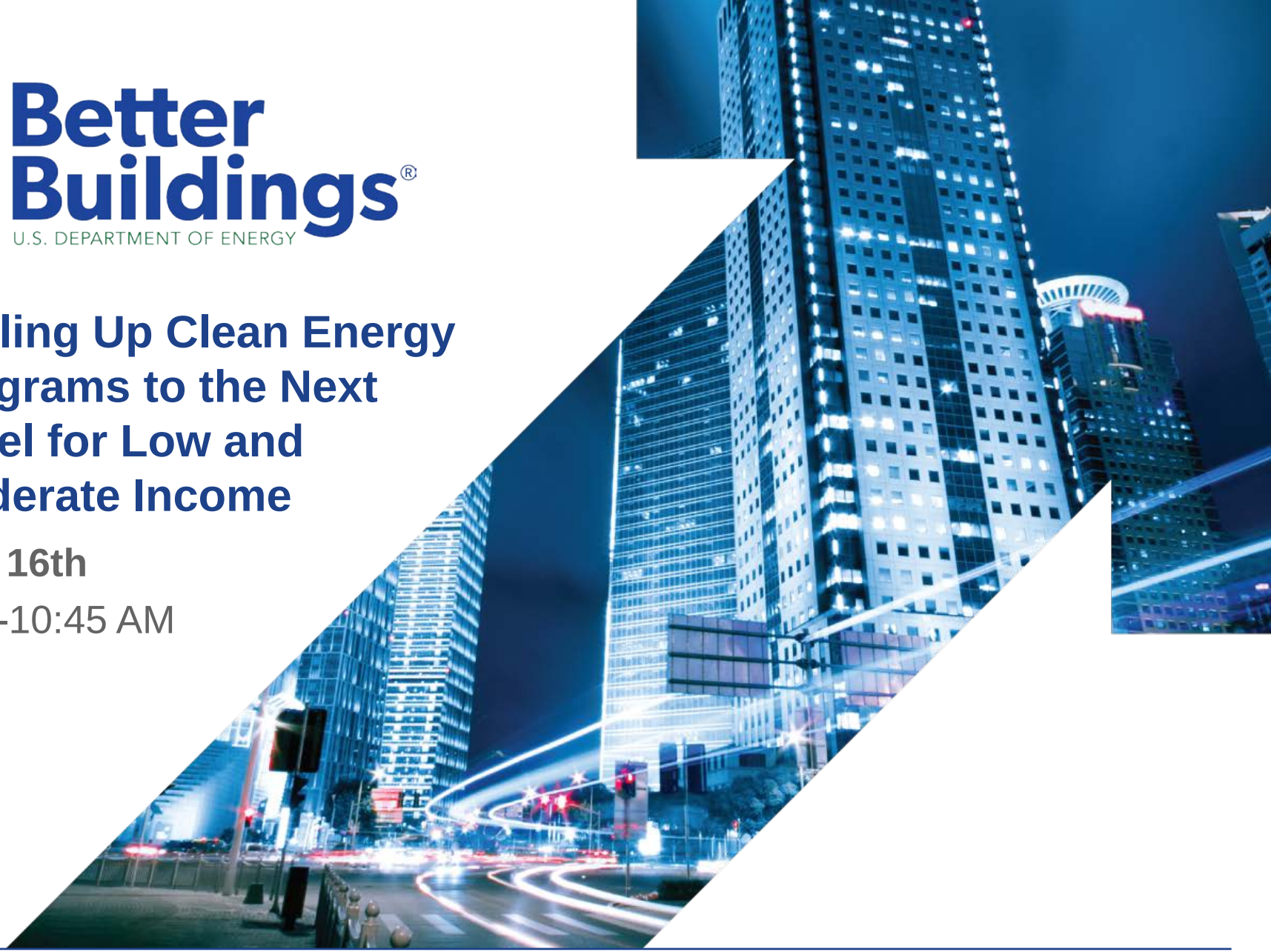
Better Buildings®
U.S. DEPARTMENT OF ENERGY

Scaling Up Clean Energy Programs to the Next Level for Low and Moderate Income

May 16th

9:30-10:45 AM



U.S. DEPARTMENT OF ENERGY

Panelists

- Diana Duva, State of Connecticut
- Benjamin Healey, Connecticut Green Bank
- Joe Pereira, State of Colorado
- Jennifer Gremmert, Energy Outreach Colorado
- Michael DiRamio, US Department of Energy

Diane Duva & Benjamin Healey

State of Connecticut &
Connecticut Green Bank

U.S. DEPARTMENT OF
ENERGY

Scaling for Success: Clean and Efficient Energy for Low to Moderate Income Homes in Connecticut

Better Buildings Summit

May 17, 2017

Progressive State Policies

The backbone of successful programs

Executive Order 46 on Climate Change Creates the GC3

Public Act 15-107 authorizes large scale procurements by the Department

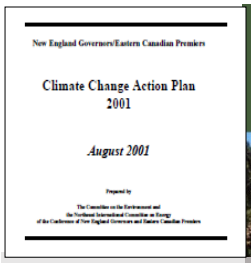
Public Act 12-2 establishes C-PACE

GSC finalizes *CT Climate Change Action Plan*

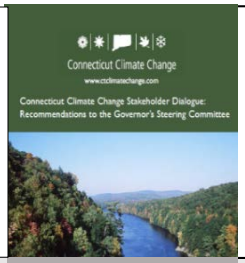
2007 Public Act 07-242 – Energy Efficiency and Expansion of the Renewable Portfolio Standard

2014 Integrated Resource Plan

CT signs *NEG/ECP 2001 Climate Change Action Plan*

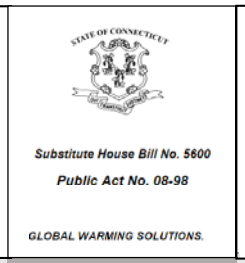


2001

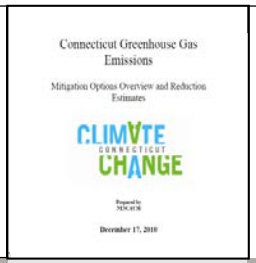


2004

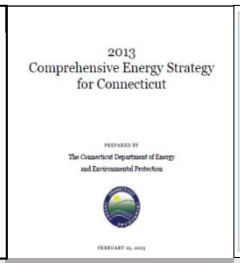
2005



2008



2010



2013

2015

2015

An Act Concerning Climate Change (Public Act 04-252) sets GHG goals that align with NEG/ECP regional goals

CT Global Warming Solutions Act (Public Act 08-98) reaffirms commitment to GHG targets for 2020 and 2050

