

Welcome to the 2019 Business Partner Open House

Agenda



- **2016-2018** 3-Year Plan Results & Performance
- New **2019-2021** 3-Year Plan Overview
- New Initiatives
- Program & Application Highlights
- Mass Save Application Portal (MAP) Demonstration
- Heat Pumps Presentation

Thank you Business Partners!



Ranked

No.

1

8th Year in a row
In energy efficiency

#EEscorecard



Thank you Business Partners!



COMMISSIONER JUDSON:

**“MASSACHUSETTS SET
THE NATIONAL STANDARD
FOR EFFECTIVE ENERGY
EFFICIENCY PROGRAMS THAT WILL
RESULT IN BILLIONS OF DOLLARS
OF BENEFITS FOR CONSUMERS.”**



2016-2018 Three- Year Plan Results & Performance

MA Statewide C&I Energy Efficiency Program Highlights



- **Electric highlights YTD 2016-2018:**
 - 88,000 participants
 - 2,278,000 annual MWh in energy savings
 - ~\$734M in budget expenditures
 - Resulted in \$3.9B in total benefits

**Meaning ~ \$5.30 in benefit / \$1 expended
by C&I electric programs**

MA Statewide C&I Energy Efficiency Program Highlights



- **Natural Gas highlights YTD 2016-2018:**
 - 17,000 natural gas C&I customer participants
 - 32,303,000 annual therm savings
 - \$138M in total budget expenditures
 - Resulted in \$492M of total benefits

**Meaning ~ \$3.55 in benefit/\$1 expended
by C&I natural gas program**

New 2019-2021 Three-Year Plan (3YP) Overview – Priorities, Changes, Goals & Budgets

Core Principles of Energy Efficiency




Providing value for customers



Saving energy



Supporting a reliable energy system



Providing a sustainable workforce and delivery infrastructure



Supporting Commonwealth's broader energy, capacity, environmental, and climate goals

2019-2021 3YP- Overall Highlights



- Support employment of over 78,000 workers
- Targeting \$8.5 billion in benefits
- Aggressive energy reduction goals with significant corresponding Green House Gas (GHG) reduction
- Investment of over \$2.7 billion over 3 years
- New C&I strategies and programs for
 - Active Demand Reduction (ADR)
 - Energy Optimization (EO)
 - Electric Vehicles (EV)

2019-2021 3YP- C&I EE



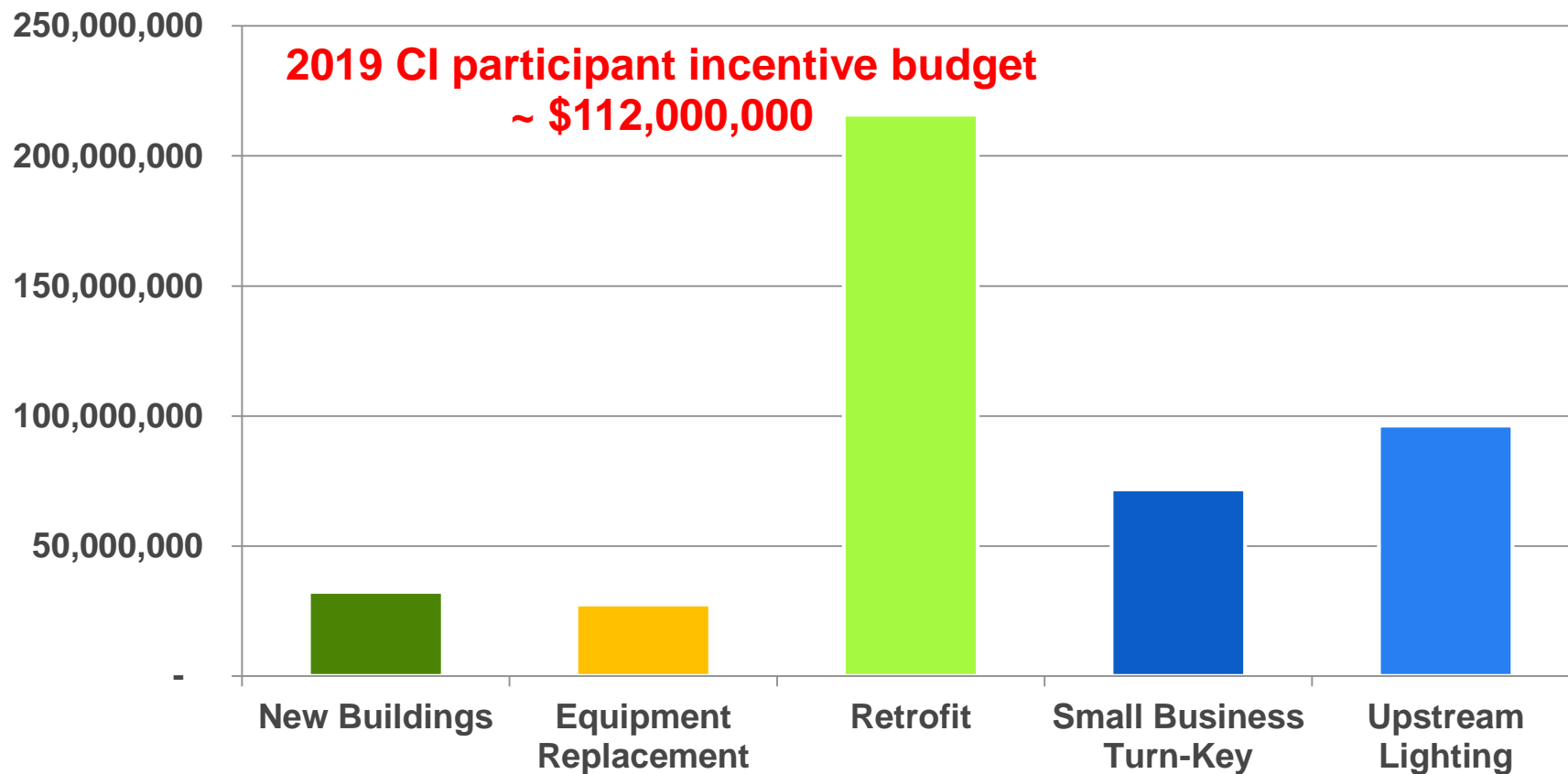
	Annual MWH	Lifetime MWH	Active Demand (MW)	Budget (\$M)
Electric	2,307,997	30,537,575	192	\$970

	Annual therms	Lifetime therms	Budget (\$M)
Gas	40,872,269	564,373,265	\$167.5

2019 C&I Core Initiative Breakdown – Electric (annual kWh savings)



EVERSOURCE

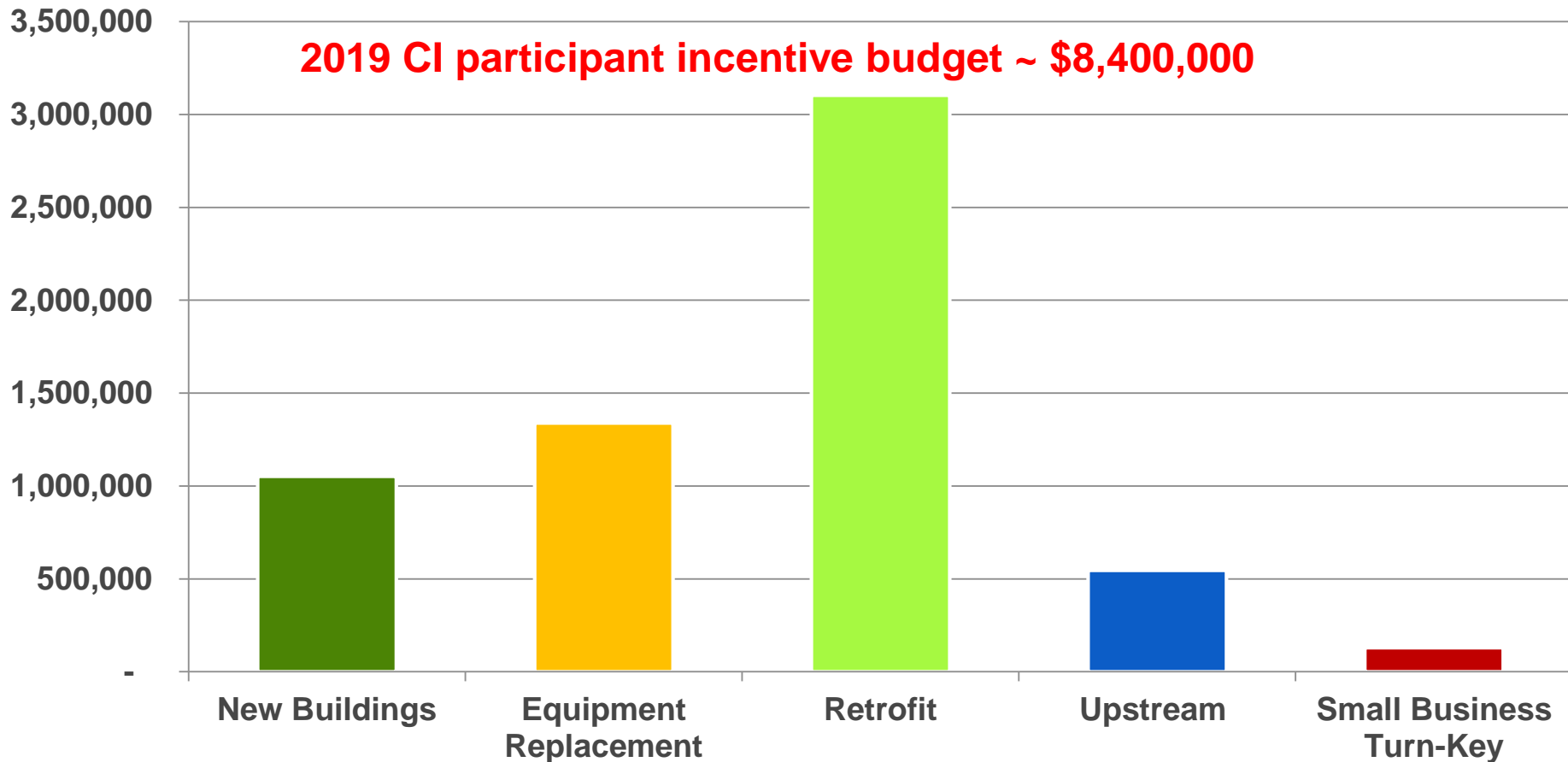


2019 Core Initiative Breakdown Natural Gas

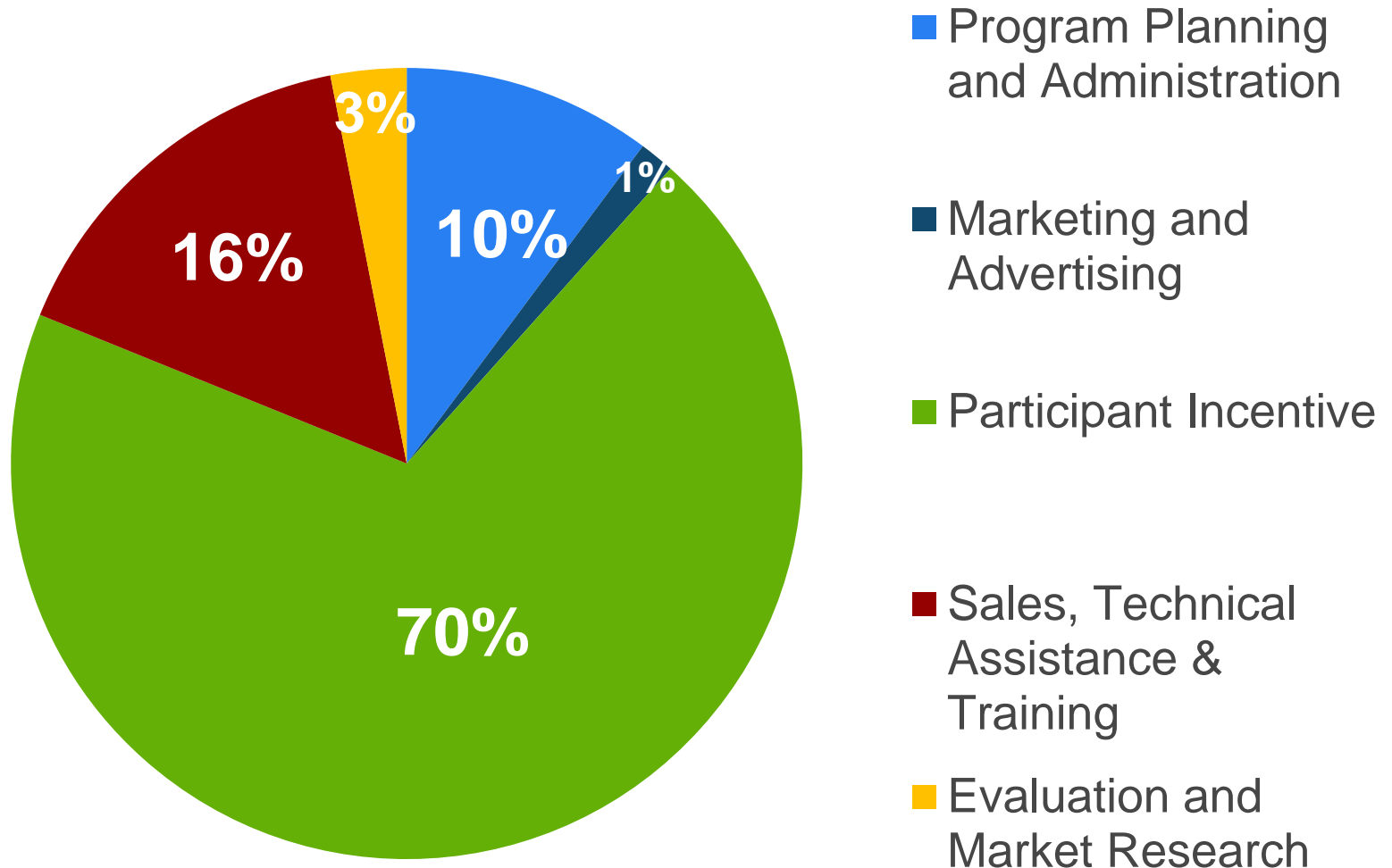
(annual therm savings)



EVERSOURCE



Eversource 2019 Budgets



Deliver value to customers through energy savings and emphasize continued business process improvement.

