PJM Proposal for Using E3 “Delta” Method for Allocating PortfolioELCCMW to ClassELCCMW

Andrew Levitt
Market Design and Economics Department
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PJM Aims to Use the “Delta Method” For Allocating PortfolioELCCMW to Classes

- The ELCC model identifies a total quantity of reliability MW for the entire portfolio of all limited duration and intermittent resources (this is the “PortfolioELCCMW”).
- Downstream of this calculation, the PortfolioELCCMW must be allocated to individual units. In the PJM proposal, this happens by way of classes and unit-specific performance adjustments.
- E3 developed the “Delta Method” for allocating PortfolioELCCMW to individual resources.
- The “Delta Method” can also be applied to allocation of PortfolioELCCMW to classes, which is what PJM prefers to do.
- To do that, PJM derives an “” that is a small (e.g., 1 GW) version of the hourly profincremental representative of each classile of the entire class. The Delta Method is run with the incremental representative rather than with actual units.
- PJM has not yet implemented the “Delta Method”. In case of practical difficulties in implementation, PJM would use a simpler allocation method.

Delta Method: A New Approach to ELCC Ac

- **An accreditation approach is needed that**
  - Does not exhibit sensitivity to the definition of resource classes
  - Allows for accurate accreditation of ELCC to a portfolio of resources
- **The proposed method relies on three ELCC values**
  - **Portfolio ELCC:** total ELCC provided by a combination of variable and use-limited resources
  - **First-In ELCC:** the marginal ELCC of each individual resource in a portfolio with no other variable or use-limited resources
  - **Last-In ELCC:** the marginal ELCC of each individual resource when taken in the context of the full portfolio

- **None of the above metrics alone can appropriately credit resources, but they can characterize the synergistic and antagonistic interactions within a portfolio**
  - Resources whose Last-In ELCC exceeds First-In ELCC are synergistic
  - Resources whose Last-In ELCC is less than First-In ELCC is **antagonistic**
- **The "Delta Method" adjusts each resource's First-In ELCC upward or downward based on its synergistic or antagonistic interaction with the portfolio**
- **This approach can simultaneously account for synergistic, antagonistic, and neutral reactions within a single portfolio**

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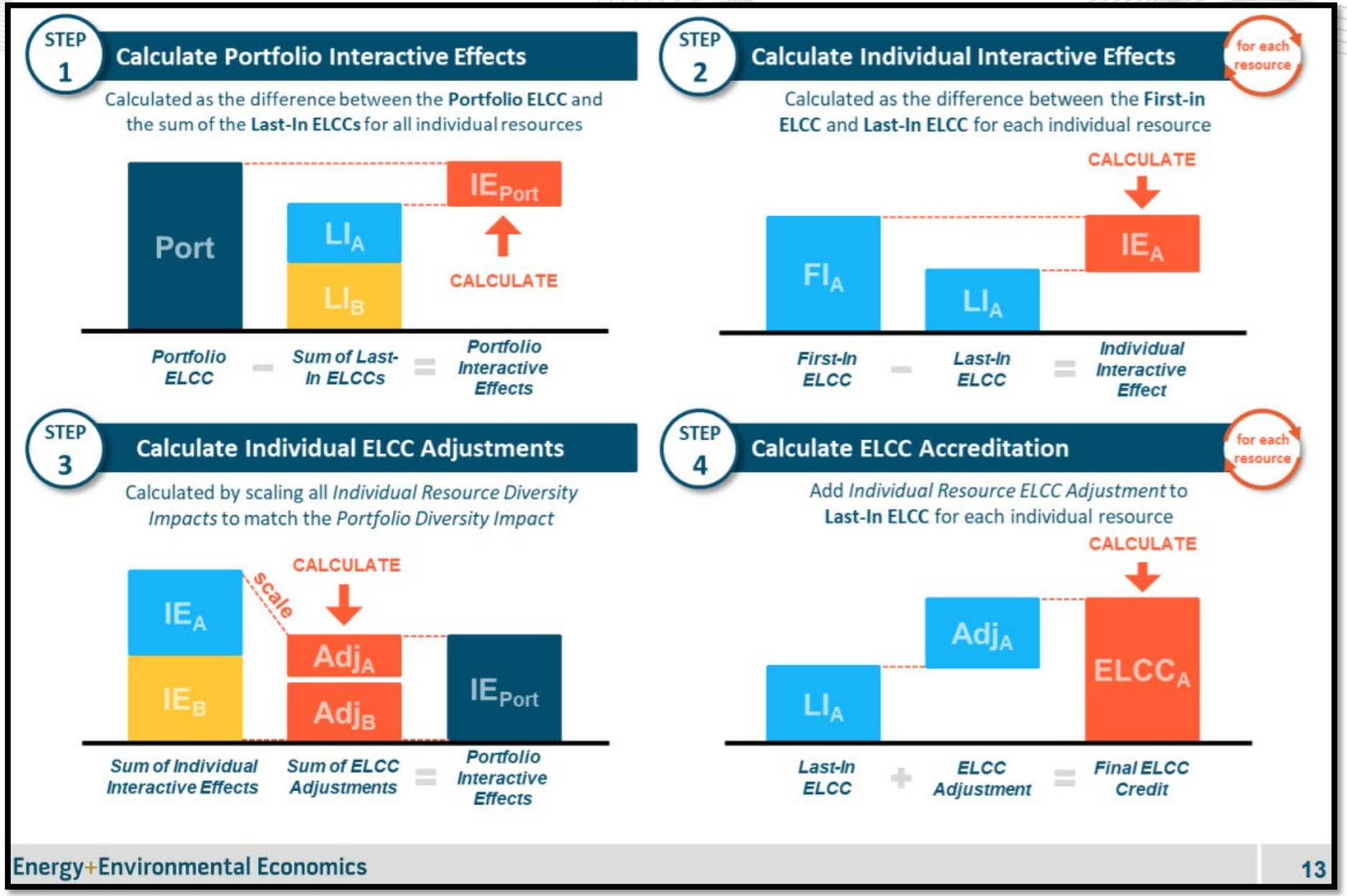
https://www.pjm.com/-/media/committees-groups/task-forces/ccstf/2020/20200807/20200807-item-04-e3-allocating-elccmw-from-portfolio-to-classes.ashx

