

2021 Integrated Resource Plan Stakeholder Workshop #2

Jan 25, 2021

WELCOME



**SAFETY
MESSAGE**



TECHNOLOGY

**Microsoft-Teams
check**



**OPENING
COMMENTS**



INTRODUCTIONS



- The value of this process is in participation ... please jump in!
- We set aside time at the end of each section for Questions, and if you need clarification at any time, feel free to ask!
- "Raise your hand" for comments and questions, we will try to get to you ASAP - We will not actively be monitoring Chat
- Video use throughout is welcome and please use your video when talking
 - Although, it's not a requirement, it helps us to see who we are speaking with.
- Mute mic when you are not speaking.



What are the Goals of the IRP Process



INTEGRATED RESOURCE PLAN (IRP):

DEI's plan to provide safe, reliable and sustainable energy solutions for our Customers in Indiana.

- IRPs are submitted every three years
- Plan is created with stakeholder input
- 20-year look at how DEI can cost-effectively serve our customers
- Modeling and analysis culminate in a utility preferred resource portfolio



What is a preferred resource portfolio?

“Preferred resource portfolio’ means the utility's selected long term supply-side and demand-side resource mix that safely, reliably, efficiently, and cost-effectively meets the electric system demand, taking cost, risk, and uncertainty into consideration.”



IURC RM #15-06, LSA Document #18-127

Link (PDF): https://www.in.gov/iurc/files/RM_ord_20181024141710007.pdf

Agenda



- 10:00 Welcome & Introductions ✓
- 10:30 Recap of first meeting
- 10:40 Follow-ups from first meeting
 - IRP 101 & Evening Q&As
 - Load Forecasting considering climate change
 - RFI
- 11:15 Scenario discussion
- 12:00 Lunch break
- 1:00 AMI, Customer Programs & DERs
- 2:30 Wrap up



Recap of first meeting (Nov 10)



- Review of the 2018 DEI IRP
- Stakeholder feedback
- Contemplated changes for 2021 IRP
- Overview of future stakeholder meetings
- Load forecasting

Follow ups from first meeting (Nov 10)



IRP 101 & Evening Q&As

- Due to the increase in number of new participants, an updated IRP 101 document has been added to the webpage
- Additionally, we held an evening Q&A meeting on Jan 20th

Load Forecasting considering climate change

- Based on feedback from stakeholders, we have been in contact and are working with the Purdue Climate Change Center to develop a load forecast that considers climate change

Request for Information (RFI)

- Also based on feedback from stakeholders, we will be issuing an RFI to gather information from the market. This will also act a foundation for an RFP that could be issued in early 2022
- Expect to issue around Feb 1
- Responses due around March 15



Scenario Development Discussion

What is a scenario?



- A scenario is a set of internally consistent assumptions that are external to the utility and beyond its control
 - Needs to include specific assumptions that can be entered into models
 - For example, carbon regulation, fuel prices, cost of new generation
- A portfolio is a set of resource additions
 - For example, build a solar or combined cycle project; retire a unit; add more Energy Efficiency
- A sensitivity is an analysis where a key variable is changed
 - Provides insight on the risks with changes in that variable
- The analysis will combine both of these efforts where we will test the portfolios across the range of scenarios which will measure the robustness and expose risks of the portfolios
- Each scenario needs to stand on its own, but a diverse group of scenarios is also important

Scenarios from past IRPs



2013

Environmental Focus
Reference (w/ Carbon Regulation)
Low Regulation

2015

Climate Change
Increased Customer Choice
Reference (w/ Carbon Regulation)
Clean Power Plan
Delayed Carbon Regulation
Repealed Carbon Regulation
No Carbon Regulation

2018

High Tech Future
Reference (w/ Carbon Regulation)
Reference (No Carbon Regulation)
Slow Innovation
Current Conditions

Key Scenario Variables

- Carbon regulation
- Fuel prices
- Load
- Cost of resources
 - traditional
 - renewables/EE



What other scenarios/variables/risk do we want to consider/test?

DEI Scenarios

- Reference with carbon regulation
- Reference without carbon regulation

Stakeholder Scenarios

- Rapid Decarbonization & Electrification
- Current Conditions
- RFI data
- Others?



Lunch

Innovation Through AMI Data & Rate Design

Lon Huber – VP Rate Design & Strategic Solutions



Targeting System Challenges with Advance Metering Infrastructure (AMI) Insights and Rate Design

RECENT ADVANCES WITH AMI DATA



Interval usage data available for most customers due to AMI rollout progress



Cleaned & validated AMI data



Reduced processing time to analyze AMI data through big data platform and data architecture

CREATING

OPPORTUNITIES FOR NEW RATE DESIGNS



Deeper insights around electricity usage by customer segments

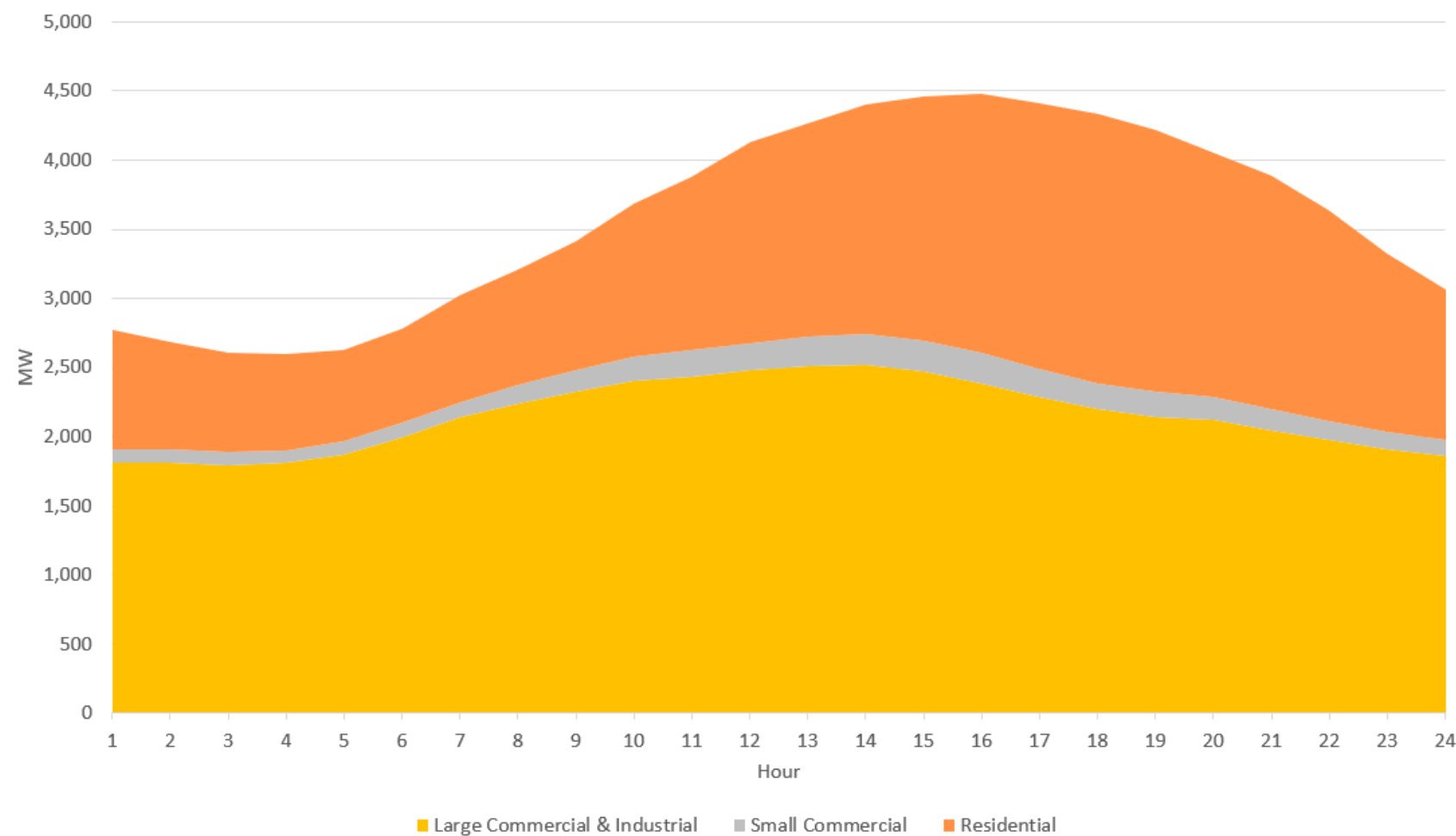


Enhance the way customers are segmented through the ability to combine customer AMI data with residential demographics, housing characteristics, and business characteristics

