mechanisms that attract private capital by increasing the size of investment opportunities available to private investors, and also improving market liquidity. Projects financed by a green bank might include everything from a small residential rooftop-solar installation to a new energy-efficient heating system for a large commercial or municipal facility. Through “warehousing,” green banks can aggregate large numbers of small loans for these individual projects and securitize them in pools—essentially combining them in a way that allows secondary lenders to invest.³⁸ The standardization and securitization reduces transaction costs for private investors (the costs of finding and investing in many individual projects) and allows for larger-scale private investment.³⁹ Thus, this type of market opportunity can attract larger investors that would not be interested in investing in small-scale, one-time projects. Similarly, green banks can also create structured products such as tax equity funds that attract investors who can use these tax benefits.⁴⁰

By structuring financing mechanisms with the goal of attracting private-sector investment—and only moving forward with projects that are economically viable and do ultimately attract private capital—green banks thus bring the discipline of the private sector into their financial model. Daniel Esty, Commissioner of the Connecticut Department of Energy and Environmental Protection at the time when CEFIA was launched, highlights the importance of this calculus: far from picking winners, the green bank model ensures that the most financially promising projects will have access to capital.⁴¹ Moreover, partnering with the private sector also helps introduce private lenders to the clean energy technology market and helps develop secondary markets in clean energy investment. Both of these developments will help ensure the private sector is positioned to finance clean technology on its own at some point in the future, without the need for government support. The green bank model is meant to work toward this goal.

36. Kennan, *supra* note 34, at 5.

37. *Id.* at 2.

38. See *New York Green Bank Business Plan*, *supra* note 26, at 20.

39. See, e.g., NYSERDA, *supra* note 25, at 8.

40. *Id.* at 9.

41. Interview with Daniel Esty, *supra* note 28.

3. “Win-Win” Benefits of Green Banks

The unique combination of benefits offered by green banks has the potential to appeal to voters and policymakers on both sides of the aisle. Taking loans and innovative financing together, this combination of fiscal discipline and partnership with private capital fixes some of the market gaps that plague clean energy investment while simultaneously generating state revenue and reducing the need for subsidy programs that weigh heavily on state and federal budgets. And by funneling investment into in-state clean energy projects that help create jobs, the green bank model also helps stimulate local economies and reduce dependence on foreign energy sources. Energy efficiency investments, moreover, can reduce operating costs for local businesses, thus increasing profit margins and boosting competitiveness. In principle, therefore, the green bank model should appeal to more conservative voters that might not otherwise support government investment in clean energy.⁴²

At the same time, the green bank model is able to attract quantities of private capital far beyond what the government would be able to provide on its own, which vastly expands the amount of financing available for clean energy technology and thus significantly increases clean energy deployment. This aspect of green banks, of course, appeals to segments of the public who want to see the government taking strong action on reducing greenhouse gas emissions.⁴³ Green banks therefore have the potential to serve as a rare win-win solution in an age of divisive politics. The wide range of states adopting or considering the green bank model serves as a poignant illustration of the model's political and economic attractiveness. In addition to the Connecticut and New

42. A 2014 poll by Pew Research, for instance, showed a widening gap between Republicans and Democrats on whether traditional environmental regulations “cost too many jobs and hurt the economy,” with fifty-nine percent of Republicans answering yes to this question. *Political Polarization in the American Public, Section 1: Growing Ideological Consistency*, PEW RES. CTR. FOR PEOPLE & PRESS, <http://www.people-press.org/2014/06/12/section-1-growing-ideological-consistency> (last visited June 15, 2014). And a 2013 Pew Research poll showed that Republican voters want even their own party to be more conservative on government spending. *Whither the GOP? Republicans Want Change, but Split over Party's Direction*, PEW RES. CTR. FOR PEOPLE & PRESS, <http://www.people-press.org/2013/07/31/whither-the-gop-republicans-want-change-but-split-over-partys-direction/> (last visited June 15, 2014). The green bank model has the potential to address both of these concerns from conservative voters; indeed, the legislation creating CEFIA was widely supported by both Republicans and Democrats in the state legislature. See *infra* note 48 and accompanying text.

43. In 2013, for instance, Pew Research found that nearly half of all Democrats considered climate change a priority issue, compared to just fifteen percent of Republicans. *If No Deal is Struck, Four-in-Ten Say Let the Sequester Happen*, PEW RES. CTR. FOR PEOPLE & PRESS, <http://www.people-press.org/2013/02/21/if-no-deal-is-struck-four-in-ten-say-let-the-sequester-happen> (last visited June 15, 2014).

York green banks described in detail below, states as diverse as Kentucky⁴⁴ and Hawaii⁴⁵ have adopted programs that incorporate elements of the green bank model. This momentum has also spurred calls for a federal green bank, and one such proposal was recently introduced in both the House and Senate.⁴⁶ Green banks thus appear to have a broad appeal, which can and should be leveraged as the green bank movement expands.

II. COMPARATIVE ANALYSIS OF CONNECTICUT AND NEW YORK GREEN BANKS

An in-depth look at the two fully developed state green banks, in Connecticut and New York, shows how the green bank model plays out to create real economic benefits and increases in clean energy deployment. Analyzing the Connecticut and New York experiences also illustrates lessons and best practices to be adopted as the green bank movement grows. As this Part describes, Connecticut's green bank has taken a consumer-oriented approach, providing loans and other financing products that have helped homeowners, businesses, and municipalities install clean energy projects across the state. New York's green bank has focused on a wholesale financing approach, making clean energy loans more attractive for existing investors and thus increasing total deployment of clean energy. These different approaches illustrate ways in which the green bank model can be tailored to fit the local conditions of a state's energy and financial markets while maintaining the same "objective function" of leveraging public funding to increase clean energy deployment.

A. *Connecticut's Clean Energy Finance and Investment Authority*

1. Model and Structure

The first state green bank in the country, the Clean Energy Finance and Investment Authority (CEFIA), was created in Connecticut in 2011 and has achieved impressive success in its first few years of operation. It has thus become a model for other green banks, even as CEFIA itself continues to grow, learn, and improve.

To launch CEFIA in 2011, the Connecticut legislature passed a law repurposing the existing Connecticut Clean Energy Fund and creating CEFIA as a quasi-public authority.⁴⁷ The legislation passed the General Assembly with strong support from both parties, with nearly unanimous votes in favor in both

44. *Kentucky*, COAL. FOR GREEN CAPITAL, <http://www.coalitionforgreencapital.com/kentucky.html> (last visited May 31, 2014).

45. *Hawaii*, COAL. FOR GREEN CAPITAL, <http://www.coalitionforgreencapital.com/hawaii.html> (last visited May 31, 2014).

