

# **ELECTRIC TRANSMISSION 201:**



## **Cost Allocation: A Primer and Current Issues**

**March 9, 2010 2:00P.M.**

**325 Russell Senate Office Building**

**FACULTY:**

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*Presented by WIRES - a national coalition of investor- and publicly-owned transmission providers customers, renewable energy developers, and technology and service companies dedicated to promoting investment in strong, well-planned, and beneficial high voltage electric transmission infrastructure*



## **Introduction**

**James J. "Jim" Hoecker**

- **Who Should Pay for New High-Voltage Transmission?**
- **Why Is This An Important Issue?**
- **What Role Will Federal Regulators Play?**
- **What is the Law and Is It In Need of Reform?**
- **To What Extent Will Changing Electricity Policies and Regional Stakeholders Drive Reform?**



***Delphine Hou***  
**The Brattle Group**

## **“Cost Allocation: A Key Factor To Achieving New Policy Goals”**

3

## **Transmission Rates – The “Basics”**

**Traditionally:** utilities build transmission lines for their load and recover costs through regulated “cost-of-service” rates from “native load” retail customers. For transactions between utilities, charges are “pancaked”.

**Today,** utilities within regional transmission organizations (RTOs) still recover most transmission costs from their retail customers under cost-of-service rates.

**Increasingly,** new transmission projects are planned by RTOs with a regional (not utility-specific) perspective. The cost of regional transmission projects may be allocated to RTO member utilities, and their customers.

**RTO cost allocation options,** exist mostly for certain types of transmission projects: (1) upgrades needed to mitigation specific violations of reliability standards; and (2) certain upgrades that reduce transmission congestion.

**Multi-state/system transmission projects:**

- Existing allocation and cost recovery mechanisms may not apply
- Lack of broadly-available cost allocation and cost recovery mechanisms is a significant barrier.

4

## Existing Cost Allocation Methodologies

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- **Five widely-used methodologies to allocate and recover costs from transmission customers**
  - 1) **License plate (LP):** each utility recovers the costs of its own transmission investments (usually located within its footprint).
  - 2) **Beneficiary pays:** various formulas that allocate costs of transmission investments to individual TOs that benefit from a project, even if the project is not owned by the beneficiaries. TOs then recover allocated costs in their LP tariffs from own customers.
  - 3) **Postage stamp (PS):** transmission costs are recovered uniformly from all loads in a defined market area (e.g., RTO-wide in ERCOT and CAISO).
    - In some cases (e.g., SPP, MISO, PJM) cost of certain project types are allocated uniformly to TOs, who then recover these allocated costs in their LP tariffs.
  - 4) **Direct assignment:** transmission costs associated with generation interconnection or other transmission service requests are fully or partially assigned to requesting entity.
  - 5) **Merchant cost recovery (M):** the project sponsors recover the cost of the investment outside regulated tariffs (e.g., via negotiated rates with specific customers); largely applies to DC lines where transmission use can be controlled.

5

## Cost Allocation Differs Across Project Types

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There are several methodologies in use today to allocate transmission costs for the following broad categories of projects:

- **Reliability Projects:** to ensure reliability of the system and support load growth. Traditional rationale for transmission expansion based on mandatory national standards.
- **Economic or Market-Efficiency Projects:** often narrowly-defined as projects that reduce congestion and yield short-term production cost savings.
- **Generation Interconnection Projects:** transmission facilities needed to interconnect single new generating plants, often including network upgrades necessitated by new plants.
- **Merchant Projects:** most HVDC lines financed by contracts with dedicated customers, thereby bypassing RTO cost allocation; mostly interface with RTOs through interconnection requests.
- **Multi-Purpose, Regional Overlay, and Renewable Integration Projects:** these are projects that do not fit neatly into one of these categories. Cost allocation for these types of projects is a significant problem and an accepted methodology is still missing in most RTO's planning and cost allocation processes