2013-2015 Conservation & Load Management Plan

CT 's implementation of 1990 Amendments to Federal CAA continues

Regional Greenhouse Gas Initiative

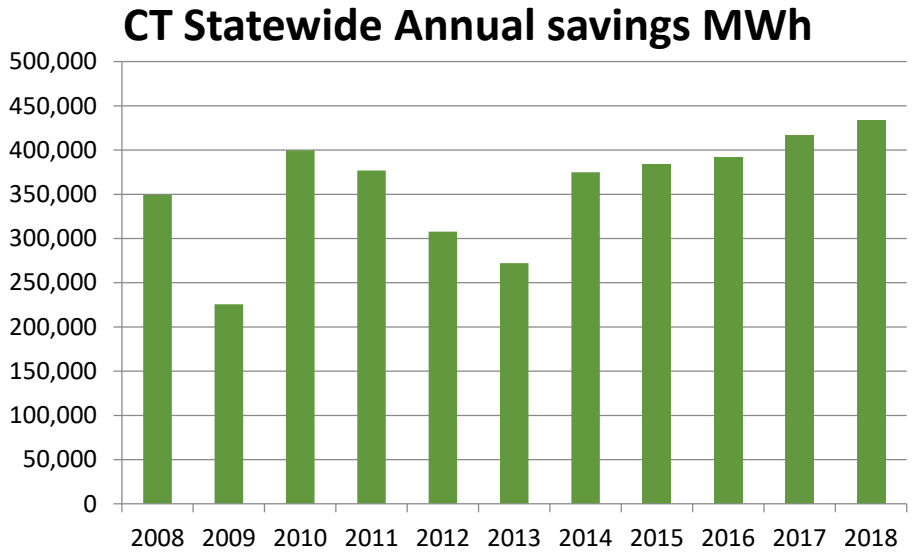
RPS (20% Class I Renewable Energy by 2020

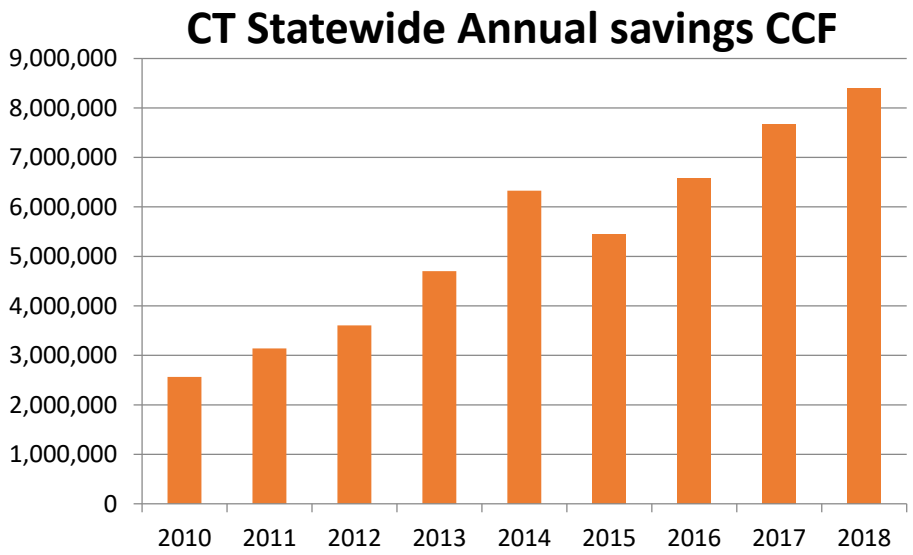
CT 's implementation of The RPS continues

2013 Comprehensive Energy Strategy

Current Policies:

Efficiency and Energy Savings as a Resource



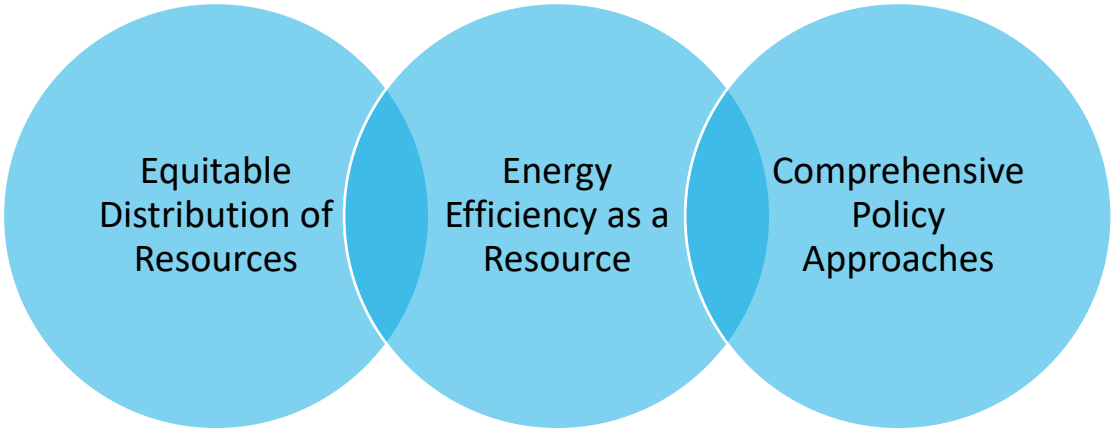


- $700M portfolio for customers
- 129k residential homes weatherized
- 9.7 M residential products distributed
- All 169 communities actively engaged
- 28k businesses more efficient

- **Energy as a resource: Energy savings equivalent to the output of a 262 MW power plant**

Current Policies:
Equitable Distribution

- Regular evaluation of statewide distribution of CT Energy Efficiency Fund and CT Clean Energy Fund to ensure equity across ratepayers.
- Census tract by census tract basis
- Ratio of proportion of contribution to the fund, to proportion of total incentives for EE projects received



Our Organizing Theory

Ground ourselves in market data, create a policy and program roadmap spanning several years.

Then look for multiplier effects and ***keep at it***.

Reducing Energy Burdens in CT

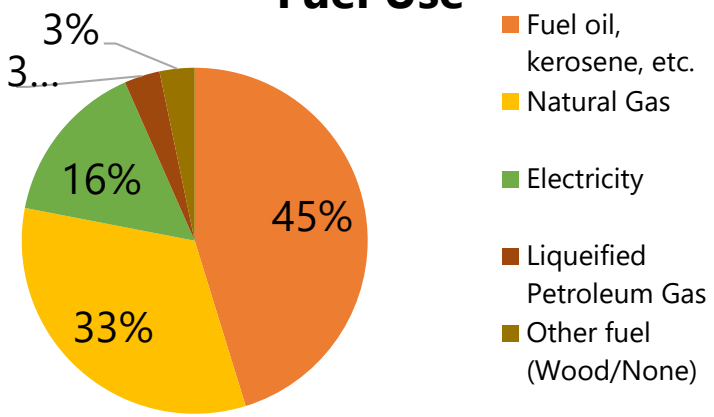
For all types of building owners

Energy costs are a significant portion of household expenses

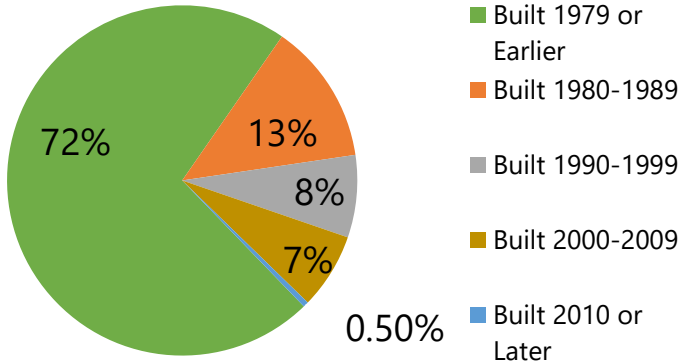
- CT residents spend $5.2 billion to heat, cool, light and provide hot water – more than the state's budget for health care or education
- More than half our low income residents suffer a **high energy cost burden** (>10% of income)
- "Energy Affordability Gap" ranges from $1,250 to $2,500 per year for households up to 200% of the Federal Poverty Level
- Aging homes and buildings are often energy inefficient and have significant health and safety issues

