



AUGUST 21-23, 2018 • CLEVELAND, OHIO

# CELICA Sunset Workshop

Wednesday, August 22, 2018

8:00 am - Noon

# CELICA Sunset Workshop

- **Alana Mathews**, California Energy Commission
- **Hans Berg**, State of Washington
- **Kerry O'Neill**, Connecticut Green Bank
- **Terri Novak**, State of Michigan

**Alana Mathews**  
**California Energy Commission**

# Energy Equity Indicators

## An Assessment and Tracking Resource



Alana Mathews  
Public Adviser  
California Energy Commission

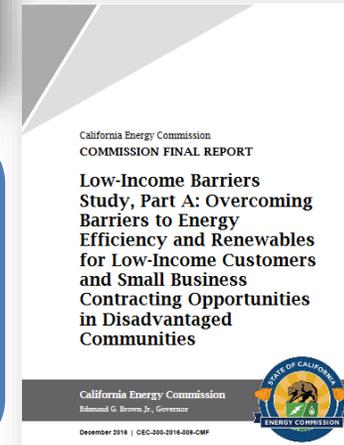


# In The Beginning....

2015  
Clean Energy and  
Pollution Reduction Act



2016  
Low-Income Barriers  
Study  
(12 Recommendations)



2017  
Implementation/Tracking  
Progress





# Energy Equity Indicators Overview

- Set Statewide Baseline
- Advance Energy Savings
- Track Performance

#	Recommendation	Indicator
1	Organizing a multiagency task force to facilitate coordination across state-administered programs	Health and safety issues abated
2	Enabling community solar offerings for low-income customers	Community energy resilience
3	Formulating a statewide clean energy labor and workforce strategy	Clean energy jobs
4	Developing new financing pilot programs to encourage investment for low-income customers	Energy savings
5	Establishing common metrics and encouraging data sharing across agencies and programs	All indicators
6	Expanding funding for photovoltaic and solar thermal offerings for low-income customers	Rooftop solar
7	Enhancing housing tax credits for projects to include energy upgrades during rehabilitation	Amount invested
8	Establishing regional outreach and technical assistance one-stop shop pilots	Number served
9	Investigating consumer protection issues for low-income customers and small business in disadvantaged communities	Number served
10	Encouraging collaboration with community-based organizations in new and existing programs	High energy bills
11	Funding research and development to enable targeted benefits for low-income customers and disadvantaged communities	Amount invested
12	Conducting a follow-up study for increasing contracting opportunities for small businesses located in disadvantaged communities	Small businesses



# Energy Equity Indicators Overview

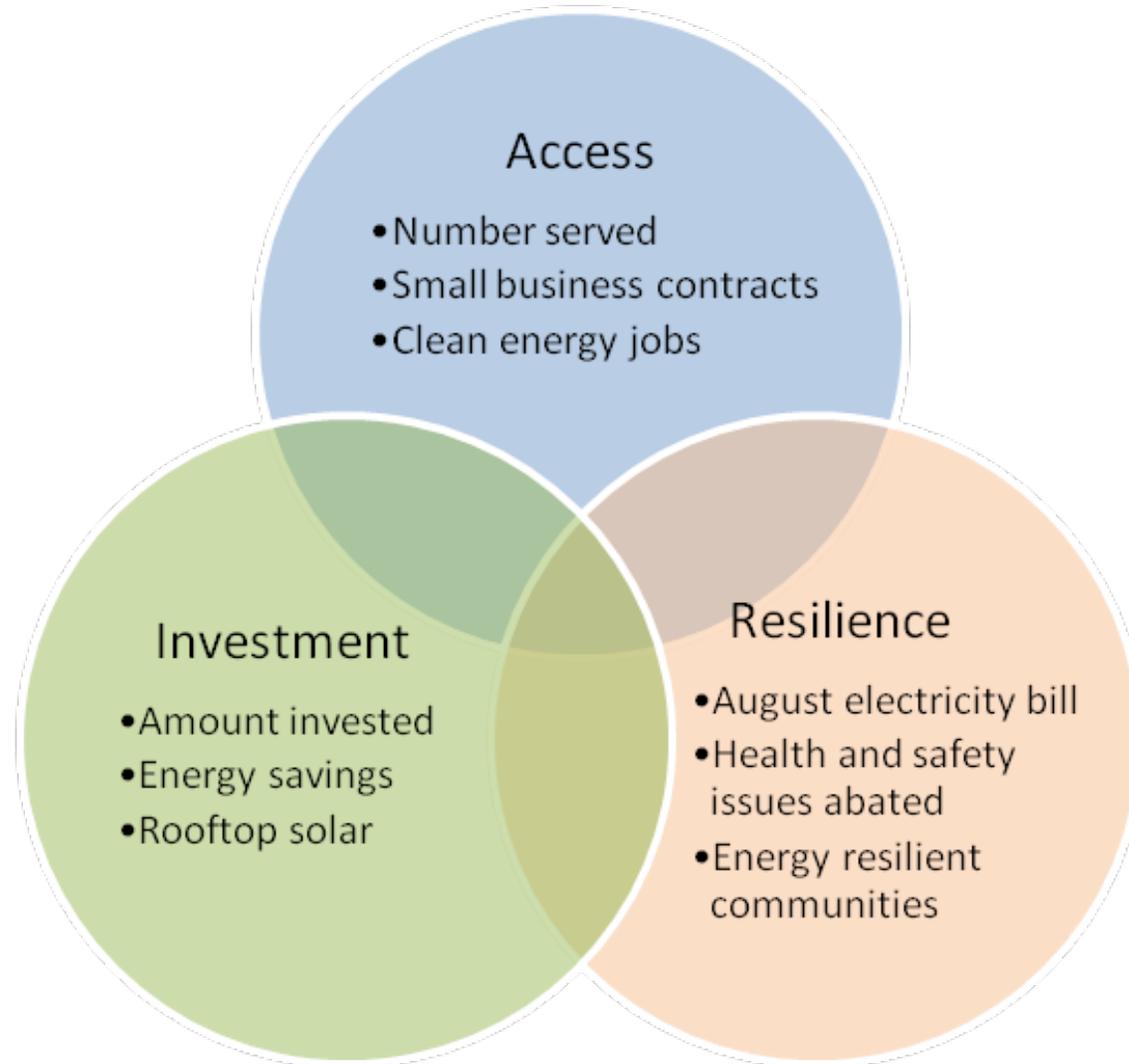
- Set Statewide Baseline
- Advance Energy Savings
- Track Performance





