

Clean Energy Finance Workshop

Proceeding 20-08-022

Workshop will start at 9 AM



California Public
Utilities Commission

Workshop Logistics

- Panels are 75 minutes – 1 hour presentation, 15-minute panel Q&A
- Public Comment at the end of each day – 15-minute moderator lightning round followed by 45-minute Public Comment
- Workshop will be recorded and be included in the record for R. 20-08-022 – link will be available at <http://www.adminmonitor.com/ca/cpuc/>
- There is a delay between the telephone audio and the Webinar broadcast
- For any technical issues with the Webinar, please call the Technical Support Line at 415-703-5263

Panel 1 – 9:15 – 10:30

- Moderator: Holmes Hummel, Clean Energy Works
- Wesley Holmes, Southeast Energy Efficiency Alliance
- Jeff Schub, Coalition for Green Capital
- Miriam Joffe-Block, CAEATFA Senior Manager, California Hub for Energy Efficiency Financing (CHEEF)

Clean Energy Financing Workshop

CPUC Rule-making 20-08-022

PANEL ONE

What have we learned from 10+ years of finance activities?

Markets served and unserved,
scale of private and public funds,
lessons learned, and recommendations

Holmes Hummel, PhD

Executive Director

Clean Energy Works

January 28, 2021

2010-2013: CPUC orders funding for on-bill financing pilot programs

- CPUC commissioned a preliminary assessment on energy efficiency financing, and resulting report presented specific terms for a consumer loan as the “characterization of ideal finance product.”
- CPUC later authorized ratepayer funding for residential and non-residential pilot programs based on loans.
- Utilities were able to proceed with making loans to non-residential customers, but not residential customers, where underserved market segments (e.g. rental properties, low-income) are very large.
- Of the \$70M total, ~\$25M for residential was referred to the **California Alternative Energy and Advanced Transportation Finance Authority (CAEATFA)** in the State Treasurer’s Office.
- In 2014, CAEATFA then established the **California Hub for Energy Efficiency Finance (CHEEF)**, which later launched the **Residential Energy Efficiency Loan (REEL)** program and two more programs for IOU customers.
- *What financing activity developments in the interceding decade help provide context for today’s workshop?*

2014: U.S. Dept of Energy releases report on “Financing Energy Improvements on Utility Bills”

The study reviewed 30 utility programs, finding that all but 1 provide consumer loan products.

Federal and state regulations that protect consumers from lenders also obligate the programs to *systematically disqualify* people with criteria that commonly include income, credit, and renter status.

The DOE study found one exception among the 30 cases:

A utility in Kansas offered more inclusive tariffed terms for site-specific investments with site-specific cost recovery through a charge on the bill that was less than the estimated savings.



2015: Utilities in North Carolina and Arkansas follow Kansas, Kentucky, New Hampshire, and Hawaii to offer tariffed on-bill investments

One utility with experience with both on-bill loans and tariffed on-bill investment reported initial results:

- A **majority** of customers who receive an offer for the utility to pay for cost effective upgrades under tariffed terms accept it, assuring cost recovery for the utility and a path to ownership for the customer.
- Virtually all multi-family **renters** in the Arkansas case receive an offer for upgrades on tariffed terms, and all accept.
- The average size of the upgrade project **doubles** as the utility expands the eligible scope of projects.

In the same year, American Council for an Energy Efficient Economy (ACEEE) held its Finance Forum in San Francisco, and ACEEE later published more data from utilities with experience in its proceedings for the 2018 Buildings Summer Study also held in California.

2016: Residential Energy Efficiency Loan (REEL) makes its first loan

We'll hear more about this program in two panels.

With more than 1 year for CPUC funding to reach CAEATFA and 1.8 years to reach the first loan, this milestone shaped the timeline ahead as well:

It started a 2 year clock before the evaluation scope and selection of contractor would be negotiated.

What is GoGreen Financing?


Whether you want to reduce energy usage, improve the comfort and health of your home or business, or just want to "go green," you can find the solution you need. GoGreen Financing serves three broad property types.

Choose your property type



Residential
Financing for homeowners and renters

RESIDENTIAL



Affordable multifamily
Financing for affordable multifamily building owners

AFFORDABLE MULTIFAMILY



Small business
Financing for small business property owners and tenants

SMALL BUSINESS

Administered by the state with the support of the utilities.

The California Public Utilities Commission authorized the California investor-owned utilities (PG&E®, SDG&E®, SCE® and SoCalGas®)* to collaborate with certain state agencies in the development of energy efficiency financing programs and to assist in building awareness about them. Consumers are encouraged to explore lending options for the financing of energy improvements that can make homes and businesses more efficient and comfortable.





Find financing
Ready to explore financing options for your energy improvement project? Search and compare options.

FIND FINANCING



Find a contractor
Want to find a contractor for your energy efficiency project? Search for participating contractors.

FIND A CONTRACTOR



Public assistance programs
Some California programs provide no-cost options for qualified candidates. Visit this info page to learn more.

LEARN MORE

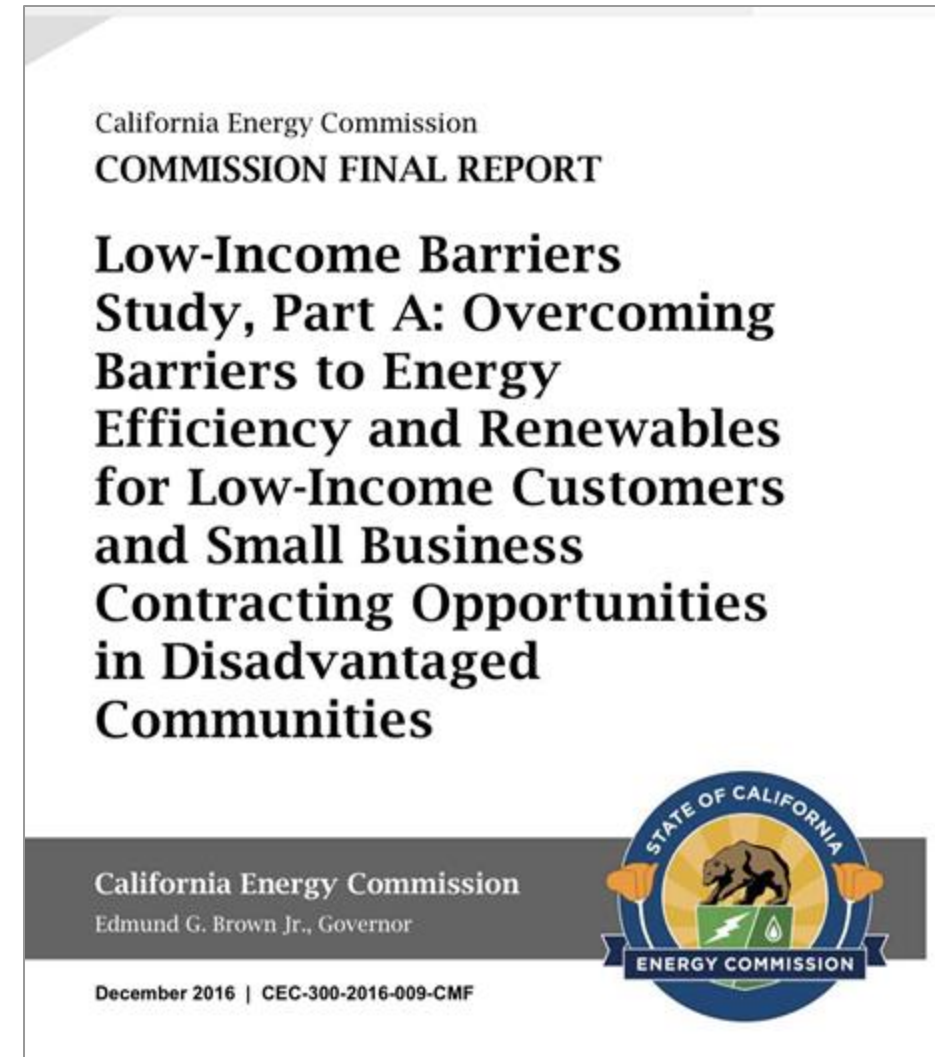
2016: SB350 mandates the CEC to produce a landmark report on Barriers to Low-Income Customers

Recommendation on financing:

“The CPUC should consider developing a **tariffed on-bill** pilot for investments in energy efficiency that targets low-income customers regardless of credit score or renter status, and that **do not pass on a debt obligation to the customer.**”

Utilities could use the program to make energy upgrade investments and recover the cost through the bill, so long as the **recovery charge is less than the estimated savings.**

The Energy Commission should encourage and provide technical assistance to POUs and other load-serving entities seeking to implement a tariffed on-bill pilot.”



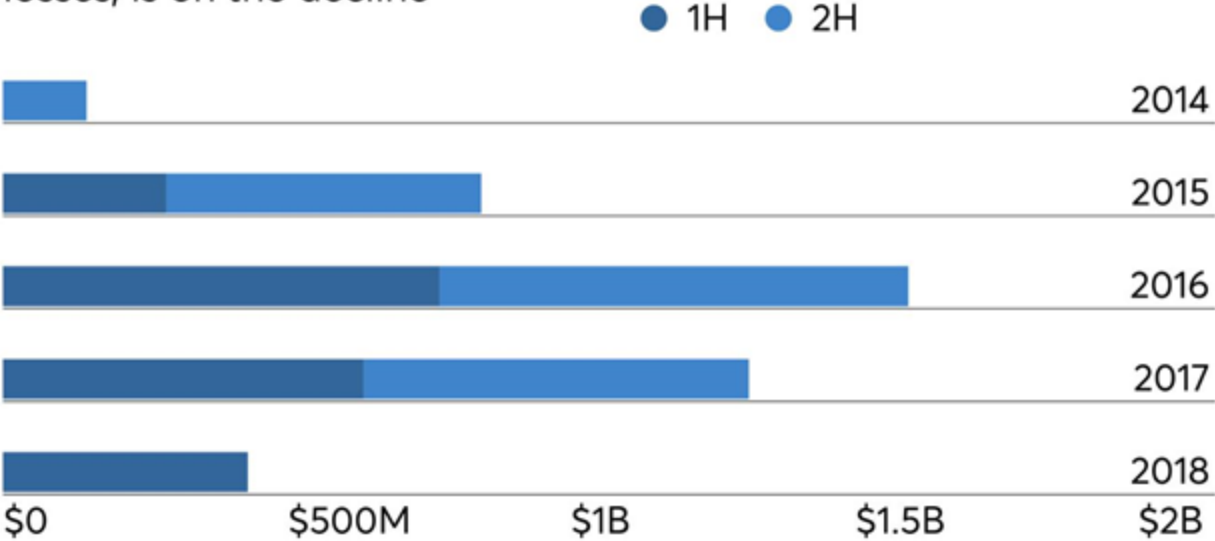
2018: Property Assessed Clean Energy (PACE) Loans Decline

Lien-backed loans had attracted billions in investment.

By 2020, some of the largest PACE vendors filed for bankruptcy, citing new consumer protection rules to lower loan volumes.

Slower PACE

Origination in California, as measured by enrollment in a program designed to compensate mortgage lenders for losses, is on the decline

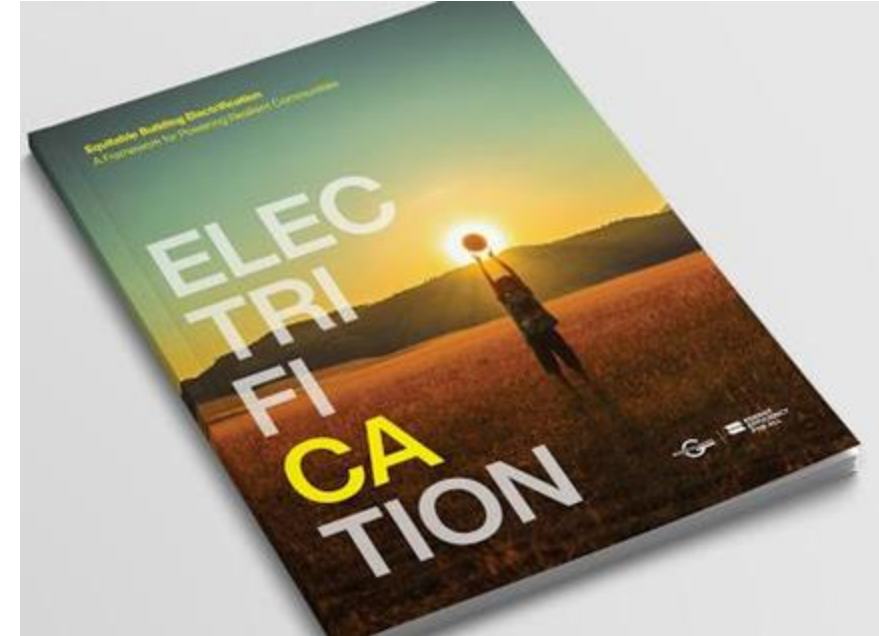


Source: California State Treasurer

Published in American Banker, Feb 15, 2019.

2018: 100% clean electricity (SB100) + building decarbonization (SB1477)

Equitable Building Electrification framework, released by Greenlining Institute and Energy Efficiency for All, calls for supporting ESJ households through alternative financing such as tariffed on-bill investments.



In following year in 2019, the Building Decarbonization Coalition convened a stakeholder process to chart a policy roadmap called *Towards an Accessible Financing Solution*, which recommends tariffed on-bill investment combined with complementary funding.

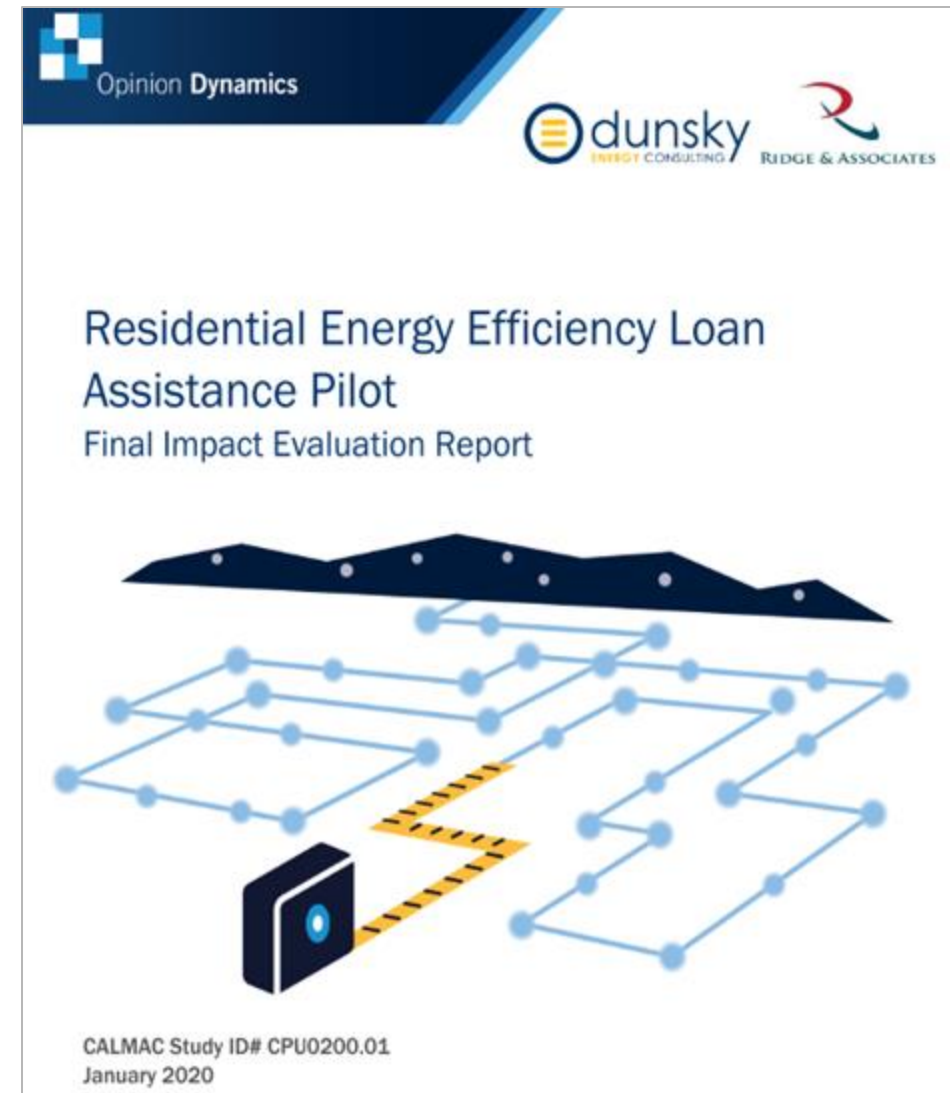
CPUC's implementation path in 2018 for the San Joaquin Valley proceeding (R15-03-010) and in 2019 for SB1477 led to funding for pilot programs, including some with a financing component taking shape in the field now.

April 2020: CPUC receives final evaluation of the Residential Energy Efficiency Loan program

Among 212 homeowners served in the first two years, 1/3 were “underserved” as defined by CalEnviro Scores, and 8% were credit challenged (score below 640).

Loan volumes increased after the evaluation period, and the High Growth scenario evaluated in the report would reach ~0.01% of IOU customers per year.

CPUC resolved to make the program permanent, deferring some decisions about how to fund continuation.



August 2020: CPUC orders a new rule-making on clean energy finance (R20-08-022)

“As we look to expand clean energy financing strategies, the Commission will look to ensure that new options will be **accessible to populations that face issues of creditworthiness and barriers to accessing affordable capital.**”

“These strategies will be informed by existing efforts to ensure equitable access to clean energy. An example is the **Low-Income Barriers Study** initiated pursuant to Senate Bill 350 (De León, 2015).”

Today’s Workshop is the next step on the path to implement the CPUC’s order to institute a new rule-making on clean energy financing.



Environmental and Social Justice Action Plan

2019: Final Version 1.0

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SEEPA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

Pursuing Scale in Clean Energy Investment in the Residential Sector

Wesley Holmes
Director of Strategy and Development
January 28, 2021



The Southeast Energy Efficiency Alliance (SEEA) promotes energy efficiency as a catalyst for economic growth, workforce development and energy security across 11 southeastern states including Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Virginia.

Areas of Work



Energy Efficiency
Policy



Built
Environment



Energy Efficient
Transportation



Regional
Investments

SEEA works to expand the availability and accessibility of capital to make energy efficiency investments.

Southeast EE Fund Investments (2014-2018)

- Abundant Power – Commercial Loans (NC)
- Renew Financial (WHEEL) – Residential Loans (FL)
- Sunstate Federal Credit Union – Residential Loans (FL)
- Kentucky Housing Corporation - EE loan program
- MACED – Kentucky On-Bill Program
- Jax Metro Credit Union – Residential Loans (FL)

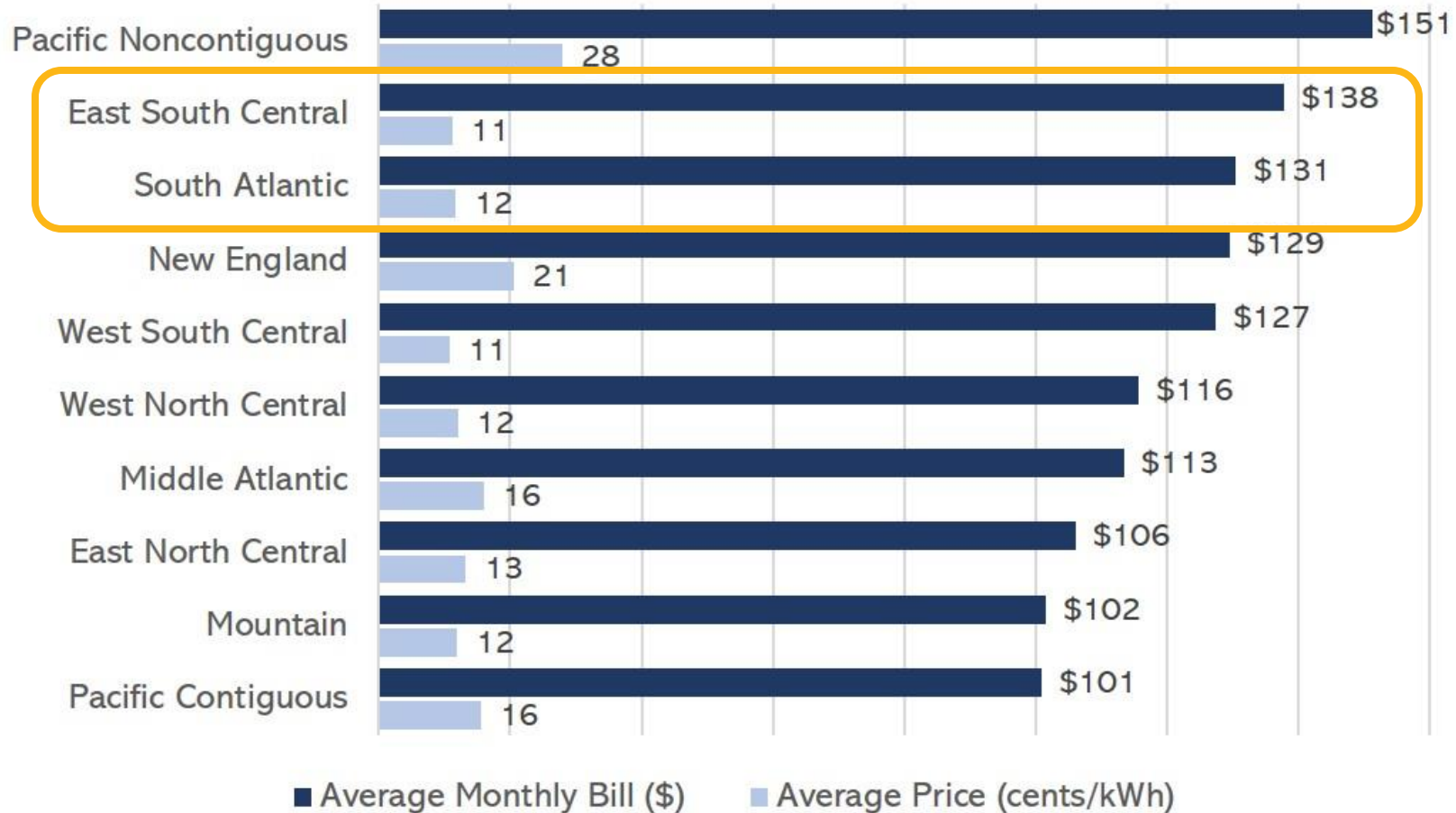
EE Finance Activities

- 2014 Arkansas Energy Office Statewide Financing Options Study
- 2014 North Carolina On-Bill Working Group
- 2017 SEEA Learning Circle for Inclusive Financing
- 2018 Co-hosted first national convening on rural EE with ACEEE
- 2019 Southeast Tariffed On-Bill Cohort
- 2020 Utility Guide to Tariffed On-Bill Programs

What have we learned from 10+ years of finance activities?