46. H.R. 4522, 113th Cong. (2d Sess. 2014); S. 2271, 113th Cong. (2d Sess. 2014).

47. Conn. Pub. Act 11-80, § 99(c) (2011).

houses of the legislature.⁴⁸ As explained further below, CEFIA's quasi-governmental status has been central to its structure, affording it the flexibility and nimbleness necessary for successful collaboration with partners in the business sector. CEFIA receives approximately \$30 million per year from a small ratepayer surcharge on electricity bills, \$5 to 10 million from the state's Regional Greenhouse Gas Initiative proceeds, and some funding from federal sources; its overall balance sheet includes \$100 million in assets.⁴⁹ In keeping with its quasi-public structure, the CEFIA board consists of a mix of officials from state government and the private sector.

Following the quintessential green bank model, CEFIA was established with the goal of helping the state "achieve cleaner, cheaper, and more reliable sources of energy while creating jobs and supporting local economic development."⁵⁰ In doing so, CEFIA helps address specific energy challenges faced by the state of Connecticut, and also addresses ubiquitous challenges in the clean energy market. In Connecticut specifically, consumers and businesses face high energy costs, an old and inefficient building stock, grid reliability challenges, and (as in many states) constrained government spending.⁵¹ The State of Connecticut also has ambitious energy policy goals such as enabling energy efficiency improvements in fifteen percent of single-family homes by 2020 and expanding solar photovoltaic panels to the 150,000 households where solar panels are feasible.⁵² CEFIA thus sees its role as leveraging the private capital necessary to address Connecticut's energy challenges and help the state meet its energy policy goals, rather than having specific clean energy or emissions reduction targets for CEFIA on its own.⁵³

To work toward these goals, CEFIA uses a variety of financial tools that fit with the green bank model, including subordinated debt, loan loss reserves, leases, power purchase agreements, bonds, on-bill repayment, loans, equity, a special capital reserve fund, third-party insurance, energy savings performance contracts, and also some grants.⁵⁴ As described below, CEFIA has chosen a

48. The Senate voted in favor of the bill by 36 votes to 0 votes. *Vote for SB-1243 Sequence Number 383*, CT. GEN. ASSEMBLY, <http://www.cga.ct.gov/2011/VOTE/S/2011SV-00383-R00SB01243-SV.htm> (last visited June 15, 2014). The House voted in favor by 139 votes to 8 votes. *Vote for SB-1243 Roll Call Number 320*, CT. GEN. ASSEMBLY, <http://www.cga.ct.gov/2011/VOTE/H/2011HV-00320-R00SB01243-HV.htm> (last visited June 15, 2014).

49. Bryan Garcia, President & CEO, Clean Energy Fin. & Inv. Auth., and Alexandra Lieberman, Senior Manager for Clean Energy Finance, Clean Energy Fin. & Inv. Auth., Presentation to Yale Law School Class: Climate Change and the Quest for Clean Energy, slide 10 (Feb. 24, 2014).

50. CEFIA, *supra* note 7.

51. Garcia & Lieberman, *supra* note 49, at slide 4.

52. *Id.* at slide 6.

53. *Id.*

54. *Id.* at slide 11.

model that uses these tools to provide low-cost financing to consumers and businesses directly, with a variety of products that appeal to a range of commercial and residential customers. (This approach contrasts with New York Green Bank's wholesale approach, as discussed in Part II.B.)

2. Flagship Financial Products

CEFIA's four main residential clean energy finance products are the CT Solar Lease, CT Solar Loan, Smart-E Loans, and Cozy Home Loans, each of which uses a combination of financial tools to attract private capital and provide low-cost financing to customers looking to install renewable energy or undertake energy efficiency upgrades.

The CT Solar Lease, for example, is a program that allows residential customers to lease a solar panel installation on their own rooftop: ACF First, a regional lender, owns the solar installations and leases them to the customer for the duration of a twenty-year contract.⁵⁵ Because the customer does not actually have to purchase the solar panels, he pays very few up-front costs, yet the consumer gets the benefit of having a cheap, clean source of energy on his rooftop. ACF First and other lenders, leveraged by CEFIA's financial products, invest the necessary up-front costs and receive a return on their investment over the course of the 20-year contract. To attract these private lenders, CEFIA provides \$10 million in the form of a loan loss reserve and subordinated debt, which helps reduce private lenders' risk. This de-risking mechanism has been able to attract \$23 million of tax equity financing via US Bank (from the federal investment tax credit), plus \$27 million from a syndicate of debt providers led by First Niagara.⁵⁶ CEFIA has thus leveraged its funds to attract substantial amounts of private capital and vastly increase the amount invested in the project. CT Solar Lease also provides insurance and makes arrangements with the installation contractor, making the product easy to acquire and therefore attractive to residential customers without expertise in clean energy technology operation or finance.

The CT Solar Loan product, for customers who want to own (rather than lease) their rooftop solar installation, similarly uses a combination of debt instruments to attract private capital with limited direct investment from CEFIA. With the CT Solar Loan program, customers pay a relatively low down payment. The rest of the initial cost is provided by this combination of private investment and CEFIA financial instruments, which the customer pays back in monthly payments over fifteen years.⁵⁷ The customer, meanwhile, receives the benefit of owning her own source of clean energy, drastically reducing the

55. *Id.* at slides 19, 21; see also *CT Solar Lease Customer Project Guide*, ENERGIZE CT (2014), http://www.energizect.com/sites/default/files/uploads/CT_Solar_Lease_Customer_Project_Guide.pdf.

56. Garcia & Lieberman, *supra* note 49, at slide 20.

57. *Id.* at slides 20, 23.

amount of electricity she has to purchase from her utility company. CT Solar Loan also represents the first “crowd-sourced” funding for clean energy, as one of the private debt providers, Mosaic, provides financing via a loan pool that crowd-sources investment from individual investors across the country.⁵⁸ CEFIA’s Smart-E Loans and Cozy Home Loans use similar financial structures to help customers pay the up-front costs for energy efficiency improvements as well as renewable energy installations in their homes.⁵⁹

These CEFIA products have been enormously successful at attracting private capital and increasing the amount of residential solar installed in Connecticut, with the CT Solar Lease program investing \$60 million into residential and commercial solar systems, CT Solar Loan investing \$5 million, and the Smart-E Loan program investing \$30 million. This investment has reduced the cost of installed solar by 10% per year since 2011, while simultaneously reducing subsidies by 20% over that time. Together the programs have produced 150% growth in installed solar capacity year-over-year since 2011, with an impressive 10 megawatts installed in 2013.⁶⁰ This great surge in installed renewable capacity, with such strong investment from the private sector, has made huge strides toward the green bank “objective function” of maximizing the amount of clean energy deployed per state dollar invested.