# Energy Equity Objectives

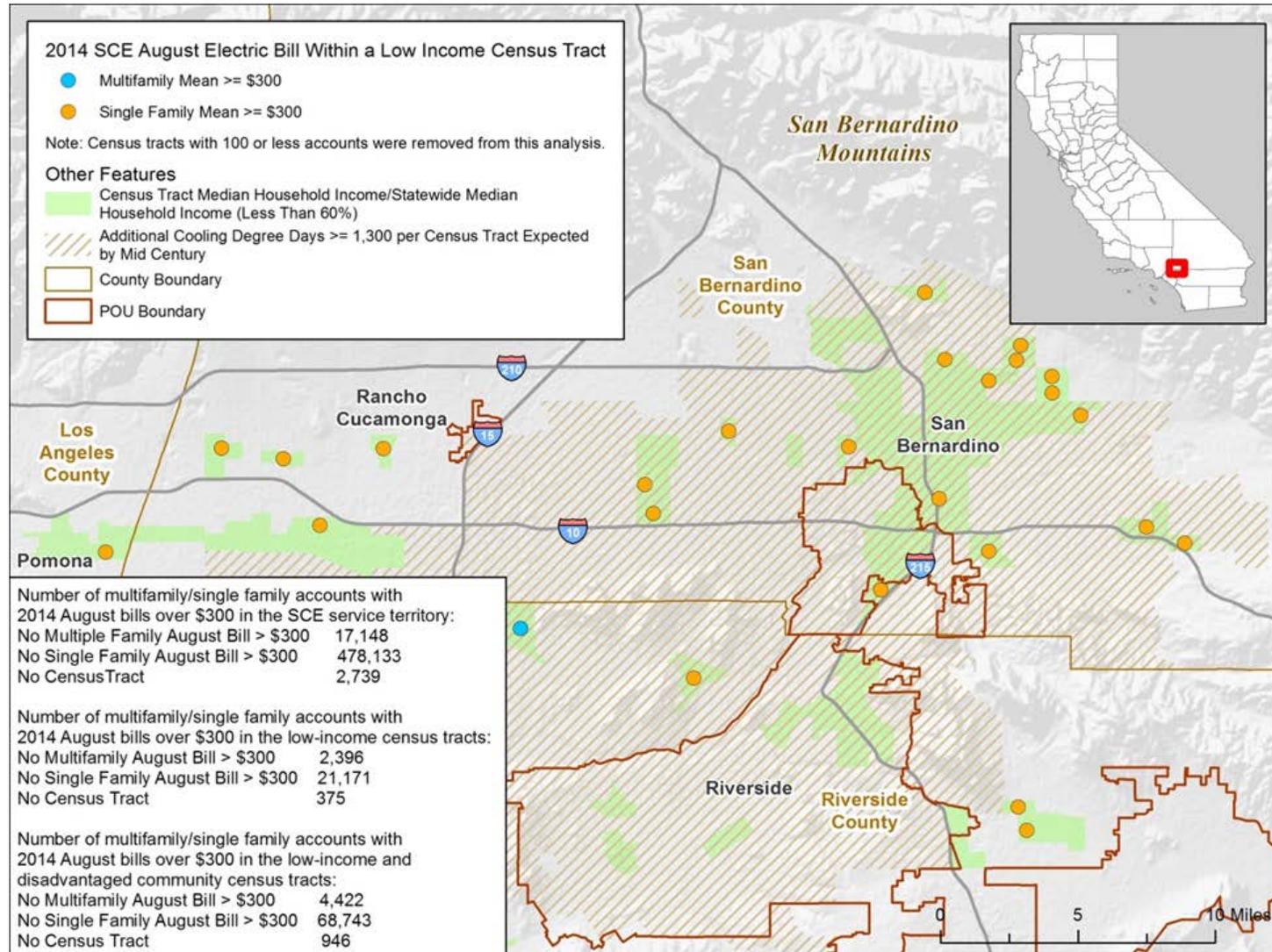
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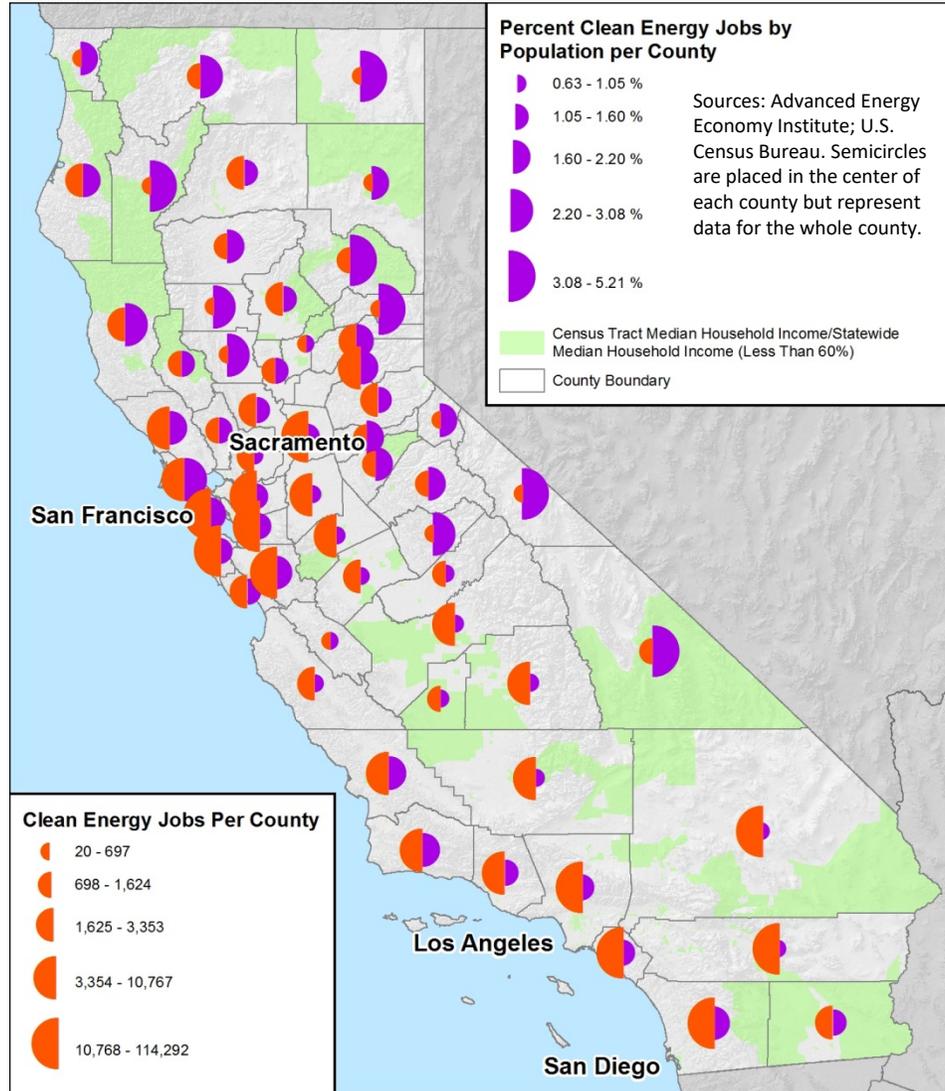
# August Electricity Bill

Source: Energy Commission analysis based on CPUC historical data, CalAdapt for cooling degree days; U.S. Census Bureau 2010 census tract boundaries; 2011-2015 ACS.





