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Findings & Report on Nevada Green Bank Study

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Nevada Governor's New Energy Industry Task Force, Technical Advisory Committee on Clean Energy Sources

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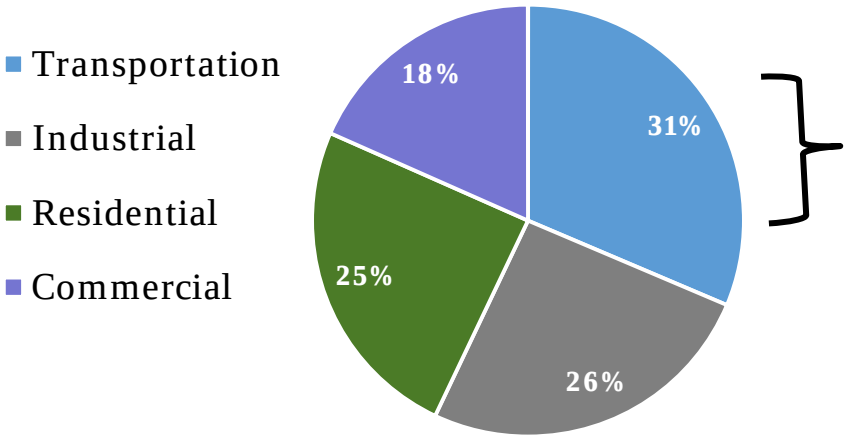
A Nevada Green Bank can accelerate deployment of clean energy and reduce energy costs for Nevadans

- A Nevada Green Bank would accelerate deployment of clean energy
  - By covering upfront costs with financing, Green Bank reduces barriers to adoption
- Today approximately 85% of Nevada's total energy from fossil fuels
- Current clean energy programs and policies mostly focused on rebates
- Massive clean energy investment opportunity still relatively untapped
  - Building efficiency alone $2.6B, entirely viable, all cost-saving
- Green Bank would use public capital to leverage private investment
  - Public capital is preserved through loans, instead of rebates
  - Animates private sector investment, business development, job creation
- Green Bank solutions lower energy costs for citizens & businesses
  - Products designed to reduce monthly cash expense; possible with affordable lending
- Green Bank can also be a central hub of trustworthy market info
  - Reliable, third-party data, technical assistance, and consumer protections
  - Can also facilitate market growth by working with contractors, lenders, etc.

Green Bank study driven by SB 360, generated deliverables & content under following structure

Transportation is largest use of energy; electricity mostly from natural gas & coal

Energy Use in NV by Sector



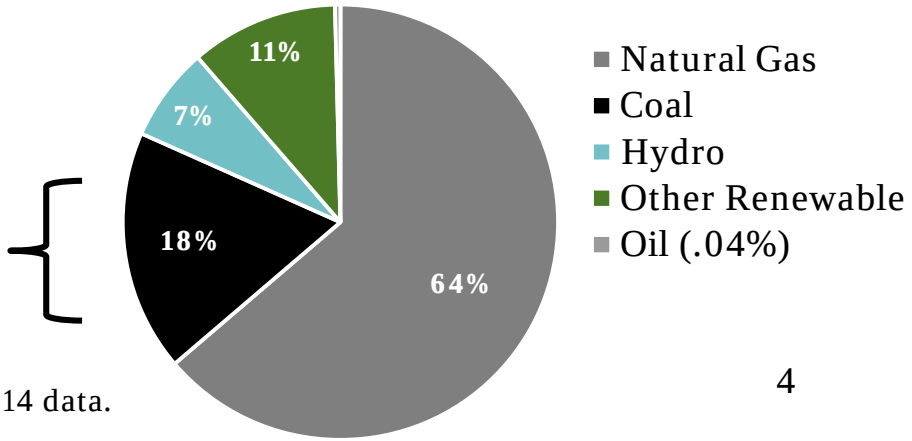
Transportation is single largest user

Buildings and Industry is 69%

Electricty Generation in NV by Source

Electricity generation dominated by fossil fuels, primarily natural gas.

Coal second largest and falling



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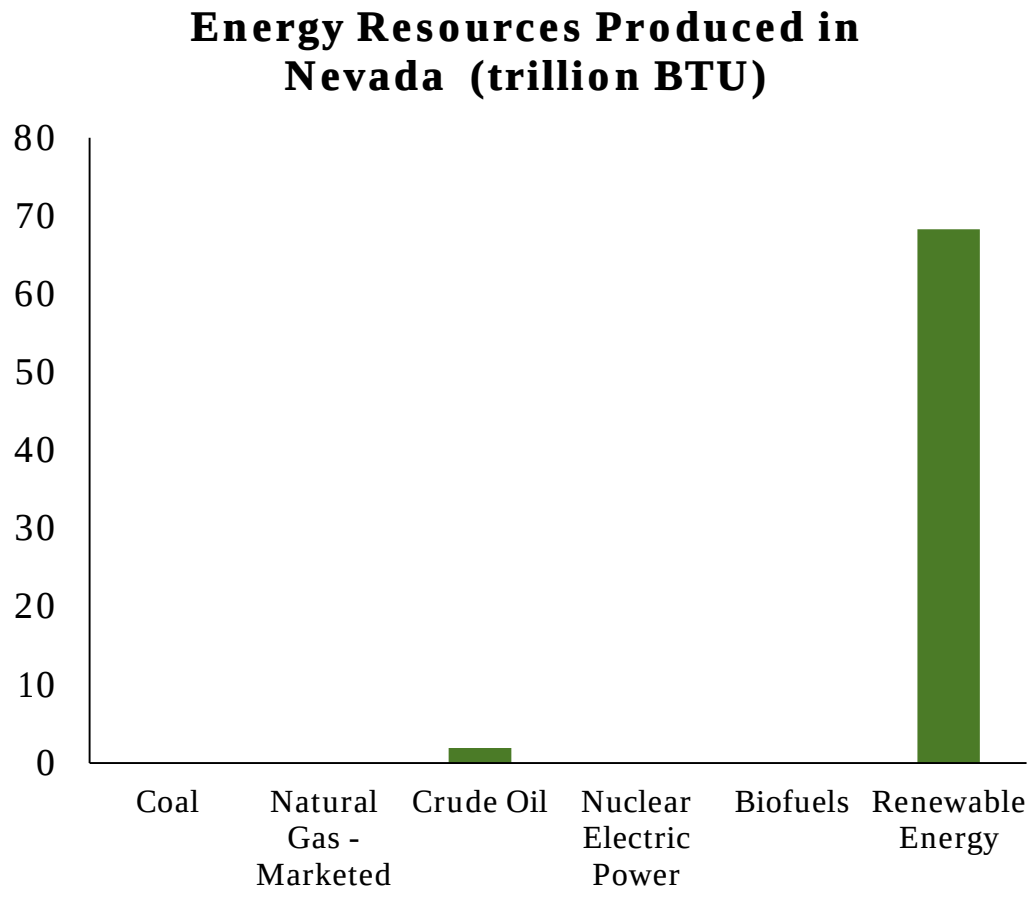
Source: EIA 2013 data and 2014 data.

