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Redding Electric Utility Cost of Service

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Cost of Service and Load Research

- Objectives of COS Study
  - Align cost recovery with fixed charges
  - Incentivize efficient use of the system
  - Maintain competitive rates

- Load issues identified
  - Residential customer
    - Monthly energy usage data
  - Commercial customer
    - Mix of energy and demand usage data
    - Concern on distribution of class data

Cost of Service and Load Research

- What is a COS Study and how does it incorporate load data?
- What sources of data are available?
- What are mechanisms used to adjust data?
- How can AMI / MDMS systems improve the process?
- What are lessons learned from REU?

Steps in a Cost of Service Study

STEP 1	Determine the revenue requirements of the utility	Revenue Requirement Determination
STEP 2	Unbundle costs by functions and services (production, transmission, distribution, etc.)	Cost Allocation
STEP 3	Classify costs (demand, energy, customer costs, etc.)	
STEP 4	Allocate cost among customer classes	
STEP 5	Design rates	Rate Design

Common Supporting Analyses to Ensure Success

- Financial Planning
- Study Period Selection
- Load Research Study
- Smart Grid (AMI)
- Data Compilation
- System Losses Study
- Resource Planning Study
- Distributed Generation
- Minimum System Study
- Lighting Study
- Accounting for Direct Assignment
- Load Forecasting

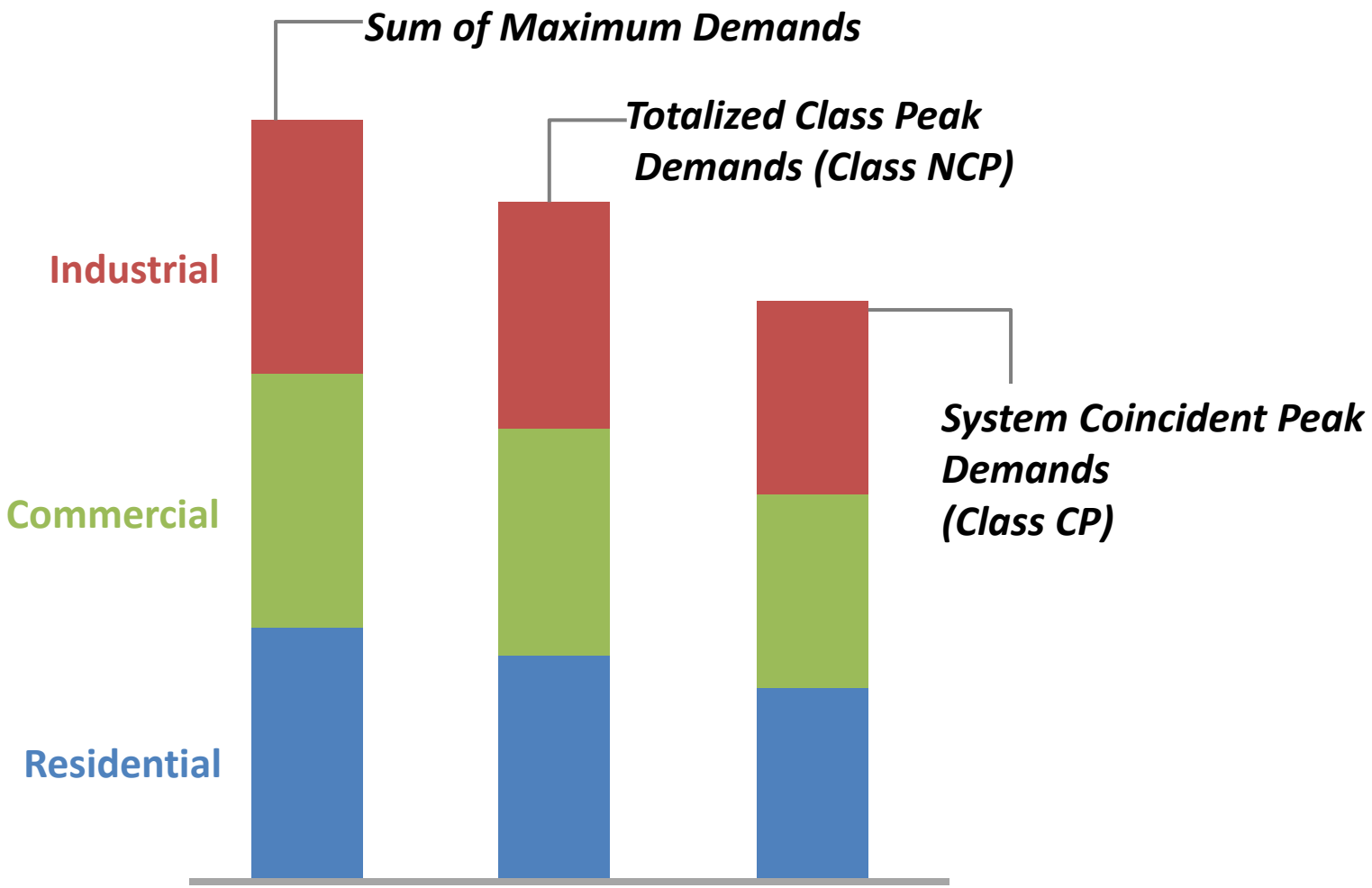
Load Research

- Allocation of demand-related costs
- Determines demands of various rate classes and the interrelationship with a utility's total system demand
- May require sampling of customers via load profile meters
  - Or use of AMI / MDMS
  - Or use of proxy data

Load Research (cont'd)

- Data to be inferred, calculated, or recorded
  - Coincident Demand (System Peak Hours)
    - Demand of a rate class at the time of system peak
  - Class Non-Coincident Demand (Class Peak)
    - Customer non-coincident maximum demand
  - On-peak and off-peak kilowatt-hours
  - Customer and class load factor

Demand (Fixed) Cost Allocation Methods

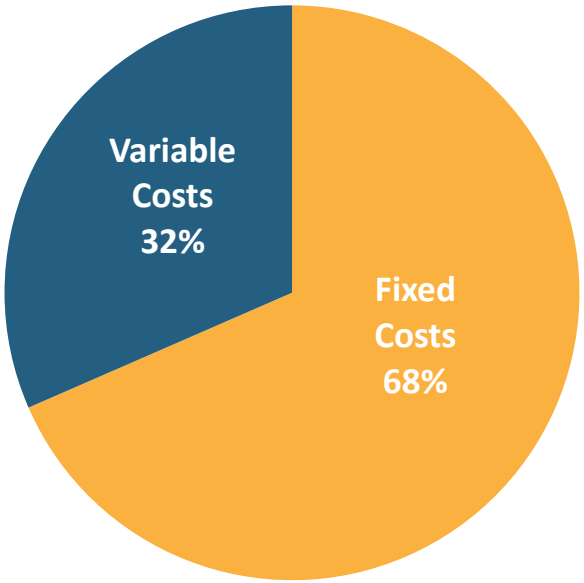


Theoretical Examples of Demand Cost Allocation Methods (Summary)

