



coalition for green capital

Nevada Green Bank Study Deliverable 5 – Recommended Green Bank Solutions

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May 2016

Project Deliverables

Review

(1) Market &
Policy Review

(2) Green Bank
Review

(3) Market Sizing

Synthesis

(4) Financing
Gaps & Needs
Assessment

Recommendations

(5) Green Bank &
Financing
Solutions

(6) Green Bank
Form &
Next Steps

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- **5.1 – Value of Green Bank**
- 5.4 – Applicable Green Bank Lessons
- 5.3 – NV Green Bank Financing Solutions
- 5.4 – NV Green Bank Market Development Solutions

Market analysis points to need for increased financing, program coordination, trustworthy info

- Numerous financing gaps in clean energy market
- Lack of financing creates barriers to adoption
- Existing govt programs are scattered across utilities, state government, local government and NGOs
- No central entity for reliable, unbiased market info
- No unified effort to create a robust, clean energy economy

Nevada Green Bank Solution

Public-private financing, paired with effective demand generation and increased consumer trust can drive Nevada's clean energy economy.

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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 Banks need to generate their own pipeline of demand – cannot sit and wait for projects

- Not Field of Dreams – “if you build it they will *not* come.”
- Demand for clean energy looks different from demand for other kinds of goods & services
 - “Rational” consumers *should* want clean energy when it is cheaper
 - But few have ever thought about their energy consumption or actively engaged in an energy purchase decision
 - And those that have thought about it, place it at low priority
- Energy customers across sectors do not actively seek out clean energy solutions (and associated financing)
- As a result, without planned and focused demand generation, capital made available sits unused

Broad gulf between capital supply and clean energy demand must be filled by series of activities

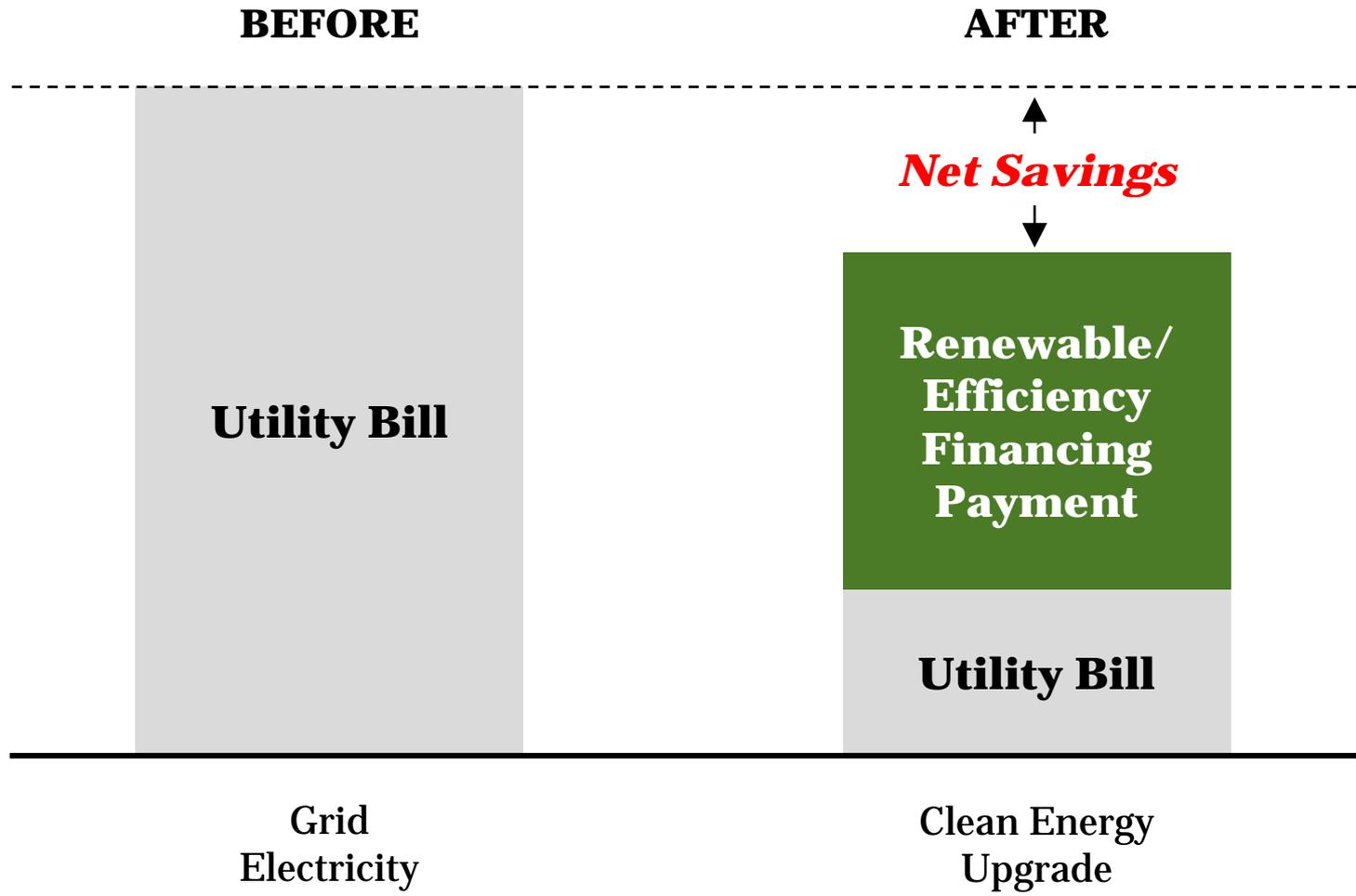
- Green Banks plus external partners must construct a pathway connecting capital to customers that makes adoption turnkey and seamless
 - Develop go-to-market channels
 - Train those channel partners (contractors, originators, ESCOs)
 - Design financing to suit precise energy service that is offered
 - Minimize project management requirements for customers
 - Make information highly accessible and easy to understand
 - Provide a central source of unbiased information for customers to make informed decisions
 - Include technical assessments to show projected savings
- All of these activities minimize barriers to adoption and simplify purchase decision for customer

Cash flow is key – financing can be designed to ensure customer cash flow is positive throughout project

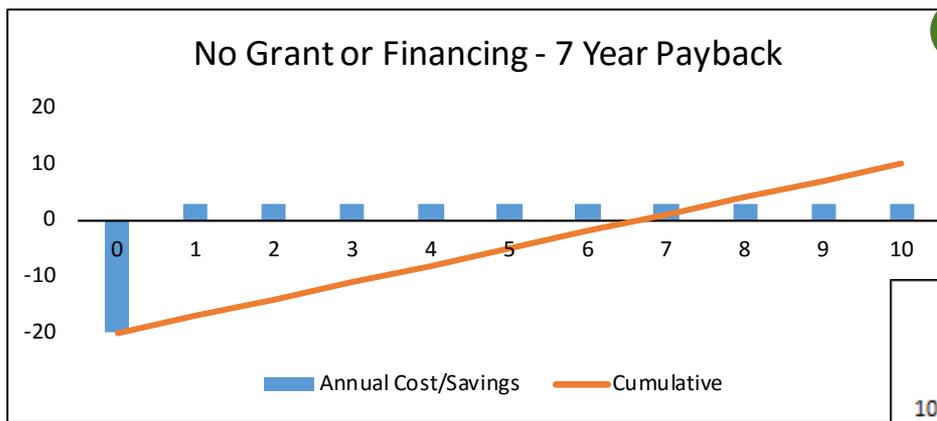
- A large barrier to adoption of clean energy – especially deep energy efficiency – is the long payback period
- Many consumers & businesses will not invest their money in a technology that has a payback period > 4 or 5 years
 - Solar and deep EE can have a payback of 20 years or more
- 100% upfront financing completely changes the payback period calculus → no upfront cost to customer, so no wait to make their money back
- Rather, financing terms can be set so that loan repayment is immediately *less* than monthly savings from upgrades

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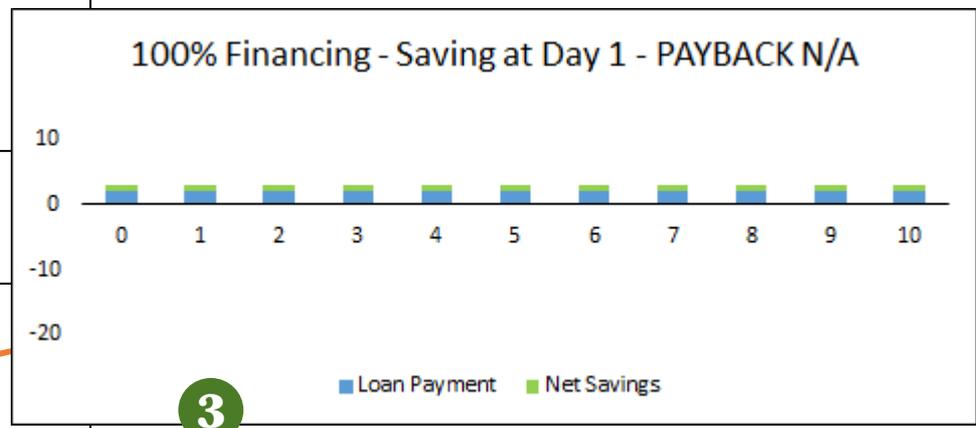
Financing structured so repayment plus remaining utility bill are less than prior utility bill