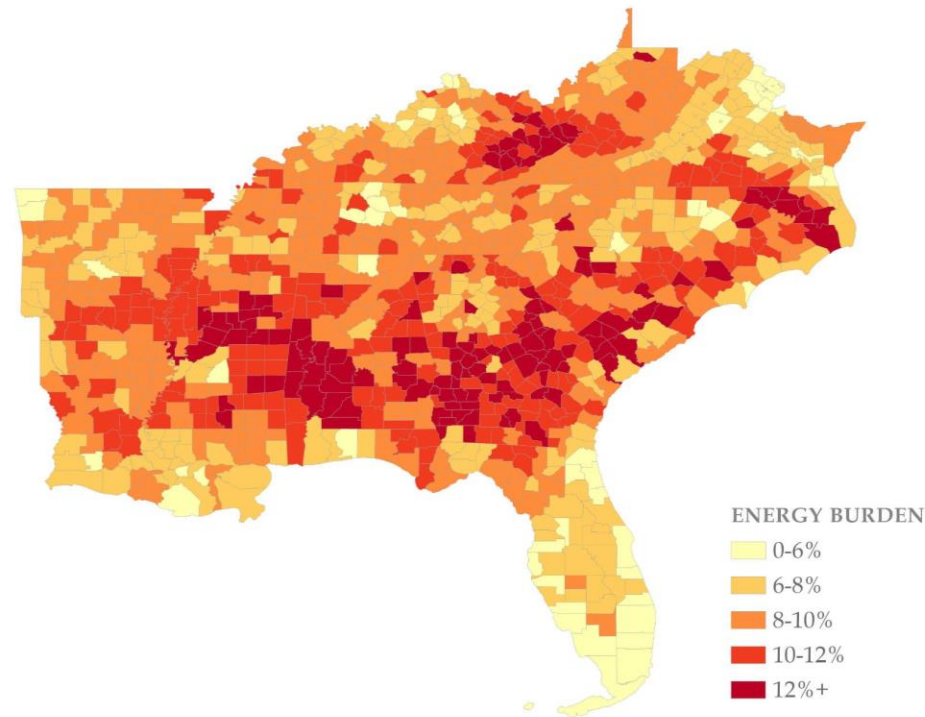
Solutions that work for anyone –
regardless of income, credit score, or
renter status – are better for everyone.

The Southeast has the lowest energy rates, but among the highest residential utility bills.



Data: Energy Information Agency (EIA) Residential Energy Consumption Survey (RECS), 2015. Chart: William D. Bryan.

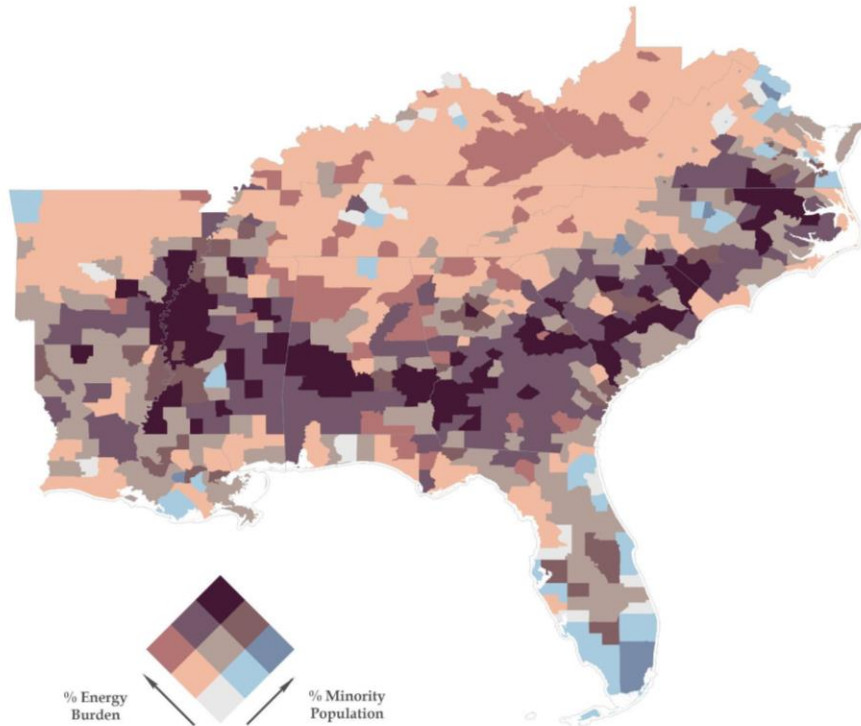
The Southeast has the highest rates of energy burden in the United States.



- 1 out of 3 people in the South struggle to pay their bills month to month.
- 15.4 million households (35%) report experiencing any energy insecurity, the most of any region in the United States.
- 7.5 million households (17%) are estimated to have received disconnection or stop service notices.
- 5 million households (11%) have had to leave their home at an unhealthy temperature because of the cost of energy.
- 3.9 million households in the South (9%) lack access to working cooling equipment in their homes, putting them at an elevated risk for heat-related illness.

Data: (2020) Low Income Energy Affordability (LEAD) Tool, U.S. Department of Energy. Maps: William D. Bryan.

Like so many consequences of poverty, this burden is not shared equally.



- Black Americans pay more for their energy than any other group in the United States, even when other factors are taken into consideration.
- The legacy of residential segregation continues to exclude communities of color from healthy and affordable housing.
- Low-income households and people of color pay a higher financial and medical price to power their homes than everyone else.

Data: (2020) Low Income Energy Affordability (LEAD) Tool, U.S. Department of Energy. Maps: William D. Bryan.

Understanding “On-Bill” Terminology

On-Bill Financing (utility loan) & On-Bill Repayment (3rd Party Loan)

Tied to the property owner

Available only to property owners

Traditional loan underwriting

No utility service disconnection

Generally not transferable

Tariffed On-Bill Investment

Tied to the meter

Available to any utility customer

Utility does not extend consumer credit

Disconnection for non-payment

Automatically applicable to successor customer

An investment in residential energy upgrades is an investment in the energy system.

Tariffed on-bill programs treat improvements to the energy performance of homes and buildings as an investment in system reliability and as a development of lower cost distributed energy resources, such as energy efficiency. The utility employs its established authority to make investments and seek cost recovery through tariffs using existing mechanisms for issuing bills and collecting revenue.



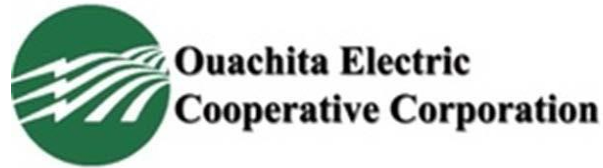
HECO and electric cooperatives first received utility commission approval, and in 2020, commissions approved programs in Missouri and Georgia.

	Midwest Energy (KS)	MACED (KY)	Ouachita Electric Cooperative (AR)	Roanoke Electric Cooperative (NC)	Appalachian Electric Cooperative (TN)
Start Date	2008	2011	2016	2017	2019
Upgrade Package	Wx, HVAC	Wx, HVAC	Wx, HVAC	DI, Wx, HVAC, DR	Wx, HVAC
Customers Reached	4.8%	0.2%	6.2%	8.5%	0.2%
Offer Acceptance Rate	70%	78%	90%	90%	90%, no-pay 77% (Overall)
Average Upgrade Package Size (\$)	\$5,965	\$7,500	\$6,300	\$7,650	\$8,550
Average Annual Savings* (Est. / Evaluated)	20% \$668	18% \$519	26% \$644	23% \$709	24% \$629
Average Monthly Energy Savings (\$)	\$55.67	\$43.25	\$55.33	\$50.08	\$52.42
Average Monthly Tariff (\$)	\$44.53	\$34.60	\$44.26	\$47.26	\$41.93
Charge-offs	<0.1%	<0.4	Zero	Zero	Zero



Source: Energy Efficiency Institute, 2019:
<http://www.eeivt.com/wp-content/uploads/2019/05/2019-PAYS-Status-Updates.pdf>

Tariff on-bill investments have outperformed loans in multiple metrics.



- Located in Southwest Arkansas Delta Region
- 8500 meters, mostly Residential
- Housing stock between 50 and 100 years old
- Average household median income of ~\$29K (AR average is ~\$42k.)
- Provided Home Energy Loan Program (HELP) from April 1, 2015 – December 31, 2015
- Converted to tariff model HELP PAYS in April 2016

Participation Tripled

- HELP (Loan) Apr – Dec 2015
 - 70 Single Family Homes
- HELP PAYS (Tariff) Apr – Dec 2016
 - 118 Single Family Homes
 - 82 Multifamily Units
 - 2 Commercial

Average Investment Doubled

- HELP = \$2,280
- HELP PAYS = \$5,600

Total Investment Tripled

- HELP = \$500,000
- HELP PAYS = Over \$1.6 Million

Tariffed on-bill terms reach the “hardest to reach” communities.



- Located in Northeast North Carolina
- 14,500 meters, mostly Residential
- Average household median income of ~\$39K (NC average is ~\$47k.)
- 48% spend over \$200/month (30% is National Co-op average)
- Provided loan program in 2014
- Converted to tariff model (Upgrade to Save) in July 2015

Participation Increased

- Loan Program Enrollment
 - 1000 targeted/15% Showed interest
 - “Handful” qualified/ < .1% participated
- Upgrade to Save Enrollment
 - 250 Single Family Homes

Average Investment Change

- Loan Program = \$0
- Upgrade to Save= \$7,200

Service Area Total Investment Change

- Loan Model = \$0
- Upgrade to Save= Over \$1.5 Million

What have we learned from 10+ years of finance activities?

The pursuit of scale is the
pursuit of equitable access.

Thank You



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Areas of Work



Energy Efficiency
Policy



Built
Environment



Energy Efficient
Transportation



Regional
Investments



**Coalition for
Green Capital**

Accelerating Clean Energy Deployment with Catalytic Public-Private Investment: Lessons from Green Banks

Jeffrey Schub

jeff@coalitionforgreencapital.com

Coalition for Green Capital

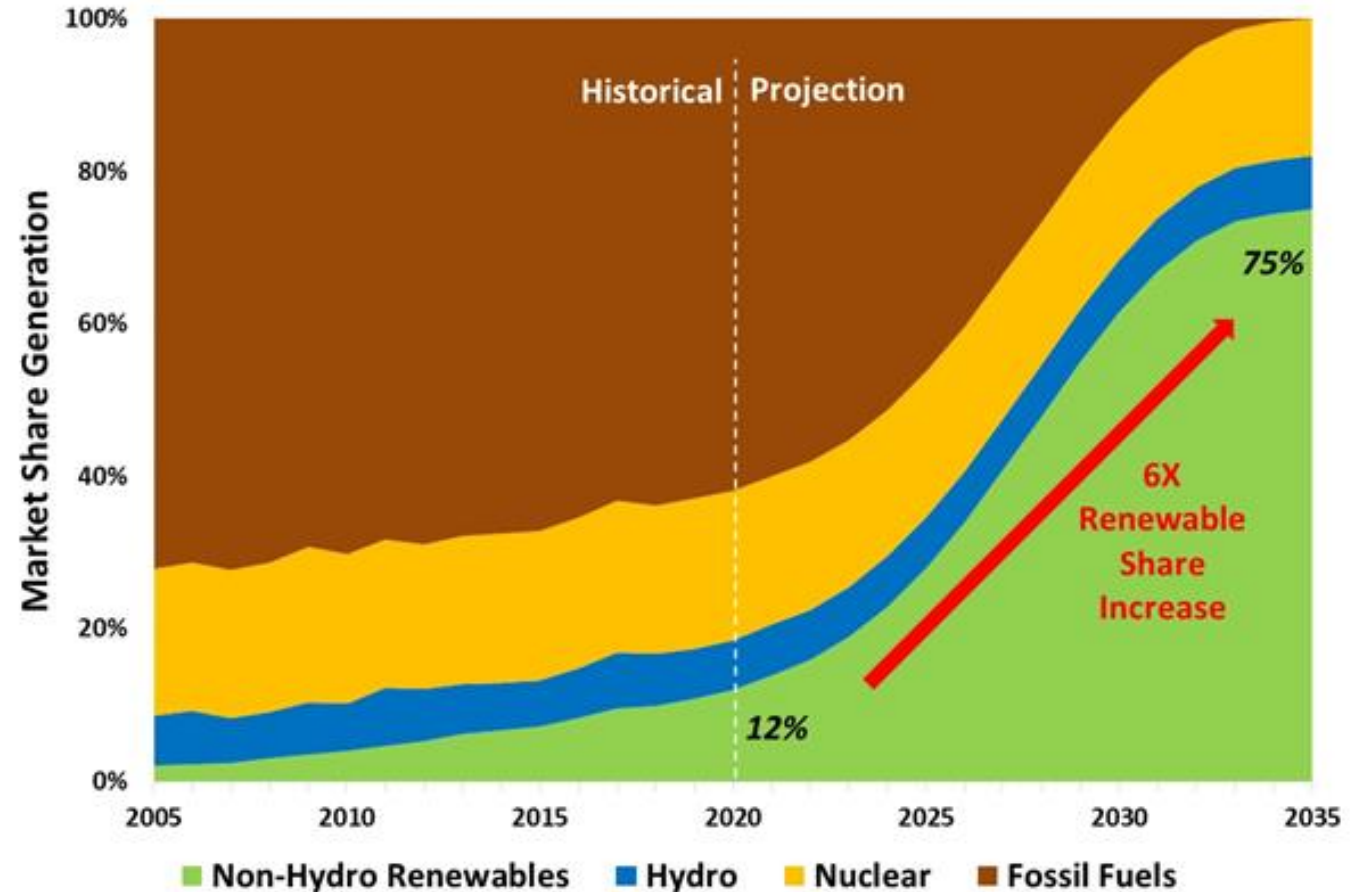
January 2021

How far do we have to go? We have a LOOONG way to go. Nationally need about \$200B investment of climate investment per year for 20 years

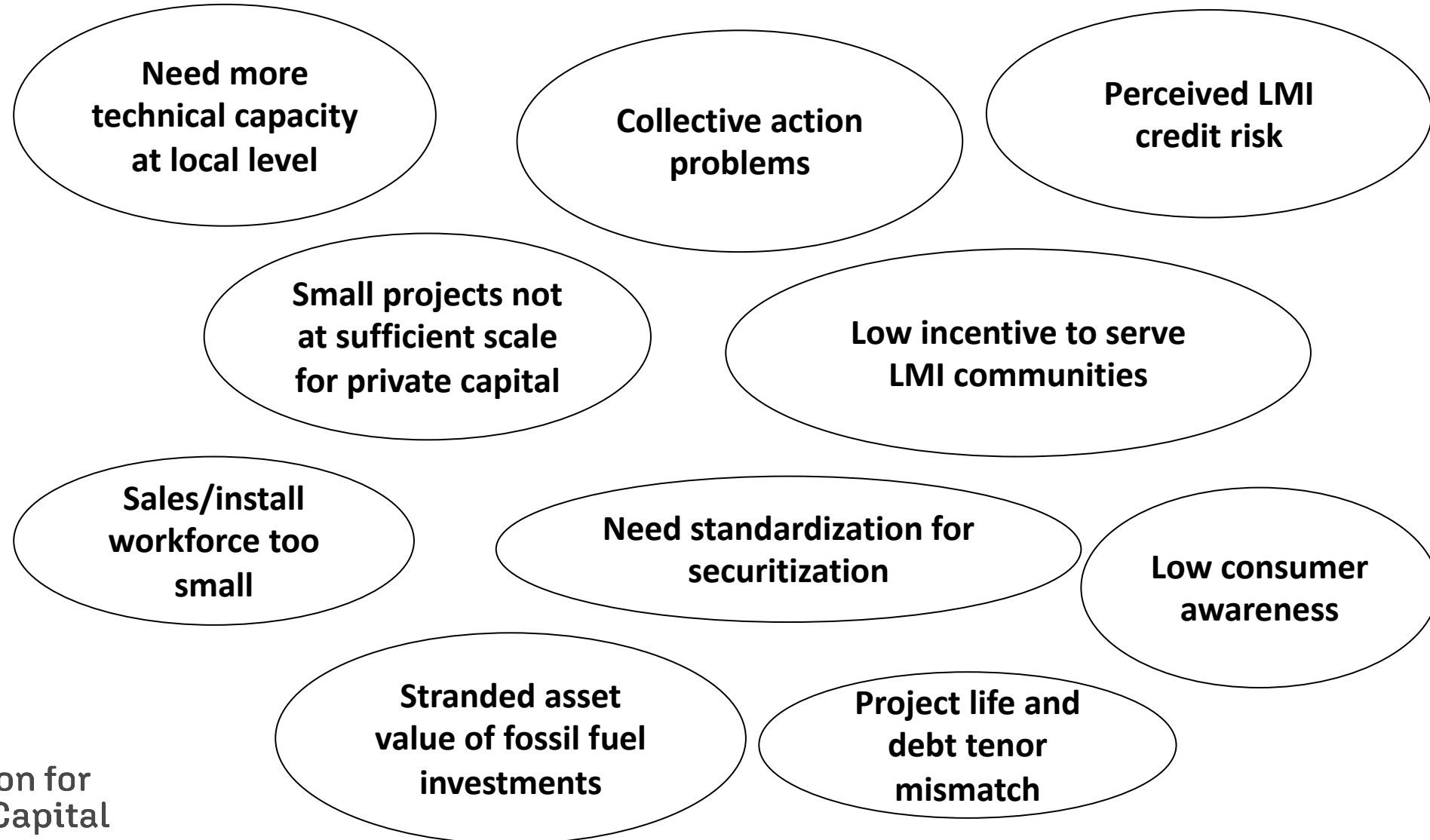
FOR EXAMPLE:

- **How much has US achieved in power sector?**
 - Non-hydro RE market share grown from 2% to 12% in last 15 years
- **How much more must we do?**
 - Non-hydro RE must grow from 12% to ~75% in next 15 years – 6x increase
- **What About CA transpo sector?**
 - ~250k EVs out of 15M registered vehicles
 - 2% down, 98% to go.

Electricity Fuel Mix to Meet Biden 2035 Goal

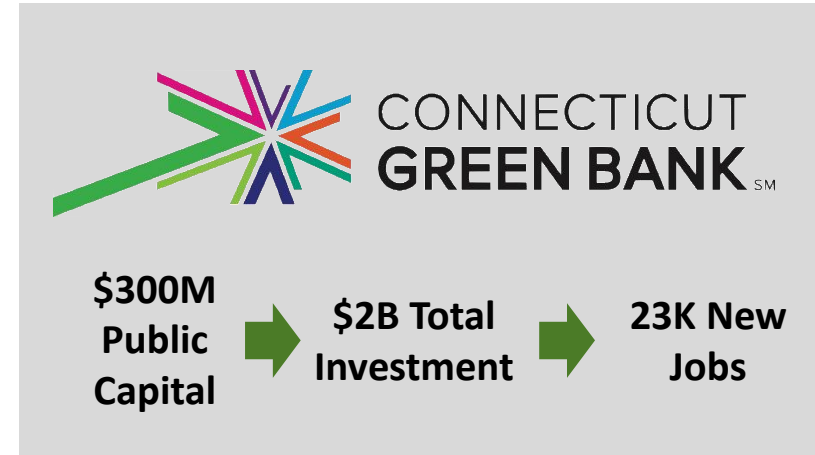
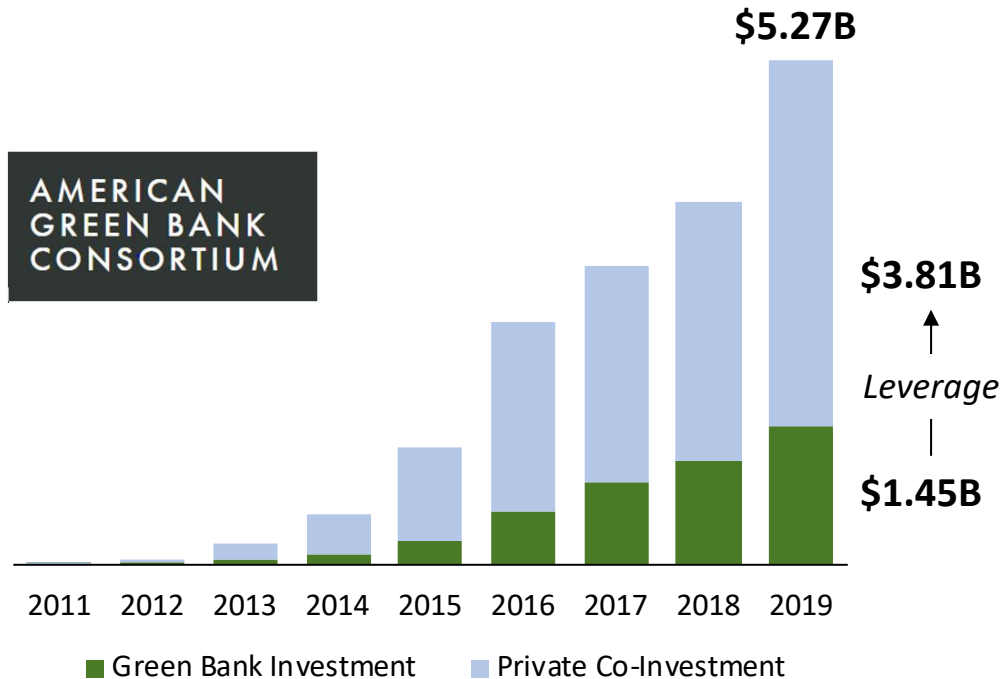


Myriad of business and capital problems create barriers to rapid market penetration of proven technologies



Green banks are proven institutional model for catalytic investment; \$5B+ investment to date; thousands of jobs created; \$20B investment pipeline