Understanding our Market:
Segmentation & Identifying Gaps

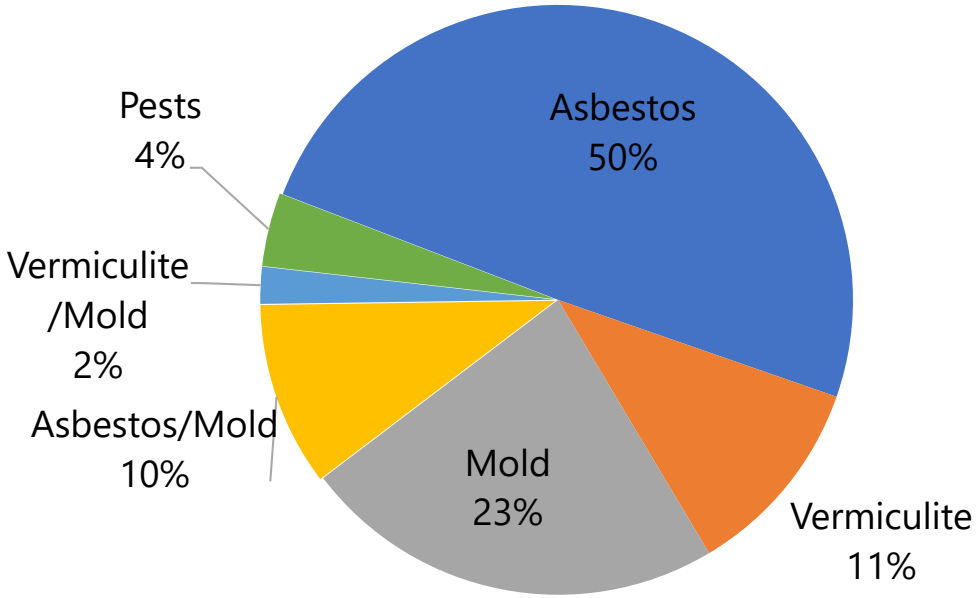
Housing Units by Thermal Fuel Use



Housing Units by Vintage



Proportion of Income Eligible Homes with Barriers to Weatherization



1.4 million housing units
140,000 businesses
Make up 70% of Connecticut's
750 trillion BTU annual energy consumption

CT Low-to-Moderate Income Market

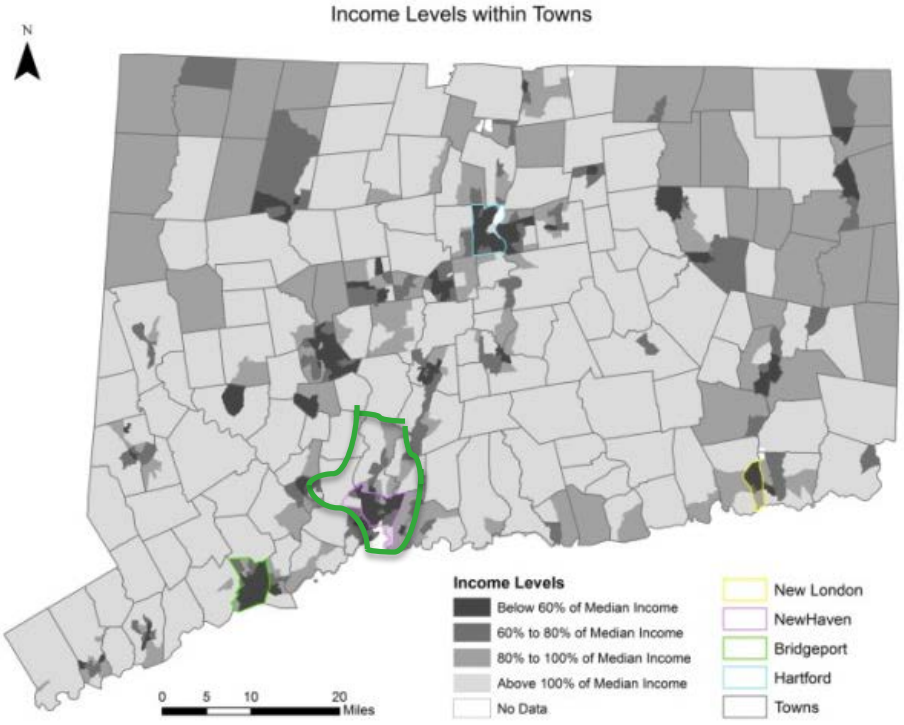
By the numbers

Income Level by AMI Band	# 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 2010 Tract Median HH Income
<60% AMI	171	240,062	18%	73,593	31%	166,469	69%	$34,401
60%-80% AMI	109	193,791	14%	104,971	54%	88,820	46%	$54,797
80%-100% AMI	153	269,711	20%	179,352	66%	90,359	34%	$68,396
100%-120% AMI	140	237,488	18%	190,944	80%	46,544	20%	$84,763
>120% AMI	251	411,504	30%	357,267	87%	54,137	13%	$118,626
Grand Total	824	1,352,556	100%	906,227	67%	443,163	33%	$77,623

Low Income = 80% AMI or lower, 1/3 of total or 430,000 households,
40% homeowners, 60% renters

Moderate income – 81%-100% AMI, 20% of total or 270,000 households,
65% homeowners, 45% renters

LMI renters split between 1-4 unit and 5+ unit buildings



REFERENCES

2015 ACS Census Info. Totals are greater than individual lines due to some projects falling in unclassified census tracts.

Where the Data/Market Insights Led Us

Not always where we thought we should focus...

