Northwest Power and Conservation Council

October 29, 2013

MEMORANDUM

TO: Council Members

FROM: Ben Kujala

SUBJECT: Northwest Power Pool Update on Energy Imbalance Market Efforts

During past two years, the Northwest Power Pool Market Assessment and Coordination Committee (MC Initiative) has been working with its members to assess an Energy Imbalance Market (EIM) for the Pacific Northwest. The first phase of the MC Initiative focused on scenario analyses to develop conservative estimates of the potential benefits of a regional EIM. The results of the phase one effort were released on October, 21 2013, and indicated a conservative estimate of benefits "clustered within the range of $70 million to $80 million dollars per year."

The second phase of the MC Initiative has been evaluating governance issues and barriers to implementing an EIM, and is nearing completion. It is also charting a path forward for this effort.

Rachel Dibble of the Strategy Integration Group at BPA is serving as a representative of the MC Initiative. At the council meeting in Boise on November 5, she will provide a progress report on MC Initiative activities to date, along with an outlook for upcoming activities.

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Executive Director

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NWPP Members' Market Assessment and Coordination Initiative

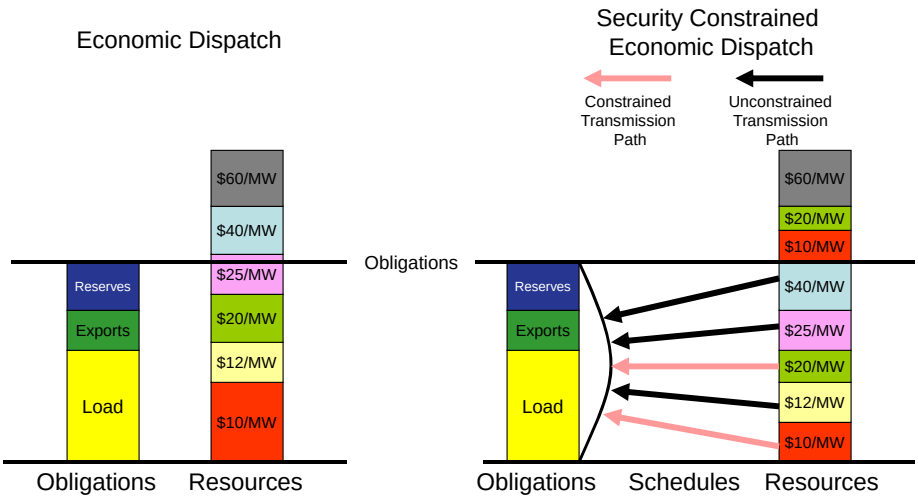
Rachel Dibble, Strategy Integration
Bonneville Power Administration

November 5, 2013
Northwest Power and Conservation Council
Public Meeting

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Energy Imbalance Market Basics

Today's World and EIM



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Today's World (No EIM)

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- L = Load
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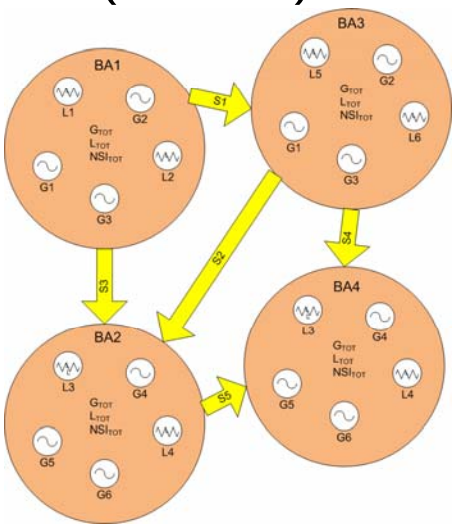

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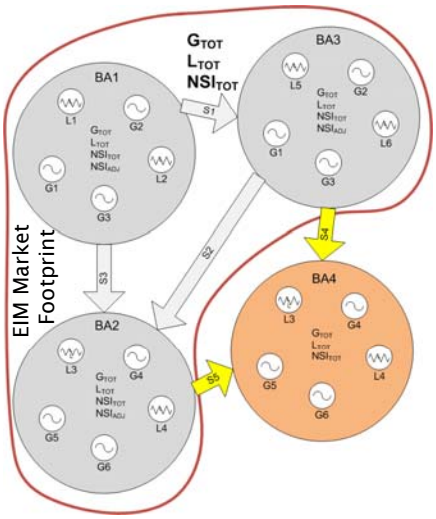


Participation

- Voluntary to decide to join EIM.
- Voluntary for participants to offer dispatchable generation (MW range and offer prices) into the market.
- Mandatory for participants to settle load and generation imbalances via the EIM.

NWPP Members' MC

Timeline

- Phase 1 – May 2012 - June 2013
  - Final Phase 1 Report posted publicly
- Phase 2 – June 2013 – November 2013
  - Recommendation to Executives in November
- Proposed Phases 3-5
  - Infrastructure
  - Market/Policy
  - Security Constrained Economic Dispatch (EIM)

Problem Statement

- We need additional tools to manage ramps and increasing demand for balancing capacity associated with variable energy resources;
- We seek better tools to systematically share load and resource diversity across our systems;
- We need to better manage and use our increasingly constrained transmission system;
- We seek to contain the costs and compliance risks associated with operating Balancing Authorities;
- Evolving solutions must address cost causation and cost allocation;
- We seek to leverage existing tools and platforms as feasible; and
- We must preserve the value of our existing Contingency Reserve Sharing Program.

