The Brattle Group

Interregional Cost Allocation: A Flexible Framework to Support Interregional Transmission Planning

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Content

Background on Interregional Effort in SPP

Interregional Planning and Cost Allocation Framework

About this Presentation

We assisted the Regional State Committee (RSC) of the Southwest Power Pool ("SPP") by developing a framework for "seams cost allocation"

- RSC has the responsibility for transmission cost allocation framework within SPP
- RSC (in coordination with SPP) previously developed Highway/Byway approach for regional cost allocation
- RSC then focused on "seams" cost allocation, an effort that predates FERC Order 1000; retained Brattle
- Results of our analysis documented in report posted on HEGP website:

  Johannes P. Pfeifenberger and Delphine Hou, *Seams Cost Allocation: A Flexible Framework to Support Interregional Transmission Planning*, April 2012 (also available at www.spp.org and www.brattle.com)

Earlier this year, SPP and RSC started process of building on this work to comply with the interregional planning and cost allocation provisions of Order 1000

Interregional Cost Allocation Effort for RSC

In collaboration with and feedback from RSC staff, SPP staff, and stakeholders in SPP and neighboring regions we:

- Reviewed seams and cost allocation frameworks and principles in SPP and other markets
- Identified barriers to interregional planning and cost allocation
- Identified candidate seams projects and developed "test case studies" to aid development of workable cost seams allocation framework
- Reviewed interregional planning and cost allocation provisions in existing Joint Operating Agreements (JOAs) between SPP and neighbors to identify gaps
- Developed comprehensive framework of 7 "Building Blocks" for interregional planning and cost allocation to overcome identified barriers and fill the gaps in existing JOAs
- Developed illustrative tariff language and started testing the framework by applying it (conceptually) to candidate seams projects
- Presented to and obtained input from SPP, neighboring system operators, and stakeholders

Seams and Cost Allocation in Other Markets

Helpful experience with seams and cost allocation frameworks and principles from other markets:

a. PJM-MISO interregional cost allocation for Reliability Projects and Market Efficiency Projects
b. NYISO-ISO-NE inter-area planning effort
c. Interregional cost-allocation for Michigan PAR to address Lake Erie loop flows
d. Northern Tier cost allocation principles and process
e. ColumbiaGrid planning process and cost allocation guidelines
f. Upper Midwest Transmission Development Initiative (UMTDI) cost allocation principles
g. NESCOE draft framework for public policy project identification
h. European Inter-Transmission System Operators Compensation (ITC) mechanism
i. Europe-wide transmission system planning

Identified Barriers to Seams Cost Allocation

- Uncertainty as to how or when neighboring regions will evaluate and consider seams projects as part of their regular planning processes
- Insufficiently detailed and current **data and models** for the neighboring system (*e.g.*, no jointly validated interregional power flow cases)
- Limited time and staff to evaluate and consider seams projects, given high work load of region-internal planning efforts
- Insufficiently detailed, actionable cost allocation principles/guidelines
- Different project types, evaluation **processes and benefits/metrics** used in neighboring regions
- Individual seams projects may offer very **different types of benefits** to each of the neighboring regions and their transmission owners
- Difficulty of developing a single interregional evaluation framework that does not yield **least-common denominator outcomes**
- Uncertainty about who would owns which portions of the project and gets rights commensurate to share of project costs
- Gap between top-down (ITP) and bottom-up (TSR & GI) transmission planning studies

Interregional Planning and Cost Allocation Framework

Towards Effective Interregional Cost Allocation

Framework needs to be robust and flexible enough to:

- Be applied to all neighbors, which often consist of both FERC jurisdictional and non-jurisdictional entities
- Be compliant with FERC Order 1000, but go beyond minimum requirements of Order 1000 if necessary to be effective
- Be able to address different types of seams projects, identified either unilaterally or jointly (e.g., through JOAs' Joint and Coordinated System Plans)
- Be sufficiently flexibility (to allow for learning based on experience and deal with range of different types of projects and uncertainties) while providing enough guidance to be actionable

Needs to be an integral part of interregional planning:

- Allow for bilateral or multilateral interregional agreements between neighbors
- Build on existing JOAs

Seven Building Blocks for Interregional Planning and Cost Allocation

1. Regular interregional planning meetings
2. Regular exchange of planning data and models

Leverage existing JOAs and expand

3. Process to propose and analyze seams projects
4. Evaluation criteria and benefit metrics
5. Seams cost allocation principles and guidelines
6. Payment mechanisms

Building blocks largely missing from or underspecified in current JOAs and also most closely related to seams cost allocation

7. Integration with internal planning and cost allocation

Leverage existing JOAs and expand

OPTIONAL: Pre-specified formulaic evaluation and cost allocation

Optional building block – may be added over time

Leverage and Expand Existing JOAs

With some modifications, clarifications, and expansion, existing JOAs can serve as a foundation for building blocks 1, 2, and 7 of an interregional planning and cost allocation agreement between SPP and its seams entities.

