

# Why care about the cost of renewable energy and energy efficiency?

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*Want the United States to have...*

Cleanest power generation possible.

Most efficient energy consumption possible.

Clean energy must be cheaper to accomplish these goals.

# Can pull several levers to make clean energy cheaper

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1) Cheap and Available Financing



2) Scale

3) Technology Advances

4) Subsidies & Tax Policy

# Green bank can reduce financing costs across clean energy markets with many financial tools

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<b>Green Bank Products</b>
Direct Debt
Wholesale Debt
Subordinated Debt
Loan Loss Reserves
Credit Enhancements
Warehousing



<b>Markets</b>
Distributed Generation
Residential EE
Commercial EE
Low-Income
Utility-Scale Generation

Because Green Bank is a non-profit, financing costs for clean energy are lower

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### Expected Returns of Typical Clean Energy Investors

Investor Group	Required Return
Commercial Debt	6%
Tax Equity	12%
Developer Equity	15%
Green Bank Debt	2%

Rather than maximizing return, Green Bank offers cheap capital in order to lower consumer payments for clean energy

# If cost of financing is lower, consumer payments for clean energy are lower

## INVESTORS



Upfront  
Investment



Consumer  
Payment Provides  
Profit to Investors

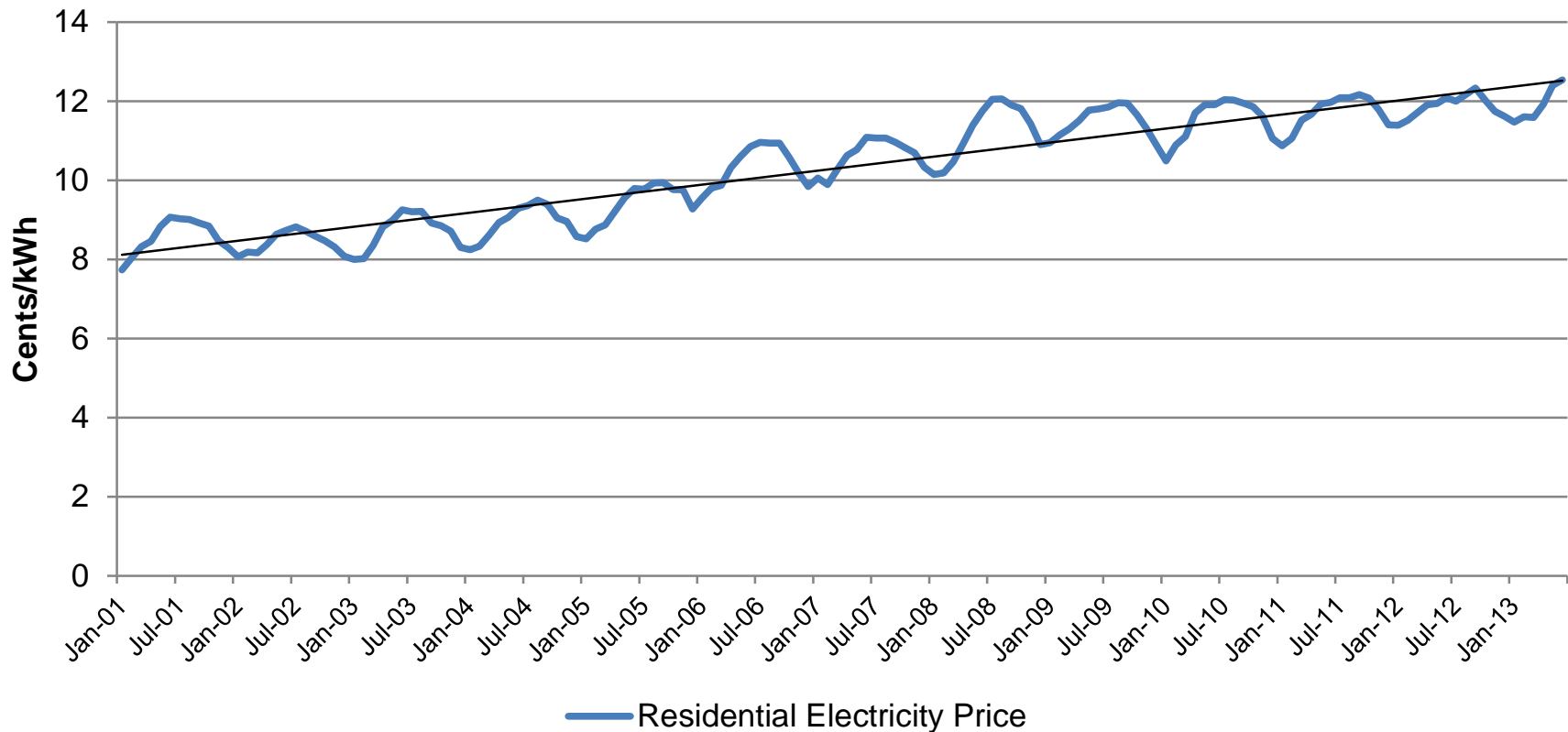


## Lower Required Profit Means Lower Payment

- Private investors provide upfront capital to developers to build power projects
- Developers use consumer payments for power to pay back investors, with profit
- Investors seeking lower profits charge lower interest rates
- Lower interest rates mean lower customer payments
- If payments for clean energy are below retail rate of electricity, customers will demand clean energy

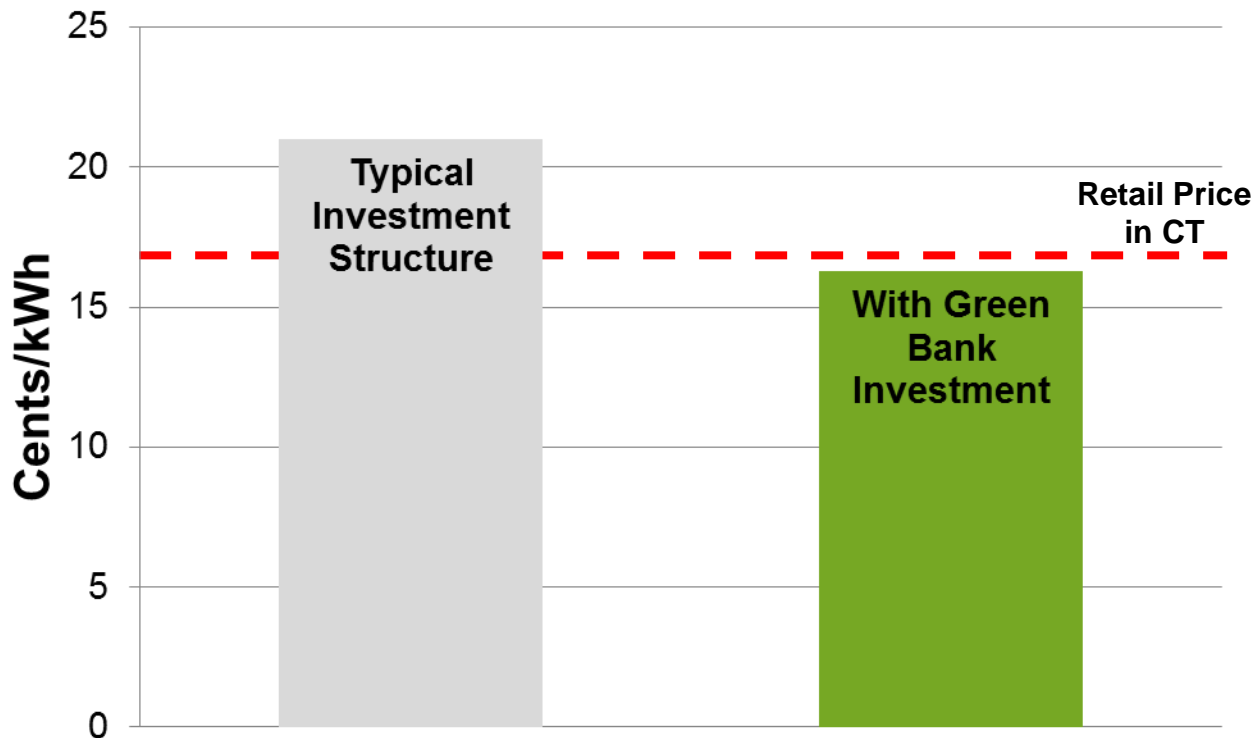
# Green Bank can make consumer payments less than retail price – and retail rates only continue to rise

## Average Retail Residential Electricity Price in U.S.



# For example, Green Bank can make residential solar cost competitive in Connecticut with a 20% investment

## Price of Electricity from Solar in CT<sup>1</sup>



### Green Bank Makes Clean Energy Cost Competitive

- In Connecticut, for example, Green Bank debt brings price of solar electricity below retail
- Highlights significant impact financing cost has on clean energy price
- Assumes only 20% Green Bank debt investment
- Inclusive of current Connecticut subsidies

1) Capital structure is 20% Green Bank Debt, 20% Commercial Debt, 48% Tax Equity and 12% Developer Equity. Assuming Green Bank debt offered at 2% for 15 years, Commercial debt is at 6% for 6 years, developer equity return is 15%, tax equity return is 12%, 15-Yr REC price is 3 cents/kwh and 6-Yr State Incentives are 22.5 cents/kwh.