Nevada highly dependent on energy imports

- About 90% of all energy (natural gas, coal, gasoline) used in Nevada comes from outside the state.
- Nearly 100% of all "home grown" energy in Nevada is from renewable sources



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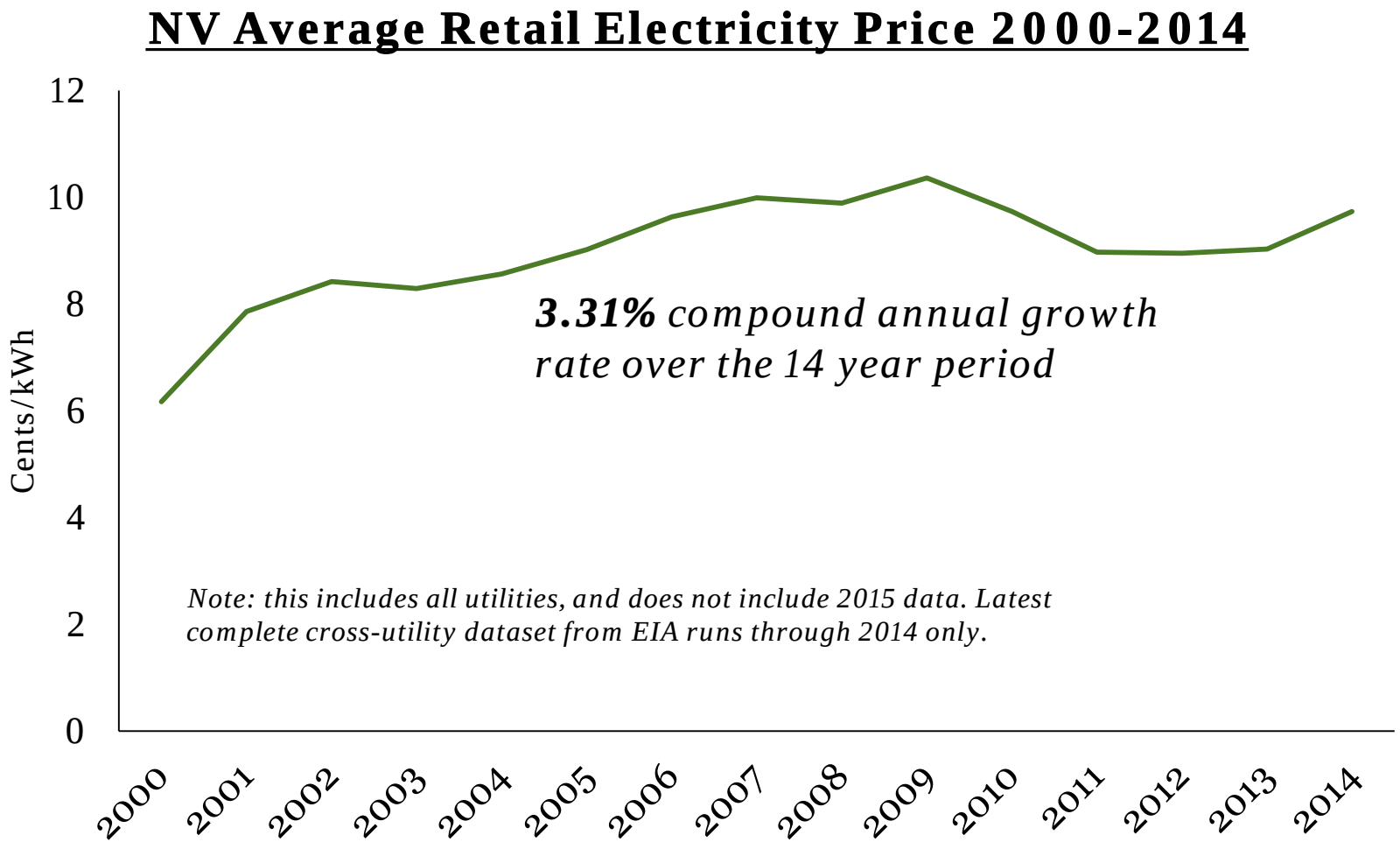
Source: EIA 2013 data.

Electricity rates in NV show modest uptick; future rates tied in part to variable prices of natural gas



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Source: EIA 2014, average across all utilities across all customers.

SB 123 means NV more dependent on natural gas prices; large scale solar prices largely fixed & falling

Impact & New Power Plants Driven by SB 123

- Nevada's grid will be cleaner
- Most new replacement generation from SB-123 coming from natural gas

Owned capacity (not reflected in current rates):

Plant Name	Fuel	Capacity	Total Cost (million $)
LV Cogen	Nat. Gas	274 MW	$148.9
Sun Peak	Nat. Gas	210 MW	$18
Nellis Solar PV II	Solar	15 MW	$54.5
Total		**511**	**$221.4**

Power Purchase Agreements: 100MW each

Plant Name	Fuel	PPA price	Notes
Boulder Solar	Solar	$46/MWh	fixed price
Playa Solar 2	Solar	49/MWh	levelized

Source: PUCN presentation to legislative committee on energy November 21, 2015.