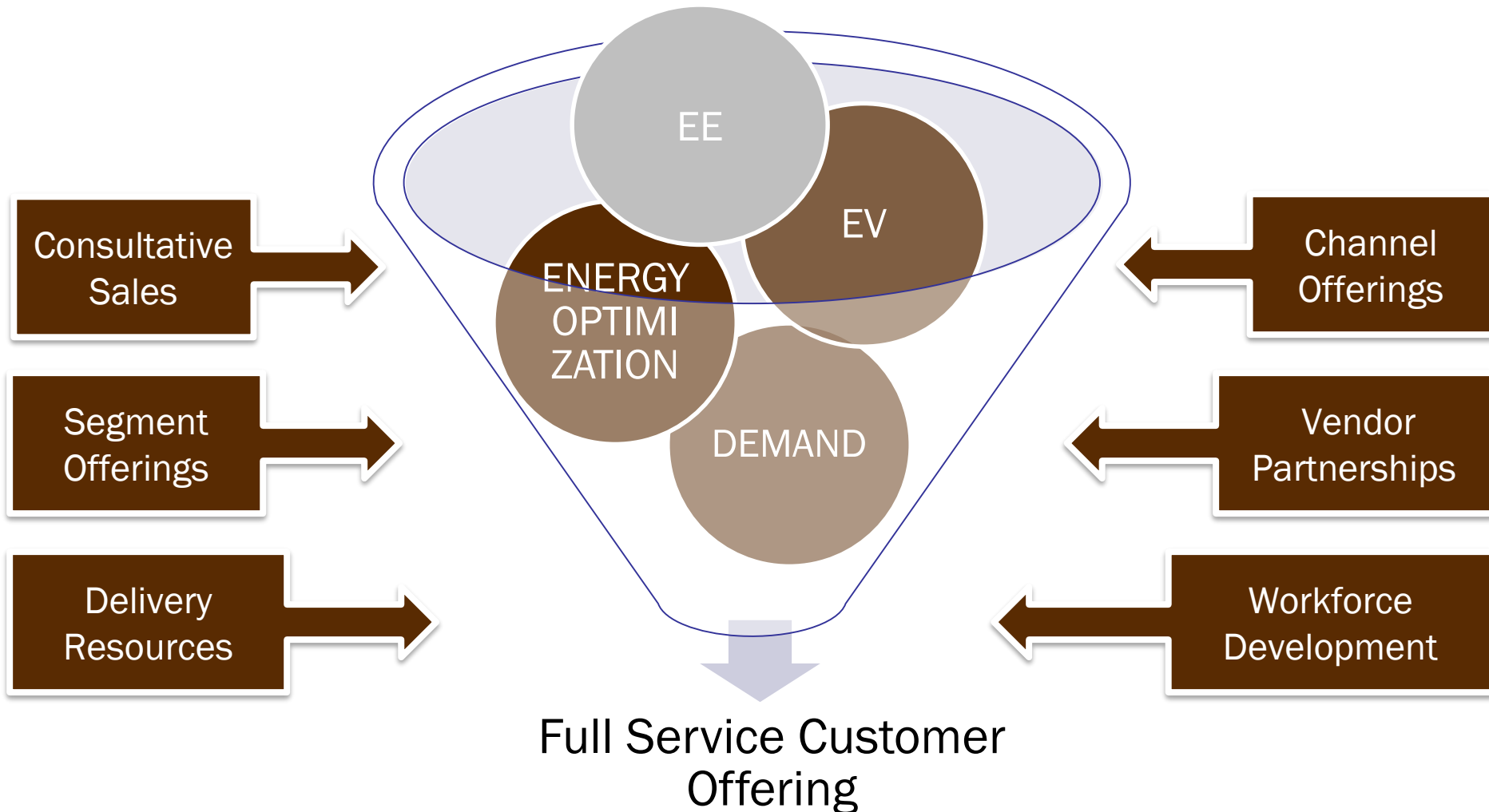
- Achieve current 3-year plan production targets
- Improve customer experience and increase participation
- Accessibility of expertise through various pathways
- Build on success of existing vendor partnerships

2019 PA Priorities



- Continued expansion of pathways for engagement, participation and savings
- Delivering customer-centric programs that highlight newer areas of focus-
 - ***A “Systems Approach”***
 - ***Advanced controls and technology integration***
- Driving confidence in our vendor business partners to operate in the market effectively- delivering value to customers and growing their businesses

Putting it all together- Synthesizing Programs for the Customer



** Expanding delivery pathways, offers/resources requires emphasis on clarity for participants*

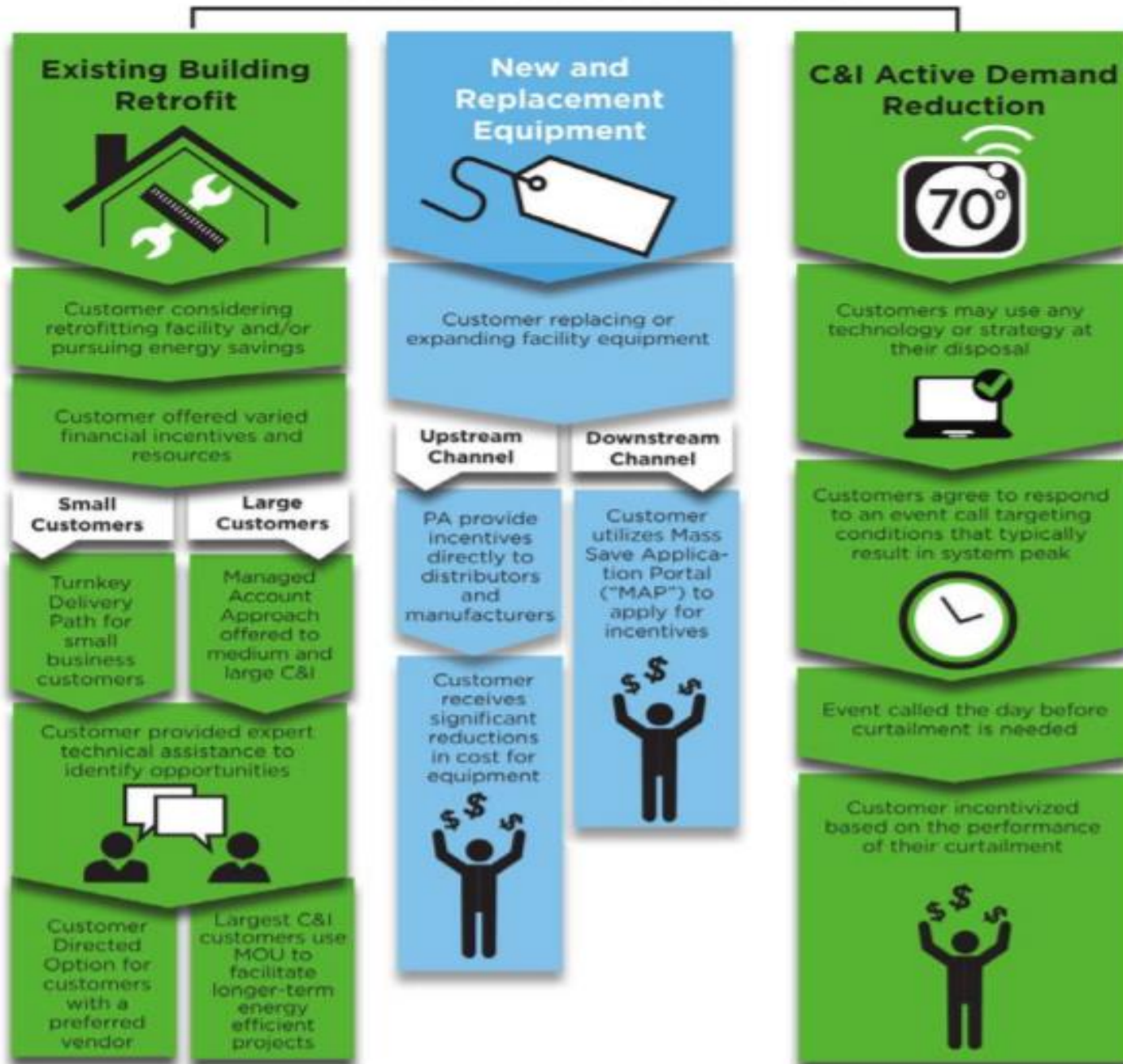
2019-2021 3YP- C&I Traditional Energy Efficiency (EE)



Updates Additions and Refinements

- Clarity of C&I EE Program Structure
- Lightings, HVAC Controls, Process and CHP continue as key driver technologies
- Expanded TA & Industrial/Process Engineering support and offerings
- New paths to Equipment & Systems Optimization- via RCx and O&M
- Expanded Trainings & emphasis on Workforce Development

C&I EXISTING BUILDINGS



C&I NEW BUILDINGS & MAJOR RENOVATIONS

Whole Buildings Approach



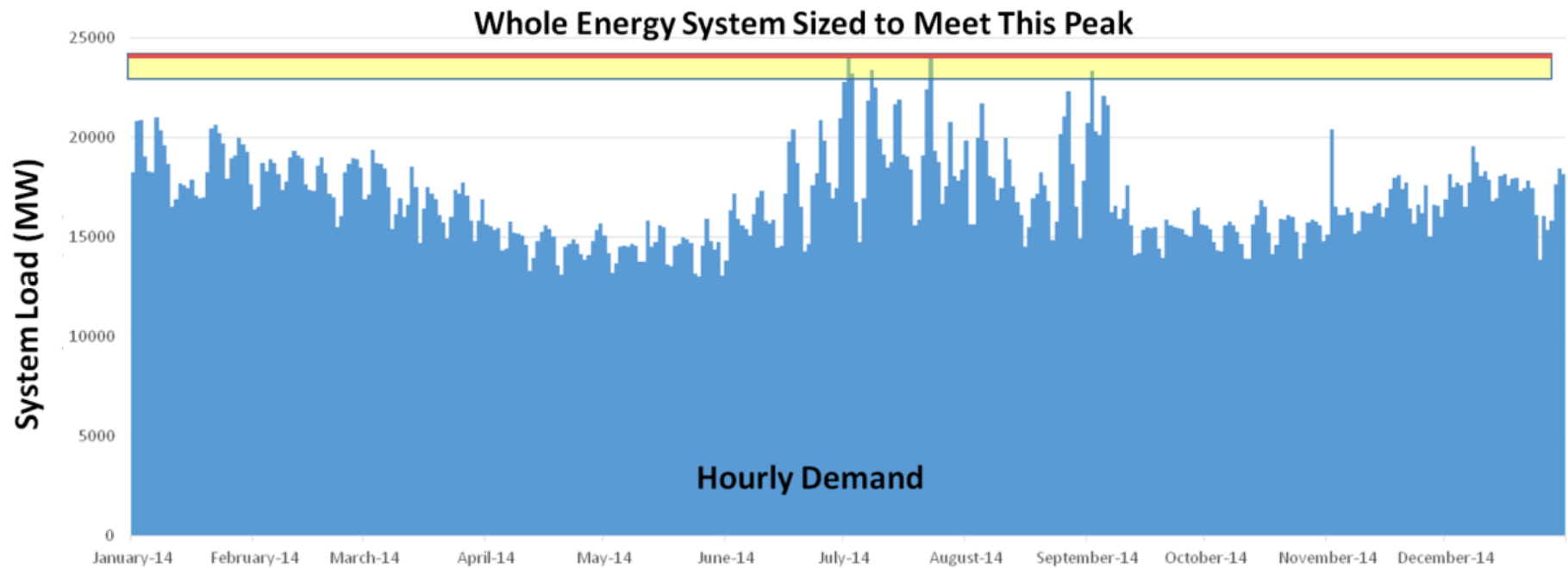
Systems Approach



New Initiatives:

Active Demand Reduction

Why Demand Management?