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

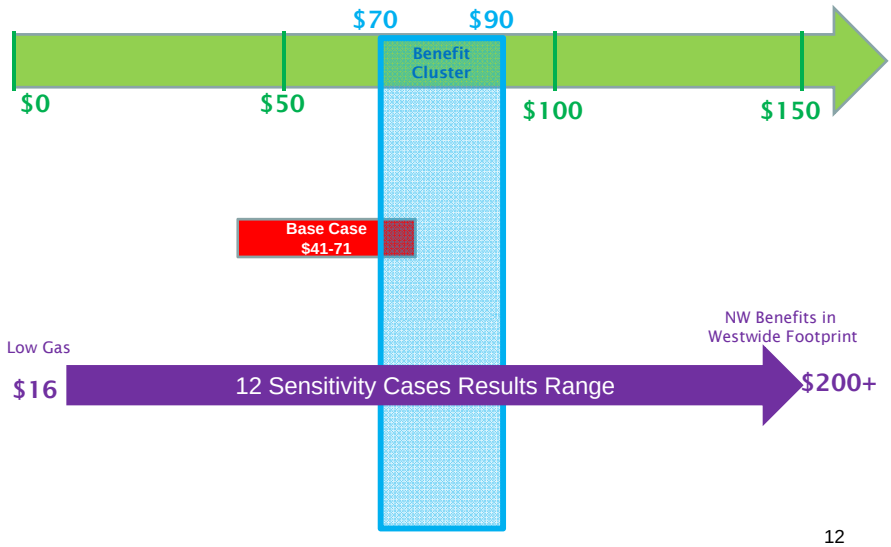
Final Phase I Report

MC Phase 1 Summary Observations

- No silver-bullet solution to region's challenges
- Market design decisions drive overall costs
- Market Participant costs outweigh Market Operator costs
- Key concerns:
  - Governance (FERC Jurisdiction, EIM Admin Corp)
  - Policy (Hydro, Transmission, Capacity)
  - Technical (Infrastructure, Market Platform)

Annual NW Regional Benefits of an EIM

Base Year 2020
Benefits in $millions



Sensitivity Cases

Case Descriptions		
Base	**Base Case 95% (Minimum Achievable Benefits)**	•95% Confidence Level (CL) on meeting wind & load forecast error for each BA •Hold reserves constant between EIM and BAU •NW Footprint EIM •$5.62 per MMbtu HH gas price •2006 Loads and hydro energy to represent average water (2003 in CA).
Flex Reserves	**Base Case 99.5%**	Increased Confidence Level on meeting wind & load forecast error to 99.5% for each BA. Held reserves constant between EIM and BAU.
	Reduced EIM Flex Reserve Case	Reduced flex reserve obligation in EIM to 95% CL on meeting wind & load forecast error for the NWPP EIM footprint ***as a single entity***.
Inefficiencies	**3% Holdback Case**	Reduced hydro and thermal availability by 3% each, so more units commit.
	6% Holdback Case	Reduced hydro and thermal availability by 6% each, so more units commit .
Footprints	**WECC-wide Case**	Changed EIM footprint to WECC-wide, otherwise same as Base Case.
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B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

NW Footprint Benefits Continuum

Relative Value of Single Year Benefits BAU v. EIM (Millions$ in 2020)

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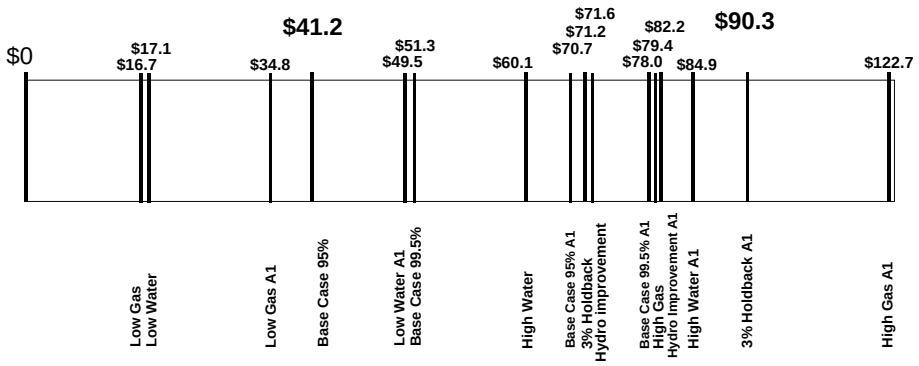


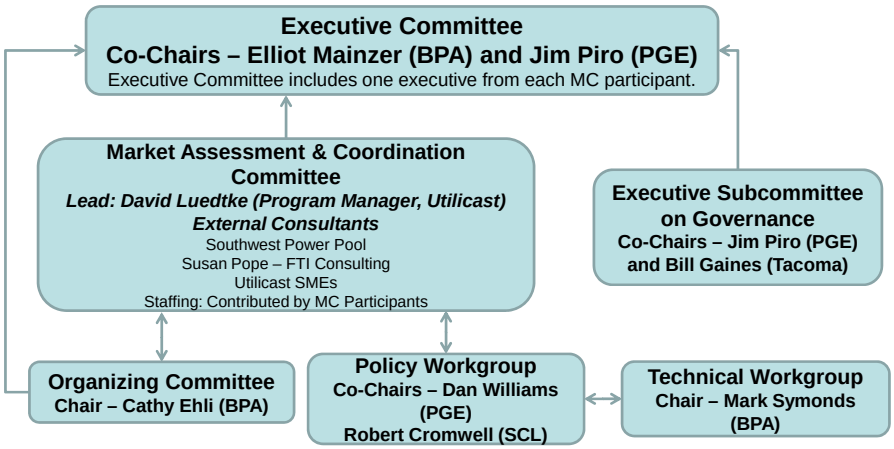
NWPP MC MEMBERS' INITIATIVE

A T I O N

Phase 2 Update

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

MC Phase 2
Organizational Structure



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Phase 2 Objectives

The Work Order called for five areas of focus:

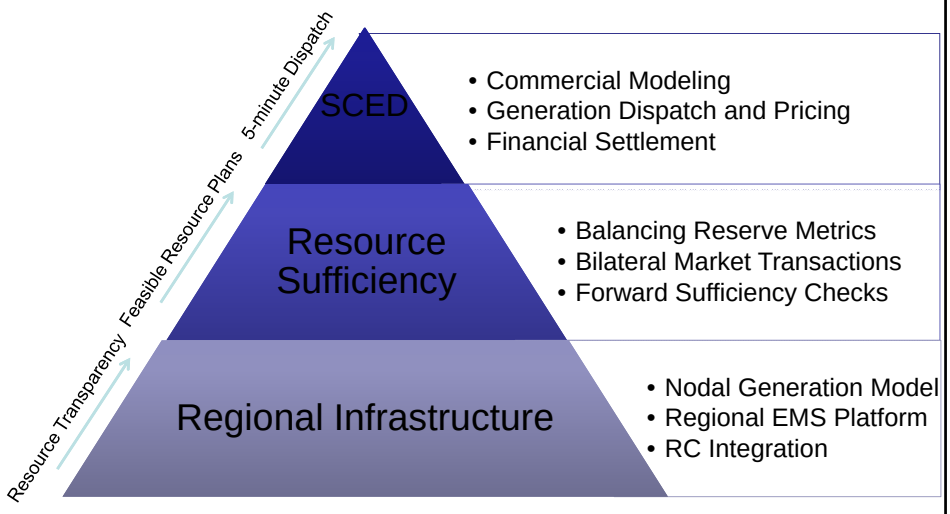
- Address EIM design issues that were identified during Phase 1
- Initiate data sharing objectives associated with regulation sharing
- Refine “all-in” costs including Market Operator, Market Participant and other requisite costs for starting and operating an EIM
- Develop an Implementation Plan that maximizes benefits and options (with or without an EIM)
- Provide illustrative Bylaws for EIM Admin Corp that would help shield its members from FERC jurisdiction

Policy Issues

- Data Sharing
- Capacity Backed Imbalance Trading
- Following Reserve Assistance Program (FRAP)
- Resource Sufficiency
- Transmission Compensation
- Hydro Resources in EIM

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Technical Dependencies



B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Regional Value Proposition
5.5% Discount Rate & Amortization

Example NPV of EIM Benefits-Costs (millions of $ in 2014)

	Low SPP Cost Est	High SPP Cost Est	CAISO Cost Estimate	CAISO Cost Estimate
	Low Participant Cost	High Participant Cost	Low Participant Cost	High Participant Cost
Low Benefit ($41.2 mil)	$1.89	$143.75	$62.43	$50.23
High Benefit ($90.3 mil)	$312.84	$170.98	$377.16	$264.50

Benefits: 10 years, 2018 EIM launch date through 2027

Costs (Operator+Participants): 14 years, 2014-2017 Start-up, 2018-2027 Operations,

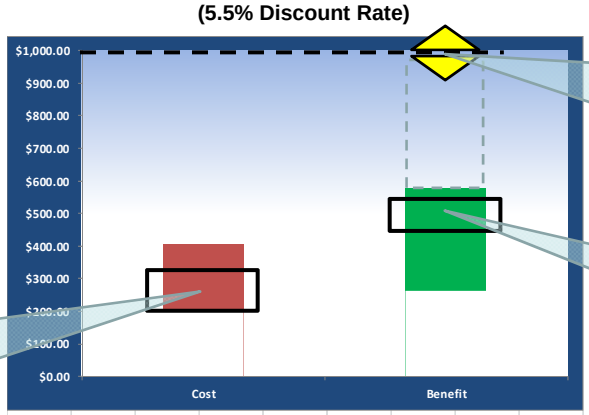
Entities borrow start-up capital at 4.5%interest rate and fully repay it in first 10 years of operation

Inflation Rate = 2.5% ; Discount Rate = 5.5% based on Participant feedback for capitalization example purposes

Phase 2 Update

Regional Value Proposition

($Millions in 2014; 2.5% Inflation Rate)
(5.5% Discount Rate)



Flex Reserves - Depends on Resource Sufficiency Requirements and other factors.