The success of CEFIA’s direct-to-consumer model comes in part from programs like Solarize Connecticut, which aggregates demand and thus creates economies of scale for solar installers. The Solarize program, currently in its fourth round, encourages residents of a town to sign up for solar installation with a designated installer, and it incrementally reduces the price to consumers as more people sign up.⁶¹ The program highlights the importance of innovation in marketing and public engagement: by combining aggregated demand with a concentrated marketing program, Solarize reduces the installers’ costs of acquiring new customers and therefore reduces overall costs. This has helped reduce the cost of solar power by 20 to 30%, with the average installed solar cost

58. Bryan Garcia, President & CEO, CEFIA, Quarterly Market Report: CEFIA Stakeholder Webinar, slide 21 (Mar. 19, 2014); *see also* Press Release, Clean Energy Fin. & Inv. Auth., CEFIA Announces \$5 Million Deal to Offer New Crowdsourced Residential Solar Loans (Feb. 6, 2014), http://www.ctcleanenergy.com/NewsEvents/PressRoom/tabid/118/ctl/ViewItem/mid/1364/ItemId/289/Default.aspx?SkinSrc=%2fPortals%2f_default%2fSkins%2fsubpages%2fsubpage_levelo.

59. Garcia & Lieberman, *supra* note 49, at slide 18.

60. *Id.* at slide 38. One megawatt is roughly the amount of power needed to supply one thousand homes with electricity at average levels of demand. However, because solar panels do not produce power at all hours of the day, the amount of electricity actually produced by this installed capacity would power somewhat fewer than one thousand homes. *See* Jonathan G. Koomey et al., *Sorry, Wrong Number: The Use and Misuse of Numerical Facts in Analysis and Media Reporting of Energy Issues*, 27 ANN. REV. ENERGY & ENV’T 119, 121-24 (2002).

61. *About Solarize*, SOLARIZE CONN., <http://solarizect.com/about-solarize/> (last visited May 30, 2014).

down to \$3.80 per Watt in Solarize towns, compared to \$4.76 per Watt in non-Solarize towns.⁶² The program has been hugely popular and successful: since inception, Solarize CT has helped install 450 rooftop solar systems, and in the space of just a few months, every participating town has at least doubled the number of solar systems that had been installed in the previous *seven years*.⁶³ Moreover, this combination of reduced costs for consumers with increased numbers of solar installations is a great example of how clean energy can create economic opportunity in the form of both jobs and cost savings. Highlighting these benefits, as discussed below, can and should play a major role in making the case for expanding these programs.

CEFIA's flagship product for commercial customers, Commercial Property-Assessed Clean Energy (C-PACE), has also met with substantial success in its first few years. As with similar programs in other states, C-PACE allows building owners and municipalities to finance efficiency improvements by taking out a loan that is repaid as part of their property tax bill. Because the loan is secured by a lien on the property, and because default rates on property taxes are extremely low, private lenders are willing to provide low-interest loans.⁶⁴ Connecticut law allows municipalities to opt into the C-PACE program, agreeing to assess and remit payments to CEFIA, which then allows local businesses to access C-PACE financing.⁶⁵ Since this provision was passed in 2012, eighty Connecticut municipalities have already opted into the program, comprising over 80% of the eligible commercial and industrial marketplace for C-PACE.⁶⁶ By creating a channel for cities and towns to enter into an agreement with CEFIA directly, this bottom-up approach remains grounded at the municipal level, allowing cities and towns to feel engaged in the program.⁶⁷ And the remarkable uptake rate shows that towns and businesses understand the benefits of the innovative new financing methods provided by CEFIA, underscoring the idea that green banks can provide a popular, win-win solution advancing economic growth while also expanding clean energy and energy efficiency.

62. Garcia & Lieberman, *supra* note 49, at slide 16.

63. *Id.* at slide 17.

64. *About C-PACE*, C-PACE, <http://www.c-pace.com/about-c-pace> (last visited Jan. 7, 2015).

65. *C-PACE Municipalities*, C-PACE, http://www.c-pace.com/assets/pdf/CF_I0003_Municipalities_List.pdf (last visited Jan. 7, 2015); *see also* Garcia & Lieberman, *supra* note 49, slide 37.

66. Garcia & Lieberman, *supra* note 49, at slide 37.

67. C-PACE, *supra* note 65.

3. Success Metrics

CEFIA's remarkable successes prove that the green bank model works, while even its challenges and bumps in the road provide valuable insights for future green banks. Importantly, CEFIA has already made great strides toward the green banks' objective function of leveraging capital to deploy as much clean energy as possible with limited state funding. At the close of fiscal year 2013, less than two years after its creation, CEFIA proudly declared that it had "attracted \$180 million in private capital using \$40 million of ratepayer funds, of which \$20 million of ratepayer funds used are in loans (i.e., paying back over time), thus achieving a leverage ratio of about 10:1."⁶⁸ The cumulative investment of over \$220 million into Connecticut's clean energy economy drove the installation of nearly 30 megawatts of new clean energy, including the largest fuel cell array in the country. This large increase in clean energy deployment using limited public funds is a powerful illustration of the green bank objective function. CEFIA calls it simply "doing more with less and faster."⁶⁹

This impressive and rapid increase in clean energy deployment is an easy sell for those who already support the transition away from fossil fuels: CEFIA estimates that its investments through fiscal year 2013 will reduce 250,000 tons of carbon dioxide emissions over the life of the clean energy installations it has deployed.⁷⁰ At the same time, the limited use of public funds should be a major selling point for champions of fiscal restraint. And CEFIA is already in the process of selling down a \$30 million loan portfolio to a private investor, allowing CEFIA to recover those ratepayer funds and re-invest them in new projects.⁷¹ This recycling of funds helps CEFIA further leverage its investments of limited public dollars. Moreover, the \$220 million of investment catalyzed by CEFIA has gone straight into the state economy and has helped create over 1,200 jobs in fiscal year 2013 alone (400 direct jobs and 800 indirect jobs).⁷² This economic opportunity, too, should be a selling point for proponents of economic growth who might not otherwise prioritize clean energy.

68. *Public Comments on the Petition of New York State Energy Research and Development Authority to Provide Initial Capitalization for the New York Green Bank [Case 13-M-0412]*, CLEAN ENERGY FIN. & INV. AUTH. [hereinafter CEFIA] 3 (Nov. 1, 2013).

69. *Id.* at 4.

70. *Id.*

71. Garcia, *supra* note 58, at 6.

72. CEFIA, *supra* note 68, at 4.

4. Lessons Learned

Some of the main reasons for CEFIA's early success include its institutional nimbleness and flexibility, its creation of strong partnerships, and its push for standardization on multiple levels—in addition to, of course, its smart and hardworking staff. CEFIA's structure as a quasi-public authority, rather than as a fully government-operated agency, gives it the ability to operate on a faster and more flexible timetable that is required for success in the financial sector. Bryan Garcia, president and CEO of CEFIA, says that CEFIA's quasi-public structure allows it to operate “at the speed of business,” thereby facilitating partnerships with private financial institutions that CEFIA hopes to attract.⁷³ After developing operating procedures that went through a state review process, CEFIA's relative freedom to make decisions within the bounds of those procedures—including hiring staff outside the normal governmental process—has been critical to its success.