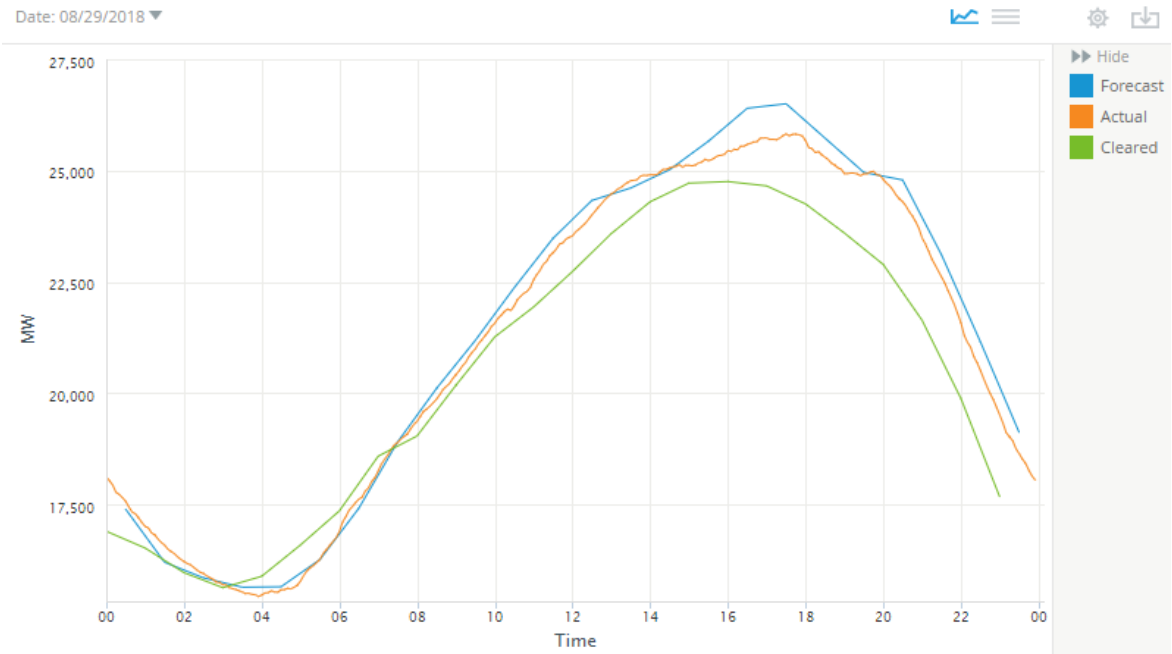


ISO-NE System Peaks - Summer



Annual System Peak Day, Hour, and Load

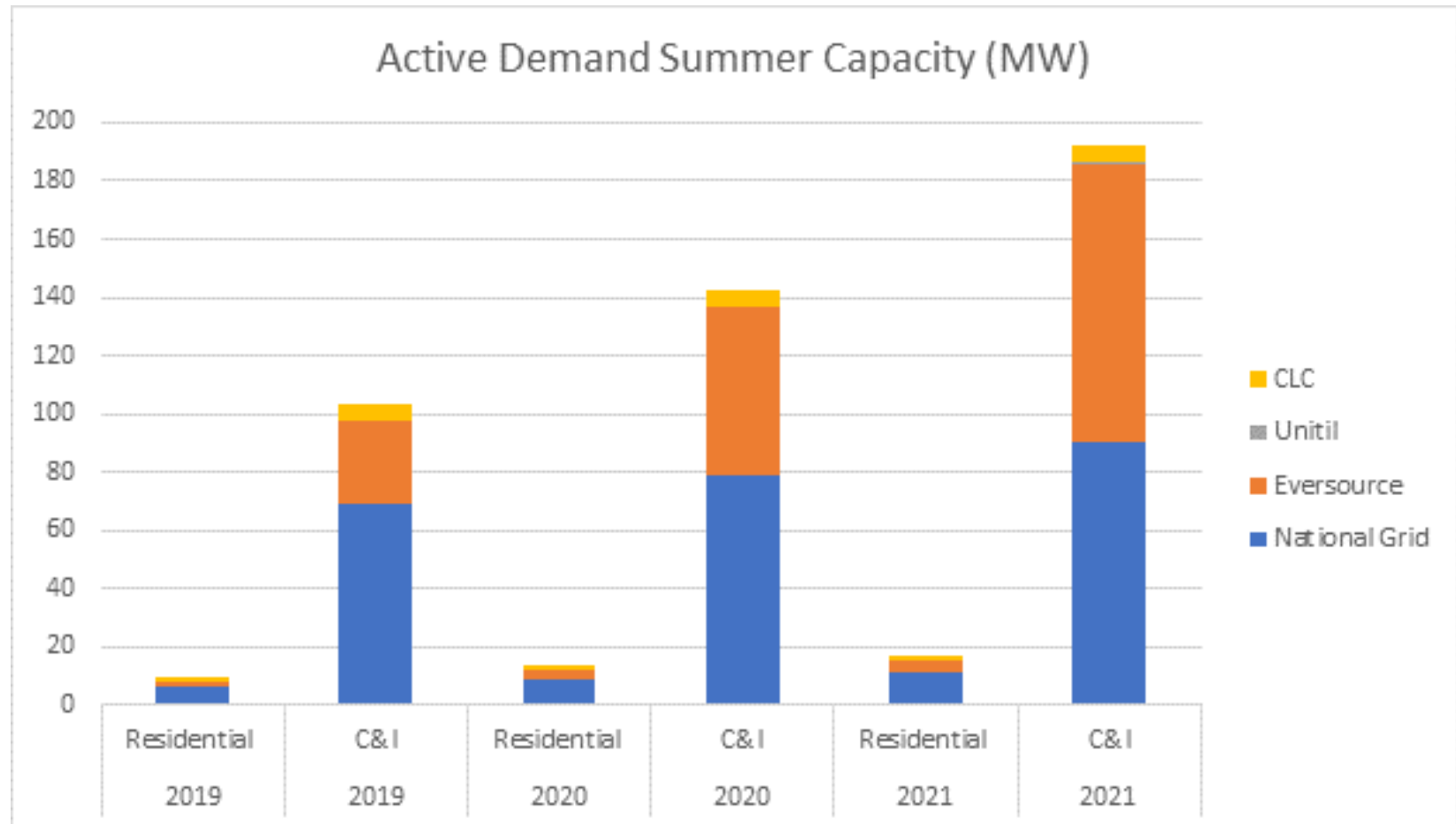
Peak Date		System Peak Load
Date	Hour End	MW
8/09/2001	15:00	-24,723.332
8/14/2002	15:00	-25,103.369
8/22/2003	15:00	-24,310.552
8/30/2004	16:00	-23,718.721
7/27/2005	15:00	-26,617.688
8/02/2006	15:00	-28,038.238
8/03/2007	15:00	-25,773.240
6/10/2008	15:00	-25,691.470
8/18/2009	15:00	-24,707.827
7/06/2010	15:00	-26,701.350
7/22/2011	15:00	-27,312.342
7/17/2012	17:00	-25,543.347
7/19/2013	17:00	-26,910.954
7/02/2014	15:00	-24,067.772
7/29/2015	17:00	-24,052.353
08/12/2016	15:00	-25,111.431
06/13/2017	17:00	-23,507.885
08/29/2018	17:00	-25,528.391



- All PA's on same system = all targeting same peaks
- All PA's running same program offerings
- System peaks June – September & Later in day

*Cape Light Compact's Demand Response Program Approval is pending

Statewide Active Demand Goals



ISO-NE Winter Generation



- During prolonged cold stretches, the ISO is forced to dispatch oil fired generation, which impacts costs and emissions

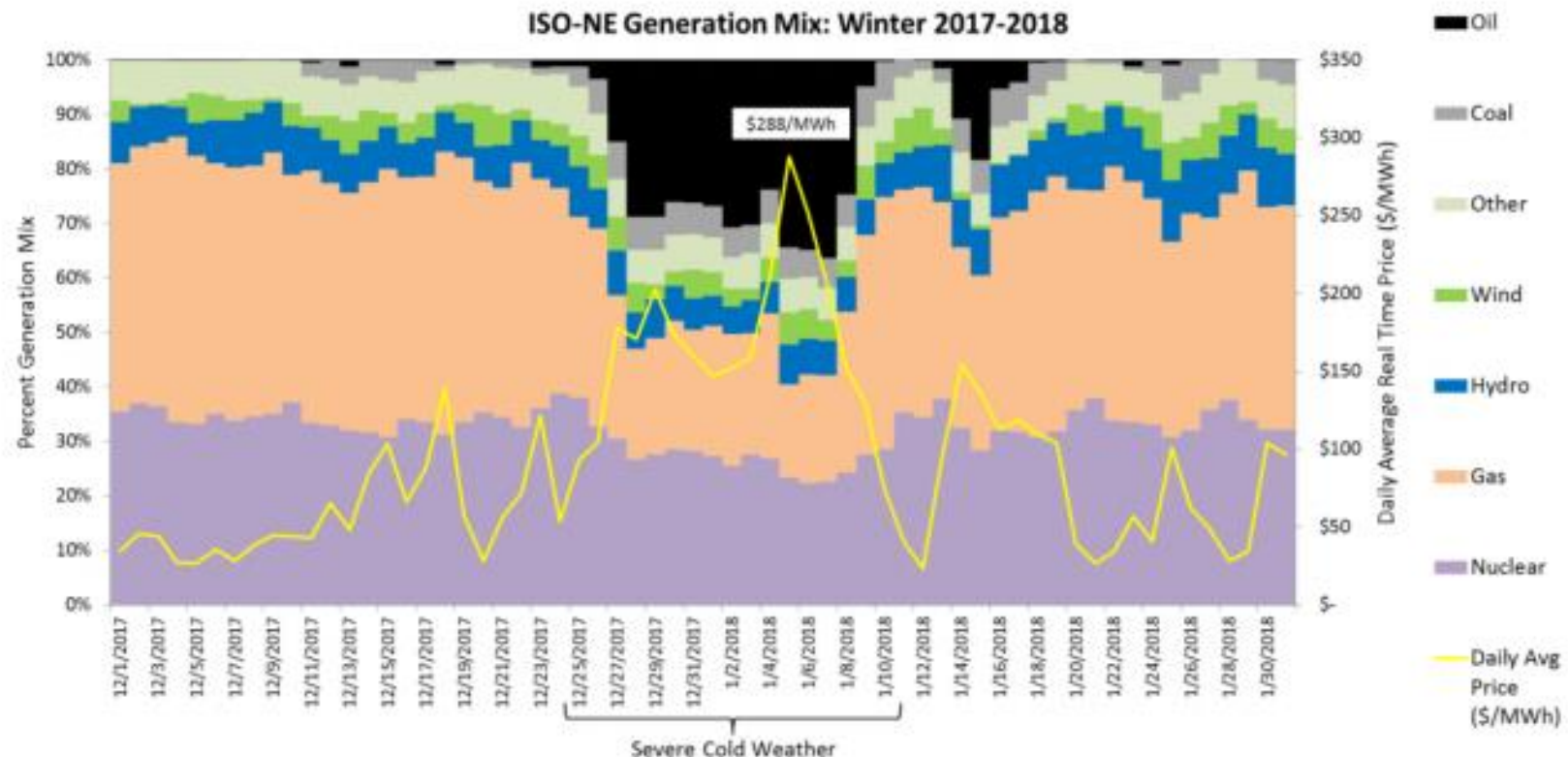
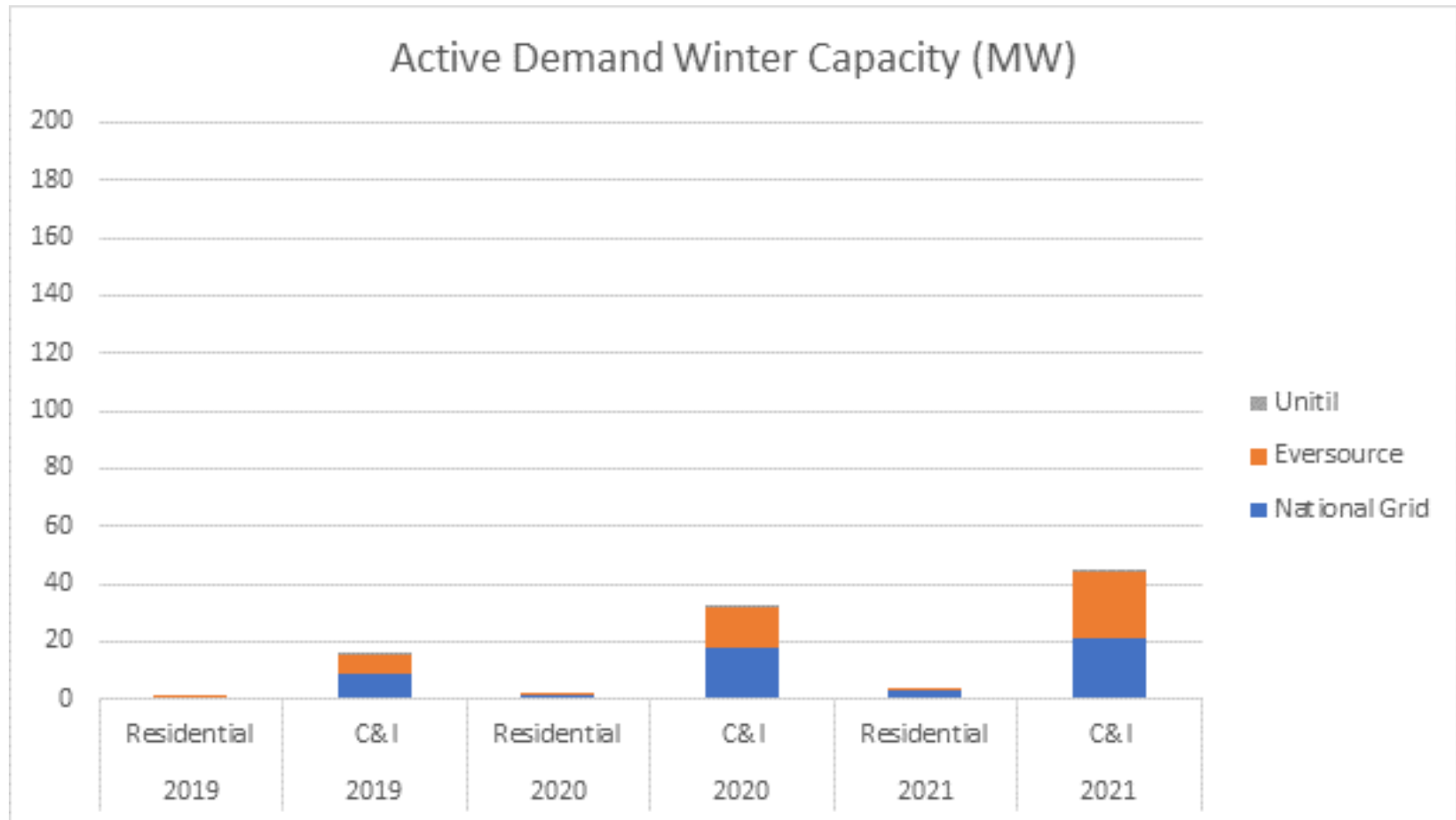


