

2016 Integrated Resource Plan Public Webinar Series

Part 2: Demand Side Management

**Wyoming Municipal Power
Agency**

June 28, 2016



Agenda

- ▶ DSM Purpose
- ▶ WMPA DSM Programs Considered
- ▶ DSM Methodology
- ▶ Next Steps

Study Methodology

Develop 30-year Load Forecast

Ability of existing resources to meet future load demand

Develop Model

Evaluation of demand side management

Evaluation of supply side options

Evaluation of integrated supply and demand side

Conclusion & Recommendations

Propose a 5- and 30-year plan to meet needs

Demand Side Management

Demand Side Management (DSM)

- ▶ Conservation: Reducing energy demand year round through efficiency measures
 - Known as energy efficiency programs
- ▶ Load management: Reducing peak demand by adjusting time or amount of usage
 - Known as direct load control or peak shaving programs

Potential Benefit

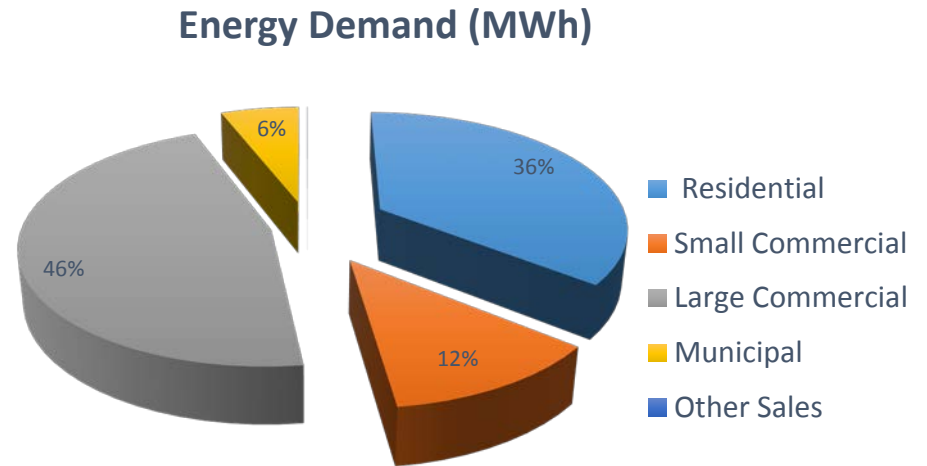
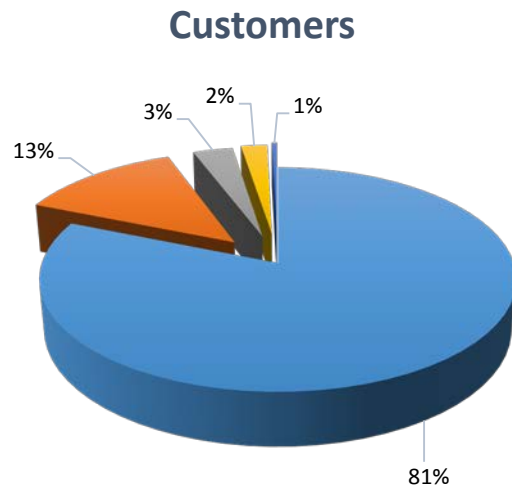
The potential benefit to WMPA for developing DSM programs include:

- ▶ Wholesale energy revenues and margins generated through surplus market energy sales
- ▶ Avoided cost of building resources or purchasing energy from the market to meet demand
- ▶ Customer bill savings from reduced household demand

Benchmarking

PROGRAM	Black Hills Power	Montana-Dakota Utilities Co.	Rocky Mountain Power	Wyoming Municipal Power Agency
Peak Shaving				
Central Air Conditioning	✓	✓		
Electric Hot Water Heater				
HVAC Efficiency				
Electric Resistance & Heat Cove	✓			
Air Source Heat Pump	✓	✓	✓	✓
Central Air Conditioning	✓	✓	✓	✓
Appliance Efficiency				
Electric Hot Water Heater	✓		✓	✓
Refrigerator		✓	✓	✓
Freezer		✓	✓	✓
Clothes Washer			✓	✓
Dishwasher			✓	✓
General Lighting	✓	✓	✓	
Electronics			✓	
Ceiling Fan			✓	
Energy Audit				
CAC Tune-up			✓	
Room Air Conditioner Tune-up			✓	
Refrigerator Retirement			✓	✓
Duct Sealing/Insulation			✓	
Wall/Ceiling/Window Insulation			✓	

