



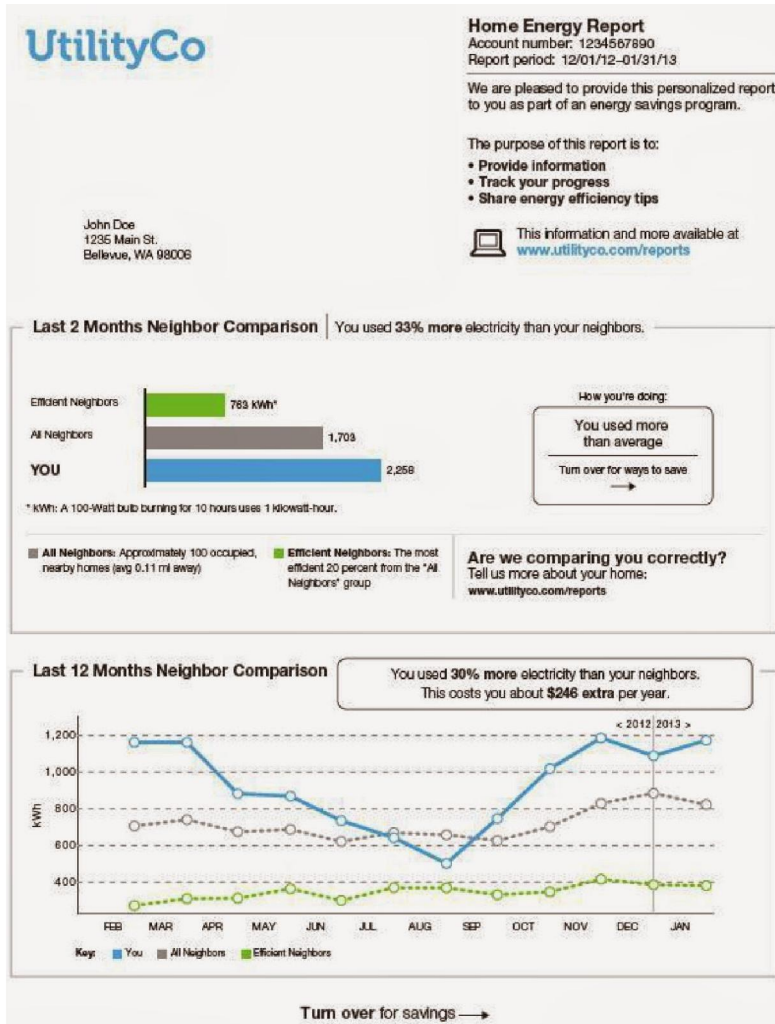
A LOOK INSIDE THOSE AVERAGE HOME ENERGY REPORT SAVINGS

DRAFT

AGENDA

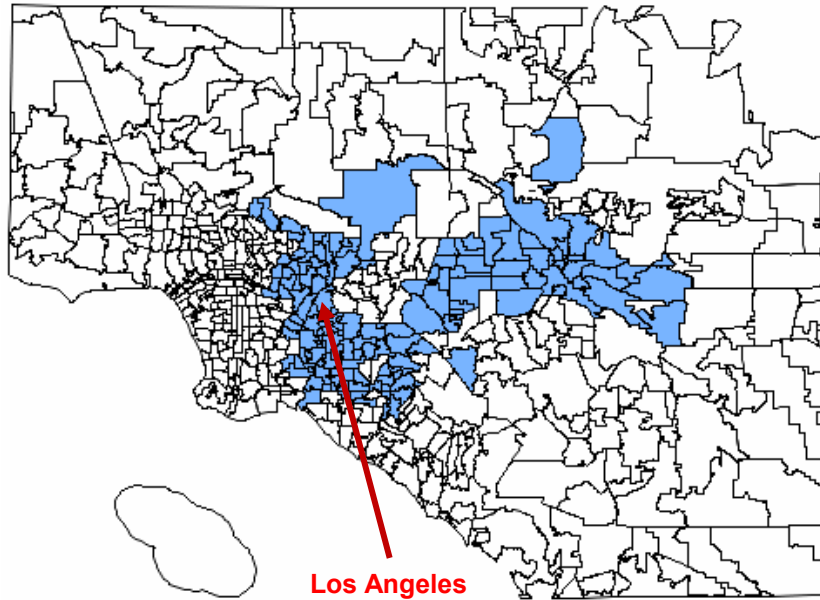
- What is the Opower2 Program?
- High Level Impacts of the Program
- Sub-analysis Results
 - Energy Stratum (Low/Medium/High Users)
 - Size Stratum (Small/Medium/Large Homes)
 - Vintage Stratum (Old/New Homes)
 - Climate Zone
 - California Alternate Rates for Energy (CARE) / Family Electric Rate Assistance (FERA)
 - Time-of-Use Rates (TOU)
 - Vintage and Size of Home
- Concluding Thoughts