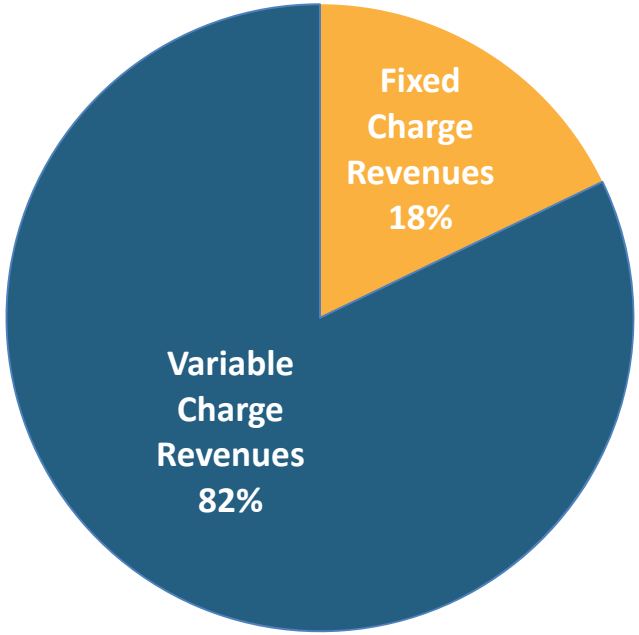
Demand Cost Allocation Percentages	RES	COM	IND	Total
1 CP Method	47.00%	29.00%	24.00%	100.0%
4 CP Method	47.60%	26.60%	25.80%	100.0%
12 CP Method	42.60%	27.40%	30.00%	100.0%
1 NCP Method	44.65%	28.84%	26.51%	100.0%
12 NCP Method	41.80%	28.90%	29.30%	100.0%
AED Method	43.88%	28.66%	27.46%	100.0%
Range	41.80 – 47.60%	26.60 – 29.00%	24.00 – 30.00%	
Ratio, High/Low	1.14	1.09	1.25	

REU –
Fixed vs. Variable (Costs and Charges)

Cost Structure



Existing Rates



Fixed Costs	Variable Costs
Production Plan	Fuel
Distribution System	Materials
Metering	Emission Costs

REU's Use of Load Research

- OpenEI data
  - Open Energy Information (on-line databases)
  - Supported by DOE / Office of Energy Efficiency, universities, agencies and partnerships
- Residential usage data
  - Uses "Building America House Simulation Protocols" and "Residential Energy Consumption Survey" for statistical references of building types by location
  - Hourly load profiles are available for TMY3 locations in the United States
- Commercial usage data
  - Hourly load profile data for 16 commercial building types (NAICS codes)
  - Based on DOE commercial reference building models

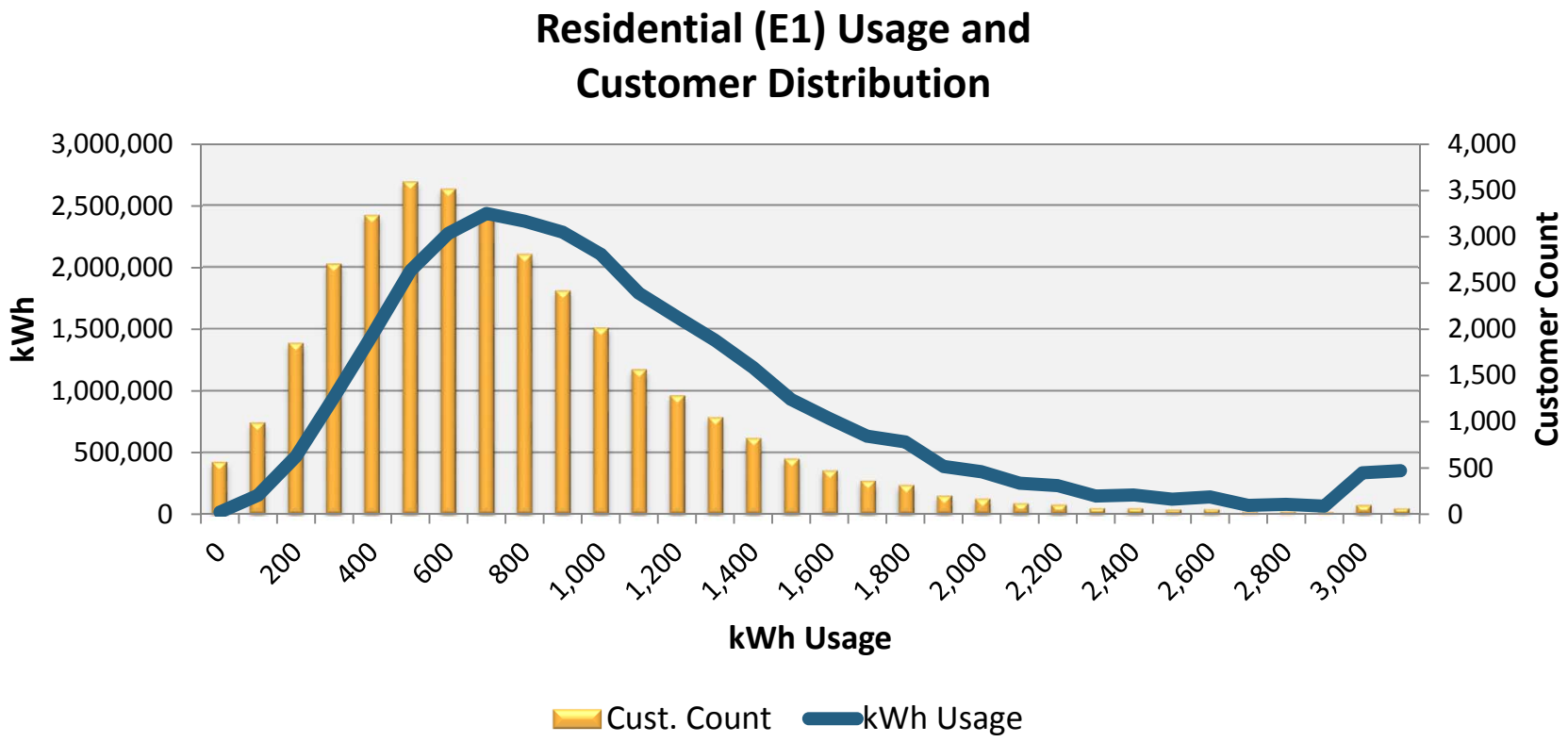
REU's Use of Load Research

- Itron developed distribution of customer average monthly usage
  - Analyzed by 100 kWh "bucket"
  - Drove decision making around rate design
- Utilized OpenEI data for estimated demand
  - Utilized Redding/Shasta region data
  - Aligned NAICS load data to REU customer report
  - Applied load shape to REU monthly energy data
  - Determined "average" demand billing determinant

