

LIPA Oversight Committee

July 26, 2017

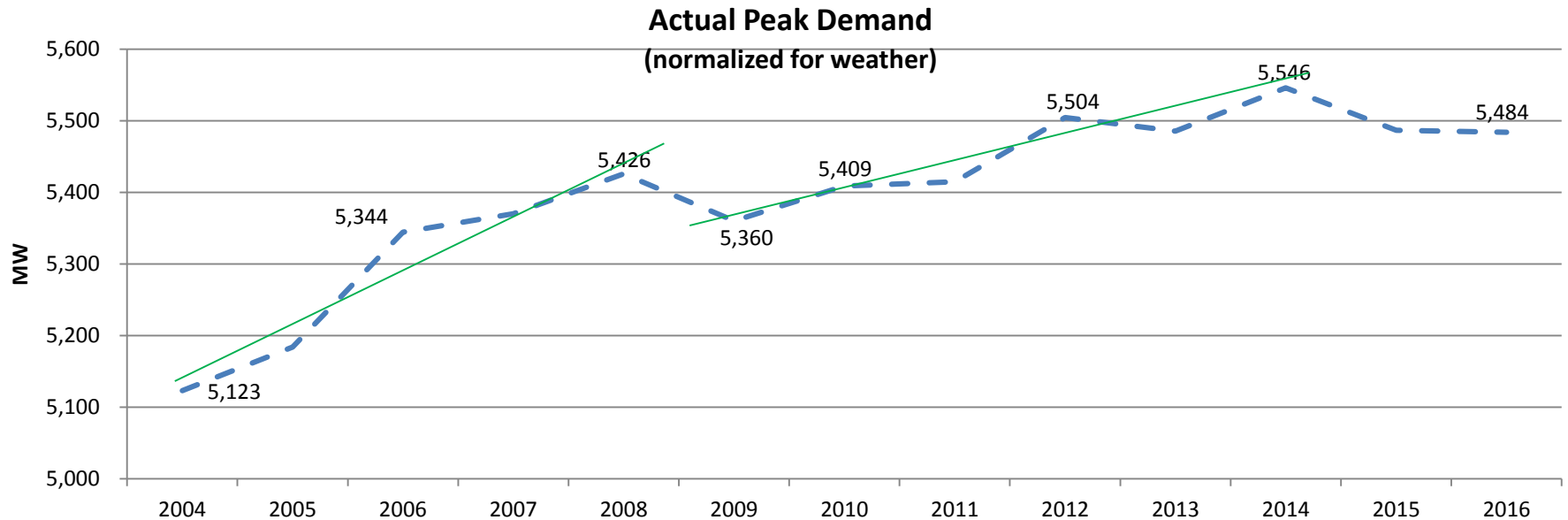
Impact of Energy Efficiency and Trends in Customer Use

Key Questions about reductions in projected load

- How has load growth changed over the past five to ten years?
- How has average use per customer changed?
- What is driving the change and is it permanent?
- What can we expect in the future ?
- Are there specific areas of the Island that are seeing growth?

How has load growth changed in the past 12 years?

- Growth in peak load from 2004 to 2008 was 1.4% per year
- Peak load dropped 66 MW (1.2%) in 2009 - Great Recession
- Growth in peak load from 2009 to 2014 was 0.7% per year
- Load peaked in 2014 at 5,546 MW, dropped to 5,484 MW by 2016.
- Consistent with trends noted by EIA regionally and nationally (0.7% annual growth)
 - Energy intensity of residential, commercial and industry sectors will fall.
 - Mature economies require less energy to sustain growth



What has contributed to the recent decline in growth?