WHAT IS THE OPOWER2 PROGRAM?



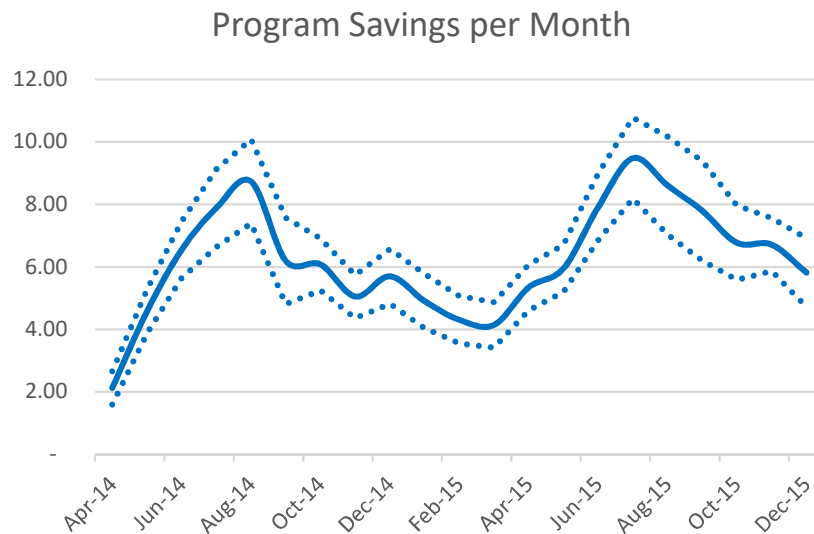
- To Cover the Basics...
- Who: Southern California Edison
 - Provider: Opower
 - M&V: Applied Energy Group
- What: Home Energy Reports
- When: March 2014 to Present
- Where: Los Angeles and San Bernardino Counties
- Why: Encourage customers to reduce energy consumption by providing a comparative report

WHAT IS THE OPOWER2 PROGRAM?



- Selected 150,000 customers in December 2013
 - Stratified using energy per day, home size, and home vintage (18 subgroups)
 - Split evenly into Treatment and Control
- First reports mailed in March 2014
- Evaluation Covered Program Period of 03/2014 to 12/2015