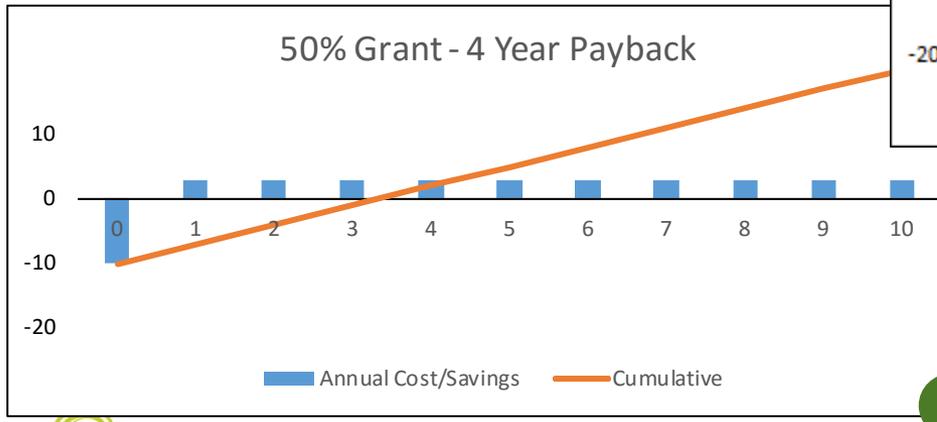
Financing at appropriate term and rate means payback period no longer matters, all about cash flow



1 A deep efficiency project has high upfront cost and long payback –barriers to adoption



3 100% financing eliminates these barriers – **NO UPFRONT COST, IMMEDIATE SAVINGS, NO PAYBACK PERIOD**



2 Even a large grant covering 50% of the cost only reduces those barriers – doesn't eliminate them

Aiming for net cash flow positive projects will dictate certain Green Bank behaviors

- Payback period becomes N/A – no longer a concern
- Clean energy adoption now looks like a way to lower operating expenses, rather than taking on debt
- This requires Green Bank to have flexible terms
- Must conduct technical evaluation of projects to know project savings
- Gives Green Bank more confidence in accepting only the stream of savings as the pledge for repayment
- Green Banks should only finance projects that can be cash flow positive – “savings-to-investment ratio” must be >1

Design financing to work in concert with other state programs

- Often Green Banks operate in an existing and complex landscape of public programs and institutions
- Creates market confusion – hard to know where to start
- Programs can overlap or leave gaps
- If not designed to work in concert – rules of one program may restrict participation in another unnecessarily
- A question of central coordination/communication and careful program design

Coordination with other state activity and information transparency can maximize value of public dollar

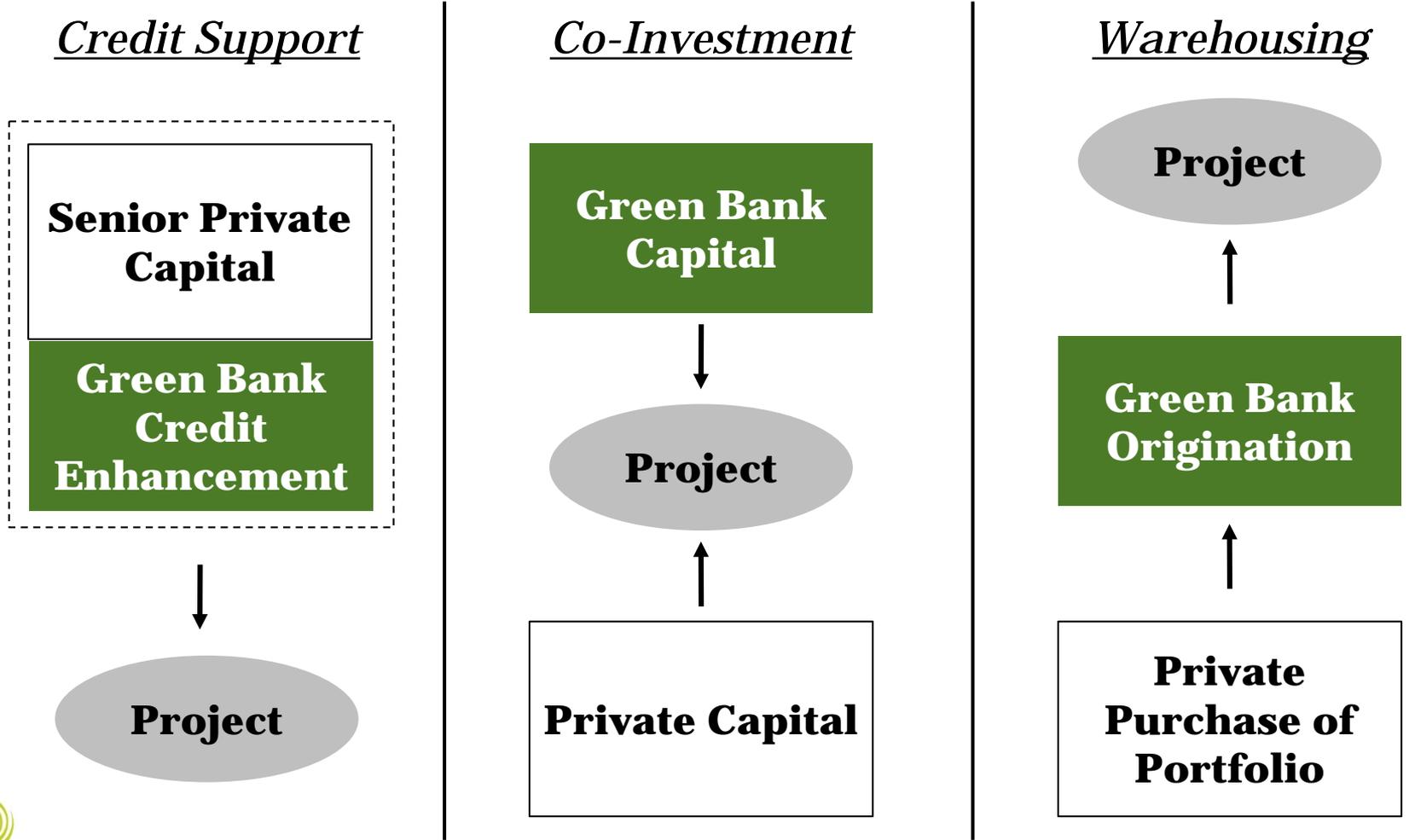
- Design financing program guidelines so loans can be easily paired with any other benefits
- Ensure that your lending criteria don't prohibit using grants from other entities
- Make it easy for borrowers to use multiple public finance sources if needed
- Provide info and explain Green Bank in the broader context of state activity so customers & contractors understand how your program fits in
- This goes a long way toward alleviating market confusion and maximizes the value of public dollars

Green Bank can sit in varying places in financing landscape to fill the market gap

- There is no hard rule about Green Banks acting as retail lender, wholesale lender, or another kind of financial intermediary
- Can lend directly to projects OR create warehouses/credit enhancements for other partners to do direct lending
- Institutional flexibility for using different financing structures helps fill requisite financing gaps
- Determination of the role a Green Bank should play is driven by the target market, the observable gaps, and the available private sector partners

D

The same Green Bank can engage in all three types of lending, depending on market need



Chosen financing strategy depends on needs of private lenders and existence of retailing partners

- Acting as a wholesale lender will be ineffective if there are no downstream origination partners
- Alternatively, providing direct loans may be unnecessary if private companies (banks, contractors, originators) are only in need of capital support (e.g. LLR) and training
- Engaging with banks (retail and wholesale) and marketing channels (ESCOs, project developers and contractors) will make clear Green Bank place in the market that will be most valuable

Green Banks get greatest leverage through credit enhancements

- Credit enhancements like loan loss reserves (LLR), partial loan guarantees, subordinated debt, and other types of insurance can draw in private capital at great scale
- A direct Green Bank loan with 100% of the capital is good – a Green Bank LLR of 10% that leads to 100% financing from a private lender may be better
- Preserves public capital – risk of repayment is so low, enhancement unlikely to be drawn upon
- Plus gets private lenders comfortable and familiar with clean energy lending – can sooner lend on their own