Represents **annual** benefits clustering in the $70-80 million range in 2020$

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Update

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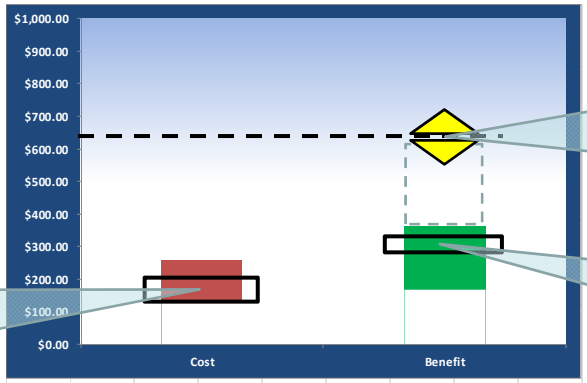

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Data submissions represent 91% of participating load (MWH) modeled in 2020 E3 EIM case

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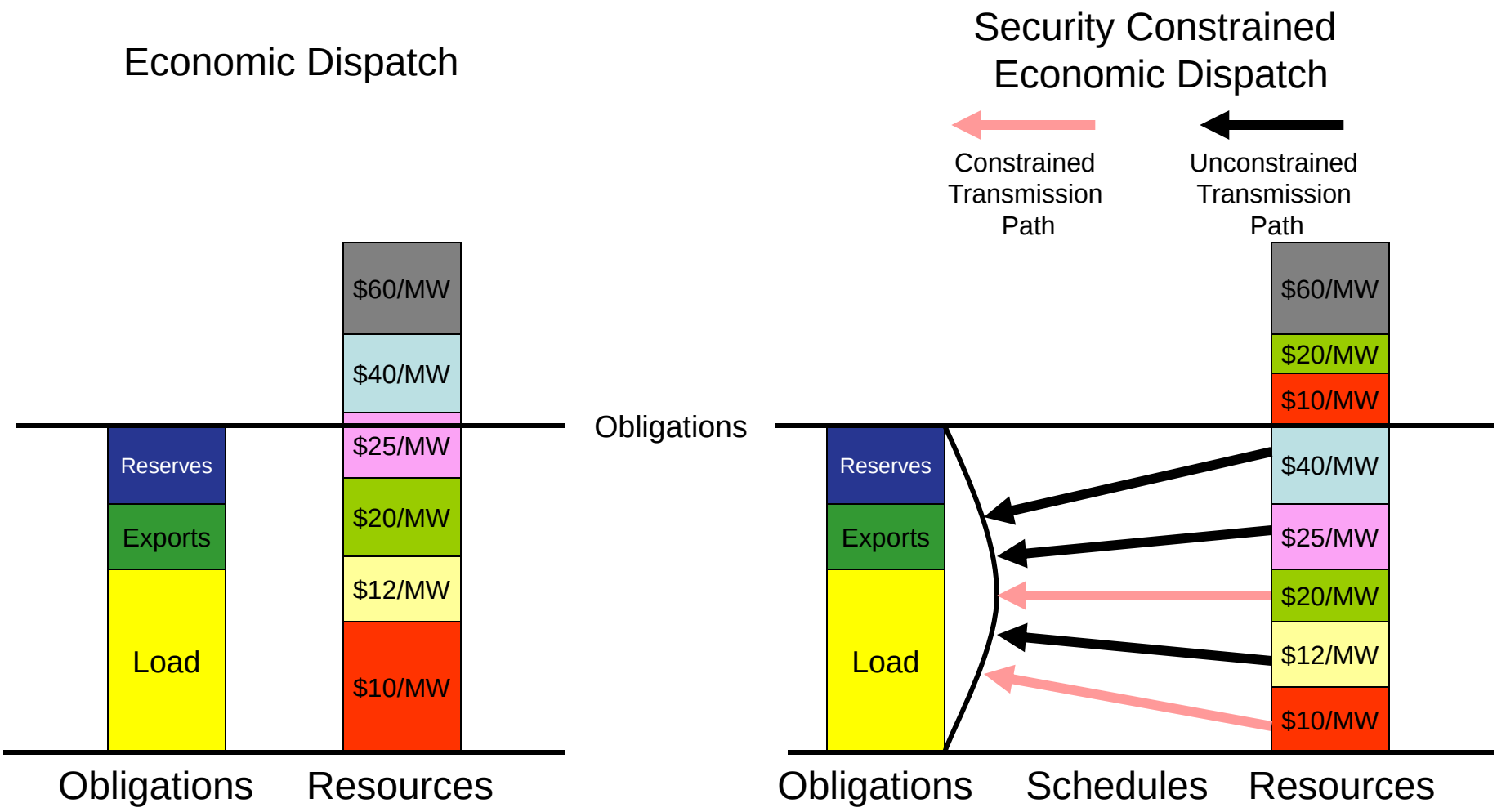