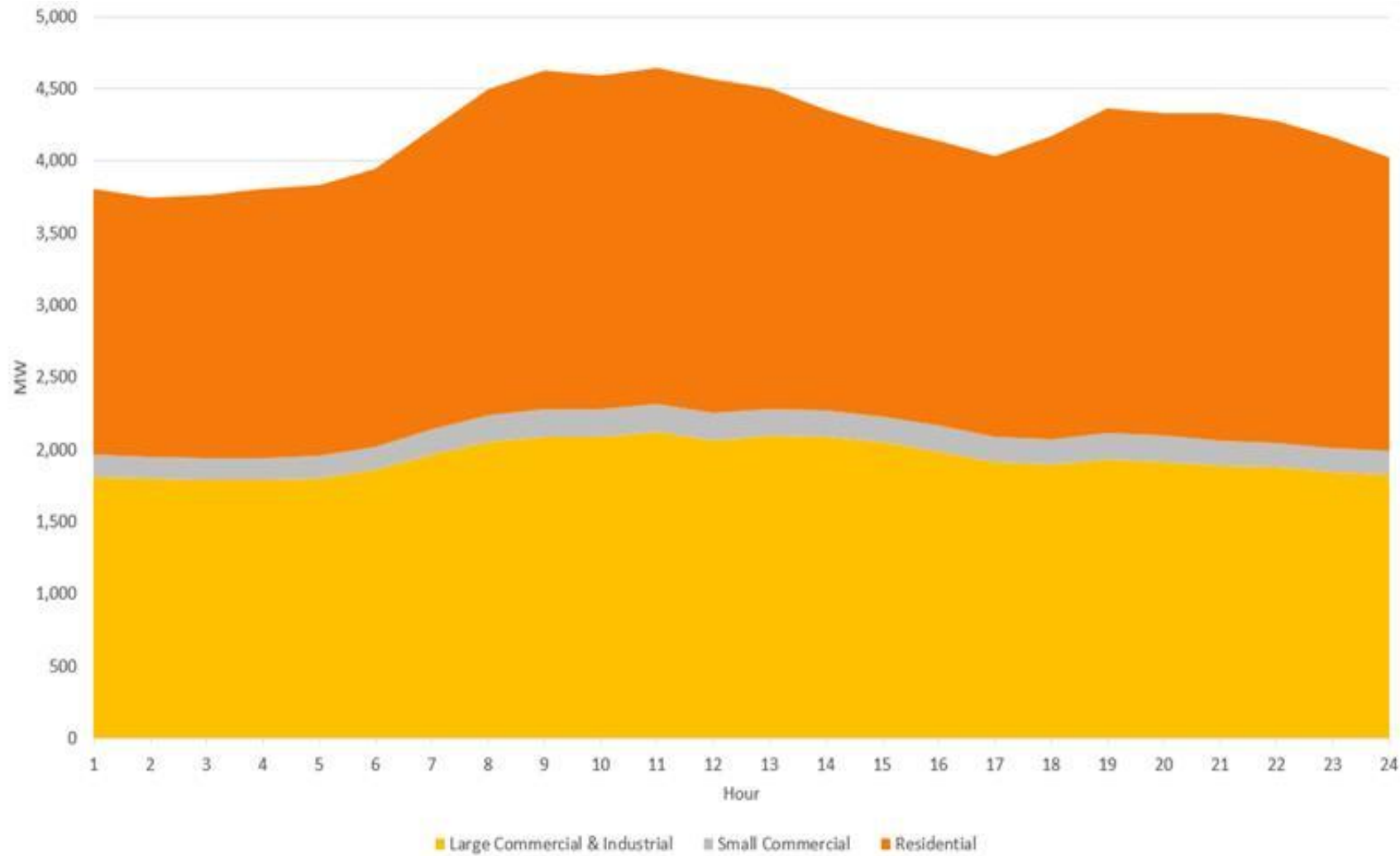


Highlight usage patterns through user friendly interfaces and informative data visualizations

Using AMI to Target Summer Peak Loads



Using AMI to Target Winter Peak Loads

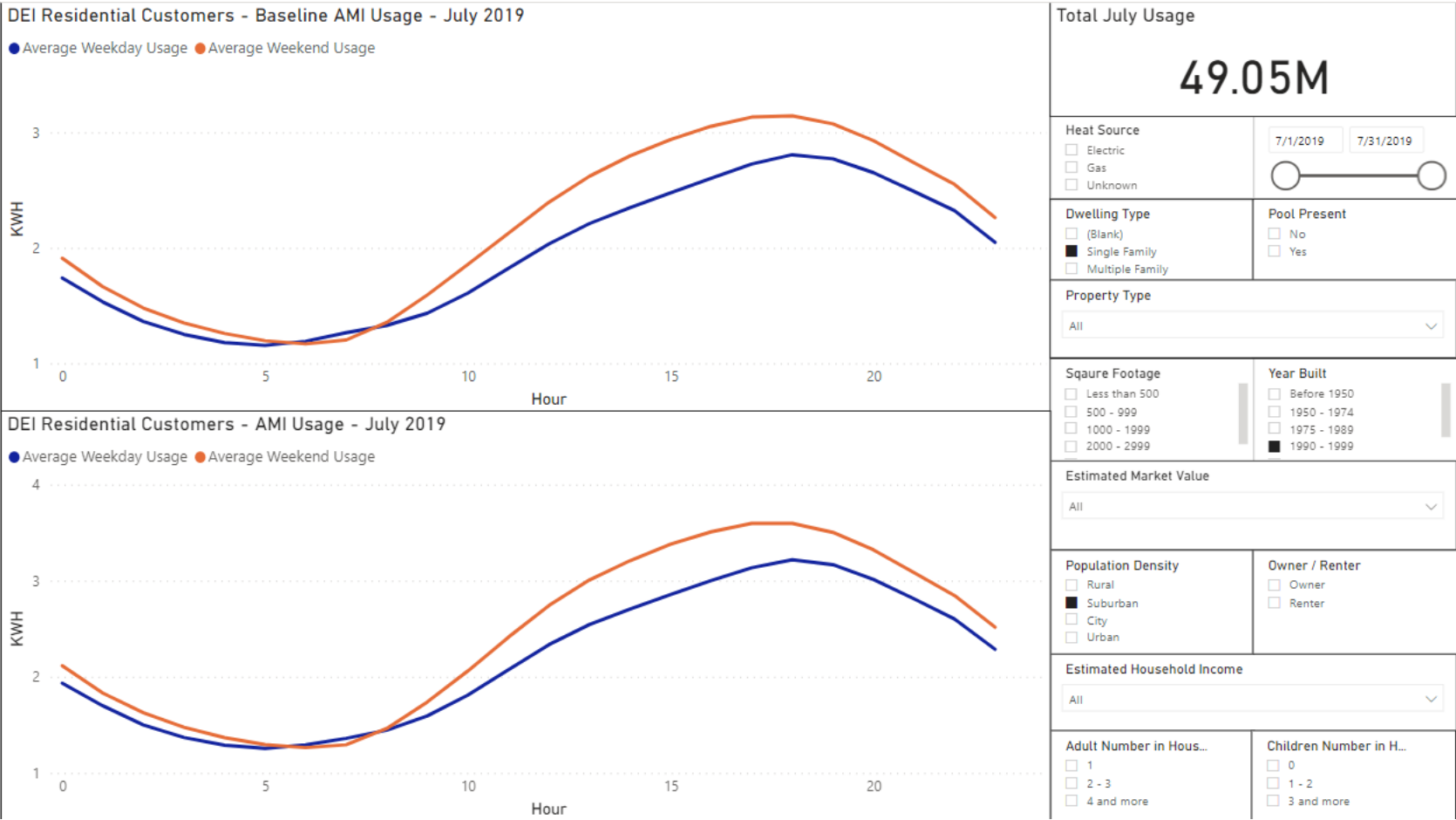


Pricing Team Vision - Enterprise Data Analytics Built

**EARLY
RESULTS
ON THE
SLIDES
AHEAD**

Hourly
weekend/weekday load
shapes from AMI usage
data

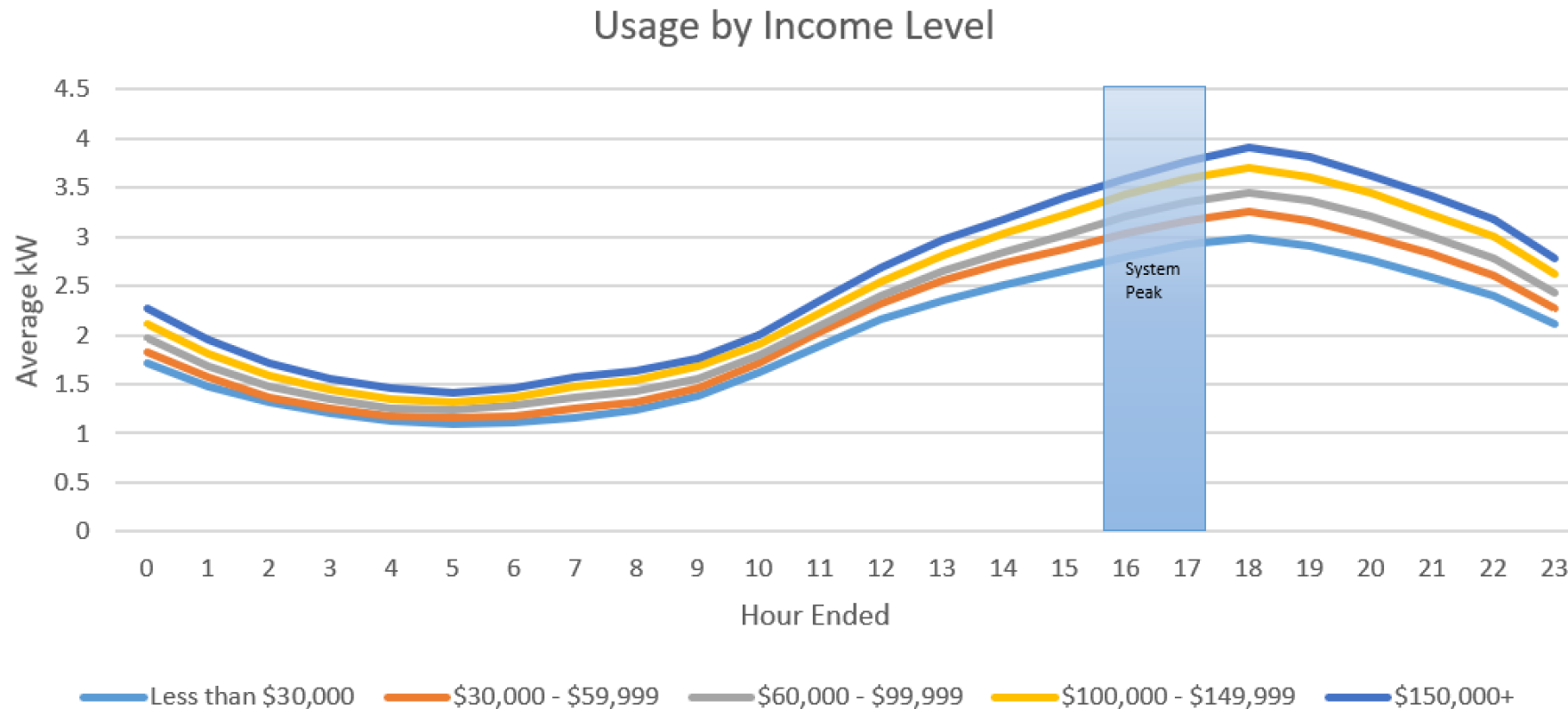
Compare different
customer segmentations