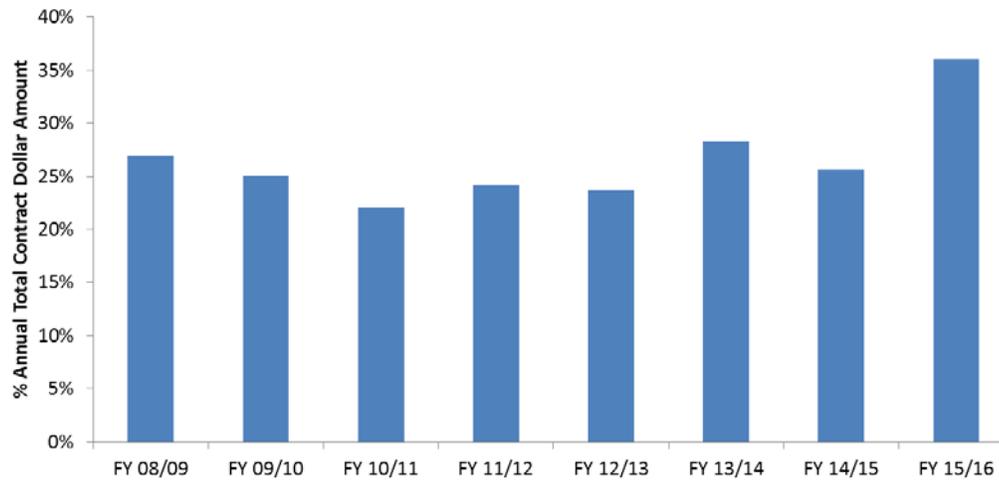
# Clean Energy Jobs





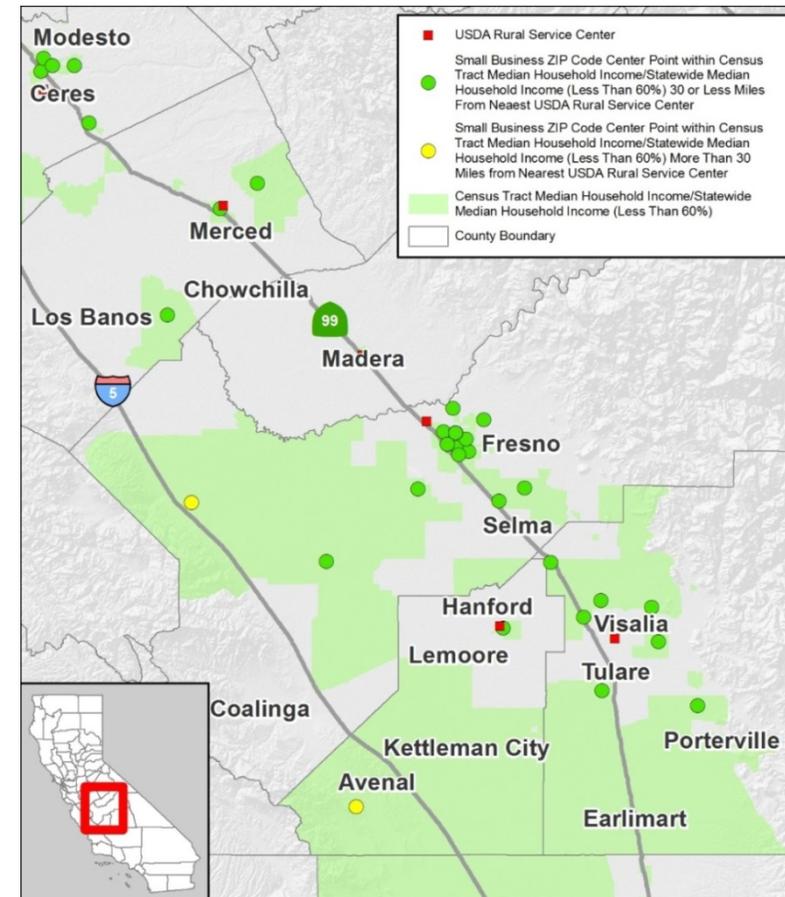
# Small Business Opportunities

**Percentage of California State Government Contract Dollars Awarded to Small Businesses and Microbusinesses: Annual Results (Fiscal Year 2009-2015)**



Source: Department of General Services

**California Small and Microbusinesses in Low-Income Areas**



Source: U.S Department of Agriculture Service Center Locator; U.S. Census Bureau.  
<https://offices.sc.egov.usda.gov/locator/app?state=us&agency=rd>



# More Information

- Energy Commission Tracking Progress Reports  
[http://www.energy.ca.gov/renewables/tracking\\_progress/](http://www.energy.ca.gov/renewables/tracking_progress/)
- Draft Energy Equity Indicators Tracking Progress Report  
[http://www.energy.ca.gov/2018\\_energypolicy/documents/#03022018](http://www.energy.ca.gov/2018_energypolicy/documents/#03022018)
- Energy Commission Low-Income Barriers Study, Part A  
[http://www.energy.ca.gov/sb350/barriers\\_report/](http://www.energy.ca.gov/sb350/barriers_report/)
- California Air Resources Board Clean Transportation Access Guidance Document (Barriers Study, Part B)  
<https://www.arb.ca.gov/msprog/transoptions/transoptions.htm>
- SB 350 Disadvantaged Communities Advisory Group  
<http://www.energy.ca.gov/sb350/DCAG/>

# Thank You

Alana Mathews

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**Hans Berg**  
**Washington State Department of Commerce**

**Kerry O'Neill**  
**Connecticut Green Bank**



# Expanding Access to Clean Energy for LMI Communities through Financing

CELICA Sunset Workshop

August, 2018



# Connecticut Green Bank

## Delivering Results for Connecticut



- **Investment** – mobilized nearly **\$1.3 billion** of investment into Connecticut’s clean energy economy so far, using a **8:1 leverage** ratio
- **Energy Burden** – reduced the energy burden on over **30,000 households and organizations**, including **“beyond parity”** for LMI solar
- **Jobs** – created over an estimated **16,000 total job-years** – 6,200 direct and 9,700 indirect and induced\*
- **Clean Energy** – deployed more than **285 MW** of clean renewable energy helping to reduce over 4.6 million tons of greenhouse gas emissions that cause climate change

**Private investment drives economic growth**  
Creates jobs, lowers energy costs, and generates tax revenues



#### REFERENCES

CT Green Bank data warehouse report from July 1, 2011 through February 28, 2018

\*62,500 private non-farm jobs created in the state over 5 years since Green Bank creation mid-2011. Green Bank statistics are in job-years; “total jobs” include direct, indirect and induced. CT DOL statistics are aggregated from monthly point-in-time estimates. CT Department of Labor - <http://www1.ctdol.state.ct.us/lmi/privatesectoremployment.asp>

# Tapping into our LMI Market

Market research and data-driven approaches are key to:

- Identifying our target audiences
- Developing programs that identify and address the needs of our target audiences
- Targeting our efforts and developing community partners
- Adapting our messaging and communicating benefits