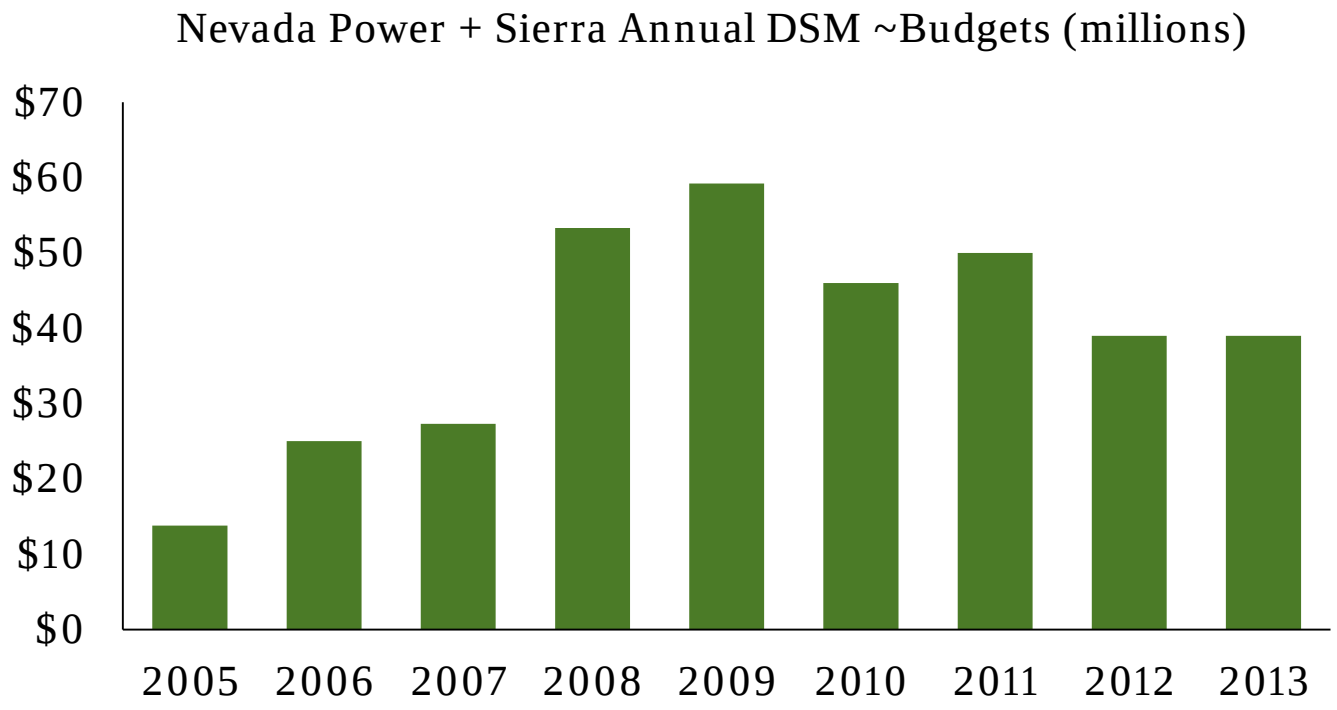
Limited number of programs across Nevada offer clean energy support to select markets

Direct Energy Assistance Loan (DEAL)
• DEAL offers EE home upgrade loans to state employees • Paid off via automatic monthly payroll deduction • Interest-free loans • Up to $6,000 per homeowner • Terms up to 60 months, with monthly payments of $50 or $100 • Simple & streamlined structure

Rural Energy for America Program (REAP)
• USDA program that offers grants and loan guarantees for rural clean energy projects • From 2003 to 2014, wind project assistance worth $150,832, and loan guarantees totaling $8,319 • Energy efficiency: $40,124 • Solar: $961,361 • Biomass: $105,703,595 – (one large biorefinery project)

Ratepayer dollars used to support Demand Side Management rebates approx. $50 million annually

- Funded through charge on utility bills
- Nevada Power DSM program cut by $11 million in Dec 2015



Source: NV Energy PUCN Dockets and SWEEP

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Successful NV Energy Grant program has gone through 90% of funds for solar, 75% of funds for hydro/wind

- Renewable Generations program created by 2003 legislature
- Funded through charge on utility bills
- Since 2003, over $257 million spent

NV Energy Renewable rebates 2003-2015 (million $)	
Initial Program Funding	$295.3
Amount Spent/Committed	$257.1
Remaining Funding	$38.2

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Source: NVEnergy
http://energy.nv.gov/uploadedFiles/energynvgov/content/Programs/Queue%20and%20RenGen%20Update%20v5.pdf

Study includes estimated clean energy market sizes to help identify significant market opportunities for GB

Methodology

- NREL assessment produced economic potential estimates for multiple renewable technologies all 50 states
- 6 different scenarios depending on policy and market conditions
- This study considers low and high estimates across scenarios for each technology
- Also includes other key data points from trusted sources
- Efficiency market size from SWEEP market assessment

NREL NATIONAL RENEWABLE ENERGY LABORATORY

U.S. DEPARTMENT OF ENERGY

USGS science for a changing world

SWEEP Southwest Energy Efficiency Project

AWEA

SEIA Solar Energy Industries Association®

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Estimated Nevada market potential for economically viable clean energy is at least $26 billion

High & Low Scenario Addressable Market by Technology

	Selected Technologies		Potential Energy Capacity		Investment Need (millions)	
			High Scenario	Low Scenario	High Scenario	Low Scenario
1	Solar	Utility	352.8 GW	5.7 GW	$511,600	$8,200
		Distributed	0.3 GW	0.3 GW	$1,000	$1,000
2	Geothermal		4.242 GW	1.391 GW	$10,605	$3,478
3	Wind		6.329 GW	1.526 GW	$2,609	$10,822
4	Electric Efficiency		7,040 GWh		$2,590	
	TOTAL		N/A	N/A	**$528,404**	**$26,090**