6

## What Works and What Doesn't

- **Existing cost allocation processes have varying degrees of effectiveness**
  - 1) **Works well:** cost recovery for traditional single-utility, single-state projects built to satisfy reliability needs
  - 2) **Mostly works:** cost allocation and recovery at the RTO level for reliability-driven regional projects and *conventional* generator interconnection requests
    - Some unintended consequences of existing RTO cost allocation framework
    - MISO's assignment of wind integration costs illustrates difficulties
  - 3) **Still mostly unresolved:** Cost allocation and recovery for all other types of regional projects, including "economic" projects, renewable integration projects, EHV overlay projects, and any multi-purpose projects
    - Only two single-state ISOs (ERCOT and CAISO) have been able to resolve cost allocation for multi-utility, multi-purpose, and renewable integration projects
    - SPP closer to resolving this issue
    - MISO and other RTOs and regions have only started to address this issue
    - Court remand of PJM postage stamp tariff creates additional uncertainty

7

## Current Cost Allocation is Complex and Incomplete

LP = License Plate Tariffs; PS = Postage Stamp Tariffs or Postage Stamp Allocation; M = Merchant Lines; GI = Generation Interconnection Tariffs;  
 ✓ = workable approach; n/a = workable approach not yet available

RTO/Region	General Tariff Methodology	Reliability	"Economic" Projects	Renewables Interconnection	Regional/Overlay Projects
CAISO	PS 100% ≥200kV; otherwise LP or M	✓	✓	✓ GI and specific location-constrained resource tariff (Tehachapi)	✓ Not specifically discussed, but 100% PS of all network facilities
ERCOT	PS or M	✓	✓	✓ CREZ (100% PS)	✓ Not specifically discussed, but 100% PS of all network facilities
SPP	PS 33% ≥60kV reliability projects; PS allocation for balanced portfolio; otherwise LP or M	✓	✓ "Balanced Portfolio" allocation	GI; developing EHV overlay and PS (Highway/Byway) treatment	Developing EHV overlay and postage stamp treatment (Highway/Byway to be approved)
ISO-NE	PS 100% ≥115kV; otherwise LP or M	✓	too narrowly defined	n/a (GI only)	n/a
PJM	PS sharing 100% ≥500kV; otherwise LP allocation (beneficiary pays) or M	✓	too narrowly defined	n/a (GI only)	n/a
MISO	PS sharing 20% ≥345kV; rest LP allocation (beneficiary pays) or M	✓	too narrowly defined	n/a (GI only)	n/a – under study via CARP
PJM-MISO	Sharing of reliability project based on net flows/beneficiaries	✓	too narrowly defined	n/a	n/a
NYISO	LP allocation (based on beneficiary pays) or M	✓	too narrowly defined	n/a (GI only)	n/a
WECC (non-CA)	LP; often with cost allocation based on co-ownership	✓	✓ (differs across WECC subregions)	✓ GI (e.g., BPA open season); under discussion in WREZ	n/a – under discussion in WREZ

8

## Promising New Tariff-Based Cost Recovery Approaches

- **Some attractive approaches (and some hopeful efforts) for allocating costs of renewable power projects within RTO tariffs:**
  - **CAISO:**
    - Postage stamp for all network upgrades  $\geq 200$ kV
    - *Tehachapi LCRI* approach: up-front postage stamp funding of project, later charged back to interconnecting generators, thereby solving chicken-egg problem
  - **ERCOT:**
    - Postage stamp for all CREZ transmission being built to integrate 18,000 MW of new wind; build-out awarded to a diverse set of 7 transmission companies
  - **WECC:**
    - WECC utilities often use co-ownership of lines (within and out of footprint) based on contractual allocations of point-to-point capability to resolve cost allocation issue
    - BPA open season approach for  $>5,500$  MW renewable generator interconnections
    - Northern Tier's multi-state cost allocation committee
  - **SPP:**
    - Developing EHV overlay and postage stamp recovery
  - **MISO's CARP:**
    - 13-state (OMS) effort to design "injection-withdrawal tariff" – regional postage stamp, subregional postage stamp, and local license plate rates charged to both load and generators
    - Decision mid-2010