## DATA WE USE

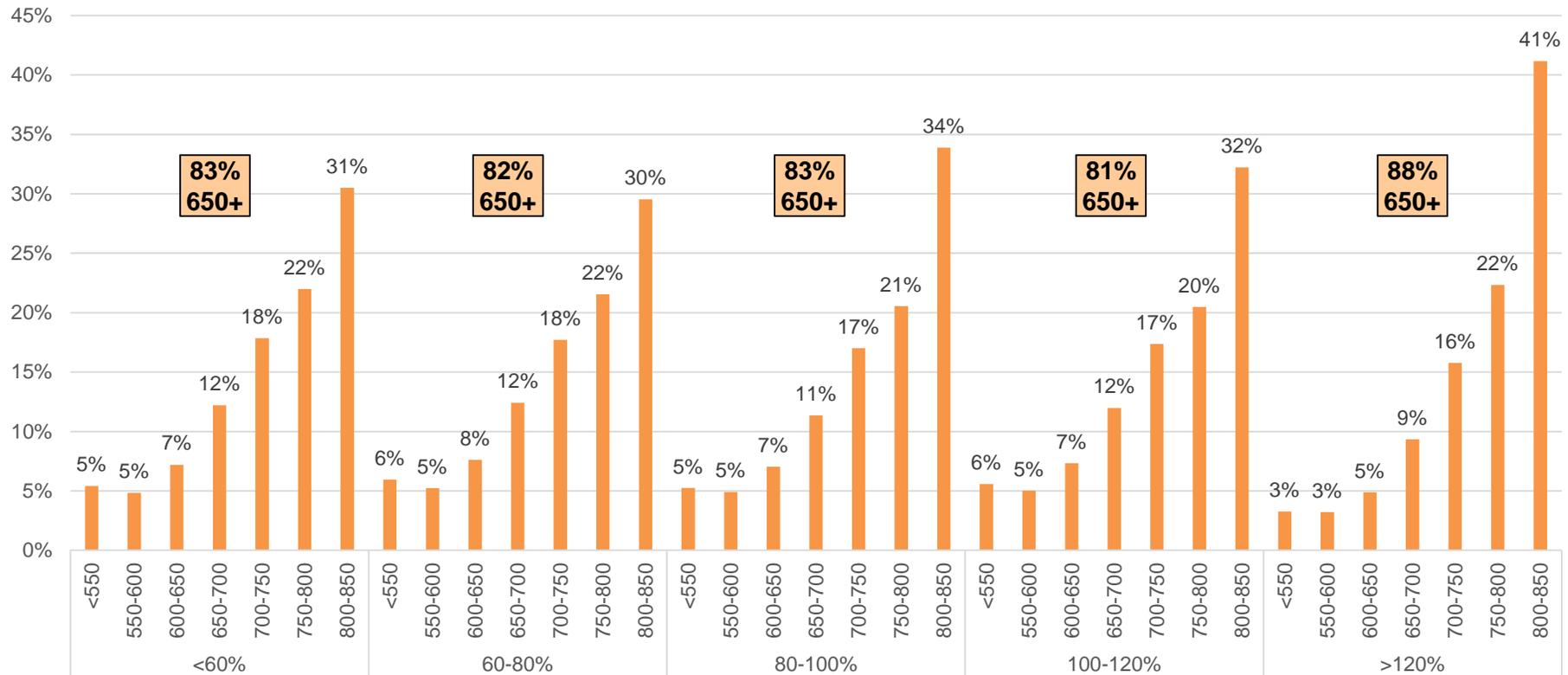
- Competitive product scan
- Census and general market data (DOE LEAD)
- Credit data (FICO)
- Customer segmentation data (PRIZM)
- Energy burden modeling



# Credit-Worthy LMI Borrowers In Greater #'s in CT than Presumed



CT Homeowners 2017 FICO Scores by Income Band



This presents an opportunity for financing for some segments of the low-to-moderate income market

# Residential 1-4 Owner Occupied Low-to-Moderate Income Portfolio



## smart-e loan

- Anchor offering using a 2<sup>nd</sup> loss reserve to attract local lenders
  - \$3MM LLR
  - \$6MM in interest rate buydown campaigns
- Low interest, flexible terms
- 40+ measures (EE and RE) through managed contractor network
- Traditional underwrite with generous criteria



- 2015 LMI Solar Financing RFQ helped create a \$45MM+ Fund – Solar for All
- \$8.5MM CGB investment
- Product offering combines non-escalating solar lease with energy efficiency services
- Utility weatherization programs (HES or HES-IE) leveraged
- Alternative underwrite
- Community partnerships

***Thoughtful program guidelines help achieve strong consumer protections***

# Smart-E Loan for Homeowners with Network of Local Lenders & Contractors



## *Quick, Easy, Affordable*

- Unsecured personal loan, no application fee, no prepayment penalty
- **Low-interest** with **flexible terms** and fixed monthly payments
  - 2<sup>nd</sup> loss reserve used to achieve below market rates and longer terms
- **40+** energy improvements can be financed
  - Boilers, Furnaces, Heat Pumps, Central Air, Insulation, Solar, EV Chargers and more!
  - Loan amounts from \$500-\$40,000
- 25% of Loan can be used to address **health & safety**, appliances, “other”
- **Working capital** built in for contractors

Loan Terms			
5-yr	7-yr	10-yr	12-20-yr
4.49%	4.99%	5.99%	6.99%

- **Standard:** **640+ FICO**, 40-45% DTI
- **Credit-Challenged:** **580+ FICO**, 50% DTI



**smart-e loan**

# Smart-E Results in Connecticut



- **2,900** closed loans totaling **\$51 million** of investment
  - 1,500 financed with .99% special offer (\$28M)
  - 425 financed with 2.99% special offer (\$10M)
- **40,000 MMBTUs** saved, **7.7MW** of solar PV
- **\$17,500** average amount financed
- Average FICO is **735**, trending down, DTI 30%
- Approaching **market penetration parity** across income-banded census tracts
- Superior portfolio performance



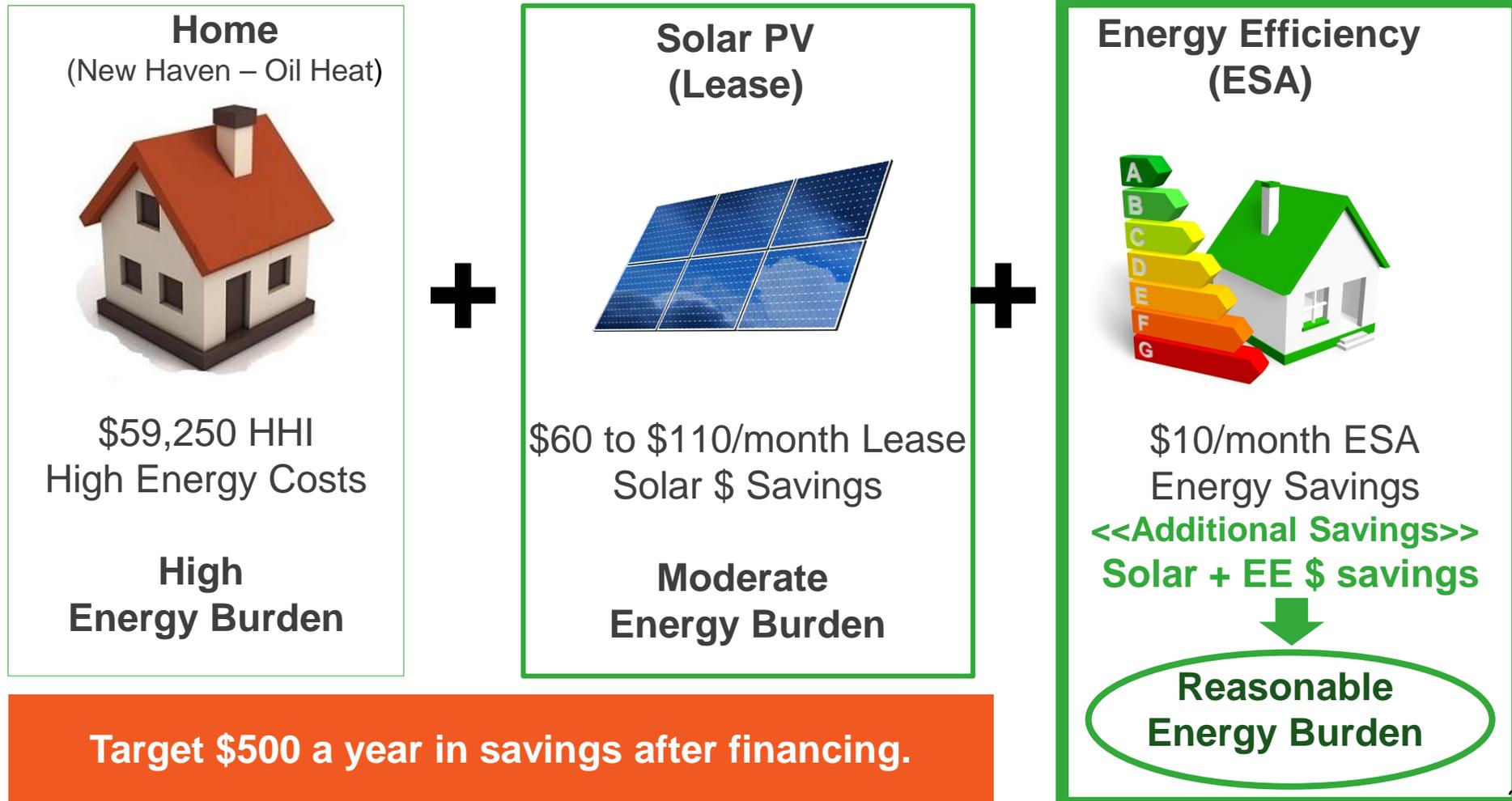
TOP SMART-E MEASURES	
Measure Category	Percent of Projects
Solar PV	18%
Boiler	17%
Insulation	13%
Other*	10%
Ductless Heat Pump	10%
Furnace	10%
Central AC	9%
Hot Water Heater	5%
Windows	3%
Air Source Heat Pump	3%
Electric Heat Pump Water Heater	2%
Geothermal Heat Pump	1%