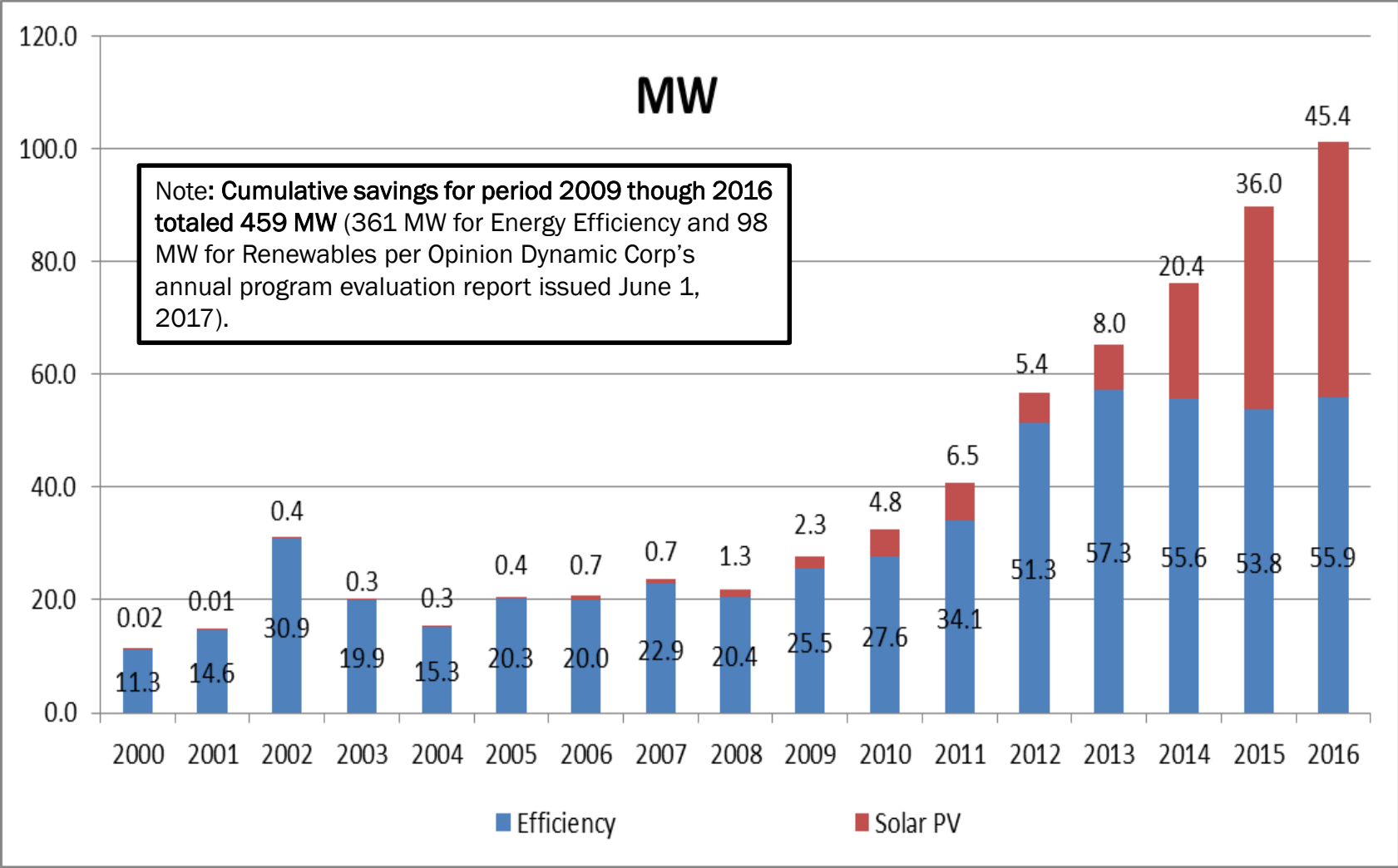
- Solar PV grew in the last 5 years at a rate that was not foreseen in the earlier forecasts.
- Energy efficiency programs are now projected to continue past the 2018 end of the 10-year Efficiency Long Island (ELI) program.
- Market-driven energy efficiency and renewable resource programs are transforming consumer behavior
 - PV technology is becoming self-sustaining
 - LEDs are replacing incandescent and compact fluorescent bulbs
 - Appliance standards are rising
- New electronic devices use much less power than previously

Technology Trends (Solar PV)

There are now more than 40,000 net-metered solar PV systems on Long Island (about 4% of LIPA customers)