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12th most technical potential, but share of potential that is economical is FAR higher than any other state

State	Technical Potential (TWh/yr)	Economic Potential (TWh/yr)	% of Technical Potential
Texas	41,309	17,066	41%
New Mexico	17,561	3,368	19%
Kansas	13,637	0	0%
Arizona	13,580	2,720	20%
Nebraska	10,614	0	0%
Oklahoma	10,280	208	2%
Montana	10,174	0	0%
South Dakota	10,001	0	0%
Colorado	9,998	28	0%
Minnesota	9,565	0	0%
Nevada	9,494	7,705	81%
California	9,192	92	1%

Market & policy analysis identifies Nevada's key energy challenges going forward

Key Nevada Energy Questions

- How does NV continue to grow its distributed solar market?
- How does NV continue to make its energy sources even cleaner while keeping costs low?
- How does NV address the market segments in greatest need for energy efficiency upgrades?
- How does NV replace gasoline cars with electric vehicles?

Market Interviews with industry stakeholders are essential to identifying barriers that slow market growth, and developing solutions to these questions.

Wide range of stakeholders interviewed for Nevada Green Bank Study

Market Interviews for Green Bank Study	
Utility Representatives and Regulators	**12**
Policymakers, Government and NGOs	**24**
Clean energy project developers and installers	**7**
Banking, real estate, small business interests	**8**
Total	**51**

Questions focused on market size, demand, marketing techniques, challenges, barriers to growth, and opportunities

Interviews point to numerous obstacles to clean energy market growth

"***Getting financing at attractive rates is tough*** *as the state still struggles to* ***come out of the recession***"

"*With the* ***NV Energy rebates declining****, access to finance is becoming* ***more important than ever***"

"*There are many smaller casinos that can't or won't do retrofits, because* ***the interest rates are too high***"

"*Many commercial building operators are* ***unaware of the Sure Bet rebates****. And if they need financing, that just adds to the complexity as often they don't have the expertise in house*"

"*For commercial building owners, one of the* ***biggest impediments to doing upgrades is information*** *about the payback of technologies and* ***how to finance them***"

"*It can be* ***hard to our energy grant dollars out the door****, as sometimes Nevadans have little knowledge of what's available*"

Study finds market failures and gaps that leave viable projects unfunded and consumers unaware of options

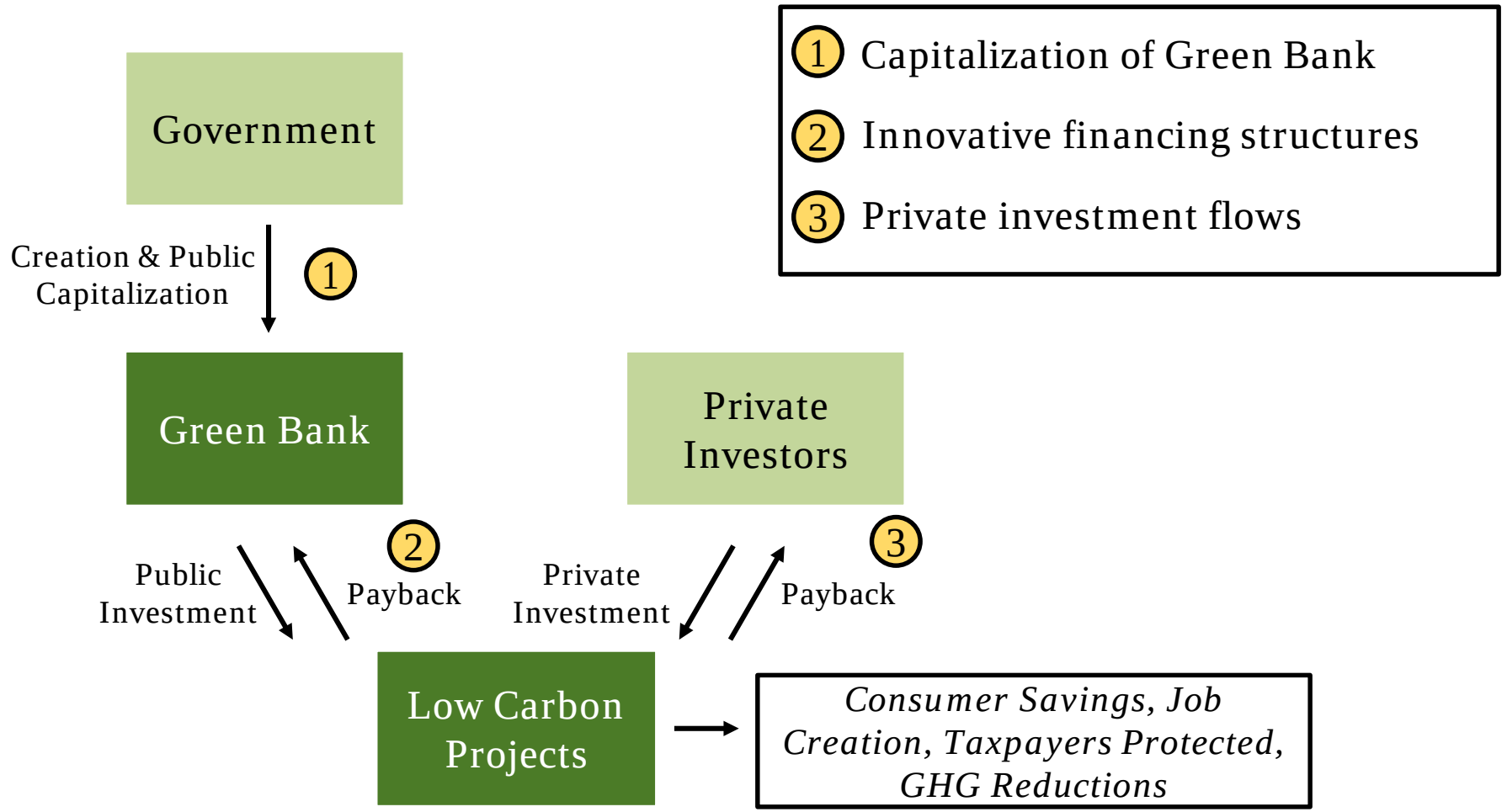
- Contractors don't bother recommending deeper energy efficiency upgrades due to longer payback periods and lack of turnkey finance
- It is extra work to hunt down attractive finance
- Lack of trustworthy, impartial source of clean energy market information leaves customers potentially confused and vulnerable
- Lack of credit history makes access to finance difficult for small to medium commercial buildings
- Some grant programs are unable to get all dollars out customers due to lack of information; many customers unaware of various programs