- **1/3 of low income households own their homes**
  - **No statewide community solar policy**
  - **Very little tax burden for these owners**
    - Economics of tax credits are different
    - Credit and income don't correlate in CT, so financing options are on the table
  - **So…3rd party owned rooftop solar as part of solution**
- **State-sponsored housing was "target rich" even though it housed a minority of renters**
  - CHFA, DOH became strategic partners
  - Consultants, developers, etc. active in this market are also active in broader market
- **Majority of renters are in naturally occuring 1-9 unit MF properties**
  - Hardest to reach, in most financial distress
- **Would need to solve health & safety and other capital needs of housing stock**
  - Had some limited solutions, but would need to figure out more and better solutions

Differentiated Approaches

To scale clean energy for all incomes and all homes

Single Family

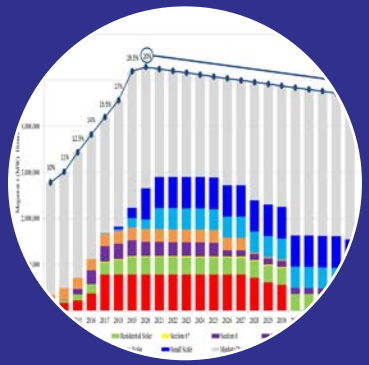
Private Partnership

Leveraging public programs

Multifamily

Public Agency / Utility Partnership

Housing + Energy

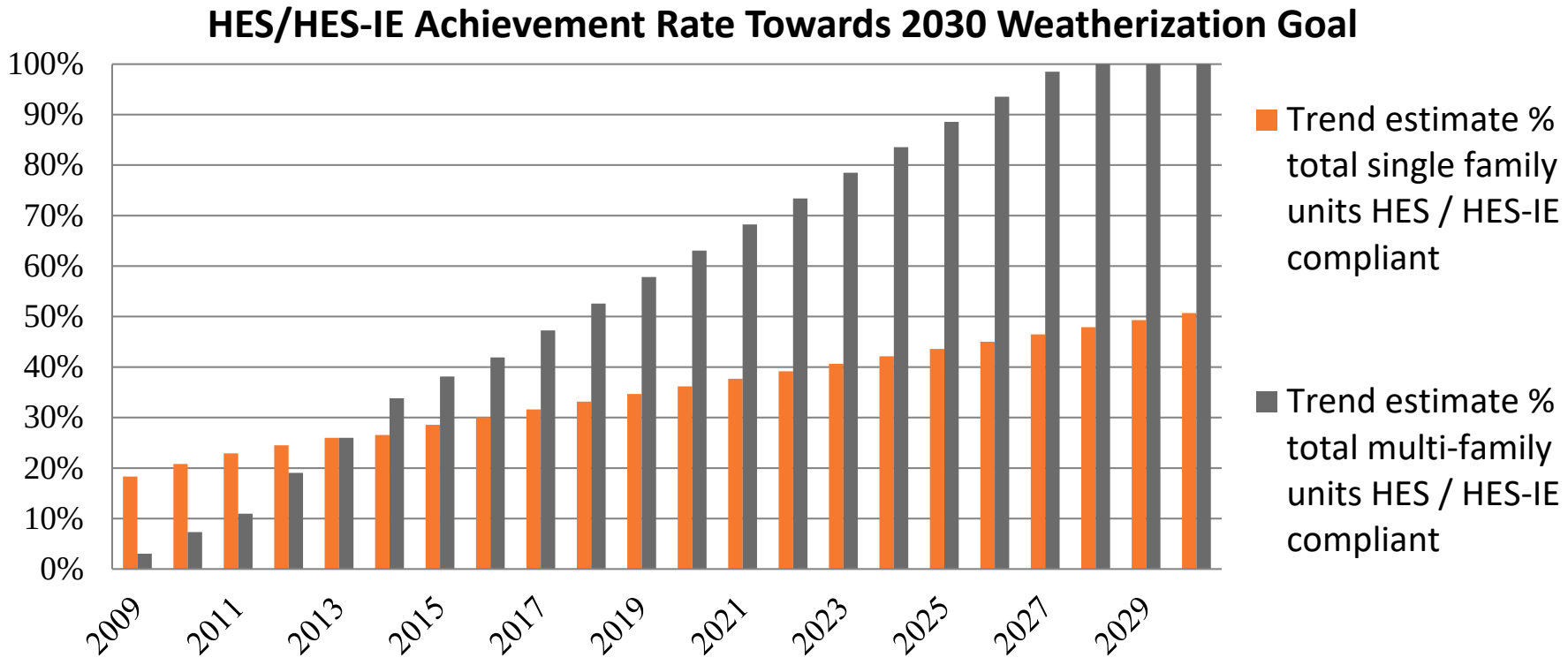


Larger Scale

Public large-scale procurement of efficiency as a resource and utility-scale renewable energy

Multiplier Effects

Scaling Up Weatherization of Low Income Homes Home Energy Solutions Income Eligible Program (HES-IE)



2016: 21,328 income-eligible households served

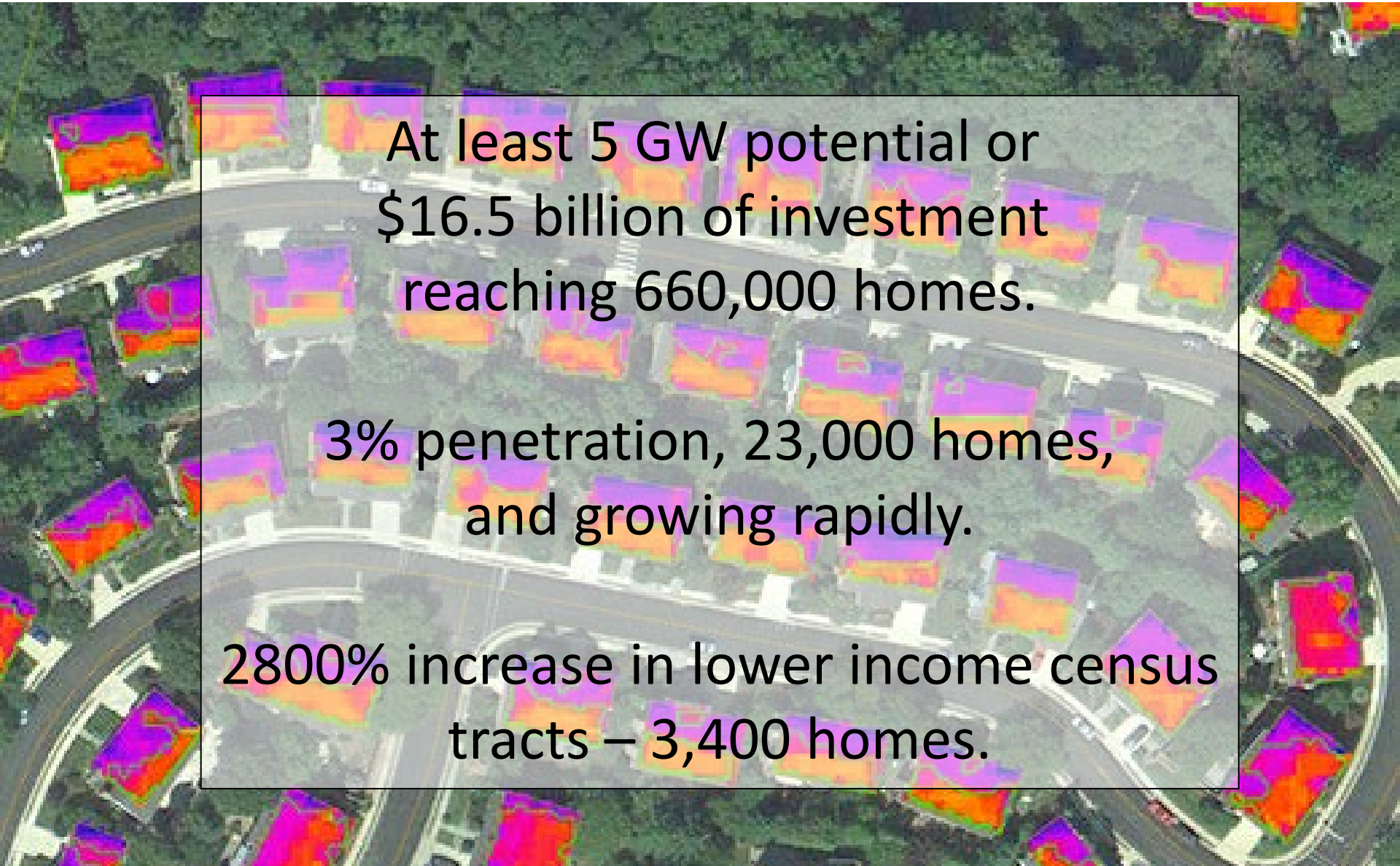
- $6.4 million in energy savings ($102.6 million lifetime)
- Average energy burden reduction of 24%