Some credit enhancements can get 10-to-1 leverage, attract 10 private dollars per single public dollar

- Credit enhancement can be offered in exchange for agreement by private lenders to reduce rates and offer better terms
 - Ensures that the benefit of the credit enhancement actually flows through to the end customer
- Standard-offer credit enhancements—available to enrolling lenders—is an efficient way to build lending network
- And because private partner is doing the underwriting and lending, their staff can quickly learn about clean energy lending practices → hastens private lender market entry

Green Banks create attractive scale for private investors through warehousing

- Distributed projects (solar or EE) are often unattractive to private lenders to finance
 - Small scale
 - Varying technologies
 - Inconsistent project structures and partners
 - Differing borrowing credits
- The cost and hassle of underwriting deters market entry
- For example, small-to-medium commercial properties that aren't credit rated struggle to finance projects
 - Private banks struggle to underwrite if no credit rating
 - Capital made available often requires personal guarantee of owner

Green Bank warehousing & aggregation can bridge this market gaps

- Green Bank directly finances projects that fall in the gap
- Takes on the market activities that private sector won't do, even though the projects are low-risk and save money
- Smaller loans can then be pooled together, creating scale and diversifying risk
- *Then* the Green Bank can bring the whole portfolio to private lenders to purchase – now much more cost effective and attractive for a private lender to invest
- Green Bank can also try to set up warehouse or line of credit before making loans, but may be more challenging

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Public-private financing solutions can support market gaps and grow target markets

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** Green Bank Net-Metering Aggregation
- G** Solar-plus-storage combined-financing
- H** EV fleet conversion & charging station network licensing

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

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

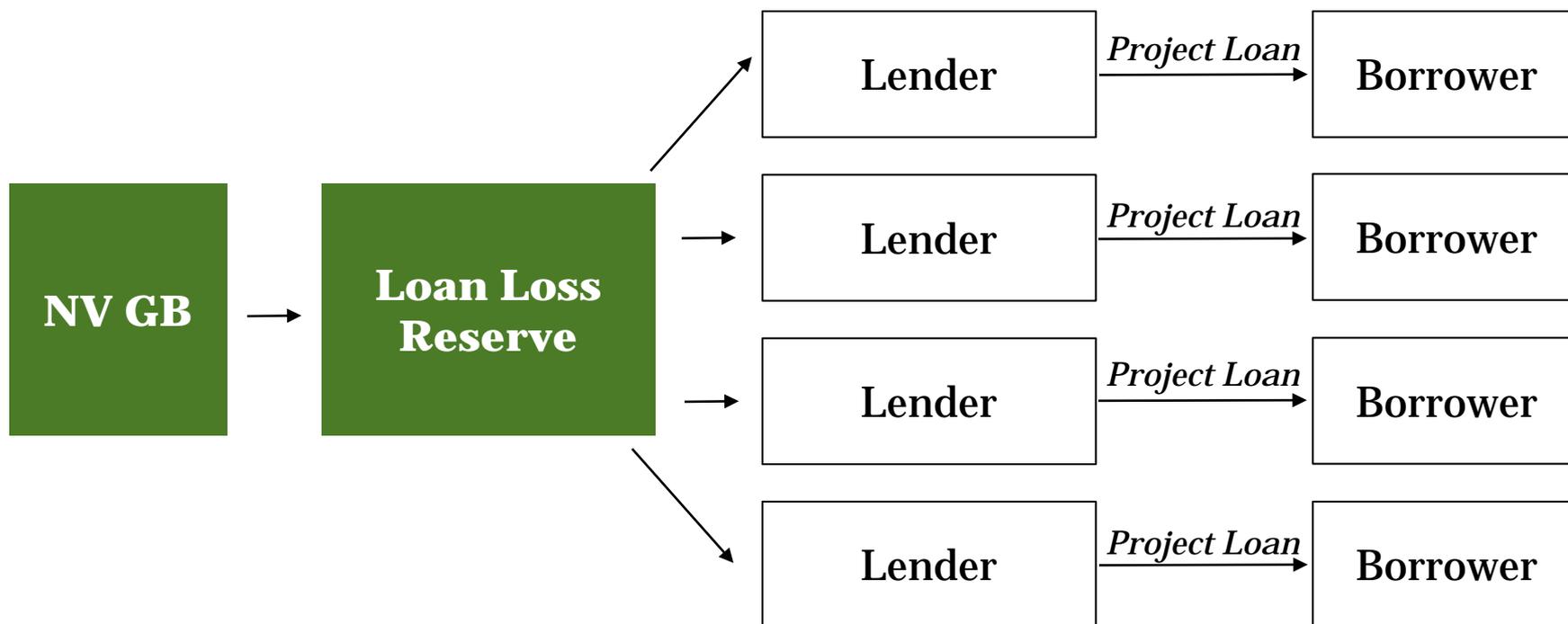
- GOE offers Direct Energy Loan Assistance – an interest-free loan to state employees for home upgrades
- Repaid through simple structure via a monthly payroll deduction from paycheck
- Similar structure can be pushed out to large employers to offer to their own staff
 - Green Bank could provide employers 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

Nevada GB could provide Standard Offer Credit Enhancements to enable network of local lenders

- One of simplest potential structures is to set aside of pool of funds to serve as a loss reserve, which a lender can draw upon in the event of loss
- Reserve would be open and available to any lender allowable under program rules
- In exchange, lender would make loans available for clean energy projects that, if designed properly, wouldn't be made without the reserve
- Range of conditions and rules to be considered

Basic structure designed to draw lenders into the market that wouldn't otherwise participate

Hypothetical Model for NV GB Standard Offer LLR



Range of product parameters to consider for credit enhancement

- *What kind of lender is eligible?*
 - Credit unions? Community banks? Commercial banks?
- *How much loss will the reserve cover?*
 - First loss or second loss reserve?
 - Up to 10% of loan amount? 20%? How much leverage can you get?
- *What are the lending terms?*
 - Up to the lender? Set max rates? How to ensure borrower benefits?
- *What are the underwriting criteria?*
 - Standard limits for all lenders? Or do they set their own rules?
- *What technologies are eligible?*
 - Is solar included? How does that impact max loan size?
- *How is the product marketed?*
 - Do banks do own marketing? How to reach contractors?

Michigan Saves ran one of the first programs of this kind to support residential upgrades

Home Energy Loan Program

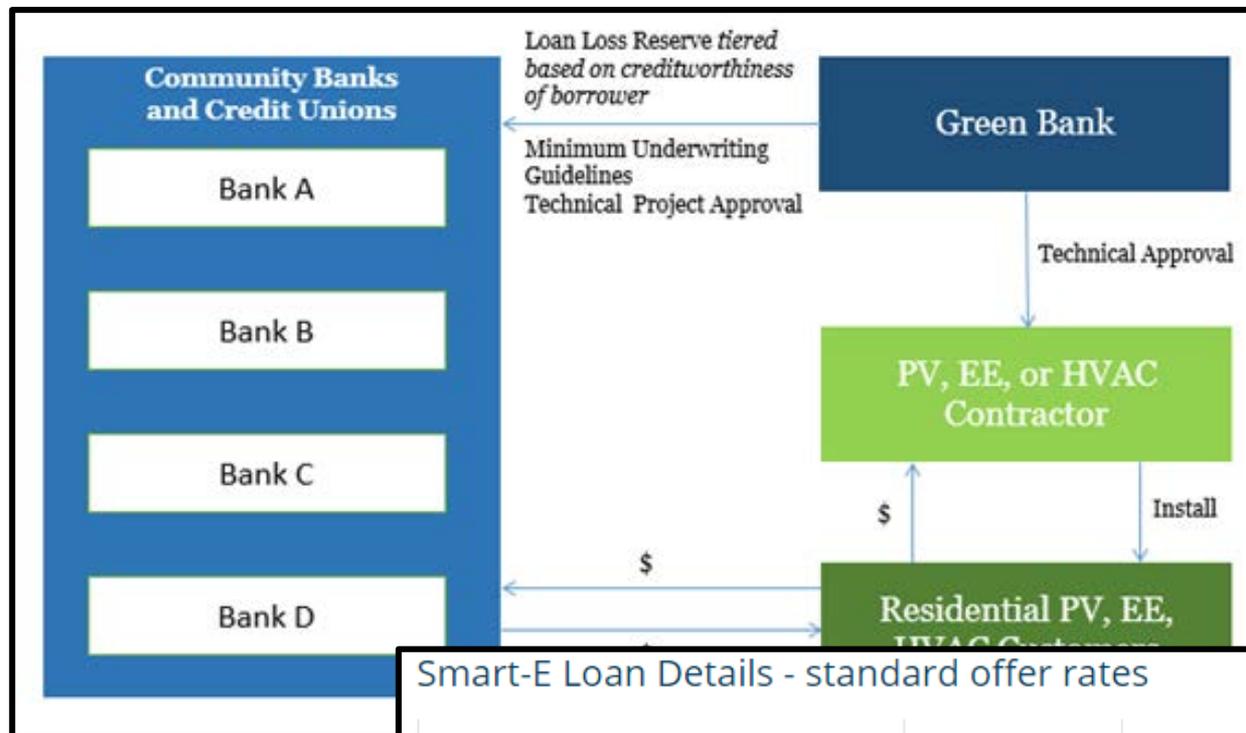
- Personal, unsecured loans up to \$30k, fixed rate not to exceed 7%, term up to 10 years depending on loan size
- Single family homes only
- Must use a program-certified contractor
- Can install pre-approved items, or get a whole-home upgrade based on comprehensive audit