Customer Profile

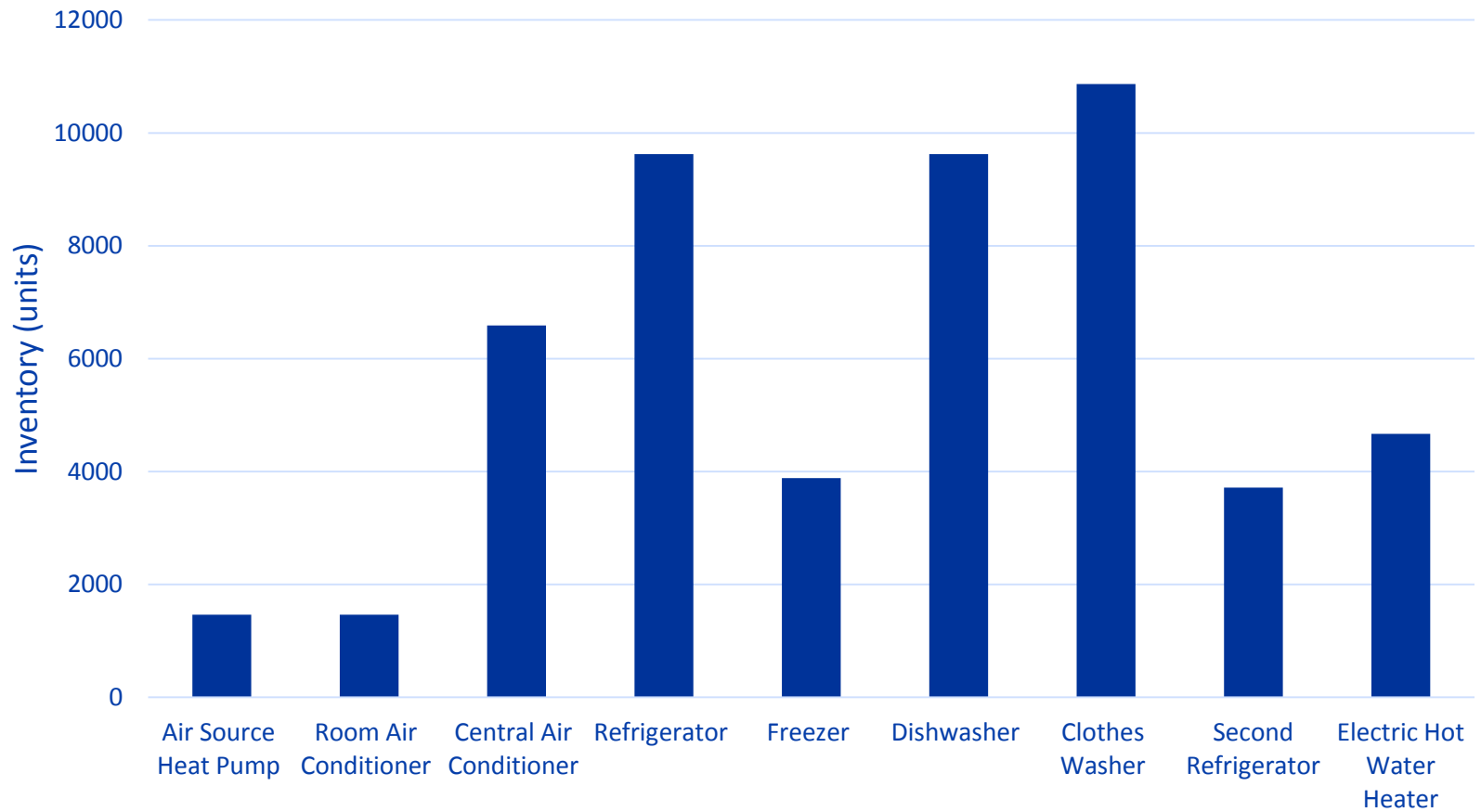


Appliance Inventory

Appliance	Inventory Saturation [1]
Air Source Heat Pump	9%
Room Air Conditioner	8%
Central Air Conditioner	42%
Refrigerator	79%
Freezer	36%
Dishwasher	66%
Clothes Washer	87%
Second Refrigerator	20%
Electric Hot Water Heater	25%

[1] Inventory saturation from EIA 2013 Residential Energy Consumption Survey, for Mountain census region.