CEFIA's nimble institutional structure, in turn, has helped it form the strong partnerships with banks, clean energy contractors, and other private institutions that have been another key to its success. CEFIA's four residential loan products depend on partnerships with fifteen financial institutions, ranging from local to regional to national in scale.⁷⁴ These institutions have helped provide the private capital, in different forms and instruments suited to their lending niche and expertise, that drove the success of CEFIA's clean energy finance products. Similarly, CEFIA's partnerships with municipalities were crucial for promoting programs like Solarize CT and C-PACE. Moreover, these partners not only support CEFIA's ongoing programs but can also be an important—and different—voice in support of the green bank model.

Standardization of loan procedures and data collection has also played a role in CEFIA's success. For example, standardized contracts for the CT Solar Lease program made it easier to underwrite loans because the lender does not need to develop an entirely new contract for each new customer.⁷⁵ This contract standardization reduces costs for the lenders and thus allows them to offer better loan terms.⁷⁶ Tracking the performance of these new solar installations with standardized metrics, in addition, will increase both lender and customer confidence. Moreover, the standardization and availability of data also normalizes investments in the clean energy sector, making them seem less risky to potential investors. As more green banks are formed, collaboration across these institu-

73. Telephone Interview with Bryan Garcia, President & CEO, Clean Energy Fin. & Inv. Auth. (Mar. 17, 2014).

74. CEFIA, *supra* note 68, at 5.

75. Garcia & Lieberman, *supra* note 49, at slide 20.

76. *Id.* at slide 27.

tions to continue increasing standardization will also help facilitate loan securitization, thus further improving access to capital markets.⁷⁷

Many of the challenges that CEFIA still faces revolve around marketing, education, and outreach. The challenge inherent in being the nation's first state green bank, of course, is that neither customers nor lending institutions have prior experience dealing with a green bank. This means that CEFIA has had to shoulder the task of explaining the green bank model to clean energy customers, banks, and even the state legislature that passed the law creating CEFIA. The most dramatic illustration of this challenge came in June 2013, when the Connecticut legislature saw CEFIA's balance sheet—the capital necessary for the success of CEFIA's lending model—as a budget surplus, and so reallocated that funding toward other state programs.⁷⁸ Though CEFIA ultimately replenished its balance sheet from other sources of state funding,⁷⁹ CEFIA had to work hard to convince its investors to maintain their confidence in the institution and to educate the state legislature (for the future) about the importance of a healthy balance sheet for CEFIA to be able to attract private investment.⁸⁰

Marketing clean energy finance products to potential customers has also been a challenge that CEFIA is working to overcome. For example, CEFIA will soon finance two methane anaerobic digester projects (which convert manure or other organic wastes into methane that can be used for heating and electricity) that originally came in as grant requests. In offering a loan instead, CEFIA's financing team worked to educate the customers about the value of a long-term, low-cost loan rather than a grant.⁸¹ On the residential end of the spectrum, programs like Solarize CT contain a built-in marketing component within each town, which helps educate residential customers about the value that a loan can bring them. As CEFIA develops a strong track record over time, it can also highlight the fact that its customers' energy savings often exceed their loan payments, making projects cash-flow positive almost immediately.⁸²

In order to attract private capital, meanwhile, CEFIA has had to help lenders understand the clean energy market and convince banks that investments in clean energy are financially sound. As CEFIA and other green banks build a record of success—and track this success using standardized metrics—the level of

77. Alfred Griffin, President, N.Y. Green Bank, Presentation on Standardization & Collaboration at the Green Bank Academy, slide 7 (Feb. 7, 2014).

78. Jan Ellen Spiegel, *Budget Cuts to Green Bank Irk Enviro and Concern Solar Industry*, CT MIRROR, June 3, 2013, <http://ctmirror.org/budget-cuts-green-bank-irk-enviro-and-concern-solar-industry>.

79. Jan Ellen Spiegel, *All's Well that Ends Well in Energy—Maybe*, CT MIRROR, June 6, 2013, <http://ctmirror.org/all-s-well-ends-well-energy-maybe>.

80. Telephone interview with Bryan Garcia, *supra* note 73.

81. Garcia, *supra* note 58, at slide 10.

82. Email from Bryan Garcia, President & CEO, CEFIA, to author (June 30, 2014, 05:48 MDT) (on file with author).

perceived risk in the clean energy market should decline. The presence of an increasing number of state (or federal) green banks should also increase the financial sector's familiarity with clean energy markets, increasing its willingness to lend. CEFIA believes its next wave of innovation will be in its marketing techniques; it is preparing to hire a marketing director, which will help CEFIA continue to address this challenge and expand the market for its financial products.⁸³

Ultimately, as discussed further in Part III, building on CEFIA's success and expanding the green bank model will require continued progress in assimilating these lessons learned—particularly the importance of institutional flexibility, contract and loan standardization, and adaptive marketing strategy. CEFIA's experience has also shown the importance of highlighting the economic benefits of reduced consumer costs and growing clean energy jobs. The broad bipartisan support for CEFIA's creation and the strong reputation it has built in its first few years of operation help illustrate the promise of the green bank model, and they give CEFIA a strong foundation on which to build as it moves forward.

B. New York Green Bank

1. Model and Structure

The New York Green Bank, created in 2013, has built on many of the lessons from CEFIA while adapting its programs to fit the context of its own state. Its large balance sheet and its connection to New York City are helping NY Green Bank pioneer a wholesale model that is well suited for a state green bank aiming to increase access to capital from one of the world's major financial centers. Like CEFIA, NY Green Bank focuses on financing commercially proven technologies that are economically viable and will help the state meet its preexisting clean energy and emissions reduction goals. But, true to the green bank model, its primary focus is on attracting private capital to invest in clean energy, not on achieving a specific level of emissions reductions.

Unlike CEFIA's quasi-public structure, NY Green Bank was proposed by the Governor and then launched through an administrative process that created the bank as a division of a state agency, New York State Energy Research and Development Authority (NYSERDA).⁸⁴ Created in 1975, NYSERDA is a public entity aiming to "advance innovative energy solutions" through research and investment, funded by a charge on consumer utility bills.⁸⁵ Establishing the NY Green Bank as a part of NYSERDA meant that the bank did not require enabling legislation, but also meant that it is structured as a fully public entity—

83. Garcia & Lieberman, *supra* note 49, at slide 36.

84. N.Y. GREEN BANK, *supra* note 8.

85. *About NYSERDA*, N.Y. ST. ENERGY RES. DEV. AUTHORITY, <http://www.nysesda.ny.gov/About.aspx> (last visited Oct. 17, 2014).

meaning it must operate within NYSERDA's existing framework and adhere to administrative procedures followed by all state agencies. Thus NY Green Bank has needed to find new ways to create the institutional nimbleness necessary for operating an effective green bank. Although the green bank model is very different from the type of funding model that NYSERDA has used during its forty-year history, both NYSERDA and the Public Service Commission have given NY Green Bank the funding and flexibility it has needed to get its operations underway.⁸⁶ In December 2013, after an independent market survey confirmed the beneficial role that a state green bank could play in New York,⁸⁷ the New York State Public Service Commission gave NY Green Bank an initial capitalization of \$165.6 million, plus \$52.9 million from Regional Greenhouse Gas Initiative proceeds, for a total of \$218.5 million.⁸⁸ More than twice as large as CEFIA's, the NY Green Bank's balance sheet gives it the capacity to attract capital from large "money center" banks as well as smaller local and regional banks.