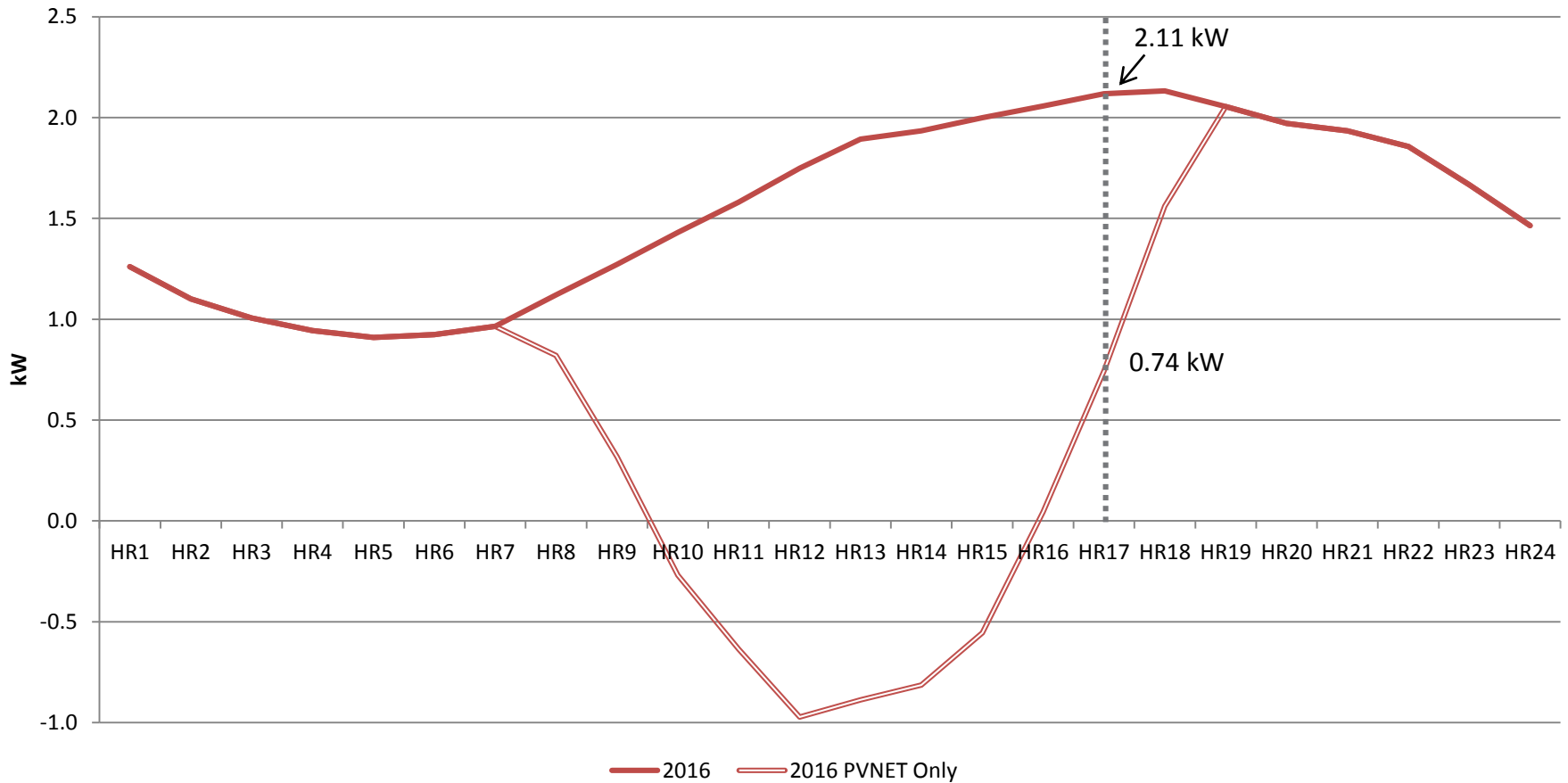
- There were more than 11,000 Residential installations on Long Island in 2016
- Residential Installations remain steady at about 6,000 - 8,000 systems per year, even after the NY Sun Rebates for residential customers were eliminated
- The federal investment tax credit was extended at the end of 2016 for another five years
- The cost of solar PV has declined making it economic for many, even without rebates
- Typical systems are sized to cover 80 - 100% of the annual electric usage for a residential home
- At hour ending at 5:00 pm, during the summer peak period, net-metered solar customers consume 1.37 kW less than typical residential customers (0.74 kW vs. 2.11 kW)