9

## Promising Non-Tariff-Based Cost Recovery Options

- **A number of transmission developments have successfully bypassed the RTO's tariff-based RTO cost recovery options:**
  - **Long-term merchant PPAs:**
    - HVDC cable from PJM to LIPA financed with long-term PPA for capacity
    - Example: Neptune (independent transmission LLC)
  - **Merchant anchor tenant with open season:**
    - Anchor tenant signs up for large portion of capacity, open season for rest
    - Standard model used for new pipelines
    - Example: Zephyr and Chinook HVDC lines (TransCanada)
  - **Regulated PPA with ISO operational control:**
    - Utilities own transmission, sold bilaterally to generator at state regulated rates, buy bundled long-term PPA
    - Project under RTO operational control but bypasses RTO cost recovery
    - Example: NU-NSTAR-HQ HVDC link
  - **Mostly used for HVDC lines because (by being "controllable" like pipelines) they allow owners/customers to capture more of the system benefits than AC projects.**

10

## Takeaways: Cost Allocation – Subregional Planning Entities

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- Despite years of effort, cost allocation remains number one barrier for multi-state, multi-utility transmission projects
- Strong support from (or direct involvement by) state governors needed to achieve regional solutions
- Threat of federal cost-allocation and siting backstop seems necessary to achieving timely multi-state agreements
- As a compromise, we suggest:
  - Common set of federal rules for regional planning processes and region-specific policy goals
  - States voluntarily form Subregional Planning Entities (“SPE”) which are smaller than the Western and Eastern Interconnections
  - Each SPE, with coordination from neighboring SPEs, must produce plans to meet reliability and region-specific policy goals with binding proposals for cost allocation and siting
  - FERC or federal government can approve the plans or act as backstop

11

## Additional Reading

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Pfeifenberger, Fox-Penner, Hou, *“Comments from The Brattle Group Principals Peter Fox-Penner and Johannes Pfeifenberger and Associate Delphine Hou,”* filed at the U.S. Federal Energy Regulatory Commission for Transmission Planning Processes Under Order No. 890 – Notice of Request for Comments (Docket AD09-8).

Pfeifenberger, Fox-Penner, Hou, *“Transmission Investment Needs and Cost Allocation: New Challenges and Models,”* The Brattle Group, Inc., presented at the Working Group for Investment in Reliable and Economic Electric Systems (WIRES) meeting, Washington, DC, December 1, 2009.

Fox-Penner, Pfeifenberger, *“The Anchor-Tenant Model – And Some of the Chickens and Eggs,”* The Electricity Journal Guest Editorial, Volume 22, Issue 6, July 2009.

Pfeifenberger, *“Assessing the Benefits of Transmission Investments,”* presented at the Working Group for Investment in Reliable and Economic Electric Systems (WIRES) meeting, Washington, DC, February 14, 2008.

Pfeifenberger, Newell, *“Evaluating the Economic Benefits of Transmission Investments,”* EUCI’s Cost-Effective Transmission Technology Conference, Nashville, TN, May 3, 2007.

12



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***Cynthia Bogorad***  
**Transmission Access Policy**  
**Study Group**

**“A Legal Perspective on Just and Reasonable Cost Allocation”**

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**Federal Power Act, Section 205**

- “All rates and charges made, demanded, or received by any public utility for or in connection with the transmission or sale of electric energy subject to the jurisdiction of the Commission... shall be *just and reasonable*, and any such rate or charge that is not just and reasonable is hereby declared to be unlawful.”
- No “undue preference or advantage.”

## Federal Power Act, Section 206

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If FERC finds that any rate or charge demanded “by any public utility for any transmission or sale subject to the jurisdiction of the Commission... is *unjust, unreasonable, unduly discriminatory or preferential*, the Commission shall determine the *just and reasonable rate....*”

15

## 75 Years of Commission and Judicial Interpretation of “Just and Reasonable”

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“[A]ll approved rates reflect to some degree the costs actually caused by the customer who must pay,” but precision is not required – “cost allocation mechanism [must] not be ‘arbitrary or capricious’ in light of the burdens imposed or benefits received.”