Priority markets identified based on potential size, savings potential, current policies, market needs

Nevada Clean Energy Priority Markets

- Residential Whole-Building Upgrades
- Commercial Whole-Building Upgrades
- Distributed Solar PV (+Storage)
- Low to Moderate Income Efficiency and Solar
- Transportation Electrification

A Nevada Green Bank can address these obstacles to facilitate market growth



Green Bank plays dual role of increasing the flow of capital and building market to increase demand

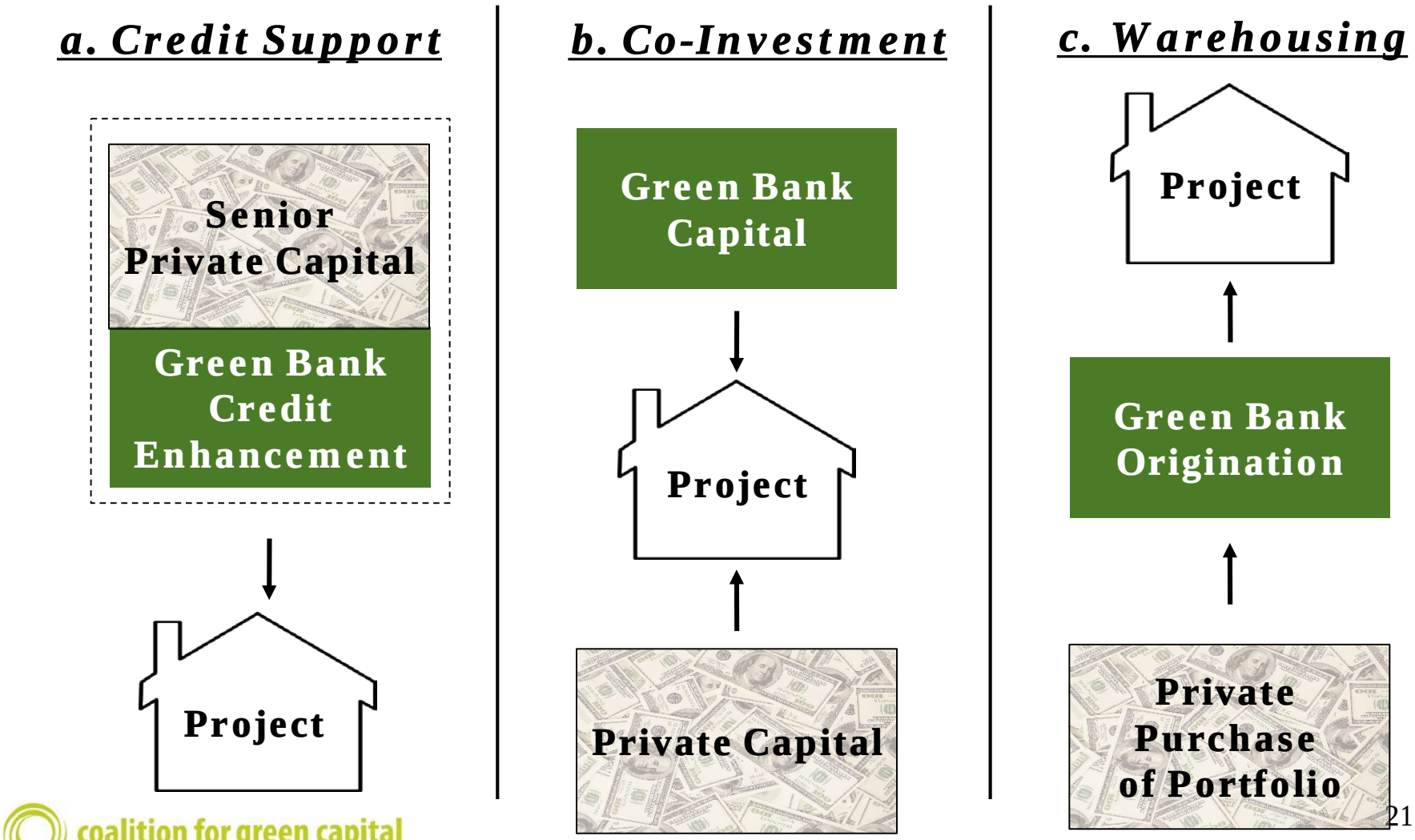
Financing Projects

- Leverage public dollars
- Stimulate private investment
- Fill market gaps

Generating Demand

- Turn-key solutions
- Harmonized programs
- Local Community-based Marketing
- Trustworthy source of reliable consumer information
- Cross-agency coordination

Green Banks can be a flexible institution that employs various financing methods to suit Nevada's need