The independent study of green bank potential in New York, conducted by Booz & Company, identified several key challenges to the clean energy market: "undeveloped secondary markets; lack of familiarity, understanding or confidence in energy performance and payment data; a fragmented vendor landscape; and existing balance sheet debt burden."⁸⁹ While these challenges do not differ greatly from the challenges facing clean energy markets in other states, New York chose to address them in a new way, by developing a wholesale financing model.

This wholesale market approach, NY Green Bank's defining feature, distinguishes it from CEFIA's retail-oriented approach. Rather than designing loan programs to reach individual loan customers, NY Green Bank focuses on credit enhancement—extending credit and thus allowing existing investors to expand the sectors in which they operate.⁹⁰ Credit enhancement allows the green bank to address "areas with clear financing gaps, such as medium credit quality customers and small scale projects"⁹¹ that are economically viable but do not receive adequate financing due to perceived risk and other factors discussed in the Introduction.⁹² NY Green Bank aims to address these gaps with a number of financing tools that fall within the green bank model, including credit enhance-

86. Telephone Interview with Jessica Aldridge, Senior Assoc., N.Y. Green Bank (Mar. 23, 2014).

87. *New York Green Bank Business Plan*, *supra* note 26.

88. N.Y. GREEN BANK, *supra* note 8.

89. NYSERDA, *supra* note 25, at 5.

90. Telephone Interview with Jessica Aldridge, *supra* note 86.

91. *New York Green Bank Business Plan*, *supra* note 26, at 19.

92. In addition to perceived risk, other factors hindering clean energy finance include a lack of data (especially standardized data) about technology performance and projected return on investment, and undeveloped credit markets that provide few opportunities for loan pooling and securitization. *See supra* Introduction.

ment (e.g., loan loss reserves and technology guarantees), warehouses for securitization, and structured products such as tax equity funds.⁹³

NY Green Bank chose this approach because its leaders believe a wholesale financing model will be the best way to access the large-scale capital markets in New York City and elsewhere. As NYSERDA explained in its petition for capitalization of the bank, “we believe the Green Bank’s strategy of focusing on market gaps and working on a wholesale basis in partnership with private sector intermediaries who are already making progress is conducive to scale.”⁹⁴ NY Green Bank also believes this scalable model will help lead to the development of clean energy capital markets, specifically bond markets.⁹⁵ As one of NY Green Bank’s top staffers explains, their strategy is to “support the transition from illiquid, fragmented financing markets for clean energy and energy efficiency to markets that are functioning well.”⁹⁶ This goal of facilitating the development of secondary markets targets the current gaps that NY Green Bank is designed to address, and also aligns with its ultimate goal of moving the clean energy investment market toward the point where public capital is no longer needed.

Still in its first year of operation, NY Green Bank is already accepting proposals through its Request for Proposals (RFP) process. The RFP invites “private sector capital providers and other clean energy industry participants to propose partnership arrangements with the Green Bank that would facilitate the financing of clean energy projects (including energy generation and energy savings projects) in the State of New York.”⁹⁷ Essentially this means the bank is working with interested investors on a rolling basis, evaluating proposals as they are received. As these projects are still in their early stages, NY Green Bank does not yet have aggregated data to illustrate its successes. Nonetheless, the process of getting the bank up and running has been successful and has yielded valuable insights for NY Green Bank’s future operations and for other green banks that hope to use a similar model.

2. Lessons Learned

NY Green Bank has learned from and built on some of the same lessons that emerged from CEFIA’s first years of operation, particularly the need for institutional flexibility, standardization, and education and normalization. NY Green Bank’s creation as a division of NYSERDA posed a potential challenge for its nimbleness and flexibility. But the experience ultimately shows that a

93. NYSERDA, *supra* note 25, at 7-9.

94. *Id.* at 6.

95. *Id.* at 2.

96. Telephone Interview with Jessica Aldridge, *supra* note 86.

97. *Clean Energy Financing Arrangements - Request for Proposals (RFP) No. 1*, N.Y. GREEN BANK 1 (2014), <http://greenbank.ny.gov//media/Files/FO/Current%20Funding%20Opportunities/RFP%2001/RFP-1-Summary.pdf>.

green bank can work as part of an existing government agency as long as it is given adequate flexibility to work with private sector partners. One challenge, for instance, is the slower timetable of a public institution, in which decisions can require multiple layers of administrative approval before moving forward, making it difficult to collaborate with a faster-moving private sector investor.⁹⁸ But NYSERDA recognizes these challenges and understands that the green bank must “[m]aintain the administrative flexibility needed to adapt to movements in the markets.”⁹⁹ NYSERDA has therefore given NY Green Bank as much autonomy as possible, which staffers attest has worked remarkably well.¹⁰⁰

Standardization of loan procedures and metrics, always important for a green bank, plays an even more critical role in a wholesale financing model like NY Green Bank’s. A lack of standardization particularly hinders the secondary markets that NY Green Bank aims to promote because it prohibits the pooling and accurate assessment of investments, which are necessary for securitization.¹⁰¹ NY Green Bank recognizes that standardization of loan documents, methods, and structures is thus a prerequisite to developing mature financial markets in clean energy, and aims to promote such standardization by developing standard legal and financial documents, processes, and structures.¹⁰² Furthermore, as with any green bank model, NY Green Bank understands that increasing the availability of consistent data on loan and technology performance will make it easier to assess lending risks, and will thus decrease the cost of capital.¹⁰³ The bank therefore intends to “compil[e] and publish[] loan payment and project performance data on all Green Bank-financed clean energy transactions.”¹⁰⁴ These steps will not only help NY Green Bank achieve its own goals, but will also help promote standards for other green banks to follow, thereby further increasing the potential for collaboration and standardization.

NY Green Bank has recognized that education and normalization, too, play an important part in the wholesale financing model. While the wholesale approach avoids the necessity of educating individual retail customers about the value of clean energy loans, it does require educating investors and the *market* about clean energy finance opportunities. Improving the availability of data on loan performance can help with this goal, and investors will also become more comfortable as they gain experience in clean energy finance. Educating the market is particularly important for someday achieving a self-sustaining clean

98. Telephone Interview with Jessica Aldridge, *supra* note 86.

99. NYSERDA, *supra* note 25, at 2.

100. Telephone Interview with Jessica Aldridge, *supra* note 86.

101. Griffin, *supra* note 77, at slides 4-9.

102. *Id.*

103. *Id.* at slides 5-6.