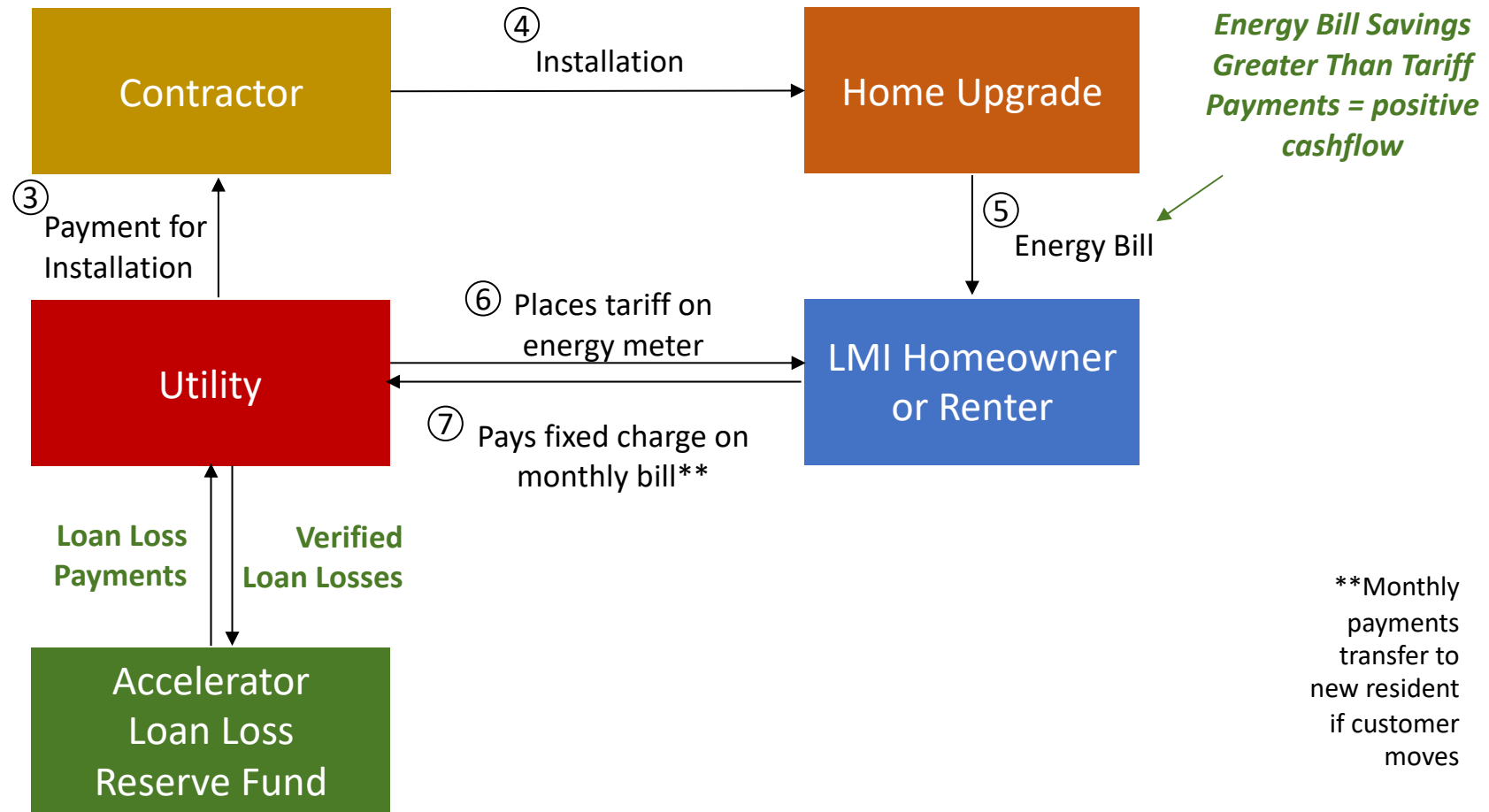
**Cumulative Investment Mobilized
by State & Local Green Banks**



16 State & Local Green Banks

\$20B+ Project Investment Opportunity – Only Piece Missing is the Public Capital

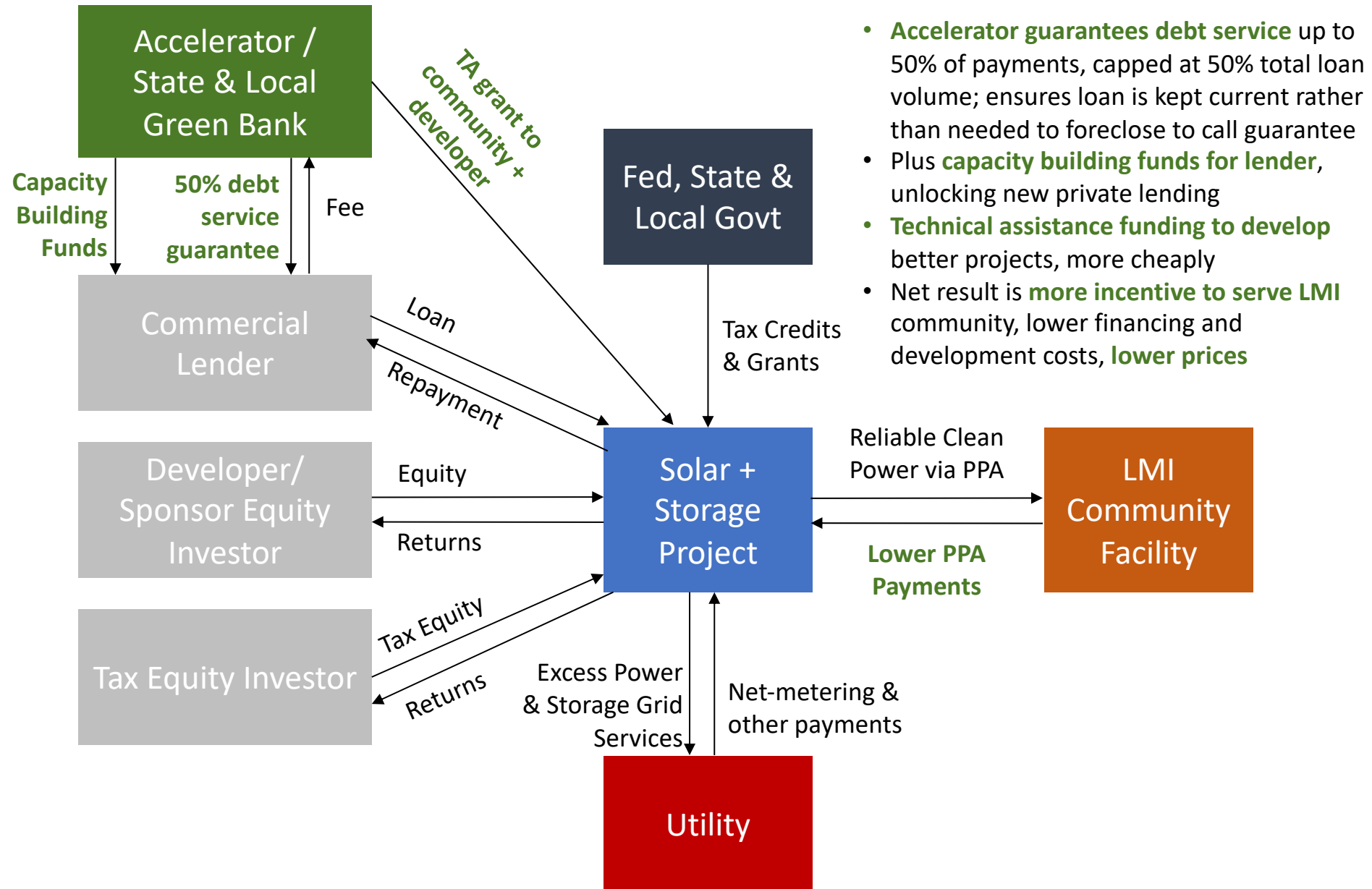
Example: Seed Loan Loss Reserve Fund to expand utility-based finance



Solution: Accelerator creates a no-cost loan loss reserve fund to mitigate risk of tariffed on-bill losses

- **Accelerator offers utilities participating in tariffed on-bill programs access to a no-cost loan loss reserve fund**
- **Loan loss reserve fund pays out up to 0.1% of losses in tariffed on bill program**
- **By providing the loan loss reserve fund, the NCB encourages more utilities to invest in tariffed on bill programs** instead of investing in distribution assets or increasing electricity sales
- **Increased utility participation in tariffed on bill programs increases consumer access to cost-effective home clean energy upgrades**

Example: TA funding + 50% loan guarantee for solar + storage at LMI community facilities



- **Accelerator guarantees debt service** up to 50% of payments, capped at 50% total loan volume; ensures loan is kept current rather than needed to foreclose to call guarantee
- Plus **capacity building funds for lender**, unlocking new private lending
- **Technical assistance funding to develop** better projects, more cheaply
- Net result is **more incentive to serve LMI** community, lower financing and development costs, **lower prices**

Lessons learned – public/ratepayer capital must be flexible AND it must be someone’s job to achieve penetration (esp. LMI) – this is not Field of Dreams

Broad Market & Technology Lessons

- Private capital wants to invest in this space, but somebody else has to do the hard work
- Capital alone achieves little – penetration requires MASSIVE growth of new businesses and jobs
- Barriers go beyond financing – have to think holistically, not just about a finance mechanism
- Different solutions for different markets – LMI resi electrification likely needs OBR; commercial heavy duty trucking EV fleet conversion may need ESA-based lease structure. No silver bullet.

LMI-Market-Specific Lessons

- Risk perception v. reality is genuine barrier, good place for public or utility funds. But cannot just leave it up to private capital to show up and take advantage of an LLR or reserve fund.
- Making something “available” to a customer does not count as success, only uptake

What we have learned from administering the CHEEF

Clean Energy Financing Workshop, January 2021

Miriam Joffe-Block, Senior Manager, CA Hub for Energy Efficiency Financing



California Hub for Energy Efficiency Financing (CHEEF, or the Hub)

CAEATFA, a rulemaking agency in the **State Treasurer's Office**, administers the CHEEF on behalf of the CPUC.

○ Key elements:

- Authorized to pilot energy efficiency financing programs in the **residential, small business, and affordable multifamily** sectors
- Goals include testing whether financing alone can yield **similar or greater savings** than traditional rebate or incentive programs
- Programs utilize a credit enhancement to **leverage private capital** for **customer energy efficiency investments**
- Unsecured or equipment secured loans, leases or energy service agreements
- **Open market transactions program:** range of lenders and contractors connect with customers on projects; the CHEEF is not involved in the financial transaction

A credit enhancement can successfully leverage private capital

For the Residential Energy Efficiency Loan (REEL) Program:

1,059

loans

\$2.6MM

leveraged **\$17.5MM** in private lending

\$1 in CE

leverages **\$6.60** in private lending

7

Enrolled Lenders

493

Enrolled contractors

Lenders receive a loan loss reserve contribution for each enrolled loan:


- 11% for a loan to a non-underserved borrower
- 20% for a loan to
 - LMI Borrowers (by household income or property census tract)
 - Borrowers with credit scores <640
- Loss reserve contribution is paid back to program when loan is paid off

The Small Business Financing Program has used **\$117k** in credit enhancement to leverage **\$1.5MM** in lending

A credit enhancement can produce measureable benefits for customers

What has worked


For lenders participating in the Residential Energy Efficiency Loan (REEL) Program, a credit enhancement has facilitated:


 **Borrowing limits**
raised
from \$20k to \$50k

Payback terms
extended
from 5 to 15 years


Interest rates
lowered
1000 basis points


Credit score minimum
lowered
from 640 to 580


 No fees, no property liens,
no prepayment penalties

 Borrower with a credit score of 580 can get a
5, 10 or 15 year loan at 3.99%, 4.99% or 5.99%



A wider pool of borrowers gets access to larger amounts of capital and longer terms at lower interest rates

Measureable benefits include interest savings

What has worked

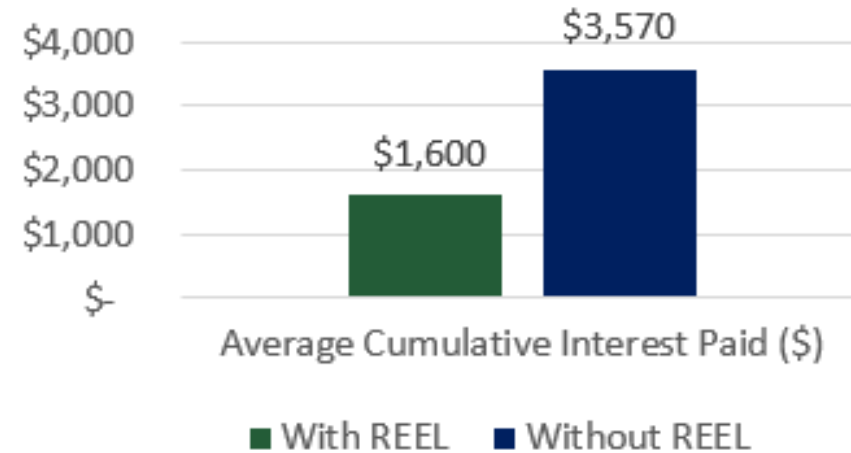
Average interest rate of a **REEL loan**, across all terms, November 2021:

5.02%

Average credit union interest rate for an unsecured personal loan, likely up to 60 months, November 2021*:

10.4%

Cumulative Average Interest Paid
for terms up to 60 months



* www.cuna.org, monthly credit union estimates, page 6.

Chart compares interest rates between REEL loans and the equivalent non-REEL signature loan products offered by the Program's participating lenders, using a data set for loans with terms up to 60 months for borrowers who would have qualified for non-REEL loans. Includes data from program inception through 12/31/20.

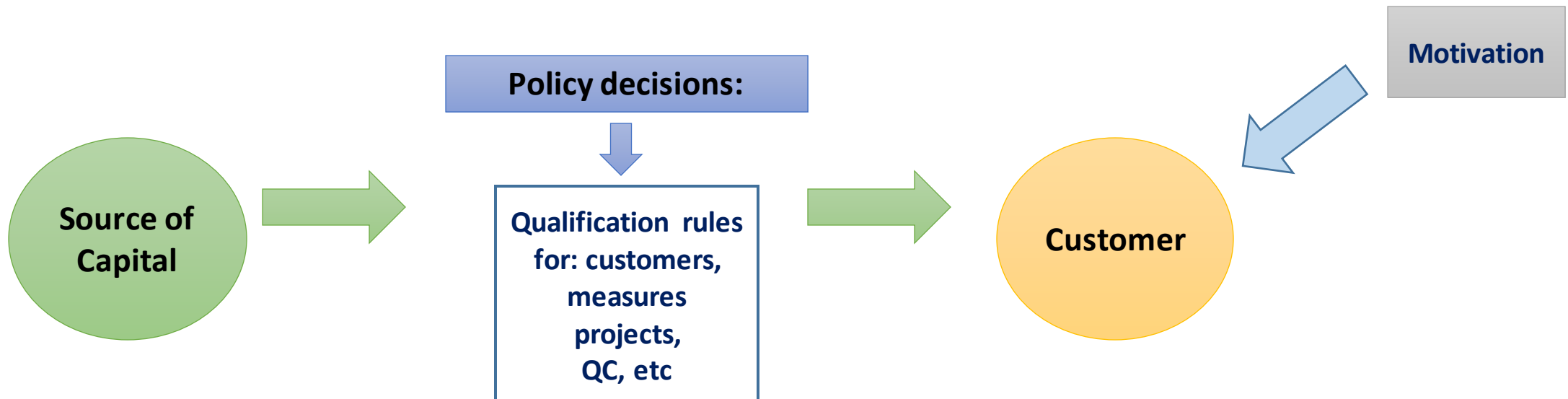
- ✓ Finance companies want access to the California market
- ✓ Customers will make energy efficiency investments without rebates or incentives
 - ✓ 86% of REEL projects are “finance only” with no rebate or incentive applied (92% in Dec. 2020)
- ✓ Contractors and utilities are effective referral sources to financing
- ✓ A loan program can reach some portion of the underserved market... But only those with the cash flow to repay loans



Private capital providers want to invest \$, not understand program requirements

What hasn't worked

- Lenders and investors need to be freed up from project scoping, eligibility screening, and data collection
 - Lenders' expertise is evaluating and pricing for credit risk, funding and servicing
 - This is a real challenge with our "front end" transaction model in which private lenders originate deals directly



Program complexity & uncertainty

What hasn't worked

- **Geographic complexity:** Lenders, customers and even most contractors do not view the world through the lens of IOU vs. POU jurisdictions
- **Project silos:** Customers and contractors don't look at EE and other energy measures (solar, storage, etc.) measures
- **Lenders like certainty,** not “pilot” programs

West Sac:
SMUD/PG&E
Service
No heat pumps



Sacramento:
PG&E Service
Heat pumps encouraged

Financing alone does not constitute a “Program”

Remaining barriers & instruments to resolve them

- ✓ **Link financing to “Programs,” delivery mechanisms, and good operations**
 - Financing removes the upfront investment barrier, but doesn’t create demand
 - Delivery mechanism and operations can be a challenge on par with customer credit
- ✓ **Dedicated intermediary needed between source of capital and the project**
 - “These loans scare the heck out of me” – quote from a REEL lender that wants to be in the EE space, but has to sort through too many eligibility requirements
 - Single originator model, dedicated program staff for eligibility screens or IT solutions
- ✓ **Make financing available truly statewide**
 - Figure out how to combine ratepayer and non-ratepayer sources of credit enhancement
 - Uniform eligibility and access across IOU and POU jurisdictions
 - Ease and simplicity for lenders and contractors will lead to more projects in IOU territory

Miriam Joffe-Block

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GoGreenFinancing.com



CALIFORNIA HUB FOR
ENERGY EFFICIENCY
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We'll return at 10:45



Workshop Logistics and Housekeeping

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Panel 2 – 10:45 – Noon

- Moderator: Dan Adler, Go-Biz/IBank
- Cisco DeVries, Ohm Connect
- Carmelita Miller – Greenlining Institute
- Kerry O’Neill, Inclusive Prosperity Capital

CPUC Clean Energy Finance Workshop

Cisco DeVries, OhmConnect
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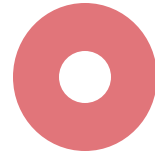
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People hate finance.

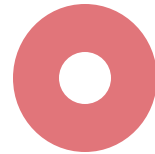
- Finance does not generate demand. It only enables demand.
- People generally feel that finance is a reason not to do something.

We Know How to Access Large Scale Capital



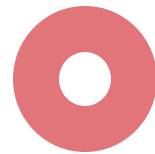
Unsecured Lending

Easy to access, fast, and well integrated into capital markets. Credit score dependent.



Property secured lending

Home equity and PACE are proven successful. PACE is now a well-known asset class in the ABS market. Success with low/mod income.



Utility secured lending

On-bill financing has mixed record, but can be great for low-income and renters. The Hawaii GEMs model has a useful approach to capital markets.

Five Ground Rules for Attracting Large-Scale Capital

Do not make the perfect the enemy of the good. Think big. And put the consumer and contractor first.



1. **Don't Reinvent.** Use an existing finance mechanism and adjust it as little as necessary to achieve the policy outcome.
2. **Make it Big.** Attracting large scale capital requires large scale volume. Be as inclusive as possible in eligibility and access.
3. **Make it Simple.** If it isn't easy to use, customers and contractors won't use it. Making it "cheaper" isn't as important as simplicity and ease of use.
4. **Make it Safe.** Home improvement is a messy industry. How can we make projects safer without requiring finance entities to be home contractor police?
5. **Hide the Spinach in the Smoothie.** People do not want to buy "efficiency." How do we use finance to bring efficiency and demand flexibility into something people already want?

Deeper Dive: A Couple Ideas on How to Improve “Safety”

Home improvement is one of the least trusted, most complained about service. How do we build trust?



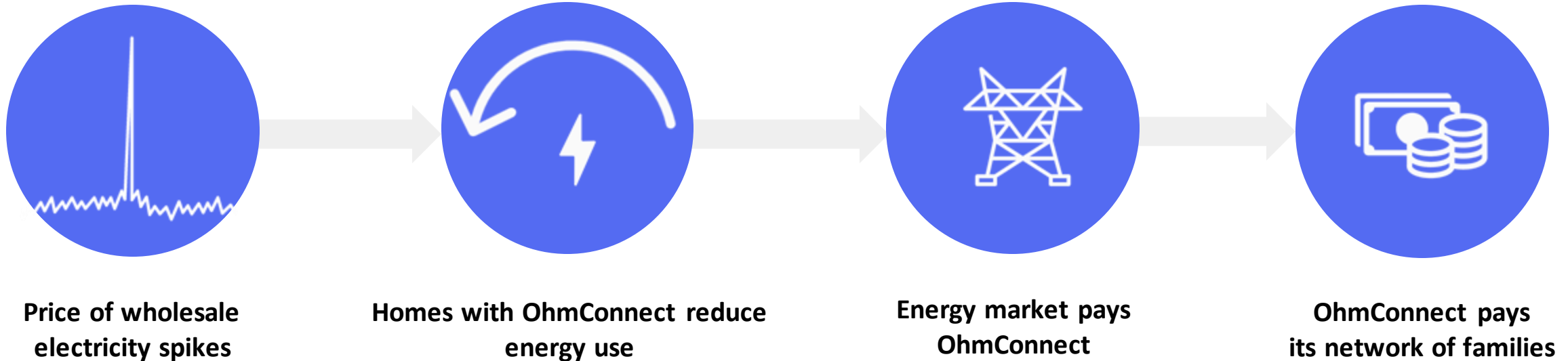
- U.S. DOE Home Energy Score can be done by the contractor in less than an hour.
- While inaccurate, it provides a basis for determining the benefit of an improvement.



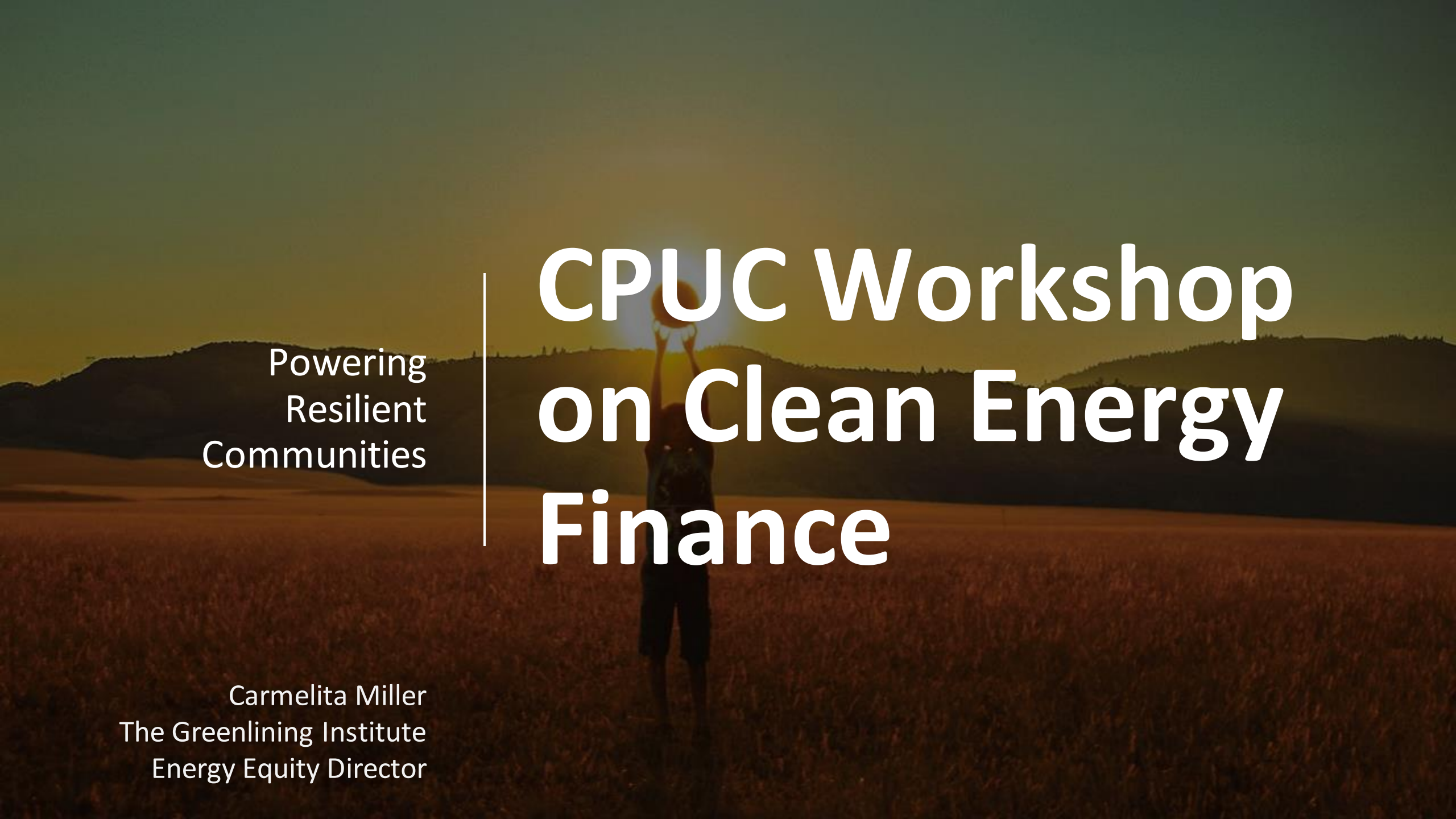
- Provide financial benefits based on actual energy benefit.
- Contractor and homeowner may financially share in performance risk

Creative Option: Reduce cost, improve finance terms with grid

150,000 California customers now provide over 100 MW to the grid. Over \$4M paid to CA families in 2020.



