

2016 Integrated Resource Plan Public Webinar Series

Part 4: Integrated Analysis

**Wyoming Municipal Power
Agency**

July 12, 2016



Agenda

- ▶ Updated Assumptions
- ▶ DSM Evaluation
- ▶ Integrated Analysis
- ▶ Conclusions & Recommendations

Study Methodology

Develop 30-year Load Forecast

Ability of existing resources to meet future load demand

Develop Model

Evaluation of demand side management

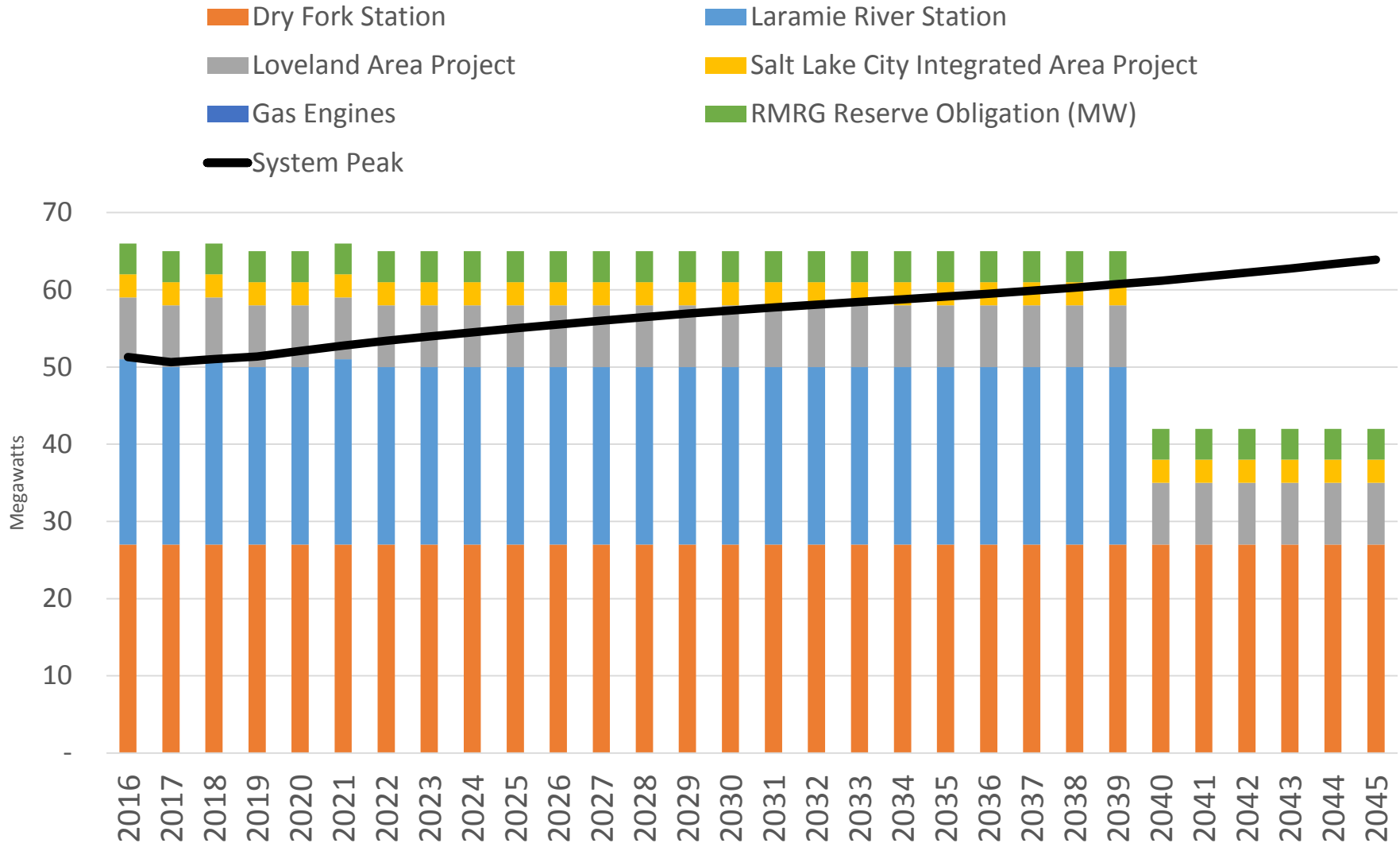
Evaluation of supply side options

Evaluation of integrated supply and demand side

Conclusion & Recommendations

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

Balance of Loads and Resources



Scenario Comparison

Scenario	Combined Cycle	Market Capacity	Reciprocating Engines	Reciprocating Engines + Wind	Reciprocating Engines + Solar