Select combinations of
different customer
demographics and housing
characteristics

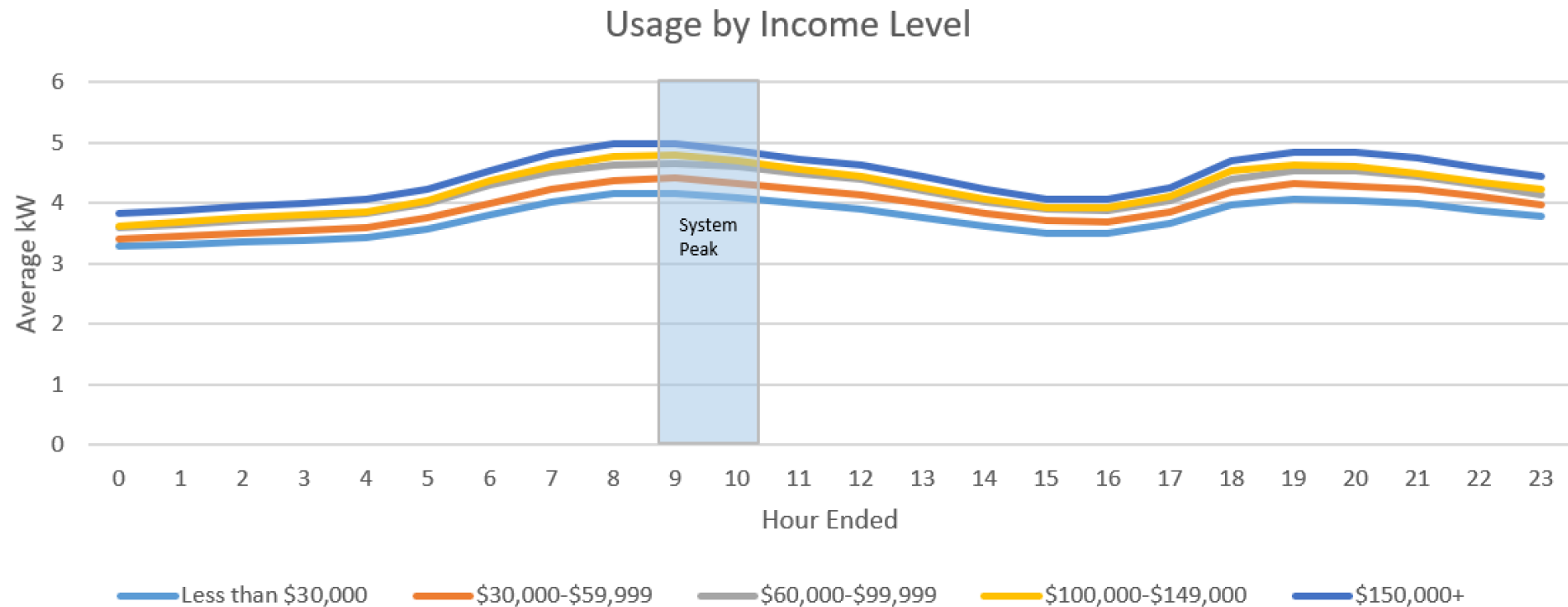
Contributions Factors to Summer peak: Income Level

- Residential energy usage during the day of Duke Energy Indiana's summer peak was analyzed



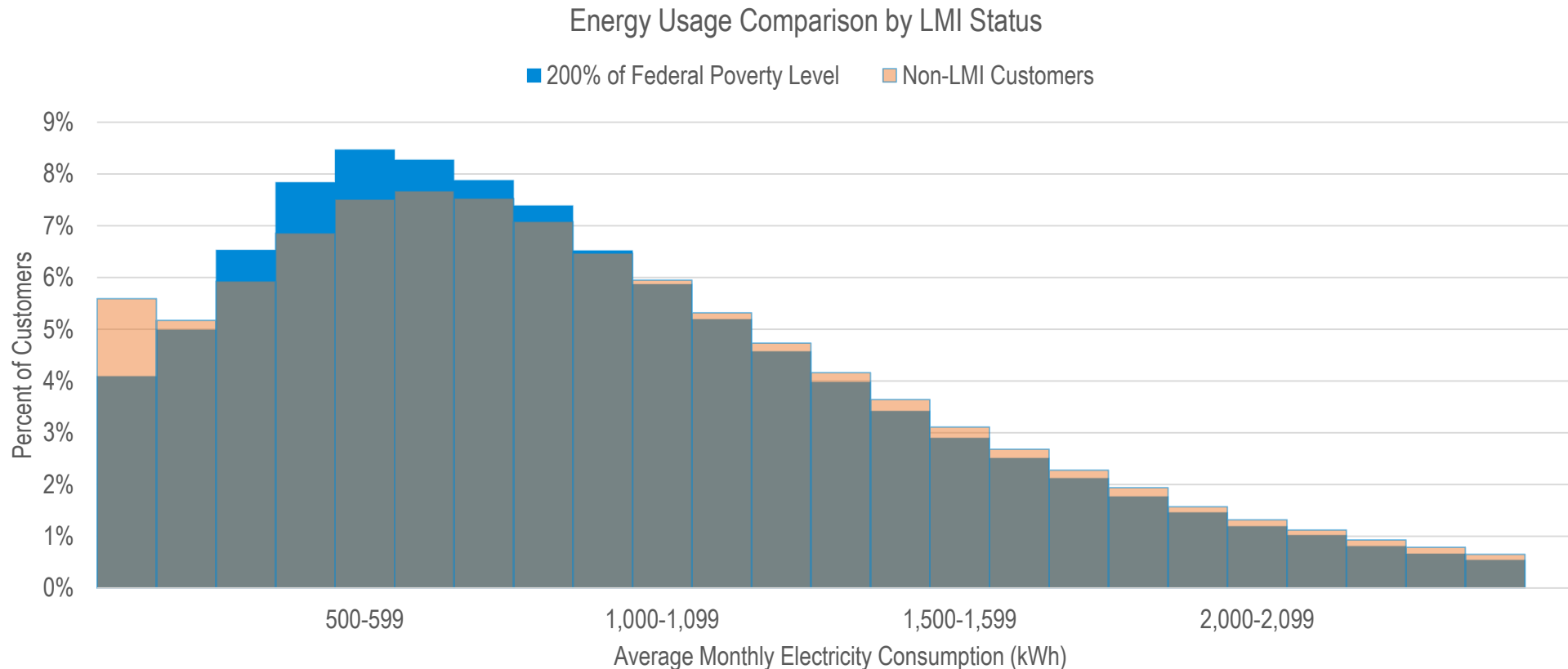
Contributions Factors to Winter peak: Income Level

- Residential energy usage during the day of Duke Energy Indiana's 2019 system peak was analyzed
- Income level, by itself, was not a driver of usage throughout the day or at the peak



