ESIG Presentation on Cost Allocation Wars

RETURN OF THE JEDI?

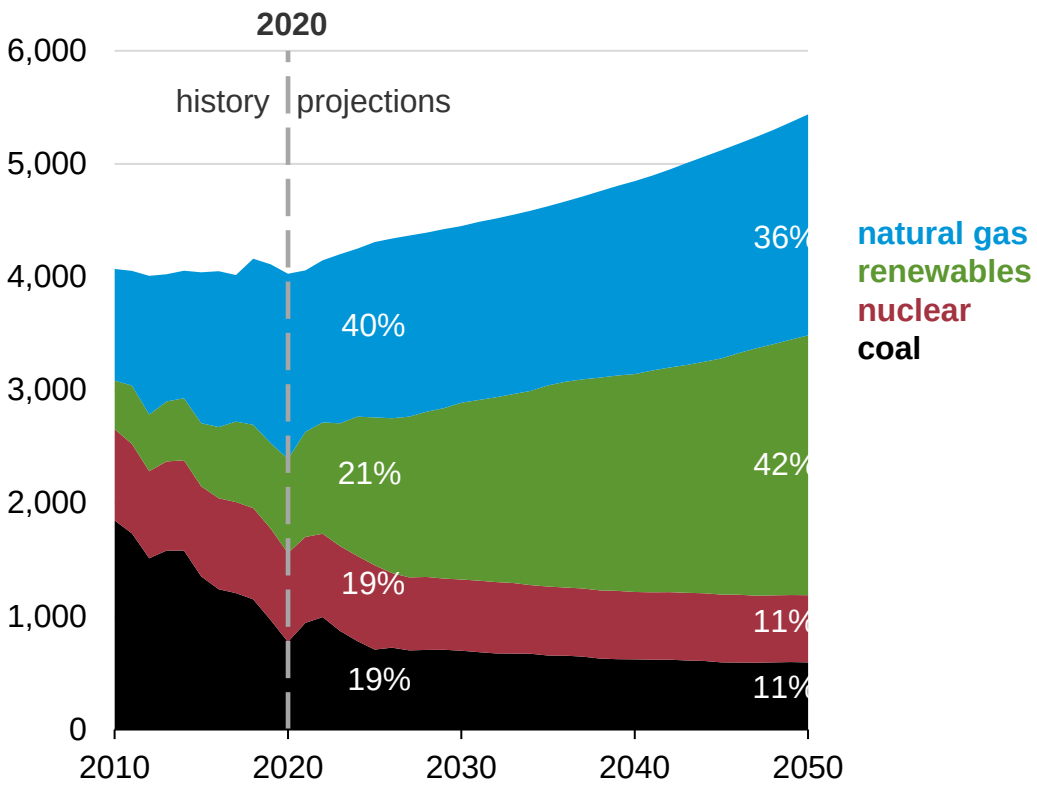
STEVE GAW

Why Do We Care About Cost Allocation?

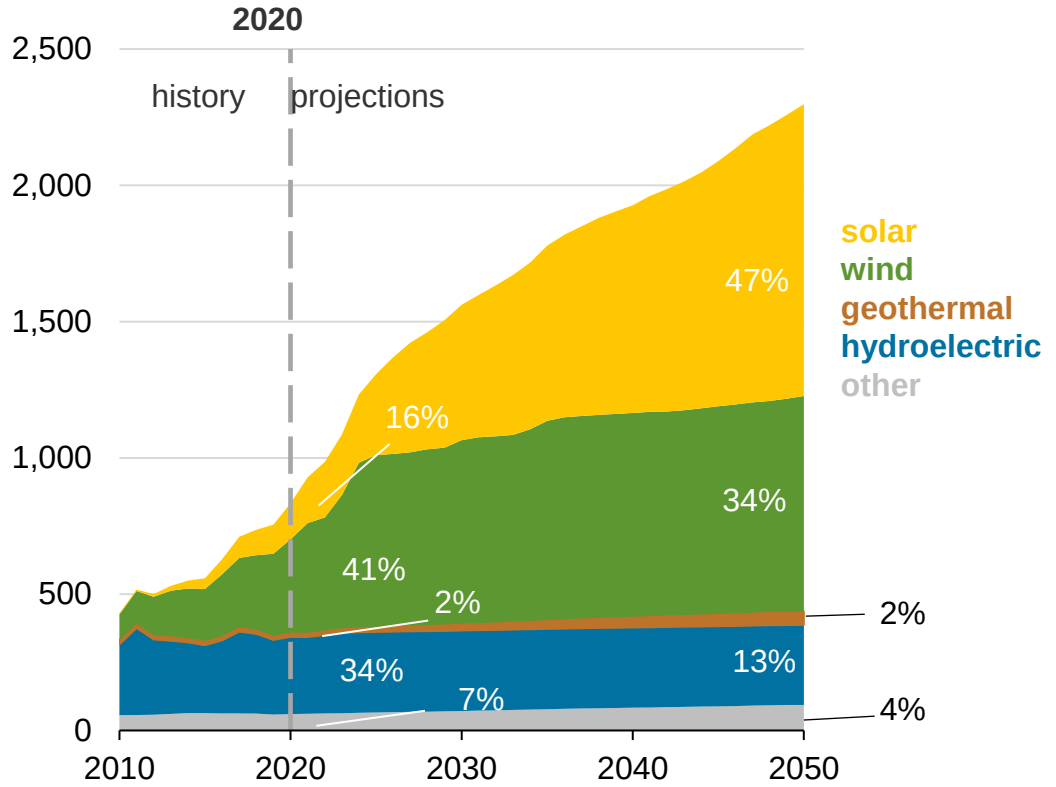
- It is a necessary prerequisite to Construction
- Planning without Cost Allocation gets you paper on a shelf
- We are going through a revolution in the way we produce electricity and Transmission is a necessary and needed component of the change