*Midwest ISO Transmission Owners v. FERC*, 373 F.3d 1361, 1368-69 (D.C. Cir. 2004).

16

## Individual Transmission Owner System

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- “Roll-in” is the general rule for integrated transmission facilities.
- Network operates as a single piece of machinery, so that an addition is used by and benefits all users. *Pub. Serv. Co. of Colo.*, 62 F.E.R.C. ¶ 61,013, at 61,061-62 (1993).

17

## Regional Transmission Organizations

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- Order 2000/2000-A recognized “pancaked” transmission rates create obstacles to the competitive markets FERC seeks to foster; termed eliminating rate pancakes a “central attribute of RTO formation.”
- FERC has approved a variety of rates structures proposed by RTOs, e.g., “license plate,” “postage stamp” for certain facilities.

18

## **Order 890 Cost Allocation Principles**

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- Fairly assigns cost among participants, including those who cause them to be incurred and those who otherwise benefit from them.
- Adequate incentives to construct new transmission.
- Generally supported by state authorities and participants across a region.

19

## ***Illinois Commerce Commission v. FERC,* 576 F.3d 470 (7th Cir. 2009)**

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- Remanded because FERC had not supported “postage stamp” treatment of new 500 kV+ facilities.
- “FERC is not authorized to approve a pricing scheme that requires a group of utilities to pay for facilities from which its members derive no benefits, or benefits that are trivial in relation to the costs sought to be shifted to its members.”

20

## ***Illinois Commerce Commission v. FERC***

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“We do not suggest that [FERC] has to calculate benefits to the last penny, or for that matter to the last million or ten million or perhaps hundred million dollars. ... If it cannot quantify the benefits ... but it has an articulable and plausible reason to believe that the benefits are at least roughly commensurate with those utilities’ share of total electricity sales in PJM’s region,... [it] can approve.... [FERC] can presume that new transmission lines benefit the entire network by reducing the likelihood or severity of outages... But it cannot ... avoid ... ‘comparing the costs assessed ... to the burdens imposed or benefits drawn by that party.’”

21



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***Jimmy Glotfelty***  
**Clean Line Energy**

**“Cost Allocation Issues: A  
Merchant Perspective”**

22

## Cost allocation DC vs. AC

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- **DC Lines:**
  - Can allocate costs thru numerous methods:
    - Long-term merchant Power Purchase Agreements – commercial transactions.
    - Anchor tenant model with open season – FERC regulated
    - Regulated PPA with ISO operational control – FERC regulated
- **AC Lines:**
  - Different allocation models in each market
  - Courts have created uncertainty
  - Energy policy issues driving a change in allocation policy, as well as current pushback.

23

## CERTS / CEC Study on Cost Allocation

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- **CERTS studies cost allocation methods in California in 2006 - 2008**
- **Findings include:**
  - Models understate benefits of long life assets (50+years) by reducing the impact of benefits beyond the first 10-years
  - Models minimize impact of high impact but low probability events, like blackouts
  - Models are static and inaccurate—require assumptions about future generation mix, fuel prices, and transmission network
  - Extreme market volatility and multiple contingency system events which can be very costly and risky to society are not captured in current models
    - 2001 California market dysfunction --\$20-40 billion
    - 2003 Northeast Blackout --\$5-10 billion

24

## CERTS - Transmission benefits fall into 3 categories

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- **Primary Benefits**
  - Improve network reliability –meet reliability standards and guidelines
  - Lower cost of energy and capacity adjusted for transmission losses as a result of reduced congestion, access to lower cost resources, and increased inter-regional power trading
- **Strategic Benefits**
  - Renewable resource development and integration
  - Fuel Diversity –lower natural gas consumption, gas prices
  - Emissions reduction/environmental
  - Market Power Mitigation
  - Insurance against contingencies
  - Development of new capacity and inter-regional trading
- **Extreme Event Benefits**
  - Reliability --improve network load carrying capacity and ability to reduce or mitigate impact of extreme events resulting from multiple contingencies
  - Market volatility –societal benefit of reduced vulnerability to extreme price volatility due to long term outages and catastrophic events

25

## Conclusions

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- AC Transmission will not get built as needed unless this is resolved quickly
- DC will get built, but in limited quantities and only long distance lines
- Congress should direct FERC to better understand benefits, but
- FERC must be given the tools and flexibility utilize and capture primary, strategic and extreme event benefits
- Merchant transmission in DC form will get built, AC will be stuck until allocation is resolved.

