



Legislative Testimony of the Connecticut Green Bank
Energy and Technology Committee
March 1, 2018

Regarding [Senate Bill 9](#)
AN ACT CONCERNING CONNECTICUT'S ENERGY FUTURE

As the nation's first green bank, the Connecticut Green Bank ("Green Bank") leverages the limited public resources it receives to attract multiples of private investment to scale up clean energy deployment. Since its inception, the Green Bank has mobilized nearly \$1.2 billion of investment into Connecticut's clean energy economy, supported the creation of over 14,000 direct, indirect and induced jobs, reduced the energy burden on over 26,000 families and businesses, deployed over 250 MW of clean energy, helped reduce over 4.0 million metric tons of CO2 emissions over the life of the projects, and generated over \$50 million in tax revenues to the State of Connecticut. For its innovation and performance, the Green Bank was awarded with the "Innovations in American Government Awards" by Harvard University's Kennedy School's Ash Center in 2017. The Green Bank supports the policy vision of cleaner, cheaper and more reliable energy sources for Connecticut – while creating jobs and supporting local economic development.

The Connecticut Green Bank is supportive of Senate Bill 9 with the following comments and proposed modifications and inclusions.

Section 1 – RPS Increase

The Green Bank supports the proposed expansion of the Class I Renewable Portfolio Standard (RPS). This expansion takes the state's statutory targets from 20% by 2020 to 40% by 2030. In our view this is a necessary step to support the renewable energy market by sending a long-term signal of public policy support to market participants. Connecticut and other states in the region, have successfully used long-term contracting and behind the meter policies to support renewable energy deployment in-state and across the region.

Sections 2 and 3 – Controlling for RPS Policy Cost Exposure on Electric Ratepayers

The proposal to expand the Class I RPS along with reducing the Alternative Compliance Payment (ACP) from \$55 to \$40 starting on January 1, 2021 is wise because it contains overall public policy cost exposure to electric ratepayers for the increase in the Class I RPS.

Section 4 – Grandfathering of Behind the Meter Net Metered Customers

The proposal to grandfather those residential solar PV systems installed through the residential solar investment program and the other commercial and industrial behind the meter programs for net metering after a 20-year period is appropriate. Following the period of net metering – through December 31, 2039 – a tariff structure is to be established by the Public Utilities Regulatory Authority (PURA), whereby the utilities would purchase energy and renewable energy credits from those systems.

Section 5 – Tariff for Behind the Meter Customers

In order to support the sustained orderly development of the local installer industry, the transition from a net metering policy to a tariff policy must be carefully executed. This section proposes a tariff structure that transitions all current behind the meter policies, including zero emissions renewable energy credit (ZREC), low emissions zero emissions renewable energy credit (LREC), virtual net metering (VNM), shared clean energy facilities (SCEF), and the residential solar investment program. The tariff price would include both the value of the energy as well as the renewable energy credit for Class I RPS compliance.

Commercial, VNM, and SCEF Programs

In order to promote the continued growth of commercial and industrial behind the meter solar in Connecticut and the solar industry, the Green Bank is in support of a program that continues on the success ZREC/LREC while balancing the issue of overall ratepayer cost. To promote the transition to a more dynamic and “smarter” grid that includes storage, we agree with the policy approach under SB 9 that supports time of use rates and other dynamic pricing to ensure that the value of the solar PV systems’ excess generation is shared between the owner and ratepayers.

The Green Bank believes shared clean energy facilities have a critical role to play in the clean energy mix for the state. We would like to see SCEF’s competing against each other in a separate competitive procurement or auction process. We support a SCEF program that incents policy goals such as locational siting to alleviate grid congestion as well as promoting access to low-to-moderate income subscribers. The Green Bank welcomes the opportunity to be involved in the design or administration of a SCEF program in collaboration with DEEP and industry stakeholders. The Green Bank has a track record of managing down the subsidy cost of residential solar over time, while expanding its deployment, and could apply similar strategies in a SCEF program.

Residential Solar Investment Program

As the Green Bank implements a renewable energy credit incentive through the residential solar investment program (RSIP), with a lesser of target of 300 MW or the end of 2022, we would offer the following observations:

- Tariff Price – it should appropriately value projects that provide participating household, electric system, and societal benefits, with adders, including for example the inclusion of energy storage and support for low-to-moderate income households. It should also recognize time of use rates, or other dynamic pricing to ensure that the value of the solar PV systems’ excess generation is being shared between the owner and electric ratepayers.