Residential – Current Rates

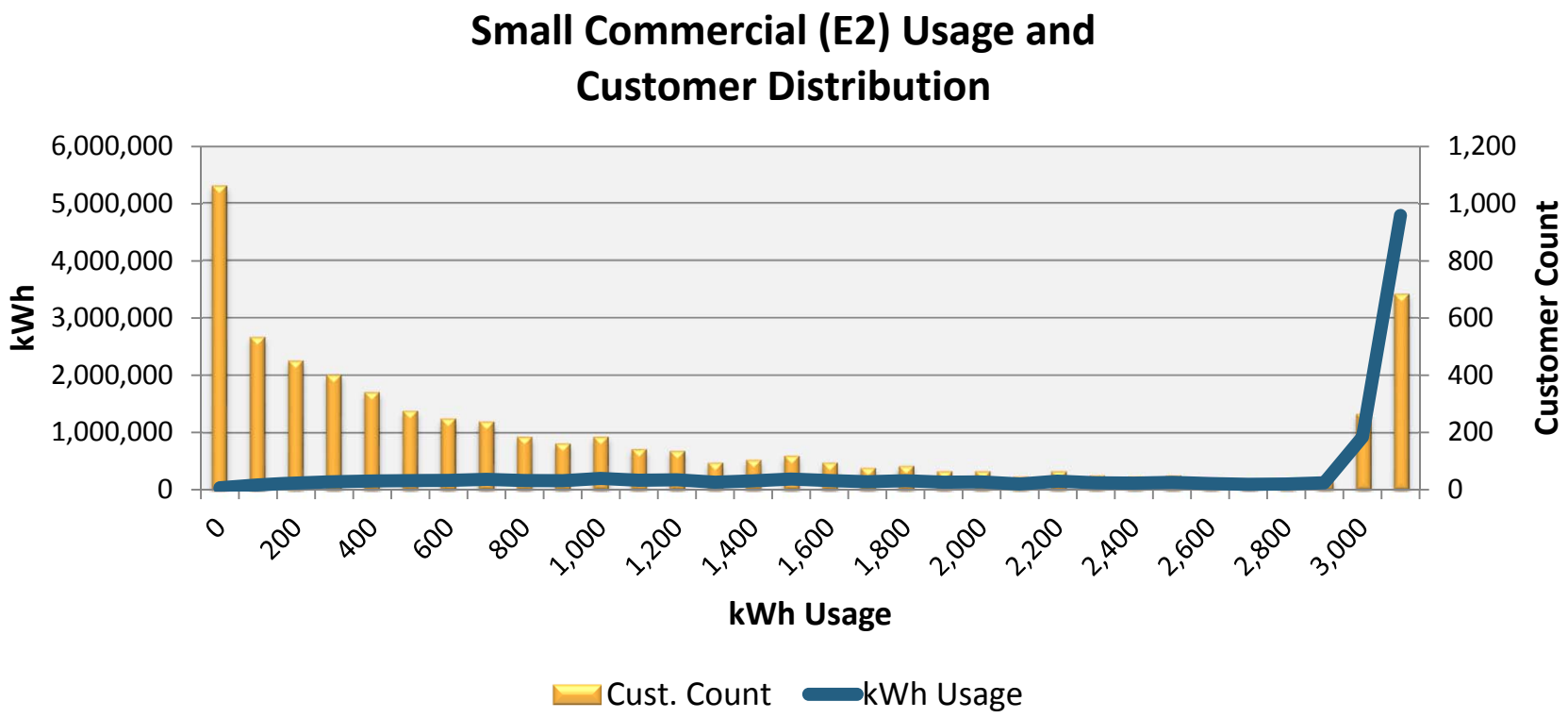
Existing Selected Rate Structure Comparison			
Rate Code	**Cust Charge**	**Energy Charge**	**Demand Charge**
E1 - Residential	$13.00 / mo	15.28 c / kWh	N/A
E2 - Small Commercial	$20.00 / mo	16.79 c / kWh	N/A
E7/E8 – Large Commercial	$33.00 / mo	16.79 c / kWh 8.09 c/ kWh	29.65 / kW 32.95 / kW
		*Tiered at 15,000 kWh	**Tiered at 15,000 kWh

REU Load Research – Residential



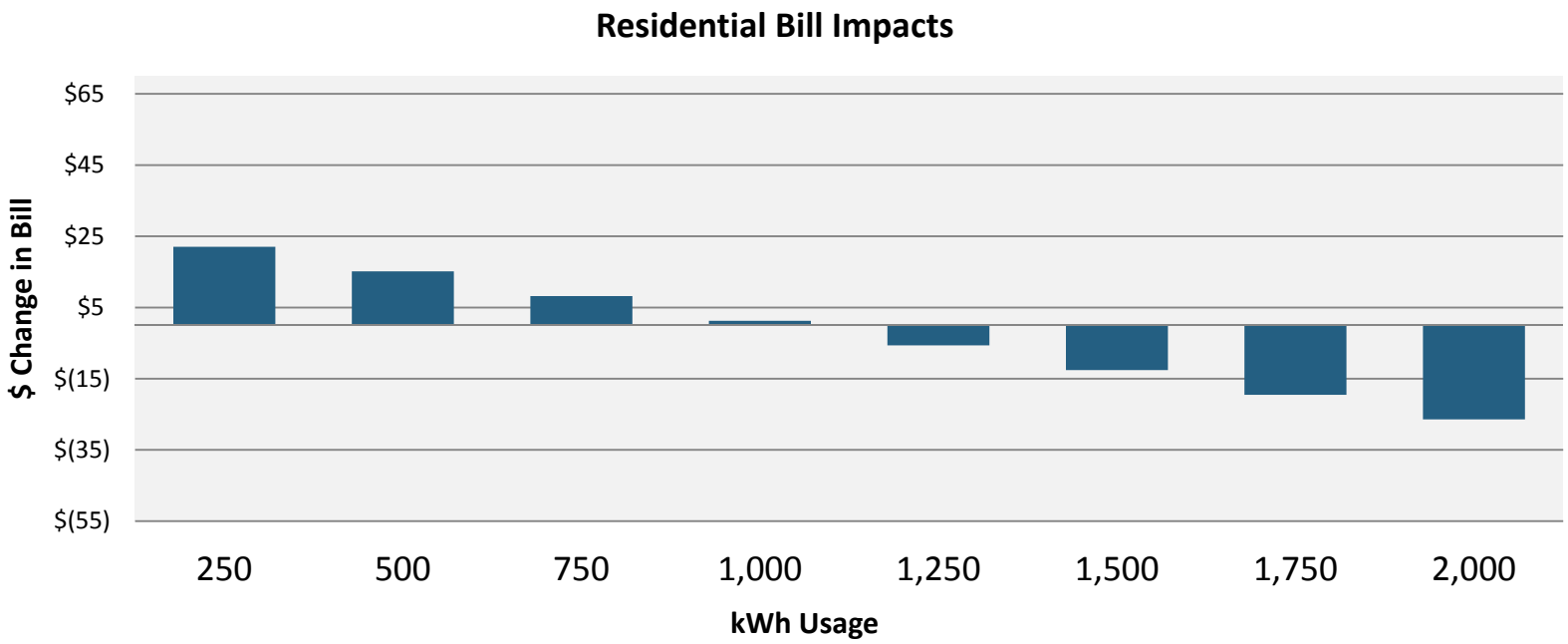
For the Residential class, a large number of very small users who would see a large percentage increase on their monthly bill with an increased fixed customer charge