26



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**Steve Kozey**  
**Midwest ISO**

**“The Challenge of ‘Fairness’”**

27

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**How Large Is The Issue?**


- Estimated at a possible \$20 Billion
  - over 25 years; perhaps \$5 Billion in the first 5 years.
- The planning effort to define the grid expansion has the support of the Midwest Governors’ Association.
- Plan to meet state policy goals and deliver the lowest cost wholesale energy to consumers consistent with those goals.

28

## Objectives of New Methodology

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- Eliminate / minimize free riders
- Ensure the “right” loads pay
- Reflect changing system usage over time
- Balance attributes of system use
  - Cost causer vs. beneficiary
  - Local vs. regional
  - Access (demand) vs. Usage (energy)



A fair cost allocation system to enable transmission development to support renewable integration, public policy, reliability and economic goals while maintaining the Midwest ISO Value Proposition

29

## Injection / Withdrawal: A different way of thinking about it

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- Hypothesis: Whoever uses the system is who benefits.
- This is a new method never presented to FERC before.
  - Can define multiple use types to balance extremes (i.e. capacity vs. energy, regional vs. local, etc.) and better define which aspects of the system are being used.

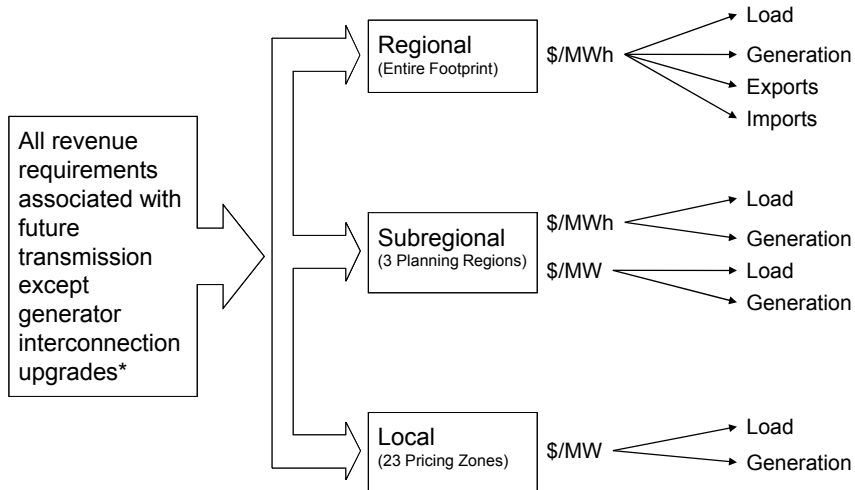
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## Possible Injection / Withdrawal Charges

	Capacity Based	Energy Based
Injection	Installed Capacity Transmission Reservation	Generation MWh Import MWh
Withdrawal	Peak Demand Transmission Reservation	Load MWh Export MWh