104. NYSERDA, *supra* note 25, at 2.

energy finance market: through this education process, as Jessica Aldridge of NY Green Bank puts it, “we are teaching the market to fish.”¹⁰⁵

Perhaps the greatest strength of NY Green Bank is its potential to attract large amounts of capital from national and multinational banks. As large financial institutions have the capacity to make enormous investments, attracting these investors could go a long way toward achieving truly large-scale deployment of clean energy technology. On the other hand, one drawback of the wholesale approach is that, because it engages less with individual customers and clean-energy contractors, it can obscure the benefits of the green bank to the state’s ordinary citizens. A bank like NY Green bank will thus have to work harder to highlight its benefits in terms of lower clean energy costs and job growth in the clean energy sector. Such an effort, combined with the lessons and best practices laid out here, will help move NY Green Bank toward the point where it can realize its own goals and also serve as a model for other state green banks.

III. POLICY LESSONS FOR GREEN BANK EXPANSION

Although the green bank movement is still in the early stages, the combination of theory and experience from the two operational state green banks point toward a set of initial best practices that future green banks should adopt. These best practices would apply not only to other state green banks but also to a potential federal green bank.¹⁰⁶ The most crucial best practices include (A) focusing on loans that will maximize the amount of clean energy deployed per state dollar at risk—the green bank “objective function,” (B) standardizing lending procedures and metrics, (C) maintaining administrative flexibility, (D) forging strong partnerships with the private sector, and (E) selling the green bank model as a boon for energy consumers and a driver of clean energy job opportunities. Many of the state green banks currently under consideration assimilate at least some of these lessons and should continue to move in this direction. The currently proposed federal green bank would adhere to most of these suggestions and could provide particularly significant benefits for standardization and normalization of clean energy finance.

A. *Objective Function*

To truly follow the green bank model, all green banks should aim to boost clean energy investment and to maximize the amount of clean energy deployed per state dollar at risk—the “objective function” discussed in Part I.B. As Reed Hundt points out, the costs and characteristics of electricity generation vary

105. Telephone Interview with Jessica Aldridge, *supra* note 86.

106. Indeed, as discussed below, the green bank bill currently pending before Congress would incorporate most of these best practices. See H.R. 4522, 113th Cong. (2d Sess. 2014).

greatly from state to state, so the projects that fit a state green bank's objective function will vary.¹⁰⁷ This variation represents the classic federalist idea that each state can "serve as a laboratory"¹⁰⁸ for project design in the clean energy finance arena. Yet to maintain a green bank model, an institution must still adhere to the same objective function. The Connecticut and New York examples nicely illustrate the way in which green banks can offer different products and projects—financial products for individual residential and commercial customers in Connecticut, and wholesale financing instruments in New York—while operating under the shared goal of leveraging public capital to attract private investment and increase clean energy deployment.

Even the goal of maximizing clean energy deployment, however, could vary depending on its interpretation. Some of the academic literature argues that maximizing clean energy should mean maximizing emissions reductions.¹⁰⁹ Others argue that it is difficult to measure the "additionality" of emissions reductions, and therefore clean energy deployment should focus on maximizing the value to energy consumers.¹¹⁰ The latter approach is closer to the stance that both Connecticut and New York have taken: both of these green banks aim to finance the projects that are most financially viable, and both work to support state energy policy goals but do not have specific emissions reduction targets of their own.¹¹¹ Moreover, as I argue here, green bank expansion to other states will depend in part on a messaging strategy that highlights the benefits of green banks in non-partisan terms. Therefore, focusing on maximizing value to energy consumers and on local job creation in the clean energy sector—rather than on carbon dioxide reduction goals—will push green banks toward success metrics that resonate with a broader segment of the population.

107. Telephone Interview with Reed Hundt, *supra* note 29. A consumer-oriented goal might also highlight the value of consumer choice, allowing customers to choose between a renewable energy installment, energy efficiency measures, or fuel switching.

108. *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting) (characterizing the states as potential "laboratories" for policy experimentation).

109. *Clements & Sims*, *supra* note 20.

110. Telephone Interview with Reed Hundt, *supra* note 29. "Additionality" is a term of art indicating the net effect of new emissions reduction projects. The concern is that any given project might displace other clean energy projects that would otherwise have occurred through different avenues, and thus that the project in question may not actually create "additional" emission reductions. *Id.*

111. See *supra* Part II.

B. Standardization

Standardizing both lending procedures and metrics will be crucial for unlocking the potential benefits of green banks. The benefits of loan contract and procedure standardization are clear: they reduce transaction costs and thus reduce the cost of capital. This is as true within any given state as it is across states. Further, as elaborated in Part II.B.2, standardized loan contracts and procedures also facilitate the development of secondary markets. Both Connecticut's and New York's green banks have focused on standardization, as discussed above. NY Green Bank officials summarized the benefits of contract standardization in a way that can and should serve as advice to all green banks:

The market feedback indicates that there are opportunities for the Green Bank to reduce transaction costs by standardizing documents and procedures . . . Standardizing contracts and procedures will also play an important role in developing capital markets (e.g., bond markets) for clean energy assets. The lack of robust bond or secondary investor markets further constrains clean energy capital and drives up financing costs.¹¹²

In addition to *contract* standardization, standardizing accounting methods and performance *metrics*—of loan payment performance as well as technology performance—is similarly important because it can increase investor confidence and thus further reduce capital costs. Both CEFIA and the NY Green Bank plan to collect and publish data on this type of metric; NY Green Bank describes it as an opportunity to “[e]nhance market confidence in clean energy investing by compiling and publishing loan payment and project performance data on all Green Bank-financed clean energy transactions.”¹¹³ This commitment to standardized data collection and dissemination should be a common feature of all green banks, state or federal. In addition to investor confidence, standardized performance data could also help build confidence among the public and, again, could help sell the green bank model as a driver of economic opportunity. Data showing strong financial performance of green bank investments, plus benefits for energy customers, would be particularly helpful in distancing green banks from federal grant programs that have not always been financially efficient and have come under scrutiny for their “picking winners” approach. A public image of green banks as a new and successful model is key for the expansion of green banks in the U.S.

In turn, standardization will become increasingly important as more state green banks emerge. During the launch of NY Green Bank, CEFIA recognized the significant benefits of standardization and collaboration across states, and it offered explicit suggestions for areas where Connecticut and New York might standardize their loan products and procedures.¹¹⁴ These suggestions included

112. NYSERDA, *supra* note 25, at 5.

113. *Id.* at 2.

114. CEFIA, *supra* note 68, at 9.

relatively simple steps such as standardizing on-bill repayment programs to facilitate loan securitization, as well as more complex proposals to create joint specialized products with tax equity investors.¹¹⁵ The benefits of these synergies, and the potential hazards of a failure to standardize, will grow as more green banks enter the clean energy finance arena.