REU Load Research - Commercial



For the Small Commercial class, a large number of users who use substantially more energy each month than the rest of the class

Bill Impacts of Proposed Rates - Residential



Rate Class	Bill Component	Existing Rate	Proposed Rate
E1	Network Access Charge	$13.00	$42.00
	Energy Charge	$0.1528	$0.1231

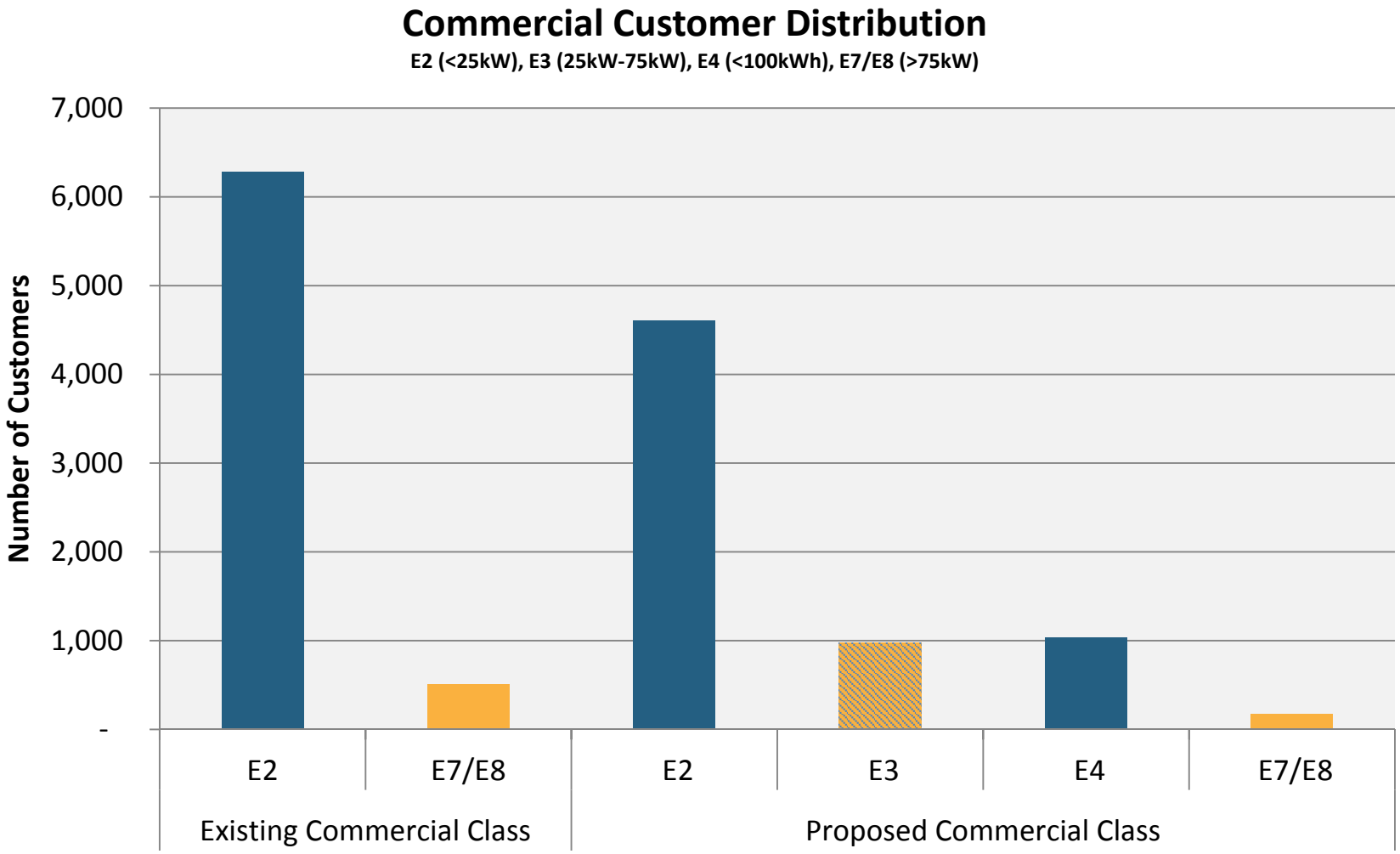
REU designed monthly credits derived from GHG reductions coming from low energy usage to lessen the monthly increase to small users