\*Other may include doors, appliances, or health and safety remediations

# Solar For All with PosiGen

## Lease & ESA for Single Family LMI Market

PosiGen Co-investment: \$8.5 million in Green Bank capital leveraged to create a **\$45 million fund**



# Solar for All with PosiGen



## Solar for All Campaign Progress

- ✓ 1,600+ contracts since 2015, ~10 MW of solar PV
- ✓ ~2/3 of contracts are LMI (*getting the LMI tiered incentive*)
- ✓ 75% of projects in census tracts <80% AMI

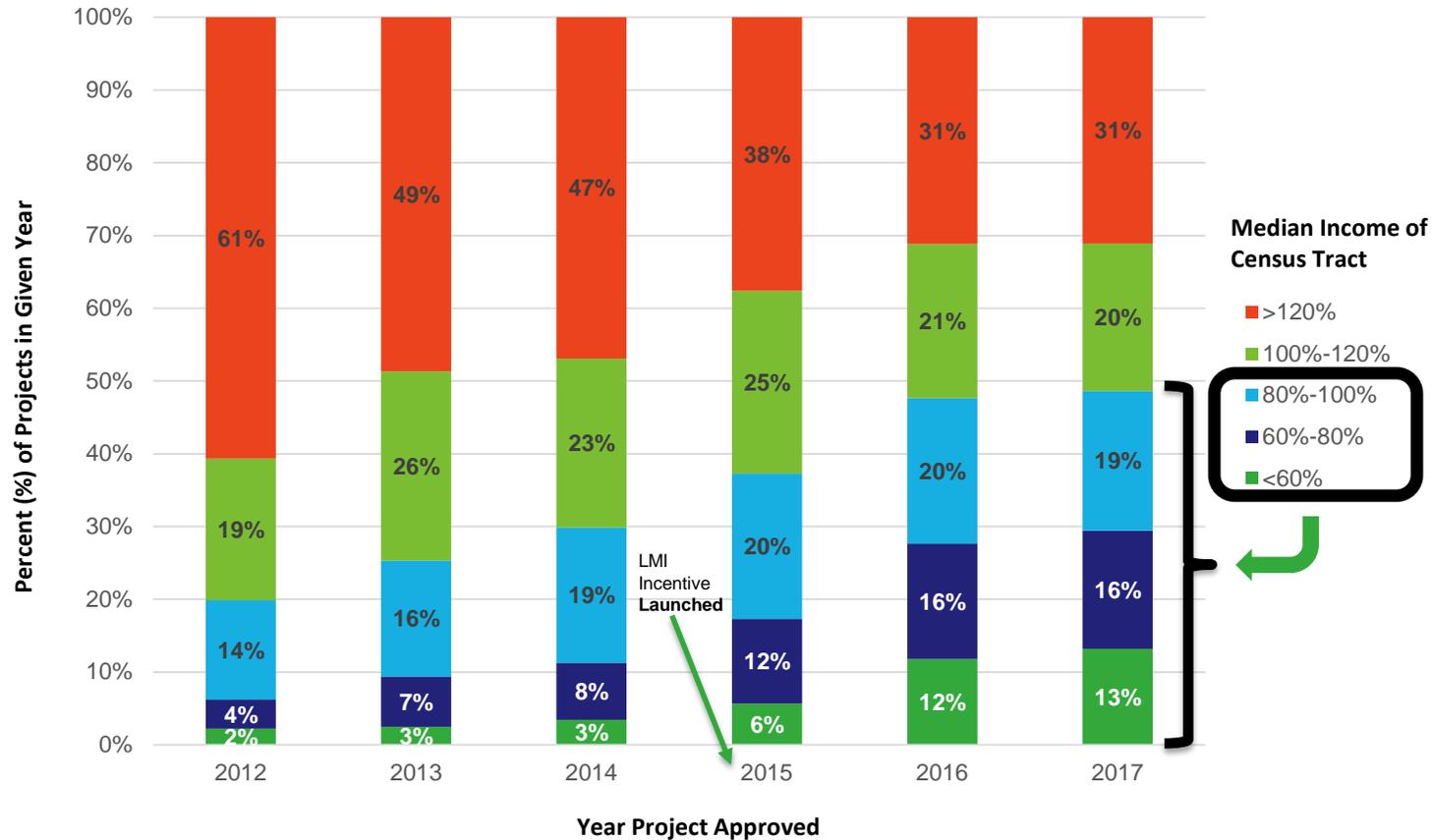
## Energy Efficiency Progress

- ✓ 99.9 % of households get Direct Install EE measures, 19,500 MMBTUs saved
- ✓ **69% of households also undertake “deeper” energy efficiency projects** through \$10 ESA payment/month for 20 years



# Moving the Needle on Inclusive Prosperity – Residential Rooftop PV

Solar Penetration by Census Tract Median Income 2012-2017



*Solar penetration in census tracts earning <100% of area median income grew from 17% in 2012 to 48% in 2017*

# Mobilizing Investment for All

## “Beyond Parity” for Rooftop Solar



AMI Band	# of Solar PV Projects	# Owner Occupied HH (1-4 Units)	% of Total Owner Occupied HH (1-4 Units)	% Projects in AMI Band
<60%	2,179	60,769	7.1%	8.1%
60-80%	3,347	99,220	11.6%	12.5%
80-100%	5,152	165,331	19.3%	19.2%
100-120%	6,070	187,463	21.8%	22.6%
>120%	10,077	345,311	40.2%	37.6%
<b>Total</b>	<b>26,826</b>	<b>858,094</b>	<b>100%</b>	<b>100%</b>

“There can be no renewal of our relationship with nature without a renewal of humanity itself. There can be no ecology without an adequate anthropology.”