If the proposed federal green bank comes to fruition, it could provide valuable guidance and create incentives for state green banks to standardize their procedures and metrics. Ideally this guidance should come sooner rather than later, before different metrics and documentation systems arise in different states. Even if a federal green bank did not mandate specific requirements for all state green banks (and it likely would not have the authority to do so), it could make the receipt of any federal green bank support contingent on state adherence to standardized loan procedures, accounting, and performance metrics. The current legislative proposal for a federal green bank recognizes the importance of data availability. It would mandate the online publication of loan applicants' and recipients' names, project descriptions, and "other information sufficient to allow the public to understand and monitor loans, loan guarantees, insurance, portfolio insurance, and other forms of financing support or risk management provided" by the federal green bank.¹¹⁶ If a federal green bank is established, such standardized contracts and procedures could be developed once the bank is operational, and could play an important role in realizing the financial and public-opinion benefits of standardization.

C. *Administrative Flexibility*

Operating with the administrative flexibility necessary for doing business with the private sector is also a necessity for all green banks. As CEFIA's structure has shown, it is often easiest for a green bank to attain this flexibility as a quasi-public authority rather than a fully governmental entity. In some ways, this structure is the best of both worlds—CEFIA has access to public funds, but is able to hire staff and operate in a manner consistent with private sector timelines and financial expectations. As CEFIA's President and CEO explains, "We operate more like a business than like a government agency."¹¹⁷ And CEFIA's staff members repeatedly underscore the importance of this flexibility in paving the way for CEFIA's strong working relationships with the business sector, which have facilitated CEFIA's early successes.

CEFIA also highlighted the importance of this institutional nimbleness in its public comments on the formation of NY Green Bank, which are broadly applicable to the green bank model:

NYGB should be able to transact its business with minimal disruption or additional bureaucracy or approvals. They need to act at the speed

115. *Id.*

116. H.R. 4522, § 2(e)(12)(A)(v), 113th Cong. (2d Sess. 2014).

117. Telephone Interview with Bryan Garcia, *supra* note 73.

of business and this will necessitate a fresh look at transactional governance for contracting and procurement approvals. Successful public private partnerships will require flexibility and the ability to react quickly to opportunities as they arise.¹¹⁸

These words of advice are apt for all green banks, in whatever way they can be achieved within a given green bank structure. At CEFIA, this flexibility was achieved through a quasi-public structure. The proposed federal green bank would follow a similar model by creating the bank as a semi-autonomous government corporation, rather than an executive agency. But not all states may have the option to structure a green bank this way, and indeed, fully public organizations can also find ways to meet these flexibility requirements.

Ultimately the NY Green Bank's creation as a division of NYSERDA, and its early success as it begins operations, has helped show that it is possible to create the necessary administrative flexibility within a fully public entity. It has helped that NYSERDA itself understands the importance of flexibility for a green bank, as noted in Part II.B.2. In creating NY Green Bank, NYSERDA recognized that the bank would need the agility to operate at a "constantly evolving frontier" of clean energy finance.¹¹⁹ Despite some initial challenges, this approach has worked well so far. NYSERDA has been able to give NY Green Bank a high degree of autonomy, which has allowed it to operate with the flexibility and speed necessary for collaborating with private-sector investors.

A third possible structure for green banks would attach a clean energy finance institution to an existing state infrastructure bank.¹²⁰ Like other possible green bank formations, this structure must permit the necessary flexibility for green bank operations. California is considering attaching a green bank to its infrastructure bank (among other possible options),¹²¹ but no existing green banks have this structure, so there are no specific examples of how such a bank might create the necessary level of administrative agility. But the lessons from both CEFIA, as a quasi-public authority, and NY Green Bank, as a division of a public agency, show that administrative flexibility is essential for a green bank's success and can be achieved within multiple different organizational structures.

D. Partnerships

Establishing strong partnerships, on many levels, is also essential for green bank success. The independent study commissioned by NYSERDA, which surveyed existing green banks and other clean energy finance institutions, found that these institutions all identified strong partnerships as a best practice that

118. CEFIA, *supra* note 68, at 8.

119. NYSERDA, *supra* note 25, at 2.

120. Berlin et al., *supra* note 24, at 11-12.

121. California, COAL. FOR GREEN CAPITAL, <http://www.coalitionforgreencapital.com/california.html> (last visited June 15, 2014).

other green banks should replicate.¹²² Due to the relative novelty of green banks, this will often mean that green bank officials will first need to work with their partners to help them understand the green bank model before moving forward with other elements of collaboration, but this investment of time is more than worthwhile.

Some of the partnerships that green banks must form are clearly practically-oriented or necessary for their operations. CEFIA emphasizes, for instance, the importance of partnering with private sector banks that will help finance green bank projects as well as the installers who will actually carry out the projects.¹²³ Other partnerships have impacts that are less direct but no less important. Partnering with other green banks to standardize procedures and share best practices, for instance, yields many benefits already discussed above. Green banks may also need to partner with municipalities or other jurisdictions that have authority over their projects. With C-PACE, for example, CEFIA reached out to towns and cities across Connecticut and asked them to pass local resolutions authorizing the liens and property tax assessments necessary for C-PACE to function. Moreover, by building trust and a successful track record with local banks, CEFIA has even achieved their consent to let C-PACE payments sit above the mortgage in terms of debt seniority, which increases investors' willingness to lend.¹²⁴

Still other types of partnership opportunities exist with entities that will help promote green bank efforts more broadly, such as NGOs, unions, and local chambers of commerce.¹²⁵ Unions and chambers of commerce, in particular, can be unconventional advocates for green banks, and can thus help promote the green bank model to a broader cross-section of the public. Relatedly, partnerships with well-established organizations such as mortgage lenders or housing authorities, which already have their own clientele, can help green bank managers tap into those potential customer bases.¹²⁶ Distinct from the process of partnering with and normalizing clean-energy finance for *lenders*, this type of partnership can help green banks make their case to policymakers and the public. At all of these levels, thus, partnerships not only help a green bank's operations run more smoothly but can also build coalitions of advocates for green bank expansion.

122. *New York Green Bank Business Plan*, *supra* note 26, at 12.

123. *Id.*

124. Telephone Interview with Bryan Garcia, *supra* note 73.

125. *See New York Green Bank Business Plan*, *supra* note 26, at 12.

