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The Potential Impacts of the Chu Memorandum.*”
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As public utility commissioners, I and my colleagues are acutely concerned with keeping electric rates affordable, while maintaining reliability. The west has a long tradition of states engaging regionally with industry and other stakeholders to discuss ways to better utilize the electric grid to reduce costs. The regional energy imbalance market (EIM) concept has been on our collaborative agenda for several years and grows out of other efforts to more closely integrate western grid operations. It appears that at least \$100 million in annual cost savings (and quite possibly more) could be realized with an EIM, with benefits to the customers of both investor-owned and public power entities that choose to participate in such a voluntary market for balancing energy.

The participation of the Western Area Power Administration in a western EIM can lead to greater benefits for consumers across the west, including those served by Western's public power customers. I welcome Secretary Chu's memorandum indicating WAPA participation and directing the power marketing administrations to work with the states and others to formulate cooperative paths to achieving our common objectives of delivering reliable power supplies to retail consumers at low costs.

The Function and Benefits of an EIM

Today in the Western Interconnection, we have 37 separate balancing authorities. (Figure 1) Each works continuously to keep electric generation in balance with fluctuating loads. The regional EIM being considered will offer several advantages over this balkanized status quo. (Figure 2)

The imbalances that must be addressed within each balancing authority (BA) can be either too much or too little electric supply relative to the real-time demand. By summing real-time demand and supply across multiple BAs, we can expect that a portion of the deviations will wash-out on their own, reducing the need for active dispatch by the EIM operator. It's likely that often when one BA is long, another BA will be short, and so rather than the first BA curtailing generation at the same time as the second BA increases it, we can let the excess supply in the first area meet the excess demands in the second. Of course, the EIM will work within the physical constraints of the transmission system and not just assume that any positive imbalance in the interconnection can offset a negative imbalance somewhere else. And also of course, generators will be paid when their electricity winds up serving customers in another BA.

The second inherent benefit of a regional EIM is that the EIM operator can address intra-hour balancing requirements using the lowest cost generating resource from a broader range of options, thus lowering the cost to electrical consumers. The customers of the utility needing extra electricity in a balancing transaction will benefit by getting the lowest-cost dispatch from across the whole region, instead of just what would have been available within the BA. And the customers of the utility that supplied the balancing electricity should also benefit by the fact a sale that would not otherwise have occurred has now been made, providing in most cases a revenue credit against the fixed costs of the generating plant.

The larger footprint of a regional EIM, with greater diversity of resources and loads, is also expected to make it easier and cheaper to make use of variable generating resources such as wind power. An EIM can also lead to more efficient use of the existing transmission infrastructure.

To summarize, every five minutes, the proposed energy imbalance market will dispatch the lowest-cost resources available to eliminate generation and load imbalances across the EIM's footprint. Cost savings come from reduced fuel costs, as the generating plants with the highest efficiencies (known as "heat rates") and lowest cost fuels are used more. Additional savings are expected from less wear and tear on generating plants from rapid cycling and from reduced need for reserves. Existing, but underutilized, transmission lines will be used to carry the lower-cost electricity to where it is needed in the region, and so the owners of those lines such as the Western Area Power Administration (WAPA) will gain additional revenues that can be used to reduce costs to their customers.

An EIM is not an RTO

The regional EIM that is being considered would be purely voluntary. Each existing BA would be able to decide whether to join the EIM and each utility or other owner of generation would be able to decide how much – if any - of its plant capacities it wished to make available to the EIM for dispatch.

The regional EIM would be a market for intra-hour balancing energy only. The EIM would be a far cry from a full-fledged RTO (regional transmission organization). The existing practices of self-generation and bilateral contracts by each utility to meet its own capacity and energy needs would not be disturbed. There would not be centralized unit commitment, day-ahead markets, capacity markets, regional transmission tariffs, etc.

If some of these other RTO aspects were on the table, many western utility commissioners – myself included – would be among the most vocal opponents. The vertically-integrated, cost-based model that we use keeps electricity costs to consumers low and bypasses the capacity-creation challenges we see in the organized markets. But that a western EIM looks like one of the functions RTOs perform is not a good reason to walk away from the potential of hundreds of millions of dollars in savings to consumers across the west (outside of California) from more cost-efficient intra-hour balancing.