New Resource COD	2040	N/A	2040	2040	2040
Capacity (MW)	27.39	N/A	27.5	27.5	27.5
Renewable Capacity (MW)	N/A	N/A	N/A	25	25
Total Scenario Cost	\$374,800,000	\$378,300,000	\$381,300,000	\$382,300,000	\$387,700,000
% Different (from low)	0.00%	0.93%	1.73%	2.00%	3.44%

DSM Evaluation

- ▶ DSM programs were evaluated over 10 years.
- ▶ Low cost supply side scenario used to establish avoided costs for the DSM program evaluation.
- ▶ As stated during Part 2, three test were used:

Program Administrator Cost Test

Benefits: Avoided supply costs

Costs: Utility costs, utility incentives

Total Resource Cost Test

Benefits: Avoided supply costs, customer bill savings

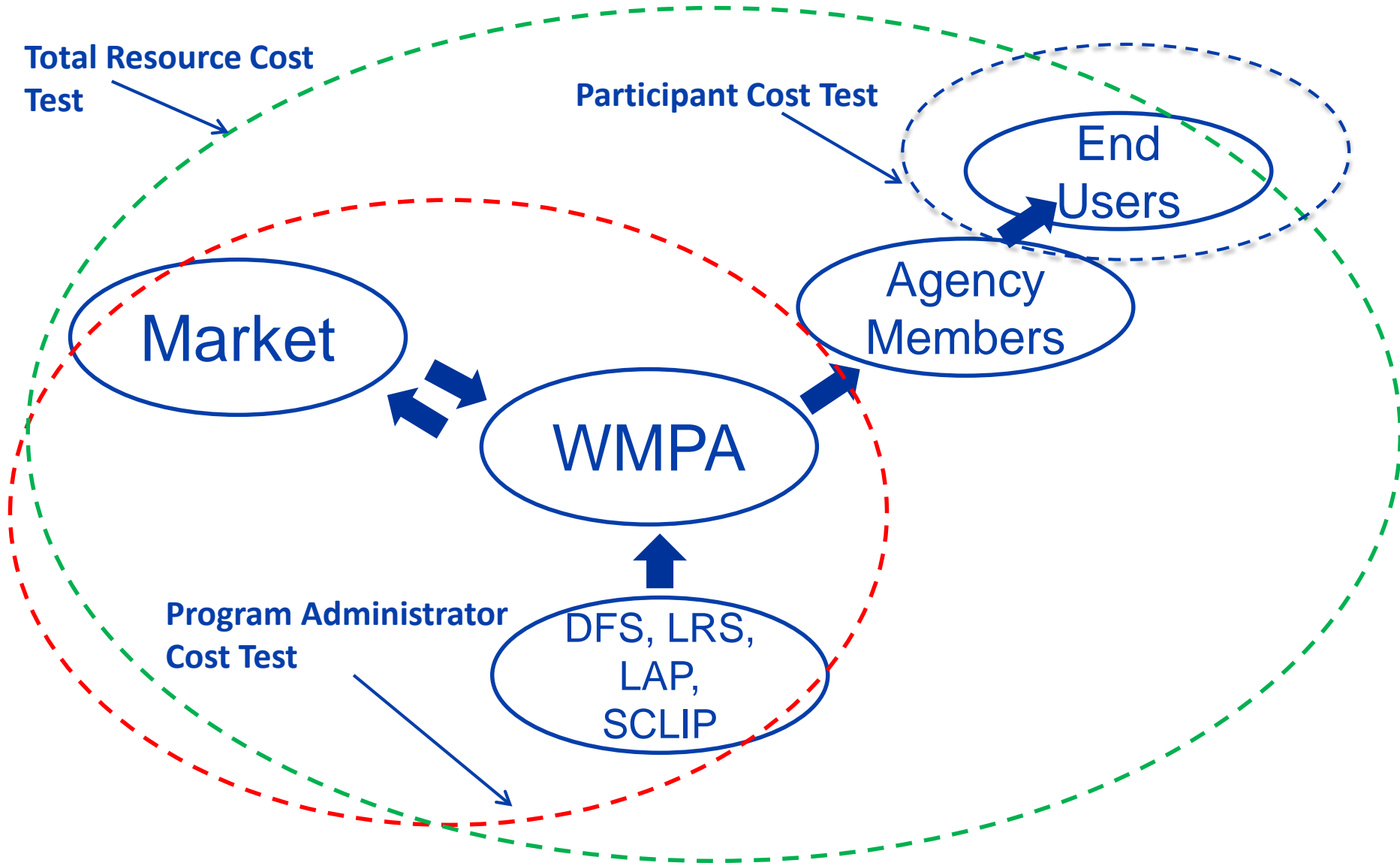
Costs: Utility costs, utility incentives, customer cost