Figure 4: ISO-NE Generation Mix During Winter 2017-2018

Statewide Active Demand Goals



Active Demand Management vs. Traditional Energy Efficiency



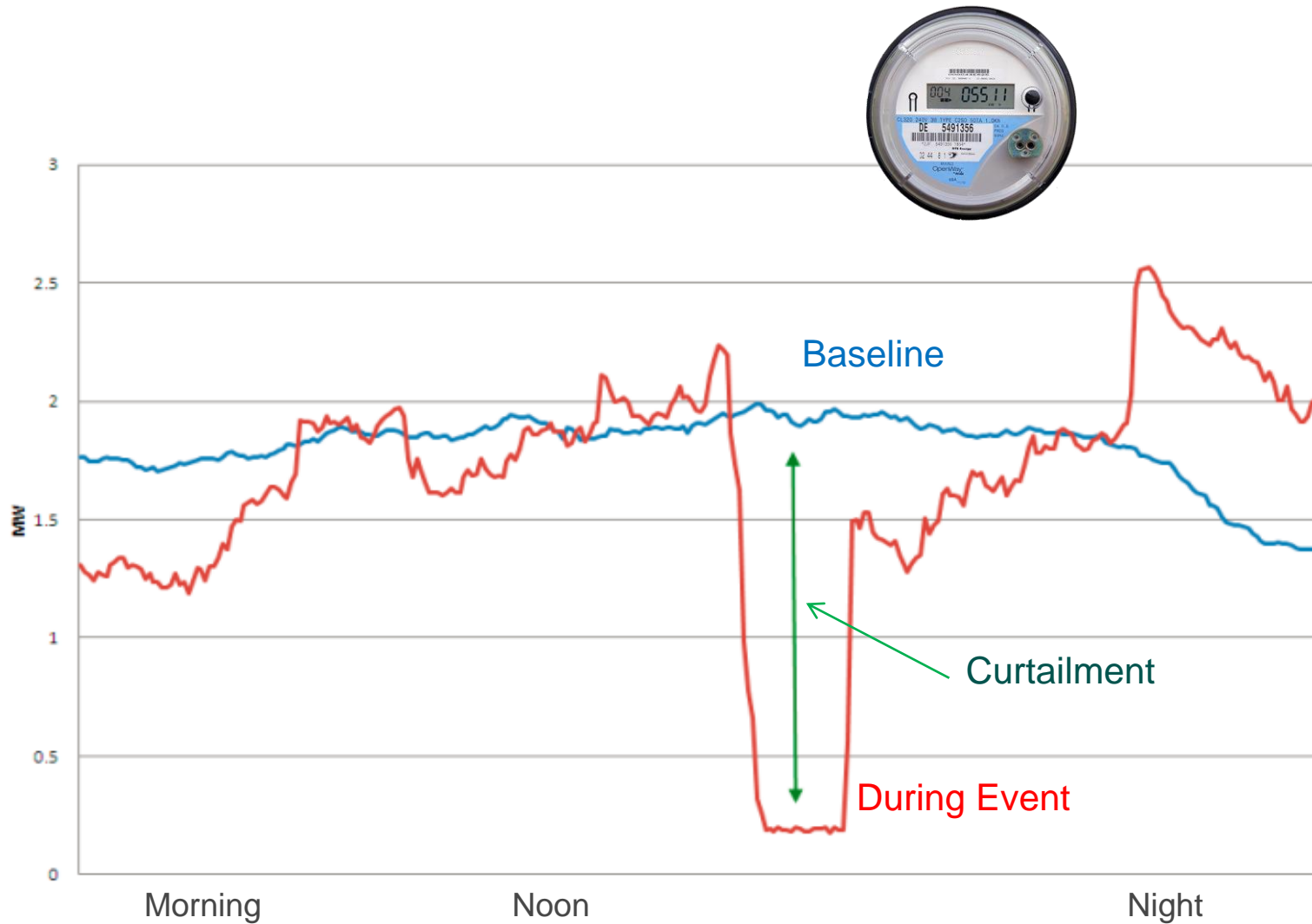
Active Demand

- Control & Dispatch
- Pay for Performance
 - Single Year
 - V. Coincident Baseline
- Year-to-Year incentives for capacity
- PI for dispatching correctly
 - Unknown until end of season

Traditional EE

- Continuous savings
 - Claimed for lifetime
- kW & kWh Benefits
 - Screened through BCR
- Upfront incentives
- PI for completed projects

Measuring Active Demand



Three Options to Curtail



Targeted Summer

- June – September
- 8 Events Maximum
- 24 Total Hours Max
- 3 Hour Event Duration
- Weekday / Non-Holiday
- Day Ahead Notifications

Daily Summer

- June - September
- 3 Hour Event Duration
- Dispatch window 2–7p
- Weekday / Non-Holiday
- Day Ahead Notifications

Targeted Winter

- December – March
- 5 Events Maximum
- 15 Total Hours Max
- 3 Hour Event Duration
- Weekday / Non-Holiday
- Day Ahead Notifications



New Initiatives:

Energy Optimization

ENERGY OPTIMIZATION



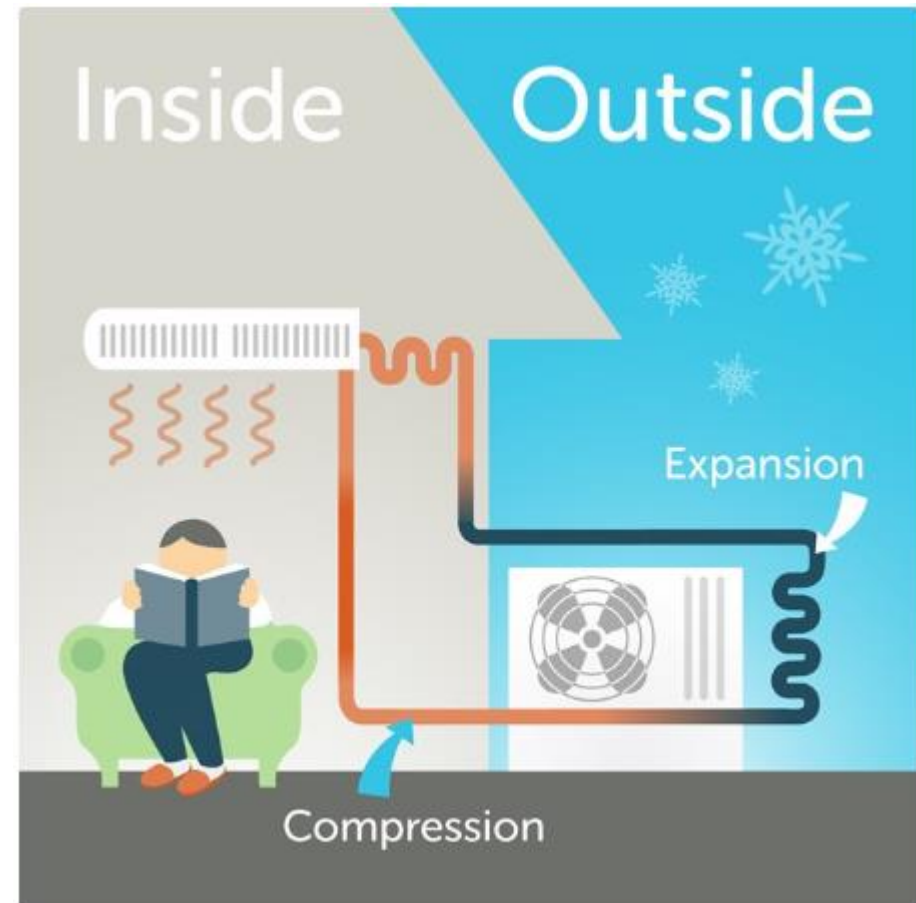
- 2018 amendment to GCA allowed for electric programs to look beyond electric measures
 - Delivered fuels
 - Strategic electrification
- Optimize energy use without focus fuel type



Strategic Electrification



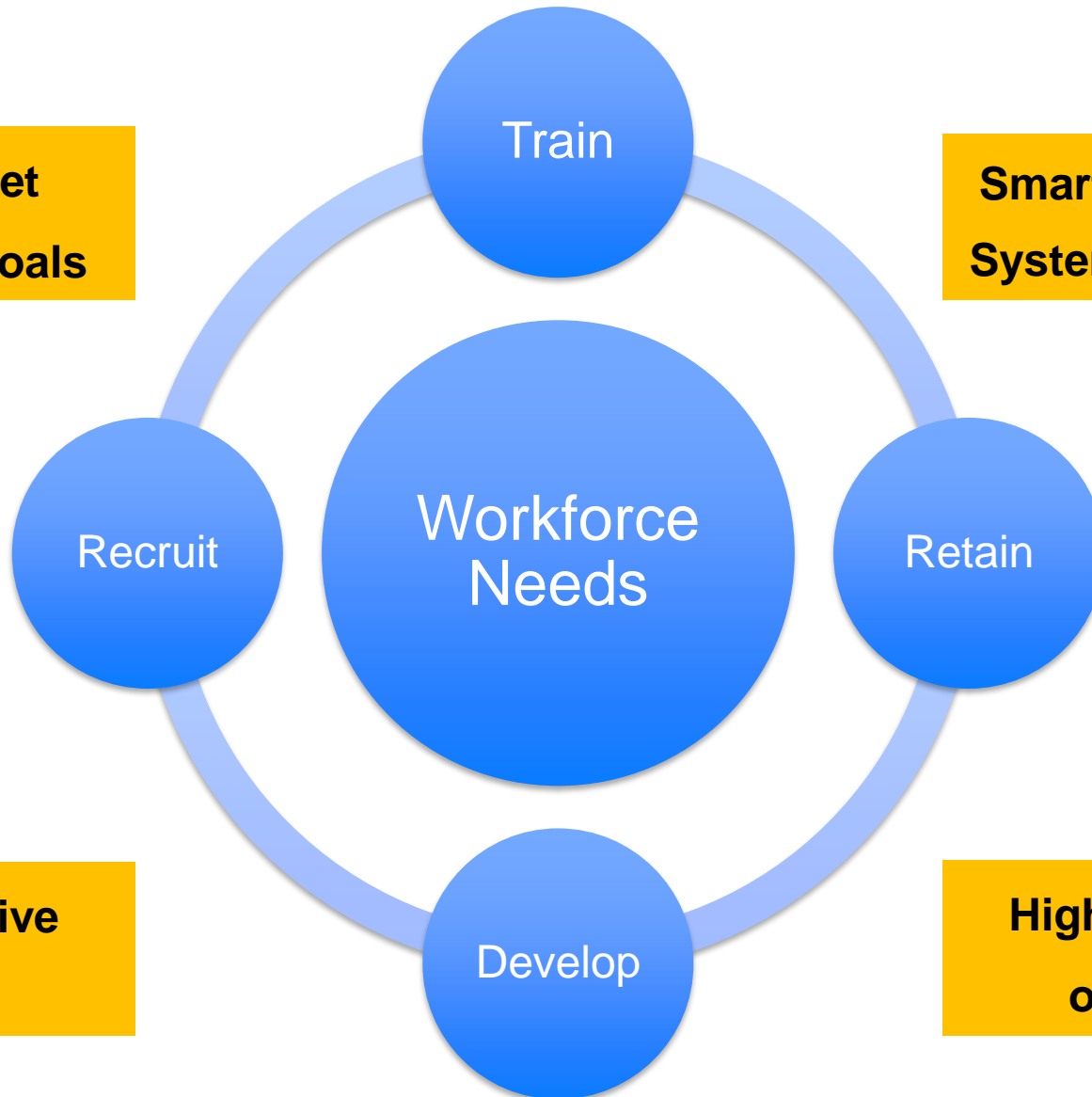
- Specific goals for heat pumps – 17,980 units
 - Bi-annual reports to Council with focus on fuel switching
 - Deliverable fuels to cold climate heat pumps
- First approach – Custom analysis
- Coming soon – prescriptive rebates and other pathways