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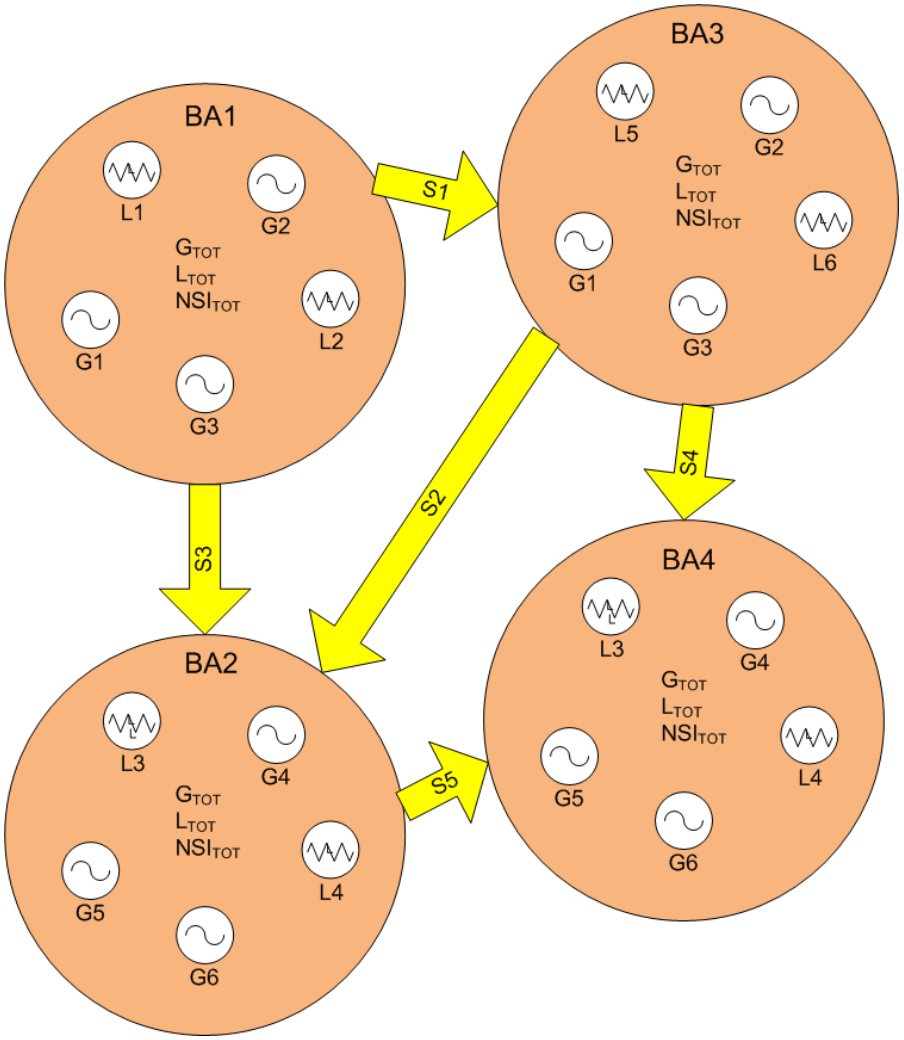

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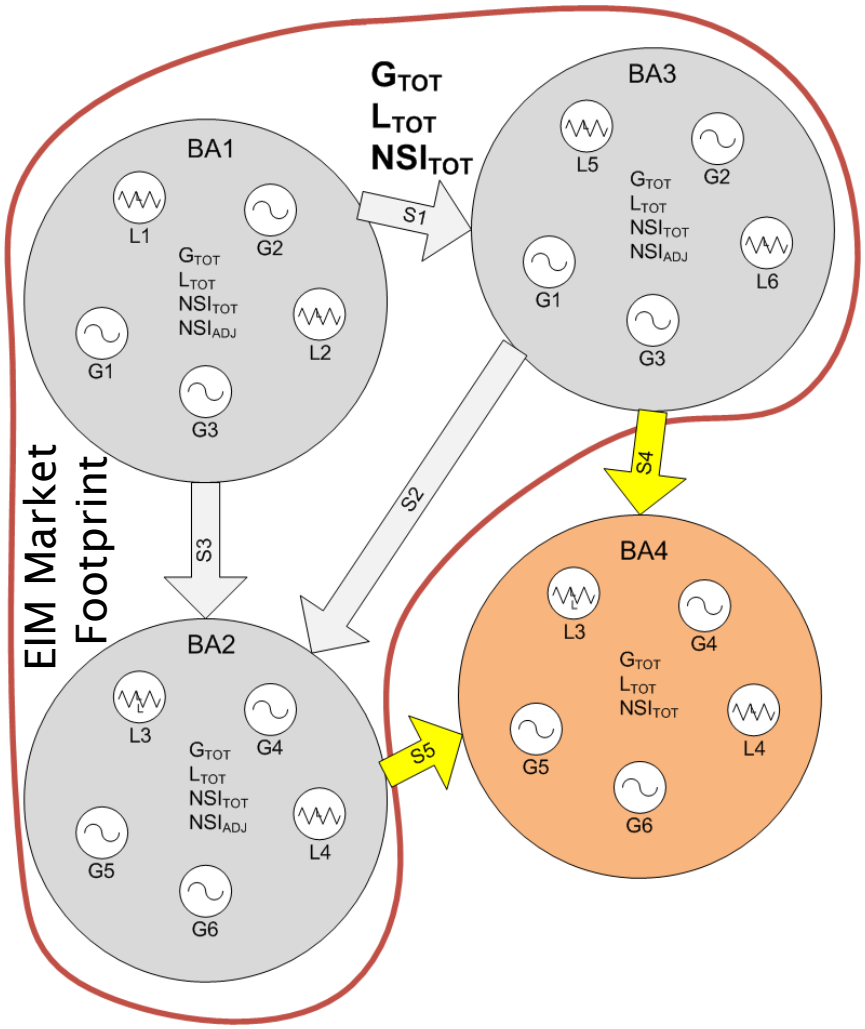