Concerns have been raised that an EIM could evolve into an RTO over time. Many parts of the west have particular reasons for being suspicious of plans to form a western RTO. Legal provisions can be crafted for the governance structure of an EIM to ensure that "mission creep"

does not occur, and to specifically protect EIM participants from being involuntarily forced into RTO.

Cost Benefit Studies and the Formation of the PUC EIM Group

Last year, an EIM cost-benefit study was performed under the auspices of the Western Electric Coordinating Council (WECC). The WECC study came up with a very broad range for EIM costs and a somewhat narrower range of benefits. (Figure 3) The WECC study results left open the possibility that EIM could lead to significant savings. But if actual costs came in at the higher end of the range, there would be negative economic benefits.

The PUC EIM group that I chair was formed in order to carry forward and refine the analysis of an EIM. Our group commissioned the creation of an illustrative market design. Then, using this design as a fixed point of departure, we solicited informational bids from two existing market-operators, the Southwest Power Pool (SPP) and the California Independent System Operator (CAISO), on what they would charge to implement and operate such a market. Concurrently, with the financial assistance of the Department of Energy, we commissioned the National Renewable Energy Laboratory (NREL) to conduct a more refined analysis of potential EIM benefits using a new production cost modeling tool called PLEXOS, running on a ten-minute timescale.

The PUC EIM group includes representatives from 13 state utility commissions. (Figure 4) We have opened up our activities to any and all interested stakeholders. We have conducted an extensive series of public webinars on each aspect of our project. We solicited and addressed comments on the illustrative market design and we've also begun loose coordination with WSPP, a membership organization that is looking at governance options for a voluntary western EIM, with a specific focus on preventing mission creep.

State utility commissioners recognize that, should a regional EIM be created, market design and governance will be prerogatives of the industry members. Our role in the process has been to facilitate, not to dictate, because – representing the interests of millions of retail electric consumers in the unorganized part of the west – we believe that there are substantial amounts of cost savings that would be left on the table if the EIM conversation was to stop.

The informational bids we have received from SPP and CAISO are both significantly lower than the engineering estimates that came out of the WECC study. (Figure 5) Because these are informational bids from entities that currently own and operate platforms that can be adapted to handle the business of a regional EIM, they can be given greater weight than the earlier estimates, which were done in the abstract and with uncertainty about whether market operations would be contracted out to an existing entity. The cost of operating an EIM would be about \$28 million per year based on the SPP proposal.

The results of the PUC EIM engagement with NREL to calculate the financial benefits of an EIM will be released in early May. NREL's analysis using a 10-minute dispatch simulation could show higher benefits than what was found in the WECC study, which was limited to one-hour cycles. Using only the WECC benefits in conjunction with the better information on costs

that we have now obtained, it appears there would be in excess of \$100 million in net financial benefits from an EIM.

Conclusion

Based on the information available to-date, a western EIM would appear to be a very attractive option to improve the utilization of the existing electric grid. Net financial benefits to electricity customers appear to be in excess of \$100 million a year, shared throughout the region. Fears about excessive or runaway costs are being answered by the illustrative market design and illustrative bid process undertaken by the PUC EIM group, which has identified two potential vendors that are willing and able to operate the market for relatively modest costs and start-up fees. Governance alternatives that can provide necessary reassurances against mission creep are being developed and shared with interested stakeholders.

Two principles guide those of us involved in the EIM conversation. The first is that the decision to proceed needs to be data-driven. An EIM should be pursued if (but only if) it shows significant net financial benefits to our constituents outside the margin of forecasting error. The second is that participation in an EIM must be voluntary. My expectation is that there will be a positive financial case for both investor-owned and public power to participate in a regional EIM.

An EIM needs a critical mass of participants in order to be successful. The broader the participation of load and generation, the more opportunities that arise for cost-saving transactions. Costs to participants will be lower if the fixed costs of a single EIM can be spread over a broader footprint. Conversely, alternatives in which multiple balancing markets are operated will inherently lead to increased fixed costs.

The Power Marketing Administrations are key players for this initiative due to the PMAs size and scope, the public power constituencies they serve, and their unique legal and regulatory posture. While the detailed cost/benefit calculations have yet to be prepared, we can safely assume that a larger footprint, with more participants and more contiguity, will translate into greater economic benefits and less cost per unit. I look forward to working with the PMAs, and their customers in working together to achieve our common goals of delivering reliable power supplies to all consumers at low costs.