→ You can help “finance” energy improvements and appliances by imbedding the future value of grid services in the upfront cost of financing structure

A person stands in a field of tall grass, holding a globe high above their head. The background is a sunset over rolling hills, with the sun low on the horizon, creating a warm, golden glow. The person is silhouetted against the bright light of the sun.

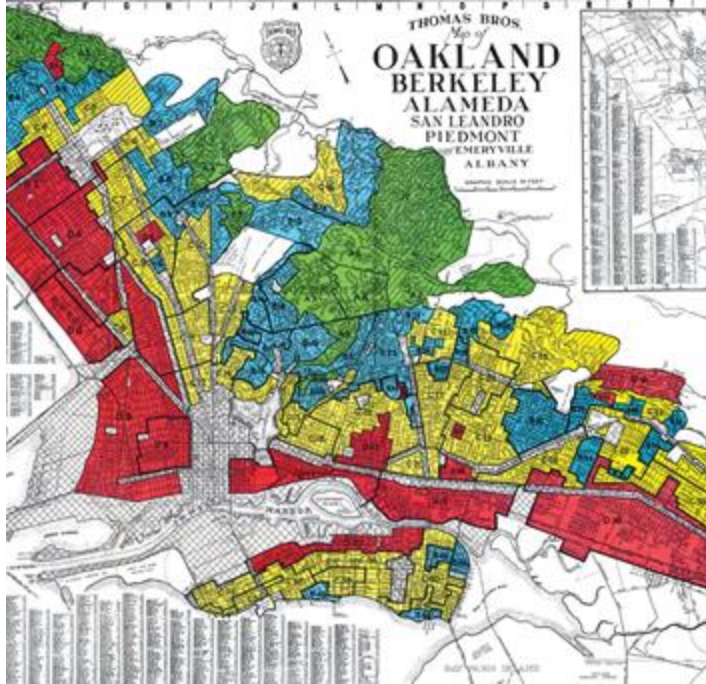
Powering
Resilient
Communities

CPUC Workshop on Clean Energy Finance

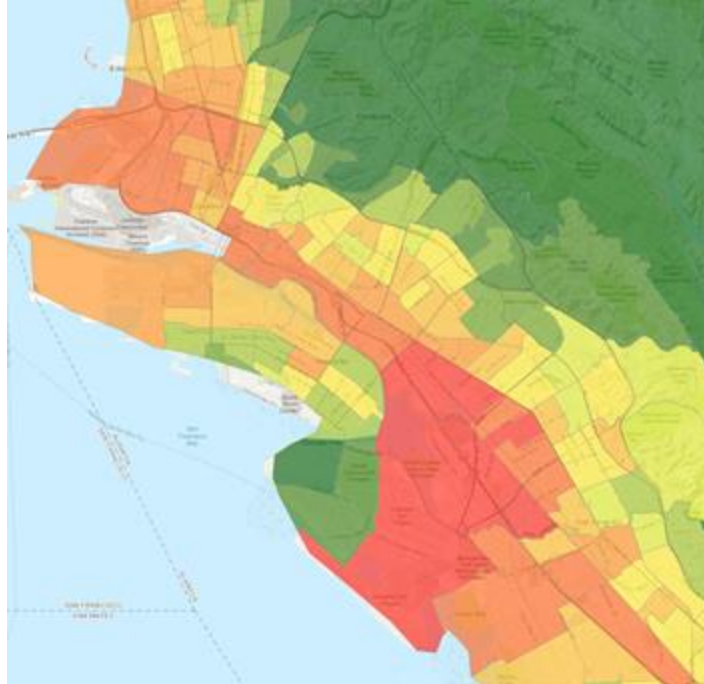
Carmelita Miller
The Greenlining Institute
Energy Equity Director

Energy Equity Principles

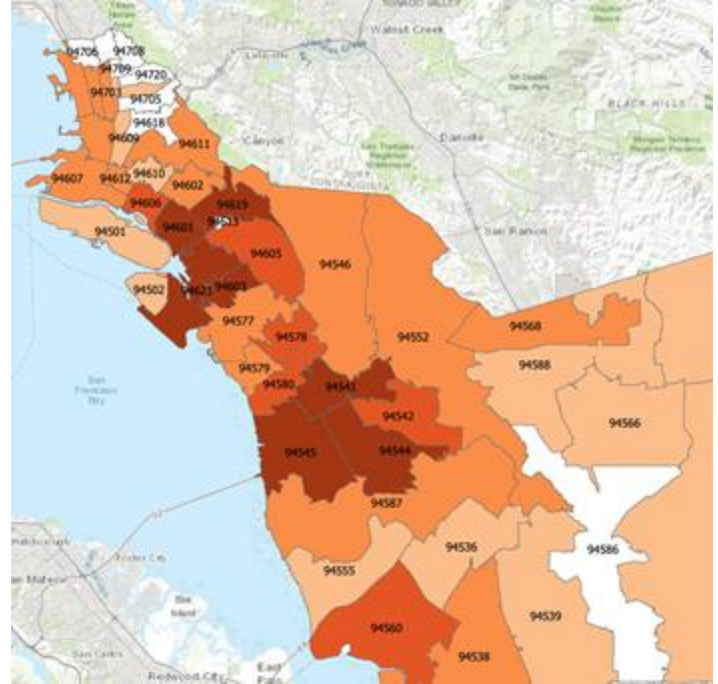
- **Affordable access to clean power**
- **Healthier, safer, and thriving in our homes and neighborhoods**
- **Actively engaged in the energy decisions that impact our lives**
- **Attain wealth-building opportunities in a green economy**



1937
Oakland Redlining Map



2018
Cal EnviroScreen



April 23, 2020
Oakland COVID-19 Map

**COMMUNITIES HAVE ENDURED DECADES
OF ECONOMIC EXCLUSION BASED ON RACE**

Percentage of California's Renter Households Experiencing Rent Burden by Income

Extremely Low-Income or Below Poverty Line		Very Low-Income		Low-Income	
1.41M	total renter households	0.82M	total renter households	1.13M	total renter households
90.2%	rent burdened	85.4%	rent burdened	64.6%	rent burdened
76.9%	severely rent burdened	47.4%	severely rent burdened	16.9%	severely rent burdened
Subtotal: All Lower-Income Renter Households (80% AMI and below)					
3.36M	total renter households	80.4%	rent burdened	49.5%	severely rent burdened
Moderate-Income		Above Moderate-Income		Total: All Renter Households	
0.59M	total renter households	2.03M	total renter households	5.97M	total renter households
41.5%	rent burdened	12%	rent burdened	53.4%	rent burdened
5.3%	severely rent burdened	0.9%	severely rent burdened	28.7%	severely rent burdened

Source: 2017 National Low-Income Housing Coalition tabulations of 2015 American Community Survey Public Use Microdata Sample (PUMS) housing file.
From: California Housing and Community Development "California's Housing Future: Challenges and Opportunities"



Equitable Electrification Framework

5-Step Process

Assess

- Assess communities' needs

Establish

- Establish community-led decision-making

Develop

- Develop equity-driven metrics

Leverage

- Leverage program benefits and funding

Track and improve

- Track and improve performance

CPUC must prioritize financial inclusion in order to achieve a just and equitable transition.

A person stands in a vast field of tall grass, holding a globe high above their head. The sun is setting directly behind the globe, creating a bright, glowing effect. The background shows rolling hills under a clear sky.

Thank You!

carmelitam@greenlining.org



INCLUSIVE
PROSPERITY CAPITAL



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GREEN BANKSM

**CLIMATE FINANCE FOR CLIMATE JUSTICE:
GREEN BANKS STRATEGIES AT WORK FOR UNDERSERVED
MARKETS & DISADVANTAGED COMMUNITIES**

CPUC CLEAN ENERGY FINANCING WORKSHOP FOR R.20-08-22: WHAT SUCCESS MIGHT LOOK LIKE
JANUARY 28, 2021

The “Why”



We believe everyone should have access to the **benefits** of clean energy:

- A cleaner, more resilient environment in the face of climate change
- Healthier communities & buildings that create positive social outcomes
- Sustainable economic development: reduced energy burdens, increased savings, job creation, and enhanced community productivity

We can change the conversation in underinvested neighborhoods and underserved markets, helping to deliver Inclusive Prosperity.



Gaps



Intersections



Ecosystem



or...



Green Bank Strategies “Work” for Underserved Markets!

It can be done, but it’s not one size fits all – need to **bring a range of financing tools:**

- Subordinated debt, co-investment, concessionary debt, bridge/incentive financing, warehousing/aggregation, loan loss reserves, interest rate buydowns, etc.

Have to be grounded in market data (housing/property info, income, energy burden, etc.)

- Need to tailor the solution to the market segment

Must leverage partnerships

- And financing alone doesn’t move the needle – need \$’s for technical assistance, programmatic support, marketing and outreach

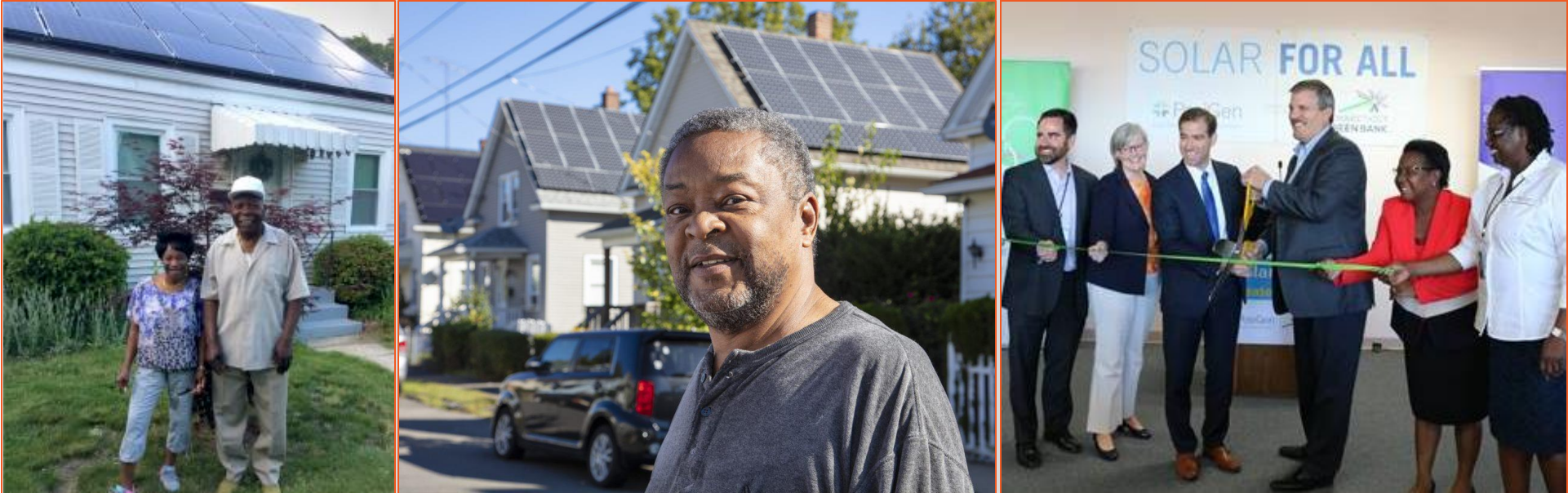
Some organization has to “own” the deployment targets and aim high!

- This doesn’t happen on its own – and have to have a long-term commitment – these are HARD markets

CT has mobilized \$480M in underserved markets... For CA, that = ~\$6.25B



Solar for All for Low-to-Moderate Income Homeowners



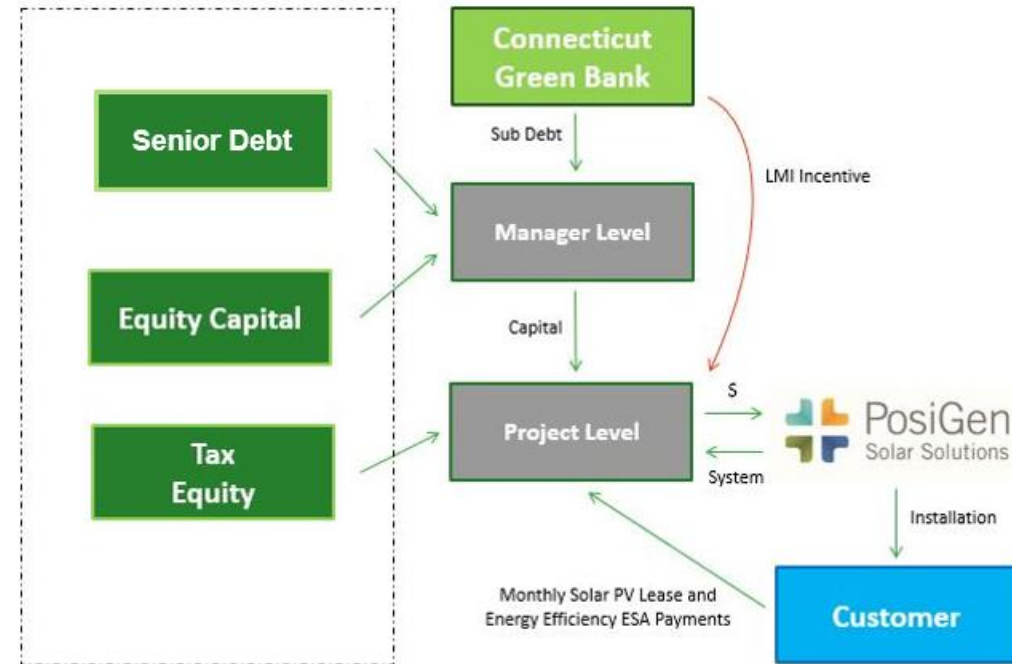
From Surviving to Thriving

Green Bank Role in Solar for All

- Administered RFP
- Provides subordinated debt
- Provides elevated incentive
- Sponsors Solar For All
- Outreach support

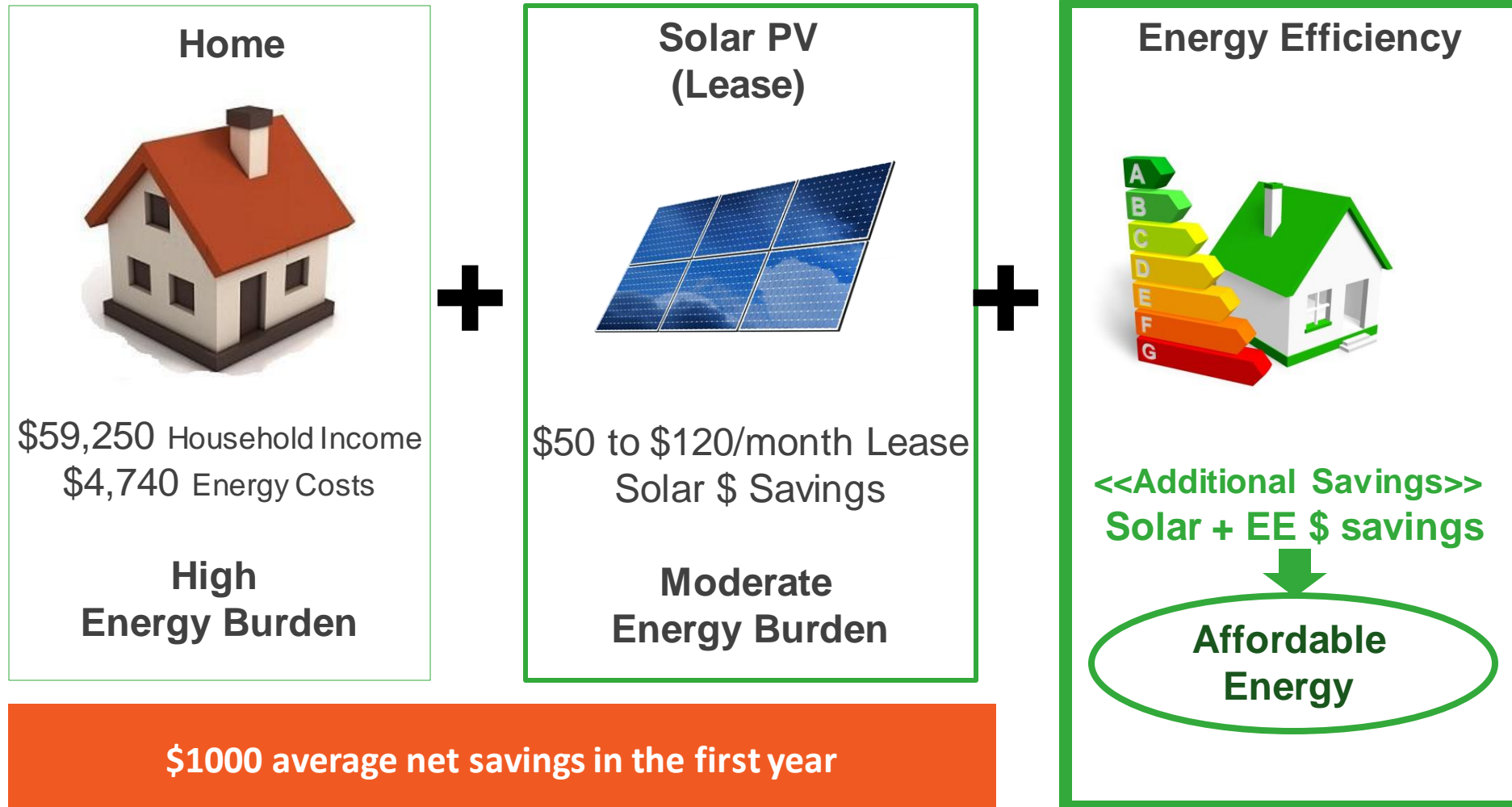
IPC Role

- Finance performance-based incentive
- Programmatic support to CGB for Solar for All



Solar For All with PosiGen

Lease & EE for Single Family LMI Market



Moving the Needle on Inclusive Prosperity Equity for Rooftop Solar in Connecticut

AMI Band	# of Solar PV Projects	# Owner Occupied Households (1-4 Units)	% of Owner Occupied Households (1-4 Units) with Solar
<60%	2,759	60,769	4.5%
60-80%	4,007	99,220	4.0%
80-100%	5,931	165,331	3.6%
100-120%	6,934	187,463	3.7%
>120%	11,347	345,311	3.3%
Total	30,978	858,094	3.6%

	# Owner Occupied Households (1-4 units)	% Owner Occupied Households (1-4 units)	% of RSIP Installations
Majority Hispanic	31,152	3.6%	4.1%
Majority Black	18,163	2.1%	3.8%
Majority White	731,901	85.3%	81.8%
No Majority Race	76,878	9.0%	10.3%
Total	858,094	100.0%	100.0%

Households that were previously underrepresented in solar adoption responded favorably to market focus.

CT residential rooftop solar is now “beyond parity” in LMI and communities of color

Multifamily Affordable Housing: Identified Gaps & Leveraged Partnerships

High level strategy:

- ❖ Worked within the housing ecosystem to identify strengths and gaps
- ❖ Developed a product roadmap based on gaps (\$\$, capacity)
- ❖ Partnered to deliver starting with State HFA pilots in 2014, key nonprofits
- ❖ Key partners have been CHFA, Dept. of Housing, CDFIs, CT Housing Coalition (nonprofit trade association)
- ❖ Focused on a social justice mission serving the LMI sector
- ❖ Note: still unserved sectors (e.g., small rentals/2-4's)

PRE-DEVELOPMENT

- **Navigator** – below market rate loans using foundation PRI and CDFI partner

TERM

- **Lightly secured loan** – in partnership w/ CDFI, providing LLR and low cost debt
- **CPACE** – providing debt, aggregation
- **Solar PPA** – providing debt, aggregation
- **Health & Safety Loan** – providing below market rate loan using state \$'s

M&V

- **Benchmarking** – co-sponsored w/ CHFA
- **Performance Reports** – built into loans

CAPACITY

- **Technical assistance** – with housing consultants, UHAB
- **Trainings** – free of charge
- **Peer-to-Peer Network** – with utilities, CHFA
- **Solarize Multifamily** – with CHFA



Case Study: Catalyst Term Loan Funding Energy Efficiency

East Meadow Condo Association, Manchester, CT

Description:	Lighting, boilers, roof replacement, insulation
Total Project Costs:	\$654,000
Utility Incentives:	<u>\$34,000</u>
Financed:	\$620,000
Estimated Annual Savings:	\$79,000
Annual Debt Service:	\$53,000, 1.48 DSCR
Estimated Free Cash Flow:	\$26,000
Financing Terms:	20 years, 6.00%
Payback Period:	7.8 years



www.ctgreenbank.com/our-stories/-multifamily

Energy improvements yield significant savings, unlocking cash flows that cover debt service – often for additional improvements such as needed structural, health or safety work.

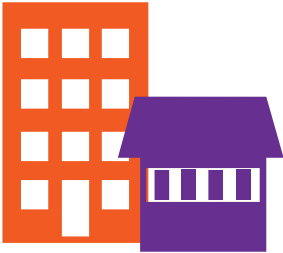
Accomplishments/ Impact

101 projects
closed/completed
(since FY14)

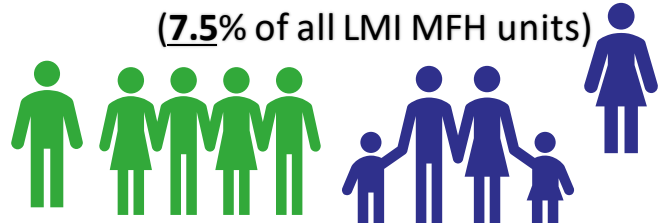
\$ 45,966,228
energy project costs

\$ 9,170,369
CGB investment

\$ 36,795,859
non-CGB energy investment



10,500 units
(7.5% of all LMI MFH units)



\$45,966,228
capital deployed for
energy improvements
(= ~\$600M for CA)

\$ 305,819,867
total investment (energy, pre-dev & other)

What Else?