Michigan Saves Home Energy Loan Program Lenders

Home Energy Loan Program				
LENDER	MINIMUM CREDIT SCORE	MAXIMUM LOAN	RATES	COUNTIES SERVED
AAC Credit Union*	640	\$20,000	4.25% - 4.99%	Herman Miller employees and residents of the city of Holland
FreeStar Financial Credit Union	640	\$15,000	4.99%	Genesee, Lapeer, Lenawee, Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, Wayne and all military members within the state of Michigan
Consumers Credit Union	640	\$30,000	4.99% - 6.99%	Entire Lower Peninsula
DCECU*	640	\$30,000	4.24% - 4.99%	Dow employees and affiliates

CT has second loss reserve, ~10:1 leverage, standard underwriting, max terms, lower terms for bundles

CT Green Bank Smart-E Loan Program



Smart-E Loan Details - standard offer rates

Loan Term	5	7	10	12
Maximum Rate (varies by lender)	4.49%	4.99%	5.99%	6.99%

WHEEL product would give Nevada access to national existing lending platform & public capital markets

WHEEL Overview

- The Energy Programs Consortium, Pennsylvania Treasury, Renew Financial and Citi collaborated together to implement WHEEL in April 2014.
- States participate in the program to gain access to a warehouse of capital available for unsecured residential energy efficiency loans.
- Each participating state sponsor contributes public funds as socialized “structured equity” and yield support for the EE loans financed under WHEEL
- State sponsors can receive a return on their contribution into WHEEL if cash is available after securitization and senior capital holders are paid out.
- Renew Financial operates the loan program, working with a network of contractors
- WHEEL completed first securitization in June 2015, with \$12.6 million in securities backed by \$16 million in loans from PA, KY and OH.
- WHEEL rates now 9.99% to 7.99%, max loan \$20,000, min FICO at 640
- Max loan size means few renewable energy projects, almost all efficiency
- **EXAMPLE:** NY Green Bank made \$20 million subordinated capital investment into WHEEL to support extension of up to \$100 million of loans in New York.



Nevada could follow established process for state enrollment in WHEEL, just as other states did

1

- State Sponsor (GB) commits capital to WHEEL to gain access to warehouse

2

- Contractor, such as Renew Financial, originates loans in the state

3

- WHEEL purchases and aggregates loans across all participating states

4

- WHEEL sells loan through securitization to secondary market investors

5

- WHEEL repays investors and sponsors

6

- Sponsor recycles or reallocates funds to invest in more projects

GB could support new Fannie efficiency mortgage product to simplify new home and re-fi upgrades



HomeStyle® Energy Mortgage Loans

Financing to Help Your Energy-Conscious Borrowers Save

Fannie Mae HomeStyle Energy Efficiency Mortgage

- “HomeStyle Energy” is new, revamped EE loan product from Fannie Mae, designed to streamline home improvement lending
- Can finance efficiency improvements up to 15% of assessed property value
- Can be a new home purchase, or refinance of existing home
- Can also be used to pay off existing, higher interest debt for prior efficiency improvements (including PACE loans)
- Energy assessment required, except for streamlined \$3,500 weatherization project, Lender can deliver loan to FNMA before upgrade complete
- Lenders given \$500 per loan completed as incentive
- Built-in network of lenders; requires broader awareness in real estate industry
- New home purchases could be a milestone point when consumers consider upgrades

On-bill financing structures open up clean energy to low-income and renters, increase lending security

On-Bill Financing Mechanisms

- As PACE is designed to increase lender security, on-bill financing mechanisms allow loans to be repaid on the existing utility bill
- Upfront costs are financed and repaid over time
- Wide variation in program structure depending on capital source, recovery, etc.

ACEEE Report on OBF Benefits

- Drastically reduces or eliminates first costs for customers.
- Aligns timing of costs and benefits of energy efficiency measures, generating immediate positive cash flow—monthly energy savings are equal to or greater than the repayment charge.
- Leverages existing billing relationship between consumers and utilities.
- Can operate concurrently with a rebate program to reduce the total amount financed.
- Financing can be tied to a property (often through the meter) so that debt transfers across owners/tenants.
- Bill payment history can be used instead of or to complement a full credit report.
- Implied or actual threat of disconnection increases repayment rates.

Range of potential on-bill structures can open capital markets, streamline for utilities or increase security

OBR v OBF Loans v Tariff-Based Financing

	On-Bill Recovery	On-Bill Financing	Tariff-Based On-Bill Financing
Capital Source	Private Lenders	Utility	Utility*
Financing Type	Loan	Loan	To-the-meter tariff
Obligation tied to:	Individual Borrower	Individual Borrower	Building/meter
Stays with Property?	No	No	Yes

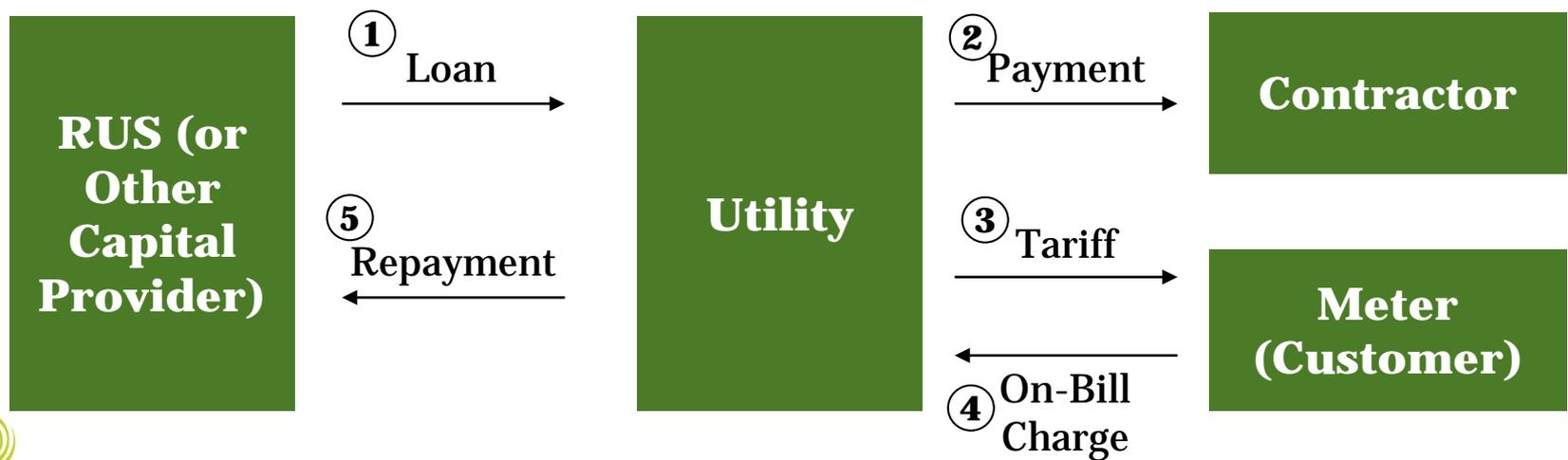
*Because financing is tariff-based, capital technically must come through the utility. However, underlying capital source can be any partner utility chooses.

GB would have to work with regulator, government, utilities to set parameters and implement

- *What is geographic coverage?*
 - Statewide? IOUs? Rural? What form of regulatory approval needed?
- *Whose capital is used?*
 - Open platform for lenders? Single lender? Utility capital? Feds?
- *Tied to the meter?*
 - Tariff-based system to stay with property? Or unsecured loan?
- *Shut-off provision included as security?*
 - Is power shut off if customer pays electric bill, but not financing?
- *Bill neutrality requirement?*
 - Must projects save money every month? Or can it fluctuate?
- *What help do implementing utilities need?*
 - Are utility systems capable? Who pays for upgrades if needed?