Figures follow.

Respectfully submitted,

/s/

Jason Marks

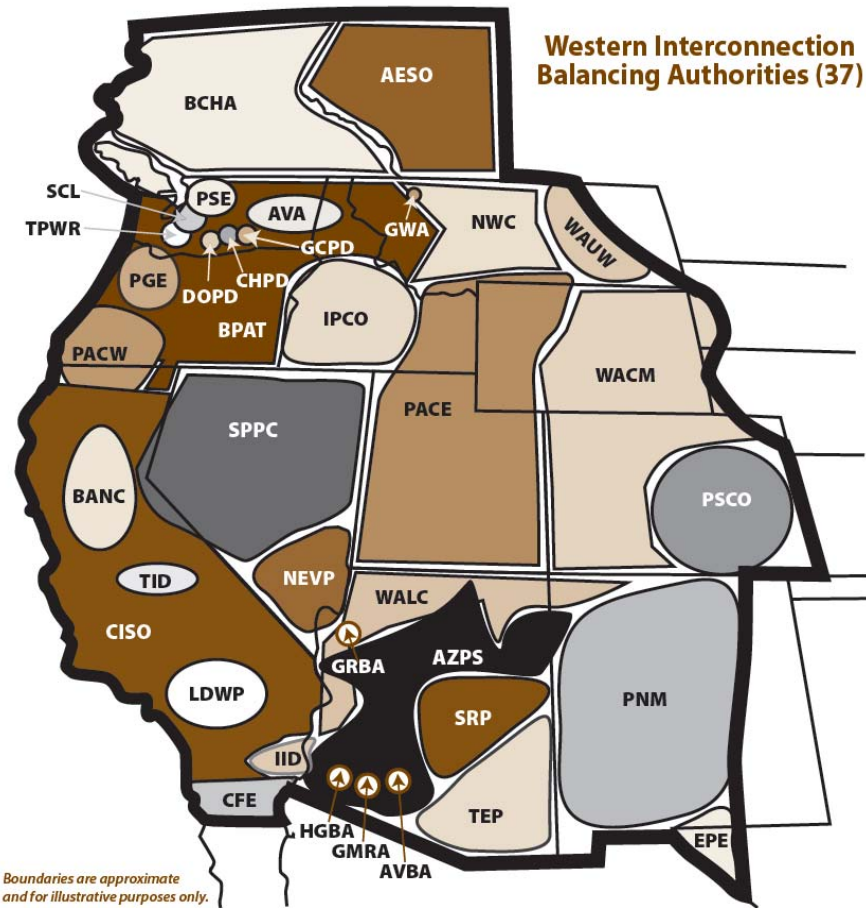


Figure 1: Map of Western Balancing Authorities

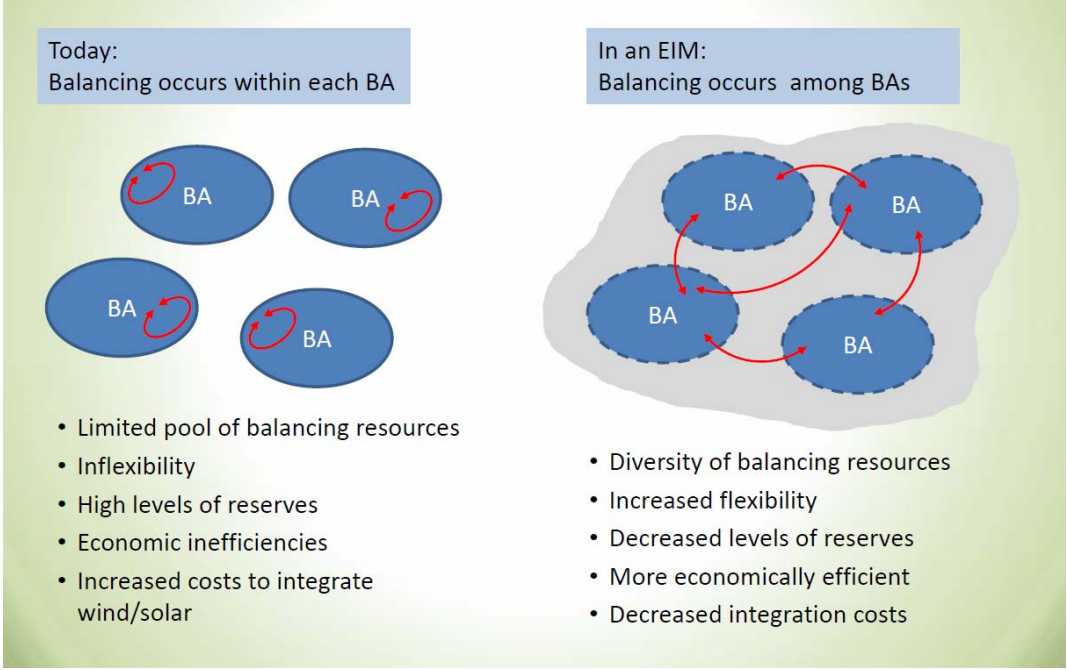


Figure 2: What is an EIM?

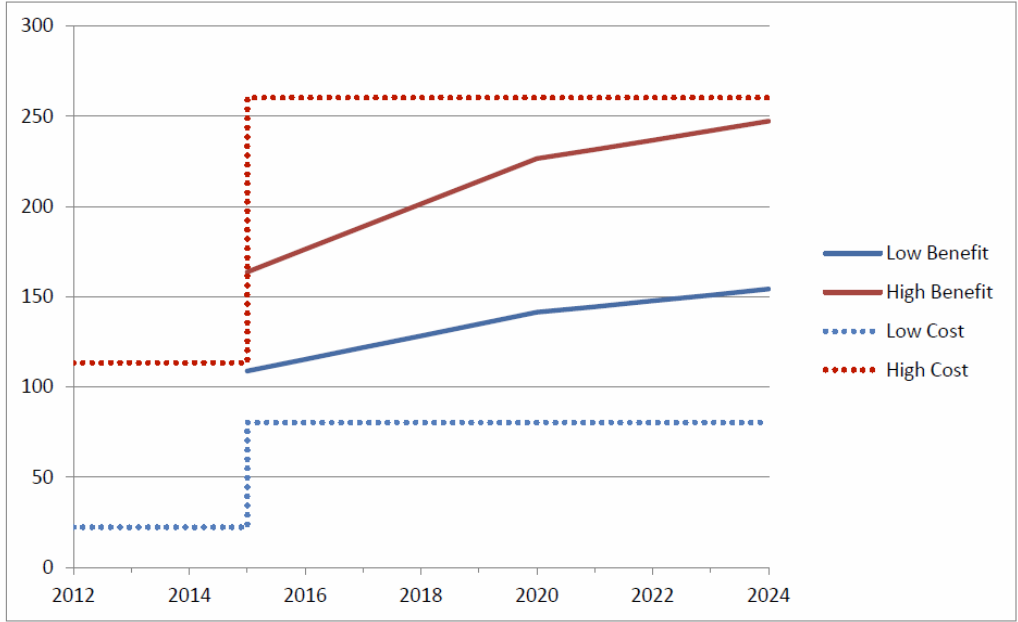


Figure 3: WECC Cost Benefit Study Results

California	Timothy Alan Simon
Arizona	Paul Newman
Colorado	Jim Tarpey
Idaho	Paul Kjellander
Montana	Travis Kavulla
Nevada	Rebecca Wagner
New Mexico	Jason Marks
Oregon	John Savage
South Dakota	Brian Rounds (Staff)
Texas	Rolando Pablos
Utah	Ric Campbell
Washington	Jeff Goltz
Wyoming	Steve Oxley

Figure 4: PUC EIM Group Members

	Start-Up Costs	Ongoing Operational Costs
WECC	\$42.2 - \$114 million	\$50 - \$95.7 million
SPP	\$64.4 million	\$28.5 million (first year) \$28 million (years 2+)
CAISO	~ \$ 16 million <ul style="list-style-type: none"> • (\$.03 per MWh x 2009 net energy for load) 	Variable <ul style="list-style-type: none"> • \$.19 per MWh in the EIM • \$1,000 per month per scheduling coordinator

Figure 5: EIM Informational Bids