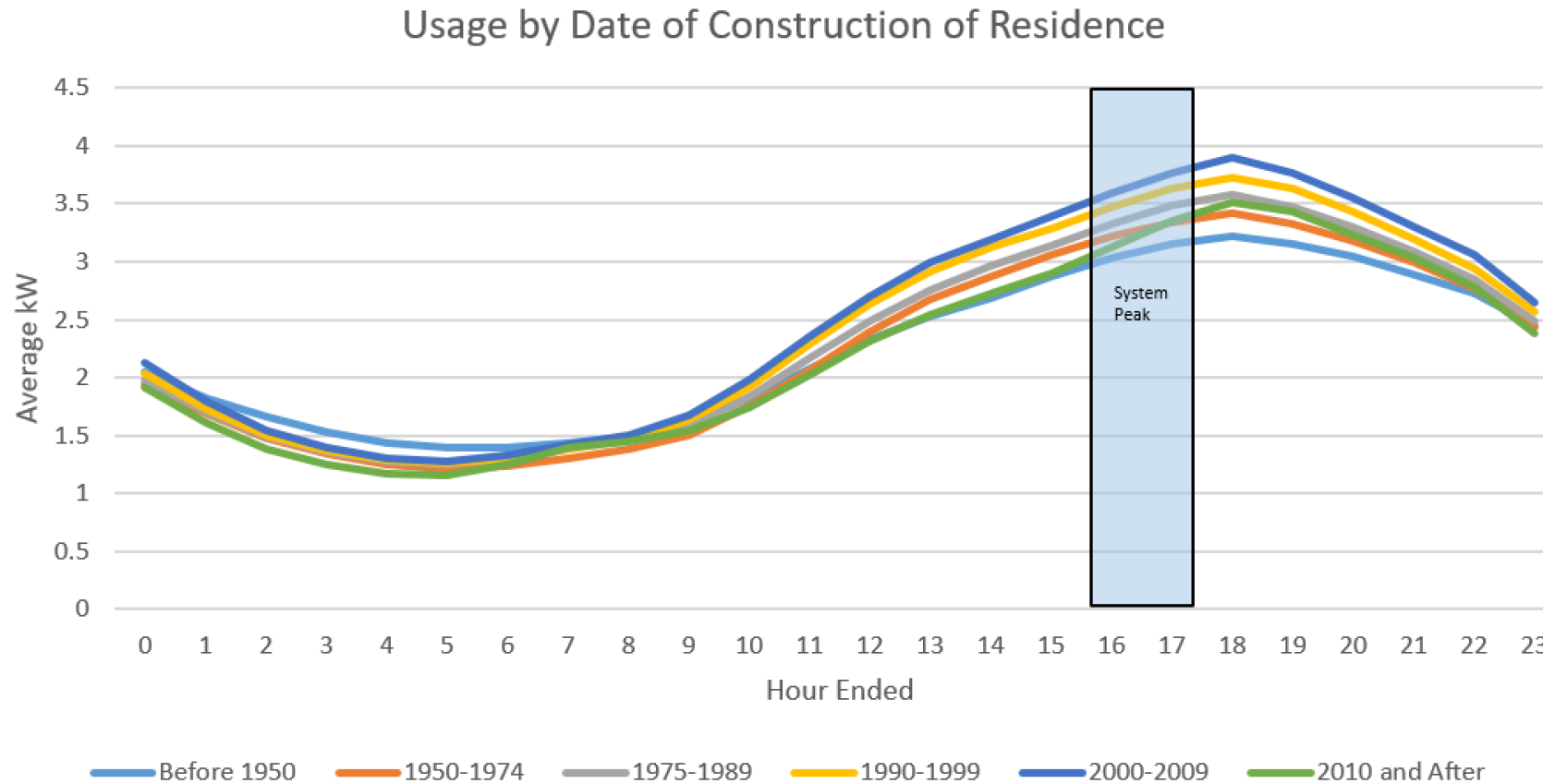
Low & Moderate Income (LMI) Customers are Nearly As Likely to Have Above-Average Usage

- Examining residential accounts in Duke Energy Indiana:
 - Small difference between LMI customers compared to non-LMI customers
 - 969 kWh monthly average for LMI vs 1,012 kWh for non-LMI
 - ~38% of LMI (less than 200% of federal poverty level) customers consume more than 1,000 kWh per month



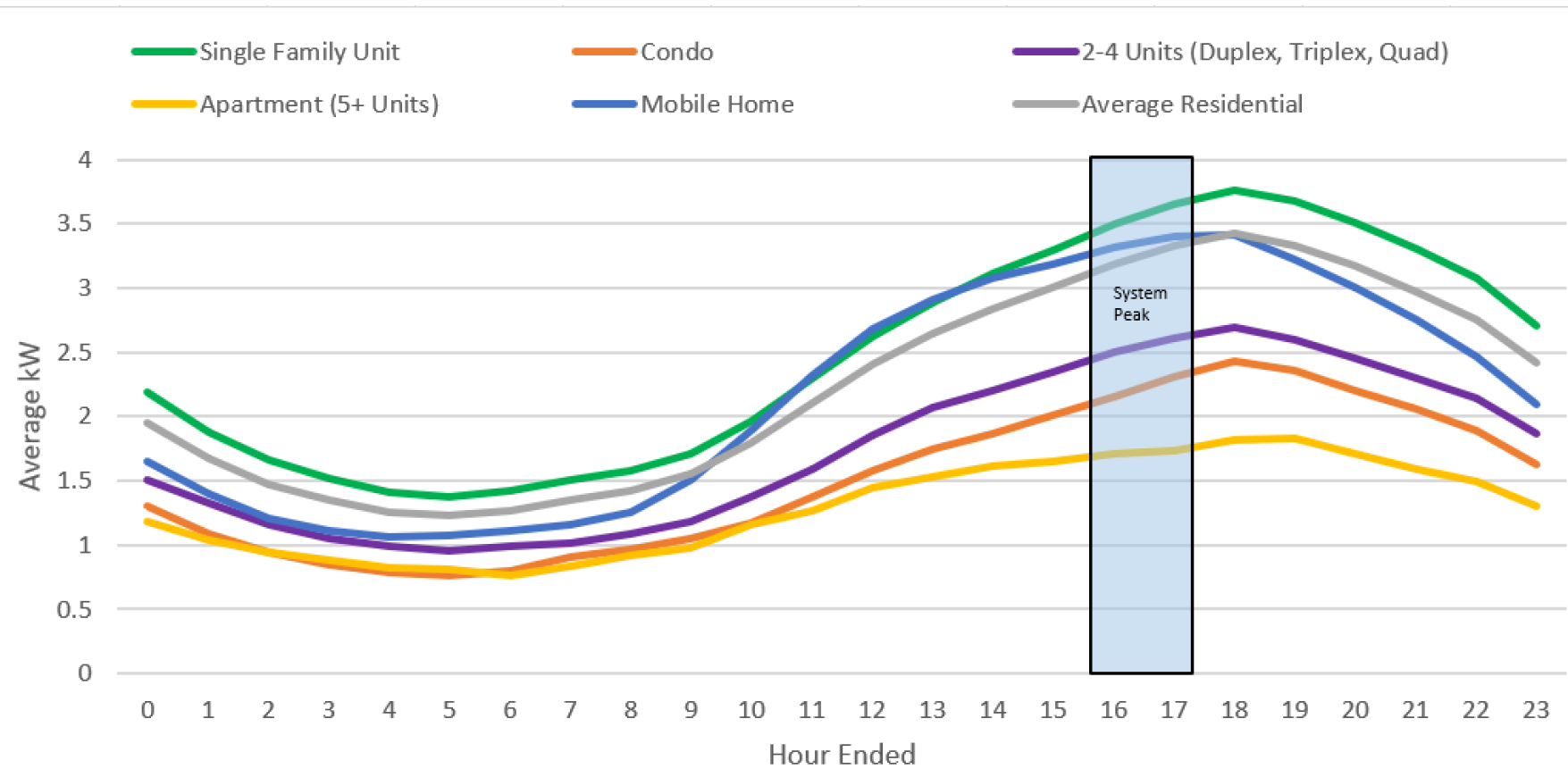
Contributions factors to Summer peak: Age of Residence

- The age of a home has as a more significant effect on contributions to summer system peak
- Homes built from 2000-2009 have the most usage and contributions to summer system peak



Contributions factors to Summer peak: Property Type

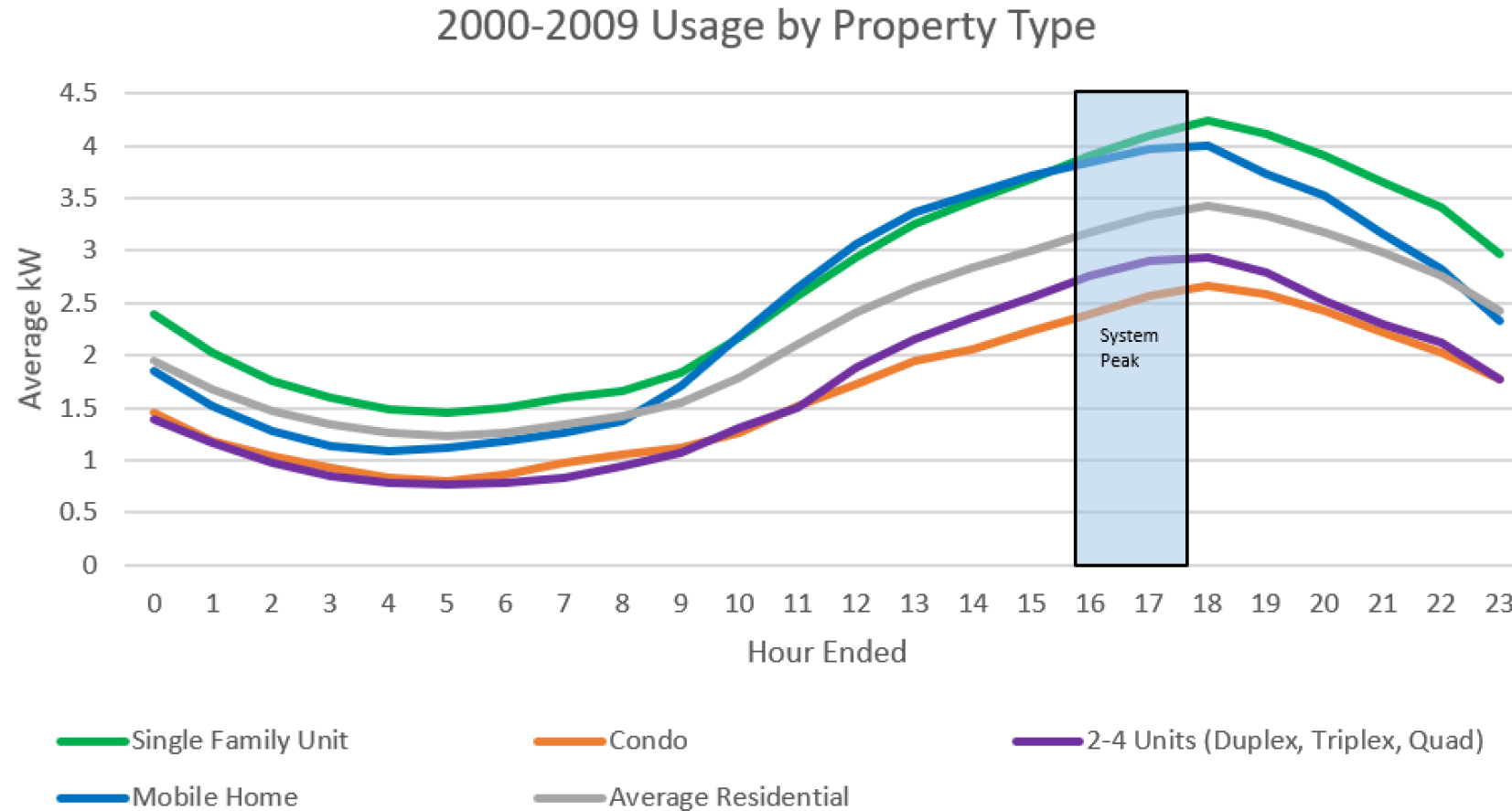
- Single Family Homes were a particularly large contributor to the summer system peak