Pay As You Save[®]

- Love this for low-income homeowners and renters of all incomes!
- LLR and subordinated debt or co-investment (for utilities that need a 3rd party capital source)

Loan Loss Reserves to mobilize local lenders to offer standard clean energy loan to homeowners

- Aim high! CT, MI and CO have originated >\$250M and 23,000 loan with 16 active lenders, 1000+ contractors. All 3 states offer programmatic support to lenders and contractors. Some have IRBs too.
- MI is >50% LMI census tracts, FICO down to 600 (CT down to 580)
- CA is a bigger market than CT, MI, CO combined – can REEL be vastly scaled?

What Else?

Partnerships with Housing Developers

- Portfolio owners – help them green or solarize their portfolio
 - ❖ Take a standard loan product and tailor to their specific needs (e.g., if debt terms look a certain way, they can apply across their portfolio)
- Virtual power plant models
 - ❖ Subordinated debt or co-investment, particularly to support LMI communities/developments

“Second Look” or credit-challenged products

- For big solar/efficiency financiers
- Their capital providers don’t like lower credits – enable credit-challenged or alternative underwriting approaches through LLRs, subordinated debt, tailored structures

What Else?

Proof of Concept with Specialized Models

- IPC did this with BlocPower
 - ❖ We were the first credit facility for their heat pump leasing model aimed at affordable MF, nonprofits and small/medium commercial in the urban core. Intention is to “graduate” to bigger private capital facility.

Finance the “friction points” in the market

- Bridge financing for incentives (utility, RECs) is a big one, especially for smaller/minority contractors with fewer options/access to working capital
- Big issue in getting contractors back to work coming out of pandemic

Strong state agency buy-in and stakeholder capacity in energy, housing and health sectors are the foundation of a statewide collaboration



Vision

“Any family across Connecticut - whether they come to a health facility for treatment of asthma, contact their utility for energy efficiency services, or seek housing repairs from a local social service nonprofit – would get the package of interventions needed to make their home green, safe and healthy.”

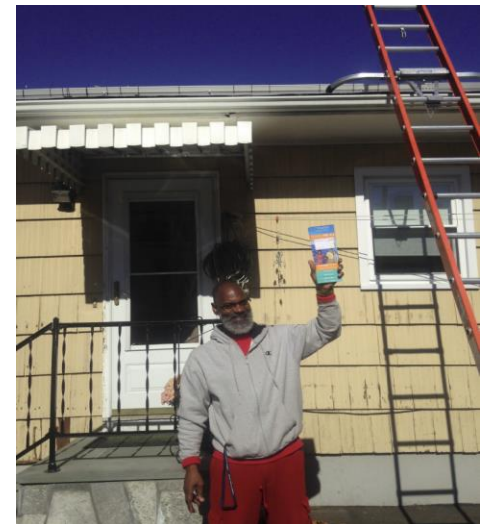


Green & Healthy Homes Initiative[®]



Ingredients for Success

- **Partnerships** are needed to leverage resources and provide comprehensive solutions
- Programs should **fill gaps** in the market and be developed with a data-driven approach
- **100% financing** that **reduces energy burdens** is ideal – but there are **some markets that just need access** to financing
- **Targeted outreach** and focused efforts amplify results
- **Barriers** to program participation should be **reduced** as much as possible – don't assume just because uptake is low that your product is the problem... it could be execution (see above on partnerships + targeted outreach, also look at contractors/are they serving target markets?)
- Universal program metrics engender **transparency and accountability** – measure progress, identify what works, what doesn't and where the gaps are
- **Consumer protections** and education are a must, especially with LMI, and even more ***especially with LMI seniors*** (public \$'s at play give you control here)
- No one size fits all, need a **range of financing tools across all market segments**
- Need to have a **long horizon**, analyze your market, **sequence strategies**, and **invest for long term**
- **Aim high** and make sure some organization **owns deployment targets**



You must be
INTENTIONAL

about **EQUITY**

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We'll be Back at 1 PM



Workshop Logistics and Housekeeping

- Panels are 75 minutes – 1 hour presentation, 15-minute panel Q&A
- Public Comment at the end of each day – 15-minute moderator lightning round followed by 45-minute Public Comment
- Workshop will be recorded and be included in the record for R. 20-08-022 – link will be available at <http://www.adminmonitor.com/ca/cpuc/>
- There is a delay between the telephone audio and the Webinar broadcast
- For any technical issues with the Webinar, please call the Technical Support Line at 415-703-5263

Panel 3 – 1:00 to 2:15

- Moderator: Jeff Deason, LBNL
- Amber Mahone, E3
- Mike Henchen, Rocky Mountain Institute
- Matthew Brown, National Energy Improvement Fund

Getting to scale: Magnitudes of investment needed

Clean Energy Financing Workshop

California Public Utilities Commission R.20-08-022

January 28, 2021



Session outline

- What scale of investment is necessary to meet California's clean energy goals?
- What are the priority technologies that will require investment?
- How might we expect these priority technologies and needs to evolve over time?
- How do those investment needs look from the customer's perspective?
- What have we learned from past efforts about how the impact of financing investment dollars in clean energy can be maximized, so that these investments deliver the scale we need?
- To what extent will these lessons obtain to future technologies (e.g., storage, electrification), and to what extent might things need to be different?



Panelists

- Amber Mahone, Partner, Energy and Environmental Economics, Inc.
- Mike Henchen, Principal, Rocky Mountain Institute
- Matthew Brown, Co-Chair and Founder, National Energy Improvement Fund





Energy+Environmental Economics

Financing California's Residential Building Decarbonization Goals

CPUC Clean Energy Financing Workshop, R.20-08-022

01/28/2021

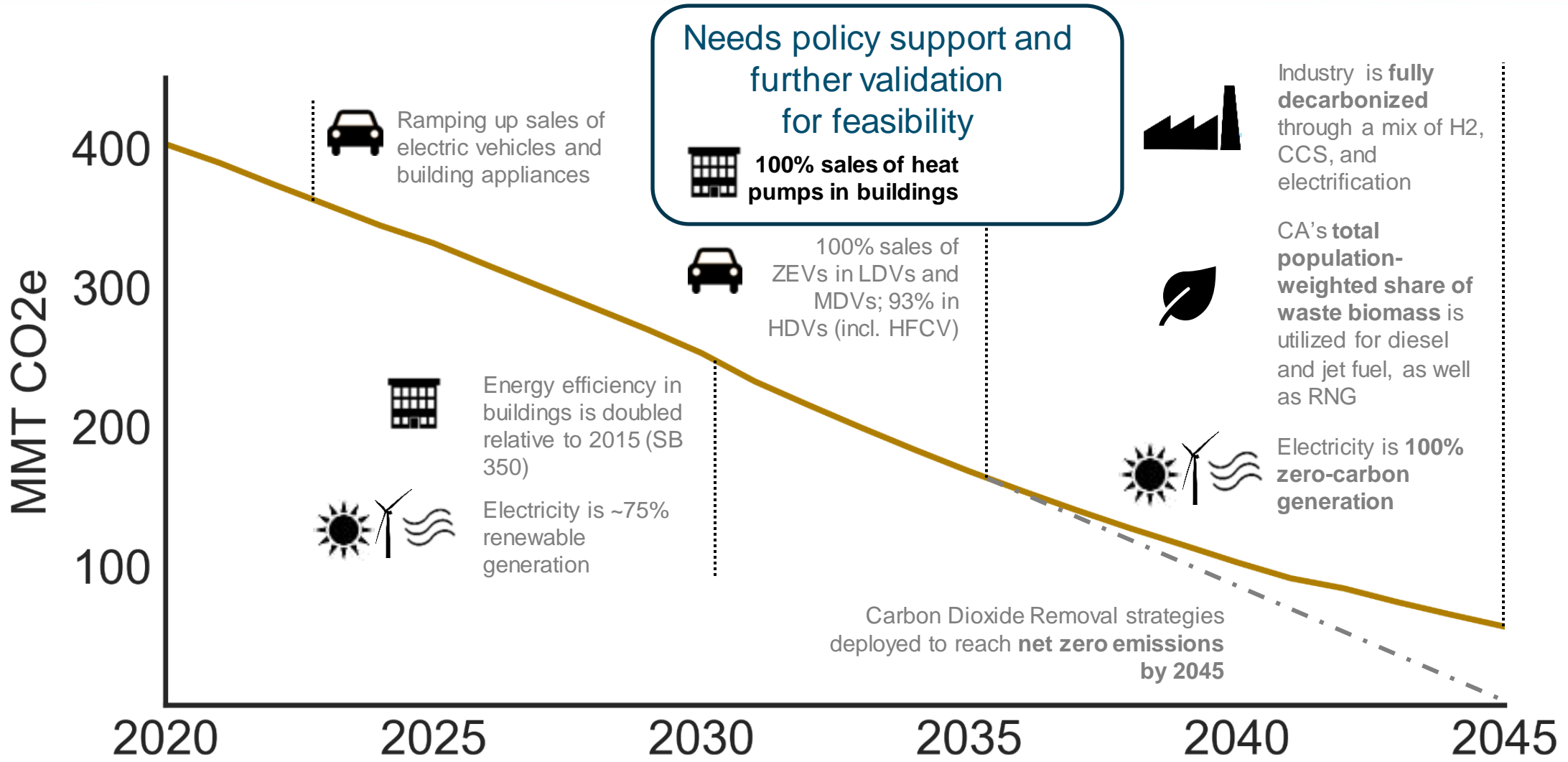
Amber Mahone



- + Achieving carbon neutrality in California**
- + Climate change & impacts on buildings**
- + Lifecycle costs/savings from residential electrification today**
- + Decomposing electrification retrofit costs**
- + Rough cut: Statewide residential capital costs for building electrification**
- + Concluding thoughts**



What might it take to achieve carbon neutrality in California by 2045?



Source: Achieving Carbon Neutrality in California, 2020
https://ww2.arb.ca.gov/sites/default/files/2020-10/e3_cn_final_report_oct2020_0.pdf



Four Key Strategies to Decarbonize Buildings



Energy efficiency & conservation

- ✓ Whole-home high efficiency retrofits & new construction codes
- ✓ Electric heat pumps displacing resistance heat
- ✓ Smart-growth: higher density housing in transit-oriented communities



Electrification

- ✓ Heat pump HVAC
- ✓ Heat pump water heater
- ✓ Induction stoves
- ✓ Electric clothes dryers
- ✓ Electric fireplaces, grills, space heaters, etc.



Low-Carbon Fuels

- ✓ Zero-carbon electricity
- ✓ Zero-carbon biomethane
- ✓ Potentially, small share of renewably produced hydrogen blended into gas pipeline



Reduce non-combustion emissions

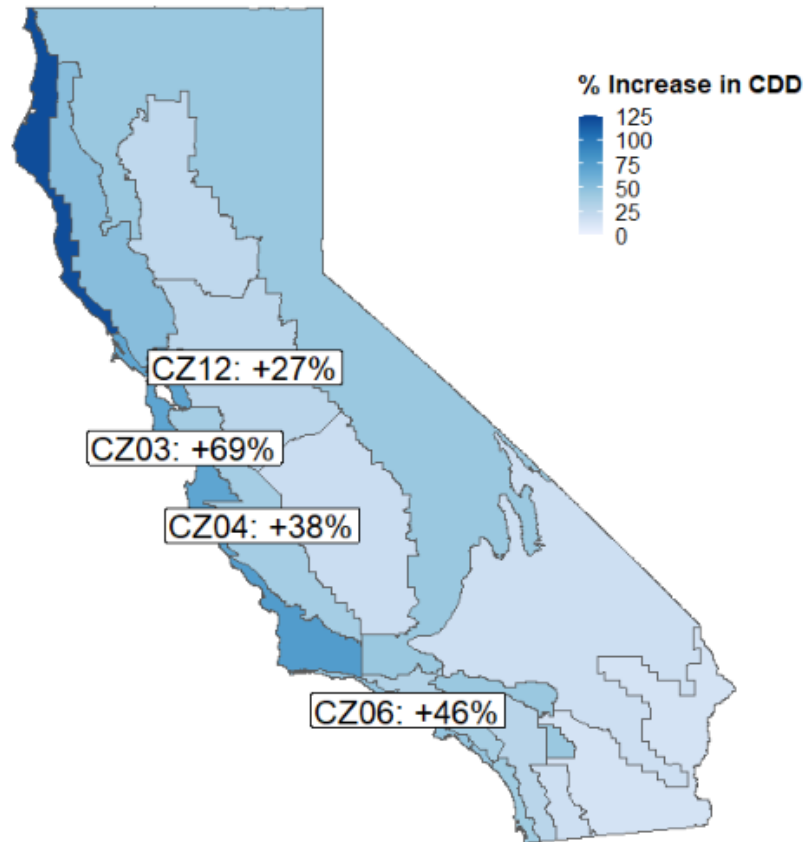
- ✓ Prevent methane leaks in homes and gas pipeline
- ✓ Replacement of high global warming potential gases (“F-gases”) in air conditioners and heat pumps

Customer-facing decision-making requires customer financing (+ other policies & strategies) to enable



Climate change is affecting our buildings & health

Projected Increase in Cooling Degree Days (CDD) by 2050



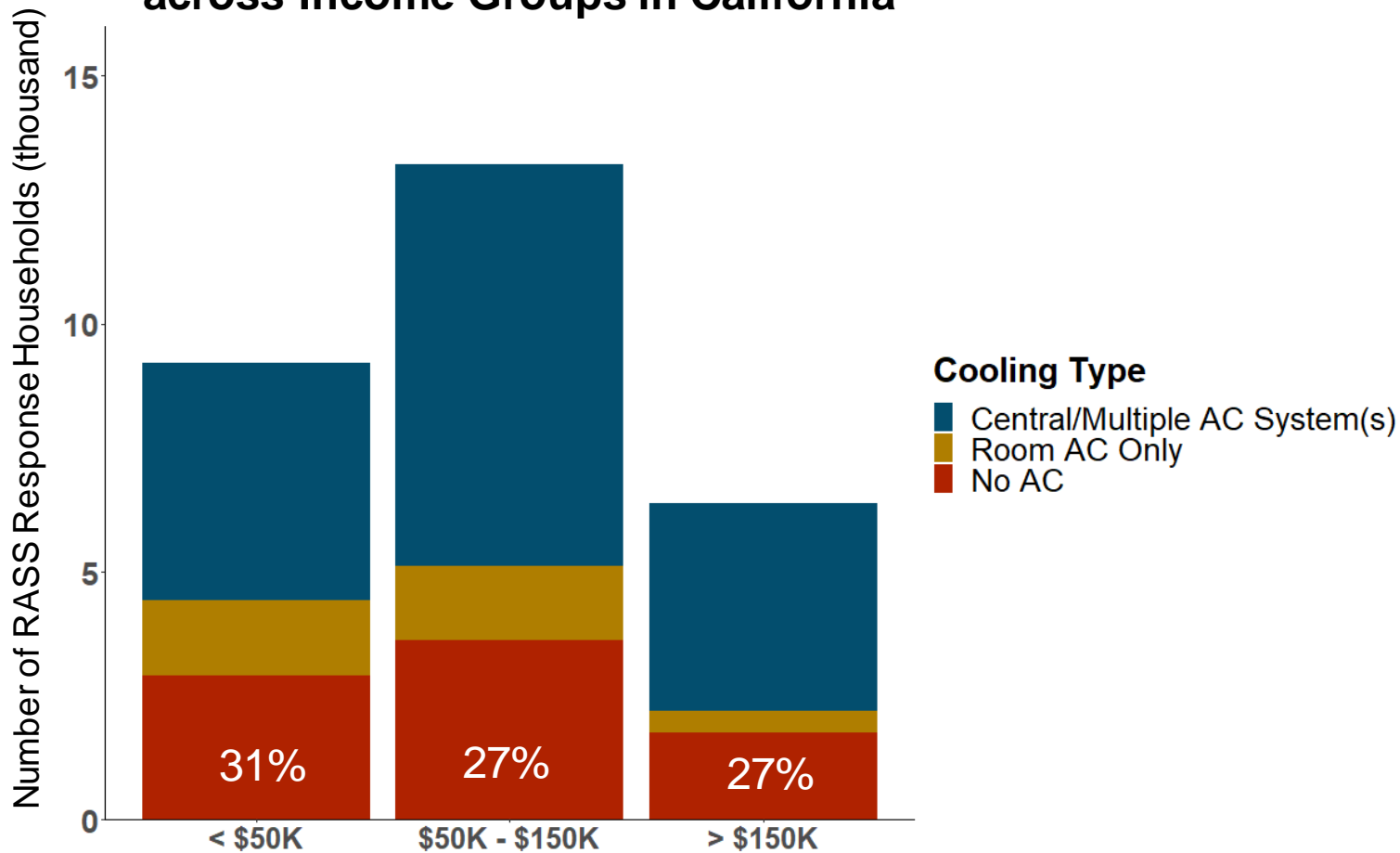
- + A warming climate will increase the need for air conditioning (AC) in buildings, particularly in regions of the state that historically have not needed AC
 - Heating needs in buildings will also decrease
- + Heat pumps provide both heating and cooling, and are most cost-effective in homes that have or need AC
- + COVID and wildfire smoke are also causing building owners to re-think ventilation and air filtration standards, which may create additional needs & opportunities for building retrofits

Source: Cal-Adapt data portal, average annual increase in cooling degree days in RCP 8.5, averaging across all 32 climate models in Cal-Adapt.



Can we find opportunities to address equity and comfort in buildings, while reducing carbon emissions?

Air Conditioning (AC) Adoption across Income Groups in California



Source: California Residential Appliance Saturation Survey, 2019

- + ~30% of households in the state currently do not have A/C
- + Low-income households are slightly more likely to lack air conditioning, and are less likely to be able to afford building upgrades
- + With warming climate, more of these households will likely want & need EE & AC
 - Other important cooling & comfort solutions include better insulation & building envelope, shading, ventilation & other passive cooling methods



Lifecycle savings currently most attractive for Res. electric new construction and heat pump HVAC

Lifecycle costs ← Lifecycle savings over lifetime of equipment →

Single Family

Entire home

- All-electric (new construction w/ AC in baseline)
- All-electric (new construction, no AC in baseline, CZ3)

HVAC

- Mini-split(retrofit)
- Ducted heat pump (retrofit)
- Ducted heat pump (new construction w/ AC in baseline)
- Ducted heat pump (new construction, no AC in baseline, CZ3)

Water heater

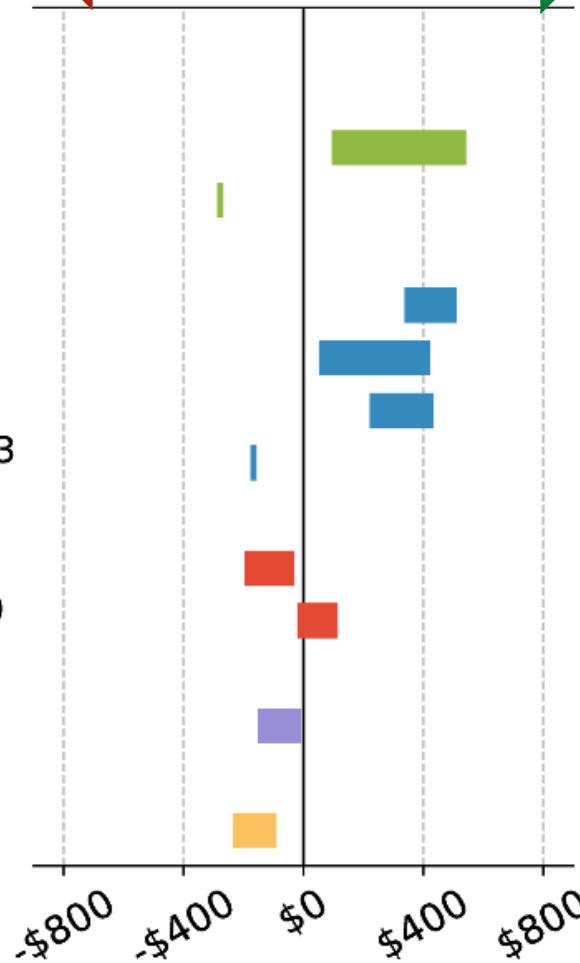
- Heat pump water heater vs. gas storage (retrofit)
- Heat pump water heater vs. tankless gas (new construction)

Range/Oven

- Electric induction

Clothes dryer

- Heat pump dryer



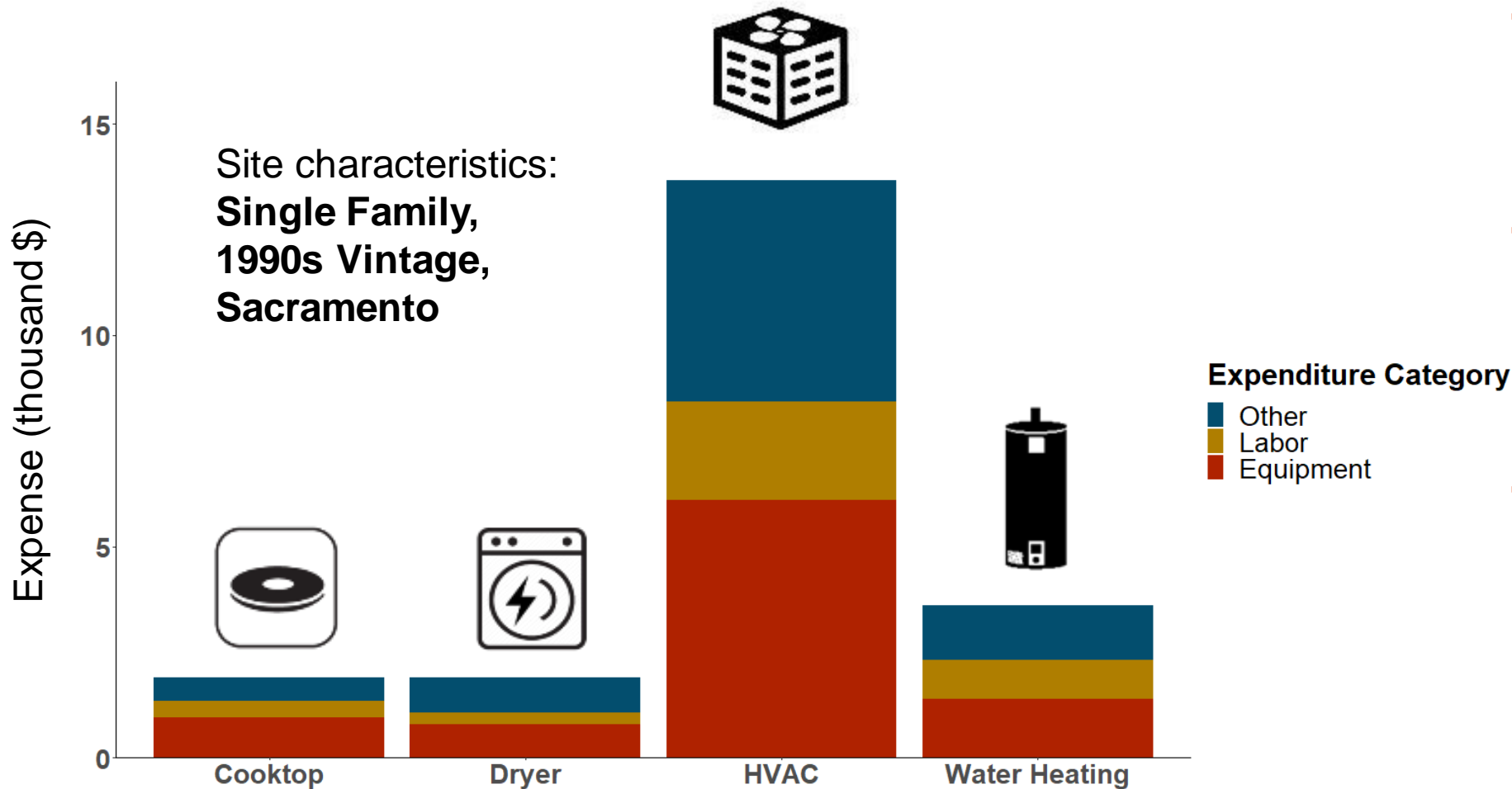
- + Customer lifecycle savings requires that incremental capital costs can be offset by bill savings over time (assumes 3.35% after-tax real discount rate) – **this option is currently not available to renters (landlord/tenant split) nor many households**
- + Costs shown are for electrification in single family homes, relative to a gas baseline.
- + Cost ranges reflect variation in climate zone and utility rates.