- Tariff Pilot – to assist the transition from net metering to the tariff policy, to ensure sustained orderly development of a local industry, the bill proposes a pilot tariff, which the Green Bank supports. The Green Bank expects to work closely with the residential solar industry and PURA to establish an appropriate tariff price that is economically comparable to the current residential solar investment program alternatives while transitioning between net metering to a tariff policy.
- Target Deployment – it appears that the annual allocation of the \$35 million for tariff purchases on energy and renewable energy credits for residential solar PV deployment would be approximately 40 MW a year – based on the Comprehensive Energy Strategy (Table S2 on Page 39). It should be noted that thus far in 2018, the residential solar PV market is on pace for 45-50 MW, and that the best year in Connecticut was 2015 where nearly 55 MW of residential solar PV projects were approved.

The RSIP has been a very successful and “cost effective”¹ behind the meter program – effective in deployment (i.e., nearly 200 MW in 6 years) and efficient in ratepayer incentives (i.e., \$105 million in REC incentives over 6 years of the program) – see Table 1.

Table 1. Performance of the Residential Solar Investment Program (Calendar Years 2012-2017)

Year	# Projects	kW _{STC}	Total System Cost (\$MM)	Total Incentive (\$MM)	Cost / kW _{STC}	Incentive / kW _{STC}	Incentive % of Cost
2012	790	5,520	\$26.522	\$9.203	\$4,805	\$1,667	35%
2013	1,465	10,410	\$46.105	\$13.778	\$4,429	\$1,323	30%
2014	4,506	33,468	\$145.757	\$32.492	\$4,355	\$971	22%
2015	7,053	54,216	\$234.726	\$23.586	\$4,329	\$435	10%
2016	5,709	45,453	\$169.601	\$15.001	\$3,731	\$330	9%
2017	5,053	40,062	\$138.915	\$11.911	\$3,467	\$297	9%
Total	24,576	189,130	\$761.626	\$105.971	\$4,027	\$560	14%

It should be noted, that in comparison, each of the six rounds of the ZREC is \$120 million of long-term REC contracts – and that current ZREC prices range between \$55 to \$90 in comparison to the RSIP which has an equivalent current ZREC price of \$25. The RSIP REC incentive has decreased by over 80 percent since 2012.

The Green Bank has also made substantial progress ensuring that residential solar PV deployment is increasingly reaching low-to-moderate income households over time – see Table 2.

¹ Residential Solar Investment Program Evaluation by Cadmus (January 28, 2015)

Table 2. Activity in Metropolitan Statistical Area (MSA) Area Median Income (AMI) Bands Above or Below 100%

Year	Projects		Deployment		Investment	
	Total # Projects	% at 100% or Below AMI	Total kW _{STC} Installed	% at 100% or Below AMI	Total Investment (\$MM)	% at 100% or Below AMI
2012	156	20%	1,003.0	18%	\$4.596	17%
2013	368	25%	2,334.6	22%	\$10.538	23%
2014	1,316	29%	8,895.6	27%	\$39.618	27%
2015	2,593	37%	18,422.6	34%	\$80.514	34%
2016	2,684	47%	19,494.8	43%	\$72.741	43%
2017	2,460	49%	17,602.2	44%	\$62.055	45%
Total	9,577	39%	67,752.8	36%	\$270.063	35%

Ensuring that clean energy is more affordable and accessible to all ratepayers has been a goal of the Green Bank. By mobilizing more private investment in underserved market segments like low to moderate income communities, the Green Bank is ensuring that the clean energy economy can provide benefits to all – especially those in need of assistance the most to reduce the burden of energy costs.

The RSIP has created over 10,000 jobs (i.e., direct, indirect and induced), will reduce over 3 million tons of CO₂ emissions over the life of the projects, and has generated \$26.1 in individual income taxes and corporate income taxes to the State of Connecticut.

With the successful growth of residential solar PV in Connecticut and the long-term public policy commitment proposed in SB 9, the Green Bank suggests that the Energy & Technology Committee consider removing the sales tax exemption for residential solar PV – see Appendix I for suggested policy language. The Green Bank proposes that the removal of this sales tax exemption be included in SB 9 as part of Section 5, or immediately thereafter to signify the synergies between the long-term public policy commitment embodied in SB 9 that supports a growing local solar PV industry that is also giving back to Connecticut. A phased in approach for the removal of the sales tax exemption should also be considered to minimize any impact on the solar industry.