*Excluded miscellaneous residences

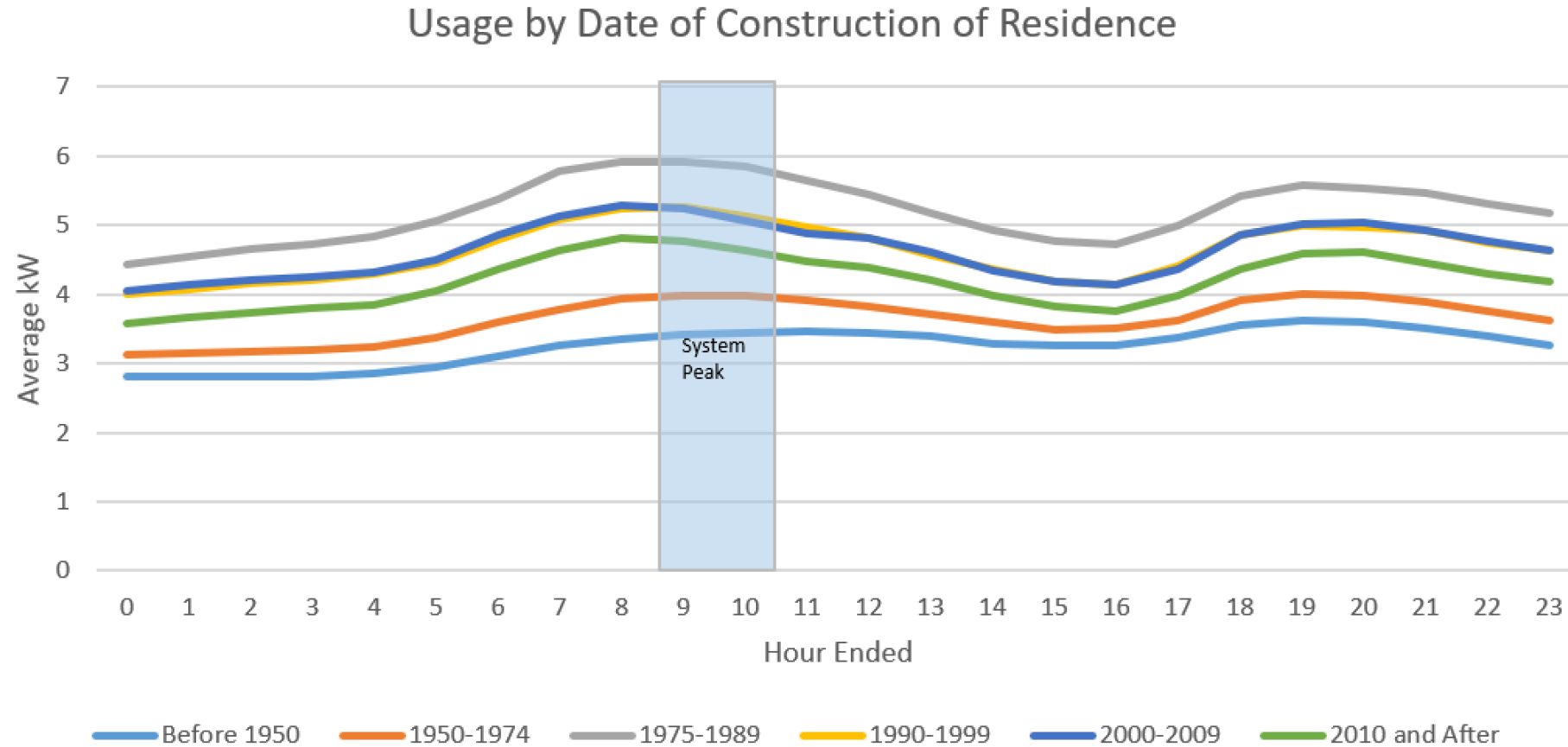
Contributions factors to Summer peak: Age of Residence 2000-2009

- From 2000-2009, Single Family Units have the most usage and contributions to summer system peak, with Mobile Homes contributing the second most



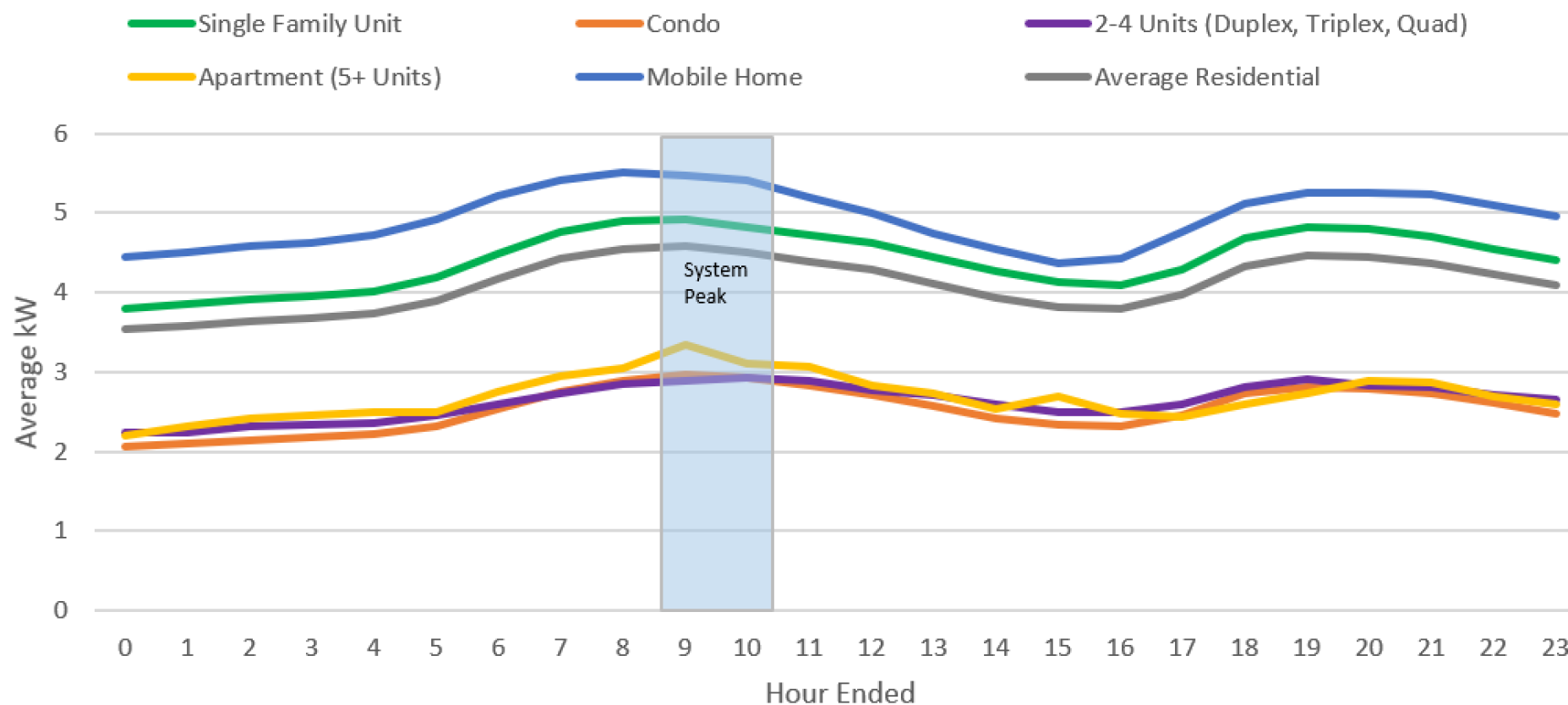
Contributions factors to Winter peak: Age of Residence

- The age of a home has as a more significant effect on contributions to winter system peak
- Homes built from 1975-1989 have the most usage and contributions to winter system peak