Bringing Weatherization to Scale:

- Slightly lower investment per home but allows 45 times the number served by WAP

Residential Rooftop Solar PV

Meaningful progress in low income communities



At least 5 GW potential or
$16.5 billion of investment
reaching 660,000 homes.

3% penetration, 23,000 homes,
and growing rapidly.

2800% increase in lower income census
tracts – 3,400 homes.

Residential Rooftop Solar PV

Steady, consistent effort to close the gap

2014

- **Began measuring solar penetration by income-banded census tract**
- Customer Segmentation Analysis
  - "Prudent Yankee" – less affluent customer segment going solar
- Credit data indicates financing opportunity for some segments

2015

- **Opened Solar Financing RFP**
- Created tiered LMI solar incentive
- PosiGen responds to both – got EE too

2016/ 2017

- **Keep drumming segmentation and credit/income message**
- Continue to recruit other 3rd party owners to LMI tiered incentive

Single Family Success Story

- **Solar for All Campaign Progress** – 835 installations in 17 months, 5.8 MW of solar PV
  - ✓ 71% of contracts are LMI *(getting the LMI tiered incentive)*
- **Energy Efficiency Progress**
  - ✓ 99.9 % of households get Direct Install EE measures
  - ✓ 66% of households also undertake “deeper” energy efficiency projects through $10 ESA payment/month for 20 years
- **Community Campaigns** – in Bridgeport, Hartford, New Haven, New London

We Can't Go it Alone: Interagency Partnerships are Critical to Achieving Deeper Energy Improvements in Affordable Multifamily Housing

Housing Agencies

CONNECTICUT HOUSING FINANCE AUTHORITY

CONNECTICUT Department of Housing

State of Connecticut

CONNECTICUT GREEN BANK℠

CONNECTICUT ENERGY ENVIRONMENT

DEEP/Utility Companies

EVERSOURCE

UI SCG CNG

energize CONNECTICUT℠

Common Goal: to achieve comprehensive, deeper energy improvements that help owners and tenants save energy, reduce costs, increase property values, and provide healthier and more comfortable housing.

So What Were the Challenges for Multifamily Properties?

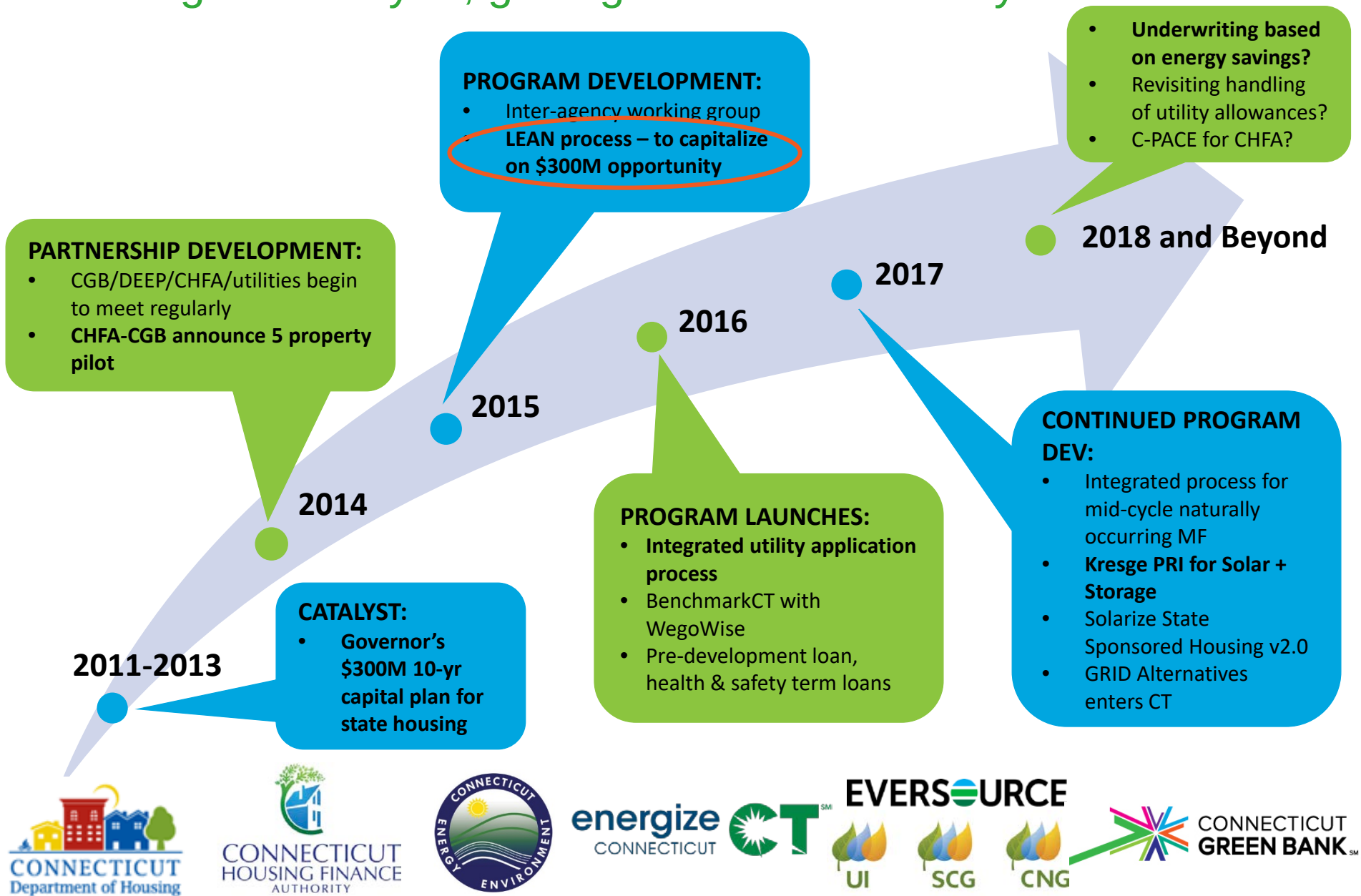
- Too **hard for owners**
- Individual agency **goals** and drivers **differed**
- We shared info, but processes **not integrated**
- Not designed to achieve desired outcomes
- We did **not** speak a **common language**
- We **operated in silos**