The Green Bank estimates that the removal of the sales tax exemption will have minimal impact on the economics of a solar PV system for a household – see Table 3. Note that the sales tax would only apply to the equipment or hardware costs of a project and not the labor, as all residential contractor service work is exempt from sales tax.

Despite the minimal impact of the sales tax exemption removal on the economics of residential solar PV (i.e., 6-9 months of payback²), a demand of at least 50 MW a year would generate \$7.4 million in sales tax revenue, \$3.7 million a year in personal income tax

² Assumes the following: degradation rate of 0.5%, useful life of 20 years, capacity factor of 13%, electricity price of \$0.20 non-escalating, and sales tax rate of 6.35% applied only to the hardware – or 65% for an effective tax rate on the total installed cost of the project of 4.1%.

revenue, and \$6.6 million a year in corporate income tax receipts – or a total of \$17.7 million a year in state tax revenues from the residential solar PV market.

Table 3. Analysis of Economic Impact to Households of Sales Tax on Residential Solar PV

	With Sales Tax Exemption	Without Sales Tax Exemption	Variance
Installed Capacity (kW)	8.0	8.0	-
Installed Cost (\$/W)	\$3.50	\$3.50	-
Total Installed Cost	\$28,000	\$28,000	-
Installed Cost after Incentives ³	\$17,800	\$17,800	-
Sales Tax	-	\$1,190	\$1,190

It should be noted that the average installed cost for residential solar PV in Connecticut during its best year (i.e., 2015 and nearly 55 MW) was \$4.33/W. Removal of the sales tax exemption is an even-handed approach weighing the removal of the exemption in return for the long term public policy support that the solar industry will receive through passage of SB 9 and at least an additional 400 MW beyond the RSIP.

Section 6 – Renewable Heating and Cooling Technologies

This section establishes an annual 1.6 million MMBtu target that would support the deployment of renewable heating and cooling technologies in Connecticut, including ground source heat pumps, air source heat pumps, heat pump water heaters, solar hot water, etc. Renewable heating and cooling technology deployment are among the highest job creating clean energy technologies in Connecticut.⁴ The Yale Center for Business and the Environment estimates that the target corresponds to a net energy efficiency of nearly 1 percent per year – or the equivalent of 30,000 households installing air source heat pumps⁵ or 27,000 ground source heat pumps.⁶

As the Green Bank has successfully demonstrated how it can catalyze a new market for residential solar PV that is less-and-less reliant on subsidies over time, while at the same time growing by orders of magnitude in deployment that supports a local industry, attracting private investment, creating jobs, and generating tax revenues, we are willing to, if provided the resources to do so, play a larger public policy role in implementing this policy given our demonstrated results and experience building new markets that catalyze private investment.

Sections 7 and 8 – Conservation Adjustment Mechanism and Procurement of Energy Efficiency

The Green Bank supports the transfer of the 3 mills from the Conservation and Load Management Fund (C&LMF) to the Conservation Adjustment Mechanism (CAM). This would

³ State incentives through the RSIP administered by the Green Bank and federal incentives through the ITC.

⁴ Clean Energy Jobs in Connecticut by Navigant Consulting for the Connecticut Green Bank (August 10, 2016)

⁵ At COP of 2.5 and 100 percent share of heating load

⁶ At COP of 3.0 and 100 percent share of heating load

leave 6 mills in the CAM, which would serve as a mechanism to limit sweeps of these important energy efficiency and load management funds to the General Fund.

The use of competitive procurements for energy efficiency, as has been practiced for renewable energy over the past several years through various requests for proposals (RFP), is good public policy. Allowing private market actors to compete to deliver energy savings at the least cost to electric ratepayers will create new opportunities for market development and access to private investment. For example, Eversource Energy was able to procure 30 MW of energy efficiency through a statewide RFP for clean energy. The Green Bank recommends that consideration be given to expanding beyond 25 MW of annual energy efficiency procurement to 50 to 75 MW of procurement.