Contributions factors to Winter peak: Property Type

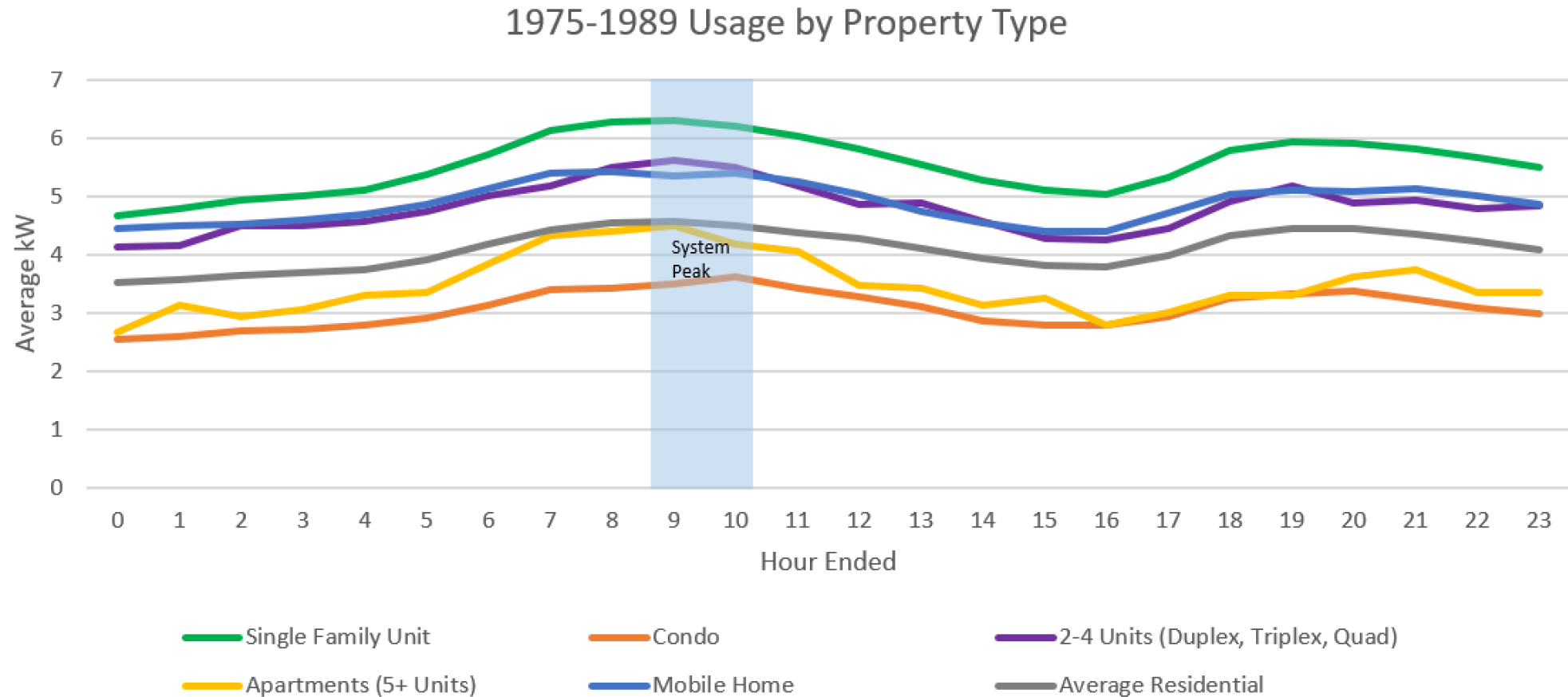
- Mobile homes were a particularly large contributor to the winter system peak
- Single family homes consumed significantly more energy than apartments or condos



*Excluded miscellaneous residences

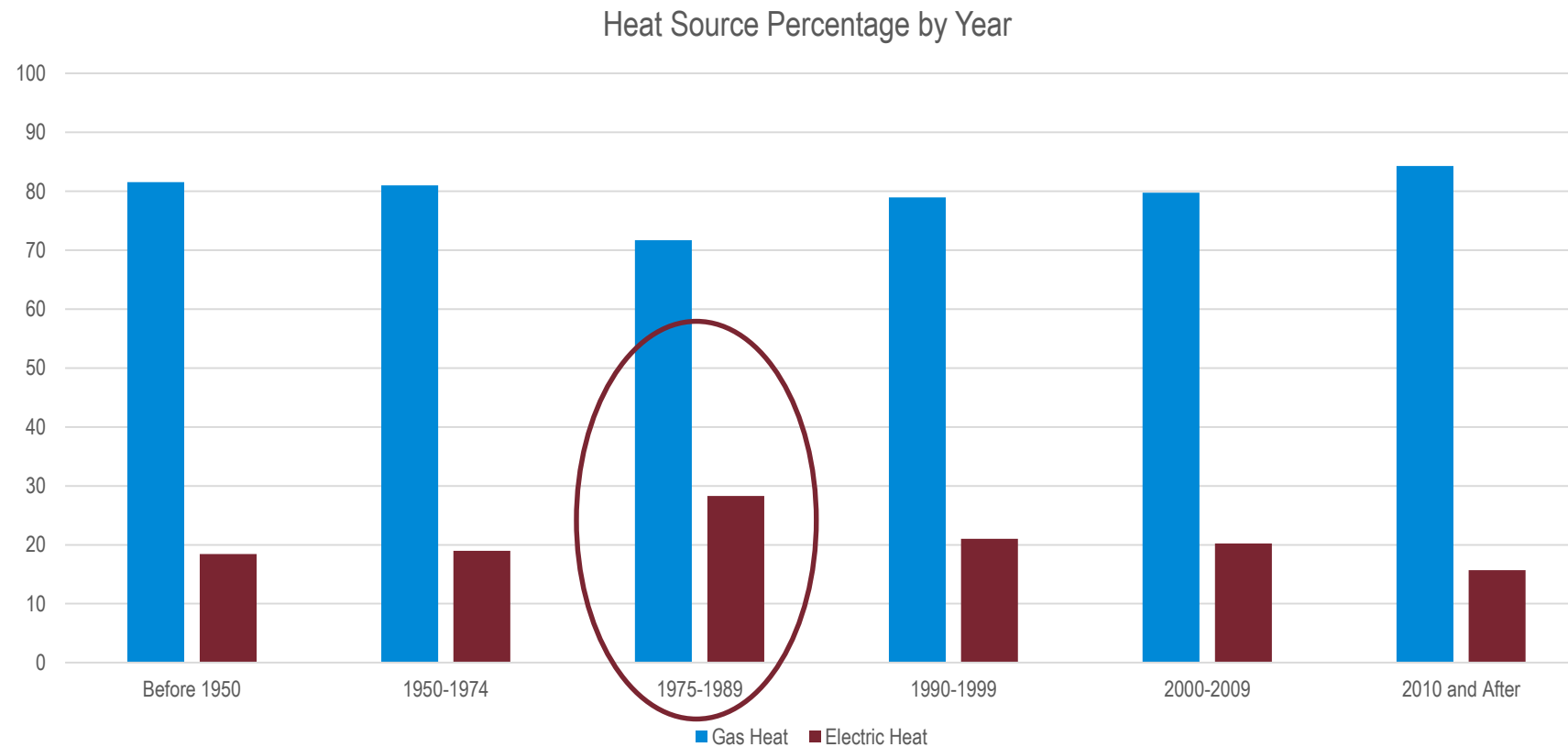
Contributions factors to Winter peak: Age of Residence 1975-1989

- From 1975-1989, Single Family Units have the most usage and contributions to winter system peak, with Mobile Homes and 2-4 Units contributing the second most



Contributions factors to Winter peak: Age of Residence

- Gas Heat is more prevalent in homes every year
- Electric Heat has the highest penetration from 1975-1989



Approach for Peak Reduction Opportunities



Target Peak Loads Identify DSM opportunities that best align with Duke's peak resource needs



Target Technologies Customers are Adopting Create customer value by taking advantage of market trends in Distributed Energy Resources.



Quick Start Opportunities Plans to acquire resources identified in the MPS.



Leverage Current Duke Programs Look for ways to improve programs, delivery channels, and platforms in partnership with trade allies.



Incremental and Emerging Opportunities Identify innovative program designs working in other areas



Stakeholder Input Carefully consider diverse stakeholder input in developing plans.



Interaction Between Technologies and Rate Designs

Combine smart programs and rate designs that provide ongoing savings for participants

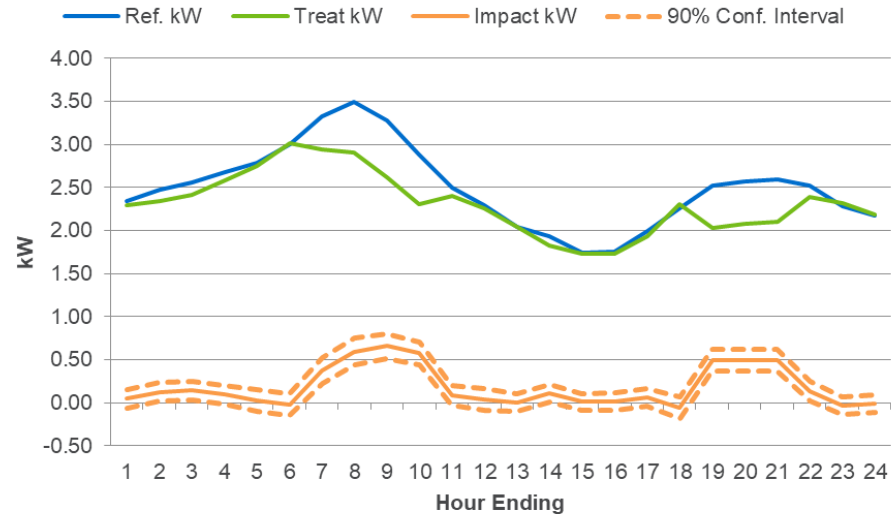
Can Rate Design Help Reduce Peak?