Participant Cost Test

Benefits: Customer bill savings

Costs: Customer incremental costs

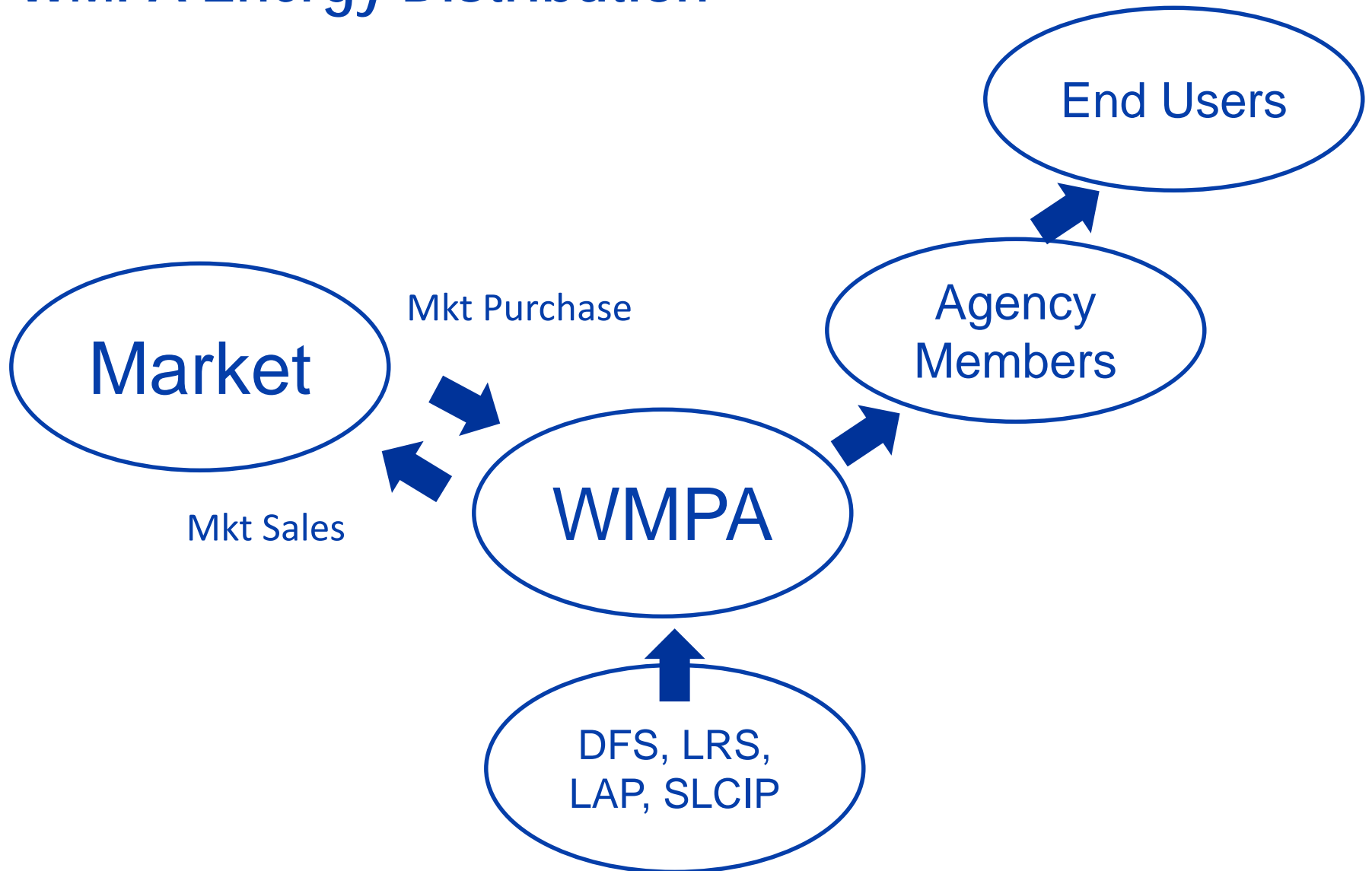
WMPA DSM Evaluation



Energy Efficiency Evaluation

- ▶ Evaluated programs on three levels:
 - Costs and benefits to WMPA and the municipalities they serve.
 - Costs and benefits to WMPA and residential customers collectively
 - Cost and benefits to municipals' residential customers.
- ▶ If programs had a B/C ratio greater than 1, the administrative cost was redistributed over the remaining programs.
- ▶ WMPA avoided power supply cost developed based on supply side production cost and market revenue analysis

WMPA Energy Distribution



Energy Efficiency Evaluation – Agency Members

	Program Administrator Cost Test	Total Resource Cost Test		Participant Cost Test
Program	B/C[1]	B/C[1]	B/C[2]	B/C
Air Source Heat Pump	<i>0.14</i>	<i>0.04</i>		<i>0.64</i>
Room Air Conditioner	<i>0.01</i>	<i>0.01</i>		<i>0.74</i>
Central Air Conditioner	<i>0.04</i>	<i>0.01</i>		<i>0.20</i>
Refrigerator	<i>0.02</i>	<i>-0.08</i>		<i>-0.43</i>
Freezer	<i>0.01</i>	<i>0.04</i>		<i>-0.50</i>
Dishwasher	<i>0.06</i>	<i>0.05</i>		<i>2.48</i>
Clothes Washer	<i>0.27</i>	<i>0.16</i>		<i>2.66</i>
Refrigerator Retirement	<i>0.34</i>	<i>5.10</i>	<i>0.07</i>	<i>-9.20</i>
Electric Hot Water Heater	<i>0.29</i>	<i>0.26</i>		<i>3.86</i>

[1] Cost based on administrative cost allocated over nine programs.

[2] Cost based on administrative cost allocated over one program.

Integrated Analysis

- ▶ Over the 10 year period evaluated, DSM programs provided less benefit to WMPA than assumed cost to implement.
- ▶ The lowest cost future integrated resource plan mirrors the low cost supply side future.