Source) Rooftop Solar PV "Green Bank" Financing Model, Sponsored by The Connecticut Clean Energy Finance and Investment Authority and the Coalition for Green Capital, Developed by the Brattle Group. Available for download from: <http://www.coalitionforgreencapital.com/the-model.html>

# If Green Bank provides enough investment and solar install costs come down, prices will drop dramatically

## Price of Electricity from Solar (cents/kWh) in CT as a Function of Green Bank Debt<sup>1</sup> and Installed Cost

% of GB Capital in Structure

		0%	10%	20%	30%
Solar Install Cost (\$/Watt)	<b>\$4.5</b>	21.0	18.7	16.3	14.0
	<b>\$4.0</b>	17.4	15.4	13.3	11.2
	<b>\$3.5</b>	13.9	12.1	10.3	8.5
	<b>\$3.0</b>	10.3	8.8	7.2	5.7

*Highlighted prices are below current retail electricity price in Connecticut*

If solar installation costs drop to \$3.5/watt and 30% of investment comes from Green Bank, the consumer needs to pay only 8.5 cents/kWh to pay back investors with adequate profit.

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# If Green Bank provides enough investment, private sector investors will add money to share in consumer payments

**Developer Return (%) in CT as a Function of Green Bank Debt<sup>1</sup> and Price of Electricity from Solar**

Price of Solar Electricity (cents/kWh)	% of GB Capital in Structure			
	0%	10%	20%	30%
<b>23.0</b>	17.0%	20.2%	24.7%	30.8%
<b>18.0</b>	12.0%	14.2%	17.4%	22.4%
<b>13.0</b>	NA	8.1%	9.9%	12.9%

*Highlighted returns exceed target developer return of 15%*

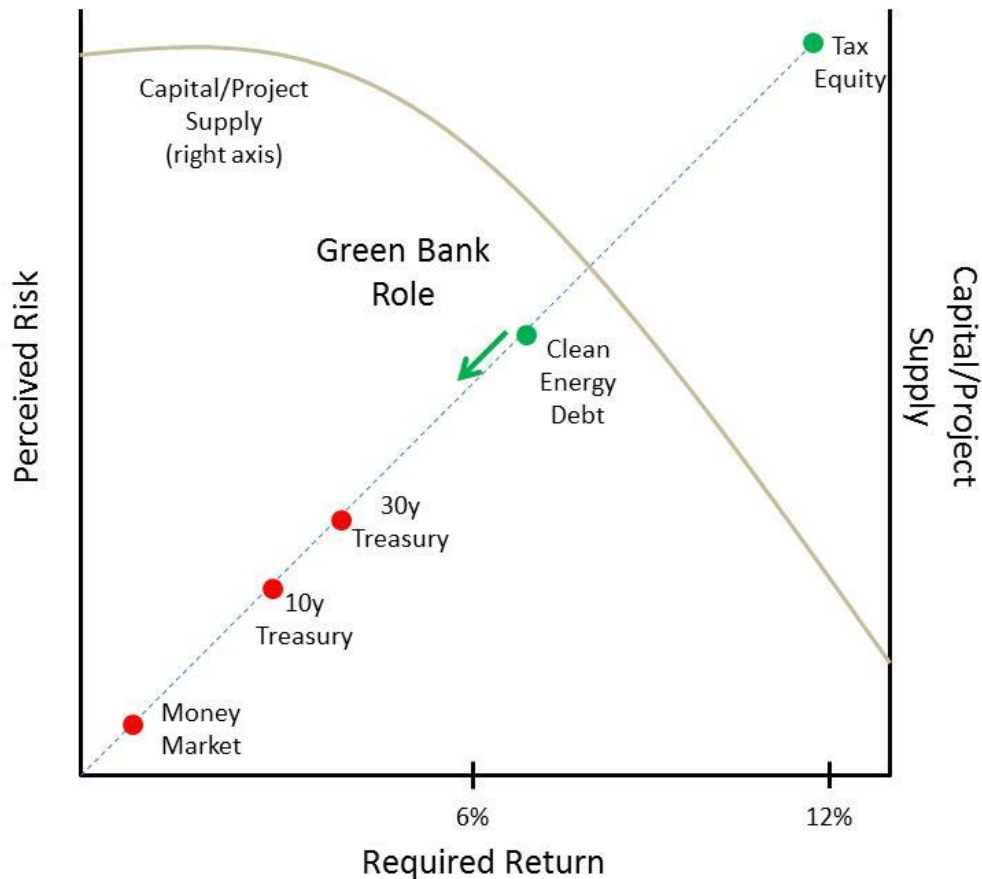
## Green Bank Attracts More Private Capital