- Residential customers showed statistically significant load impacts during the event hours on all three rates Critical Peak Pricing (CPP), Time of Use (TOU), and Time of Use – Demand (TOUD) for **critical and high event days**
 - Event based impacts ranged from **7.1%** (Residential Standard (RS) TOU, morning) to **19.3%** (Residential Electric (RE) CPP, evening)
- Residential customers showed statistically significant load impacts across event hours on all rates (TOU and TOUD) for the average non-summer weekday
 - Average non-summer weekday impacts ranged from **4.2%** (RS TOU, evening) to **8.5%** (RE TOU, evening)
 - Event day impacts were greater than average weekday impacts
- **Smart thermostats can lead to higher impacts** among RE customers on all rates, especially especially during winter events

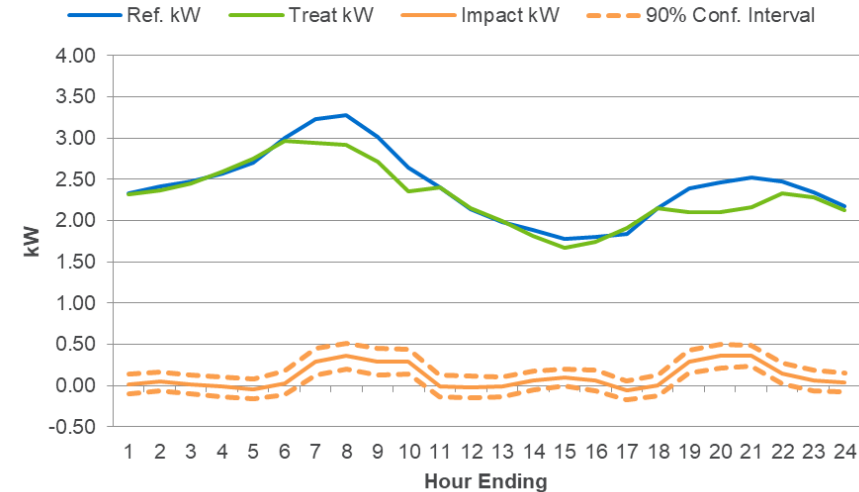
Event Day Load Impacts (RE)

- All events were called from 6 to 10 AM and 6 to 9 PM
- RE customers on all three rates showed statistically significant load reductions during the morning and evening event hours on the average event day
- It is important to note that TOUD customers experienced twelve events (9 high and 3 critical), while CPP and TOU customers experienced seven events (all critical) during the non-summer period

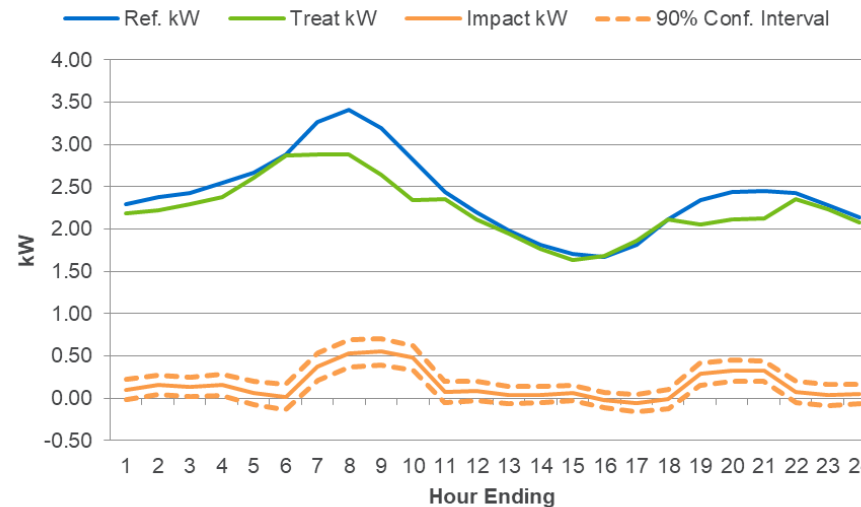
CPP



TOU



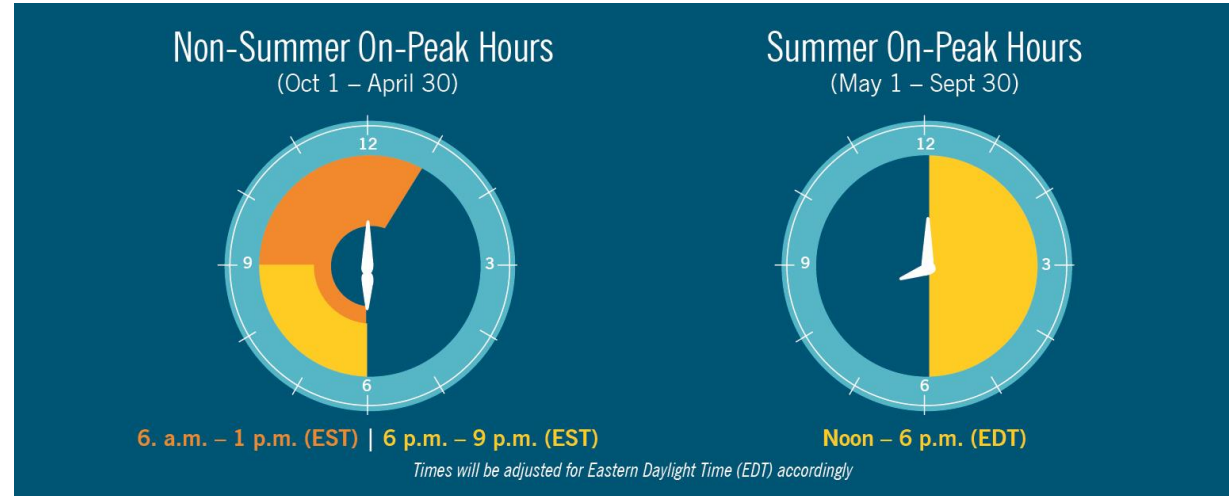
TOUD



Inspired by our DEC-NC experience and the rollout of smart meters in DEI, dynamic pricing rate pilots were proposed in Cause No. 45253 (DEI Rate Case).

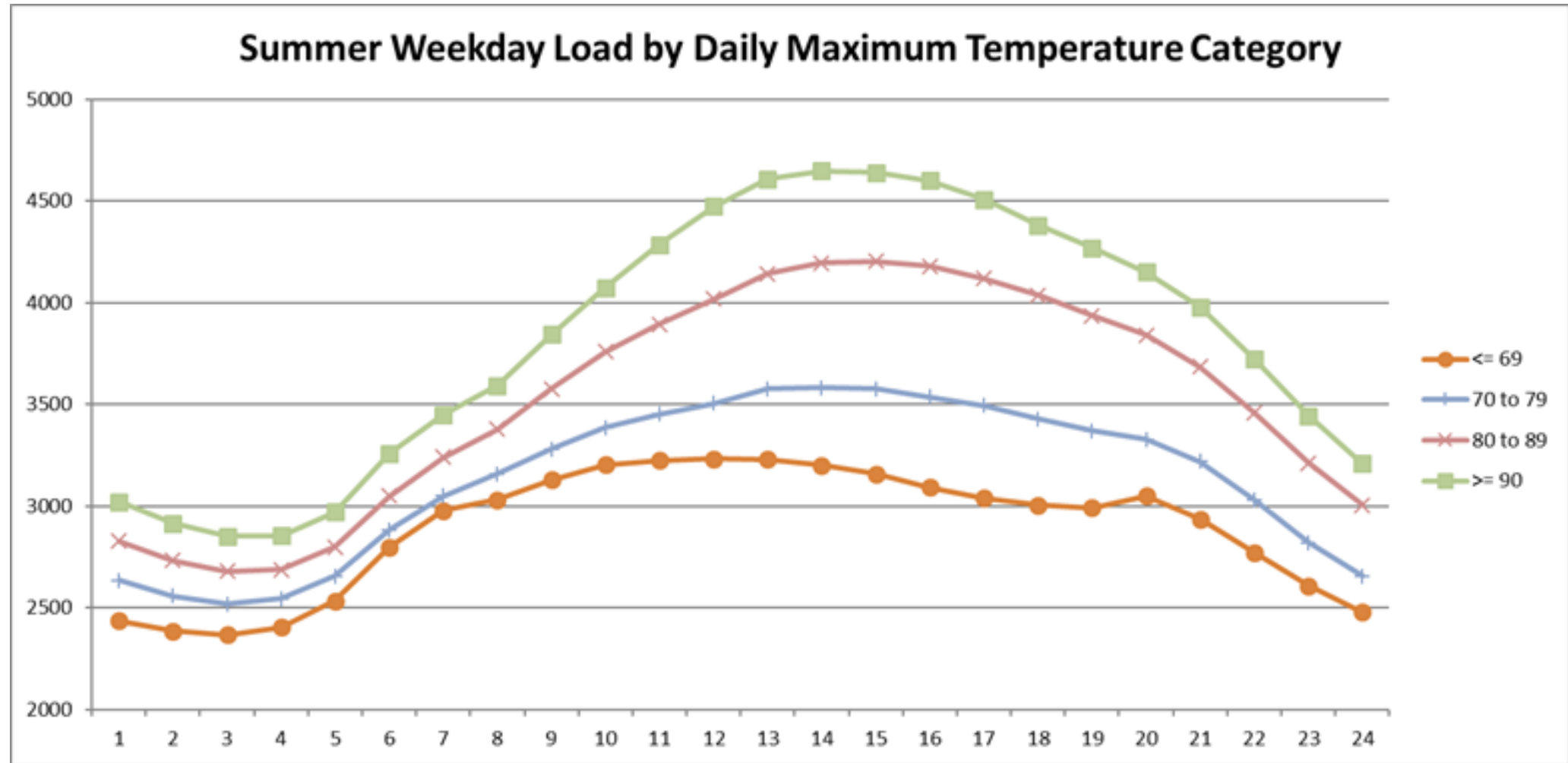
- The IURC approved all **6 pilot rates** proposed effective on July 30, 2020.
- **Pilot marketing began on September 30, 2020 with the brand name Flex Savings Option.**
 - Currently 69 CS customers and 906 RS customers
- **There are 3 pilot rates for both residential (Rate RS) and small commercial (Rate CS)**
 - Each class of customers has 3 rate designs but only 1 design was offered to any individual customer.
- The ***rate designs represent increasing levels of price signal complexity and customer engagement.*** The rate designs are:
 - **CPP – Critical Peak Pricing (20 Pricing Days)**
 - **VPP – Variable Peak Pricing (40 Pricing Days)**
 - **VPPD – Variable Peak Pricing with Demand (40 Pricing Days + kW Charge)**

- Similar to traditional TOU rates, our pilot dynamic rates have a ***defined On-peak and Off-peak period*** for the summer and non-summer months.