Pay-As-You-Save (PAYS) tariff-based system is strong example of using cheap capital in rural communities

- PAYS is designed for easy adoption by rural utilities, to allow customers to lower energy bills with cheap financing
- Tariff-based, tied to the meter, repaid with fixed charge
- No loan, no lien – charge, by rule, is less than savings
- Utilizes low-cost loans from USDA Rural Utility Service
- Well-suited for Nevada rural communities



On-bill in Nevada could expand market access in ways that other solutions cannot

- Requires broad utility engagement – likely easiest to start with co-ops and munis in rural parts of state
- Huge benefit of OBF is opening up clean energy markets for renters and low-income households that presently are effectively shut-out
- Tariff-based solution brings most security, cheapest capital, though requires most utility & regulator engagement
- From customer standpoint, low perceived complexity, not a loan so no new debt
- Would need to compensate utility for any added costs

Large market of small and medium size commercial buildings that are too small for PACE

- “Resi-mercial” market – upgrades that are more similar to residential size – less than \$50,000
- Segment struggles to find energy-specific loan products because businesses are difficult to underwrite
 - No business-form of FICO score
 - Business are too small for Credit Ratings
- Most commercial lenders decide it is too time-consuming (i.e. expensive) to underwrite this segment
- Means only lending solutions are credit cards (~25% interest) or loans with personal guarantees from owners

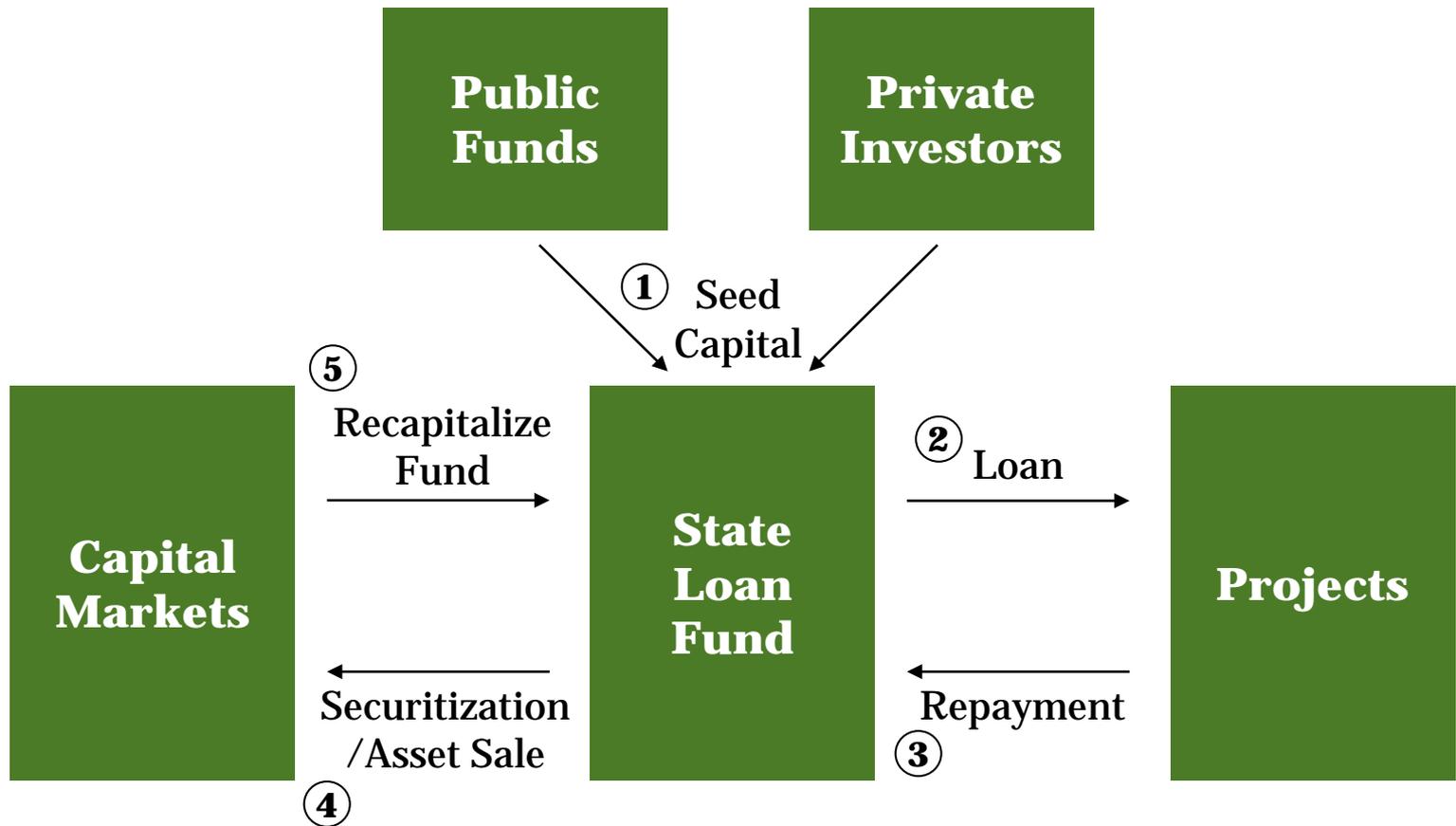
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Nevada GB could create a direct lending product for small businesses, based on revolving loan model

- Nevada GB provides loans directly to businesses
- Develops its own standardized underwriting criteria to minimize costs
- Loans would be placed a in revolving pool, so capital is recycled over time
- Can accelerate volume of lending by securitizing loan pool once it reaches critical scale that it then becomes attractive to private capital providers
- Deployment requires contractor training, energy assessments and technical assistance to ensure uptake

C

Direct lending model with revolving loan fund paired with securitization requires starting seed capital



New York loan product pairs energy assessments, technical assistance to support small businesses

Green Jobs Green New York

- Loan program operated by state energy office (NYSERDA)
- Targets small biz and single-family
- Two options for small business loan – participation loan via partner lender and on-bill repayment
- For participation loan, NYSERDA provides 50% of loan capital at low rate to pair with remaining capital from partner lender at market rate
- Lender collects and remits payment back to NYSERDA
- NYSERDA lead gen through partner contractors that perform qualified energy assessments



“Results demonstrate that small business customers benefit from dedicated project implementation assistance, including assistance identifying and accessing financial incentives and low-interest energy efficiency financing, to help lower the cost of implementing energy efficiency improvements recommended on Qualified Energy Assessments.” – GJGNY Annual Report

Commercial PACE product is well-suited for medium-to-large projects, but current structure is unworkable

- Commercial PACE is proven model, with growing market now over a quarter billion dollars
- Most effective commercial PACE program in the country is operated by CT Green Bank through statewide model
- Commercial PACE in Nevada requires significant reframing
- *Should not* be presented as just one more kind of SID-based investment implemented by municipality
- Instead, should be viewed as a building upgrade product that happens to use tax system to collect/secure repayment
- PACE statute should be pulled out of NRS section related to SIDs – break link between projects and municipal bonding

Nevada could follow lead of others, create statewide program, significantly simplify statute