31

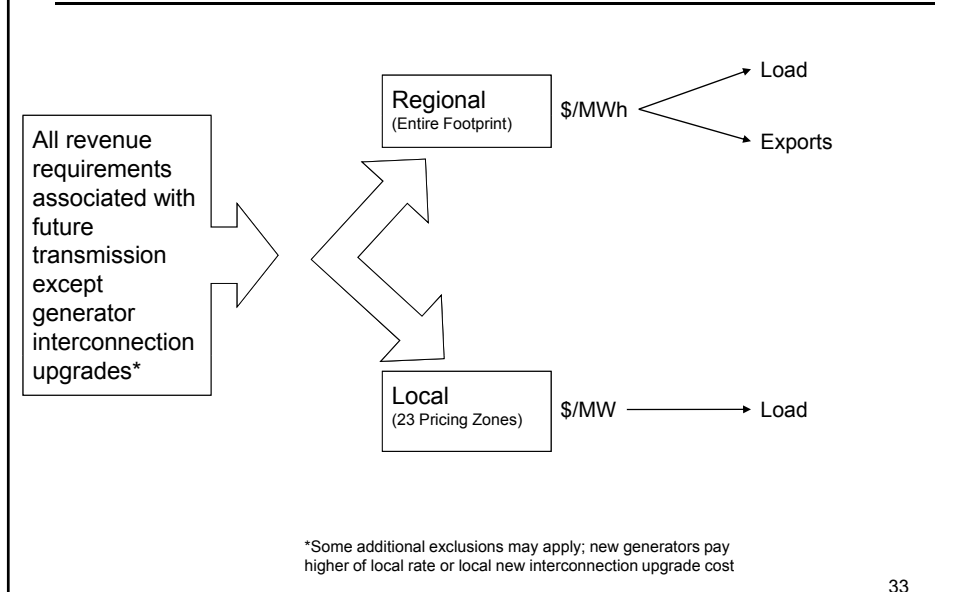
## Injection / Withdrawal



\*Some additional exclusions may apply; new generators pay higher of local rate or local new interconnection upgrade cost

32

## Highway / Byway



33

## Next Steps

- Complete market impact analysis
- Prepare comprehensive proposal
- Begin work on business rules and tariff

34



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**Craig Glazer**

**PJM Interconnection**

**“Transmission Planning/ Cost Allocation in the 21<sup>st</sup> Century”**

35

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**The Good News:  
Building Blocks In Place**

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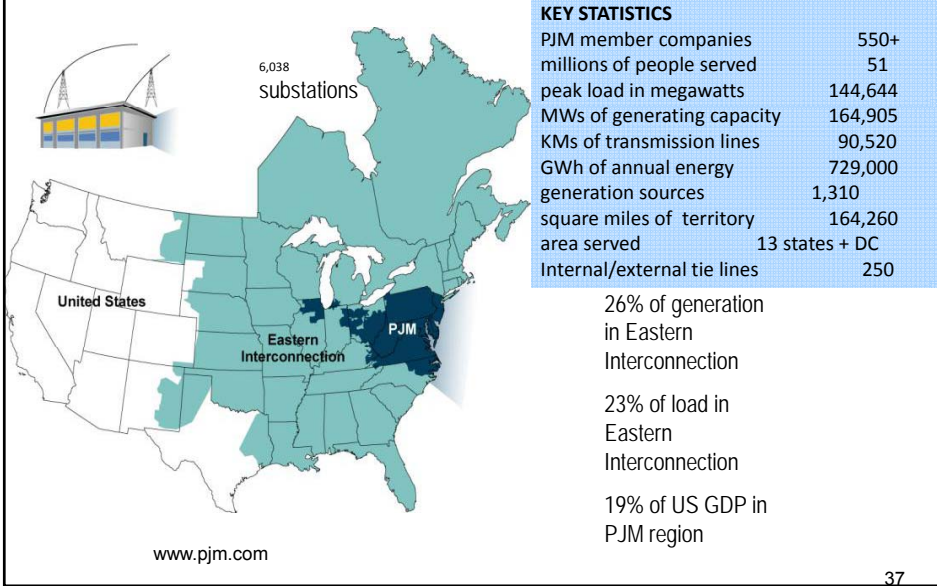
*“(P)roperly structured regional wholesale electricity markets with independent regional transmission operators can provide net benefits to customers and promote critical national goals related to fuel diversity, energy security, and environmental protection.”*