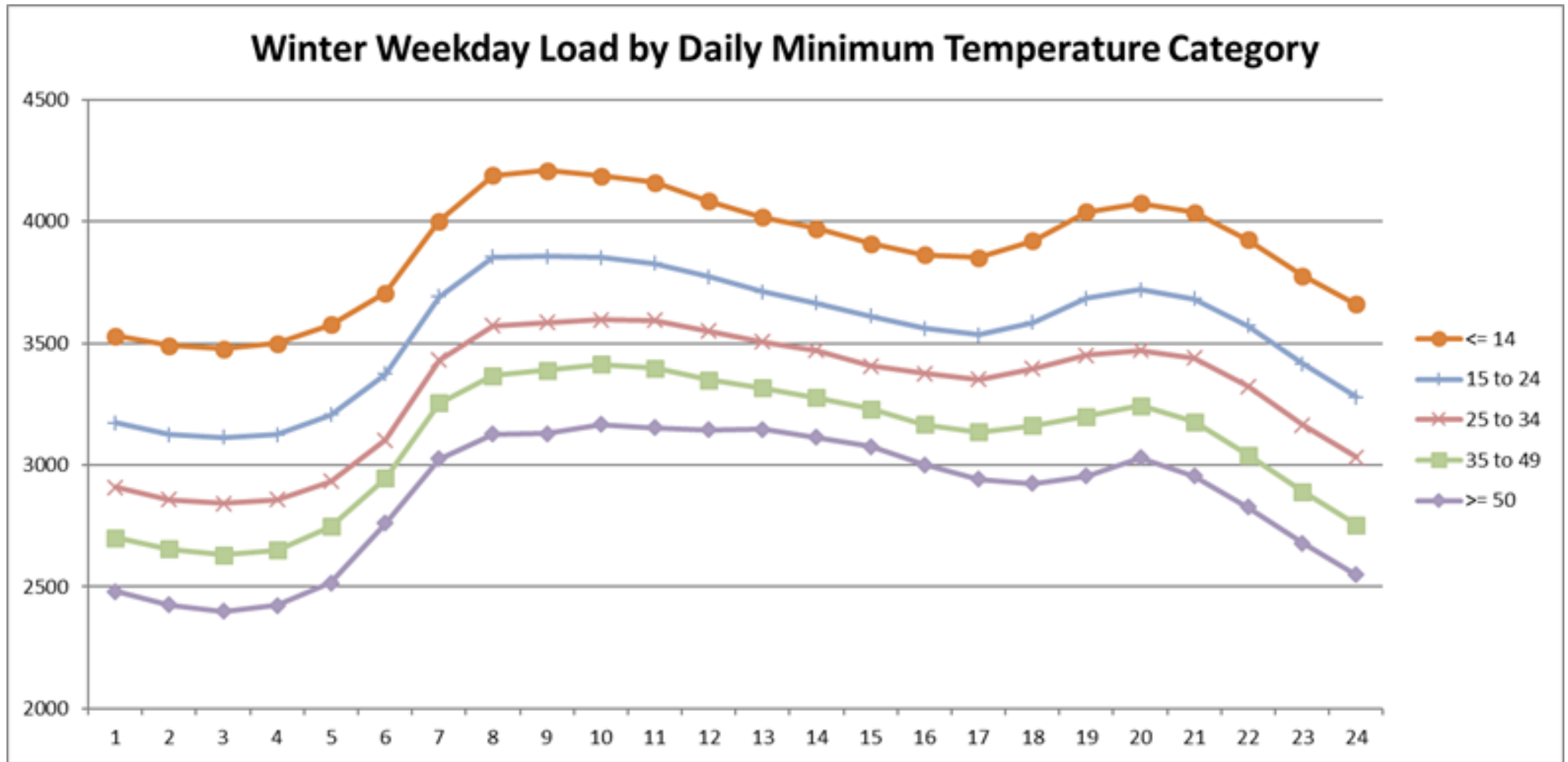


- Unlike traditional TOU rates, ***higher prices are not in effect every day during the On-peak period***. Higher prices are only effective on hot/cold days when customer consumption (i.e., system load) is high. Therefore, the higher price On-peak days are determined dynamically and must be communicated to customers.
 - Results will be developed internally and reported to the IURC after the first year of the pilots. Year 1 results should be available in early 2022.

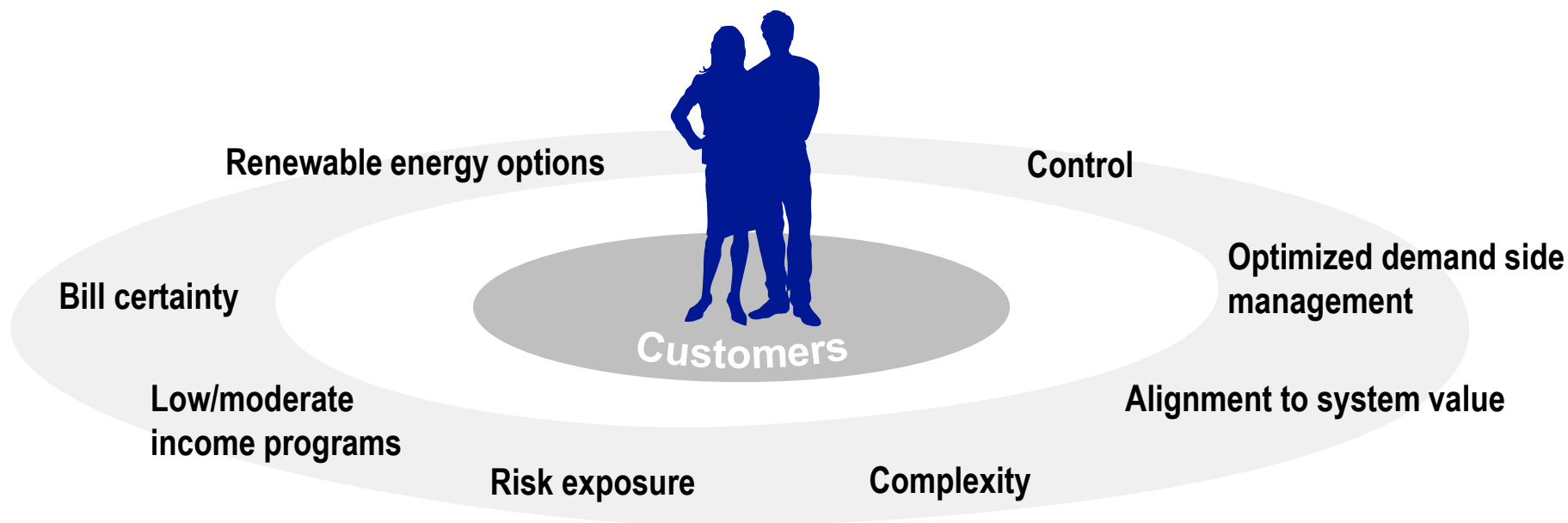
Summer Load Shapes by Temperature



Winter Load Shapes by Temperature



Pricing Options That Appeal To All Customer Segments



How Can Rate Design and Rooftop
Solar Help with Winter Peak?

**“First of a Kind” Rooftop Solar
Settlement**



Distributed Energy Resources



What do we mean by Distributed Energy Resources?

- Lawrence Berkley National Lab report to 21th Century Task Force looks at 5 different adoption levels of:
 - Rooftop solar
 - EV Charging
 - Battery Storage
- Others such as Hybrid systems, Combined Heat & Power (CHP), Fuel Cells, Small Engines

How will DERs be included in the IRP?

- Load modifier
- Generating resource



Closing Comments, Stakeholder Comments





- Meeting survey to be sent out in the next week to attendees
- Comments can also be sent to:
 - Scott at: scott.park@duke-energy.com
 - Stewart at: stewart@vanry.com
- Meeting summary and other materials will be posted on website by Feb 3rd
 - <https://www.duke-energy.com/home/products/in-2021-irp-stakeholder>
- Next workshop expected to be in March/April



Acronyms



AMI	Advanced Metering Infrastructure	LBL	Lawrence Berkeley Lab
CHP	Combined Heat & Power	LMI	Low-Medium Income
CPP	Critical Peak Pricing	MW	Megawatt
CS	Small Commercial	NEM	Net Energy Metering
DR	Demand Response	NDA	Non-disclosure agreement
DER	Distributed Energy Resource	PVRR	Present Value of Revenue Requirements
DEI	Duke Energy Indiana	RFI	Request for Information
DSM	Demand Side Mgt (EE + DR)	RS	Residential Standard
EV	Electric Vehicles	RE	Residential Electric
EE	Energy Efficiency	TOU	Time of Use
EIA	Energy Information Administration	TOUD	Time of Use with Demand
IURC	Indiana Utility Regulatory Commission	T&D	Transmission and Distribution
IRP	Integrated Resource Plan	UCAP	Unforced Capacity
LBL	Lawrence Berkeley Lab	UPC	Usage per Customer
		VPP	Variable Peak Pricing
		VPPD	Variable Peak Pricing with Demand