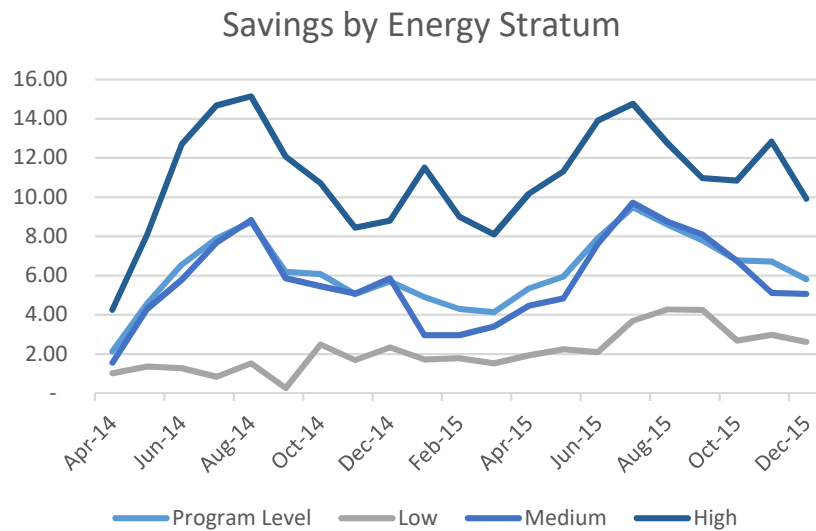
HIGH LEVEL IMPACTS OF THE PROGRAM



	Per Customer	Total	% of Usage
2014	53 kWh	3,811 MWh	0.84%
2015	78 kWh	5,340 MWh	1.01%
Total	131 kWh	9,151 MWh	0.94%

- Savings of 131 kWh/Customer over 21 months – around 1.0% of usage
- Program savings of 9.1 GWh
- Statistically significant at 95% across the entire program range
- Slight dip from December 2014 to February 2015 due to 3 month lull in reporting sending
- What’s behind the savings?

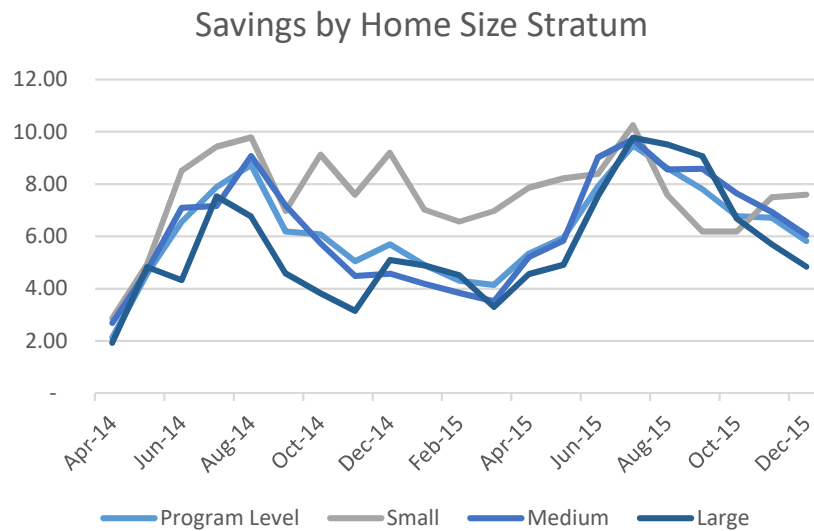
SUB-ANALYSIS: ENERGY STRATUM



	Average	Low	Medium	High
2014	53 kWh	13 kWh	50 kWh	95 kWh
2015	78 kWh	32 kWh	70 kWh	136 kWh
Total	131 kWh	45 kWh	120 kWh	231 kWh

- First of our stratification variables
 - Stratum 1: ≤ 16 kWh/Day
 - Stratum 2: >16 and ≤ 25 kWh/Day
 - Stratum 3: > 25 kWh/Day
 - Roughly split population into thirds
- Intuitively makes sense: lower energy users save less energy as there is less opportunity
- Large differential between small and large users. 5x the savings for 1.5x the usage (\pm)