Pope Francis

# Affordable Multifamily Housing

## Unlocking Cash Flows with Unsecured LIME Loan



### East Meadow Condo Association, Manchester, CT



[www.ctgreenbank.com/our-stories/#multifamily](http://www.ctgreenbank.com/our-stories/#multifamily)

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

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

# Transformative Naturally Occurring Affordable Housing Project



## Success Village Co-Op, Bridgeport



<b>Description:</b>	964 units, WWII workers housing
<b>Annual Heating Costs:</b>	\$1.8M (2015)
<b>Potential Energy Upgrades:</b>	Central steam boiler system, steam pipe network, unit insulation
<b>Health &amp; Safety Issue:</b>	Asbestos contamination

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

# High Performing New Construction



## West Gate Apartments, 515 West Ave., Bridgeport



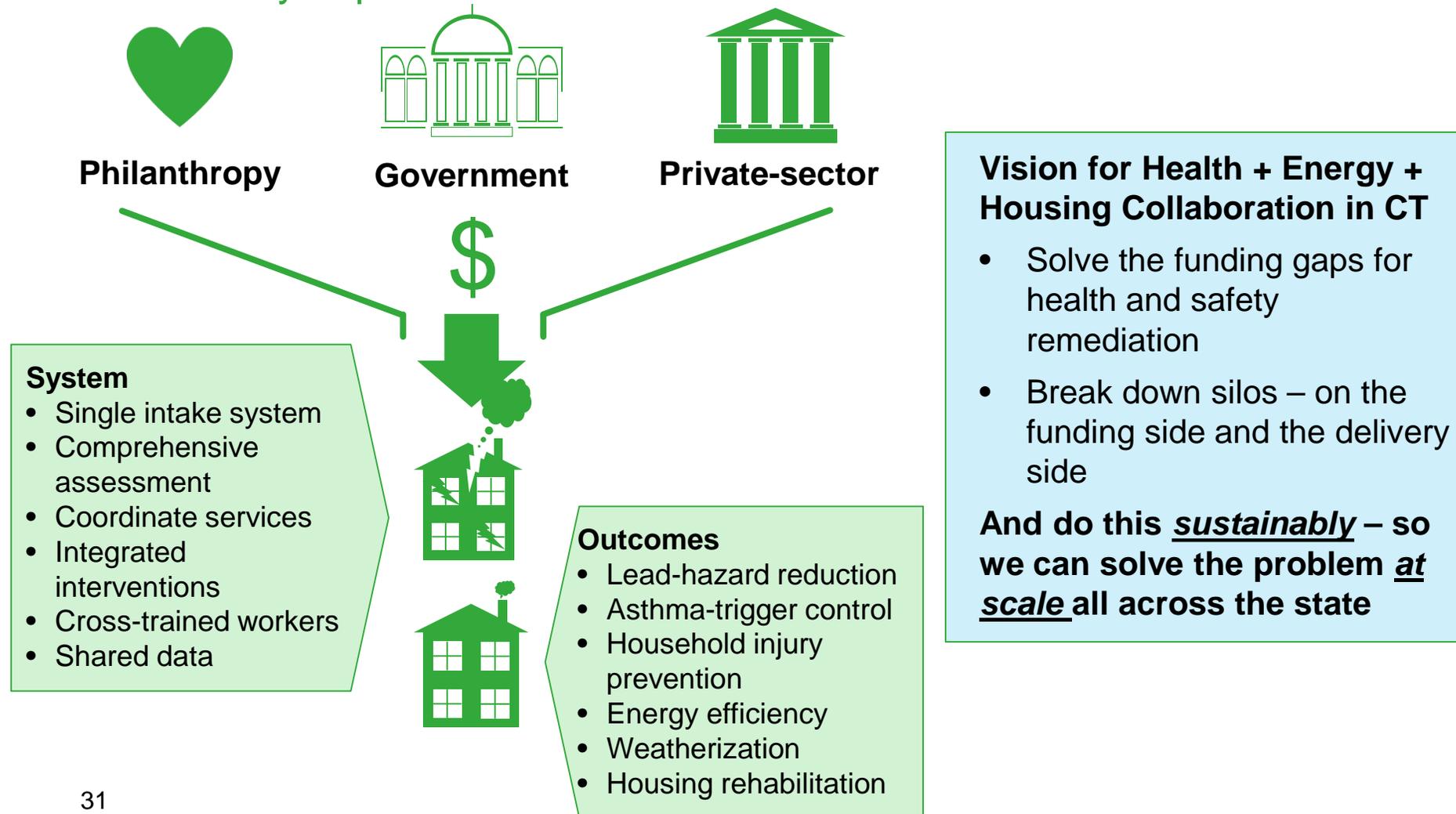
<b>Description:</b>	48 total units with two commercial spaces (58,994 sqft)
<b>Energy Efficiency Measures:</b>	Increased insulation in wall, floor, roof; increased window, water heat and heating efficiency;
<b>Energy Upgrades:</b>	Adding solar through PPA
<b>Total funds:</b>	\$391,300 Green Bank Debt Capital - \$250,000, Green Bank Forgivable Loan - \$37,500

Pre-development and term capital enables a strong nonprofit developer to include high performing green features for project supporting very low income families and homeless veterans.

# Tacking Health & Safety Funding

## The GHI Model: “No Wrong Door”

Aligning services and funding, braiding relevant resources, coordinating service delivery to produce results



# CT Green and Healthy Homes Project

## Strong Agency & Partner Buy-In for Statewide Systems Change Model to Unlock Sustainable Funding



**More Info:**

[www.ctgreenbank.com](http://www.ctgreenbank.com)

**Contact us:**

Kerry O'Neill

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# Appendix: Supplemental Information

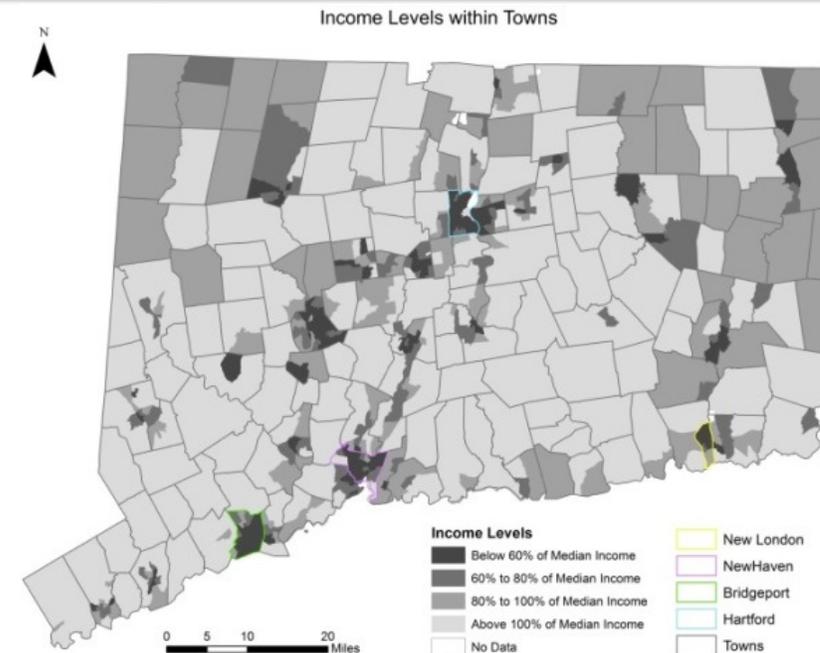
# CT Low-to-Moderate Income Market: By the Numbers

Income Level by AMI Band	# of Census Tracts	Tract Households	% of Households	Tract Owner Occupied Households	% OO HHs in AMI Band	Tract Renter Occupied Households	% Rental HHs in AMI Band	Average Median Household Income
<60%	167	232,021	17%	67,273	29%	164,748	71%	\$35,054
60%-80%	110	194,858	14%	103,963	53%	90,895	47%	\$55,135
80%-100%	128	225,955	17%	149,072	66%	76,883	34%	\$69,958
100%-120%	144	253,815	19%	193,581	76%	60,234	24%	\$81,930
>120%	274	448,028	33%	386,334	86%	61,694	14%	\$118,744
<b>Grand Total</b>	<b>823</b>	<b>1,354,677</b>	<b>100%</b>	<b>900,223</b>	<b>66%</b>	<b>454,454</b>	<b>34%</b>	<b>\$78,658</b>