Proposed Changes to Commercial Classes

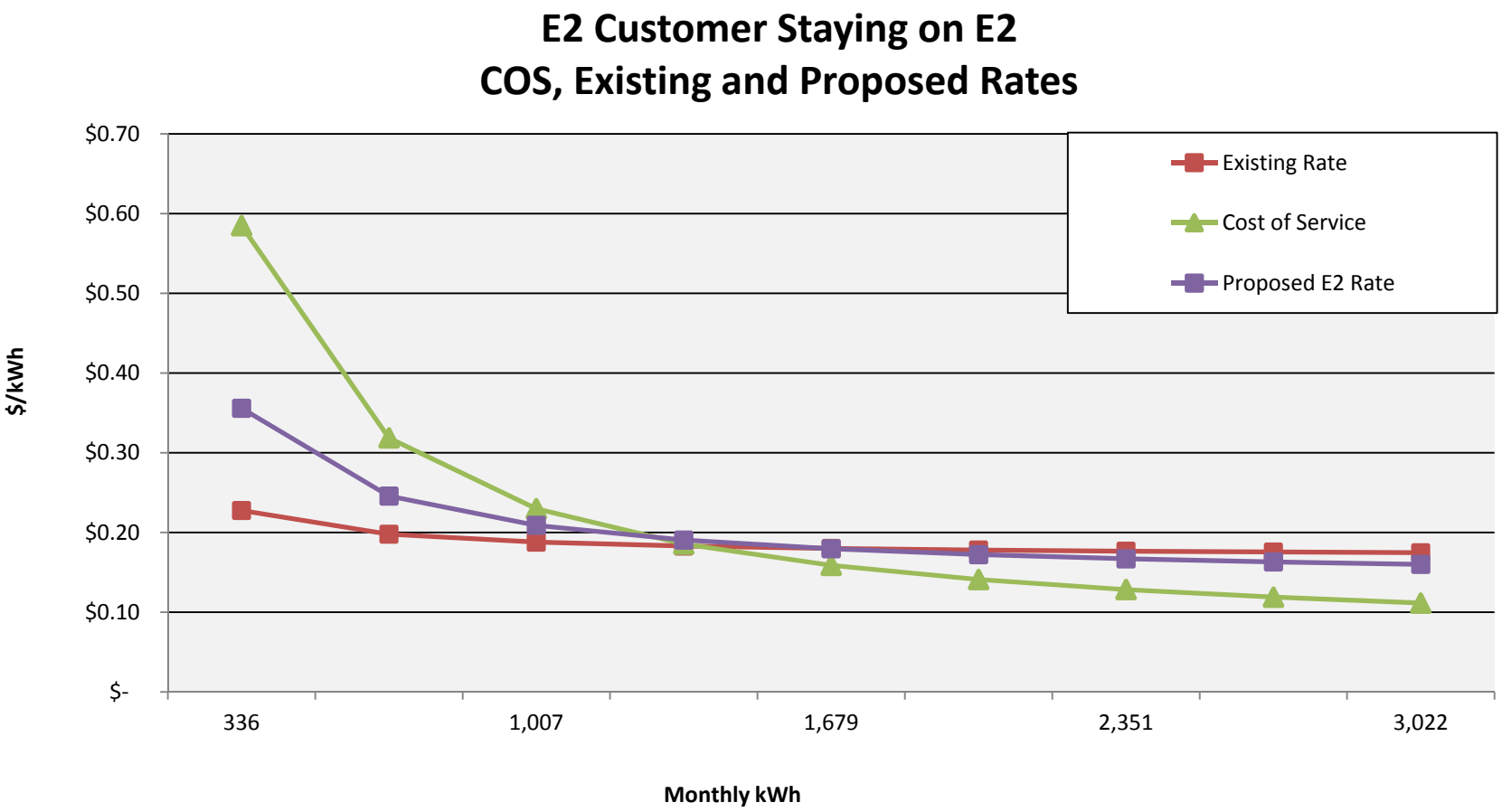
Rate Class	Bill Component	Existing Rate	Proposed Rate Class	Bill Component	Proposed Rate
E2	Network Access Charge	$20.00	E2 (<25kW)	Network Access Charge	$74.00
	Energy Charge	$0.1679		Energy Charge	$0.1354
			E3 (25kW-75kW)	Network Access Charge	$220.00
				Demand Charge	$20.00
				Energy Charge	$0.0990
			E4 (<100kWh)	Network Access Charge	$20.00
				Energy Charge	$0.1679