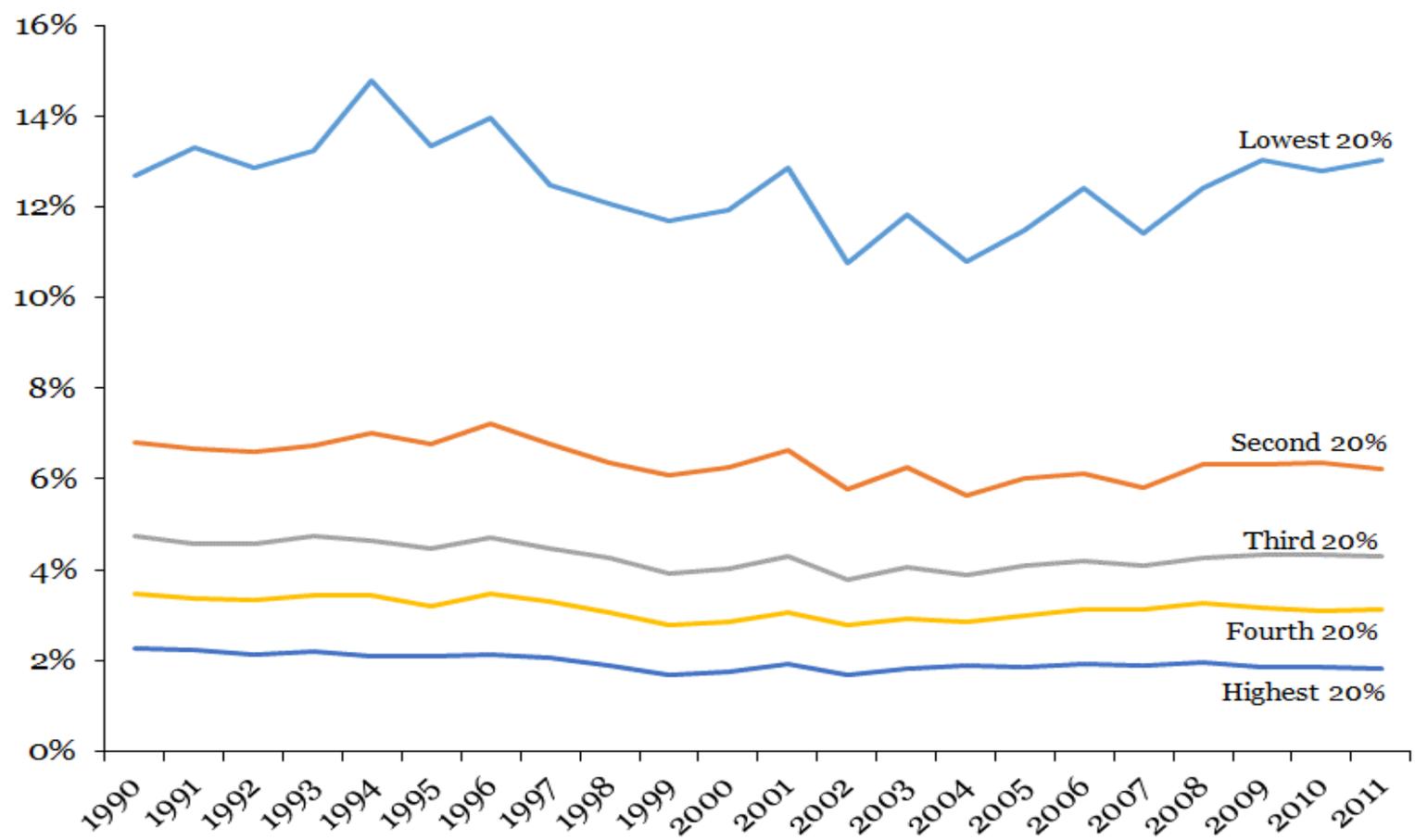
- Enable a simplified model where any taxing entity can pass single resolution to enroll in statewide platform
- Taxing entity still collects payment, but more akin to on-bill collection or payroll-based collection under DEAL
- Have a statewide program to operate PACE in any county that enrolls (e.g. CT or RI) or create statewide district (CO)
- Financing structure simplified, move away from muni bond
 - Could have open platform, where any capital provider can make a direct PACE loan to any building
 - Or could have GB-funded loan product if no private activity
 - No municipal bond needed

Large LMI gap in Nevada, most existing solutions aren't tailored to LMI needs

- Low-to-moderate income (LMI) households typically are underserved by existing clean energy solutions
- However, these households have highest energy burden (energy costs as % of disposable income)
- So LMI community needs clean and cheap energy solutions more than any other segment of the market
- New, dedicated LMI solutions for home energy efficiency are needed to reach this market

Energy burden is greatest for those who can least afford to pay high energy bills

Utility Cost as % of Disposable Income by Income Quintile



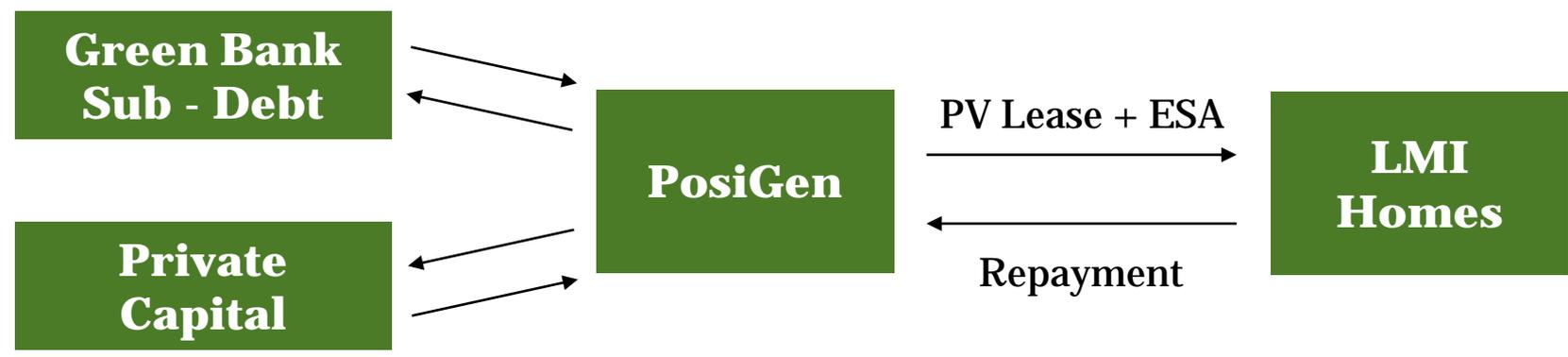
Specific considerations for LMI products

- *Alternative Underwriting Criteria*
 - Lower FICO score? Different Debt-to-Income Ratios?
 - OR, use different factors entirely, like utility bill payment history
- *Meeting LMI Household Needs*
 - Simplicity, turn-key solutions, little time and attention required
- *Debt limitations*
 - Can households take on more debt? Can non-debt solutions, like tariff-based financing, be more suitable? Or PACE
- *How to Address Renters*
 - Split-incentive barrier prevents straight loan products for renters; LMI population disproportionately rents

NV could adapt CT LMI product to focus on deep efficiency, potentially add solar when economical

CT Green Bank PosiGen Financing

- PosiGen offers standardized rooftop solar leases specifically for LMI households
- Fixed system size, 20 year lease, no escalator, fixed payment \$55-\$75 per month
- Optional efficiency upgrade with savings guarantee, standard/limited set of measures
- Alternative underwriting criteria – only considers utility-bill payment history
- Does not look at FICO scores or debt-to-income ratios
- Relies on community-based marketing to reach and engage with target customers
- CT Green Bank made \$5 million subordinated debt investment in lease fund

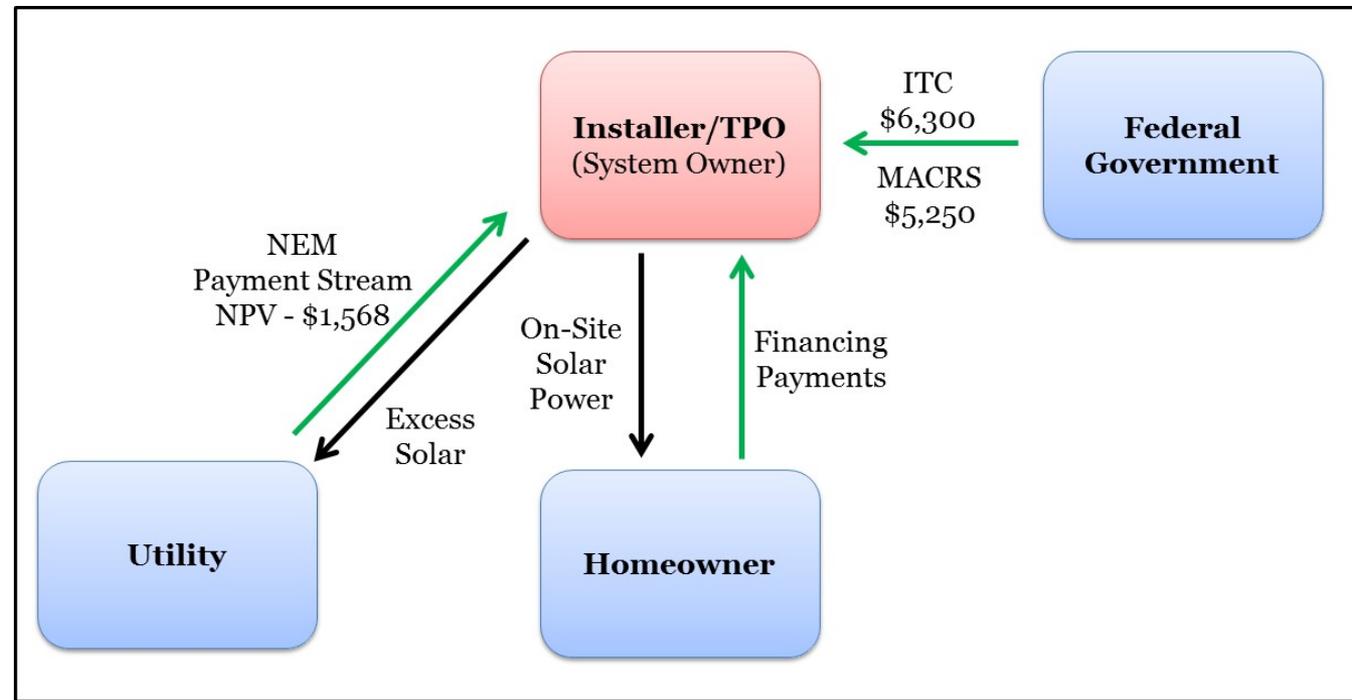


Green Bank can aggregate net-metering payments, produce value for customers, certainty for utilities