- Cheap Green Bank debt means debt layer takes less return out of a project
- More return remains for equity investors after debt is paid
- Green Bank will draw in more private investors with attractive returns
- Public dollars will leverage significant private funds

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# Green Bank can tap large amount of private investment that is presently not used for clean energy

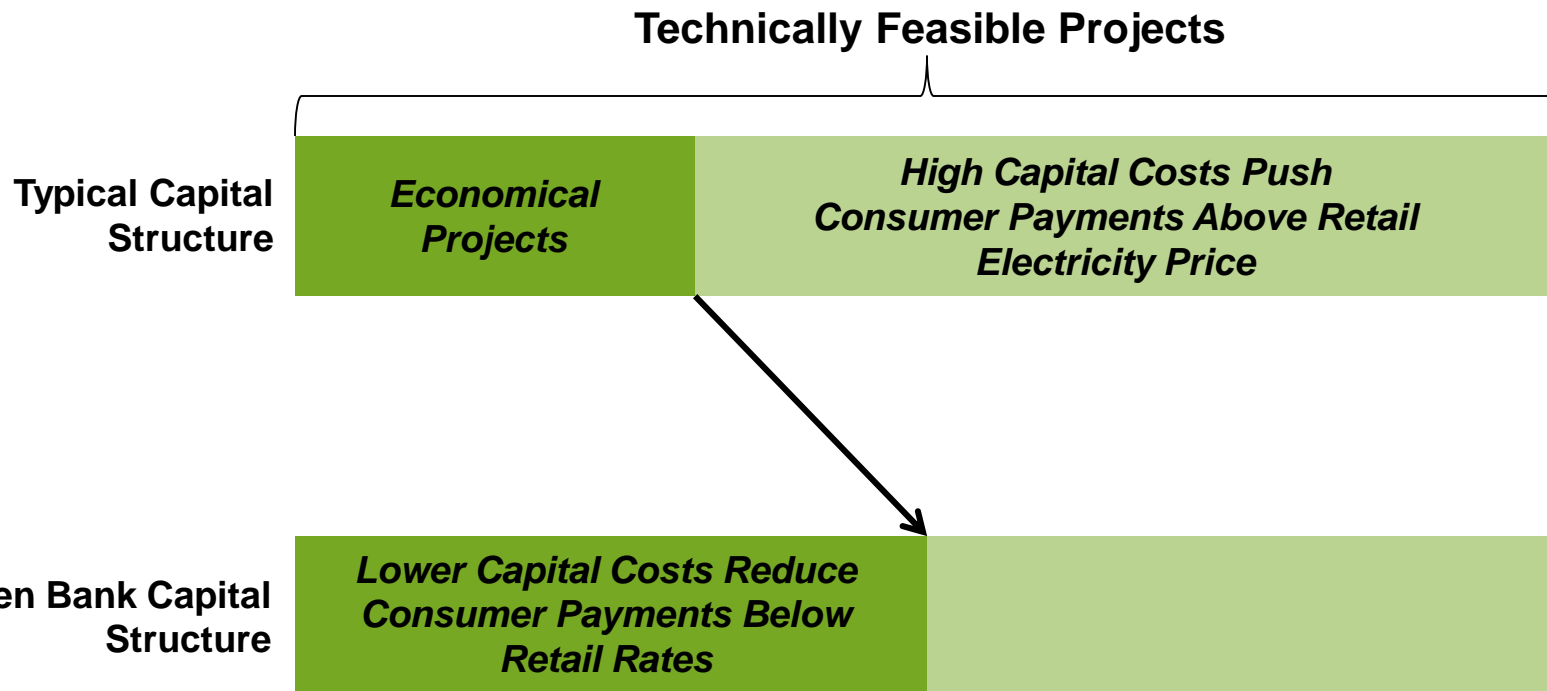


- Green Bank will attract more private investment to clean energy sector
- More investors seek low risk, low return than high risk, high return
- Green Bank can lower risk for private investors through credit enhancements and by developing mature financial markets for clean energy