E2 to E4 is Unchanged

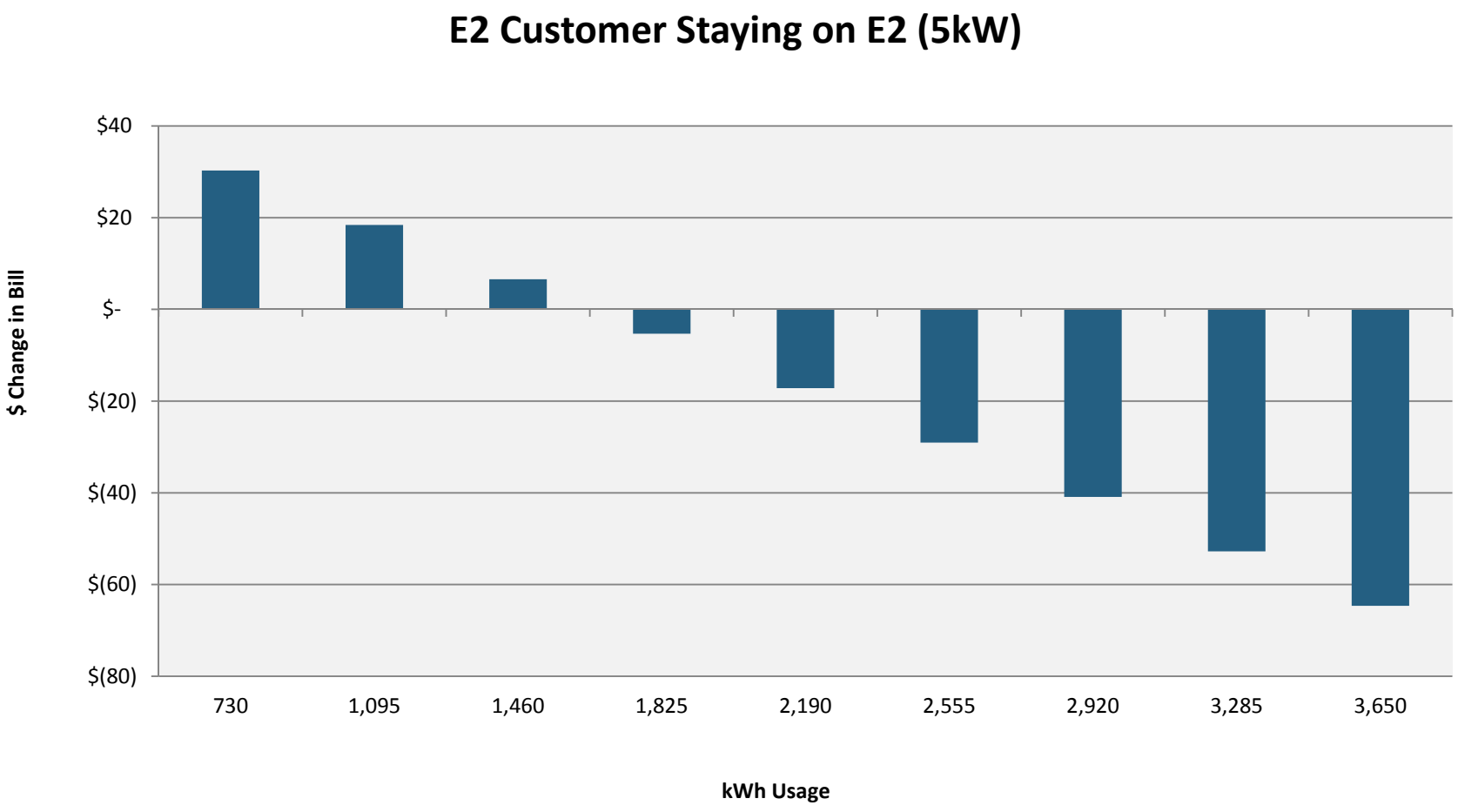
Distribution



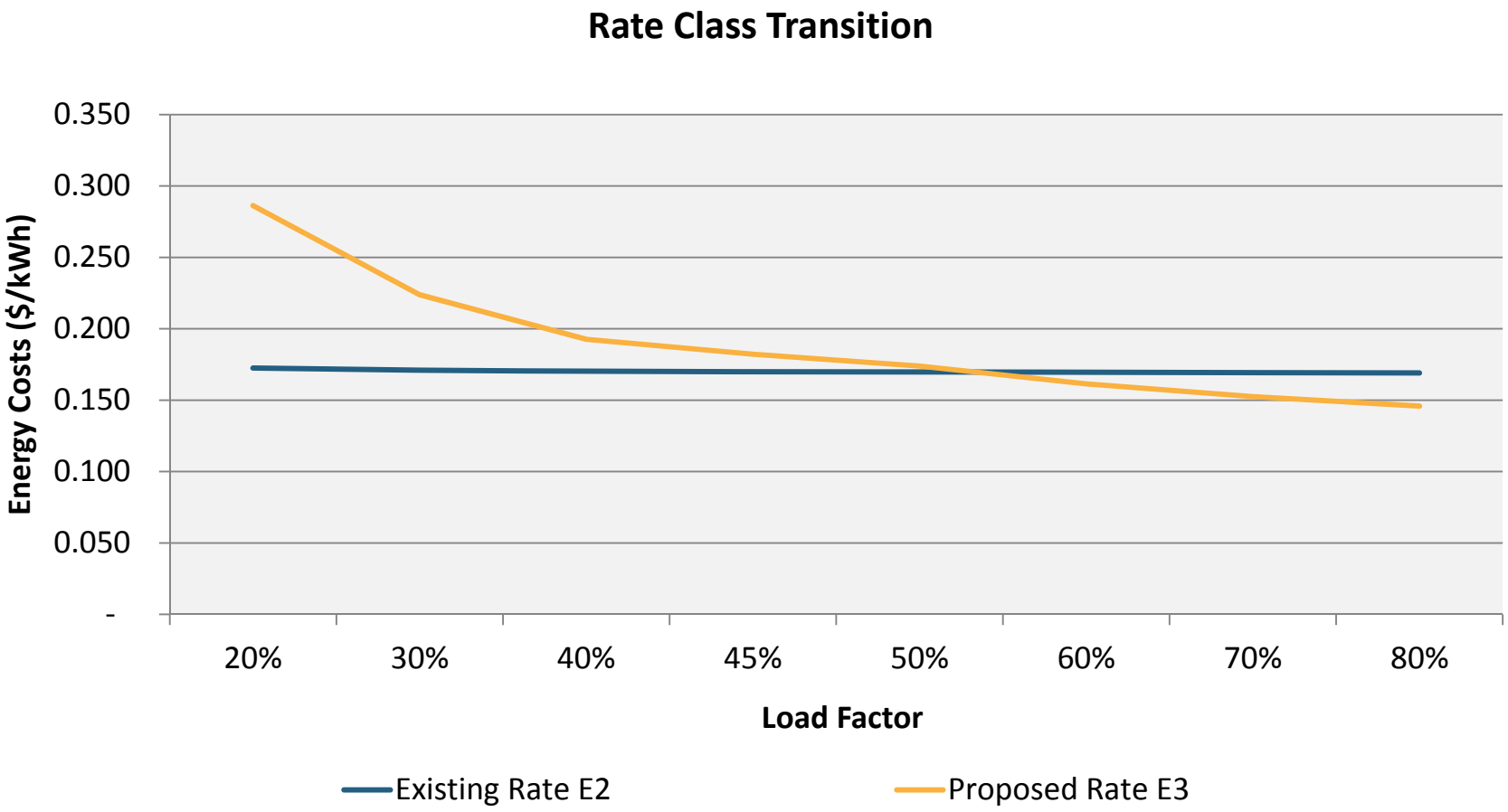
Proposed E2 Small Commercial Rate