- Rather than pay out NEM over time, Green Bank pays customer upfront, Green Bank “aggregates” NEM streams from utility
- Value of upfront “rebate” is higher for customer because of Green Bank’s lower discount rate
- Real energy costs lower than current NEM construct, monthly payments are the same when rebate used to pay down principal
- Utility has known annual costs, while still allowing for rapid, but predictable solar market growth

With normal net-metering, customer realizes value over time, heavily discounted future payments

Value Flow Chart for Nevada Solar Lease with Traditional Net-Metering Structure Under Standard Assumptions

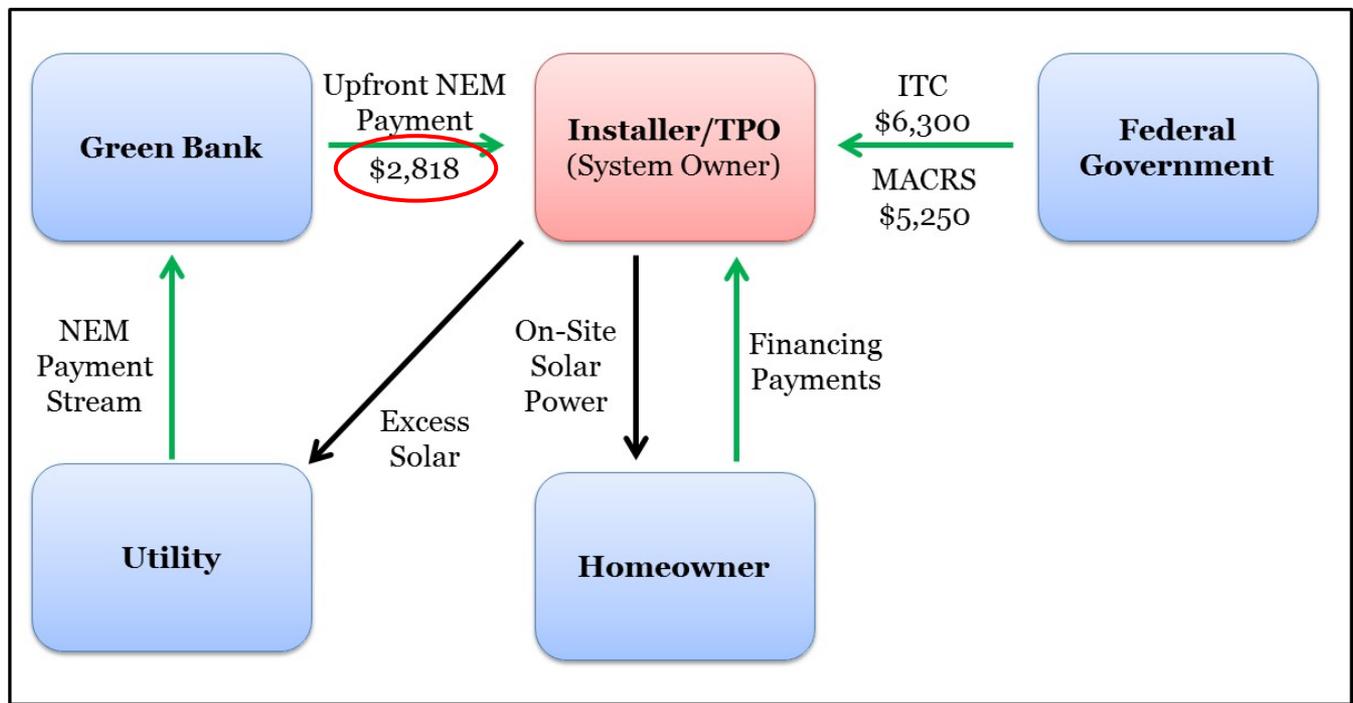


Notes & Sources: Assumes 6kw system in Las Vegas; installed at \$3.50/w, 30% ITC and MACRS present value equal to ~25% of install cost; generation based on PVWatts data; assumes 0.5% annual degradation; assumes homeowner discount rate of 15%; household load profile data from Hugh Wynne et al., "U.S. Utilities – Has Nevada Created the First U.S. Market for Residential Energy Storage." Uses real net-metering and electricity rates from <https://www.nvenergy.com/renewablesenvironment/renewablegenerations/NetMetering.cfm>.

With aggregation, owner realizes higher upfront value immediately, using Green Bank's lower discounting

Value Flow Chart for Nevada Solar Lease with Aggregated Net-Metering Structure Under Standard Assumptions

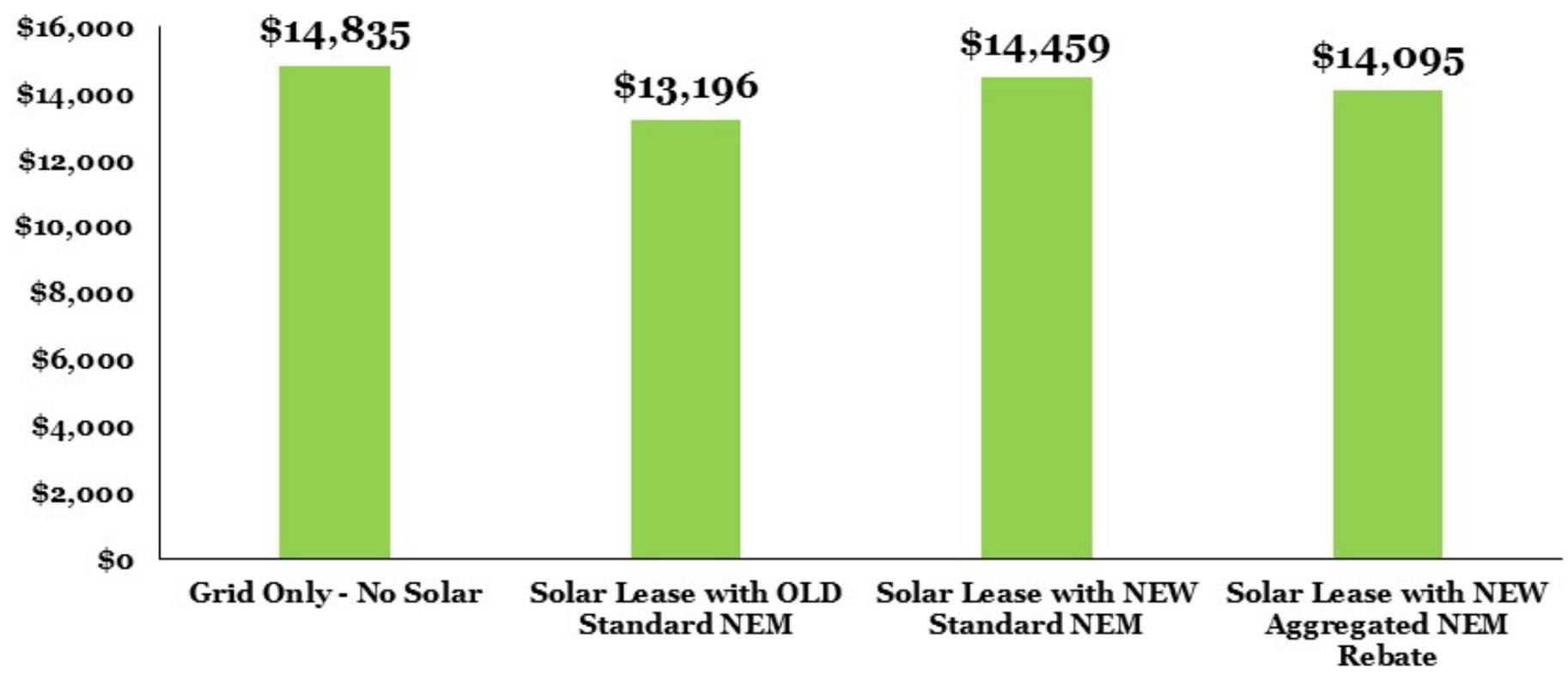
Upfront NEM "Rebate" is higher because of Green Bank's lower Discount Rate



Notes & Sources: Assumes 6kw system in Las Vegas; installed at \$3.50/w, 30% ITC and MACRS present value equal to ~25% of install cost; generation based on PVWatts data; assumes 0.5% annual degradation; assumes green bank discount rate of 4%; household load profile data from Hugh Wynne et al., "U.S. Utilities – Has Nevada Created the First U.S. Market for Residential Energy Storage." Uses real net-metering and electricity rates from <https://www.nvenergy.com/renewablesenvironment/renewablegenerations/NetMetering.cfm>.