Multifamily Achievements:

1. New, clearly defined process to incorporate utility incentives into state funded multifamily projects
    - Created and streamlined utility incentive application forms
2. Utility incentives now required with all DOH/CHFA funding applications
    - Ensures utility incentives are included in initial project capital stack
3. Changes to LIHTC Qualified Allocation Plan
4. Loans for pre-development, technical assistance, gap financing and health & safety
5. New process to incorporate utility incentives into mid-cycle naturally occurring affordable multifamily projects

Energy Meets Housing – The Ultimate Multiplier

Getting to know you, getting to know all about you



CONNECTICUT Department of Housing

CONNECTICUT HOUSING FINANCE AUTHORITY

CONNECTICUT ENERGY ENVIRONMENT

energize CONNECTICUT CT

EVERSOURCE UI SCG CNG

CONNECTICUT GREEN BANK

Our Partners

Multifamily Partnership Successes:

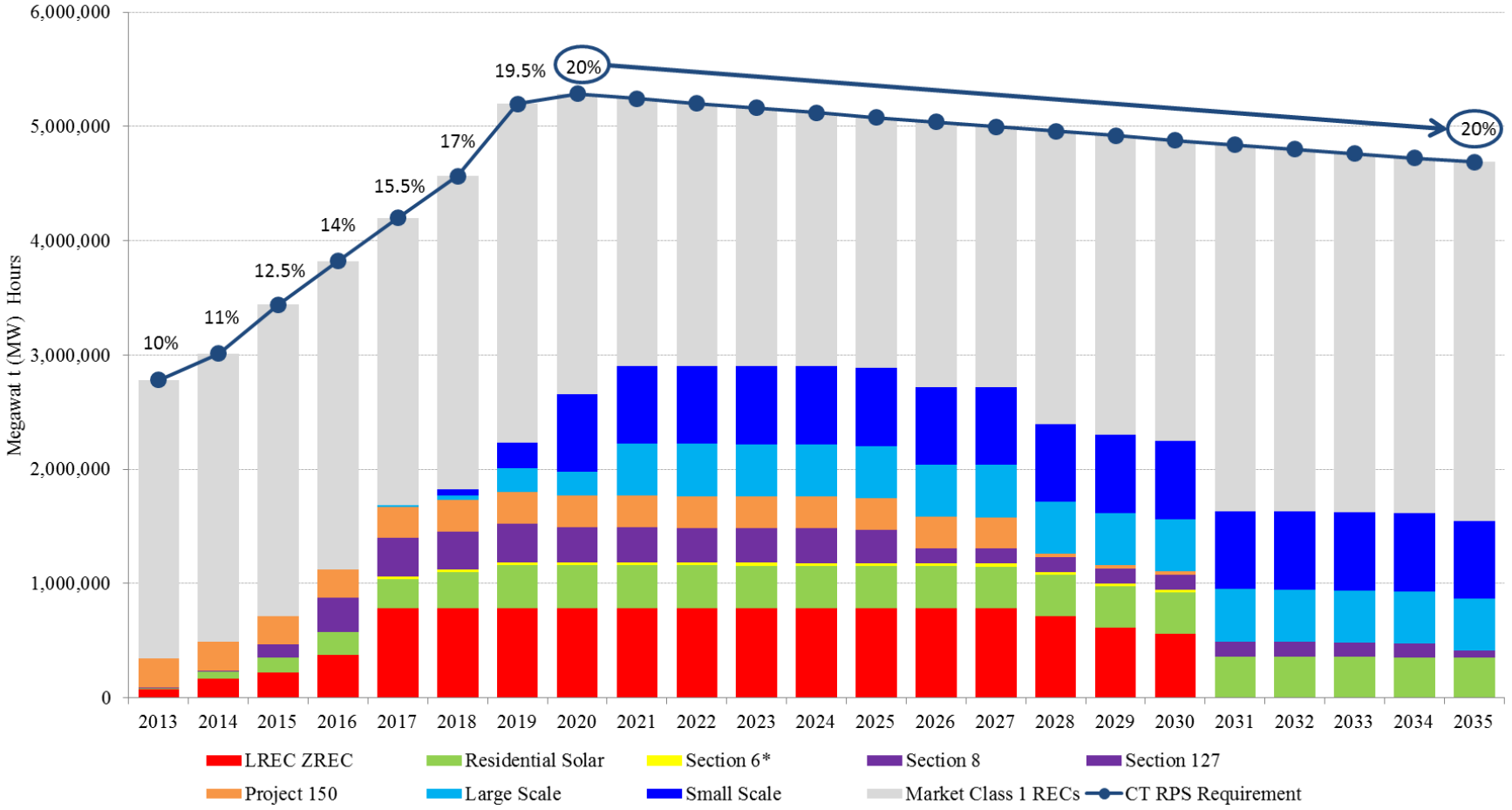
Solar on **10 housing authorities** supporting 1,300 rental units

Efficiency upgrades projected to **save 69 million kWh electricity** and 8 million CCF natural gas over their lifetime

18 efficiency and solar projects supporting **1,292 affordable rental units**

Benchmarked 1,098 buildings, or about 19,500 units, which is more than **10% of all multifamily units in CT**

Scaling Up: DEEP Procures Utility-Scale Renewables and Efficiency as Supply



Procuring Energy Efficiency As a Resource for ALL electricity users:

PA 15-107 and the Renewable Portfolio Standard (RPS through 2035)

Wrap up – what's next for us & you

What else/what's next for us?

- Getting homes ready to be weatherized or ready for solar means addressing health and safety challenges

- Wave a magic wand – what do we wish we had in our state to be even more successful? What do we need from feds?

Our advice for others:

- Analyze your market, ground yourself in the data

- Create a policy and a program roadmap – start where you've got alignment with both, chip away where you don't have that alignment yet

- Looking for opportunities, seizing them, keeping at it

- Don't go it alone – look for those multiplier effects – in the energy space, of course! But in other sectors serving LMI (housing, healthcare, other community-based org's/service providers, faith orgs, etc.)