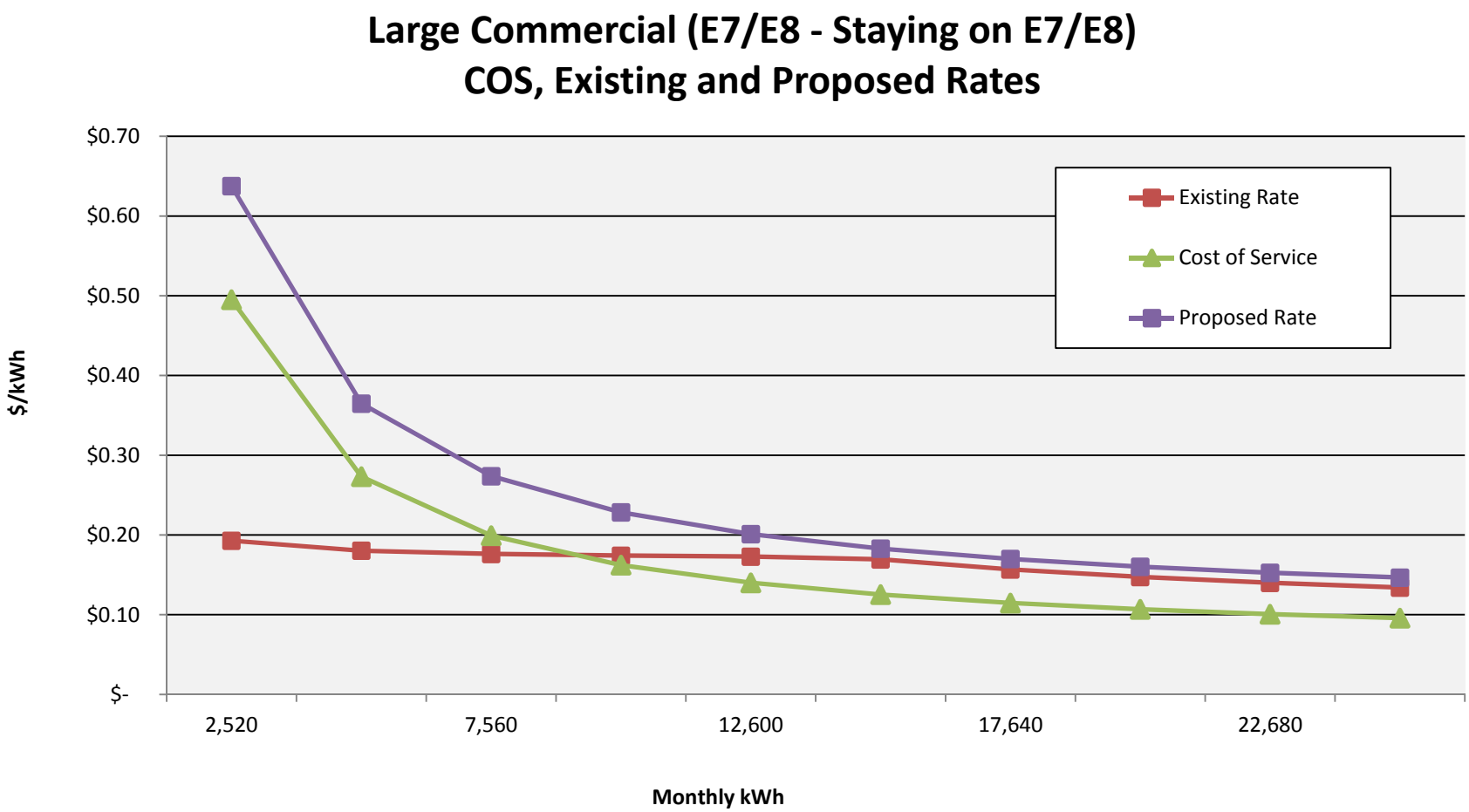
Proposed Small Commercial Changes



Crossover Point for E2/E3 Customers (Load Factor)