Real energy costs are lower, and monthly total energy bills are equivalent to current NEM structure

Net-Present Value of Household Electricity Cost Under Various Solar Lease & Net-Metering Structures



Notes & Sources: Same assumptions from prior slides. Grid only prices and old NEM rates from <https://www.nvenergy.com/renewablesenvironment/renewablegenerations/NetMetering.cfm>. Assumes customer NEM rebate is used to pay down borrowed principal

Simpler process and certain cost for utility that still allows rapid, but predictable solar growth in Nevada

Simpler Payment Process

- Presently, utility has to make monthly payments, of variable amounts, to thousands of customers in perpetuity
- Green Bank aggregation allows utility to pay just one entity and leave it to Green Bank to manage customer payments

Known Cost of Net-Metering

- Utility can pay Green Bank expected cost of NEM, based on industry and regulator projections, at start of year, creating total annual certainty
- Sends signal of total amount of NEM rebate available to market that year

Solar Growth Continues, but Predictably

- Up to Green Bank to distribute rebates to market in manner that maximizes deployment given set amount of rebate
- Green Bank could hold reverse auction and award rebates to installers seeking least amount of rebate per install, downward pressure on costs
- May result in more solar than predicted, but utility cost is already known

New net-metering rates create market opportunity for customer-cited storage paired with solar

Estimated Annual Savings from Installing Battery for Existing Residential Rooftop PV Owner

	Annual Savings
Battery + Non-TOU Rates	~\$140
Battery + TOU Rates	~\$220

- Lower NEM rates means that selling excess power back to grid has less value – opportunity for battery storage
- New time-of-use (TOU) rates mean solar owners can arbitrage price differences, increase value of excess power by offsetting grid consumption when most expensive
- Significant upfront cost to installing solar, though, for either new or retrofitted system – financing is critical

GB could support EV conversions, both through direct fleet financing and through innovative network design

- **EV Fleet Conversion with ESCO-style Financing**
 - Public fleets well-suited to partial or full conversion with EVs
 - No upfront cost in ESCO-like financing and equipment usage plan
 - Third-party owns vehicles, fleet operator pays usage fee (financing charge) over time, third-party manages charging / maintenance
 - Cost of capital is key driver of economic viability – Green Bank could support financing, extend offer to large employers (Casinos)
- **Green Bank to License/Finance Charging Network**
 - New EVs simultaneously need new public charging
 - Most charging done at home and work place, but still need optimally located public charging stations
 - Green Bank can hold reverse auction to find third-party that needs lowest payment in order to build optimized public charging network
 - Green Bank provides financing, licensee builds network, gets charging revenue for set period of time
 - Others may build stations, too, but only licensee gets GB financing

Key Takeaways

- Greatest financing need is for a simple, state-wide consistent home upgrade loan program; multiple structures to consider that build on existing models in and out of state
- Though complex, on-bill structure is excellent way expand access to low-to-moderate income market segment and renters, who are currently shut out of market
- Small commercial segment needs its own tailored product due to underwriting challenges; larger commercial projects suited for PACE, but program needs major overhaul
- Innovative solutions for solar plus storage can give commercial businesses increased reliability, premium product for households, maximize value under TOU pricing
- Green Bank can coordinate centralized procurement and financing for efficiently designed EV charging network

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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

Nevadans need a clear and designated point of contact to understand process & offers they may be given

- Research consistently found market confusion over who plays the role of market “referee”
- Who to call to help understand a PPA or an efficiency audit or to learn about financing
- Green Bank can play that central point of contact
- 411 for clean energy solutions in Nevada
- Market reliability & trustworthiness is essential for growth
- Reduce burden from GOE and others, reduce market confusion

As single point of contact, Green Bank could be central repository for market and program information

- Provide introductory info on clean energy technologies
- Clear explanation of full range of programs, rebates, financing across all entities, not just Green Bank
- Paint road map of steps in order to actually adopt technology so process is clear to customers
- Simple explanation of financial benefits of adopting clean energy (i.e. calculating bill reductions)
- Facilitate price transparency, offer reviews for contractors
- Create the “Kayak” or “Yelp” for clean energy services

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%

Green Bank can overcome barriers to demand by designing products with turn-key customer adoption

Turn-Key Adoption Process



Elements of Turn-Key Program Design

- Technology package tailored to customer's needs
- Matched with appropriate finance & rebate package
- Simple & clear economic value proposition
- Minimal need to make complex decisions
- Make adoption more like buying a car

Most important marketing channel for financing is contractors

- Financing products cannot be offered in vacuum
- Green Bank must consider how products reach customers
- Contractors are most logical go-to-market channel
- Therefore, must be well-trained on financing products available, understand how the products work
- Explain to contractors how to sell the benefits of adoption with financing – no upfront cost, savings from day one
- Green Bank should design product design details in partnership with contractors to ensure product fits sales cycle and fits contractor needs

Green Bank can also leverage community-based marketing models – word of mouth from neighbors

- Often best way to learn about a clean energy product is from a friend or neighbor.
- More credibility than high pressure sales or door to door

Solarize Program at CT Green Bank



- Pier-to-pier marketing program for rooftop solar
- Administered at a town or neighborhood level
- Residents with existing solar systems (“solar ambassadors”) host open houses and BBQs
- Neighbors learn about how the system works and see actual neighbor utility bills
- “Groupon” style tiered pricing model: the more neighbors sign up, the lower the pricing tier and cost per customer
- Installers save money: on marketing costs and installation costs due to bulk neighborhood audits and installs
- Installers pass these savings on to customers through lower tier “Groupon” pricing

Single website and brand across all state clean energy programs is essential to simplify market for customers

- Statewide, single brand and website for all programs – no matter the administrator – can maximize govt efficiency
- Doesn't require single administrator – website can sit above complex system of multiple programs
- But from customer standpoint, all looks the same
- Website can direct customers to different programs based on type, needs, geography and interests
- Includes everything from utility rebates to local tax breaks
- User friendly interface allows any kind of customer to learn about full package of support available to them
- Single statewide brand reduces customer confusion

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



Search for Services, Rebates and Financing to Save on Your Energy Bills.

Step 1: Select home type

Step 2: Select area(s) of interest

<input checked="" type="checkbox"/> Appliances & Electronics	<input checked="" type="checkbox"/> Energy Assessment (Audit)	<input checked="" type="checkbox"/> Financing	<input checked="" type="checkbox"/> Gas Water Heating
<input checked="" type="checkbox"/> Heating & Cooling	<input checked="" type="checkbox"/> Help for Income Eligible	<input checked="" type="checkbox"/> Hot Water	<input checked="" type="checkbox"/> Insulation
<input checked="" type="checkbox"/> Lighting	<input checked="" type="checkbox"/> Municipal Utility Customer Programs	<input checked="" type="checkbox"/> New Construction or Major Renovation	<input checked="" type="checkbox"/> Rebates
<input checked="" type="checkbox"/> Renewable Energy			

SEARCH FOR A LENDER

<input type="button" value="Step 1: Tell us where you need a Lender"/>	<input type="button" value="Step 2: What are you looking to have done?"/>	<input type="button" value="Step 3: How much are you looking to borrow?"/>	<input type="button" value="Step 4: Search for a Loan program (optional)"/>
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By coordinating programs across entities, public dollars can be used at maximum efficiency

- Utilities, contractors, GOE, Green Bank all coordinate to make programs designed to work together
- Financing should be easily paired with utility rebates, so that a customer can seamlessly get both benefits
 - Any homeowner getting a loan for an efficiency upgrade is automatically offered all applicable rebates
 - Rules aligned so that contractors can easily operate in both utility programs and Green Bank financing programs
 - If utility programs are designed to emphasize certain kinds of technology adoption, Green Bank products should match
- Do not want programs working across purposes so customers are forced to choose

Key Takeaways

- Today, Nevada lacks a centralized, trustworthy source of information on clean energy
- Green Bank can play role as market “referee” providing unbiased data & information
- New consumer protection measures can be implemented to ensure no Nevadan signs a contract that increases energy costs or puts them in precarious financial situation
- Green Bank can enable demand, not just offer financing, but designing programs to reach customers in a turn-key fashion – minimize barriers to adoption
- By coordinating financing, rebates and other activities across different entities, Green Bank can reduce market confusion and create simple pipeline for customer engagement
- By designing financing products to work in concert with rebates – through well-trained contractors – government can ensure public dollars reach customers efficiently



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Thank You & Appendix

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