New Initiatives:

Workforce Development

The EE Economy



**Ramp to meet
Aggressive Goals**

**Smart Technology,
Systems Integration**

**Comprehensive
Savings**

**Higher Volumes
of Projects**

Upcoming Trainings



Advanced Lighting Controls



Designers/Engineers: Tues, May 7 8am-5pm
Installers: Wed, May 8 8am-5pm



IBEW
Saturday May 18 8am-2pm

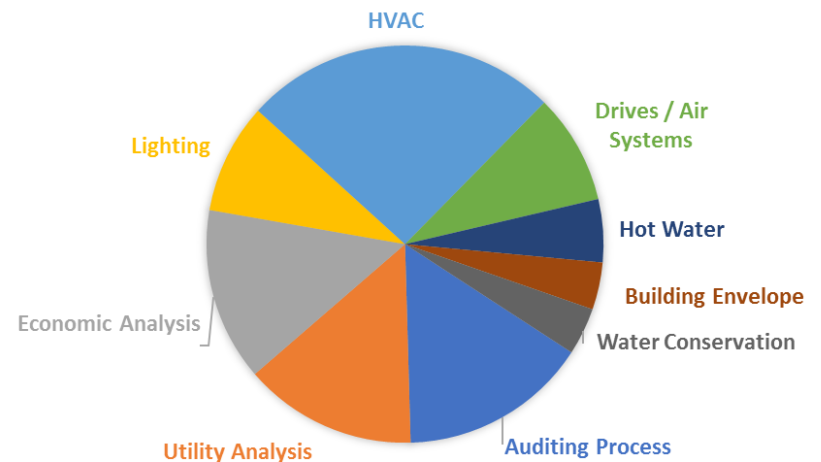


Certified Energy Auditor



May 5-8, 2019
Southboro / Hopedale

CEA BODY OF KNOWLEDGE



Workforce Development



To learn more about Training and Workforce Development opportunities please email:

info@masssave.com

INCLUDE in the Subject: C&I Training and Workforce Development

Take the Live Poll!

pigeonhole.at/MASSSAVE
(Link also sent to your inbox)

Program and Application Highlights

Program Highlights:

Equipment and Systems Performance Optimization Program (ESPO)

Summary of Key Differences



P4P

- Single Track
- No investigation funding
- Minimal support, generally reactive

ESPO

- 4 Tracks
- Investigation funding
- Early-stage support, intentionally proactive

ESPO Program Overview



Equipment & Systems Performance Optimization Program

Retrofit opportunities for RCx, O+M & Low Cost Tuning Measures for...



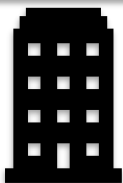
Tuning Measures:

Pick from list of select measures



Targeted Systems Tuning:

Prioritize individual, high potential systems



Whole Building & Process Tuning:

Holistically review entire building or process



Monitoring Based Commissioning:
Continuously monitor equipment or systems
for abnormalities & take corrective action

Track Relationships



Incentive & Resources Increase

Low Cost Tuning Measures

Cond. Water Reset

Chilled Water Reset

Cycle Evap. Fans

Clean Cond. Coils

Reduce Defrost

Anti-Sweat Controls

Economizer Tuning

Leak Repair

Pressure Reduction

Targeted Systems Tuning

Chiller Plants

Refrigeration

RTUs/AHUs

Compressed Air

Whole Building & Process Tuning

Comprehensive Review
of All Building & Process
Systems

MBx– Equipment, System or Whole Building Level

Incentives & Offerings



Program	Equipment & Systems Performance Optimization		
Track	Low Cost Tuning Measures	Targeted Systems Tuning	Whole Building & Process Tuning
Type	Standard	Custom	
Provided Resources	Support provided as needed	Fully Funded Tuning Investigation*	
Base Incentive Amount	Per measure prescribed incentive	\$0.17/kWh \$1.20/therm	
Performance Bonus	N/A	Where savings relative to total consumption: >2.75% Electric - \$0.03/kWh adder >1.5% Gas - \$0.20/therm adder	

Note: Monitoring Based Commissioning remains available through P4P

** For pre-approved projects, at the PAs discretion, with level of Customer commitment*

Customer Eligibility



- Must be a C&I customer within Mass Save Sponsors' Service Territory
- Existing building & controls
 - Not at end of life or part of phase out plan
 - Annual runtime >2,000 hours
- Low Cost Measures & Targeted Systems
 - Open to all
- Whole Building & Process Tuning Track requires
 - Existing functional control system required
 - Annual electric consumption of over 5,000,000 kWh

Creating Partnerships



- Market-based Program
 - Any Vendor can participate with their customer
 - Sponsors will work closely with Vendors to set expectations early & clearly identify project-specific requirements
- Tuning Investigation Funding available on a case by case basis
 - Removes a key barrier to participation for Vendors & Customers
 - Available for Targeted Systems and Whole Building & Process Tuning Tracks

ESPO Solution Station

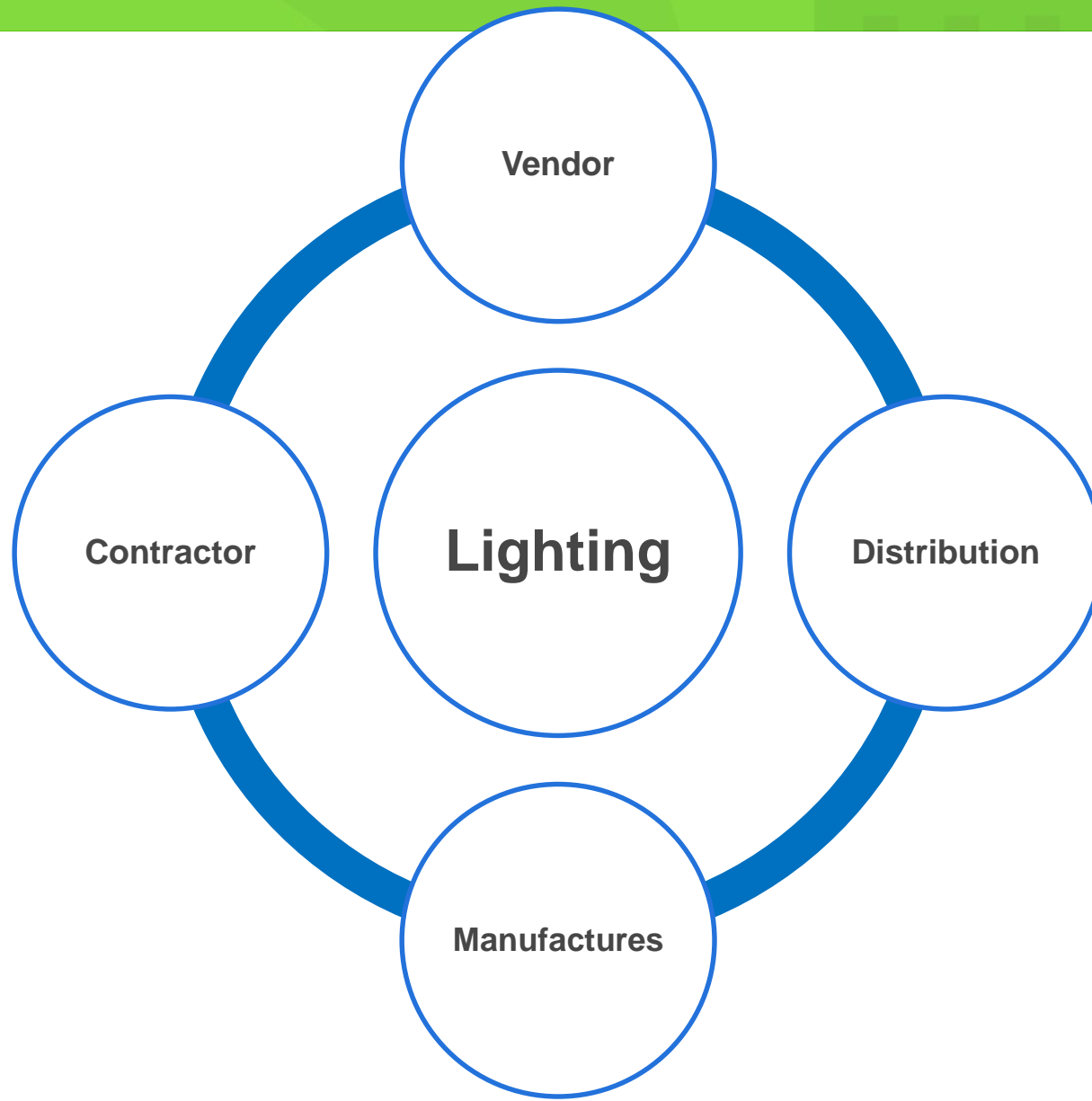


- Please visit the ESPO Solution Station to sign up for upcoming Business Partner training sessions
- For further information contact:
ESPO-Program@eversource.com

Program Highlights:

Upstream/Lighting

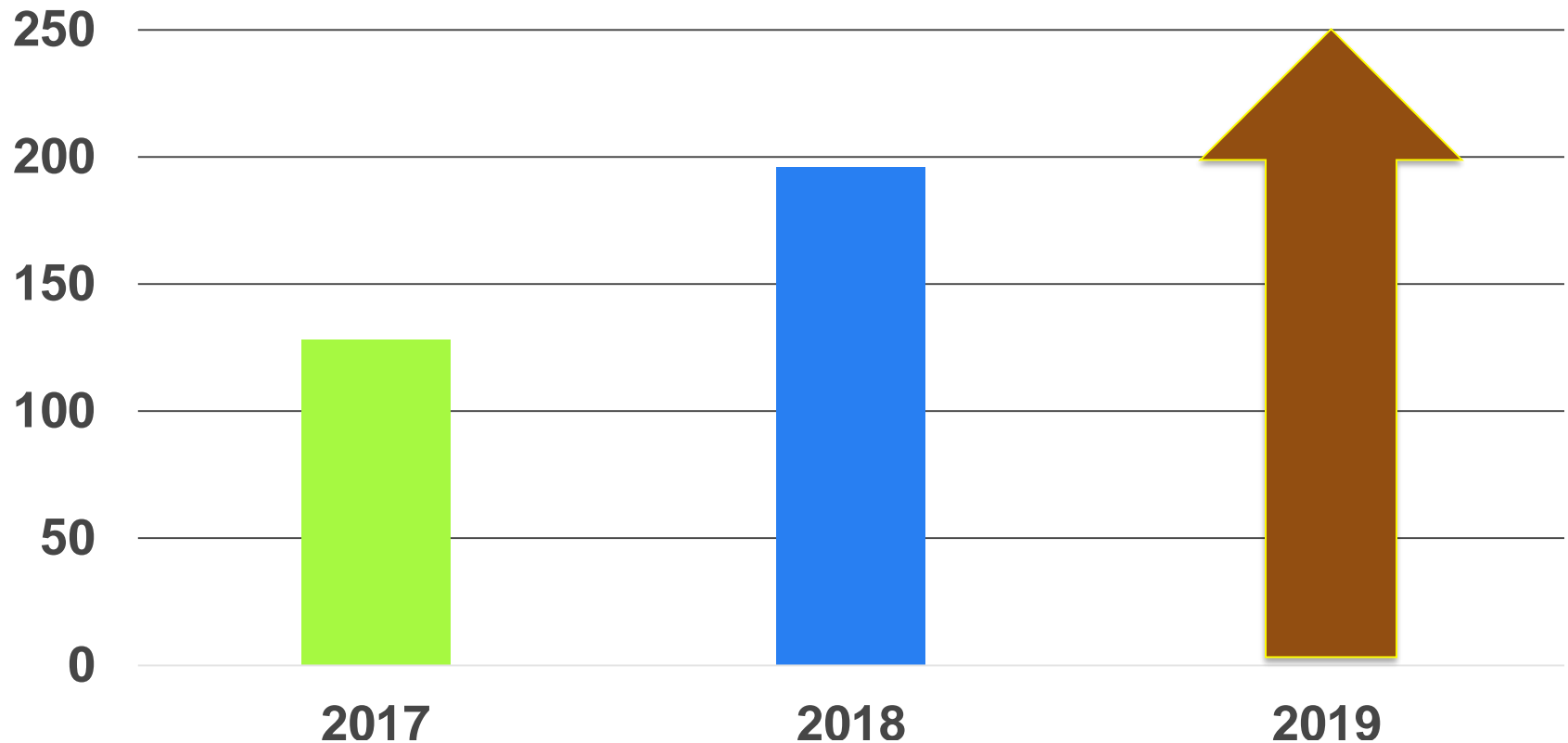
2019 Upstream : Lighting



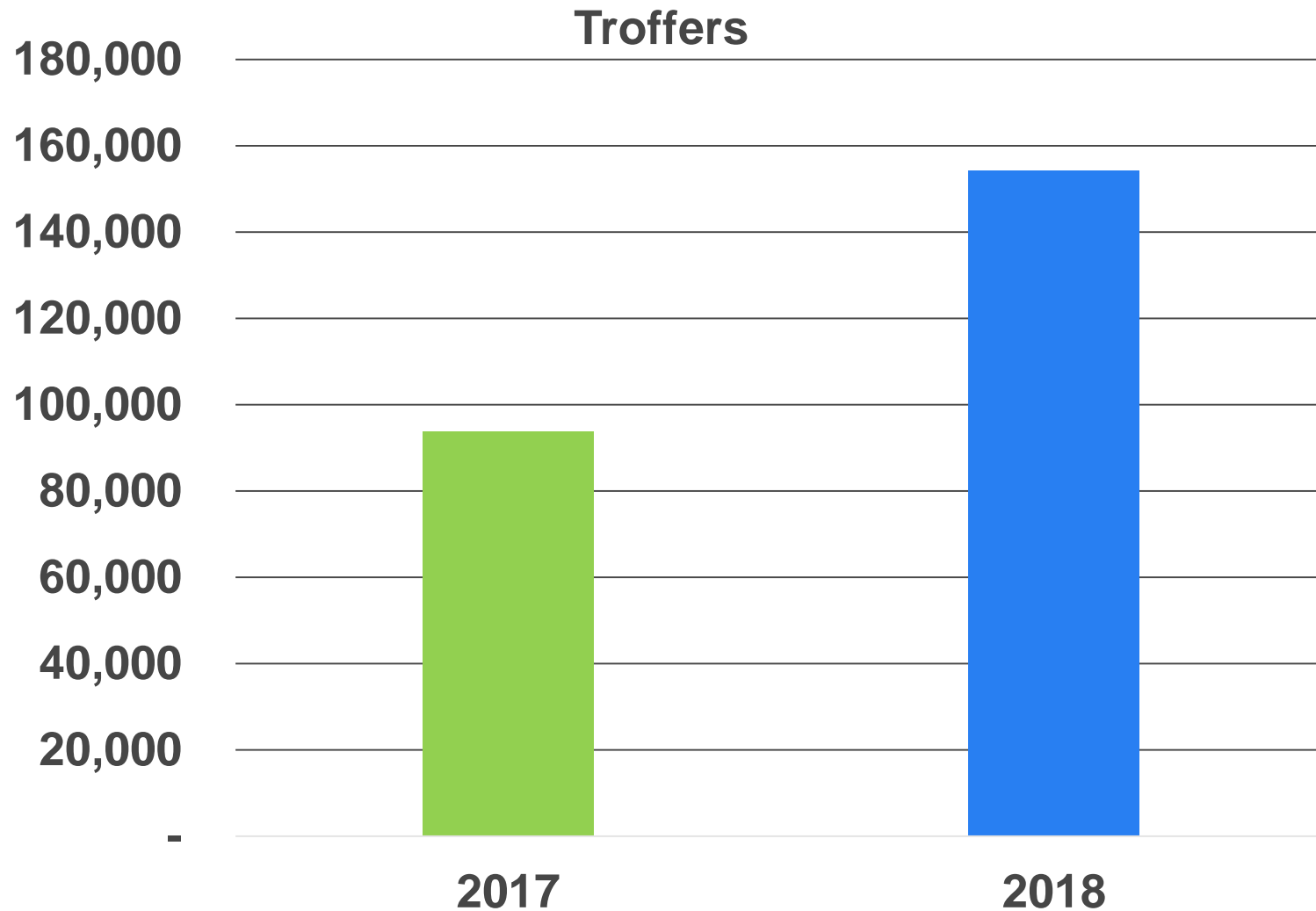
Savings increase of 54%



Total Gross Annual kWh (In Millions)



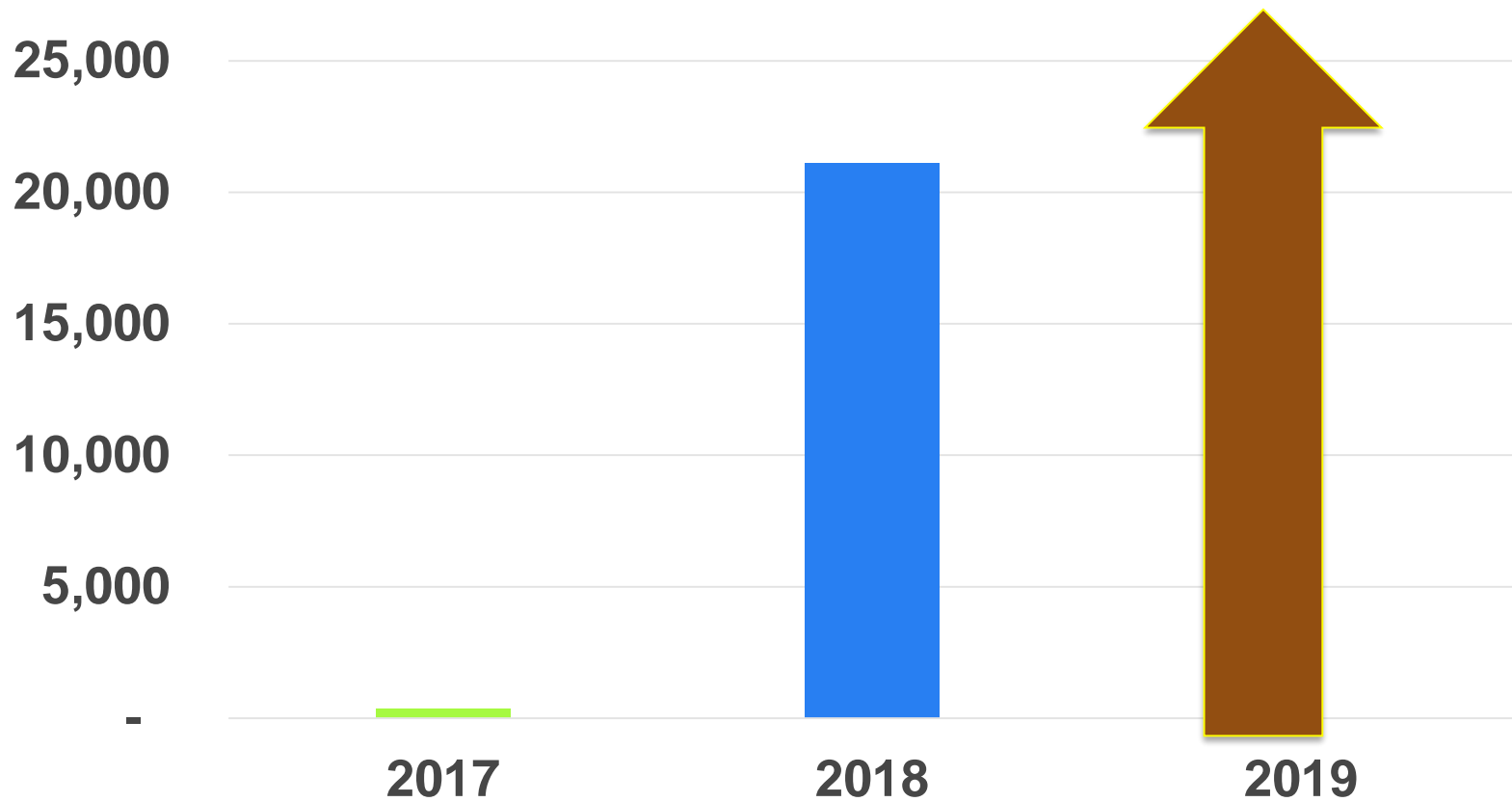
Troffer Growth



Increase of 12%



Sales Quantity



Where are there opportunities for savings?



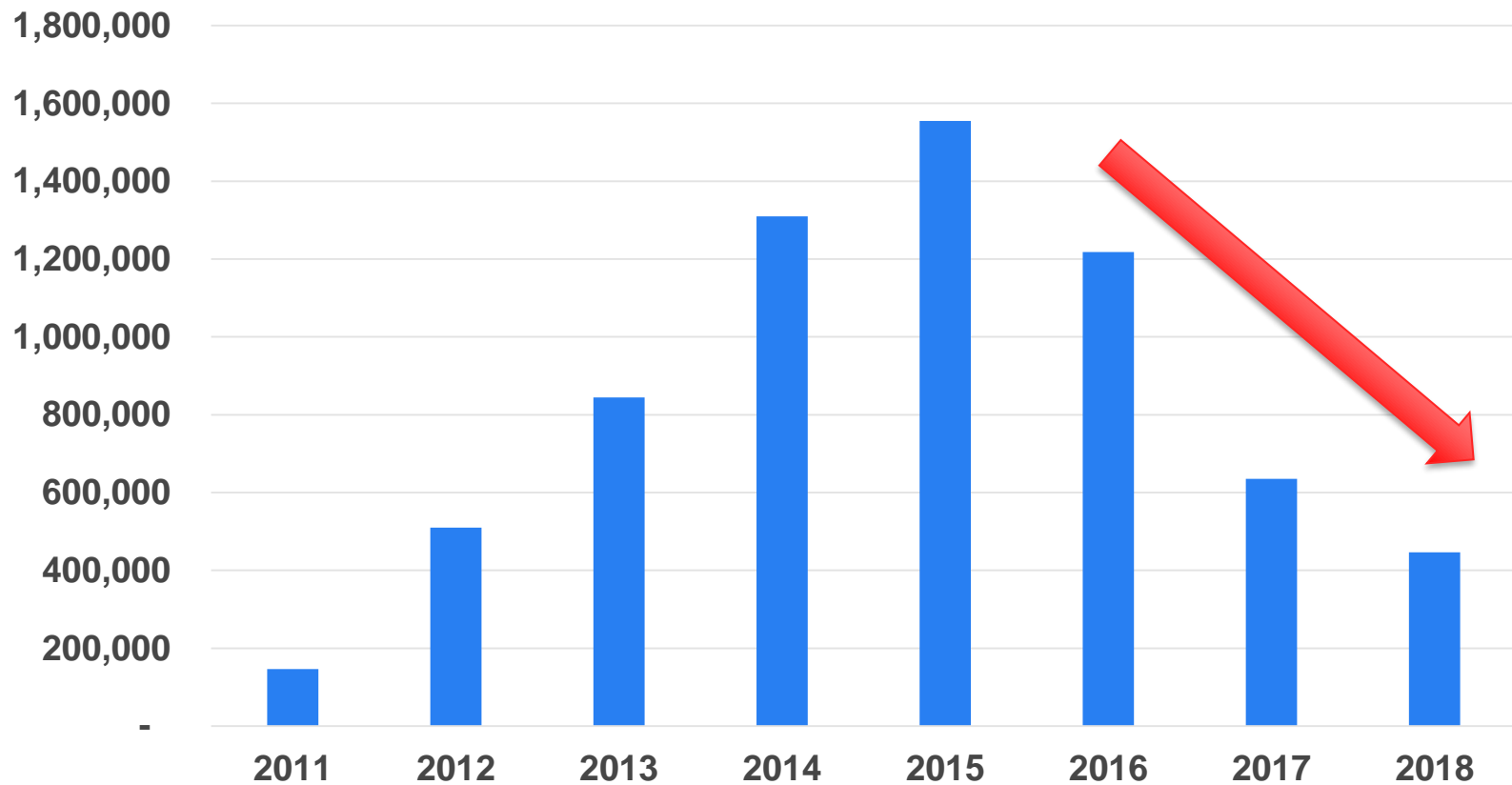
- High Bays, Troffer with Controls, Exterior, Mogul Base High Bay and Exterior



Change in landscape



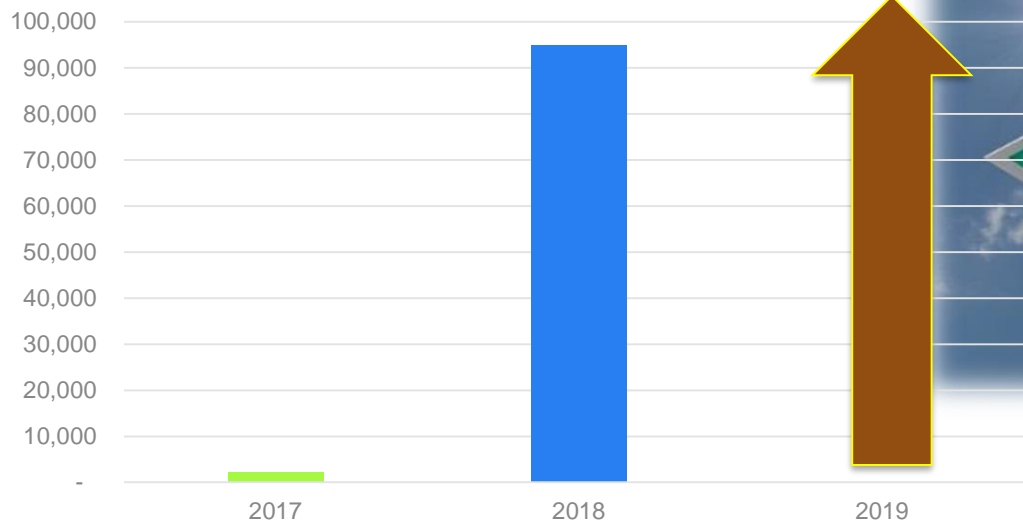
**Screw Base Sales (Quantity)
MA/ RI C&I Upstream Lighting**