Delta Method: Calculation Approach

In order to apply the Delta Method to classes, replace the term "*individual resource*" with the term "*incremental representative of each class*".



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Delta Method: Numerical Example

- The following represents a simple and illustrative numeric example demonstrating how ELCC credits would be calculated using the proposed methodology on a system with solar, wind, and storage resources
- The illustrative portfolio is representative of the current California electricity system, which has a peak load of approximately 50,000 MW

Item	Units	Solar	Wind	Storage	Notes
# of Plants	#	200	50	10	
Representative Plant Size	MW	100	100	100	
Total Capacity	MW	20,000	5,000	1,000	Plant size * # of plants
First-In ELCC for Representative Plant	MW	50	30	80	
	%	50%	30%	80%	
Last-In ELCC for Representative Plant	MW	10	20	90	
	%	10%	20%	90%	
Portfolio ELCC	MW		8,000		
Portfolio Interactive Effects	MW		4,100		Portfolio ELCC – Sum of Last-In ELCCs for All Resources 8,000 – (200 * 10 + 50 * 20 + 10 * 90)
Individual Interactive Effect	MW	+40	+10	-10	First-In ELCC MW – Last-In ELCC MW for Representative Resources Solar: 50 - 10 Wind: 30 - 20 Storage: 80 - 90
Sum of Individual Interactive Effects	MW		8,400		200 * 40 + 50 * 10 + 10 * -10
Individual Resource ELCC Adjustments	MW	20	5	-5	Individual Interactive Effect / Sum of Individual Interactive Effects * Portfolio Interactive Effects Solar: 40 / 8,400 * 4,100 Wind: 10 / 8,400 * 4,100 Storage: -10 / 8,400 * 4,100
Individual Resource ELCC Credit	MW	30	25	85	Last-In ELCC + Individual Resource ELCC Adjustment Solar: 10 + 20 Wind: 20 + 5 Storage: 90 – 5
Individual Resource ELCC Credit	%	30%	25%	85%	

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Contingency Method for Allocating PortfolioELCCMW to Classes

- From E3:
  - “First-In ELCC: the marginal ELCC of each individual resource in a portfolio with no other variable or use-limited resources”
  - “Last-In ELCC: the marginal ELCC of each individual resource when taken in the context of the full portfolio”
- In the event that the Delta Method presents implementation challenges, PJM proposes to instead use a simple average of the “First-in ClassELCCMW” and the “Last-in ClassELCCMW” for calculating the ELCCMW of each class.

Contact

Facilitator:
Melissa Pilong,
Melissa.Pilong@pjm.com

Secretary:
Jaclynn Lukach,
Jaclynn.Lukach@pjm.com

SME/Presenter:
Andrew Levitt, Andrew.Levitt@pjm.com

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Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com