**CT Green Bank Definitions**

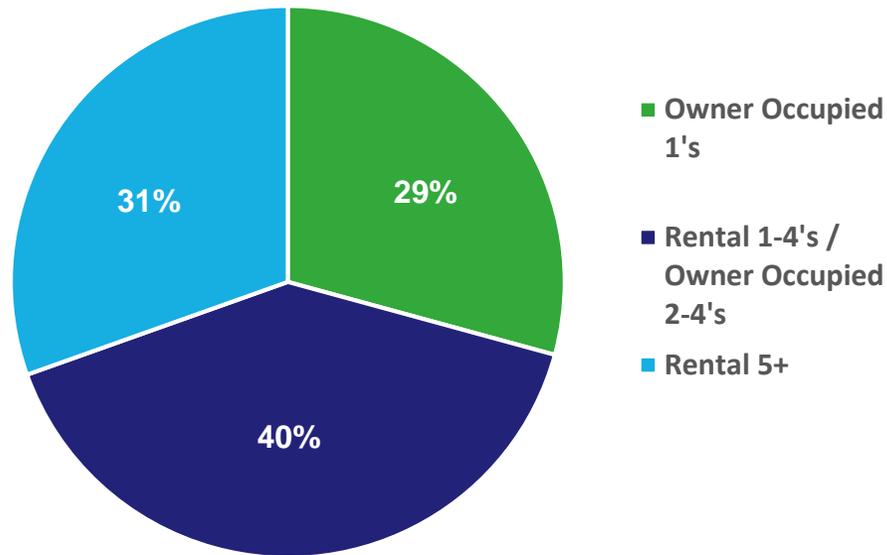
**Low Income = 80% AMI or lower, 40% are homeowners**

**Moderate income – 81%-100% AMI, 66% homeowners**



# Residential Low Income Market By the Numbers

Low-Income Households by Housing Type



## QUICK FACTS: LMI HOUSING IN CT

Connecticut Population - 3,589,000

Total Housing Units – 1,355,000

Total Low Income Units – 427,000 (32%)

% Low Income in 1-4 Units – 70% (297,000)

% of Low Income in 5+ Units – 30% (130,000)

% Homes that are Low Income

- Single Family – 17%
- 2-4 units – 64%
- Multifamily 5+ units – 56 %

% of Homes Built Before 1979 – 72%

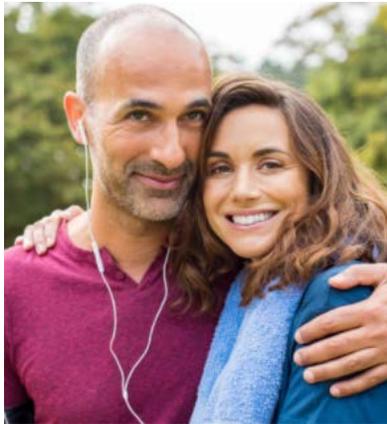
% of Homes Built Before 1939 – 25%

Low income households are concentrated in older properties in poor condition, in need of significant capital improvements, and include many smaller rental properties.

# Customer Segmentation

## A targeted approach to customer acquisition

### DOLLARS & SENSE



“Judy & Dante”



Total Customer Count:  
74,143

### SEEKING STABILITY



“Kurt”



Total Customer Count:  
61,434

### SURVIVING NOT THRIVING



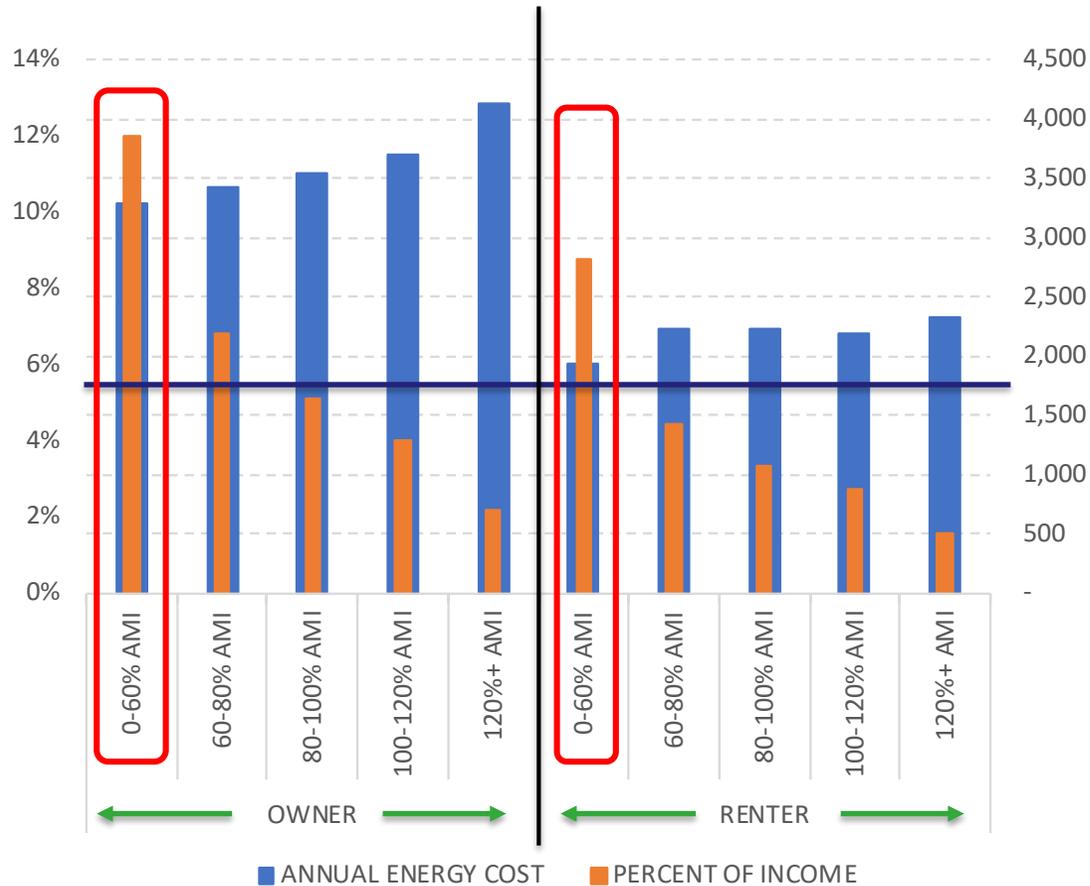
“Emma”



Total Customer Count:  
18,186

# Reducing Energy Burdens For Those That Need It Most

ENERGY BURDEN [AVG. EXPENDITURES/AVG. INCOME, \$/YEAR]



Energy costs are amongst the highest in the country and a significant portion of household expenses

More than half our low income residents suffer a high energy cost burden (>10% of income)

AMI Bands	Avg. Household Income – MF
0-60%	\$20,000
60-80%	\$48,000
80-100%	\$65,000
100-120%	\$77,000
120%+	\$131,000

To have meaningful impact on energy burdens we must provide comprehensive solutions that combine solar + EE

# Low-to-Moderate Income Residential Properties: Old and Aging (In Place)



**Older housing stock is NOT just about energy:  
Health and safety issues estimated in 25-40% of units**

# State Energy Efficiency Financing Landscape



Product	Term	Rate	How much can customers borrow?	Key Features
Home Energy Solutions Micro Loan	3 years	0%	Up to \$3,000	On bill or direct bill; for pre-approved measures
Energy Conservation Loan	10 years	0%-2.99%	\$400-\$25,000	Direct bill; Income requirements; No minimum credit score; Emergency situations only; Customers must not qualify for Smart-E or Heating Loan
Smart-E Loan	5-12 years	4.49%-6.99%	\$500-\$40,000	Direct bill; 100% financing; 40% eligible measures; health and safety; FICO 580+
Heating Loan	3-10 years	0.99%	Up to \$15,000; Up to 90% of project cost	On-bill; looks at energy savings to determine eligibility and down payment