Conclusions

► Supply Side

- Based on load forecast, WMPA is not in need of new capacity until 2039.
- WMPA has excess base load energy and capacity in the short and medium-term.
- The resources with the cheapest capital cost investment (\$/kW) should be pursued to minimize cost to WMPA and its members.
- Renewable resources without federal incentives are more costly. Federal incentives for wind are assumed to reduce in the future.

Conclusions

► Demand Side

- Based on the assumptions made, WMPA cannot afford to incentivize customers.
- DSM programs may start to look favorable closer to 2039 when new capacity is required.
- If LRS units retire earlier than planned, DSM programs will begin to look more favorable.

Short Term Recommendation

- ▶ Track actual load growth to that projected. If load growth deviates from projection, timing of new resources should be re-evaluated.
- ▶ Watch for opportunities to participate in larger projects, and compare cost to peaking projects that WMPA would control.
- ▶ Early LRS retirement, LRS gas conversion, or LRS dispatch changes would impact WMPA resource mix.
- ▶ Clean Power Plan implementation and WMPA compliance would impact WMPA resource costs.

Long Term Recommendation

- ▶ Continue tracking actual load growth to that projected.
- ▶ Peaking resources generally have a lead time of 2-3 years; maintain flexibility in resource plan.
- ▶ Compare pricing and availability of market capacity to that of peaking resources.
- ▶ Watch for opportunities to participate in larger projects, and compare cost to peaking projects that WMPA would control.

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.

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