Source: E3 Residential Building Electrification in California, 2019

https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf



Will capital costs decline over time?



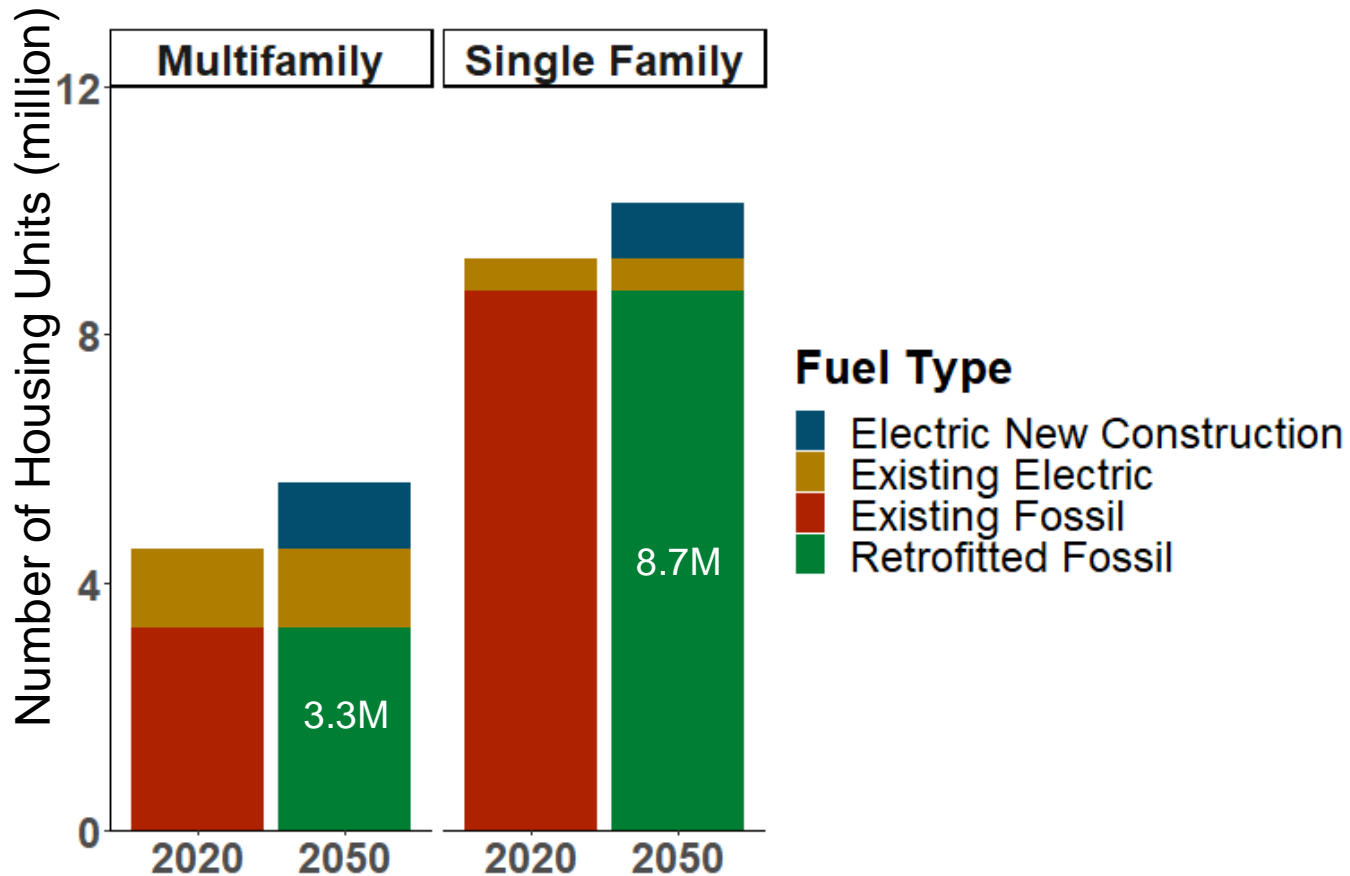
- + Total first cost for this household: ~\$21,000 (not including electrical panel upgrade)
- + Labor costs could fall with greater standardization, competition and market innovation
- + Equipment & “Other” costs are less likely to fall. “Other” includes demolition and removal of existing system, electrical wiring, duct work, etc.

Source: E3 Residential Building Electrification in California, 2019

https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf



What could it cost to retrofit single family & low-rise residential homes to all-electric by 2050?



Rough Estimate of Capital Cost Needs*

Home Type	Number of Retrofit Housing Units by 2050	Approximate Upfront Retrofit Cost/ Household (\$2018)	Approximate Total Cost for Housing Stock Retrofits/Year (through 2050) (\$2018)
Single Family	8.7 M	\$28 K	\$8 Billion/yr
Low-rise Multifamily	3.3 M	\$18 K	\$2 Billion/yr
Estimated Combined Total	12 M		~\$10 Billion/yr

* For HVAC, water heating, cooking & clothes drying. Not electric vehicle, rooftop solar, or storage. Not including high-rise multi-family, mobile homes, or commercial buildings.

Sources: Households from CA Department of Finance housing estimates, “E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2020 with 2010 Census Benchmark”. Current fuel mix proportions from California Residential Appliance Saturation Survey, 2019. Retrofit costs from E3 Residential Building Electrification in California, 2019



Concluding Thoughts

- + Greenhouse gas emissions from buildings must be nearly eliminated, in less than two decades, to achieve our climate goals**
- + Given the slow turn-over of the building stock and building equipment, the pace of change and scale of this transformation is unprecedented**
- + A warming climate, wildfires, and COVID create added urgency to make our buildings more resilient, sustainable and healthy**
- + Incentives, codes and standards, and higher prices on fossil gas (carbon price or decarbonized gas) are needed to motivate the market, but will not be sufficient on their own to transform the state's building stock**
- + Financing is an important piece of this puzzle; works best when paired with bill savings**
 - On-bill financing solutions appear promising for renters
 - Key uncertainty includes long-term trajectories for natural gas and electricity rates
- + Combine energy efficiency with electrification, EV-ready charging, and potentially solar + storage for best effect**

Clean Energy Financing in Buildings

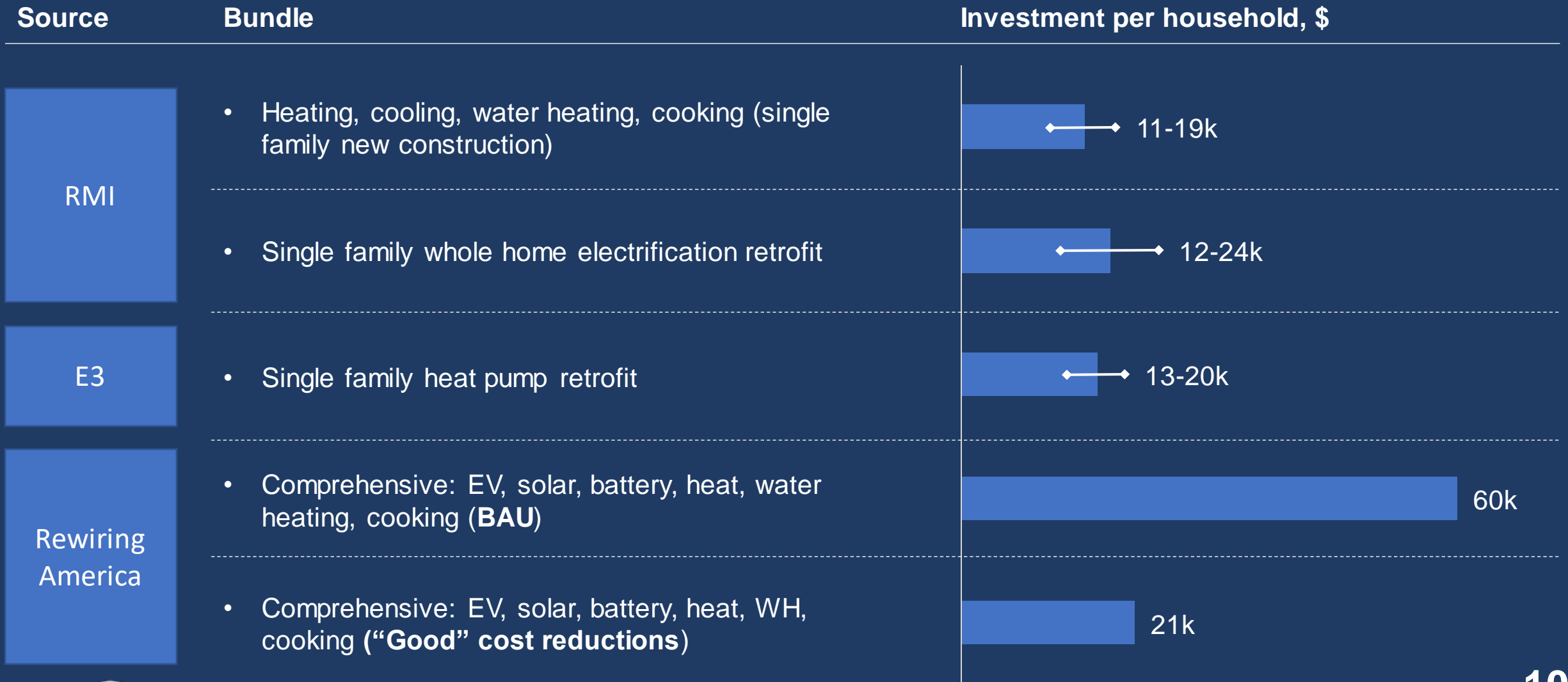
Financing Workshop for R.20-08-022
January 2021



Transforming global energy use to create a clean, prosperous, and secure low-carbon future.

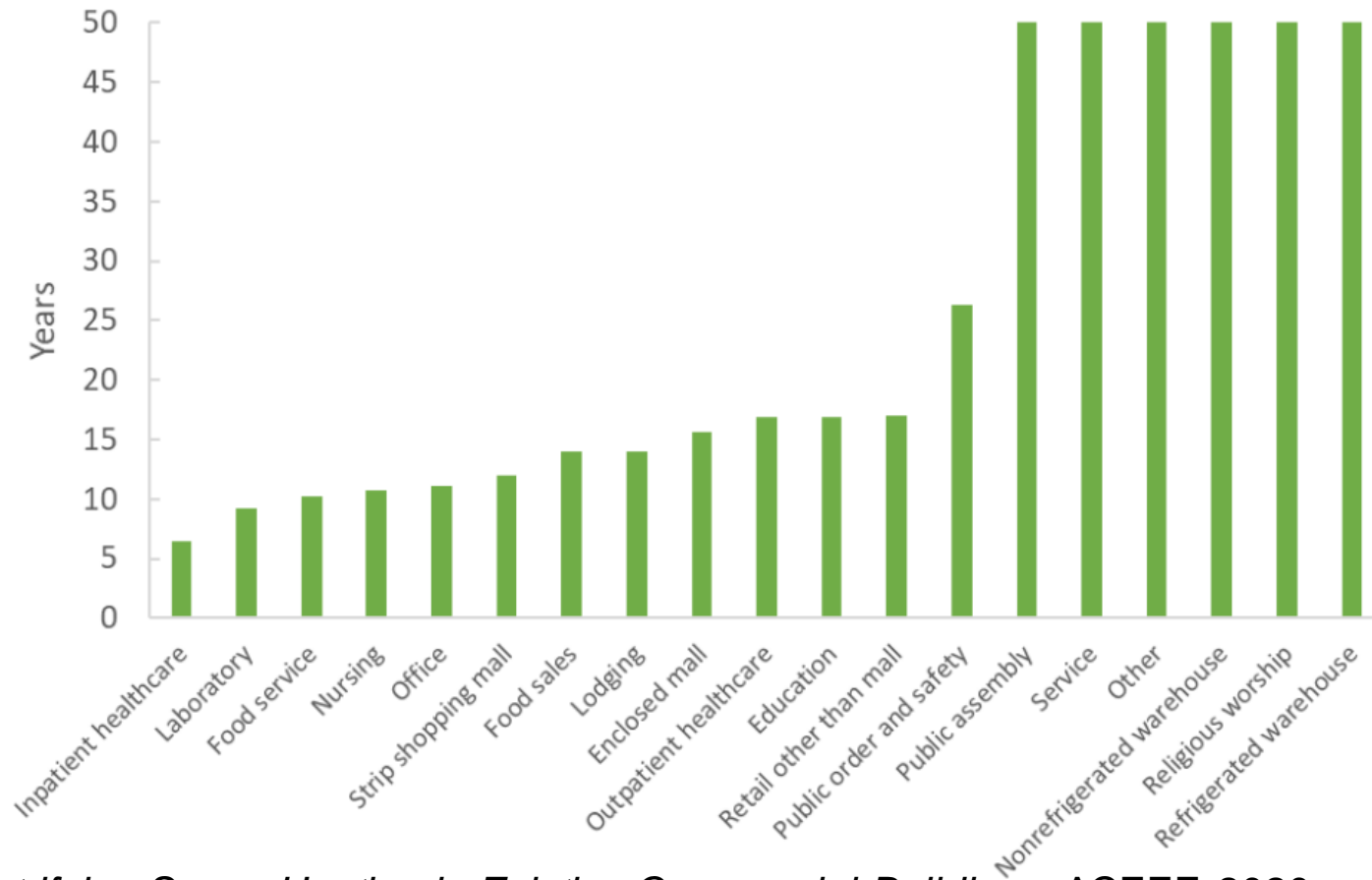


In the residential sector, investment needs vary widely based technology bundle



Commercial building electrification economics vary widely by building type...

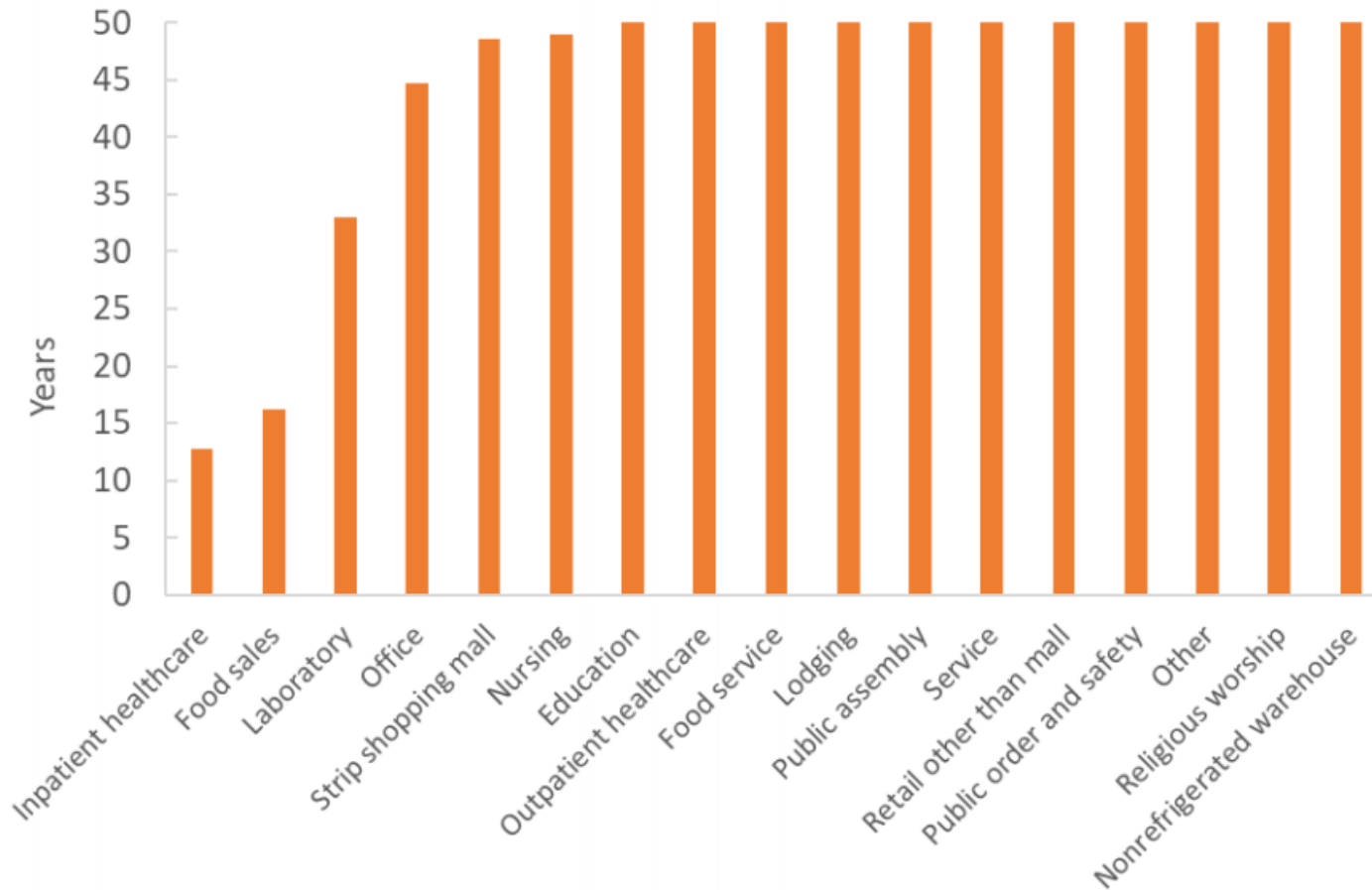
Median simple payback by commercial building type: replace **gas packaged system with rooftop heat pump**
Years



Source: *Electrifying Space Heating in Existing Commercial Buildings*, ACEEE 2020

...with some system configurations more challenging to pay back

Median simple payback by commercial building type: replace boiler with ductless or VRF heat pump

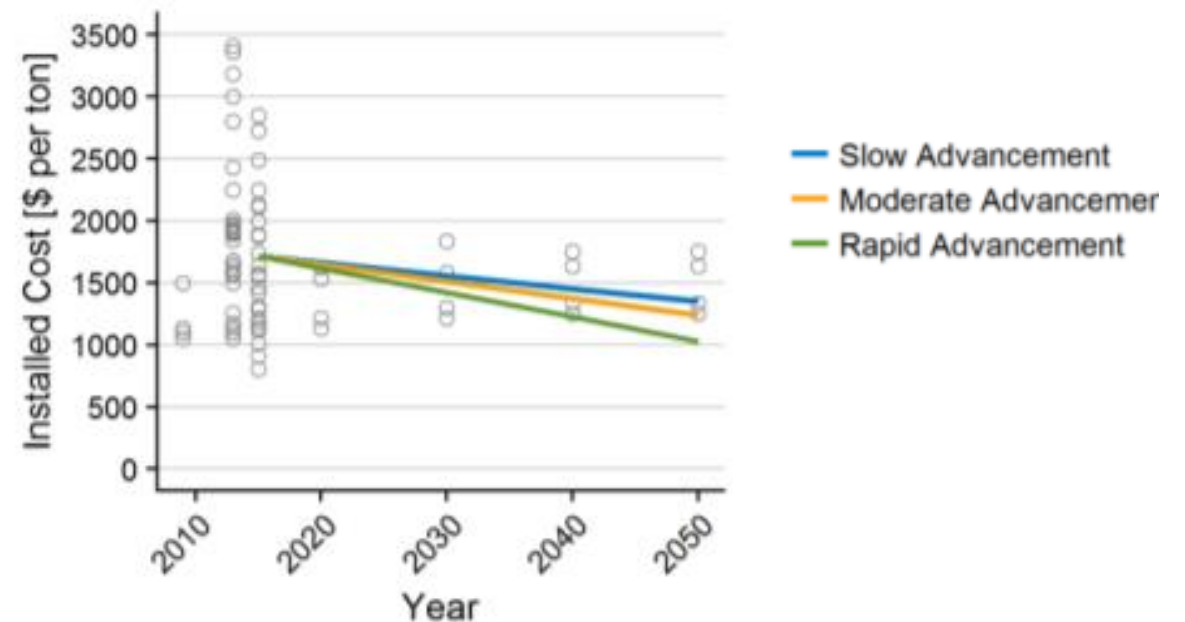


Source: *Electrifying Space Heating in Existing Commercial Buildings*, ACEEE 2020

Building decarbonization costs are likely to fall - ASHP

- **Soft costs are large component of heat pump installed costs, with significant variation**
 - Low installer, customer familiarity
 - Uncertainty as a price premium
- **Local product availability and supply chain may present opportunities**
- **Should be paired with rate reform, business model innovation to drive adoption**