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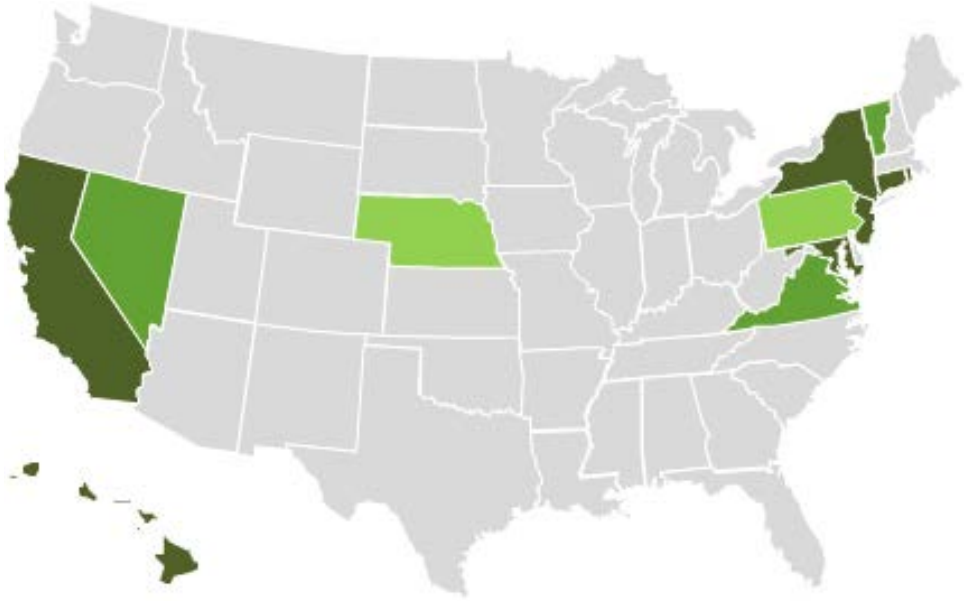
Increasing number of models and examples for NV to draw upon

Established Institutions

1. Connecticut Green Bank
2. Hawaii Green Infrastructure Authority
3. New York Green Bank
4. New Jersey Energy Resilience Bank
5. California CLEEN Center (IBank)
6. Rhode Island Infrastructure Bank
7. Montgomery County (MD) Green Bank



States with Active Initiatives to Explore Concept

8. Maryland – Legislation for Study & Task Force
9. Nevada – Legislation for GB Study
10. Vermont – Govt Steering Committee
11. Virginia – Gov's Climate Change Commission
12. D.C. – Energy Office Study

States With Related Programs

13. NE Dollar & Energy Saving Loan
14. Pennsylvania HELP
15. WHEEL

Nevada Green Bank should draw lessons on financing and demand generation from other Green Banks

Demand Generation

- **A** Green Banks need to generate their own pipeline of demand – cannot just make capital available
- **B** Cash flow is key – can overcome payback period barriers by making deals net cash flow positive from the start
- **C** Design financing to work in concert with other state programs

Financing Structure & Private Sector Engagement

- **D** Green Bank can sit in varying places in financing landscape to fill the market gap and to create suitable partnerships
- **E** Green Banks get greatest leverage through credit enhancements
- **F** Green Banks create attractive scale for private investors through warehousing

Green Bank can develop, with private sector, specific financing solutions and products to fill market gaps

Solar & Efficiency Solutions

- **A** Whole-home upgrade loans with deep EE & solar
- **B** Tariff-based financing for rural households, LMI, renters
- **C** Small-to-medium business building upgrades
- **D** Revamped Commercial PACE for larger projects
- **E** LMI-specific program with alternative underwriting

Innovative Market Solutions

- **F** Solar-plus-storage combined-financing
- **G** EV fleet conversion & charging station network licensing

A

Multiple potential product and financing structures to consider for whole-home solution

- Market assessment finds lack of simple, turn-key, statewide financing product to support whole home upgrades for both deep efficiency and roof-top solar

- Nevada Green Bank could implement one or more from proven models
  1. DEAL-like financing on-paycheck through employers
  2. Standard-offer credit enhancement to build network of lenders
  3. Warehouse for Energy Efficiency Lending (WHEEL) program
  4. New revamped Fannie efficiency mortgage product

1

State's DEAL financing program for employees can be carried into private sector for easy adoption

- GOE offers Direct Energy Loan Assistance – an interest-free loan to state employees for home upgrades
- Repaid through simple structure via a monthly payroll deduction from paycheck
- Similar structure can be pushed out to large employers to offer to their own staff
  - Green Bank could provide employers marketing materials, contractor networks and technical assistance
  - Green Bank could provide credit enhancement to support loan directly from employer or partner lender
  - Or Green Bank could directly provide capital for loan via employer

Market development solutions can increase consumer confidence and grow demand for clean energy

Market Transparency & Reliability

- **A** Contact point for customer inquiries
- **B** Central repository of unbiased market information
- **C** Consumer protection

Demand Generation & Marketing

- **D** Turnkey product design
- **E** Contractor training on financing products
- **F** Community-based marketing

Simplified Government

- **G** Single website for info across all programs
- **H** Unified branding
- **I** Program coordination across entities

C

Green Bank can develop and implement consumer protection rules through its programs

- Any new financing and burgeoning market could be susceptible to bad business practices
- Green Bank can protect customers
- Can develop specific rules in partnership with key stakeholders