U.S. electricity generation and share from selected fuels and renewable sources

U.S. electricity generation from selected fuels
AEO2021 Reference case
billion kilowatthours



U.S. renewable electricity generation, including end use
AEO2021 Reference case
billion kilowatthours

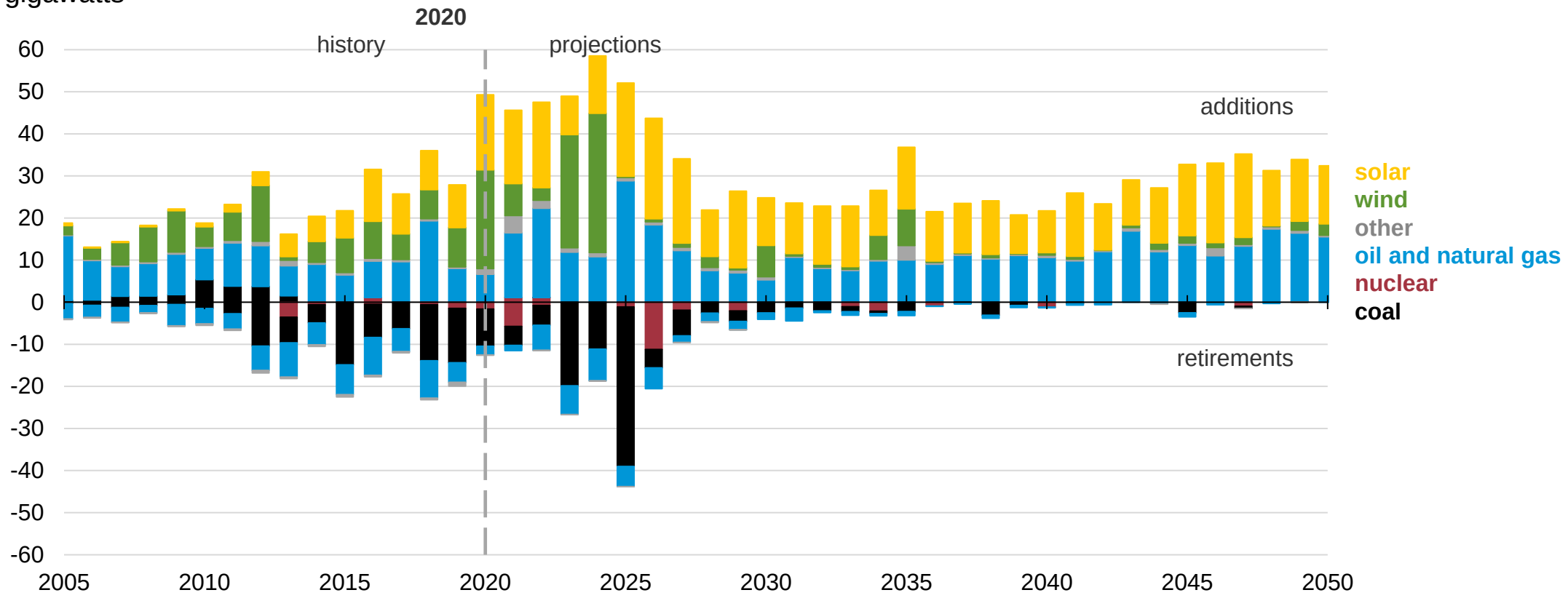


U.S. retiring and new generating capacity

Annual electricity generating capacity additions and retirements

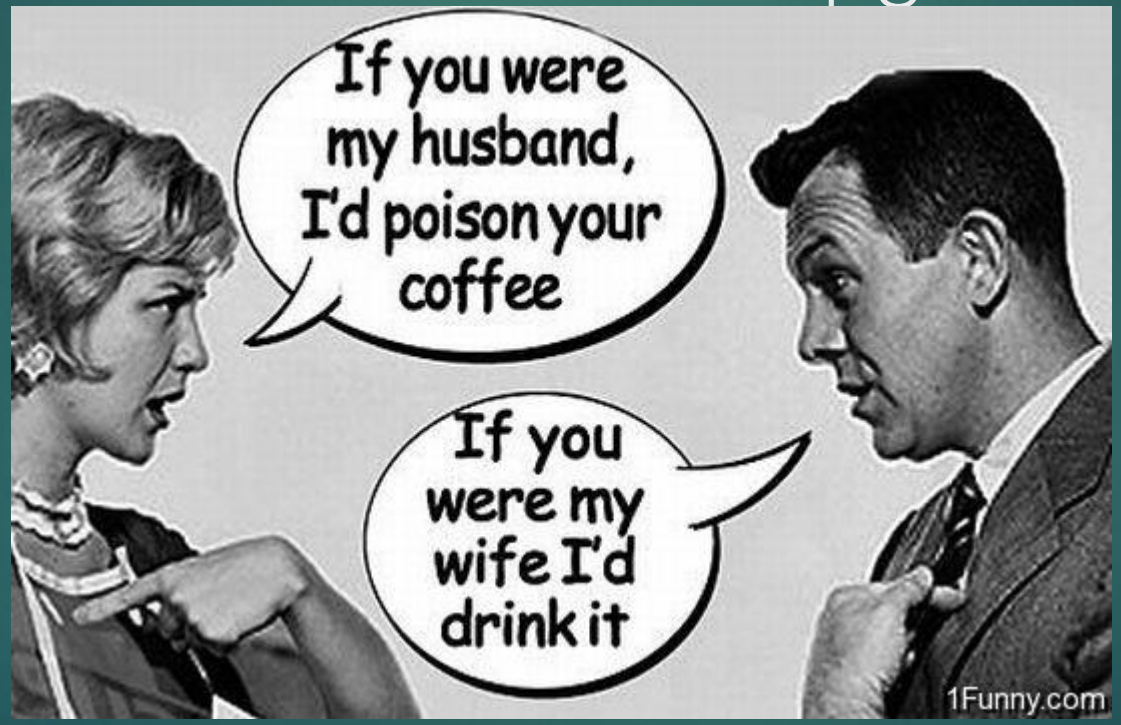
AEO2021 Reference case

gigawatts



Source: Form EIA-860M, *Monthly Update to the Annual Electric Generator Report*, July 2020

Serious arguments have occurred about who should pay for transmission upgrades



Concepts of Cost Allocation

- Participant Funding
  - Voluntarily funding upgrades
- Cost Causation
  - Who caused the upgrade to be needed?
- Beneficiaries Pay
  - Who will benefit from the upgrade?
  - Who will benefit from the system?