Figure 21. Installed unit costs (left) for residential ASHPs



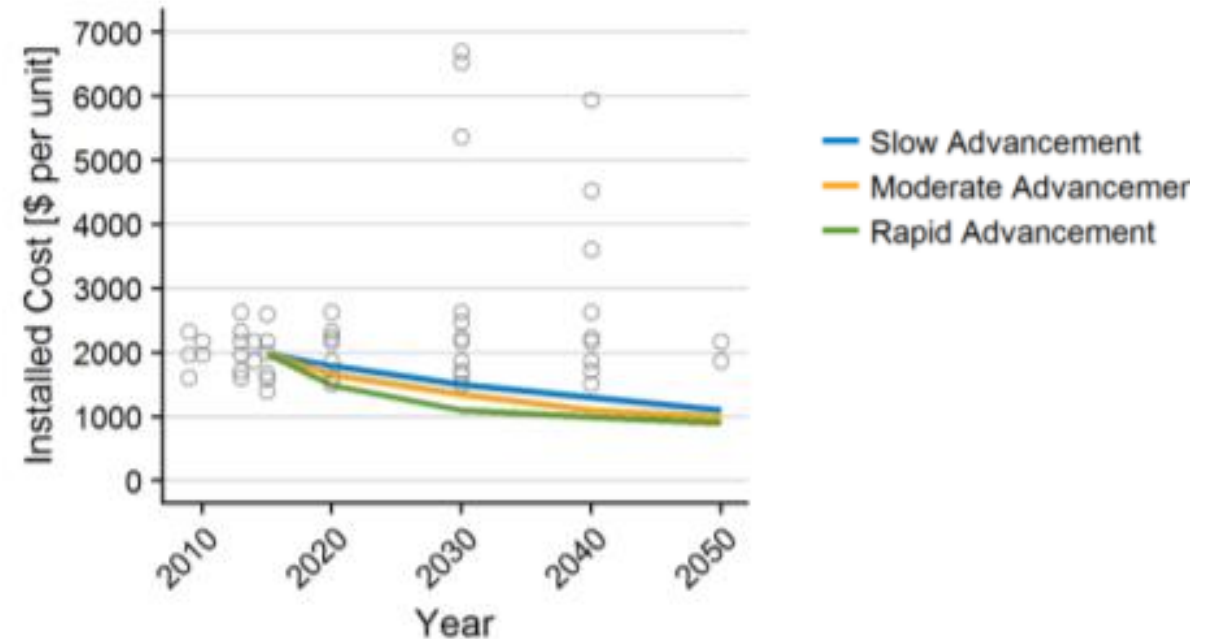
**NREL Electrification Futures Study*



Building decarbonization costs are likely to fall - HPWH

- **Soft costs are large component of heat pump installed costs, with significant variation**
 - Low installer, customer familiarity
 - Uncertainty as a price premium
- **Local product availability and supply chain is still emerging**
- **Should be paired with rate reform, business model innovation to drive adoption**

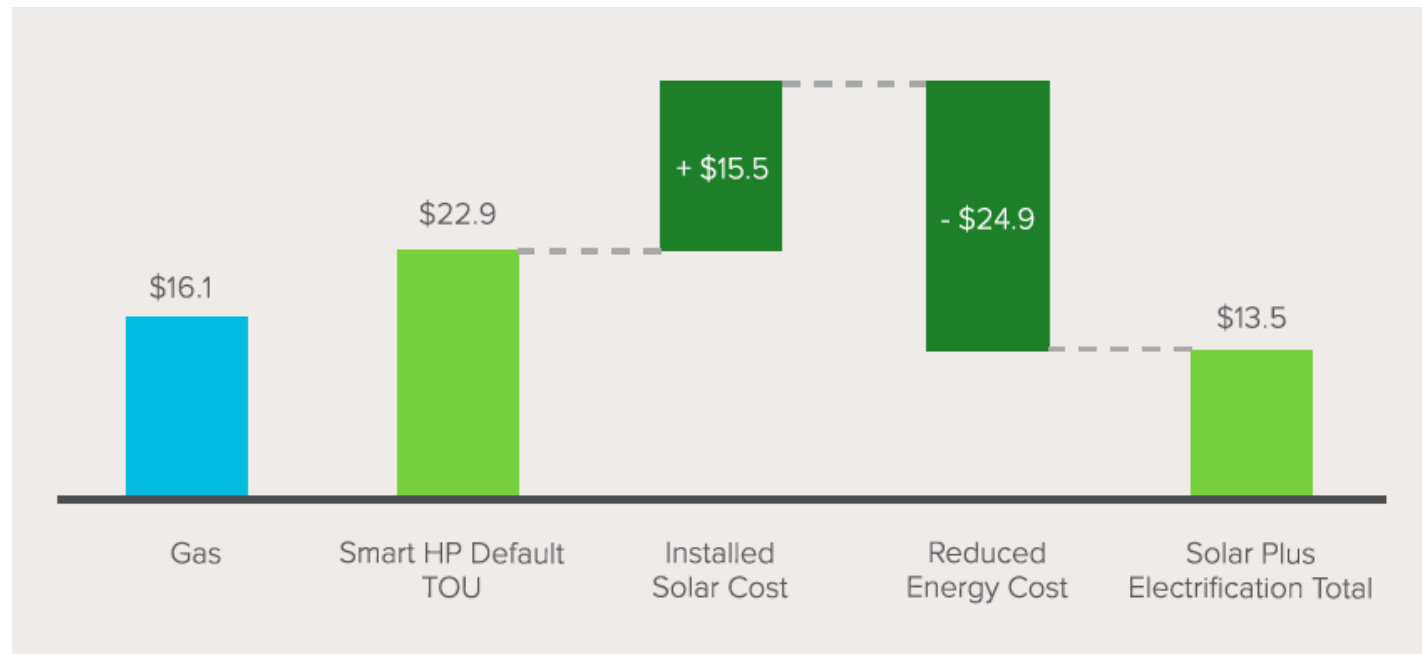
Figure 21. Installed unit costs (left) for residential HPWHs



*NREL Electrification Futures Study

Some strategies that make electrification more affordable require more up-front investment and financing

Net present cost of solar plus electrification compared with gas
Oakland default TOU scenario, thousand \$

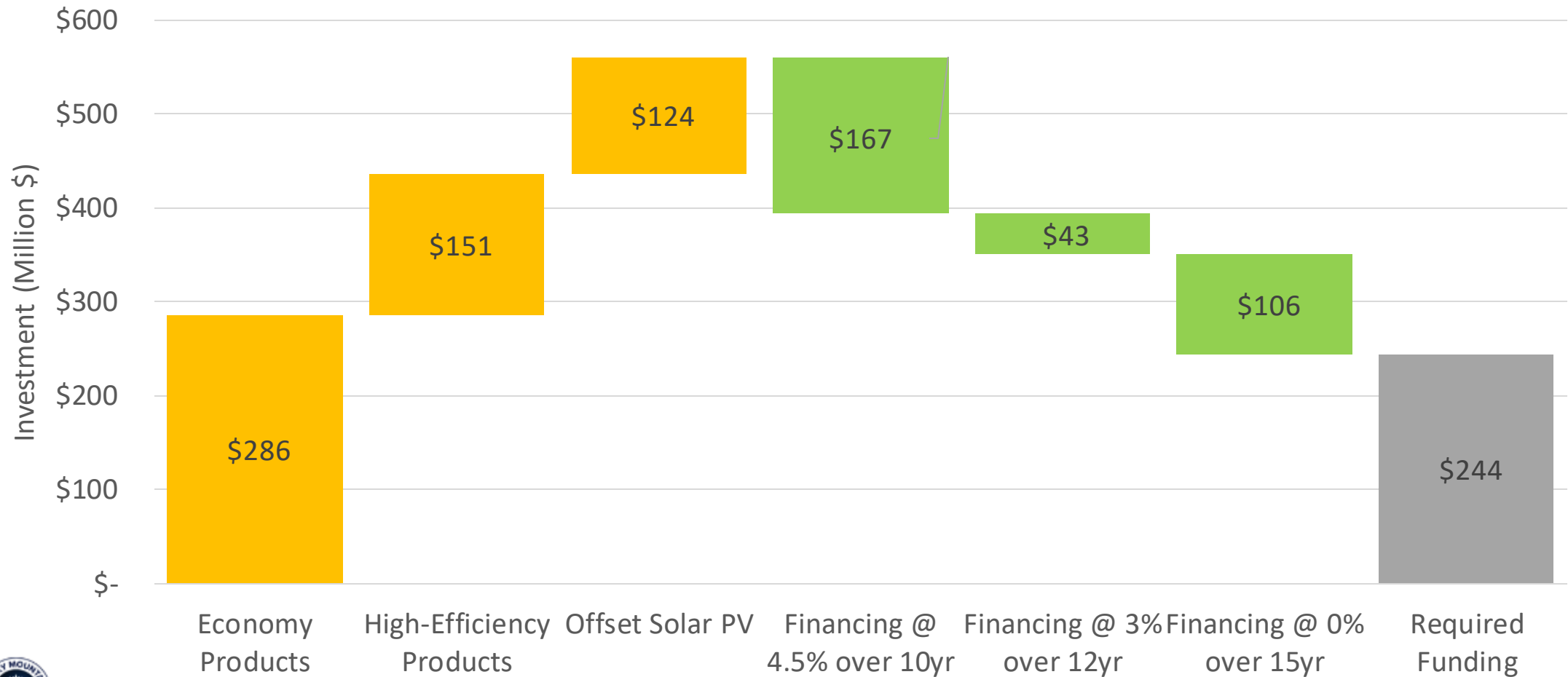


Because solar is already cost-effective vs. grid power in Oakland, in part due to inclining block rates, electrification with solar is more advantageous than with grid power



Aggressive financing terms make the transition manageable, even in the Bay

Up Front Cost to Electrify Berkeley's 42,000 Low-Rise Homes (\$Mil)



So, what to look for in “best bets” for financing building decarbonization solutions?

Strongest payback

- Favorable building configurations
- Propane heating
- New construction

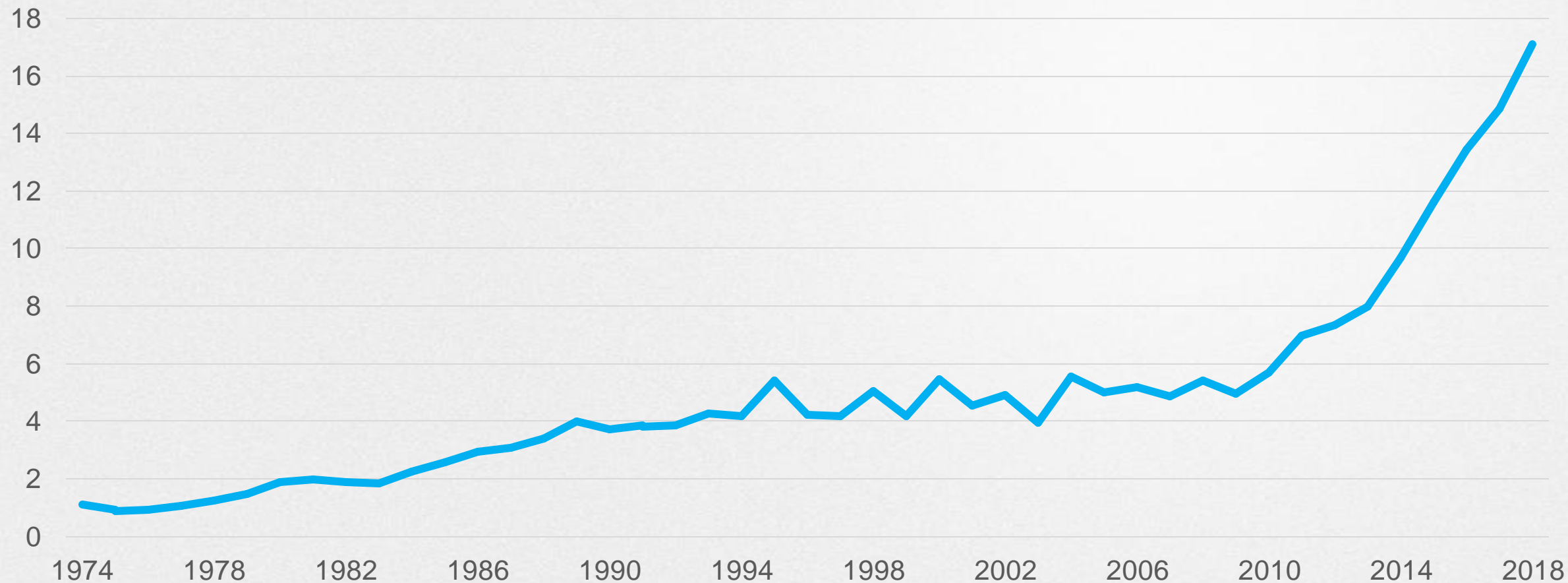
Bigger bundles

- Add solar or EE to bring down operating costs
- Bundle with EV
- Compensation to monetize DR, storage
- Updated electrification rate designs

Gas distribution system spending has tripled since 2010

US gas distribution system construction expenditures

\$ billion, 1974–2018



Thank you!

Mike Henchen
mhenchen@rmi.org





***Financing the Transition to a Resilient and
Energy Efficient Economy***

***Presentation for CPUC Financing
Workshop***





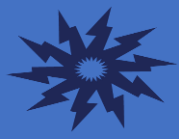
NEIF – An Energy & Resilience Lender

Provides commercial and consumer **financing for essential energy and resilience improvements** like HVAC, roofing, lighting, solar and battery storage.

Supervised as a **consumer lender** and servicer in 20 states including California and operates its **commercial financing** platform nationally.

Delivered through **partnerships** with associations, contractors, distributors, manufacturers, utilities and governments.

With experience dating to 1947 (AFC First), NEIF is a **for-profit Certified B Corporation®**.



Echoing What You've Heard Already...

- The required investments will be massive.
 - Single family residential units in California number over 7,000,000.
 - If heat pumps and other measures cost \$20,000 (a conservative number...)
 - Total investment in the single family residential sector alone is \$140,000,000,000.
 - Total investment for the public and commercial sectors are unknown. But the number is very large.
- In 2011, we did a study for the CPUC as part of the CPUC's previous finance investigation. This study is available at:

<https://docs.cpuc.ca.gov/efile/rulings/157049.pdf>



Major conclusions from 2011

- We would expect over \$20,000,000,000 required to meet the goals at the time (generally around 20-25% reduction in energy use), not accounting for climate goals, electrification etc.
- At the time, utilities had plans to spend about \$500 Million on efficiency programs from 2010-2012, resulting in perhaps \$1.5 Billion in investments.
- Bottom line: Utility investments at the time were not even close to what would have been required to meet just energy efficiency goals.
 - Financing with private capital was (and is) essential



What's Experience can We Look Back On?

Now, with a decade of experience at a (still) small scale.

- *Utility-run/funded on-bill programs.*
 - Ratepayer funds serve as only capital source.
 - Provides capital that can be lent at very low cost and able to take flexible credit risk.
 - Typically subject to all regulatory requirements of any ratepayer funds AND significantly limited amounts of funds – in the \$millions instead of the \$billions.
 - Restrictions on timing of payment (only after project is completed) and on measures funded make have hampered OBF growth.
- *Utility supported private programs.*
 - Private capital is primary source of funds, but ratepayer funds provide credit or other supports.
 - Provides capital where treatment of credit risk can be more flexible than solely use of private capital.
 - Typically subject to regulatory oversight as with above. Amount of funds available remains limited, although is greater due to leveraging of ratepayer funds.



Overall Observations on Experience thus Far

- Uptake has been modest
 - Constraints have been:
 - Limited capital available for some programs
 - Inflexibility in use of ratepayer funds has limited market size and uptake
 - Inability to use funds for solar, for water conservation, for non-energy measures, for fuel-switching has limited total market size
- Tremendous effort to set up programs
 - The time required to establish CAEATFA programs, with coordination amount 4 IOUs, the CPUC, CAEATFA and multiple intervenor parties has been substantial.



Thoughts on new and larger roll-out of CPUC-authorized programs

- Provide maximum flexibility possible: simplicity and flexibility are critical
 - Measure and measure combinations
 - Overall cost allocations among different measures (eg. Provide ability to structure different programs and sub-programs flexibly).
 - Limit number of parties involved in design, and, if possible have CPUC provide clear guidance as to goals at the outset without getting involved in authorization of specific program details.
- Continue to lean towards leverage of ratepayer funds in order to attract private capital.



Think: Scale

- Scale requires attracting private capital
- Scale requires simplicity and speed
- Scale requires a step back: Balance oversight with flexibility

Panel Contacts

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Workshop Logistics and Housekeeping

- Panels are 75 minutes – 1 hour presentation, 15-minute panel Q&A
- Public Comment at the end of each day – 15-minute moderator lightning round followed by 45-minute Public Comment
- Workshop will be recorded and be included in the record for R. 20-08-022 – link will be available at <http://www.adminmonitor.com/ca/cpuc/>
- There is a delay between the telephone audio and the Webinar broadcast
- For any technical issues with the Webinar, please call the Technical Support Line at 415-703-5263

Panel 4 – 2:15 – 3:30

- Moderator: Anthony Kinslow II – Clean Energy Works/Gemini Energy Solutions/Stanford
- Stacey Tutt, CA Low-Income Consumer Coalition
- Ashlyn Kong, CPUC Public Advocates Office
- Kathleen Yip, CPUC Energy Division Equity Lead
- Paul Yee, CA Dept of Financial Protection & Innovation



Panel Four – Policy Priorities for CPUC

Guiding principles highlighted by this panel:

- **Equity**
- **Affordability**
- **Resilience**
- **Effectiveness**
- **Consumer protections**

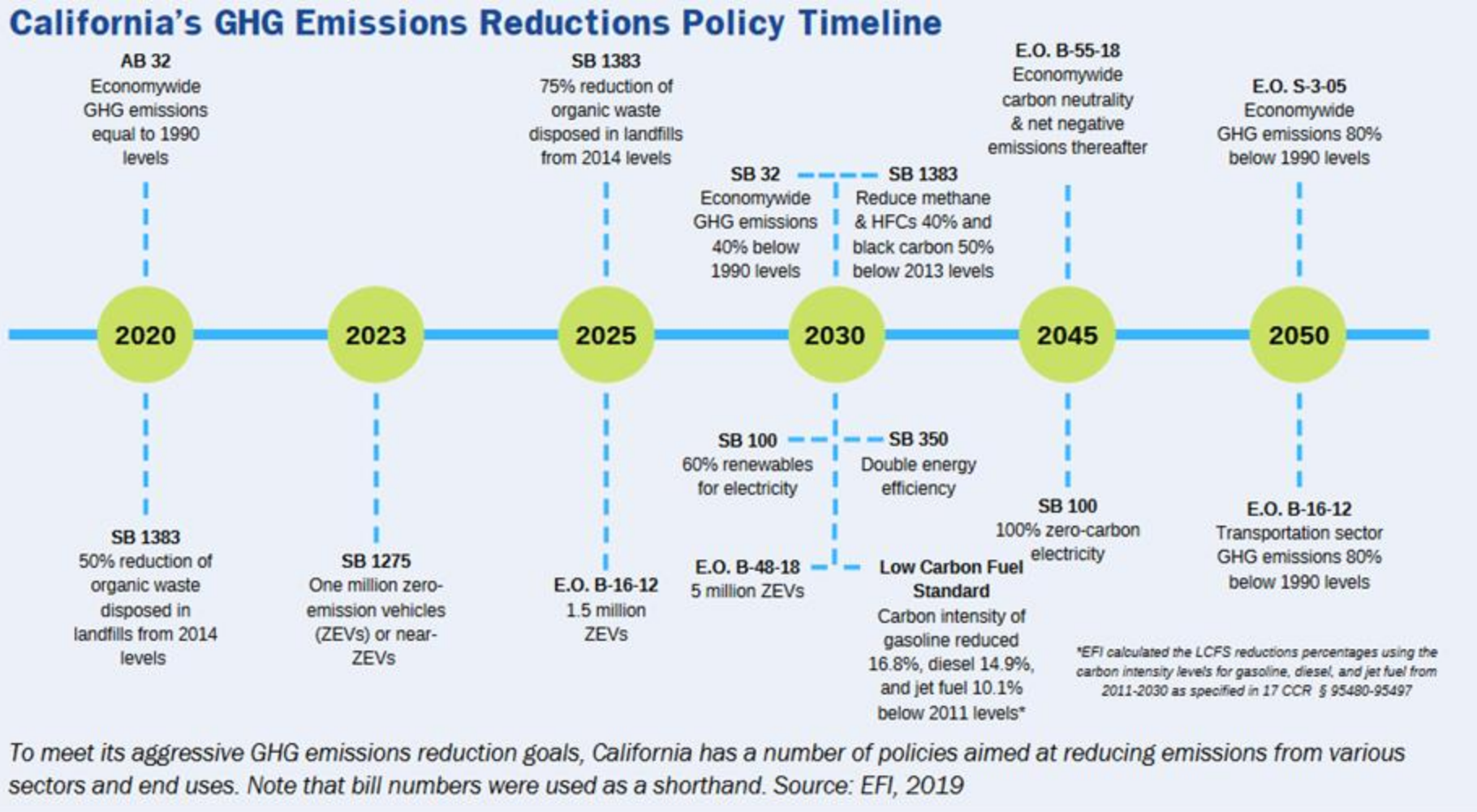
Moderator: Anthony Kinslow II, PhD

www.geminiesolutions.com | akinslow2@geminiesolutions.com

- Founder & CEO, Gemini Energy Solutions, LLC
- Member of CA Underserved Working Group
- Policy Consultant, Clean Energy Works
- Stanford University Lecturer
 - Racial Equity in Energy
 - Quest for an Inclusive Clean Energy Economy



100% Zero-Carbon Means Everybody



[Pathways For Deep Decarbonization In California](#), Energy Futures Initiative (EFI), April 2019, Figure S-1.



There is a Coverage Gap

Millions of households are fall between being unqualified for both government funded coverage and tradition financing coverage.