SUB-ANALYSIS: SIZE STRATUM

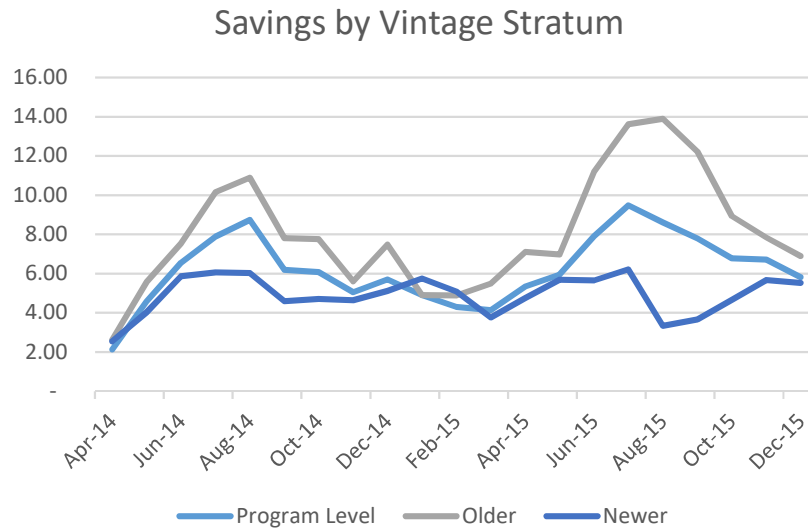


	Average	Small	Medium	Large
2014	53 kWh	68 kWh	53 kWh	42 kWh
2015	78 kWh	90 kWh	79 kWh	75 kWh
Total	131 kWh	159 kWh	132 kWh	117 kWh

- Second level of stratification*
 - Stratum 1: ≥ 700 Sqft and < 1300 Sqft
 - Stratum 2: ≥ 1300 Sqft and < 1700 Sqft
 - Stratum 3: ≥ 1700 Sqft and < 7000 Sqft.
 - Splits population into thirds again
- A bit surprising – smaller homes tended to save more energy than larger ones. Somewhat less seasonality to it as well.
- Speculation: may have done more baseload measures that saved energy over the entire year – lighting, etc.

* Each energy stratum had its own breakpoints. Figures are approximate.

SUB-ANALYSIS: HOME VINTAGE

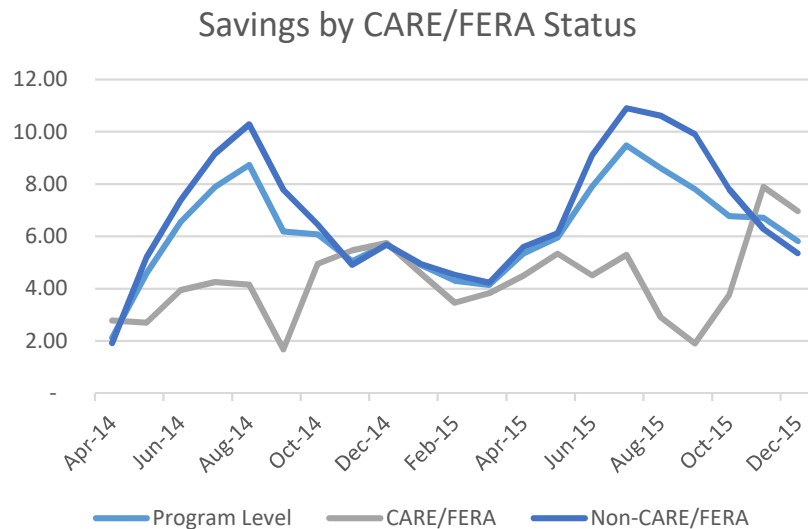


	Average	Older	Newer
2014	53 kWh	65 kWh	44 kWh
2015	78 kWh	104 kWh	59 kWh
Total	131 kWh	169 kWh	103 kWh

- Second level of stratification*
 - Stratum 1: < 1960
 - Stratum 2: >= 1960
 - Splits population into half
- As with energy – makes sense. Older homes could be less efficient than newer ones.
- Much more pronounced seasonal effect in older homes.

* Each energy and size stratum had its own breakpoints. Figures are approximate.