Annual Growth in Energy Efficiency & Solar PV Net-Metered



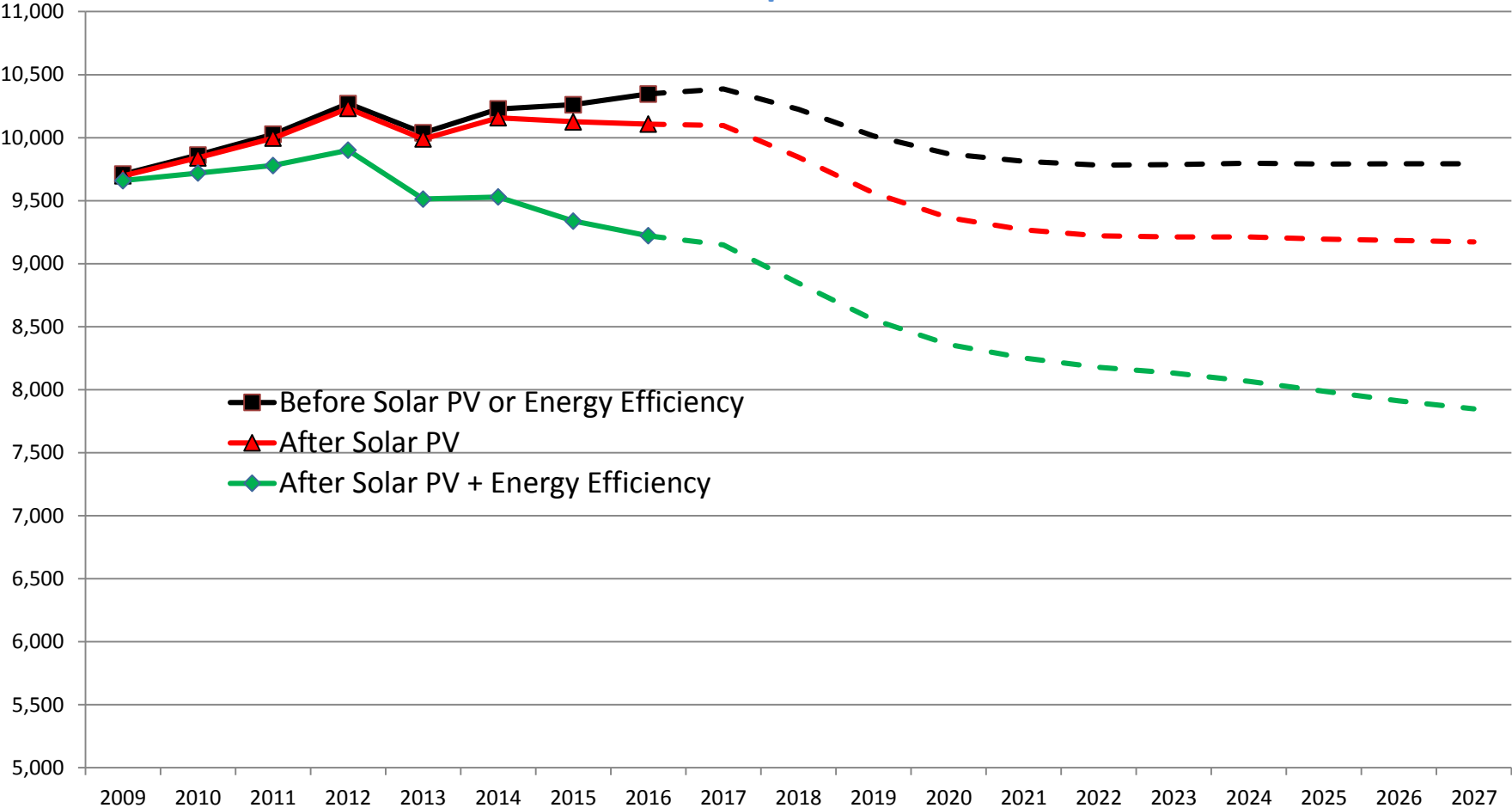
Residential Customer Average Summer Weekday Loadshape