Potential Consumer Protection Rules

No customer signs contract that increases energy costs

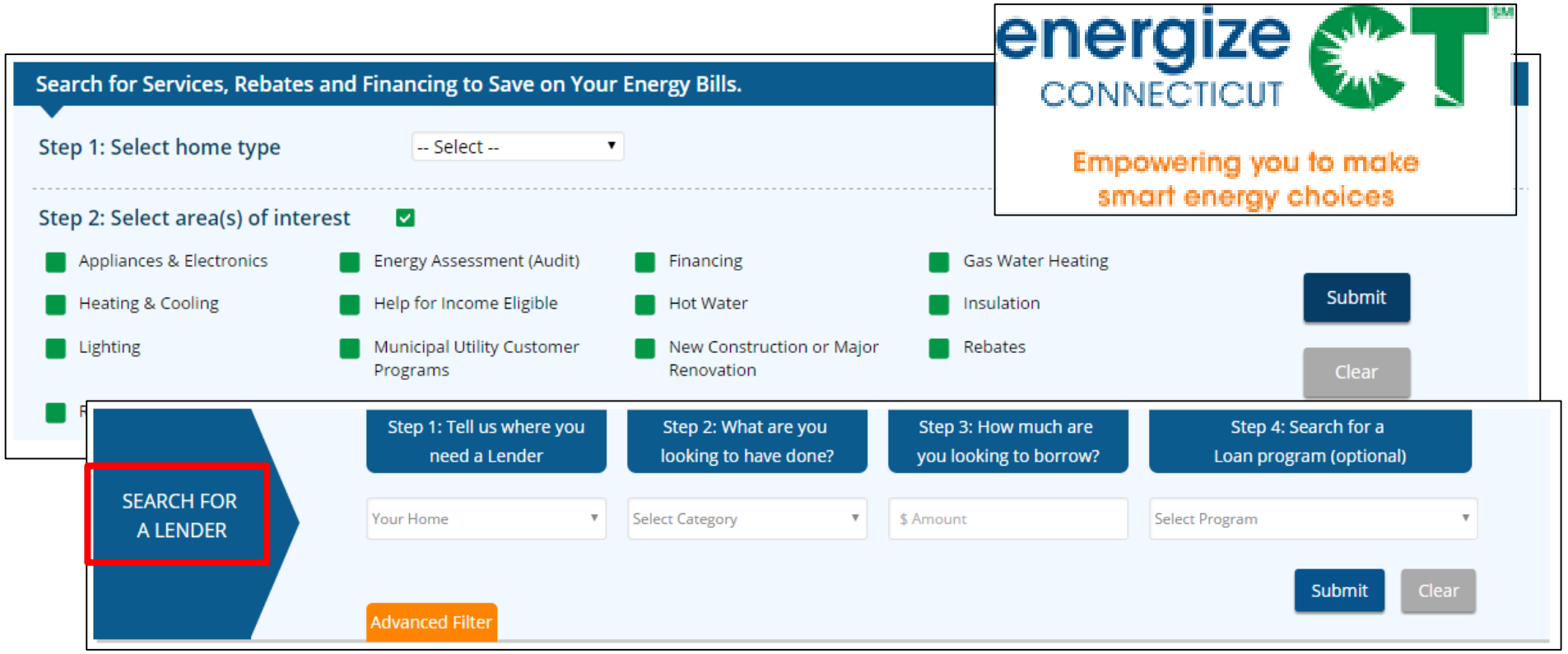
All customers know expected savings from their project

Interest rate and escalators on all financing clearly stated

No customer will be able to take too much debt

No customer can take on PACE so combined loan-to-value exceeds 90%

Energize CT provides model of single, unified brand and website that allows tailored searches for programs



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Key Takeaways

- Vast majority of energy in Nevada used by buildings; comes from fossil fuels with variable prices.
- Limited number of programs in place to support clean energy markets; most support in the form of rebates.
- Upfront cost remains major barrier to clean energy adoption, but many markets unable to secure financing at attractive terms.
- There is no central, designated entity charged with providing unbiased information to consumers.
- Nevada can create a Green Bank to drive private lending into underserved markets through aggregation, credit enhancement and marketing.
- Green Bank can serve as reliable source of unbiased information, and be a hub for technical assistance and guidance on state financing & programs.

Primary considerations for Green Bank creation are legal authority, structure and funding

- *Is Green Bank Activity Legal in Nevada?*
  - Constitution prohibits direct lending or investment of public dollars in private businesses
  - But there are precedents and structures to navigate this
- *What is Optimal Structure & Location for GB?*
  - Directly within government? A new corporation?
  - Which structure fits within legal constraints?
- *How will Green Bank be Funded?*
  - Will it receive direct seed capital (grant) from the state?
  - Will it receive ratepayer funding?
  - Will it have bonding authority?

Creation of nonprofit corporations is best method to avoid constitutional lending restrictions

Public Lending to Private

- Direct lending or investment of public money to private entities is uncommon due to constitutional prohibition
- However, Nevada can grant state funds to a nonprofit, which then lends and invests in private sector
- Multiple precedents for this structure already in place
- Best precedent is the Nevada Capital Investment Corporation, created in 2011 to make direct investments in business

Senate Bill 75 Created Nevada Capital Investment Corporation – a 501(c)(3) corp

↓

Received $50 million in public funds from State Permanent School Fund

↓

NCIC makes direct investments in private businesses (via a fund manager)

Given this legal precedent, Nevada can consider statutory v. legislative approach to external nonprofit

Statutory
Use GOE's existing power to create a non-profit corporation

- GOE Director has authority to directly create corporation, aligned with GOE purpose
- Advantage of faster execution
- Benefit of strong relationship with GOE, coordinate activities
- Complexity of securing funding

Legislative
Create new, purpose-built quasi-public non-profit

- Similar structure to Nevada Capital Investment Corporation
- Purpose-built non-profit with Board defined in legislation
- Can clearly define funding source in a single document
- Longer process, but more buy-in

Nevada GOE has statutory authority to create nonprofit corporations

"[GOE may] promote, participate in the operation of, and **create** or cause to be created, any **nonprofit Corporation**...which the Director determines **is necessary or convenient for the exercise of the powers and duties of the Office of Energy.** The purposes, powers and operation of the corporation must be **consistent with the purposes, powers and duties of the Office of Energy**."

GOE could directly create a non-profit to serve as Green Bank without any new legislation

Of potential funding sources, most are technically accessible without legislative action

Statutory approach requires cobbling together multiple existing sources of funds. Only thing completely unavailable without legislation is direct appropriation from the General Fund.

	Available Under:	
Potential Funding Sources	Statutory Approach	Legislative Approach
Direct Budget Appropriations	No	Yes
Re-directed DSM Funds	Yes (through PUC)	Yes (still requires PUC)
Renewable Energy Fund	Yes	Yes
Qualified Energy Conservation Bonds	Yes (through Executive Order)	Yes
Other Bonding Structures	Yes (via direct bonds or w/DBI)	Yes
Federal Funds	Yes	Yes

Key Takeaways

- There is legal authority and precedent for a Green Bank in Nevada
- Requires creation of nonprofit– cannot be direct public lending
- Could use existing statutory authority under GOE or create nonprofit through legislation
- Funding sources technically available through statutory approach; potential for repurposing or granting to the GB
- Comprehensive legislation to create, define and fund the Green Bank (like SB 75 for NCIC) is cleanest and most robust approach