SUB-ANALYSIS: CARE/FERA CUSTOMERS



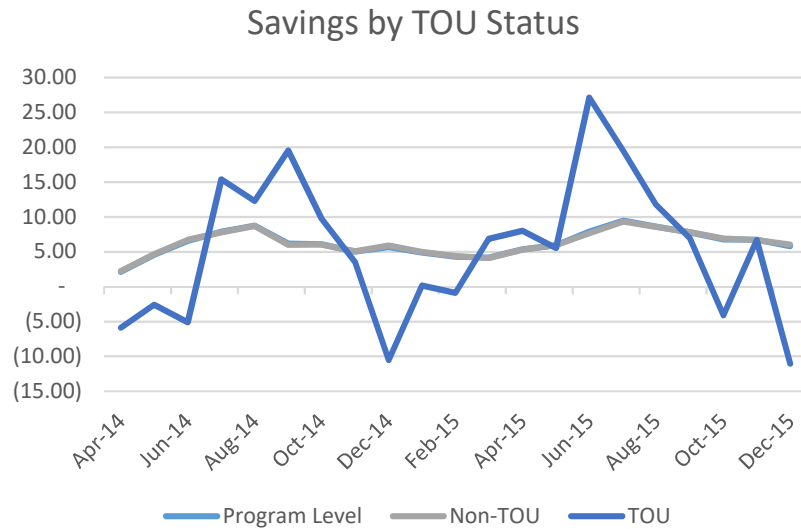
	Average	CARE/FERA	Non-CARE/FERA
2014	53 kWh	36 kWh	59 kWh
2015	78 kWh	55 kWh	85 kWh
Total	131 kWh	91 kWh	144 kWh

- Analyzed Rate Codes tied to each account and flagged down those with CARE or FERA markers.
- Savings appear to be more baseload with CARE/FERA customers.
- CARE/FERA exceeds others in November/December 2015.
- Still positive savings.

- CARE: California Alternate Rates for Energy
- FERA: Family Electric Rate Assistance

* Each energy and size stratum had its own breakpoints. Figures are approximate.

SUB-ANALYSIS: TOU CUSTOMERS

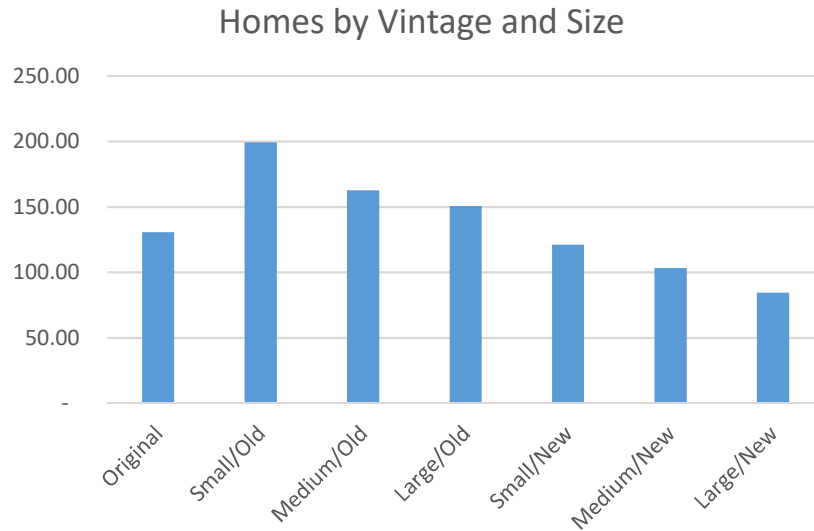


	Average	TOU	Non-TOU
2014	53 kWh	36 kWh	53 kWh
2015	78 kWh	77 kWh	78 kWh
Total	131 kWh	113 kWh	131 kWh

- Similar to CARE/FERA – analyzed rate codes looking for TOU markers.
- TOU and program likely pushes customers to install more summers saving measures when costs are highest.
- Yearly savings are still positive, but only due to outsized summer savings – winter shows increases in usage compared to Control.

* Each energy and size stratum had its own breakpoints. Figures are approximate.