The Challenge of Cost Allocation Policy

- Failure of Participant Funding For Economic Projects
- Charging initial "Cost Causers" can leave out beneficiaries of the projects and create free riders
- Determining long-term beneficiaries upfront is impossible, assessing benefits based upon a moment in time is unfair, and changing cost allocation based upon constant recalculation creates critical uncertainty

Participant Funding

- Disincentive to build
  - Inequity: Those who pay do not receive all of the benefits of the upgrade because they create excess capacity that may be used by others for which they are not adequately or reliably compensated. Unclear who the beneficiaries would be over time
  - Time Delay: Potential funders may wait for others to pay for the project
  - Nothing Happens: Frequently unable to get sufficient number of funders to construct

Cost Causers Should Pay!

- Fairness:
  - Who is the Cost Causer? The entities that add the "straw" that breaks the camel's back. Why should these entities pay for a new camel while all of the others that are added later ride the new camel for free?
  - Other Benefits of the transmission upgrades are frequently ignored.
- Optimized Design: This funding is nearly always a set of least cost upgrades that are not optimized for economic design of the system

Beneficiaries should pay!

- Trying to predict how much any particular entity benefits from particular upgrades is like……

Beneficiaries Pay: Cost Certainty vs. Cost Fluidity

- Frequently Economic Upgrades and Designs
- Across the Spectrum of Beneficiaries Pay Constructs
  - Cost Certainty/Less Accuracy tracking benefits
    - Beneficiary Proxies: Highway/Byway; MVP Regional Funding; CREZ postage stamp rates
    - One time Calculation of Benefits: Assessing Benefits at a moment in time and freezing the cost allocation accordingly
  - Cost Fluidity/Less Certainty of future costs
    - Adjust the assignment of costs according to changes in usage
    - Re-assessment of benefits in the model over time
    - Payments adjusted according to usage

How Do you Determine Who Benefits?

- APC Analysis and other benefits
  - One time
  - Intervals
- MW-Mile/DFAX
- Rough Justice
  - Highway/Byway
  - Regional Funding

Assigning Costs is Challenging

- Legal Barriers
- Simpler concepts are more difficult to legally justify
- Cost Assignments that attempt to track benefits in detail are complicated and create uncertainty as to who will pay
- Stakeholders are concerned that they might be paying for costs without getting a similar level of benefit

What is being Paid for?

- Is this a *system* designed for the region?
- Or is it a *project or set of projects* to address particular needs in a given study?
- The Perspective is a relevant consideration in the cost allocation policy discussion

A NEW HOPE

THE REKINDLING OF INVESTMENT

History of Cost Allocation in Regional Planning of an RTO: SPP

- Participant Funding
- Reliability Upgrades
- Balanced Portfolio
- Wind Rule
- Highway Byway

Legal Limitations of Cost Allocation "Roughly Commensurate"

- "We do not suggest that the Commission has to calculate benefits to the last penny, or for that matter to the last million or ten million or perhaps hundred million dollars. *Midwest ISO Transmission Owners* v. *FERC, supra,* 373 F.3d at 1369 ("we have never required a ratemaking agency to allocate costs with exacting precision"); *Sithe/Independence Power Partners, L.P. v. FERC, supra,* 285 F.3d at 5. If it cannot quantify the benefits to the midwestern utilities from new 500 kV lines in the East, even though it does so for 345 kV lines, 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, then fine; the Commission can approve PJM's proposed pricing scheme on that basis. For that matter it can presume that new transmission lines benefit the entire network by reducing the likelihood or severity of outages. E.g., *Western Massachusetts Elec. Co. v. FERC,* 165 F.3d 922, 927 (D.C.Cir.1999)." **ILLINOIS COMMERCE COM'N v. F.E.R.C.** 576 F.3d 470, 477 (2009) Emphasis added.

Legal Standard

- "But it cannot use the presumption to avoid the duty of "comparing the costs assessed against a party to the burdens imposed or benefits drawn by that party." *Midwest ISO Transmission Owners v. FERC, supra,* 373 F.3d at 1368. Nor did it in the *Western Massachusetts* case." **ILLINOIS COMMERCE COM'N v. F.E.R.C.** 576 F.3d 470, 477 (2009)

Highway/Byway

- To overcome the legal hurdles, SPP submitted calculations showing significant regional impacts from 345kV lines

- 300kV and above: Regional
- 100kV-300kV: 1/3 Regional; 2/3 zonal
- Under 100kV: Zonal

SPP Planning is Coupled with a Beneficiaries Pay Construct Based Upon a Design that Benefits the Region

- Economic
- Policy
- Reliability

FERC Approval of SPP Concept: **NEED**

- "65. Presently, evolving circumstances in the SPP region require significant expansion of its transmission system. These include the continuing transition from relatively localized transmission system operation and markets trading to larger, centralized transmission system operations and regional power markets, and the increasing adoption of renewable portfolio standards, other state policies that promote increased reliance on renewable energy resources, and a focus by Congress and the Commission on promoting reliability and economically efficient transmission infrastructure development." ER10-1069-000 FERC Order approval of SPP Highway Byway (emphasis added).