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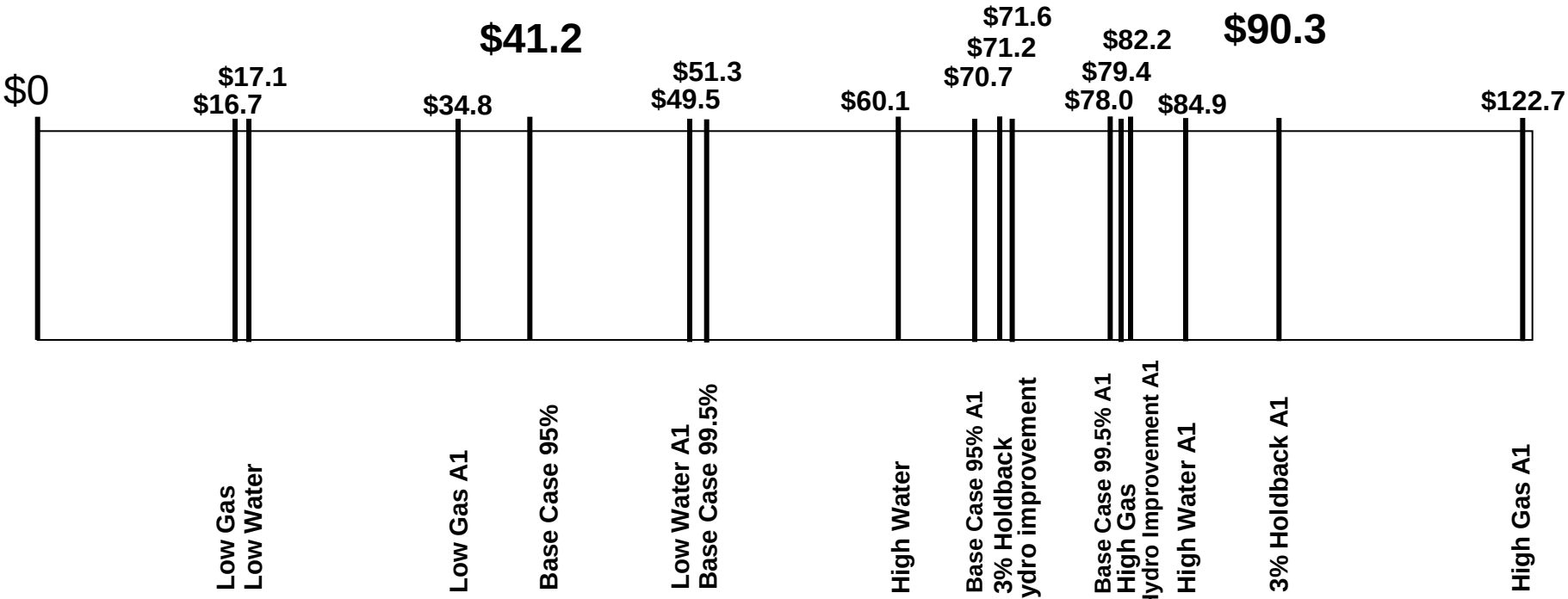
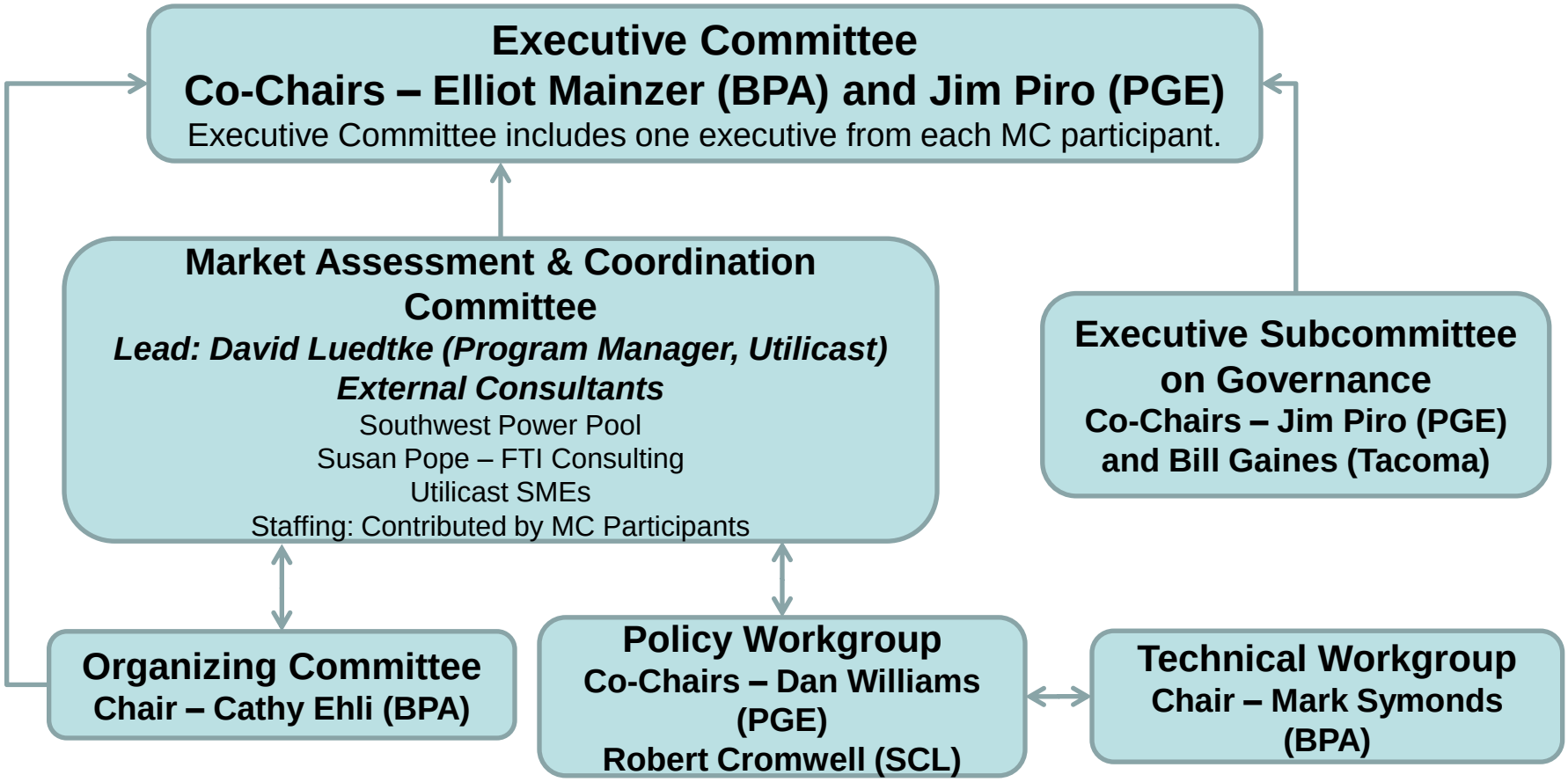