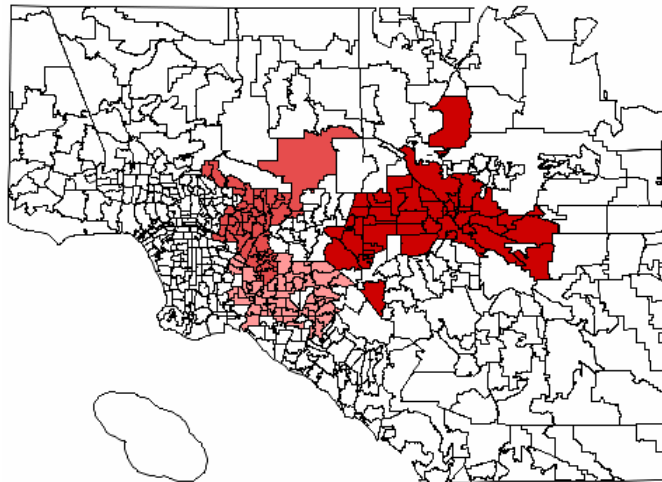
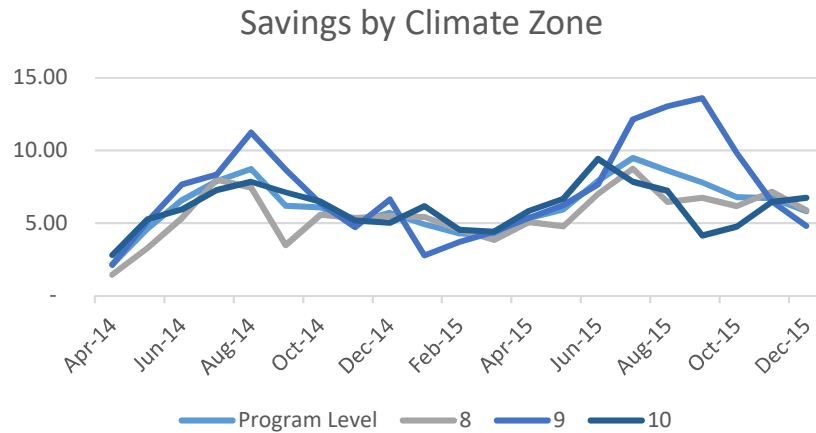
SUB-ANALYSIS: VINTAGE AND SIZE OF HOME



	Old	New	Average
Small	199 kWh	121 kWh	159 kWh
Medium	163 kWh	103 kWh	132 kWh
Large	151 kWh	85 kWh	117 kWh
Average	169 kWh	103 kWh	131 kWh

- Tested size and vintage of home
- Previous slides remain true:
 - Older homes save more
 - Smaller homes save more
- Consistency of results is interesting:
 - Older > Newer, always
 - Small > Medium > Large, always