Residential Average Summer Weekday (Jul/Aug) Rate 180



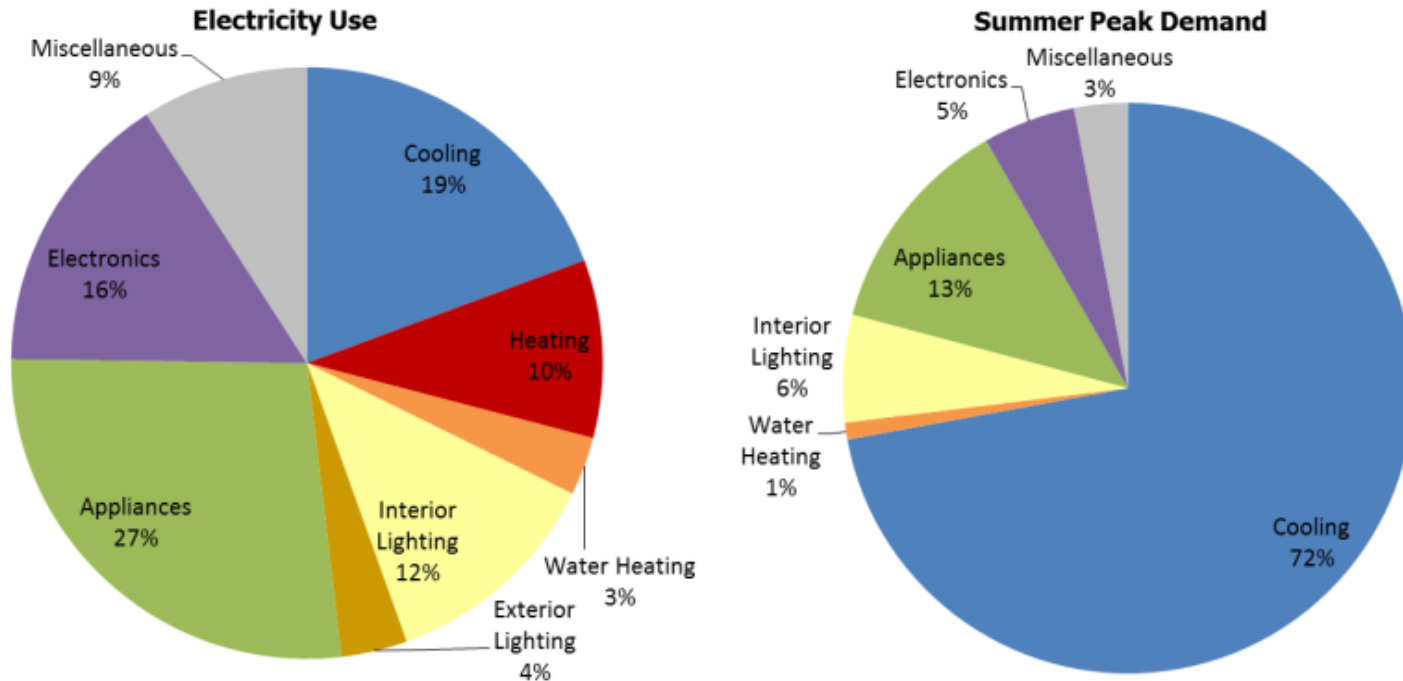
Electric Use Per Residential Customer is flat even before LIPA-sponsored programs.