Source) Treasury rates from U.S. Treasury Department. Clean Energy Debt rate based on assumptions used in NREL paper, "The Impact of Financial Structure on the Cost of Solar Energy. March 2012. Tax Equity rate based on NREL paper, Bloomberg New Energy Finance Paper, "The return – and returns – of tax equity to US renewable projects," November 2011, and USPREF paper, "Tax Credits, Tax Equity and Alternatives to Spur Clean Energy Investing," September 2011.

# Green Bank investment + Private investment leads to more clean energy projects

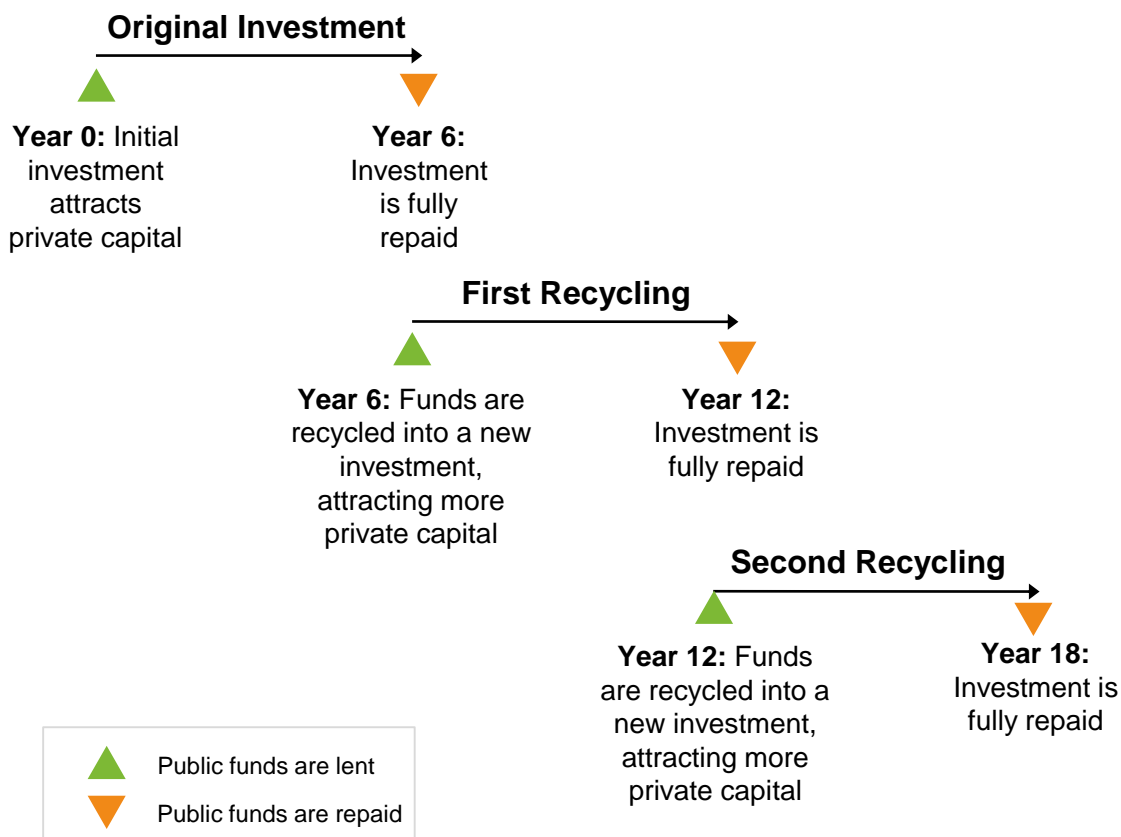
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Green Bank investment attracts private investors and increases size of clean energy market.

# As Green Bank gets paid back, it re-uses its money and leverages private capital to expand clean energy investing

## Illustrative Example of Green Bank Recycling and Leverage



- Same Green Bank dollars invested multiple times, re-leveraging private dollars
- Recycling multiplies total clean energy investment
- Illustration is conservative, as loan repayments occur constantly and cash can be redeployed throughout period