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Transmission Cost Allocation in the Midwest

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There is no single standard for transmission cost allocation in the U.S.

- The Federal Energy Regulatory Commission has not adopted a generally applicable standard or method for transmission cost allocation.
- So, in the U.S., the method used for allocating the costs of new transmission facilities varies across the transmission system operators.

Over-arching considerations in developing a transmission cost allocation strategy.

- Who causes the need for the transmission facility to be built?
- Who benefits from the development of the transmission facility?
  - However, identifying cost causers and beneficiaries is not always easy or clear.

Some other considerations in developing a transmission cost allocation strategy.

- Understandability;
- Administrative ease;
- Ability to reflect system changes over time;
- The stability of rates stemming from the cost allocation method used to recover transmission costs;
- Short-term and long-term incentives for generation and load; and
- Recognition of the public good and positive externality aspects of transmission infrastructure.
  - Positive externalities are benefits that accrue to parties that are not involved in the transmission matter.

The cost allocation method can vary based on facility type and project purpose.

- Transmission operators in the U.S. often use different cost allocation methods depending on the type of transmission facility and the main purpose for which the transmission facility was built.

Facility type

- The cost allocation method may vary based on the voltage of the transmission facility or other facility characteristics

Project purpose

- Purposes for transmission development include such factors as:
  - maintaining the reliability of delivered energy and meeting load growth needs (described as baseline reliability);
  - interconnecting new generating plants;
  - converging the delivered price of energy at different locations across the system by reducing or eliminating congestion (described as market efficiency); and
  - satisfying public policy requirements/goals such as renewable energy integration.

Midwest ISO Transmission Cost Allocation

- Baseline Reliability Projects
  - Baseline Reliability Projects are driven by the need to avoid violations of national or regional reliability standards or to ensure load reliability is maintained by not exceeding an established loss of load expectation.
    - If the transmission facility is 345 kV or greater, then 80% of the project costs are allocated to an identified subset of Midwest ISO zones and 20% are allocated on a peak load ratio share basis across the Midwest ISO.
      - The relevant subset of Midwest ISO zones is determined through a load flow analysis, specifically load outage distribution factor.
  - If the transmission facility is less than 345 kV, then 100% of the project costs are allocated to an identified subset of Midwest ISO zones using the load outage distribution factor analysis.

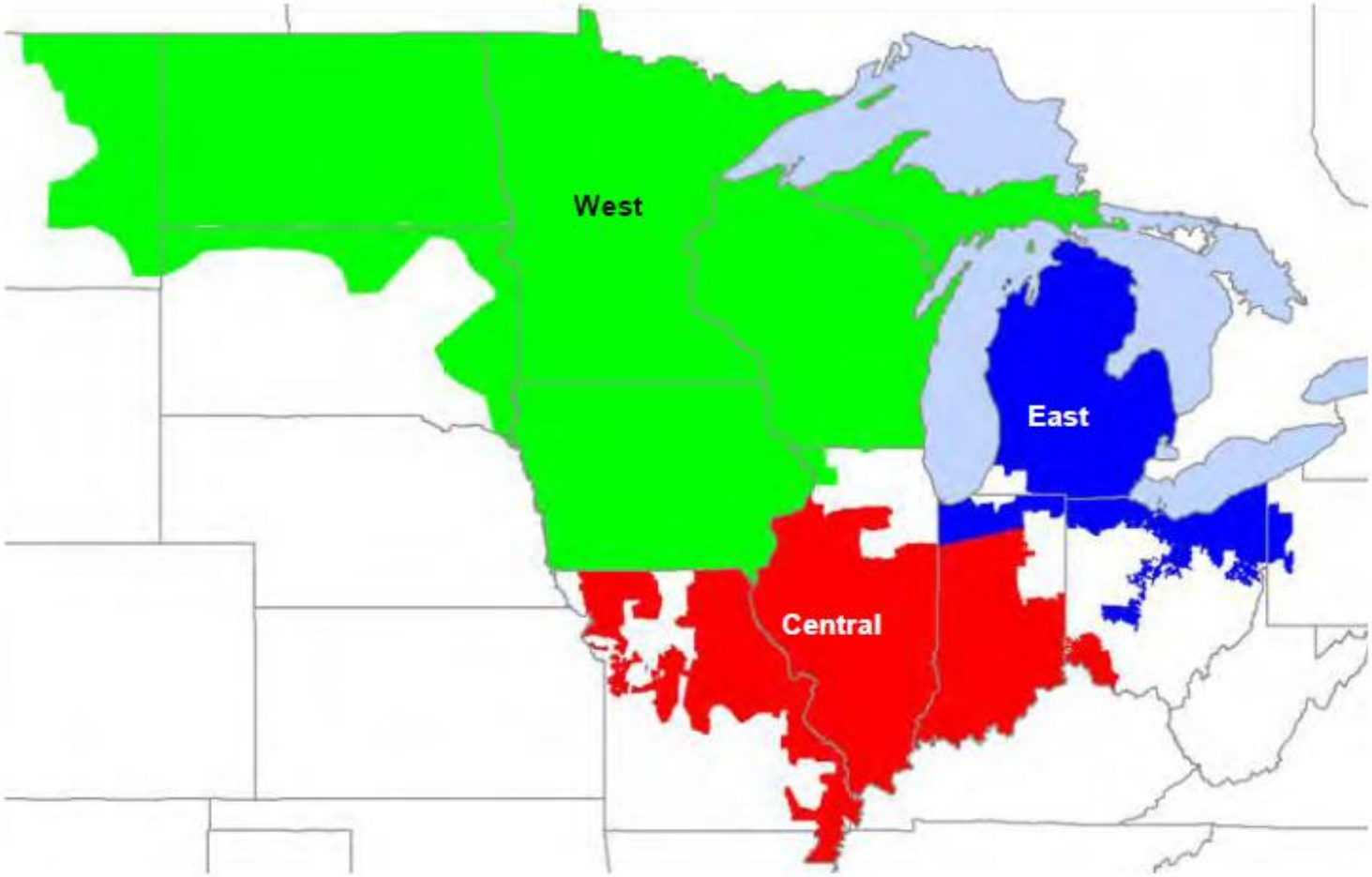
Midwest ISO Transmission Cost Allocation (continued)