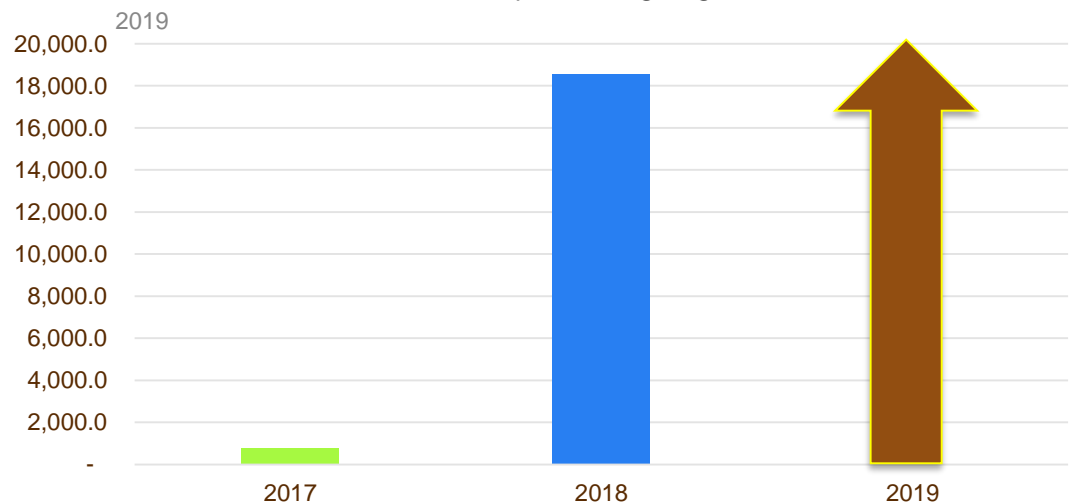
Change in Landscape (cont'd)



High/ Low Bay Sales (Quantity)
MA/ RI C& I Upstream Lighting



Exterior LED Sales (Quantity)
MA/ RI C&I Upstream Lighting

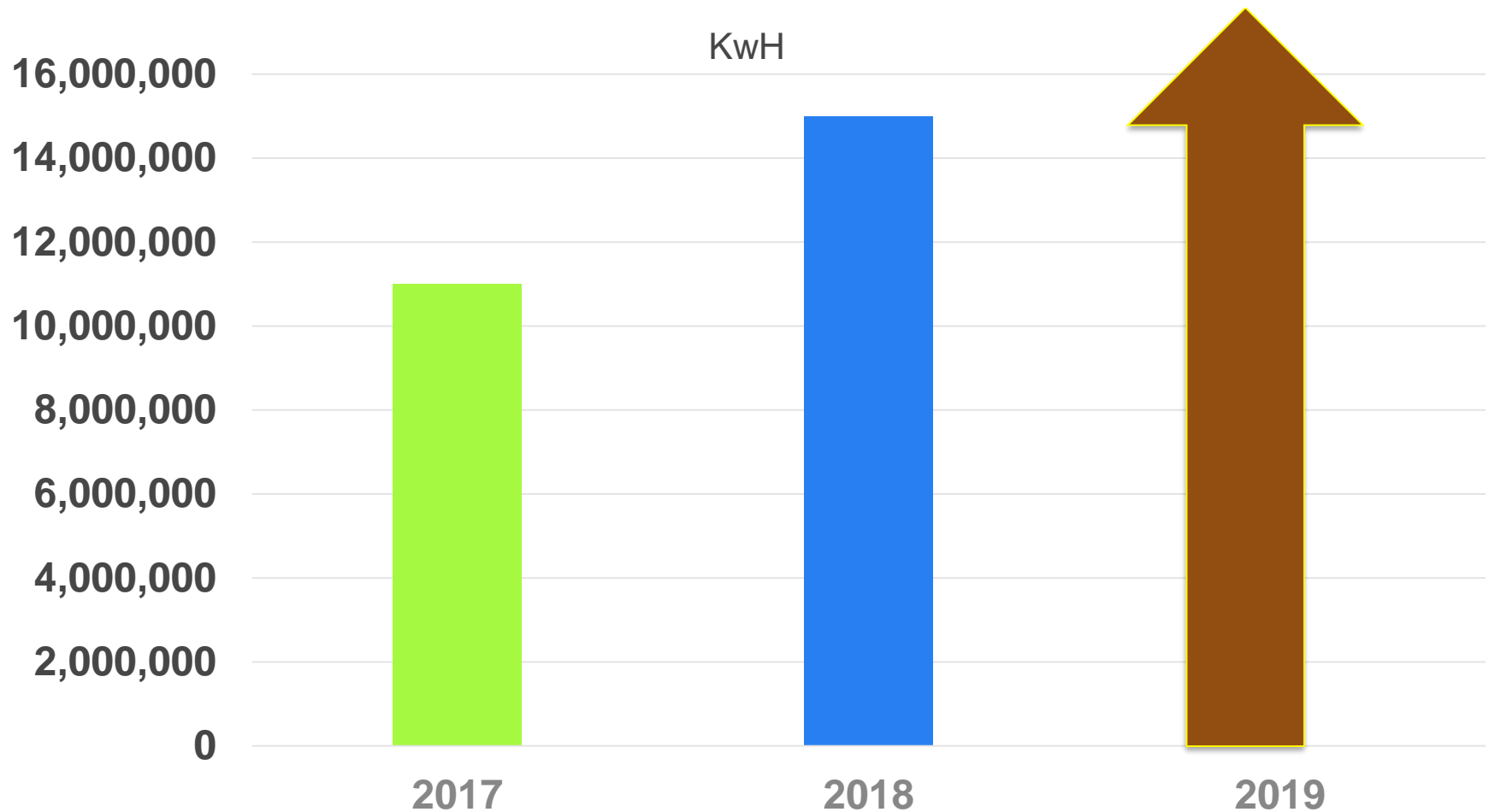


HVAC and Water Heating



- HVAC, Plumbing and Electrical Distribution partners
 - HVAC & Plumbing : 55+
 - Foodservice: 30
- Incentive details are available at:
 - [MassSave.com/CI-HVAC](https://masssave.com/CI-HVAC)
 - [MassSave.com/CI-Water-Heaters](https://masssave.com/CI-Water-Heaters)

Upstream HVAC 2018

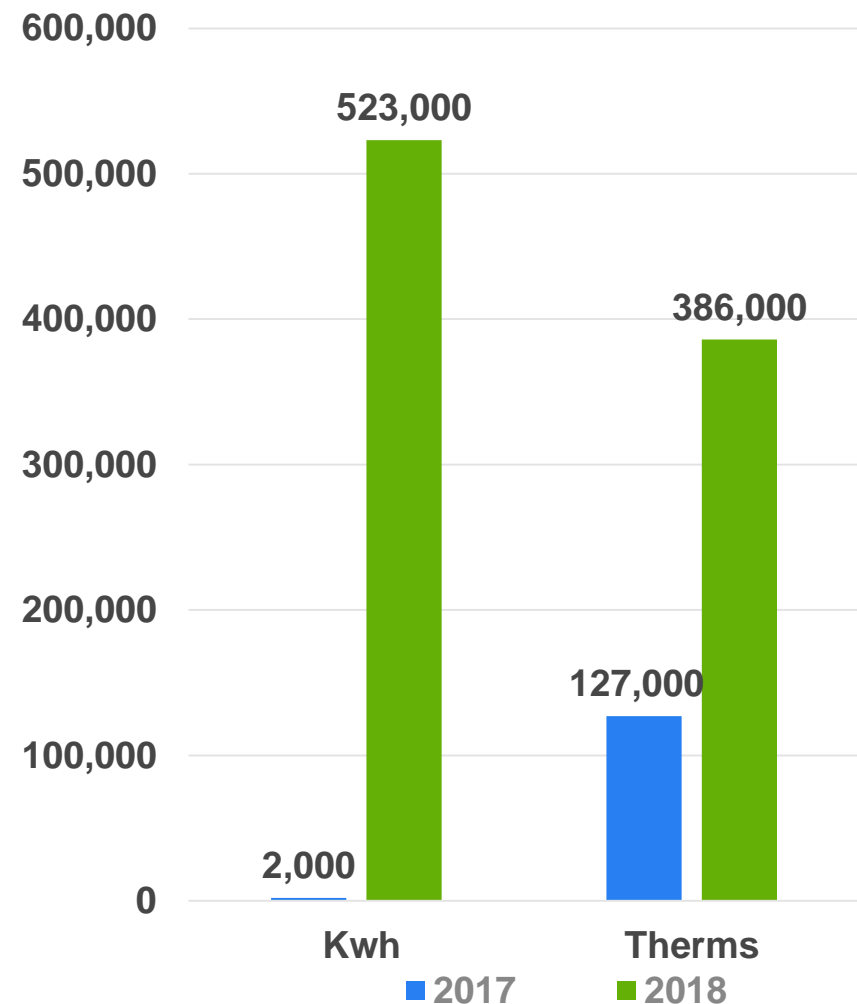


Food Service

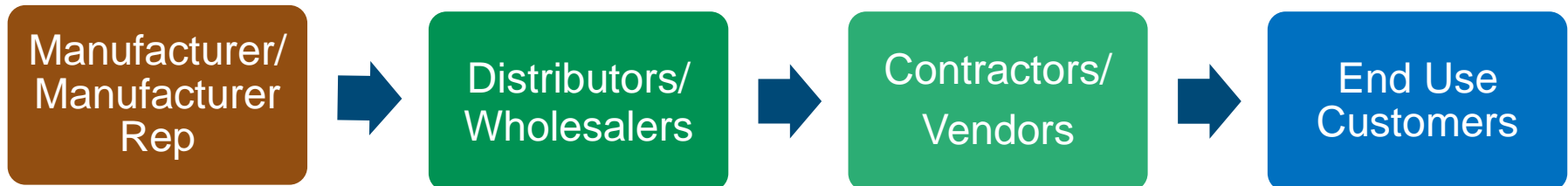


Substantial growth in the food service program:

- 2018: Addition of electric food service measures
- 2019: Statewide initiative effective 4/1/19
 - Upstream incentives available as of 4/1/19 in Columbia Gas territory
- Participating Dealer list and incentive table available at MassSave.com/Instant-Rebates



- Dedicated team
 - Expanding our pathways
 - Provides primary point of contact for Manufacture / Mfg Rep
 - Project leads that are developed at the manufacturer level
 - Training opportunities for EE personnel and contractors



Program Highlights:

Gas Savings

Gas Savings Focus



Market/Segment Focused

- Industrial
- Labs
- Laundry
- Food & Beverage

End-use-Comprehensive

- Process thermal efficiency/Waste heat recovery
- HVAC- Air Flow Reduction
- RCx and O&M

End-use - Equipment

- Steam Traps and Insulation
- Boiler Tune Ups
- Gas Leaks
- CAIR Heat Rec.

Support is available for identification and program delivery

BREAK
(10 MINUTES)

Mass Save Application Demo

Heat Pumps & Fuel Optimization

Mitsubishi/Fujitsu

Rick Nortz : Mitsubishi Electric

Mike Psihoules: Fujitsu General



Strategic Electrification



Beneficial Electrification

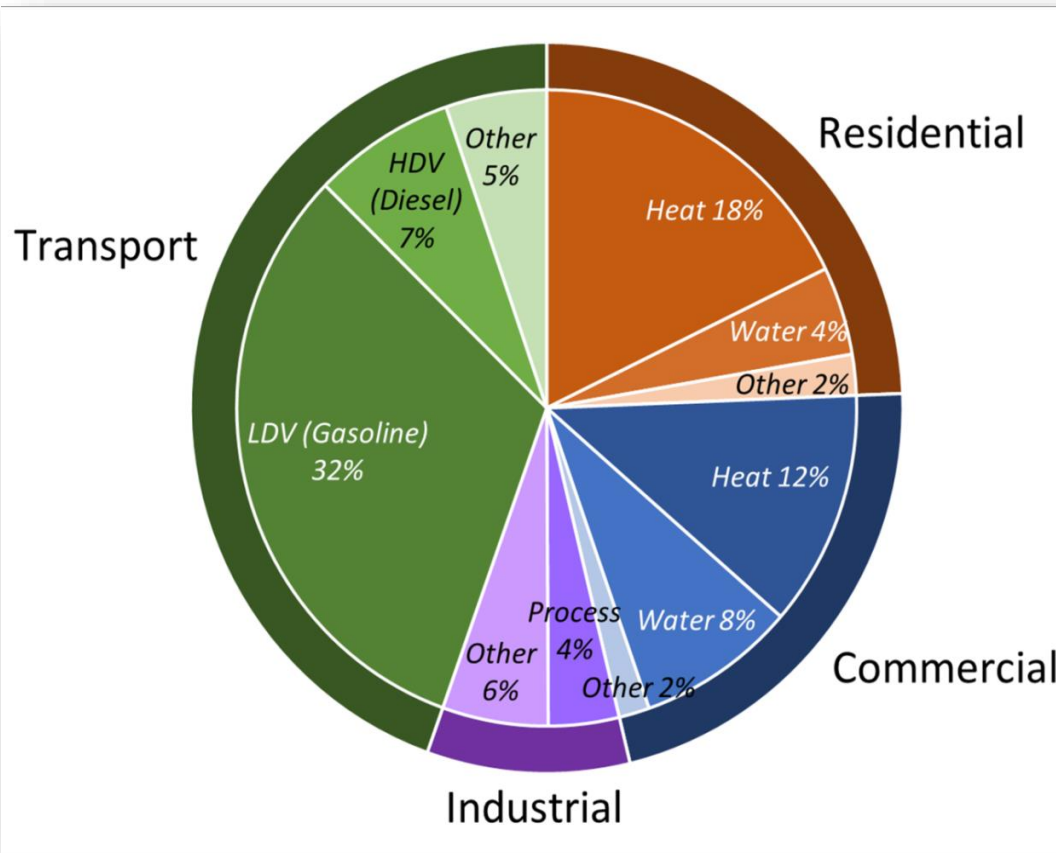


Fuel Optimization

Fuel Optimization



Fossil Fuel use [New York and New England]



- 46% of fossil fuel
 - Space Heating
 - Water Heating
- Approximately 50/50 split between residential and commercial.