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Thank You & Appendix

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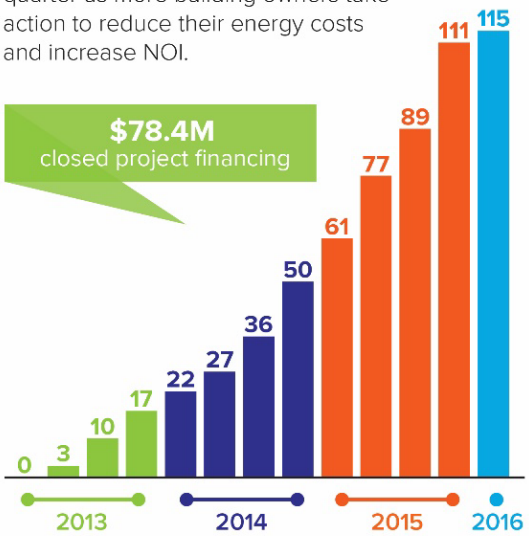
Example: Connecticut Green Bank's C-PACE program most successful in the nation

Connecticut Market Statistics at End of Q1 2016

Closed Projects

Funded projects are increasing every quarter as more building owners take action to reduce their energy costs and increase NOI.

$78.4M
closed project financing



cumulative closed projects

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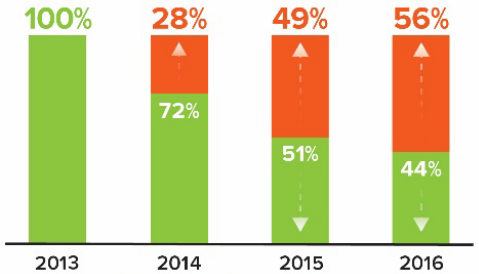
Total Capital Invested

Since program inception, the Green Bank is using fewer of its dollars to attract a growing amount of private capital.



Green Bank vs. private

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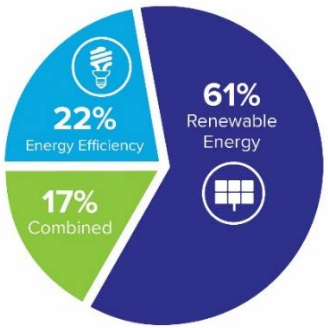
All Types of Green Energy

From simple boiler replacements to solar C-PACE works for any upgrade that reduces energy costs.



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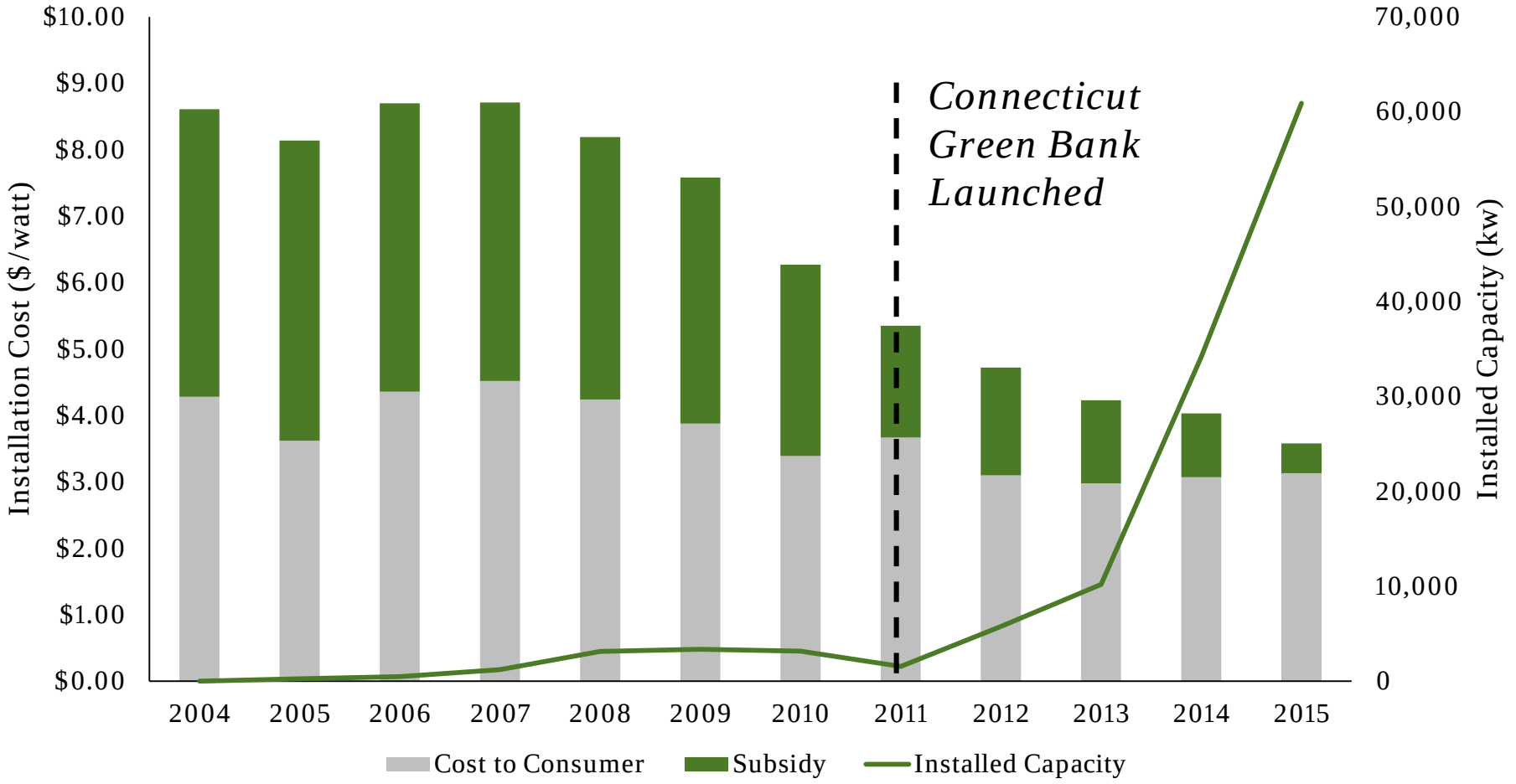
Example: Connecticut Green Bank grows residential solar with more financing and less subsidy



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