Weather Normalized KWh per Residential Customer



Residential End Use reflects large cooling load

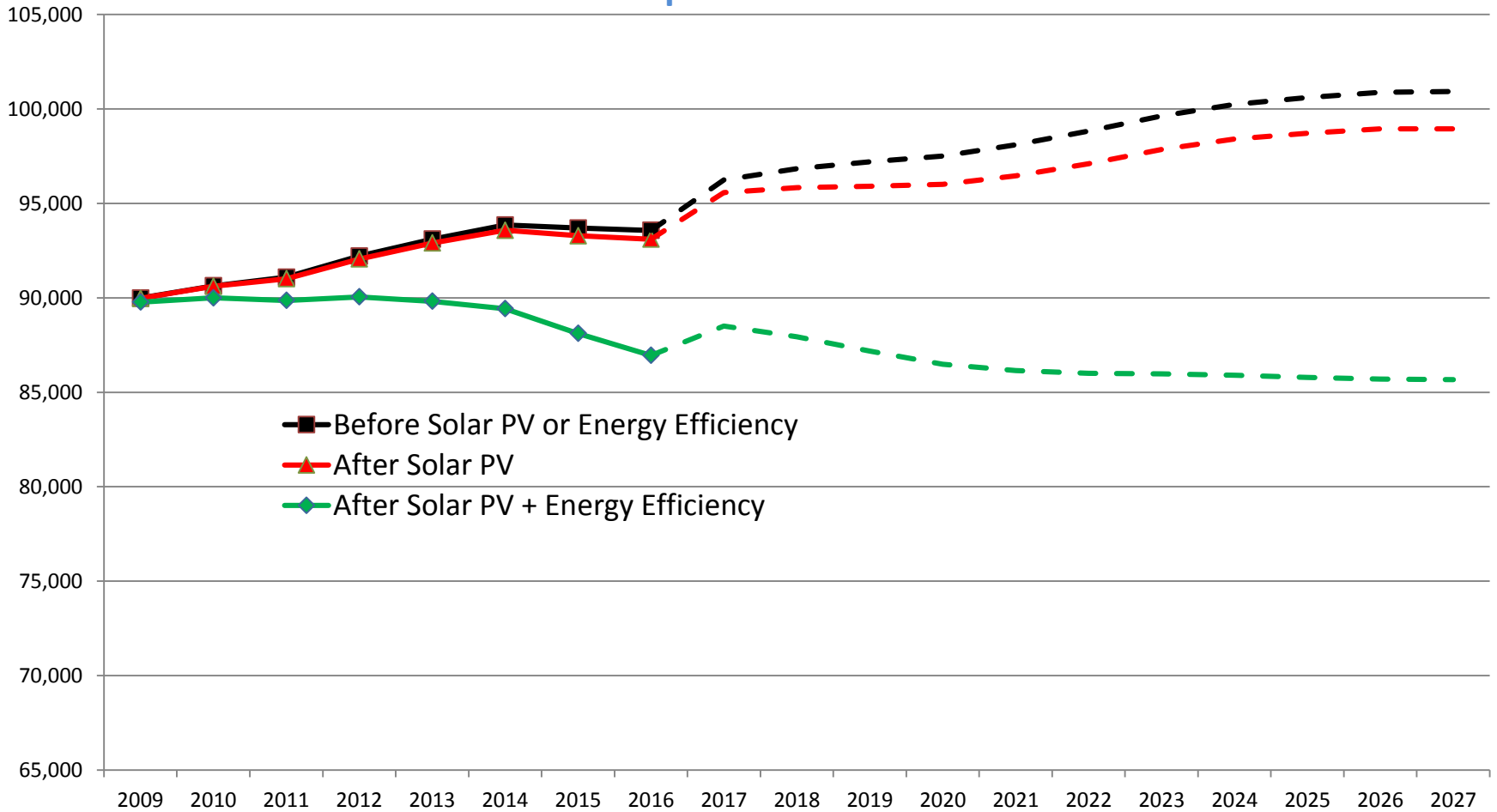
Residential Electricity Use and Summer Peak Demand by End Use (2014)



Source: PSEG Long Island Energy Efficiency Potential Study, Applied Energy Group, June 10, 2016