About Us

CT Department of Energy & Environmental Protection and CT Green Bank

The CT Department of Energy and Environmental Protection (DEEP) advances local, state, and regional energy policy including the implementation of Connecticut's Comprehensive Energy Strategy, the planning and implementation of the state's utility-administered energy efficiency programs, administering the state's Weatherization Assistance Program, and developing plans and policies related to renewable energy.

Diane Duva

Director, Office of Energy Demand

CT Dept. of Energy and Environmental Protection
diane.duva@ct.gov

The Connecticut Green Bank is the nation's first green bank. Our mission is to support the Connecticut's strategy for achieving cheaper, cleaner, and more reliable source of energy while creating jobs and supporting local economic development. We're create a thriving marketplace to accelerate green energy adoption in Connecticut by making green energy financing accessible and affordable for homeowners, businesses and institutions.

Benjamin Healey

Director of Clean Energy Finance

CT Green Bank
Benjamin.Healey@ctgreenbank.com

Joe Pereira

State of Colorado

U.S. DEPARTMENT OF ENERGY

Scaling Up Low-Income Clean Energy Programs

Joseph Pereira
Director of Low-Income Energy Services
@pereira1_j

May 16, 2017

COLORADO
Energy Office

Colorado Energy Office

MISSION STATEMENT

The CEO's mission is to improve the effective use of all of Colorado's energy resources and the efficient consumption of energy in all economic sectors, through providing technical guidance, financial support, policy advocacy and public communications.

DEPARTMENT VISION

The CEO's vision is to help Coloradans live more prosperous and healthy lives by promoting innovative energy production and efficient energy consumption practices that are beneficial to the economic and environmental health of the state.

Define Scale Up- CEO

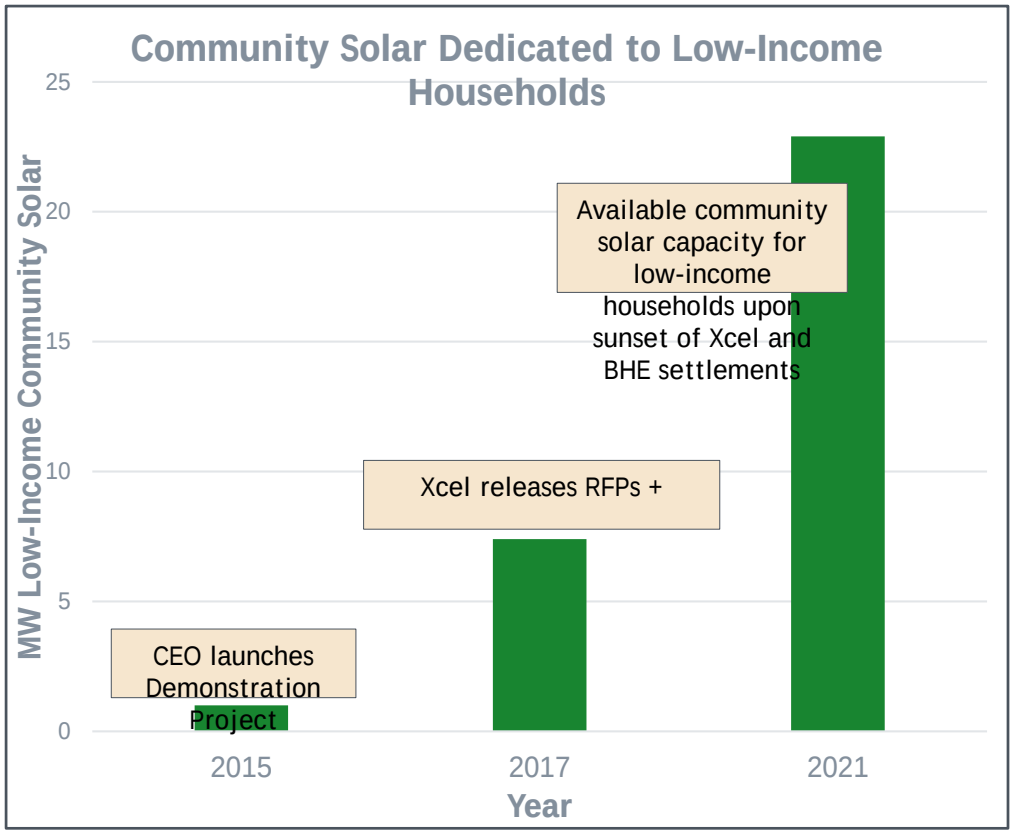
- Substantial- MW & GW
- Expands Offerings Above Required Expansions- ex. Demand Side Management
- Taps into Previously Non-Accessed Fund Sources- Renewable Energy Standard Adjustment
- Delivers Meaningful Savings to Low-Income Customers- 50% Bill Savings
- Connects to Larger EE/RE Strategy

Colorado Approaches to LI RE Scale Up

- Legislation- HB10-1342: Community Solar Gardens Act- LI Carveout
- Demonstration- CEO Low-Income Community Solar Demonstration Project- Rural Electric Focused
- Regulatory- Xcel Global Settlement/ Black Hillis Electric RES
- Program/ Public Administration- Weatherization Assistance Program Rooftop Solar

Colorado Low-Income Solar Scale Up

- In 2015, less than 1 MW of community solar generation was subscribed to low-income households
- In 2017, the Colorado Energy Office's Low-Income Community Solar Demonstration Project will bring an additional 1.4 MW of community solar online for low-income households
- From 2017-2019, Xcel Energy will:
  - Release RFPs annually for 4 MW of low-income community solar gardens;
  - Set aside .5 MW for a low-income standard offer; and
  - Manage 5% carve-out across portfolio of projects
- From 2018-2021, Black Hills Electricity will release RFPs annually for .5 MW of low-income community solar gardens



Low-Income Community Solar Demonstration Project

- Launched by the Colorado Energy Office in 2015
- GRID Alternatives awarded $1.2 million grant to implement project
- Two overarching goals:
  - Reduce household electric costs by enhancing low-income access to solar
  - Demonstrate the scalability and viability of low-income community solar arrays

What Do The Models Look Like?