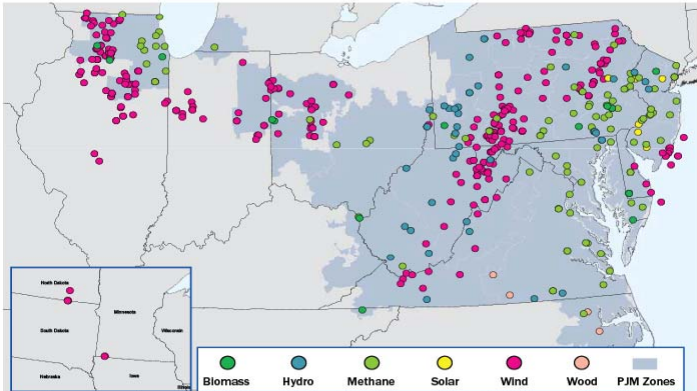
AWEA/NRDC et al. Letter to FERC  
Chairman Kelliher, February 26, 2007

36

## PJM as Part of the Eastern Interconnection



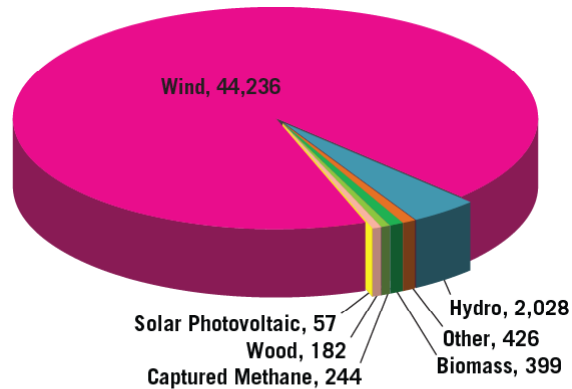
## The Good News: Robust Activity In The RTO Queue Proposed Renewable Generation in PJM



This map shows where renewable generation projects are proposed, including generation outside of PJM's footprint, which will trade in PJM's market.

www.pjm.com

## PROPOSED GENERATION (MW) – RENEWABLES 47,572 / 52%



"Other" renewable is a combination of several different unrelated sources considered renewable. This category includes the one-megawatt ion battery array project at PJM.

As of Q1 2009

www.pjm.com

39

## A Road Map to Solving the Cost Allocation Puzzle

- *Step One*: Decide what we want out of the grid of the future...
- *Step Two*: Decide who decides...
- *Step Three*: Decide who pays...

40

## The Past

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- **Transmission:** Built to support major generation projects
- **Connect distant generation to load;** Distribution = One way delivery of power to the home
- **Grid Costs:** Rate-based to the utility's domestic customers
- **Return on Investment:** Little focus on transmission as a stand alone business element



## Policy Choices: *What Do We Want?*

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### *Policy Choice #1: Is the grid an enabler or a competitor?*

#### Grid as an Enabler?

- Accept the grid as a natural monopoly
- Drive solutions through regulation
- Provide incentives for innovation



## Policy Choices: What Do We Want?

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### Policy Choice #2: A Strong or Weak Grid?

#### The “Strong” Grid:

- Generation distant from load
- Meets the needs for future transmission expansion
- Costs socialized to reflect interconnected nature of the grid
- Broad regional approach



43

## Policy Choices: What Do We Want?

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### Policy Choice #2: The alternative, localized grid ?

- Generation closer to load
- Centralized focus on development of DSR, energy efficiency and renewables
- Transmission/distribution grid as an enabler of alternative generation
- Transmission focused on meeting state/local needs



44

## The Strong vs. Weak Grid Debate

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### Policy Choice #2: Decision Points

- Siting: Regional vs. Local Needs
- Cost Allocation: Socialization vs. Direct Assignment
- IRP/RPS vs. Competitive Procurement
- Short term vs. long term procurement



45

## Policy Choices: What Do We Want?

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### Policy Choice #3: Determine the Planning Philosophy

- Transmission decisions driven by generation investment or generation investment influenced by the planned transmission grid?
- Generation interconnection queue debate



Finally, Who decides?



## COMMENTS & OBSERVATIONS

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***Dr. Jonna Hamilton***  
*Office of Senator Byron Dorgan*

***Mary Cain***  
*Office of Senator Harry Reid*

47



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## What Have We Learned Today?

48