- Generator Interconnection Projects
  - These are transmission upgrades or expansions needed to integrate new generation facilities.
    - If the transmission voltage is 345 kV or greater, then 90% of the transmission facility costs are allocated to the interconnecting generator or generators and 10% of the costs are allocated to load across the Midwest ISO zones on a peak load ratio share basis.
    - If the transmission voltage is less than 345 kV, then 100% of the transmission facility costs are allocated to the interconnecting generator or generators.

Midwest ISO Transmission Cost Allocation (continued)

- Market Efficiency Projects
  - If the transmission facility is 345 kV or greater, then 80% of the project costs are allocated to Midwest ISO sub-regions based on a benefits test and 20% are allocated on a load ratio share basis across the Midwest ISO.
    - The Midwest ISO is made up of three large sub-regions—east, west, and central.
    - The benefits test is a weighted average of adjusted production cost benefits (70%) and load cost savings benefits (30%).
      - Benefits are generally modeled over the first ten years of project service using computerized production cost models (e.g., PROMOD).
    - If a sub-region is determined to benefit by application of the benefits test, then the costs allocated to the sub-region are shared among the zones in the sub-region on a peak load ratio share basis.
  - The Midwest ISO currently does not have any policy for market efficiency projects at voltages lower than 345 kV.

Midwest ISO Sub-Regions



Midwest ISO Transmission Cost Allocation (continued)

- Public Policy Projects
  - Usually associated with facilitating the satisfaction of renewable energy procurement requirements.
  - FERC recently approved this cost allocation method for the Midwest ISO.
    - 100% of the project cost is allocated to Midwest ISO customers and to exports (except exports to the neighboring PJM region) using a load ratio share method base on megawatt-hours (MWh) withdrawn.

Allocate costs to generators?

- Should generators or some subset of generators be allocated transmission upgrade or expansion costs beyond those transmission costs needed to enable the reliable interconnection of a new generator to the transmission grid and delivery of the generator's output to loads?
  - In the U.S. generators are not generally required to pay for transmission upgrades beyond those upgrades necessary to reliably interconnect the generator to the grid and ensure deliverability of the generator's output to loads.
    - In some cases, even these transmission costs are allocated to loads, rather than generators.

Allocate costs on MW or MWH?

- For transmission upgrade or expansion costs that are allocated to load, there are a variety of possible rate design mechanisms based on MW or MWh.
  - There is no common practice in the U.S. on this question, although the zonal non-coincident peak method (MW) is more common.

Magnitude of new transmission facility cost in the Midwest ISO

- Since the Midwest ISO's first transmission planning cycle closed in 2003, transmission projects approved by the Midwest ISO Board of Directors total $8.6 billion, of which $3.5 billion is associated with projects that have already been built and put into service and $0.5 billion is associated with projects that were withdrawn after having been approved.