Section 9 – Connecticut Green Bank Additional Mill to Clean Energy Fund

The proposal to increase the Clean Energy Fund (CEF) by an additional mill, starting in fiscal year 2020, ending at the end of fiscal year 2025, would potentially provide an additional \$160 million of ratepayer funds for investment by the Green Bank during this period of time. With the intention of enabling the Green Bank to be self-sustainable for which we are appreciative, we believe there is an opportunity to strengthen this proposal and protect ratepayer funds. No guarantees or protections are currently in place that would prevent future sweeps of such funds, and cause further erosion of private investment in clean energy in Connecticut through the Green Bank. Furthermore, it likely will lead to financial distress of the Green Bank, and potential bankruptcy if it cannot meet its contractual obligations or the erosion of the Green Bank's or the State's bond rating. As a result, we recommend some additions to SB 9 that we believe will restore the capital markets' confidence in the Green Bank's stability and soundness as a financial counterparty that was lost as a result of the Clean Energy Fund sweeps.

Here are several proposed policies we would recommend:

- **Assessment of Clean Energy Fund** – The Clean Energy Fund Assessment proposal will require the legislature to conduct an assessment on how any proposed future sweeps impact the Clean Energy Fund, its operations, its ability to sustain then-existing contractual obligations and financing facilities, maintain its access to the capital markets, the potential for adverse consequences, including bankruptcy and an erosion of the Green Bank's bond credit rating, if applicable – see Appendix II. This is crucial to avoid an inadvertent unwinding, bankruptcy or triggering of the Green Bank's non-impairment clause. Such an unintended event could be damaging to both the Green Bank and the State's fiscal standing with creditors, unknown spillover effects to other quasi-public agencies, and the Green Bank's ability to meet its stated public mission.
- **Clarification of Non-Impairment Provision** – With the initial proposal to fully sweep the Green Bank's public funding, it would have bankrupted the organization. The consequence of the adopted sweep of over half of the Green Bank's public funding is that

capital providers are now hesitant to partner with us – as evidenced by withdrawal from facilities, RFPs and proposed short-term financing facilities. The bolstered non-impairment language as provided for in Conn. General Statute Section 16-245n will further insulate the Green Bank from sweeps that could shutter the doors of the organization and provide confidence to the market that the Green Bank can meet its contractual commitments on an on-going basis – see Appendix III.

Given the recent sweeps, the capacity of the Green Bank to attract private investment in Connecticut has been diminished. The sweeps have resulted in the following:

- Statement of Subsequent Events Footnote – included in the financial statements of the Green Bank, our independent auditor wanted the inclusion of this statement (i.e., Footnote 20) within our financial statements to signal to readers the risks of the Green Bank’s financial position by General Fund sweeps.
- Loss of Investment – with the weakening of the Green Bank’s financial position, the Green Bank lost a \$10 million loan at 1% interest for a 10-year term. The proceeds of the loan would have been used to reduce the burden of energy costs on small businesses and low-to-moderate income households. Also, this transaction would have put the Green Bank on a pathway to sustainability. Subsequently, a major financial institution withdrew from the RFP seeking financing facilities for the Solar Home Renewable Energy Credit program, and a further local bank’s credit committee declined to consider a short term secured credit facility for the Green Bank, specifically citing the recent Clean Energy Fund sweeps.
- Special Capital Reserve Fund (SCRF) Requirement – to support the reduction of energy costs for state buildings, the Green Bank was able to access Clean Renewable Energy Bonds from the federal government to finance solar PV projects on campuses of the Connecticut State College and University System that will save them \$240,000 a year on energy costs over the next 20-years. With the weakening of the Green Bank’s financial position, the private investor in the bonds required as a condition to closing default protection from the State of Connecticut by accessing the SCRF.
- Limited Access to Working Capital – as the Green Bank is now in a cash management mode resulting from the sweeps, local banks have, so far, been unwilling to provide us access to low cost working capital to manage through negative cash flow periods.

We propose that the Green Bank turn its economic development engine of using limited public funds to attract multiples of private capital investment to mobilize between \$135 million to \$270 million of additional investment per year, further reducing the burden of energy costs on families and businesses in our communities.

- **Additional Clean Energy Fund Mill** – an additional mill to the Green Bank through the CEF could be applied to attract private investment at the 5 to 10 leverage ratio achieved thus far with a focus to reduce energy costs on public facilities like schools. With the additional mill, the Green Bank could mobilize between \$135 to \$270 million of investment per year for projects in public facilities – see Appendix IV.