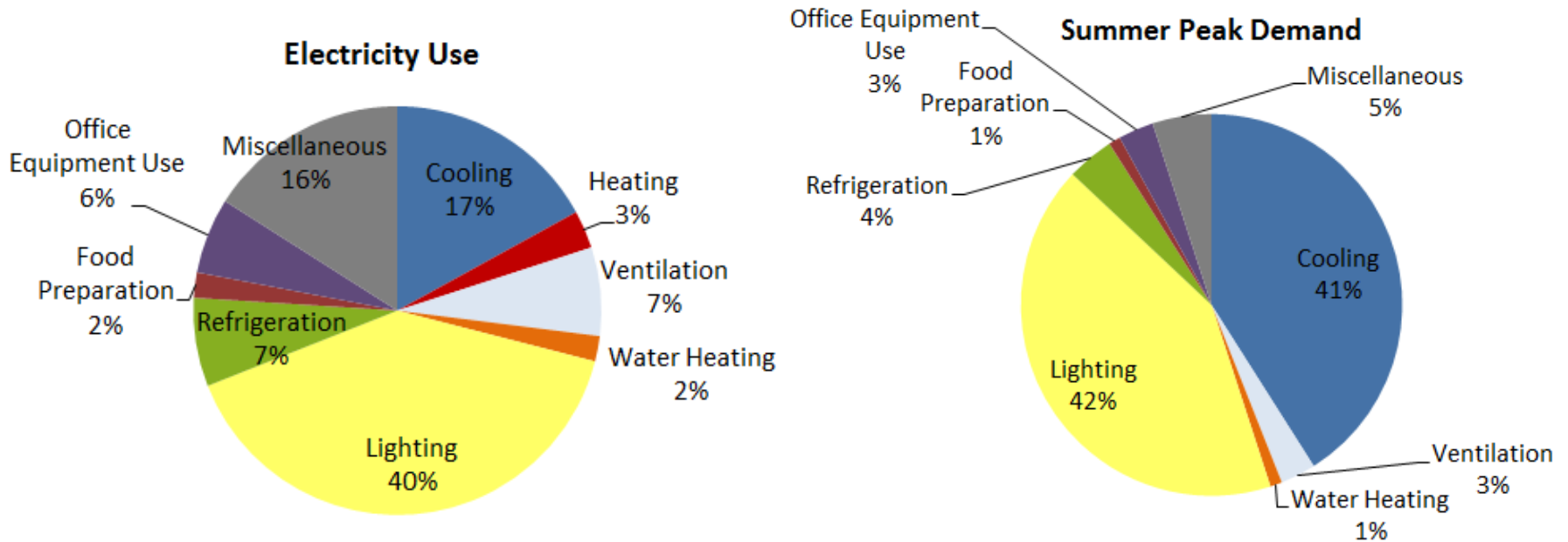
Electric Use Per Commercial Industrial Customer

Weather Normalized KWh per Commercial Industrial Customer



Commercial Load is driven by cooling and lighting

Commercial Electricity Use and Summer Peak Demand by End Use (2014)