WMPA Appliance Inventory

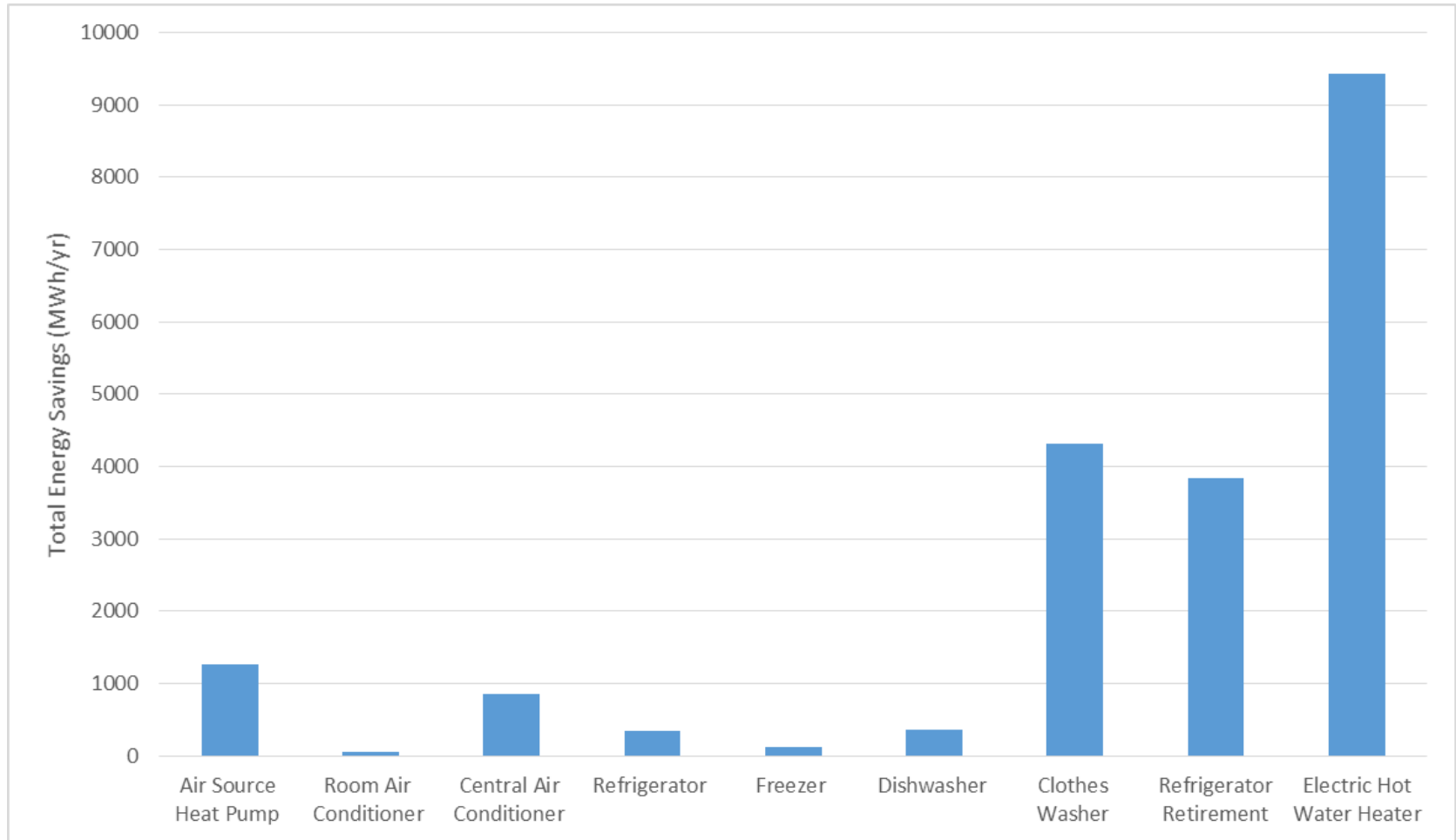


Energy Efficiency Programs

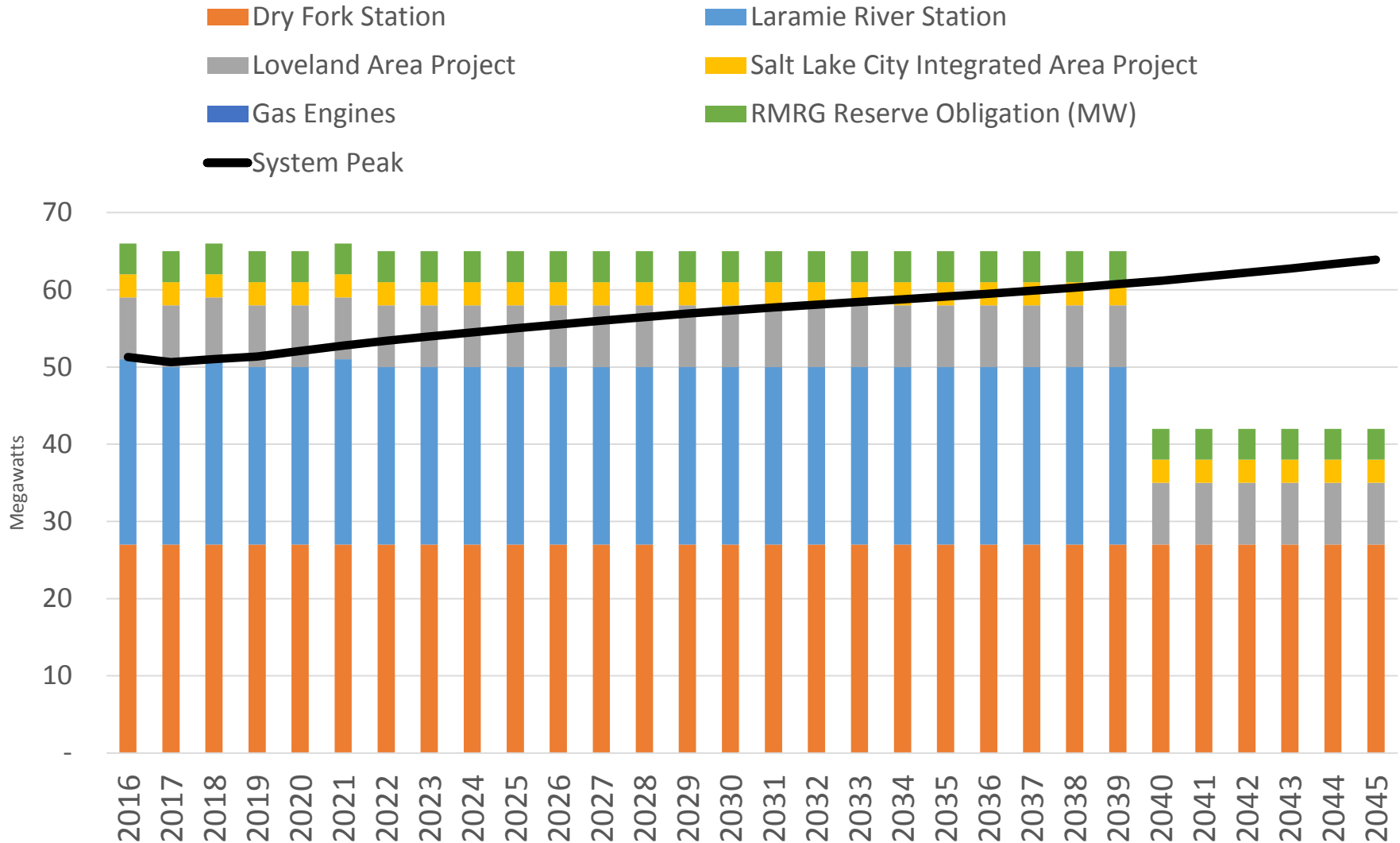
PROGRAM	Program Details	Incremental Cost [1]	Energy Savings (kWh/unit) [1]
Air Source Heat Pump	Upgrade from SEER 13 to SEER 14.5	\$ 1,000	0.058
Room Air Conditioner	Upgrade from EER 9.8 to EER 10.8	\$ 50	0.017
Central Air Conditioner	Upgrade from SEER 13 to SEER 15	\$ 556	0.142
Refrigerator	Purchase Energy Star Refrigerator	\$ 20	0.002
Freezer	Purchase Energy Star Freezer	\$ -	0.001
Dishwasher	Purchase Energy Star Dishwasher	\$ 10	0.035
Clothes Washer	Purchase Energy Star Clothes Washer	\$ 150	0.036
Refrigerator Retirement	Retire second Refrigerator	\$ -	0.018
Electric Hot Water Heater	Purchase Energy Star Heat Pump EHWH	\$ 650	0.647

[1] Based on 2016 Energy Star energy savings calculator data.