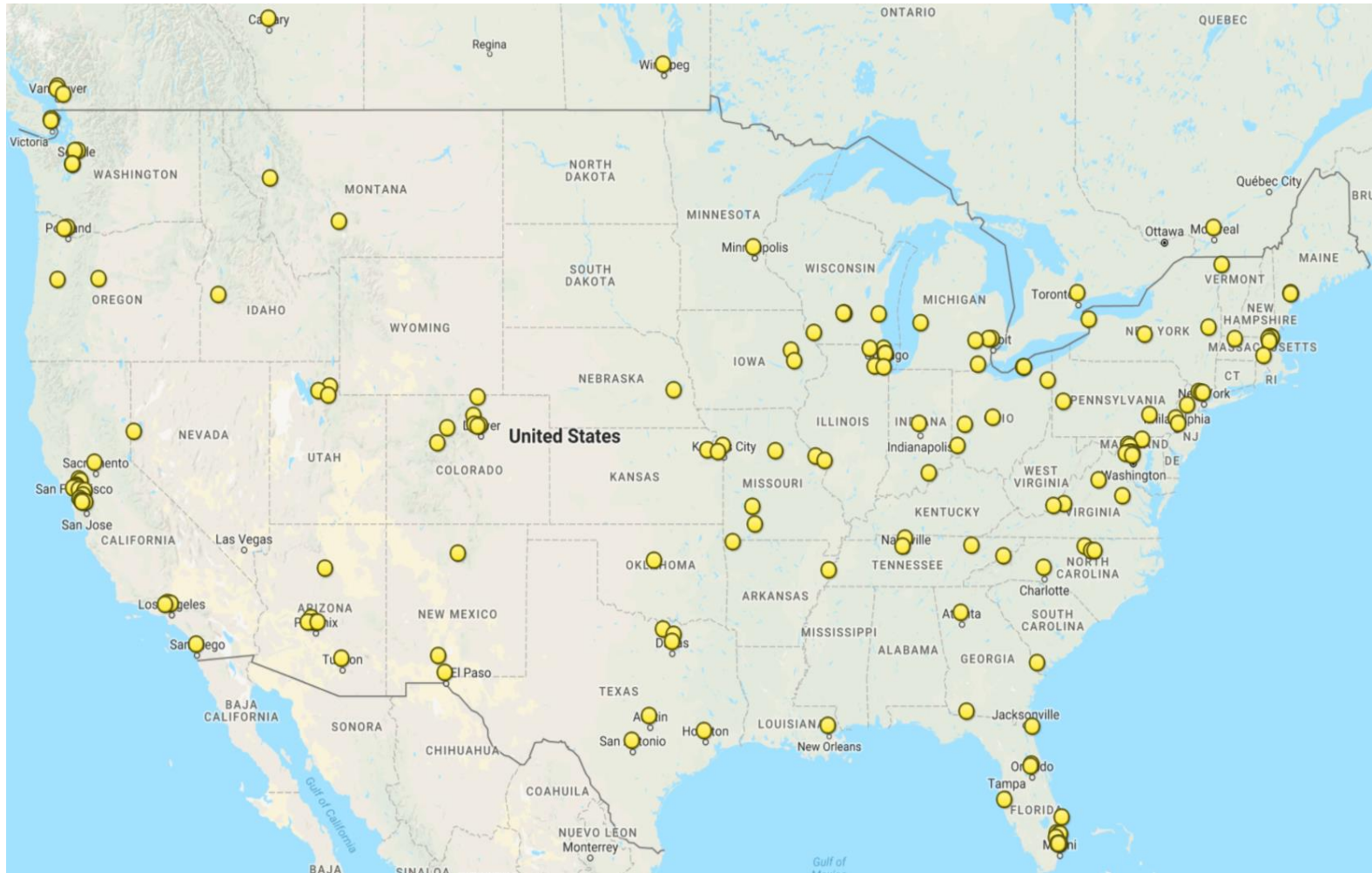
What is Electrification?



Mass Energy Efficiency Advisory Council defines it as:

“Form of fuel switching that promotes the replacement or partial displacement of fossil fuel use with clean and efficient electric technologies.”

Why Electrification?



80% x 2050

Why Electrification?



Two Choices



Technology Improvements



60 Watts



14 Watts



8 Watts

Technology Improvements



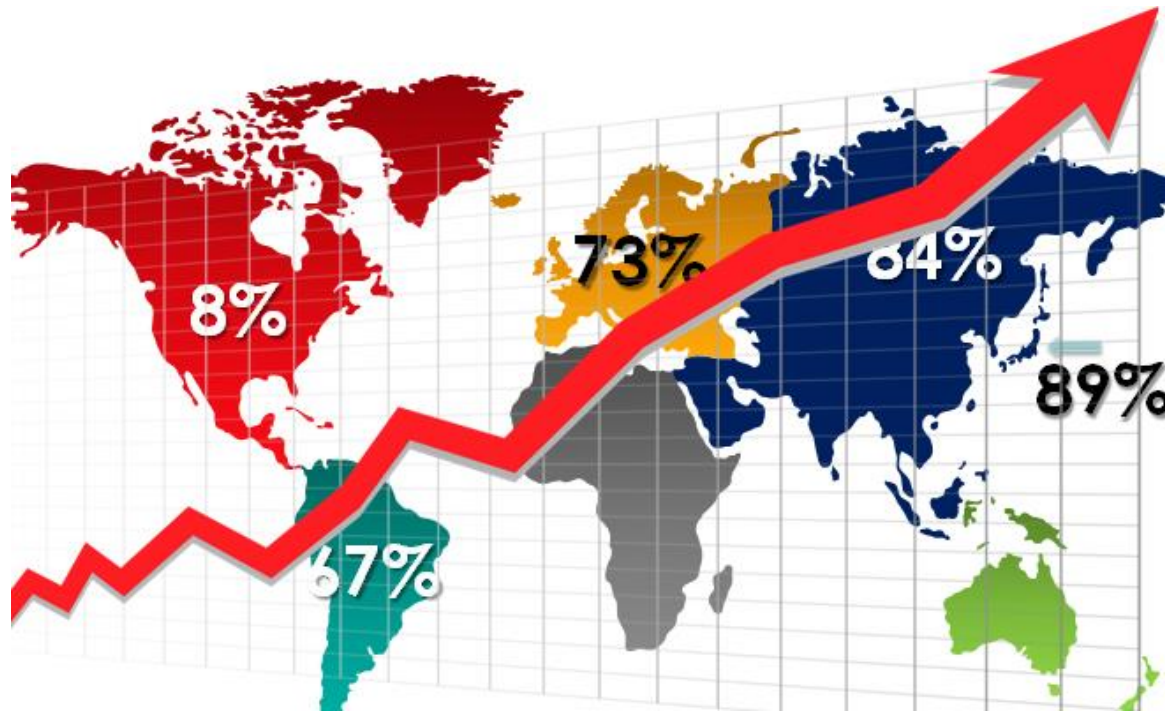
PAST....

- 10 SEER
- Operation to 32°F
- Back-up heating required at 32°F

PRESENT....

- Up to 33 SEER
- Operation below -13 °F
- 100% capacity at 5°F

Global Market



- Early stages in the United States
- Rising Awareness
- Education of contractors and consumers
- Training

Why are heat pumps part of the solution?



The grid is getting cleaner

How do we get there?

What does scenario modeling show us?

Source: NEEP (2017).
Northeast Regional
Assessment of Strategic
Electrification.
Prepared by Synapse
Energy Economics and
Meister Consultants
Group. Retrieved from
www.neep.org.

Table 10: Comparing the Max Electric and Plausibly Optimistic scenarios with the Reference case based on the 2017 Annual Energy Outlook.

	Max Electric	Plausibly Optimistic	Reference Case
2050 GHG reduction from 2001 levels	77%	69%	69%
2050 electric consumption	402 TWh	339 TWh	339 TWh
Electric energy efficiency	~2% annual savings via long-lived measures	~2% annual savings via long-lived measures	~2% annual savings via long-lived measures
Clean electricity	95% in 2050	95% in 2050	95% in 2050
Residential heat pumps	Delivered fuels: 96% sales share in 2035 Natural gas: 95% sales share in 2035	Delivered fuels: 89% sales share in 2035 Natural gas: 68% sales share in 2035	1% total installed share in 2050
Commercial heat pumps	Delivered fuels: 89% sales share in 2035 Natural gas: 78% sales share in 2035	Delivered fuels: 80% sales share in 2035 Natural gas: 66% sales share in 2035	4% total installed share in 2050
Cars and light trucks	81% sales share in 2035	70% sales share in 2035	3% sales share in 2035
Medium- and heavy-duty road vehicles	50% of miles electric in 2035	25% of miles electric in 2035	0.3% of miles electric in 2035
Process heat and steam	16% fossil energy displaced in 2035	13% fossil energy displaced in 2035	None

Heat pumps must account for **over 95% of residential sales** and **over 78% of commercial sales** by 2035

Prescriptive & Midstream Rebates

Ductless Mini and Multi Split Systems										
Equipment Type	Unit Type	Tier	Size Category ¹	Sub Category	Full Load Cooling Efficiency		Seasonal/Part Load Cooling Efficiency		Heating Efficiency ²	Customer Discount (\$/Ton)
Air-Cooled	AC or HP	1	< 65 kBtuh (<5.4 Tons)	Ductless Mini and Multi Splits	12.0 EER	and	20 SEER	and	9.0 HSPF	\$75.00
		2			12.0 EER	and	23 SEER	and	11.5 HSPF	\$150.00

VRF Systems										
Equipment Type	Unit Type	Tier	Size Category ¹	Sub Category	Full Load Cooling Efficiency		Seasonal/Part Load Cooling Efficiency		Heating Efficiency ²	Customer Discount (\$/Ton)
Air-Cooled	HP	1	≥ 65 kBtuh (≥5.4 Tons)	VRF	11.0 EER	and	18 IEER	and	3.4 COP	\$125.00
Water-Cooled	HP	1	≥ 65 kBtuh (≥5.4 Tons)	VRF	12.0 EER	and	20 IEER	and	4.3 COP	\$125.00

Project Types (midstream)



**Funeral
homes**



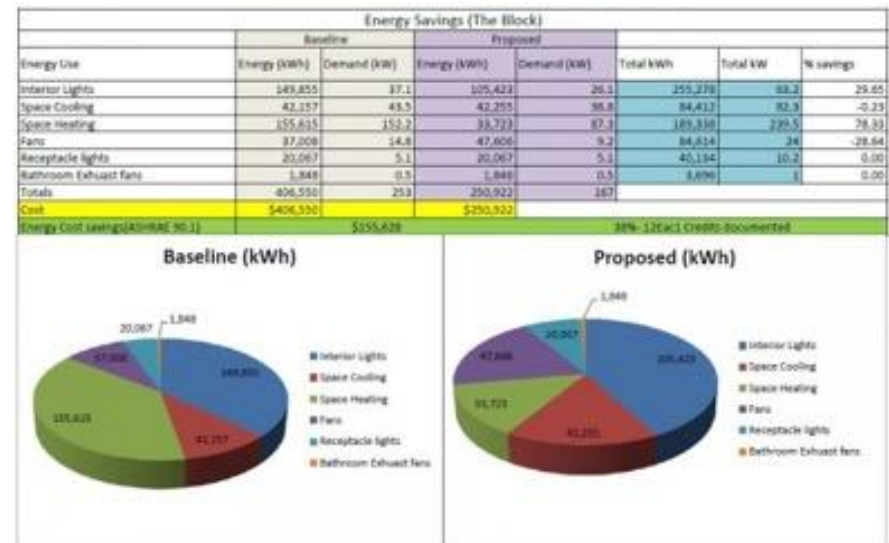
Restaurants

Incentive Design



Custom Rebates

- May be more lucrative – per kWh saved
- Calculated energy savings per project
- Must be submitted for approval BEFORE equipment purchased.
- *Potential Barriers*
- Energy calculations/models may be required



Project Types (custom)



Federal Courthouse



Hotels



University/Education



Office Building

Closing Remarks & Solution Stations

Results of the live poll