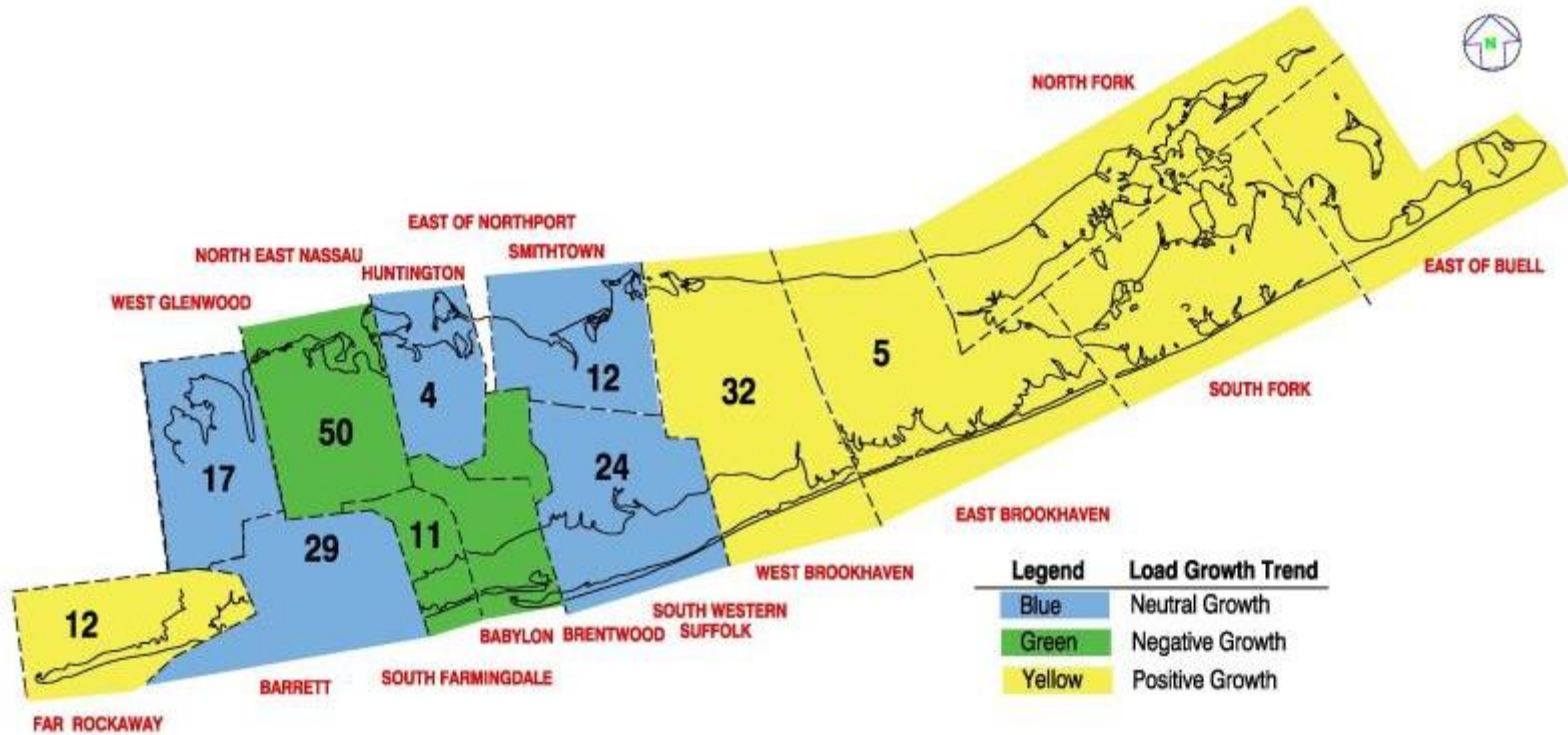
Source: PSEG Long Island Energy Efficiency Potential Study, Applied Energy Group, June 10, 2016

Technology Trends - LED Lighting is the next big thing

LED Lighting uses 50% - 85% less energy than fluorescent, incandescent and High Intensity Discharge (“HID”)

- In commercial buildings, large numbers of LED lighting products are being installed with the help of generous rebates from PSEG Long Island
- In the residential market, LED’s have now exceeded 17% socket saturation (increasing by about 5% per year). Socket saturation of LED’s should be at least 22% by the end of 2017.
- Residential LED lighting impacts are occurring outside of the Energy Efficiency Program
- Many municipalities are switching to LED’s for street lighting and parking lot lighting

Load Growth Varies across Long Island



Comments:

1. Bold numbers represent the anticipated MW additions from large customer projects
2. Capital additions are often required to meet these demands, despite flat overall load growth

* Current Trend of Customer Load in Pocket prior to the New Large Load Projects

Load Increases from Large Load Customer Projects

Projects Forecasted from 2017 to 2021

LOAD IN MW

LOAD AREA / POCKET	PROJECTED NEW / LARGE LOAD LARGEST POCKET PROJECT	2017 to 2021	Total for Pocket
FAR ROCKAWAY	Arverne by the Sea	7	11.5
BARRETT	Cedar Creek Water Treatment Plant	10	29
	Bay Park Sewage Treatment	11	
WEST GLENWOOD	Belmont Racetrack Development	4	16.8
NORTH EAST NASSAU	Garvies Point - (Was Glen Isle Renamed In 2013)	10	50
	Old Plainview Development- Countre Point, Hyatt	15	
	Nassau Coliseum Development	12	
SMITHTOWN	260 Apartment Units	3	3
SOUTH FARMINGDALE	Farmingdale Cornerstone Village Apartments	4	11
	Farmingdale/ Republic LIRR expansion	5	
BABYLON	Village of Lindenhurst - Apartments	2	2
BRENTWOOD	Heartland Town Square (Wolkoff)	16	24
	Mindshift Technologies (data center load)	4	
SOUTH WESTERN SUFFOLK	Serota Development	8	19
WEST BROOKHAVEN	Yaphank Center	12	32
	Discovery Park @ Brookhaven National Laboratory	9	