FERC SPP Order: **SYSTEM DESIGN**

- "Furthermore, as Golden Spread highlights, SPP is in need of additional EHV infrastructure to realize the benefits of its planned day-ahead and ancillary services market and evolution to a single balancing authority. *Collectively, these changes result in a growing need for new regionally-integrated high voltage facilities and appropriate cost allocation for such facilities.* These changing circumstances inform the Commission's evaluation of SPP's proposal." ER10-1069-000 FERC Order approval of SPP Highway/Byway

FERC SPP Order: **CERTAINTY**

- "76. "Furthermore, cost-benefit analyses often evaluate benefits at a distinct point in time. Because power flows change constantly with fluctuations in generation and load, as well as the addition of new transmission facilities, generation resources, and loads to the system, such static analyses cannot capture all benefits over time… SPP has therefore sought, reasonably in our view, to align the costs associated with transmission expansions with the usage of the system. When considered in conjunction with SPP's description of the benefits of a robust EHV transmission network that accrue throughout the region, we find that SPP's Highway/Byway Methodology fairly assigns costs among SPP members." ER10-1069-000

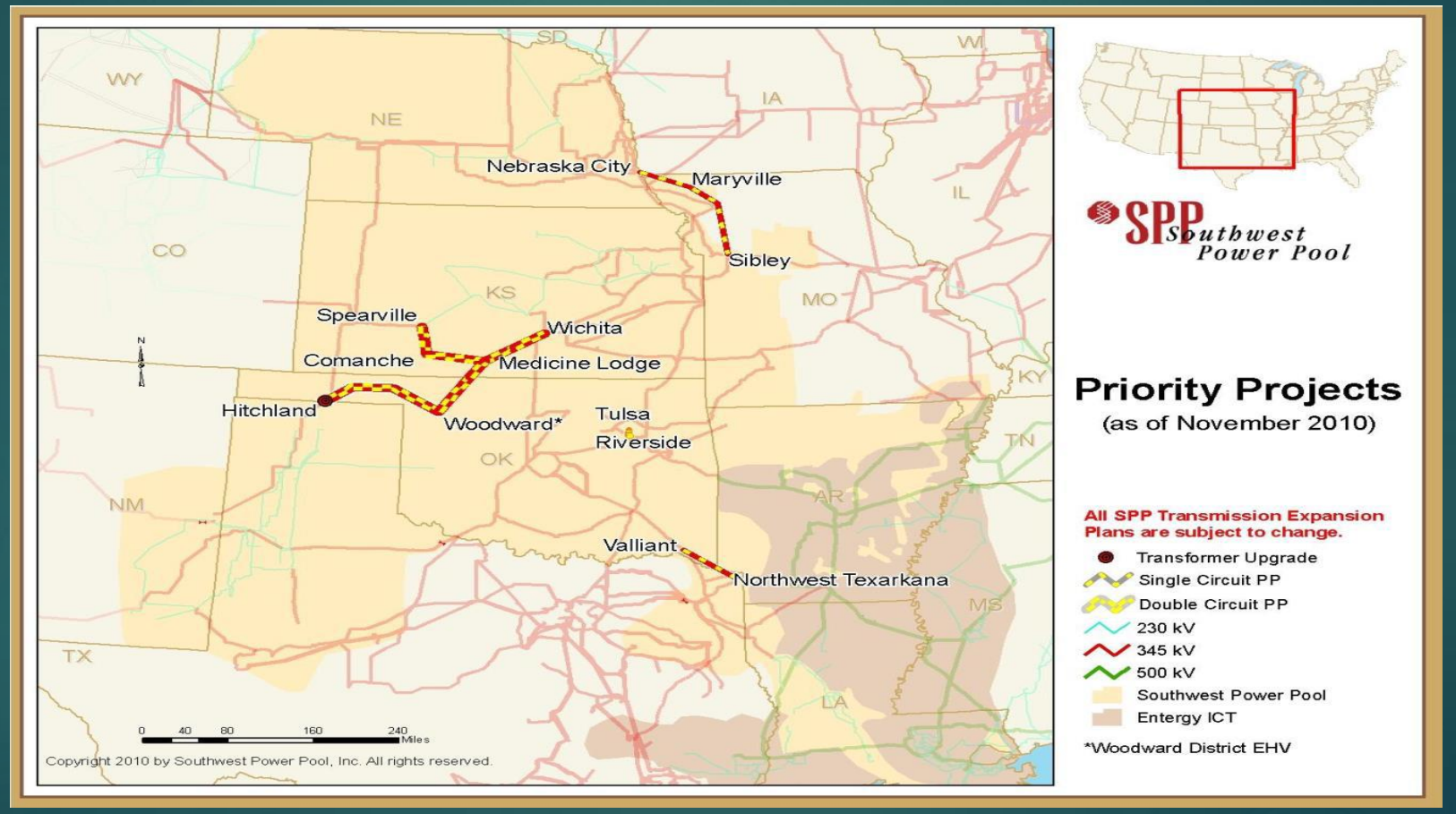
FERC Order 1000: Certainty

- "Knowing how the costs of new transmission facilities would be allocated is critical to the development of new infrastructure, because transmission providers and customers cannot be expected to support the construction of new transmission unless they understand who will pay the associated costs," *FERC Order 1000 Draft Regulation*