By supporting these policies, the General Assembly would be sending a signal that it wants private investment in its clean energy economy and would restore the confidence we lost as a result of the sweeps. As the Green Bank model espouses, private investment leads to economic growth, economic growth leads to job creation, and with more work deploying clean energy, families and businesses will lower the burden of energy costs.

APPENDIX I

Remove Sales Tax Exemption for Residential Solar PV

Suggested Draft Language

Sec. 12-412. Exemptions. Taxes imposed by this chapter shall not apply to the gross receipts from the sale of and the storage, use or other consumption in this state with respect to the following items:

(117) **Solar energy electricity generating, water and space heating systems and geothermal resource systems. Machinery, equipment, tools, materials, supplies and fuel used in renewable energy and clean energy technology industries.** (A) Sales and use of solar energy electricity generating systems and passive or active solar water or space heating systems and geothermal resource systems, including equipment related to such systems, and sales of services relating to the installation of such systems. However, commencing after December 31, 2018, the exemptions described in this Section 12-412(117)(A) shall not apply to RESIDENTIAL solar energy electricity generating systems, including equipment related to such systems, and services related to the installation, repair or maintenance of such systems or equipment RELATED to such systems.

(B) Sales of and the storage, use or other consumption of machinery, equipment, tools, materials, supplies and fuel used directly in the renewable energy and clean energy technology industries. As used in this subdivision, “renewable energy and clean energy technology industries” means industries that apply technologies to produce, improve or develop solar energy electricity generating systems, passive or active solar water or space heating systems, geothermal resource systems and wind power electric generation systems, including equipment related to such systems.

APPENDIX II
Assessment of Clean Energy Fund

Suggested draft language

The Clean Energy Fund Assessment provision would be new language added to Conn. General Statutes Section 16-245n as follows:

(NEW) Subsection (k) to read as follows:

(k)(i) No transfer or withdrawal of funds shall be made from the undesignated funds of the clean energy fund unless and until the legislative committee of cognizance conducts an assessment of the impact of such transfer or withdrawal on the financial stability and sustainability of the bank, its ability to meet contractual obligations, covenants or warranties, and the bond credit rating of the bank, if applicable.

(ii) No transfer or withdrawal of funds shall be made from the undesignated funds of the bank unless and until the legislative committee of cognizance conducts an assessment of the impact of such transfer or withdrawal on the financial stability and sustainability of the bank, and its ability to meet contractual obligations, covenants or warranties, and the bond credit rating of the bank, if applicable.

APPENDIX III
Clarification of Non-Impairment Provision

Suggested draft language

(h) (i) The state of Connecticut does hereby pledge to and agree with any person with whom the Connecticut Green Bank may enter into contracts pursuant to the provisions of this section that the state will not limit or alter the rights hereby vested in said bank until such contracts and the obligations thereunder are fully met and performed on the part of said bank, provided nothing herein contained shall preclude such limitation or alteration if adequate provision shall be made by law for the protection of such persons entering into contracts with said bank. The pledge provided by this subsection shall be interpreted and applied broadly to effectuate and maintain the bank's financial capacity to perform its essential public and governmental function.

(ii) The contracts and obligations thereunder of said bank shall be obligatory upon the bank, and the bank may appropriate in each year during the term of such contracts, an amount of money that, together with other funds of the bank available for such purposes, shall be sufficient to pay such contracts and obligations or meet any contractual covenants or warranties, and there shall be included in the charge assessed to each end use customer of electric services, as provided in subsection (b) of this section, an amount that, together with other funds of the bank available for such purposes, shall be sufficient to meet such appropriation.

APPENDIX IV
Additional Clean Energy Fund Mill

Suggested draft language

(b) On and after July 1, 2004, and until June 30, 2019, the Public Utilities Regulatory Authority shall assess or cause to be assessed a charge of not less than one mill per kilowatt hour charged to each end use customer of electric services in this state which shall be deposited into the Clean Energy Fund established under subsection (c) of this section. On and after July 1, 2019, and until June 30, 2025, the Public Utilities Regulatory Authority shall assess or cause to be assessed a charge of not less than two mills per kilowatt hour charged to each end use customer of electric services in this state which shall be deposited into the Clean Energy Fund established under subsection (c) of this section. On and after July 1, 2025, the Public Utilities Regulatory Authority shall assess or cause to be assessed a charge of not less than one mill per kilowatt hour charged to each end use customer of electric services in this state which shall be deposited into the Clean Energy Fund established under subsection (c) of this section.