Phase 2 Update

MC Phase 2
Organizational Structure



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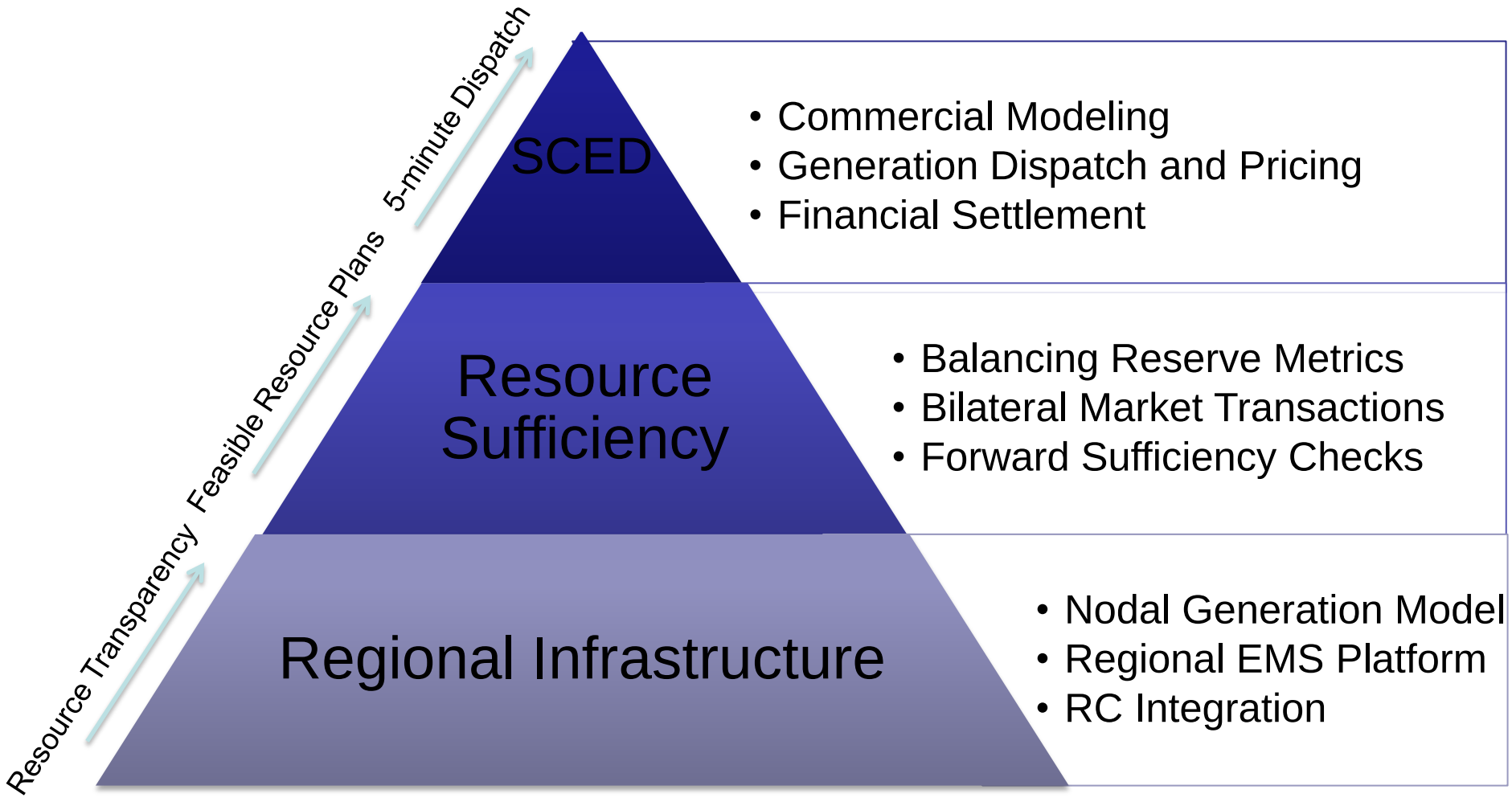