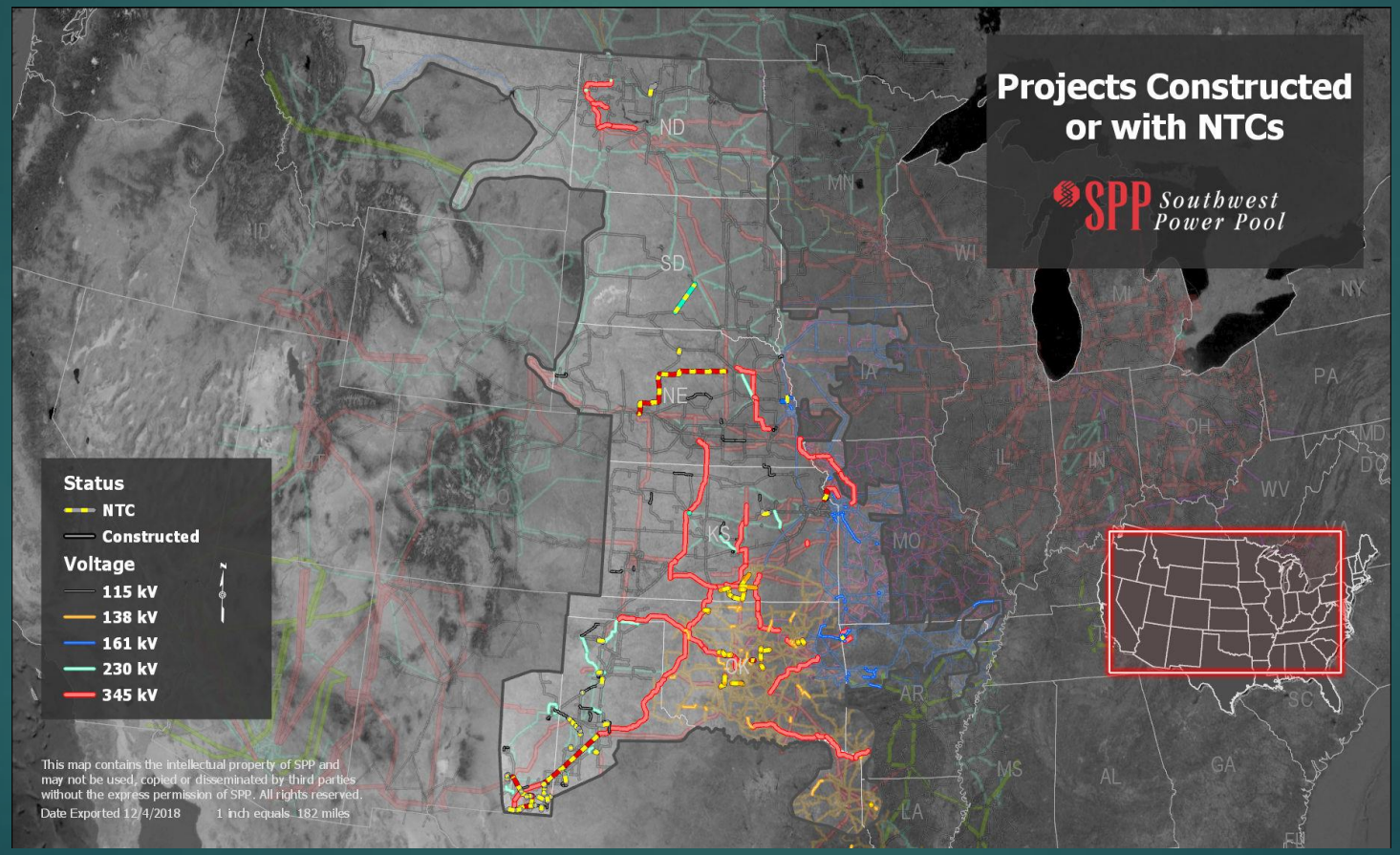
Commonalities in Successful Cost Allocation Methodologies CREZ, MVP, and Highway/Byway

- CERTAINTY (Simple and Certain): Approximate rather than exact tracking of benefits ("Roughly Commensurate" standard) is allowable, even with the assumption that benefits change over time
- REGIONAL BENEFIT of TRANSMISSION: Built upon the concept that benefits of larger voltage lines can shared by those in the market they serve
- SYSTEM DESIGN: Individual portfolios benefits may not reflect the cost allocation but over time a well planned set of transmission portfolios should benefit all paying for it