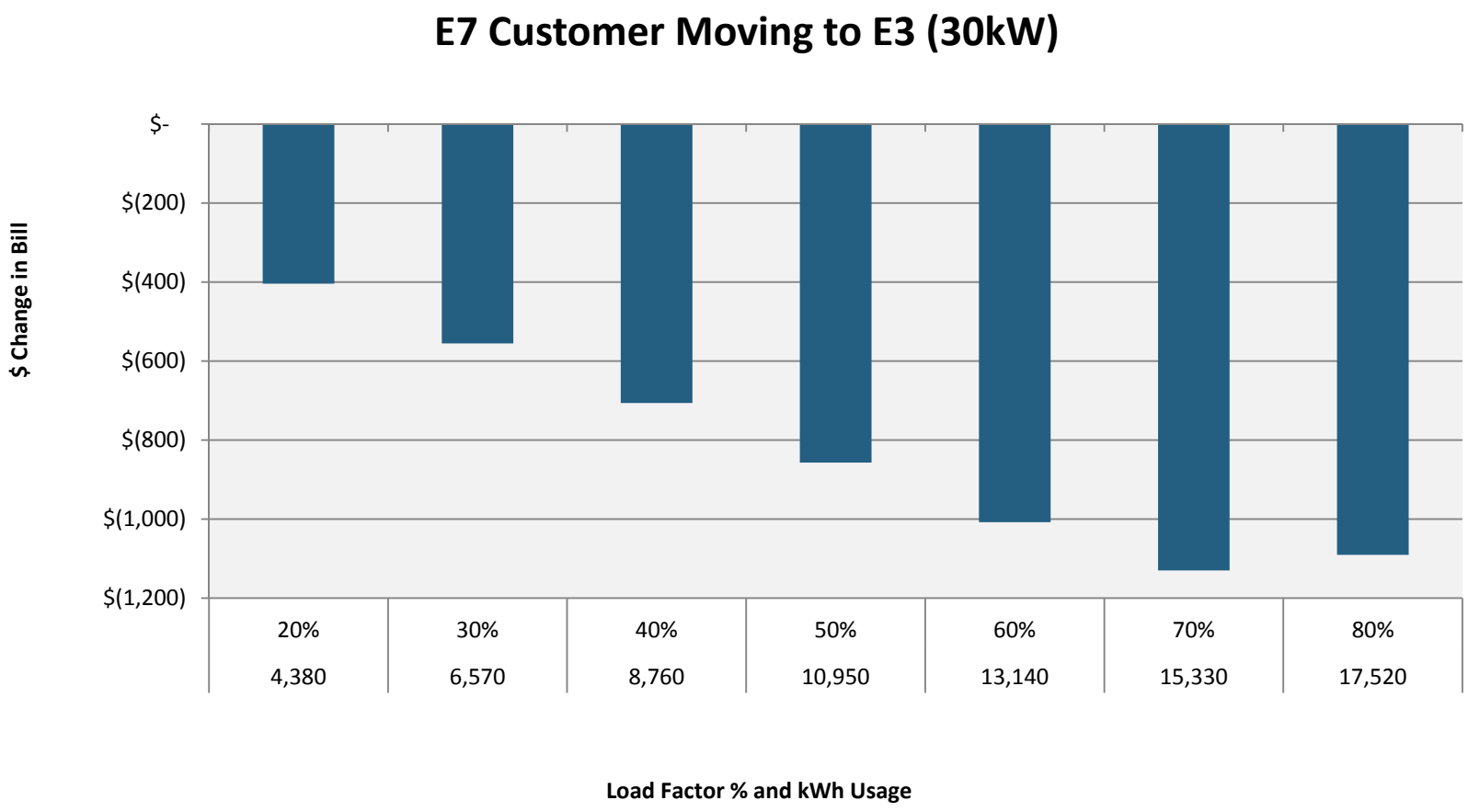
Proposed Large Commercial Rate



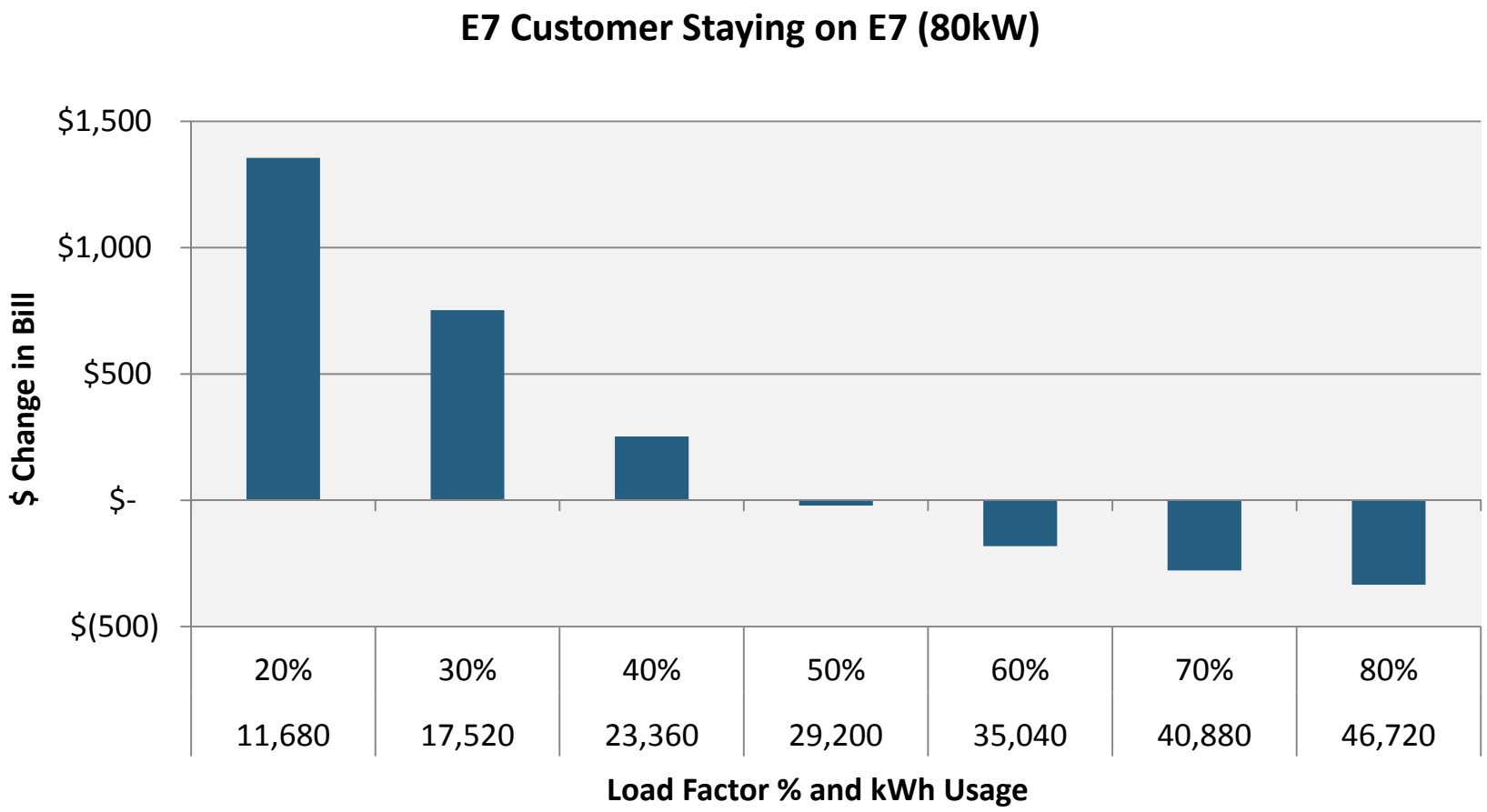
Proposed Changes to E7/E8

Rate Class	Bill Component	Existing Rate	Proposed Rate Class	Bill Component	Proposed Rate
E7/E8	Network Access Charge	$33.00	E3 (25kW-75kW)	Network Access Charge	$220.00
	Demand – Lesser of	$29.65 or $32.95 times a calculation		Demand Charge	$20.00
				Energy Charge	$0.0990
	First 15,000 kWh	$0.1679	E7/E8 (>75kW)	Network Access Charge	$675.00
				Demand Charge	$20.00
	Additional kWh	$0.0809		Energy Charge	$0.0920

Proposed Large Commercial Changes

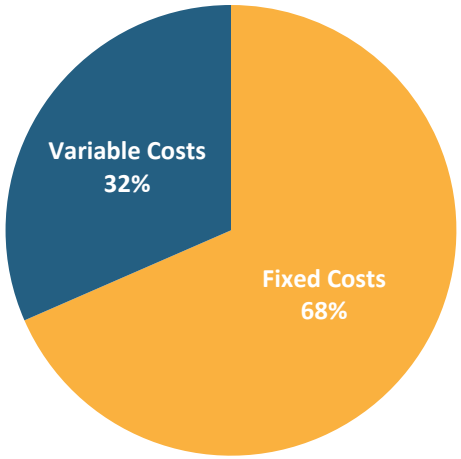


Proposed Large Commercial Changes

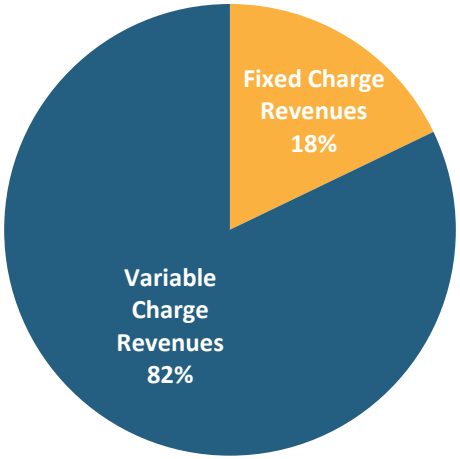


Fixed vs. Variable (Costs and Charges)

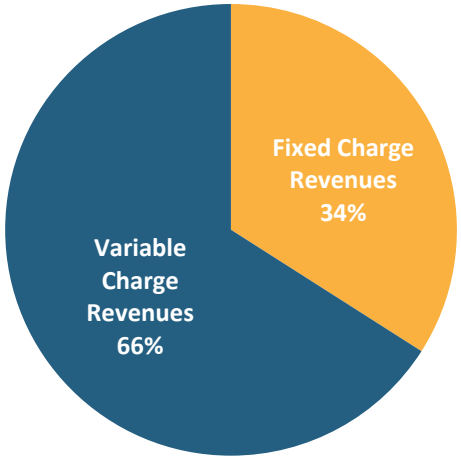
Cost Structure



Existing Rates



Proposed Rates



REU Lessons Learned

- Gradual / Incremental change is preferred
  - Sudden increases in fixed cost recovery results in active community concern
- Cost based rates / rate structures are less of a concern for customer than utility
- Message is important
  - Proposed increase in low income assistance drowned out by fixed charge
  - Solar interests are strong and well-organized

Questions / Answers

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