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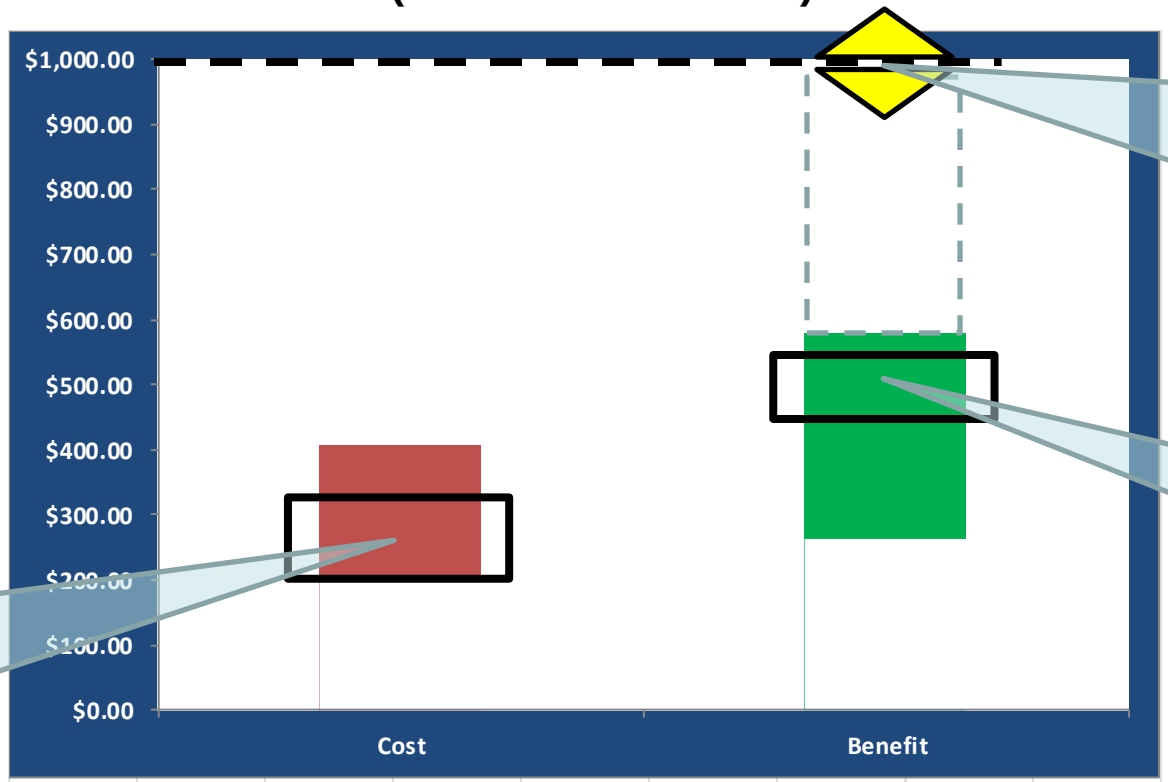

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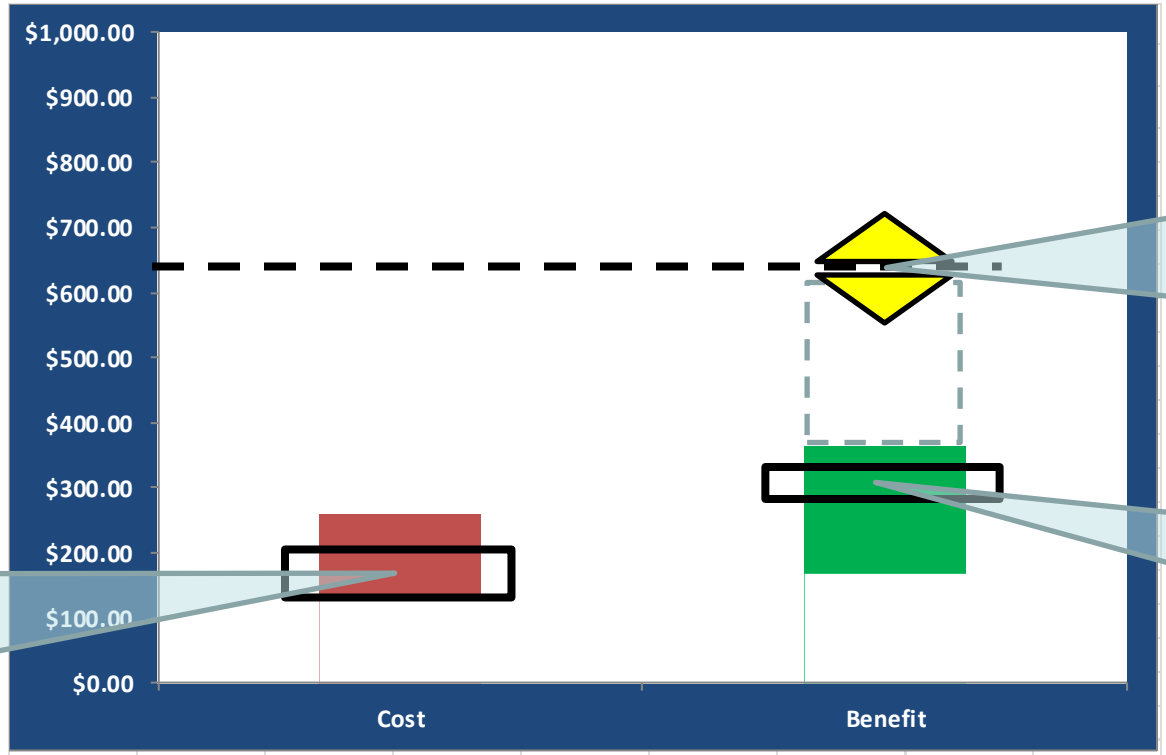

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