Priority Projects



Transmission Constructed after Highway/Byway and Planning



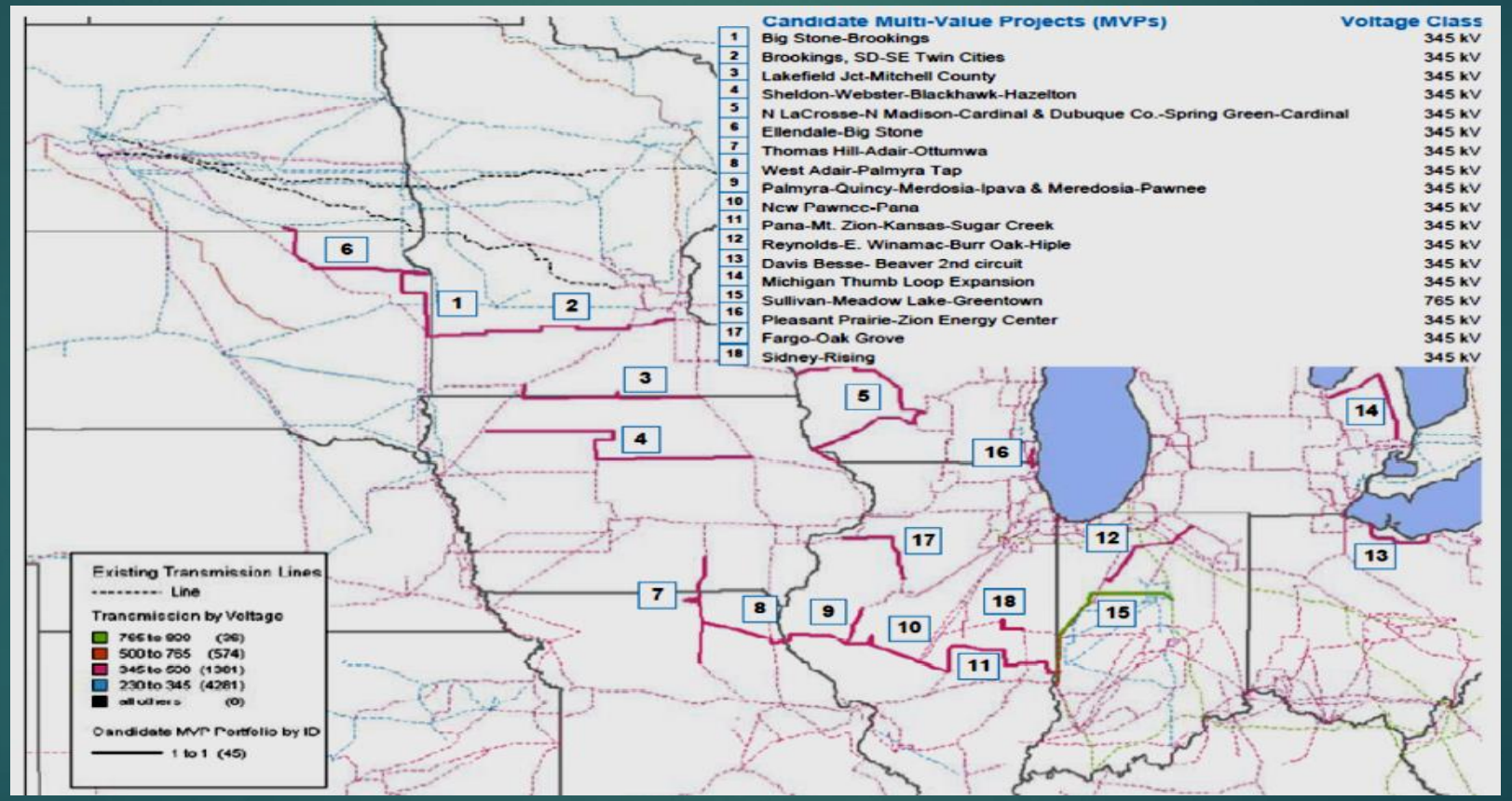
Benefits to Consumers in SPP

- "The net present value of all quantified benefits is expected to exceed $16.6 billion over a 40-year period, resulting in a benefit-cost ratio of at least 3.5. This means the investments are expected to produce more than $3.50 in overall benefits for every $1 in transmission-related costs." SPP News Release January 2016 on study of the benefits of transmission based upon transmission constructed from 2012-2014

Cost Allocation Changes in other Regions

- **CREZ**: Regional Cost Allocation for large transmission buildout that facilitated access renewables
- **MISO Multi-Value Projects**: Regional Cost Allocation of Projects that had more than one kind of benefit to the region: economic, policy, or reliability.