Utility Provider	Project Size (kW)	Counties Served	Number of Subscribers	Key Demonstration Aspect	Year Built
Empire Electric Association	26	Montezuma, Dolores, San Miguel	9	Integrated with utility-owned stranded asset	2016
Delta Montrose Electric Association	151	Delta, Gunnison, Montrose	45	Largest 100% low-income array in nation	2016
Holy Cross Energy	145	Rifle, Pitkin, Eagle, Gunnison	43	Project driven by community	2016
Yampa Valley Electric Association	148	Routt, Moffat, Eagle	47	Diverse demographics	2016
Fort Collins Utilities	65	Larimer	20	First municipal utility partner; model built on roof of building	2016
San Miguel Power Association	125	San Miguel, Montrose, Ouray, San Juan, Dolores	33	Built on a former landfill site	2016
Poudre Valley Rural Electric Association	700	Larimer, Weld	180	Largest low-income offering to date	2017
Grand Valley Power	36	Mesa, Garfield, Delta, Montrose	10	Key partnership with weatherization provider	2017
Total	**1396**		**377**		

Xcel Energy Global Settlement

Xcel Energy and 26 solar and consumer interest groups struck a far reaching compromise on a rate case, a controversial large-scale utility solar program and the regular review of the state's renewable energy plan

Replaced a proposed fixed "Grid Use Charge," with a "Time-of-Use" rate trial and a "Time Differential Rate" demand charge pilot w/ LI customer protections

Adds a 50MW utility owned market subscription solar product

Resolves Xcel's RE Plan through 2019

- Includes capacity increases in renewable energy programs
- Treats all net metered solar owners equitably

Xcel Energy Global Settlement- LI Elements

IOU 5% PUC Rule Requirement Aggregation (4 MW) – Approx. 1,300 customers

Low-Income Solar Rooftop Program (1.5MW) – Approx. 300 customers

- Integrated with WAP offering an upfront incentive and a production based incentive

100% LI Community Solar Garden RFP (4 MW Annually) – Approx. 3,900 customers

- Upfront incentive or a performance based incentive

LI Standard Offer (.5 MW Annually/ 100 kW max) – Approx. 100 customers

- Competitive upfront REC incentive plus $0.01/ kWh

Low-Income Community Solar in IOU Territory

Xcel Energy	Black Hills Energy
5% low-income carve out applied to entire portfolio of community solar gardens; subscriptions managed by Xcel. **Estimated capacity by 2020: 5 MW**	Low-Income RFP released annually by BHE for .5 MW of community solar gardens dedicated 100% to low-income households. **Estimated capacity by 2021: 2 MW**
Low-income RFP released annually by Xcel for 4 MW of community solar dedicated 100% to low-income households. **Estimated capacity by 2020: 12 MW**	
Low-Income Standard Offer - .5 MW will be set aside annually for low-income standard offer **Estimated capacity by 2020: 1.5 MW**	

LI Weatherization Assistance Program (WAP)
Rooftop Solar Integration

The CEO's Weatherization Assistance Program is the first state in the nation to be granted DOE permission to use rooftop solar as an approved measure to reduce household energy burden

CEO is integrating rooftop solar into its operations based on the following criteria:

- Cost effective (SIR 1.0) and does not exceed a DOE contribution of $3,545
- Homes with high solar capacity factors
- Customers with high electricity use
- Customers with limited access to community solar offerings


CO
COLORADO
The Colorado Energy Office
@coenergyoffice

Jennifer Gremmert

Energy Outreach California

U.S. DEPARTMENT OF
ENERGY

ENERGY OUTREACH Colorado

Helping Coloradans afford home energy

Better Buildings Summit

Scaling Up Clean Energy Programs to the Next Level for Low and Moderate Income Households

May 16, 2017

Who is Energy Outreach Colorado (EOC)

- Statewide nonprofit; founded in 1989
- **Mission** – To ensure all Coloradans have access to affordable home energy.
- Programs: Bill Payment Assistance, Energy Efficiency Projects, Energy Education and Advocacy
- Serve 25,000 families a year
- One stop shop for energy assistance and efficiency
- Strong public/private partnerships
- Advocacy plays key role in organization's success
- Starting to connect families to Community Solar

EOC Efficiency Programs

- Single–family
  - Colorado Affordable Residential Energy Program (CARE) – partner with local agencies
  - Crisis Intervention Program – furnace repair and replacement (funded by LiHEAP)
- Multi-family Affordable Housing
  - Statewide weatherization provider for MF
  - Partner with utilities, municipalities, foundations
- Nonprofit Energy Efficiency Program (NEEP)
  - Buildings that serve vulnerable households

Enrollment Success

- **Multi-family Weatherization**
  - One-stop shop – EOC manages all aspects of the project
  - Leveraging multiple funding sources, including owner contributions; projects rarely completed without multiple funding sources
  - DSM - Total Resource Cost (TRC) test can be lower than 1.0 for specific projects as long as overall portfolio is greater than 1.0; allows us to install “failed” measures
  - 25% non energy benefit adder for all low-income programs
  - Used Youth Corps to “blast” large buildings with low-cost measures and behavior change programs

- **Nonprofit Energy Efficiency Program**
  - Organizations serving low-income families - homeless shelters, food banks, transitional housing
  - Large energy users that did not have active utility account managers
  - Needed to do a lot of education to encourage participation
  - Large energy savings opportunities

Enrollment Success

- **Single-Family Programs**
  - Partner with weatherization agencies to leverage utility rebates

  - Created Colorado Affordable Residential Energy Program (CARE) to serve previously weatherized or waitlisted “gap” utility customers – 11 Partners statewide

  - Focus on highly cost effective measures that align with utility rebate programs

  - Address countless health and safety issues for clients

  - Energy Saving Kits – created cost effective program with large savings

Key Factors for Growth and Success

- Coordinating between energy efficiency and energy assistance programs
- Utilizing EOC's own private funding/capacity to initiate, develop and implement EE projects
- Leveraging Funds – public, utility and other private funds
- Getting support from both the electric AND gas utilities
- Offering a portfolio of programs
- Partnering with organizations and contractors statewide
- NEW
  - Subscribing Community Solar Gardens – 7 MW in next 3 years
  - Neighborhood Focused Programs

CASE STUDY

Garden Court Apartments, Denver

15 buildings with 300 units of affordable housing

- Annual total utility costs of $263,765

Energy Efficiency Measures installed:

- Boiler replacements ($895K)
- Insulation
- Lighting, common areas and in unit lighting,
- Refrigerators

Total Project cost – $1,050,000

- Leveraged five (5) funding sources and financing (40%)
- Xcel Energy provided 20% of the cost through rebates

Predicted Annual Savings – $69,120 – 26% Annual utility bill reduction

- With leveraged grant funds, 6-year simple payback for owner

Savings can be spent on:

- Other capital improvements
- Additional staff for supportive services

Denver Rescue Mission

ENERGY OUTREACH Colorado
Helping Coloradans afford home energy

Making an Impact

- Since 1989 –
  - 2.4M families served through energy assistance
  - 6,300 families served through CIP
  - 40,000 multi-family and single family units served
  - 339 nonprofits served through NEEP
  - 277 CARE families helped- NEW
  - $10.6 M in lifetime electric and gas savings saved for families (Lifetime = 8 yr. electric; 16 yr. gas savings)
  - Approx. 20,000 Metric Tons of CO2 reduced
  - $500M generated through advocacy efforts

ENERGY OUTREACH Colorado
Helping Coloradans afford home energy

Jennifer Gremmert

Deputy Director
303-226-5052
jgremmert@energyoutreach.org
www.EnergyOutreach.org

More Information –

Case Study - EPA

Case Study - Regional Energy Efficiency Organizations

Thank You

Provide feedback on this session in the new Summit App!

Download the app to your mobile device or go to **bbsummit.pathable.com**