SUB-ANALYSIS: CLIMATE ZONE



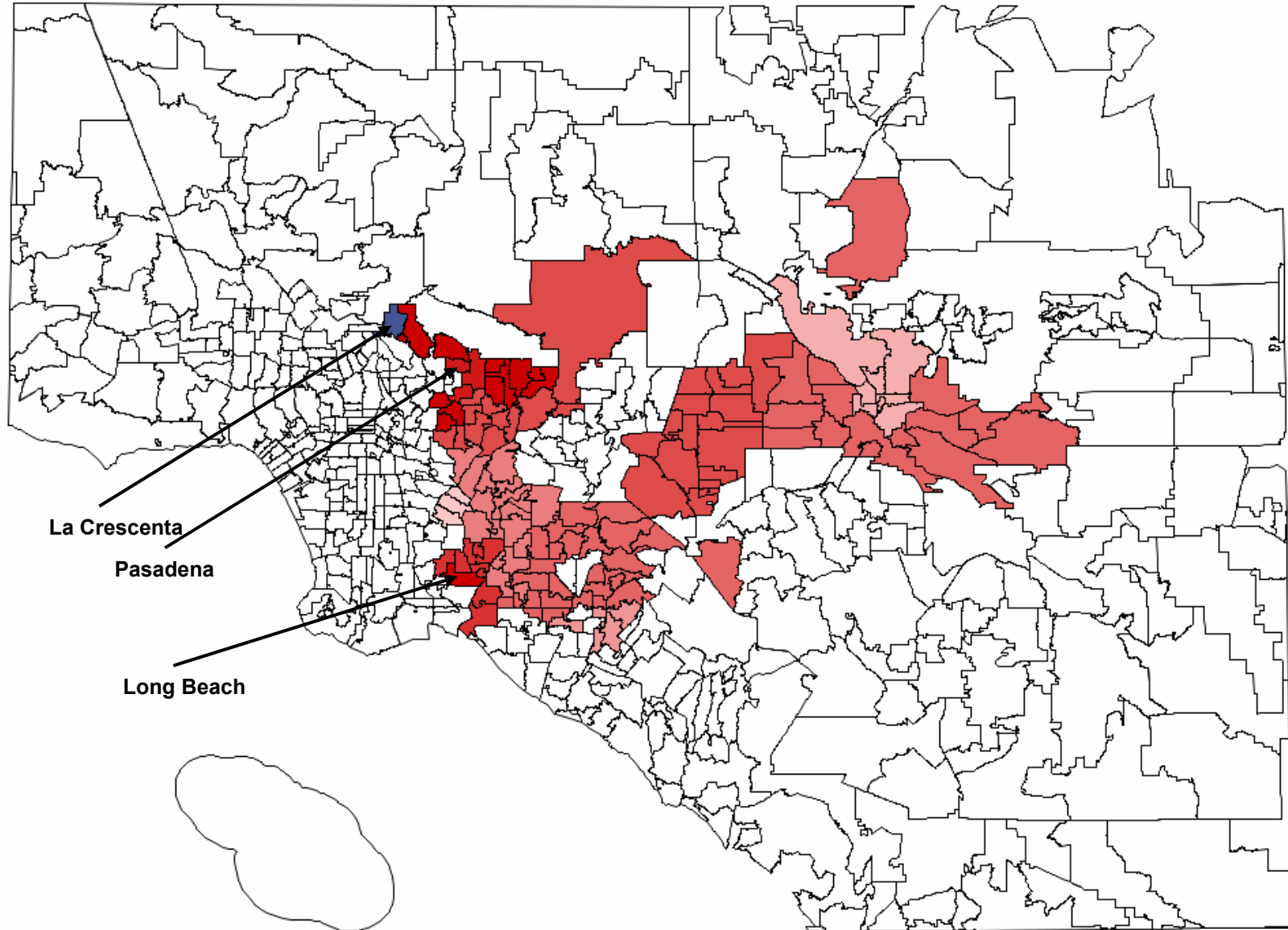
Climate Zones:

- 8 – Long Beach – Inland but influenced by marine air keeping temperatures from reaching extremes. Average temperature of 55-73.
- 9 – Los Angeles – Mix of coastal and inland air. Average temperature of 57-75.
- 10 – Riverside – interior valleys and hills. More extreme temperature swing throughout the year. Averages 55-78.
- Bit surprising that 9 is the highest, especially in 2015. 8 and 10 may be too extreme to see much summer savings as winter is very close.

	Average	8	9	10
2014	53 kWh	45 kWh	61 kWh	53 kWh
2015	78 kWh	72 kWh	90 kWh	74 kWh
Total	131 kWh	117 kWh	151 kWh	127 kWh

* Each energy and size stratum had its own breakpoints. Figures are approximate.

SUB-ANALYSIS: BY 3-DIGIT ZIP CODE



CONCLUDING THOUGHTS

- Home Energy Reports work across a broad range of customers
 - Most results are intuitive – though there are always surprises
 - Mapping provides great contextualization of results
 - Potential Next Step: further cross-class examinations
 - Do medium TOU customers save more energy than small non-TOU?
 - Are customers in CZ 9 in larger homes in general? Why do they save more?
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- **2014 Report:** http://www.calmac.org/publications/SCE_2014_HER_Evaluation_Report_FINAL_Oct_2015.pdf
 - **2015 Report:** Coming soon!



Thank You!

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