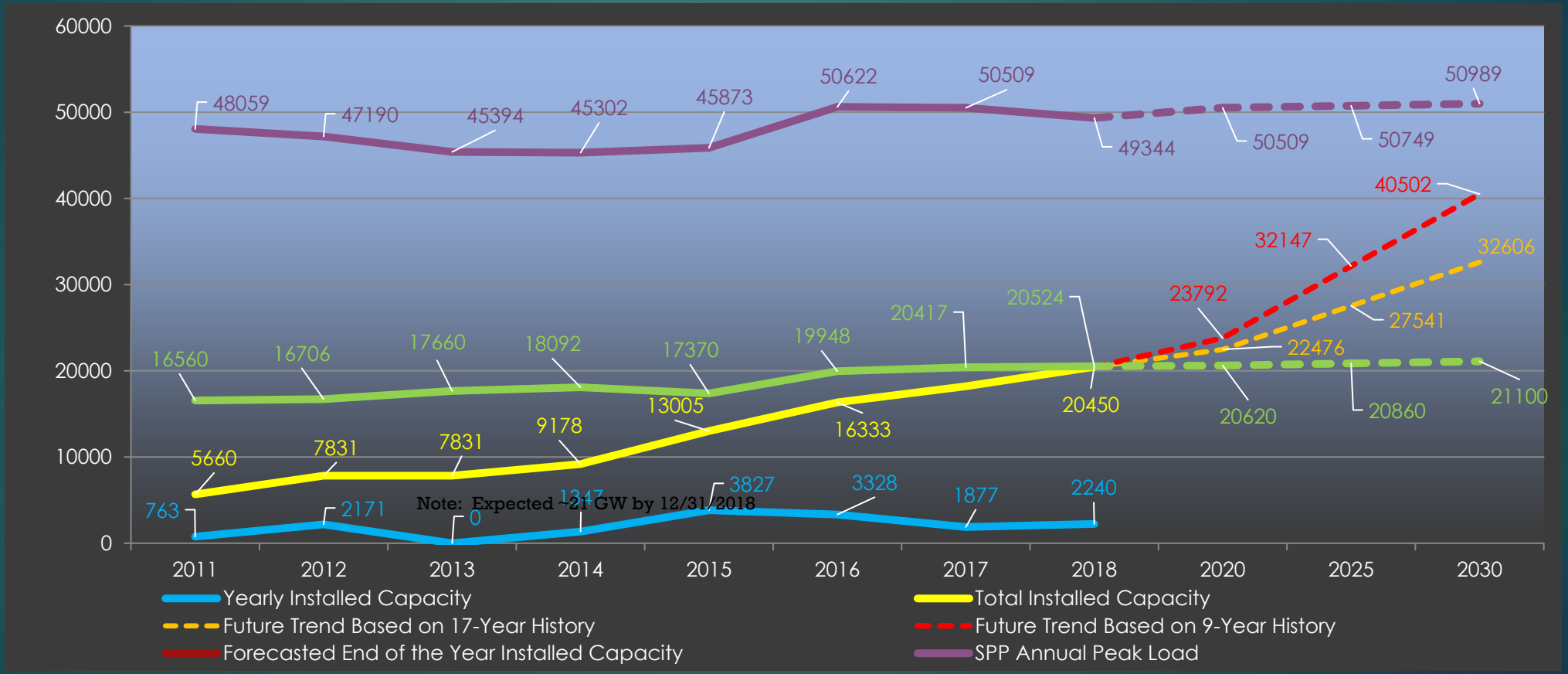
MISO Candidate Multi-Value Projects



Wind Levels Today

- SPP
  - 27GW
- ERCOT
  - +25GW as of January 2021
- MISO
  - 26GW

Wind Capacity Installed by Year (9/2/2018)



The Empire Strikes Back

INVESTMENT SLOWS AGAIN

Majority of U.S. Transmission Investments Occurs in ISO/RTO Regions SOURCE: The BRATTLE Group

Transmission investments in markets operated by FERC-jurisdictional **ISO/RTOs and ERCOT account for 85%** of current transmission investments

Transmission investments in ISO/RTO regionshave grown by 10-16% annually, and 6-10% annually in non-ISO/RTO regions.

U.S. Annual Transmission Investments (2010–2017) and Growth Since 1999

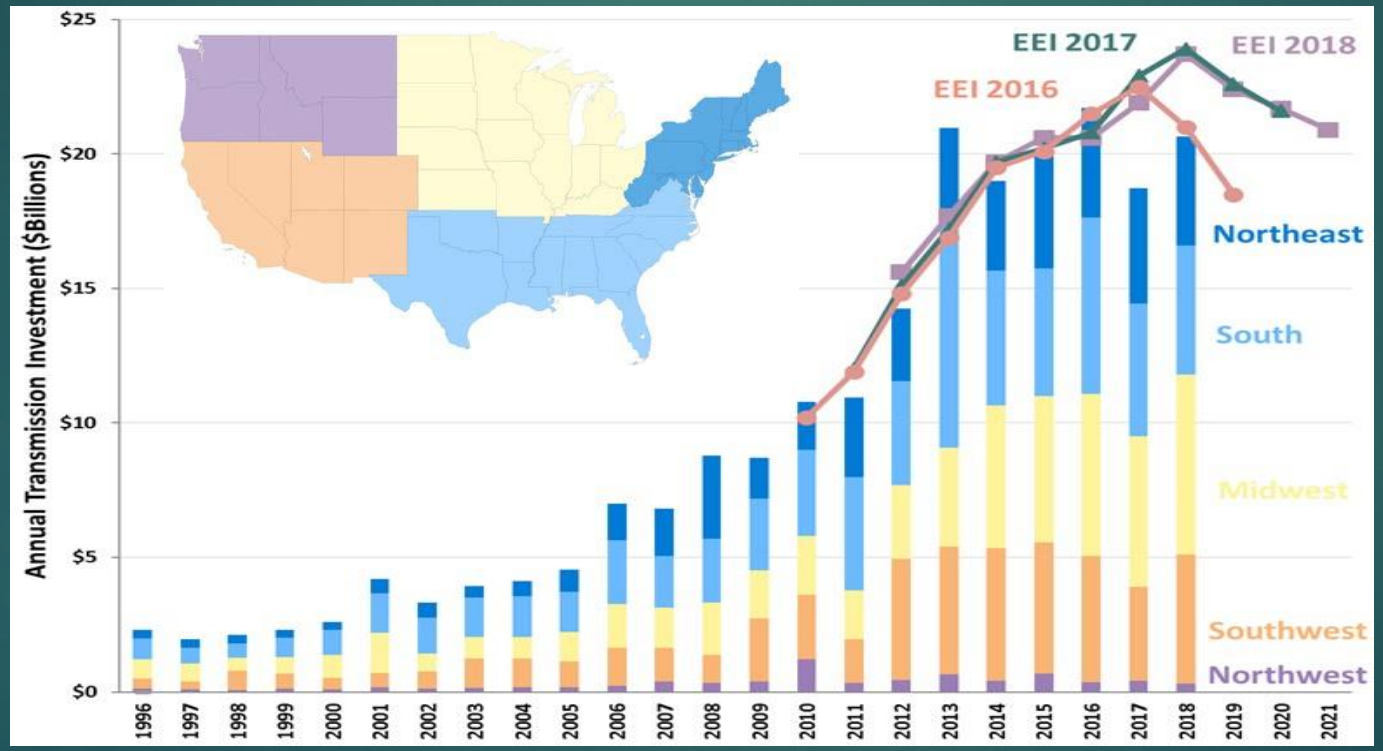
	1999	2010	2011	2012	2013	2014	2015	2016	2017	2013-2017 Total	1999-2017 CAGR
CAISO	$0.33	$1.7	$0.9	$3.5	$3.2	$2.6	$2.5	$2.4	$1.8	$12.6	10%
ISO-NE	$0.09	$0.7	$0.6	$1.4	$1.8	$1.4	$1.7	$1.4	$1.2	$7.5	15%
MISO	$0.34	$1.4	$1.0	$1.3	$2.5	$2.7	$3.0	$4.0	$3.3	$15.5	14%
NYISO	$0.08	$0.5	$0.7	$0.3	$0.4	$0.5	$0.5	$0.5	$0.6	$2.6	12%
PJM	$0.46	$1.9	$3.4	$2.9	$4.1	$6.6	$7.3	$7.1	$6.4	$31.5	16%
SPP	$0.11	$0.8	$0.6	$1.2	$1.0	$2.1	$0.9	$1.4	$0.9	$6.2	12%
Subtotal FERC-jurisdictional ISO/RTOs	$1.43	$7.0	$7.3	$10.6	$12.9	$15.9	$15.8	$16.9	$14.4	$75.9	14%
ERCOT	$0.14	$0.8	$1.2	$1.0	$5.3	$0.9	$0.9	$2.0	$1.1	$10.2	12%
Subtotal U.S. ISO/RTOs	$1.56	$7.8	$8.4	$11.7	$18.2	$16.8	$16.8	$18.9	$15.5	$86.1	14%
Other WECC	$0.32	$1.7	$0.7	$0.8	$1.2	$0.8	$1.3	$1.0	$0.9	$5.2	6%
Southeast & Other	$0.43	$1.3	$1.8	$1.8	$1.6	$1.6	$1.9	$1.9	$2.3	$9.4	10%
Total US Reported to FERC and in ERCOT	$2.31	$10.8	$11.0	$14.3	$21.0	$19.1	$19.9	$21.8	$18.8	$100.7	12%