Energy Efficiency Program Savings Potential

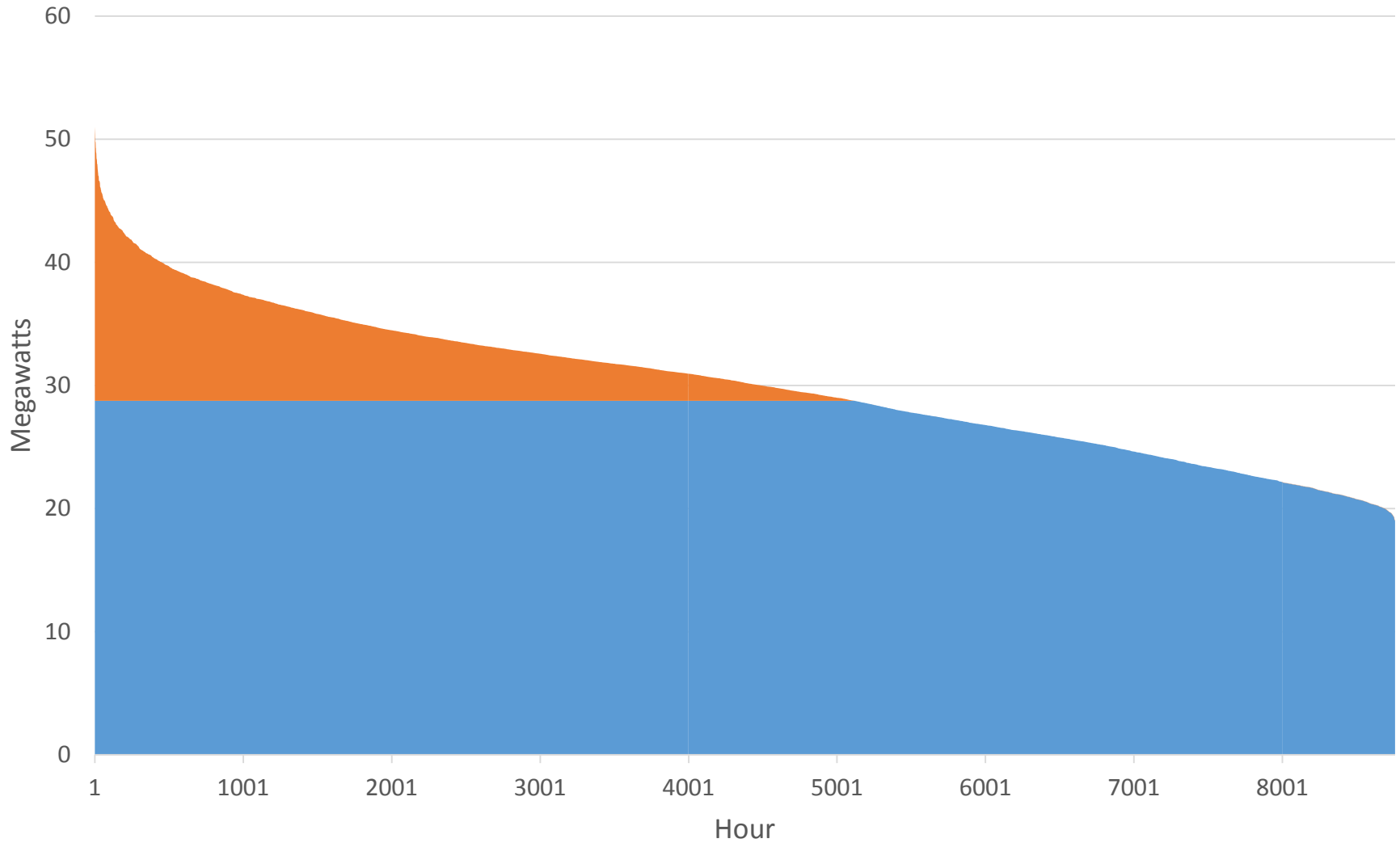


Balance of Loads and Resources



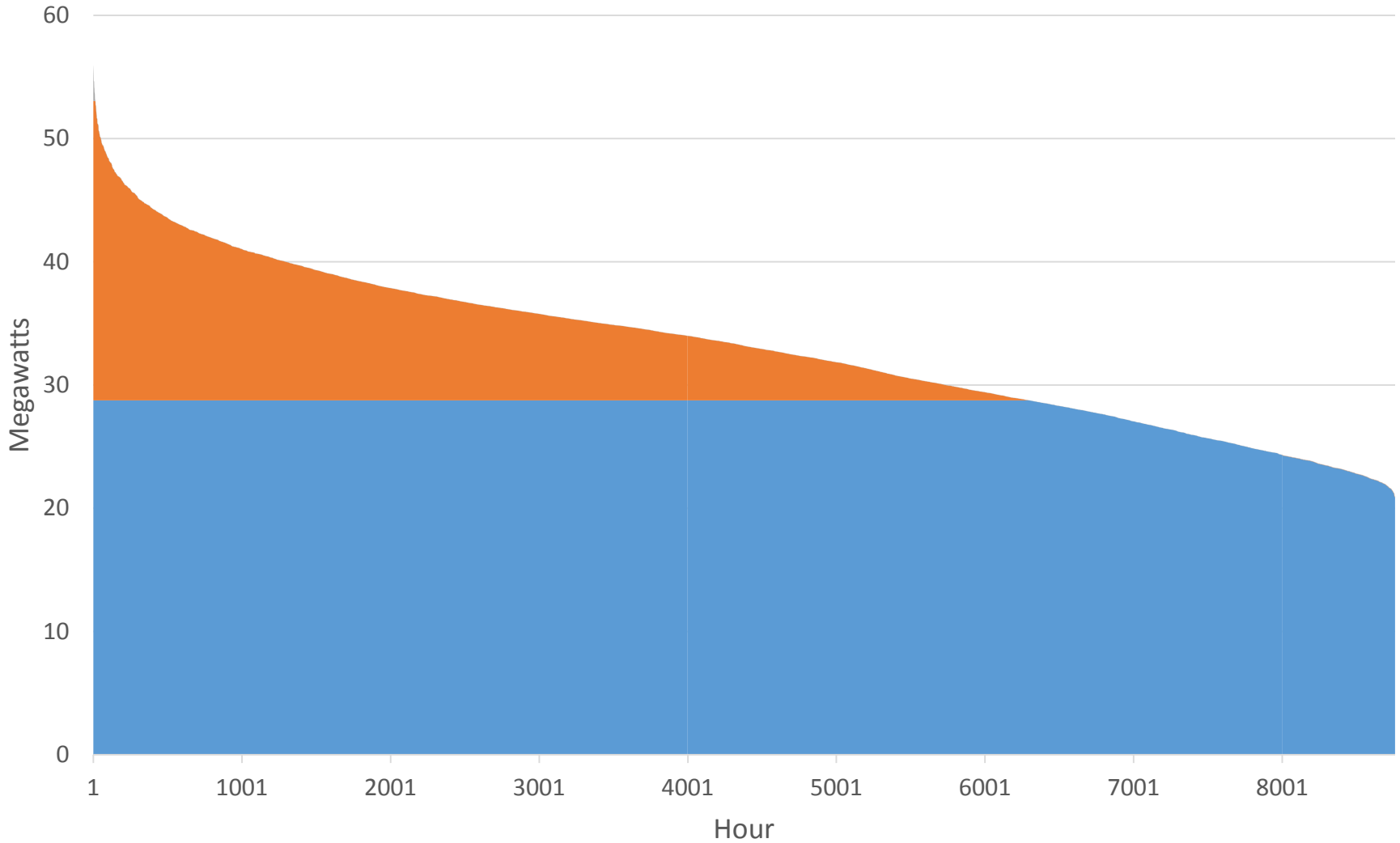
Load Duration Curve: 2016

■ DFS ■ LRS



Load Duration Curve: 2026

■ DFS ■ LRS ■ SLCIP



Benefit Cost Analysis

California Standard Practice:

Program Administrator Cost Test

Benefits: Avoided supply costs

Costs: Utility costs, utility incentives

Total Resource Cost Test

Benefits: Avoided supply costs

Costs: Utility costs, utility incentives, customer cost

Participant Cost Test

Benefits: Customer bill savings

Costs: Customer incremental costs

$$\text{Benefit Cost Ratio} = \frac{\text{Benefits}}{\text{Costs}}$$

DSM Program Evaluation

- ▶ Avoided costs (i.e. the benefits) are established by the existing generation and supply side options
- ▶ Full program evaluation is conducted during Integrated Planning, Part 4

Next Steps

▶ Continuing Public Webinar Series:

- Part 1 – Study Introduction & Background
June 21: 11:00 am -12:00 pm Mountain Time
- Part 2 – Demand Side Management
June 28: 11:00 am -12:00 pm Mountain Time
- Part 3 – Supply Side Options
July 5: 11:00 am -12:00 pm Mountain Time
- Part 4 – Integrated Analysis
July 12: 11:00 am -12:00 pm Mountain Time

Questions

Please send questions and comments to:
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Visit WMPA's website for more information on
the IRP:
www.wmpa.org

Thank you for your time.