126. *Id.*

E. *Highlighting Economic Benefits*

Finally, green banks must also focus on expanding bipartisan support by highlighting the economic benefits of the green bank model, from its use of limited public funds, to its creation of local jobs and lower energy costs, to its benefits for energy security and independence. The main potential critique of green banks is not that they are ineffective at achieving any of these goals, but that clean energy deployment should not be a priority for public funds. Highlighting the benefits to consumers, and the fact that the state can actually make money on the loans it offers, can thus be a powerful way to counter these potential criticisms. Some of this effort involves convincing potential customers of the value of low-cost, long-term loans and giving them information about, for example, potential reduced energy costs from new solar installations. As CEFIA found, a green bank must sometimes sell its products to its consumers and help them understand the potential financial benefits.¹²⁷ Under its wholesale model, meanwhile, NY Green Bank has focused on educating investors and the market about the financial opportunities in clean energy investment. “Teaching the market to fish” can eventually facilitate the creation of self-sustaining liquid markets in clean energy technology that green banks hope to achieve.¹²⁸

But beyond the benefits to their customers and financiers, green banks and their supporters should also highlight the benefits to the general public in the communities and states where they operate. Communicating benefits like clean-energy job creation and local energy security—and focusing on a positive, forward-looking rhetoric of *opportunity*—can appeal to people who might not prioritize clean energy if they associate it only with climate change and environmentalism. Green banks can also appeal to business interests by highlighting the cost savings and increased competitiveness that can come from investing in energy efficiency and clean energy projects. This type of messaging may help develop the public support that will be important for the continued expansion of green banks to other states, and will be essential if lawmakers hope to secure the passage of federal green bank legislation.

While existing green banks might not consider promoting green bank expansion as a priority in the context of all their other goals, they should keep in mind that further expansion of green banks has the potential to move markets forward faster and increase the effectiveness of green banks everywhere. Moreover, even established green banks may need to make the case for their continued existence—as CEFIA found when the state legislature raided its balance sheet for other uses¹²⁹—and an argument focused on economic opportunity may be helpful in making that case.

CEFIA has already embraced this messaging to some extent, highlighting the \$220 million investment into the state economy and the creation of 1,200

127. See *supra* Part II.A.4.

128. Telephone interview with Jessica Aldridge, *supra* note 86; see also *supra* Part II.B.2.

129. See *supra* notes 78-80 and accompanying text.

local jobs catalyzed by CEFIA's activities.¹³⁰ Publicity graphics illustrating happy communities and workers in hard-hats further underscore the impression of economic prosperity and opportunity.¹³¹ The proposed federal green bank bill also lists "achieving energy independence," and "achieving job creation" alongside "abating climate change" as some of the national objectives that the bill aims to support.¹³² State green banks (and federal proposals) should continue to expand this type of messaging focused on economic opportunity, to further broaden the coalition of green bank supporters and achieve continued expansion of clean energy finance institutions.

CONCLUSION

The green bank model holds much promise, and early successes of the first state green banks show that the model can work well in practice. Both Connecticut and New York have succeeded in creating the structures necessary to leverage limited public funds and attract private capital, facilitate standardization, afford institutional agility, and create important partnerships with other public and private entities. Other green banks, once established, should adapt the Connecticut and New York models for the context of their own states, but should follow these best practices and adhere to the same objective function of maximizing the amount of clean energy deployed per state dollar at risk.

Some other states are already moving toward the creation of their own green banks, incorporating some of these lessons. Notably, in 2013, the Hawaii legislature authorized the establishment of a clean energy loan fund that will use the green bank model to help finance clean energy infrastructure in Hawaii.¹³³ Housed within the Department of Business, Economic Development, & Tourism, the loan fund will be capitalized at \$100 million and will focus on lowering costs and de-risking loans through an on-bill repayment program.¹³⁴ Building on the lessons of CEFIA and NY Green Bank, Hawaii will pair this program with a Green Energy Market Securitization Program set to launch in 2014, which will help develop more liquid clean energy markets in the state.¹³⁵

Several other states have also created institutions that operate at least partly as green banks. In 2013, for example, Vermont established a Sustainable Energy Loan Fund, which consolidates programs existing under the Vermont Econom-

130. CEFIA, *supra* note 68, at 4.

131. Garcia & Lieberman, *supra* note 49, at slide 44.

132. H.R. 4522, § 2(b)(4)(C), 113th Cong. (2d Sess. 2014).

133. Kennan, *supra* note 34, at 4.

134. COAL. FOR GREEN CAPITAL, *supra* note 45.

135. Lorraine H. Akiba, Comm'r, Haw. Pub. Util. Comm'n, Presentation at the Second Annual U.S. Department of Energy Better Buildings Summit, slides 10-12 (May 31, 2013), http://www.coalitionforgreencapital.com/uploads/2/5/3/6/2536821/hawaii_obf-gems_presentation_-_commissioner_l_akiba_-_5.31.2013_2.pdf.

ic Development Authority.¹³⁶ While the Vermont Sustainable Energy Loan Fund will continue to provide some grants and direct loans, it is also moving toward some green bank-oriented credit enhancement methods such as loan guarantees.¹³⁷ The Green Bank of Kentucky, as another example, operates as a revolving loan fund to finance energy efficiency retrofits in state buildings.¹³⁸ Several more states are in the earlier phases of developing green banks: New Jersey recently established an Energy Resilience Bank that is in the first phases of development;¹³⁹ California and Maryland's legislatures are currently considering proposed green bank legislation; and Minnesota, Illinois and Washington State are all in earlier stages of considering their options.¹⁴⁰ As these green banks launch and grow, they should make an explicit effort to learn from the experiences of existing green banks and adopt the best practices that these banks have established. Organizations such as the Coalition for Green Capital¹⁴¹ can play a vital role in compiling these experiences and disseminating this information, and they should continue to do so, with the continued help of officials from the green banks that are already operational.

At the federal level, the currently proposed federal green bank legislation incorporates the best practices elaborated here, adapted for the federal context, and could also provide huge gains in terms of standardization as well as normalization of the green bank concept.¹⁴² To increase the chances of passing federal green bank legislation and expanding green banks to more states, green bank leaders and advocates should continue to strengthen and standardize metrics and procedures, highlight past successes, and focus messaging around the strong economic opportunities that stem from clean energy investment. These benefits—along with the climate benefits that attract the support of environmentally-conscious Americans—can help the green bank model resonate with the rest of the American public and ultimately allow it to expand and fulfill its great potential. As a possible bi-partisan solution to multiple challenges facing our energy sector—challenges that our society has spent decades debating—green banks offer a promising path forward toward a prosperous clean energy future.

136. *New Sustainable Energy Financing Available at Veda*, VT. ECON. DEV. AUTH., <http://www.veda.org/press-releases/new-sustainable-energy-financing-available-at-veda> (last visited May 31, 2014).

137. *Id.*

138. COAL. FOR GREEN CAPITAL, *supra* note 44.

139. *New Jersey*, COAL. FOR GREEN CAPITAL, <http://www.coalitionforgreencapital.com/new-jersey.html> (last visited Nov. 16, 2014).

140. *State Campaigns*, COAL. FOR GREEN CAPITAL, <http://www.coalitionforgreencapital.com/state-campaigns.html> (last visited June 15, 2014).

141. *About CGC: Who We Are and What We Do*, COAL. FOR GREEN CAPITAL, <http://www.coalitionforgreencapital.com/about-cgc.html> (last visited May 31, 2014).

142. H.R. 4522, 113th Cong. (2d Sess. 2014); S. 2271, 113th Cong. (2d Sess. 2014).