	Added Scope
1. Regular interregional planning meetings	Regular meetings should include state regulators, perhaps as participants of existing committees
2. Regular exchange of planning data and models	Jointly develop and validate load flow and other planning models for combined footprint
7. Integration with internal planning and cost allocation	More clearly specify how interregional planning and cost allocation will be linked to regional or internal planning and cost allocation

Building Blocks #1 and #2

Regular Interregional Planning Meetings and Data Exchange

- **Regular interregional planning meetings** to discuss: updates of planning studies and data, candidate seams projects that may be formally proposed later, analyses performed for formally-proposed seams projects, feasible cost allocations, and the status of formally-proposed seams projects within each entity's internal approval process
  - Leverage existing JOAs and groups (such as the Entergy SPP RTO Regional Planning Process)
  - Consider multilateral groups (*e.g.*, planning groups in WECC)
  - Involve state commission representatives to facilitate buy-in and permitting
- **Regular exchange of planning data and development of joint models** such that each seams entity is able to better assess in its own analyses the impacts of proposed seams projects on its neighbors
  - Expand existing JOAs to include additional data and assumptions, a process for data exchange (website/FTP site), point of contact, etc.
  - Include development of jointly-endorsed power flow and other planning models for planning horizon of combined footprint
  - Possibly evolve into multi-regional coordination (*e.g.*, TEPPC in WECC)

Building Block #7

Integration With Internal Planning and Cost Allocation

- Fully integrate the interregional activities and commitments with internal planning and cost allocation processes. This would include, if applicable to the particular system, the specification of:
  i. How seams projects can be proposed by regional planning staff, individual transmission owners, and other market participants
  ii. How the nominated seams project would be evaluated to decide whether to proceed with a formal proposal
  iii. The specification of timelines by which internally-nominated projects would be evaluated and, if desirable, formally proposed as a seams project to the neighbor;
- Agreements should also specify the internal cost allocation process that would be applied to recover the allocated costs of interregional project (e.g., can MISO MVP process be utilized for interregional projects providing multiple benefits?)
- Neighbors should report to each other any approved local and regional upgrades and TSR and GI requests to be able to consider interregional solutions and synergies for proposed projects

Specific Cost Allocation Components of Agreement

Each agreement would include the following components specifically addressing interregional cost allocation:

	Scope
3. Process to propose and analyze seams projects	Seams qualification criteria and more flexible process with commitment to jointly analyze
4. Evaluation criteria and benefit metrics	Rather than broad discussion of reliability and economic benefits, Include, at minimum, internally-used criteria and benefit metrics plus seams-specific benefits and metrics
5. Seams cost allocation principles and guidelines	Rather than case-by-case approach, add overarching framework with examples / illustrations of how cost allocation shares might be derived for specific project types based on metrics
6. Payment mechanisms	Options include through ownership shares or financial transfers
OPTIONAL: Pre-specified formulaic evaluation and cost allocation methodology	May include formulaic options that would apply to specific types of projects. Can be added at a later date if parties agree

Building Block #3

Process to Propose and Analyze Seams Projects

- As long as the proposed interregional project addresses both systems' transmission needs and offers benefits to both, the project could be:
  - A single line or several lines that are logically grouped together
  - Crossing the seam or (going beyond Order 1000) be wholly within region
- No threshold such as voltage class, total cost, or total benefits
  - Some "small" projects may offer substantial benefits
- Projects can be proposed unilaterally and must include:
  - A detailed description of the project
  - A qualitative discussion of the project's purpose and benefits to both neighbors (which could differ on either side of the seam)
  - Preliminary analyses (*e.g.*, power flow studies) of the project's benefits to both entities … documenting results, assumptions, and data, consistent with the specified interregional planning methods and metrics
  - A proposed preliminary cost allocation consistent with the specified cost allocation principles and benefits identified in screening analyses
- Neighbors can agree to jointly propose any interregional project(s)
- Neighbors also commit to jointly analyze any proposed project(s)

Building Block #4

Evaluation Criteria and Benefit Metrics

Interregional cost allocation (to be specified in the JOA) should be based on a set of guiding benefits principles such as:

- Seams projects may offer **combinations of different types of benefits** and entirely different sets of benefits may accrue to each neighbor
- Benefits and metrics specified for the evaluation of interregional projects will include all benefits and metrics considered in each neighbor's internal transmission planning process ➔ **avoid least common denominator**
  - Each neighbor has the option, but not the obligation, to consider some or all of the benefits and metrics used by the other neighbor
  - Interregional projects can offer **unique benefits** that go beyond those currently considered in either system's internal planning processes
  - Additional benefits can be documented as more experience is gained
- Interregional projects may avoid/delay the cost of transmission upgrades
  1. in existing regional and local transmission plans;
  2. that may be needed in the future to meet local or regional needs
  3. needed to satisfy GI and TSRs

Building Block #5

Seams Cost Allocation Principles and Guidelines

Specify general cost allocation principles, at minimum consistent with Order 1000 principles, such as:

- Cost allocated should be at least **roughly commensurate with total benefits** to each entity; neither region shall be allocated cost without receiving benefits
- Cost allocation methodologies and identification of benefits and beneficiaries must be **transparent**
- Different **cost allocation methods** may be applied to different types or different portions of projects (e.g., transmission needs driven by reliability, economic, or public policy requirements)
- The neighbors will quantify and, **if possible, monetize benefits**; but they will also **recognize non-monetized and non-quantified benefits** in assessing overall reasonableness of proposed cost allocations
- Monetized reliability, load serving, or public policy benefits will be at least equal to the **avoided cost** of achieving the same benefit through local or regional upgrades
- If **benefit-to-cost ratios** are used, the minimum ratio should not exceed 1.25
- The share of benefits to each seams entity should be sufficient to support the seams projects' **approval** through each entity's internal planning process

Building Block #5

Seams Cost Allocation Principles and Guidelines

Also pre-specify flexible cost allocation mechanisms, such as a combination of:

- The share of seams projects' total benefits received by each region as a proportion of the sum of the regions' total benefits received (consistent with specified principles and metrics)
- If shares are reasonably proxies for received benefits or roughly proportionate to benefits received, cost allocation can also be based on:
  - The share of projects' physical location in each region's footprint (*e.g.*, shares of circuit miles)
  - The share of each region's relative contribution to the need for the project (*e.g.*, power flows that contribute to a reliability-driven upgrade)
  - The share of each region's projected or allocated usage of the projects' transmission capability (e.g., shares of increased flow-gate capacity)

Provision of transmission rights:

- If feasible and practical, an region sharing the cost of seams projects should receive a physical or financial right for a commensurate share of the projects' capability (e.g., a share of increased ATC or flow-gate capacity).

Building Block #6

Payment Mechanisms

Once cost allocation has been determined, it should be implemented consistent with following principles:

- To the extent feasible, cost allocation shall be implemented through either
  - Physical ownership of individual segments of a project by the regions or their transmission owners such that the cost of each owned portion is consistent with the determined cost allocation; or
  - Co-ownership of the project (or individual segments) where the project (or segment) cannot be divided into fully-owned segments or if a proposed project (or segment) is entirely within the service territory of one of the regions
- Where ownership allocation is not feasible, cost allocation should be implemented through payments (from one entity to the other) that correspond to the obtained physical or financial rights to the projects' transmission capability
- Each region will recover allocated costs consistent with cost recovery of local and regional projects within its footprint

Optional Building Block

Pre-specified Formulaic Options

As more interregional cost allocation experience is gained, the regions may pre-specify formulaic cost allocation options.

- These would be based on (i) specific metrics for the evaluation of the seams project and (ii) a pre-specified cost allocation formulas that rely on these benefits and metrics.
  - Entities that already use similar pre-specified metrics (*e.g.*, use of APC in SPP and MISO) would be more likely to adopt this approach
  - Examples: PJM-MISO interregional evaluation and cost allocation process for reliability and economic projects
  - A less formulaic option (*e.g.*, in an agreement between SPP and AECI) might include a cost allocation in proportion to each entity's avoided costs of implementing their own alternative solutions to the identified reliability problems
- Different formulas can be applied to specific project types (*e.g.*, reliability, economic, public policy, multi-value)

Projects that do not fit the pre-specified options would be considered under the general cost allocation principles

Take Aways

Compliance with Order 1000 provides a unique opportunity for meaningful improvements to interregional transmission planning and cost allocation:

- Address the unique barriers to planning across regional seams to identify and develop beneficial projects across the often "demilitarized zones" between planning regions
- Avoid "least-common-denominator" approaches to measuring benefits of interregional projects
  - Scope of benefits considered for interregional projects should be no narrower than that for regional/local projects in each region
- Go beyond Order 1000 minimum requirements where necessary for effective interregional planning (e.g., for projects that are located only in one region but provide significant benefits to both regions)
- Be sufficiently flexibility (to allow for learning based on experience and deal with range of different types of projects and benefits to each region) while providing enough guidance to be actionable
  - Avsoid formulaic approaches to benefits and cost allocation (but offer as option if useful for specific types of projects)

About *The Brattle Group*

The Brattle Group provides consulting and expert testimony in economics, finance, and regulation to corporations, law firms, and governmental agencies around the world.

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Note:

The views expressed in this presentation are strictly those of the presenter and do not necessarily state or reflect the views of *The Brattle Group, Inc.*

Johannes (Hannes) Pfeifenberger is an economist with a background in power engineering and over 20 years of experience in the areas of public utility economics and finance. He has published widely, assisted clients and stakeholder groups in the formulation of business and regulatory strategy, and submitted expert testimony to the U.S. Congress, courts, state and federal regulatory agencies, and in arbitration proceedings.

Hannes has extensive experience in the economic analyses of electricity wholesale markets and transmission systems. His recent experience includes reviews of RTO capacity market and resource adequacy designs, testimony in contract disputes, and the analysis of transmission benefits, cost allocation, and rate design. He has performed market assessments, market design reviews, asset valuations, and cost-benefit studies for investor-owned utilities, independent system operators, transmission companies, regulatory agencies, public power companies, and generators across North America.

Hannes received an M.A. in Economics and Finance from Brandeis University and an M.S. in Power Engineering and Energy Economics from the University of Technology in Vienna, Austria

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