# Observations



- Need to have a long horizon, analyze your market, sequence strategies, and invest for long term
- Don't assume low-to-moderate income residents don't want solar!
- Don't assume just because uptake in LMI markets is low that the product is wrong (though it might be...)
  - Need targeted outreach/marketing and
  - contractors serving these markets
- LMI residents are not always correlated with bad credit!
  - But... they are much more likely to assume their credit is bad, and therefore not even apply for financing
  - Alternative underwriting strategies can be a big help
- Consumer protections and education are a must
  - Especially with LMI, and even more especially with LMI seniors

# On-Bill vs. Unsecured Lending



- On-bill doesn't appear to give a product an advantage over direct bill/unsecured
  - Contractor channel and targeted outreach are much, much more important to success
- Get to know your utilities
  - Do they want to be involved in an on-bill program
  - Are their billing, customer service, other systems set up to handle all the intricacies of on-bill?
  - What's their IT queue like? (e.g., is it 1+ years before your project can get programmed?)
  - How much will it cost, and who is paying?
    - e.g., in Smart-E product, participating lenders pay for origination/underwriting/servicing, not the program

**Terri Novak**  
**Michigan Energy Office**

# MI CELICA: Cherryland Community Solar Pilot

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Terri Novak  
Michigan Energy Office

2018 Energy Exchange & Better Buildings  
Summit

August 22, 2018



# Agenda

- **Michigan Agency for Energy/Energy Office**
- **US DOE CELICA Accelerator**
- **MI CELICA - Cherryland Pilot Project**
- **Successes/Challenges**
- **Lessons Learned**
- **Next Steps**
- **Resources**

# Michigan Agency for Energy



- **Michigan Energy Office**
  - ✓ State Energy Program
  - ✓ Technical Assistance
  - ✓ Financial Assistance
- **Energy Security**
- **Outreach and Education**

# Michigan Energy Office

**Promote healthy communities, economic growth and environmental sustainability through EWR and RE.**

- Engage stakeholders to achieve combined 35% EWR/RE by 2025
- Accelerate economic growth thru advanced mobility, manufacturing and healthy communities
- Lead-by-example initiatives
- Provide and support energy education
- Encourage the use and transparency of energy data

# MI CELICA



## Pairing:

- Weatherization
- Income Eligibility
- EWR and Solar

## Demonstrations:

- Cooperative
- Municipal
- Investor Owned

# MI CELICA - Cherryland Pilot **Project Partners**

- **Federal Partners:**

- Department of Energy, Better Buildings Initiative
- National Renewable Energy Laboratory (NREL)

- **State Agencies:**

- Michigan Agency for Energy (MAE) - MI Energy Office
- Michigan Public Service Commission (MPSC) – Customer Service
- Department of Health and Human Services (DHHS) – Weatherization Assistance Program

- **Local Utility:** Cherryland Electric Cooperative

- **Local Community Action Agency:** Northwest Community Action (NWCAA)

# MI CELICA - Cherryland Pilot Project Roles

- **Cherryland Electric Cooperative**

- Marketing, recruitment, and education
- Develop billing structure
- Collect routine energy data on electricity usage
- Lead on Power Purchase Agreement with Wolverine Power/Spartan Solar
- Support shares for 250 panel subscriptions from Spartan Solar Community Array

- **North West Community Action Agency**

- Identify and select 50 eligible households
- Marketing and educate customers
- Weatherization Assistance

- **State of Michigan**

- Coordinate partner relations and Fed TA, implementation, reporting and initial work plan
- Establish eligibility criteria
- Support shares for 200 solar panel subscriptions
- Conduct data analysis, evaluate metrics, and case study

# MI CELICA - Cherryland Electric Cooperative

- Member owned, electricity distribution cooperative
- Purchase power through Wolverine Power Cooperative
  - Wolverine owns Spartan Solar, a community solar array near Cadillac, MI  
<https://www.spartansolar.com/>
- Covers six counties in N. Michigan  
(Benzie, Grand Traverse, Kalkaska, Leelanau, Manistee, Wexford)
  - Rural, low-moderate income populations
  - Most receive heat through propane and wood

# MI CELICA - Cherryland Pilot Project Overview

- Cherryland Pilot Project launched in Fall, 2017
- Serving 50 low income households
- Eligibility criteria includes
  - Income at/below Federal poverty line
  - Previously received weatherization services
  - Own or rent their house, and designated as single-family
  - Willingness to share energy data
- Households enrolled on an annual basis
- Solar generated through existing community solar array

# MI CELICA - Cherryland Pilot **Successes**

- Partnerships (Ready, Willing and Able)
- Leveraging Resources
- Enrolled 50 households
- Bill credits began March 1, 2018 (est. to save 30-40%)
- Testimonial:

*Roblero-Gomez and Ogemagegedo are both looking forward to seeing what those shares do for their power bill. It's been higher than usual lately, and their struggle to make ends meet has only gotten worse as costs rise and Ogemagegedo deals with health issues. "We've just got to get over this hump, and we're really fortunate to have programs that can help us."*

[http://www.record-eagle.com/news/local\\_news/solar-for-struggling-households/article\\_16f40b22-4db8-536a-a19c-d599523570d9.html](http://www.record-eagle.com/news/local_news/solar-for-struggling-households/article_16f40b22-4db8-536a-a19c-d599523570d9.html)

# MI CELICA - Cherryland Pilot Challenges

- Funding/Mgt of Solar Subscriptions
- Size and Scope
- Ownership Model
- Selection and Eligibility

- Timing and Partnerships
- Investor Owned Utility issues
- State Policy
- Model Replication
- Subscription Management

# MI CELICA - Cherryland Pilot **Lessons Learned**

- **Messaging matters**
  - Local Leads on program education and enrollment
- **Strong partnerships essential**
  - Community Action Agency (weatherization provider), and Utility
  - 3<sup>rd</sup> party facilitator to help facilitate and educate
- **Start small scale**
  - Can always expand
  - Don't assume energy literacy
  - Educate, educate, educate
- **Spread the word**

# MI CELICA – Cherryland Pilot **Additional Background**

- Podcast Interview
  - <https://www.cherrylandelectric.coop/2018/02/cherryland-pilots-low-income-solar-program/>
- News Articles
  - <https://www.cherrylandelectric.coop/2018/05/caring-for-the-forgotten/>
  - <https://www.cherrylandelectric.coop/2018/02/cherryland-pilots-low-income-solar-program/>
  - <https://www.solarpowerworldonline.com/2018/03/michigans-first-renewable-energy-program-low-income-customers/>
  - <http://www.9and10news.com/2018/03/10/cherryland-electric-cooperative-helping-lower-bills-solar-energy/>

# MI CELICA – What's Next

- Continue monitoring the Cherryland pilot project
- Data analysis and project evaluation
- Find additional pilot sites to replicate
- Promote pilots



# Thank you

Terri Novak  
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# Table Top Discussion

- 1. What are you facing right now on this topic and what questions on this topic are most burning for you?**
- 2. What in your mind needs to shift for your local area to make progress in this area?**
- 3. What results have you had?**

# CELICA Feedback

1. **What would you like to see in the future for low income energy?**
2. **What initiatives are pressing for you that the federal government can assist with?**