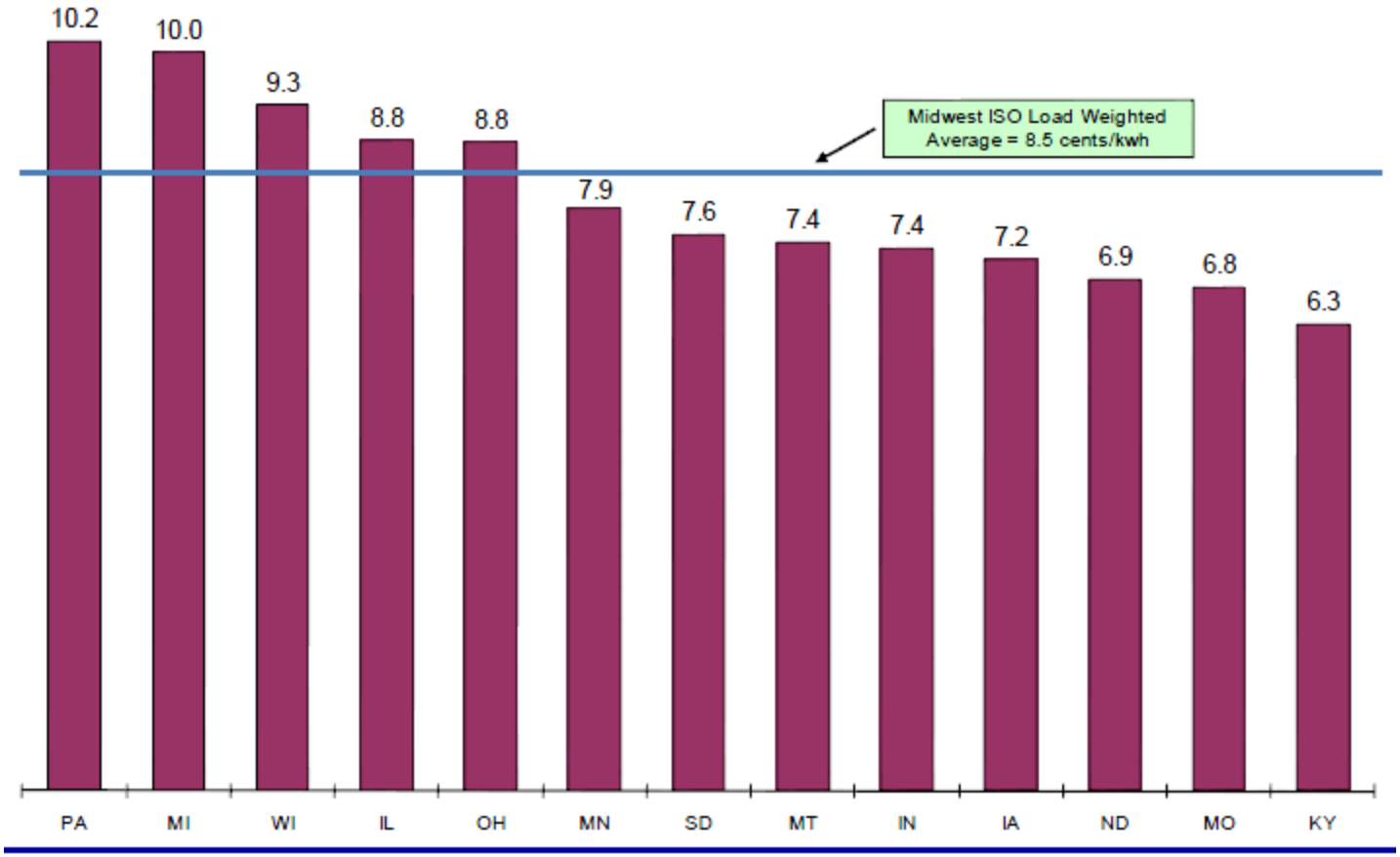
PJM Interconnection, L.L.C. transmission cost allocation

- Baseline Reliability
  - For projects at 500kV and above
    - Costs allocated across the PJM region on a load ratio share basis (zonal share of non-coincident peak load).
  - For projects below 500kV
    - Costs allocated using a distribution factor analysis under simulated peak conditions (model contribution to flows on the constrained facility).
- Generator Interconnection
  - 100% of costs allocated to the interconnecting generator or generators.
- Market Efficiency
  - For projects at 500kV and above
    - Costs allocated across the PJM region on a load ratio share basis (zonal share of non-coincident peak load).
  - For projects below 500kV
    - Depending on circumstance, costs allocated either using production cost modeling with weighting of adjusted production cost metric and load savings metric or using distribution factor analysis.

Rate Impact on the cost of delivered power

- In the U.S., transmission costs as a portion of the delivered cost of power to retail customers is a relatively small part of the overall bill, with estimates ranging from 5 to 10 percent of the overall retail bill.
  - In general, when energy costs are high, the transmission share of the total delivered cost tends to be closer to 5% and when energy costs are low, the transmission share of the total delivered cost tends to be closer to 10%.

Midwest ISO Retail Rate for all Sectors in ¢/kWh (2010 Dollars)



Estimated Costs of New Transmission by Voltage Level Based on Projects under Development

	230 kV	345 kV	500 kV	765 kV
Cost (Million $ /mile)	$2.0	$2.5	$4.3	$6.6
Cost (Million $ /GW-mile)	$5.46	$2.85	$1.45	$1.32

Source: Brattle Group, Transforming America's Power Industry: The Investment Challenge for 2010-2030 at 35, available at http://www.brattle.com/documents/UploadLibrary/Upload725.pdf