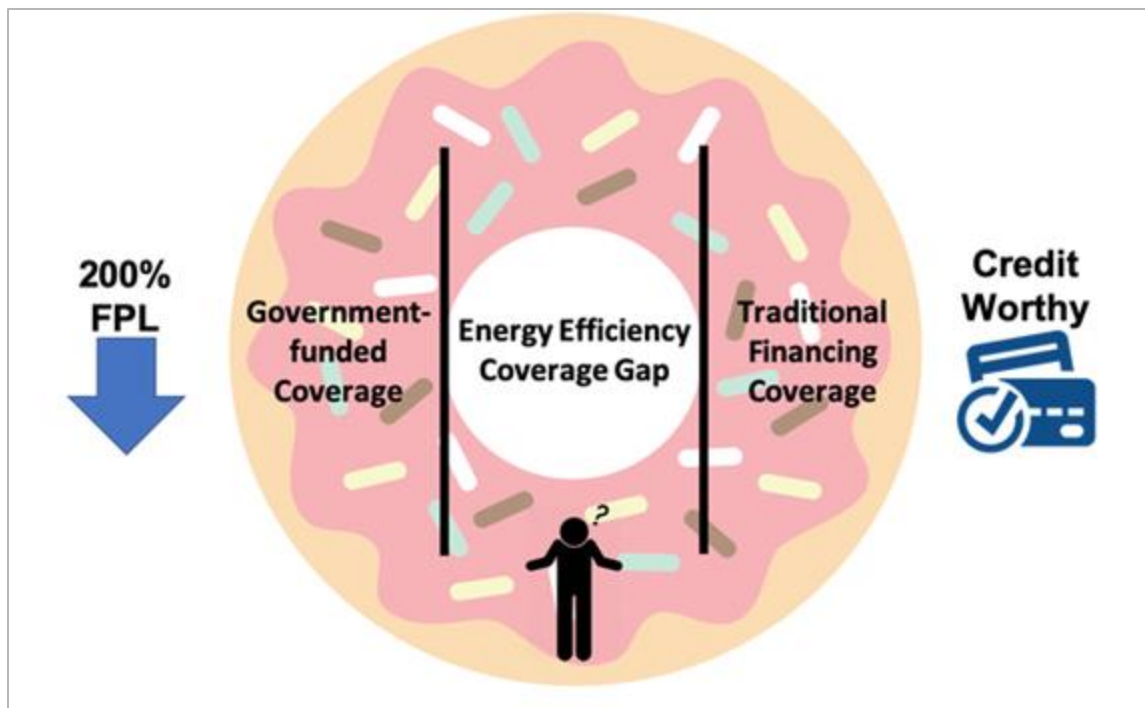


Image developed based on research published in 2020 by Prof. Tony Reames, University of Michigan



Public Awareness and Support

Black and Hispanic individuals have a measurably higher degree of concern about global warming and want more action

	U.S. government should do great deal/a lot	Global warming is a "very" serious problem for U.S.
All	61%	51%
Democrats	84	78
Republicans	32	25
Independents	63	48
Liberals	85	77
Moderates	63	50
Conservatives	42	36
Very liberal	88	77
Very conservative	33	27
Age 18-39	70	61
50+	54	44
College graduates	65	56
Post-graduates	71	66
Non-college graduates	59	50
Whites	53	46
Nonwhites	75	62
Blacks	81	71
Hispanics	75	60
Evangelical white Protestants	40	32
Non-evangelical white Protestants	53	46
White Catholics	59	46
No religion	72	66

Source: 2018 Survey conducted by ABC News, Stanford University, and RFF.
[<http://www.langerresearch.com/wp-content/uploads/1198a1Global-Warming.pdf>]



Debt-Based Solutions Do Not Scale



Residential Energy Efficiency Loan Assistance Pilot Final Impact Evaluation Report

Less than
300 Loans
in 2 years



CALMAC Study ID# CPU0200.01
January 2020

Key Insights:

Residential Loan

- 8+ million households in California
- Unable to reach 99.99% of customers

Commercial Loan

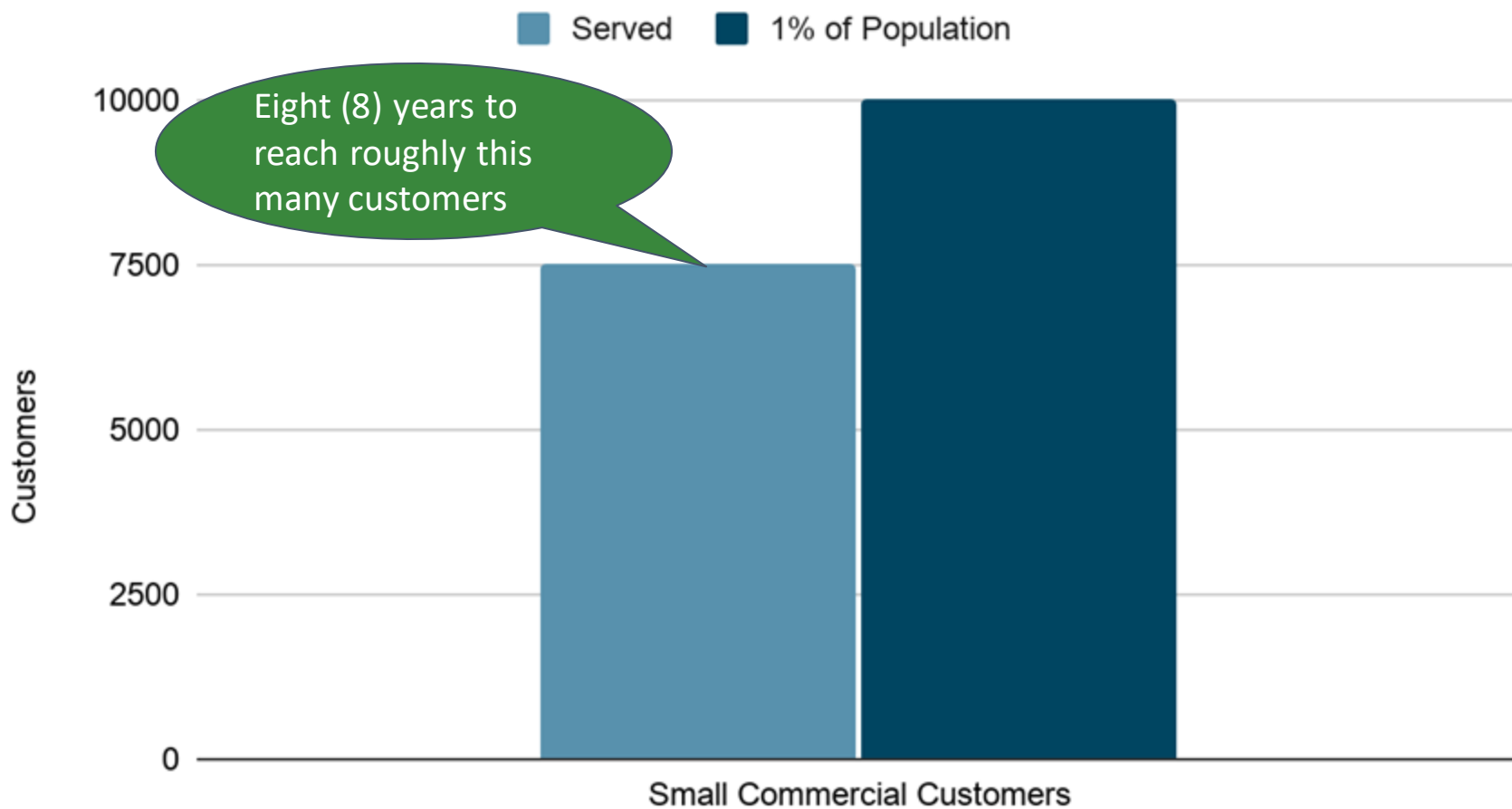
- Millions of businesses
- OBF has not reach 1% after 8 years of performance



After 8 Years, OBF has reached only ~1% of Population

How are we applying principles of **affordability**, **effectiveness** and **equity**?

On-Bill Financing Loan Program





Current Context and Landscape

- The vast majority of ratepayers are not served by existing offers
- Millions of households neither qualify for government assistance nor traditional financing - the Donut Hole
- Applying equity, affordability, resilience, effectiveness, and consumer protection principles to determine solutions will help address the Donut Hole.
- An influx of private capital is necessary to meet the scale
- Improving existing solutions is not enough





Clean Energy Financing: the Ratepayer Perspective

Ashlyn Kong
Sr. Analyst, Customer Programs
Public Advocates Office

Workshop
January 28, 2021

CPUC Clean Energy Financing

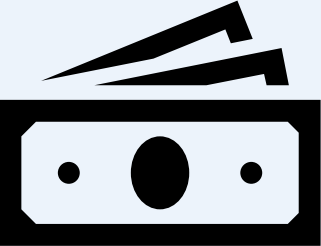
On peak 2,88 kWh x \$4.33000 = \$12,470.40
Mid peak 2,52 kWh x \$0.81000 = \$2,041.20
Energy - Summer
Off peak 9,073 kWh x \$0.05257 = \$476.95

Your Delivery charge
- \$272.05 transmi
- \$2,588.51 distrib
- \$22.99 nuclear
- \$240.17 public
Franchise fees repr
Your Generation ch
Transition Charge
DWR provided 21.2%

Electric Charges
\$351.47 - Baseline
baseline Usage
101-130% of Baseline
131-200% of Baseline
201-300% of Baseline
Over 300% of Baseline
Net Charges \$351

DWR
Energy - Summer
On peak 1,993 kWh x \$0.07981 = \$158.00
Mid peak 2,616 kWh x \$0.07981 = \$208.80
Off peak 2,710 kWh x \$0.07981 = \$216.30
Energy - Winter
Mid peak 1,235 kWh x \$0.07981 = \$98.57
Off peak 798 kWh x \$0.07981 = \$63.69
Facilities related demand 360 kW x \$1,86000 = \$669,600

2 key considerations for ratepayers



Cost-Effectiveness



Risk Management



Program benefits should exceed costs

Defining costs and benefits

Upfront

Clear

Consistent

Consider **existing methods** like TRC test for easier integration with and comparison to existing CPUC programs

Well-designed, cost-effective **pilots** may be an appropriate means of testing at a small scale before investing significant funds



Manage ratepayer risk, both broadly and individually

- Sustainable financing programs will require **majority third party capital**
 - Risk must be allocated thoughtfully between ratepayers and third parties, both downside and upside
 - Risk allocation may change over time
- **Minimize cost shift** from program participants to non-participants
 - Consider what, if any, benefits accrue to non-participants
- Protect **individual ratepayers** from excessive risk
 - Avoid disconnections



Paul Yee

Senior Counsel/Enforcement Division

California Department of Financial Protection & Innovation

What is PACE?

(Property Assessed Clean Energy)

- ▶ PACE is a financing option that property owners can choose to fund energy efficient home improvements to their homes, such as solar panels, water heaters, water systems, HVAC systems, doors & windows, “cool” painting and certain fire or earthquake projects.
- ▶ PACE financing results in a lien being placed on the property. It is paid back through the homeowner’s property tax and thus is a “super lien” – it has priority over other liens.
- ▶ PACE is administered through Program Administrators (PA) and since January 1, 2019 are required to be licensed by the DFPI. There are presently 5 PAs.

Some Facts on PACE

- ✓ Findings from the annual report for 2019 calendar year activity (report on 2020 activity due on 3/15/21)
- ✓ Gross Income: \$62,493,387
- ✓ Total amount of assessment contracts funded: \$362,347,433
- ✓ Total number of assessment contracts made: 12,335
- ✓ Aggregated fees and other charges: \$83,337,986
- ✓ Estimated greenhouse gas emissions reductions: 277,644 kilotons
- ✓ Estimated jobs created: 3,254
- ✓ 593 consumers exercised three-day right to cancel
- ✓ DFPI received 162 PACE complaints in 2020
- ✓ DFPI expects the PAs to report that the 2020 numbers to be down from 2019

Problems Encountered

- ▶ PAs sign up contractors (who are licensed through the Contractor's State License Board) to market PACE to homeowners. The contractors are called solicitors and solicitor's agents and are registered with but not licensed by DFPI.
- ▶ The solicitor/contractor is the point of contact between the PA and the homeowner. This allows the solicitor contractor to misrepresent PACE to the homeowner and the PA denies responsibility for the solicitor's acts.
- ▶ Two types of fraud: 1) outright fraud by contractor assuming identity of homeowner; 2) misrepresentation of what PACE is.

Desist and Refrain Order Against Eco Technology – Outright Fraud

1. Eco Technology – Desist and Refrain Order against Eco Technology to prevent them from participating in PACE.
2. Agents of Eco Tech promised upgrades were a “free government” program.
3. Contractor asked for PII, Tax returns, utility bills, income statements, etc.
4. Contractor created fake emails and phone numbers and applied for PACE financing.
5. PACE financing is conducted primarily on an iPad or tablet with DocuSign.
6. The items were actually installed but grossly over-priced.
7. Homeowner is not aware of the lien until the next property tax bill or mortgage statement.
8. In Connection with the D&R Order, DFPI worked with one of the PA to obtain lean release and reimbursement for 22 homeowners defrauded.

Misrepresentation

- ▶ Solicitor/contractors misrepresent that PACE can cover the cost of building ADUs (granny units).
- ▶ Solicitor/contractors tell the homeowner to sign or simply to say “yes” when the PA calls to verify that the homeowner understands the key financing terms (in a general sense).
- ▶ Many times the project is verified to be complete, contractor paid in full but in reality the job has not broken ground yet and the contractor disappears.
- ▶ In both outright fraud and misrep cases, the homeowners are mono language speaking only or elderly or both.
- ▶ Resolution of the misrep matters are difficult and ongoing.

The logo for UC Irvine Law features the text "UCI" in a large, white, sans-serif font above the word "Law" in a smaller, white, sans-serif font. The background is a vibrant, abstract design of colorful brushstrokes in shades of blue, orange, red, and yellow, all contained within a white circular shape.

UCI Law

Stacey L. Tutt

Visiting Professor and
Director of the
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SB 350 Low-Income Barriers Study, Part A - Commission Final Report

Structural Barriers Limiting Access to Clean Energy for Low-Income Customers

- Low home ownership rates
- Complex needs, ownership, and financial arrangements for low-income multifamily housing
- Insufficient access to capital
- Building age
- Remote or underserved communities

Policy and Program Barriers Limiting Access to Clean Energy for Low income Customers

- Market Delivery
- Program Integration
- Data Limitations
- Unrecognized non-energy benefits

Financial Scarcity and Financial Decision-Making



Financial scarcity unconsciously “captures attention whether the mind’s owner wishes it or not and impedes the ability to focus on anything else.”

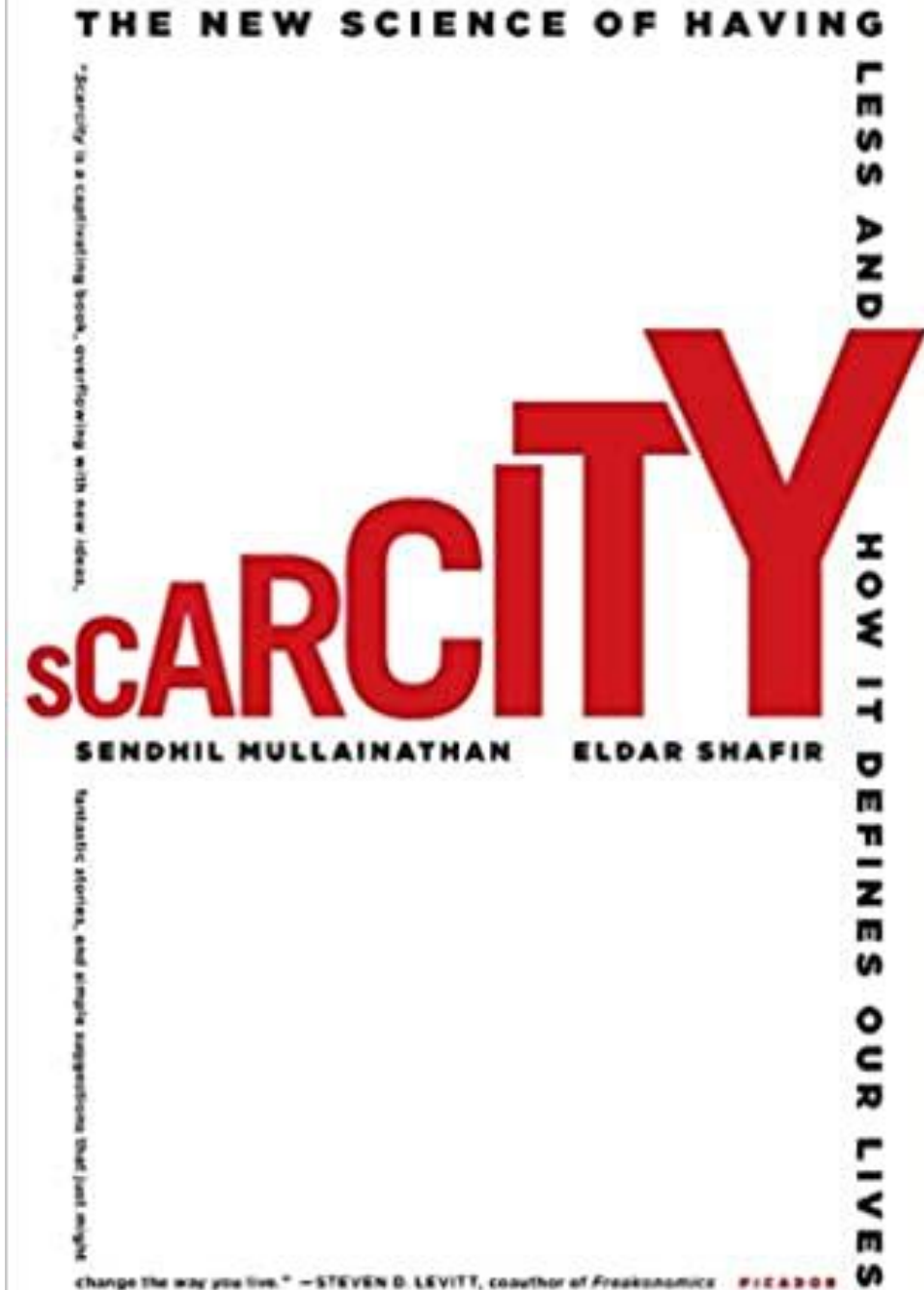


Bandwidth tax occurs when people are forced to constantly focus on an immediate crisis, which causes them to ignore other decisions.



“Tunneling,” or focusing on the most immediate and pressing financial need to the exclusion of others.

Source: A. Mechele Dickerson, *Financial Scarcity and Financial Decision-Making*, 58 Ariz. L. Rev. 137 (2016)



PACE Promises

- Door to door solicitation marketing model increased access but...

- Fraud/Negligent Misrepresentation/ Insufficient Disclosures when loans are not sold by financial specialists

More than just disclosures...

- Careful explanation, both written and verbal, is required.
- Not in financial-sector jargon.
- Materials should be available in foreign languages for homeowners for whom English is not their primary language.
- Need up-front communications
- Be realistic about how people tend to manage their budgets.

Source: Energy Programs Consortium, *Assessment of Low Income Homeowner Participation in the Property Assessed Clean Energy (PACE) Program in California*, November 2017

PACE Promises

- Door to door solicitation marketing model increased access but...
 - Equity Based Financing increased access for those with poor credit but
 - Transactions often occur at lightning speeds and are in most cases paperless but...
 - Creates super-priority lien to reduce finance providers risk but...
 - No energy audits or inspections required to reduce upfront costs to consumers but...
-
- Fraud/Negligent Misrepresentation/ Insufficient Disclosures when loans are not sold by financial specialists
 - Unaffordable for asset rich/income poor consumers
 - Incentives fraud and price gouging by home improvement contractors
 - Did not result in less expense to homeowners, PACE interest rates are often 2-3 times higher than regular mortgage rates

The Dark Side of the Sun

How PACE Financing Has Under-Delivered Green Benefits
and Harmed Low Income Homeowners



Berkeley Law | Environmental
Law Clinic
January 2021

Failure to require energy audits & inspections results in:

- Inaccurate Energy Savings Estimates and Uninformed Investments
- Lack of quality control on work performed
- Encouragement of contractor fraud

Financing Energy Upgrades With Home-Secured Debt is Inappropriate for Low-Income Homeowners

- Such debt-based financing can be perilous to those with low or fixed incomes and few assets.
- Home-secured financing for low-income homeowners can be catastrophic because a missed tax payment can quickly escalate to foreclosure.
- Without guaranteed energy savings to offset or at least meaningfully mitigate PACE assessment costs, these costs put the mere 26% of low-income Californians fortunate enough to own their homes at risk of losing their most precious asset: their home equity, or even, their shelter.

Things to consider for effective program delivery

Kathleen Yip

CPUC

January 28, 2021



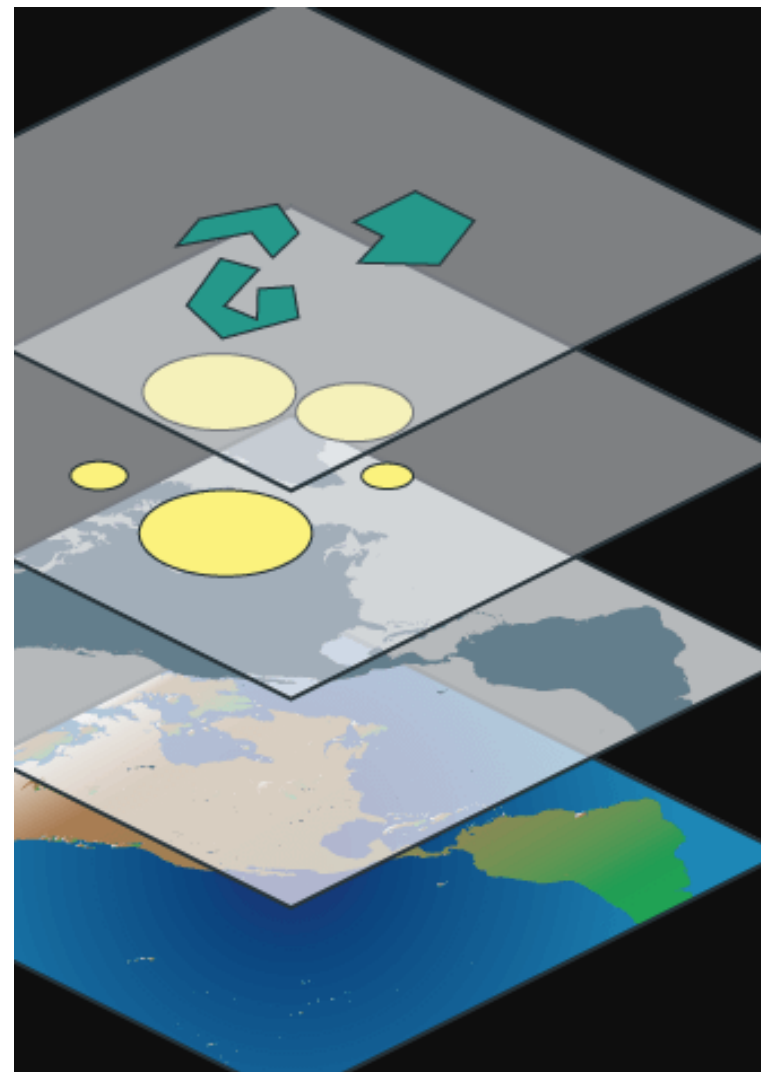
California Public
Utilities Commission

BUILD TRUST.



MEET PEOPLE WHERE THEY ALREADY ARE

- Partner with food banks, health care providers, public housing organizations
- Be flexible and adapt to the needs of the community (outreach, in-language)
- Consider how to leverage other programs that already have significant uptake
- Not just about saving money



CARB'S CLEAN VEHICLE ASSISTANCE PROGRAM

- Very hands-on program for low-income customers to get a loan for a vehicle
- Community-based organization does outreach and engagement with community members
- Financial literacy education component of the program
- Clean Vehicle Assistance Program (cleanvehiclegrants.org)



Thank you!

Kathleen Yip

ky2@cpuc.ca.gov

Public Comment Period

- For any technical issues with the Webinar, please call the Technical Support Line at 415-703-5263
- If you wish to speak during the public comment period, please unmute your phone, dial 1-800-857-1917, passcode 5180519#, and then press *1 (star one), and record your name and organization, if applicable, when prompted. Please speak clearly. You will be placed into a queue in the order that you have identified yourself. When it comes time for you to speak, the operator will announce your name and then open your line. You will have **one** minute to speak, after which a chime will sound when your time expires. To withdraw your request please press *2 (star two).

Thank you for your Participation!

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