Historical and Projected U.S. Transmission Investment by FERC-Jurisdictional Entities

Annual U.S. transmission investments are approximately **$20 billion/year** in the last six years (compared to ~$2 billion/year in late 1990s)

Historical and Projected U.S. Transmission Investments

(FERC- and ERCOT-Jurisdictional Entities Only)



Does not include transmission investments by non-jurisdictional utilities (such as BPA, TVA, WAPA), which own 40% of existing transmission in the western US and 20% in the eastern US

Sources and Notes:

The Brattle Group © 2019. Regional Investment based on FERC Form 1 investment compiled in Ventyx's Velocity Suite, except for ERCOT for years 2010 - 2017, which are based on ERCOT TPIT reports. Based on EIA data available through 2003, FERC-jurisdictional transmission owners estimated to account for 80% of transmission assets in the Eastern interconnection and 60% in WECC. Facilities >300kV estimated to account for 60-80% of shown investments. EEI annual transmission expenditures (updated October 2018) are based on prior year's actual investment through 2016 and planned investments thereafter.

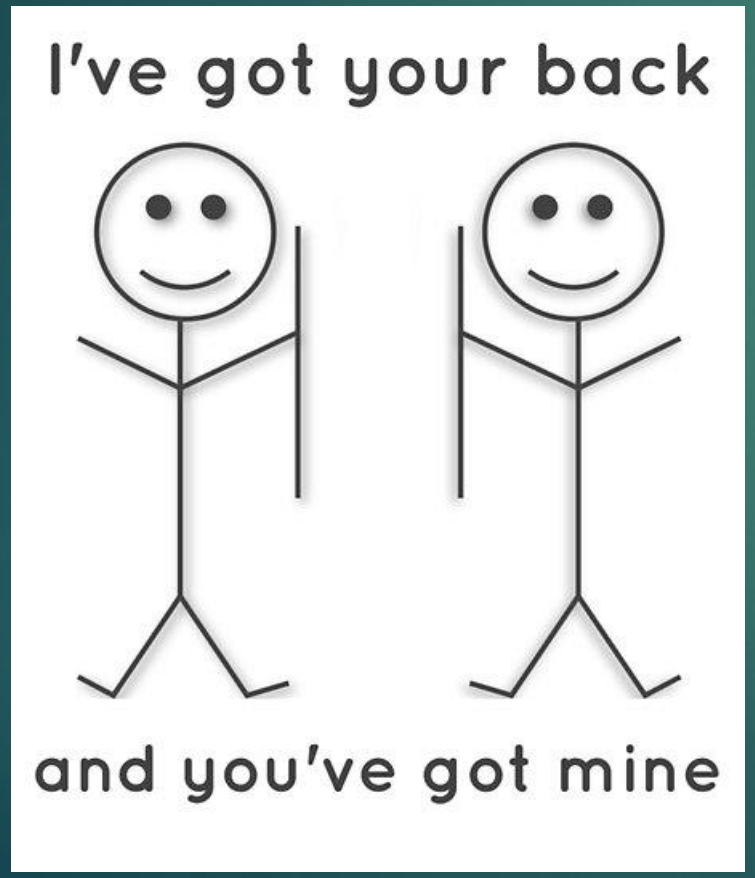
Slow Down in Transmission Investment

- Aftermath of increased investment and higher transmission costs
- Increase in Transmission bills, (without corresponding understanding of benefits)
- Some of the LSEs that needed transmission, which was subsequently built, no longer see the benefit from additional construction in other areas of the footprint
- Mismatch of cost allocation and usage: Transmission is funded based upon capacity needs when planning today is heavily focused on economics and, less frequently, policy needs
- Order 1000 mechanisms on interregional planning were nearly nonexistent. Interregional Transmission: LSEs generally do not want to pay for transmission for exports of energy

System Design vs. Upgrades

- The planning process is highly relevant to the questions of cost allocation
- Planning that is designed to take into account the needs of the region mesh well with funding that is more regional
- While the individual projects in each planning cycle may have particular sub-regional benefit, over time this approach to planning should mean that the design benefits access to the market for all
- However, the analysis of one project or a single portfolio of projects may not by itself show this regional benefit is obtained.
- Similarly, if needs are addressed in one subregion, this subregion may be opposed to upgrades proposed later that benefit another area.

In a Regionally Funded System Cost Allocation Approach: Trust is Required



Return of the Jedi

IS THERE A NEW PATH TO PAYING FOR THE TRANSMISSION NEEDED?

Siloed Approach to Planning and Cost Allocation

- GI
- Transmission Planning
- Transmission Service
- Local Planning
- Load Additions
- Retirements

“You pay!” “No you pay.” “No you!!!”

Who is going to get the Short Straw….

Silos and Cost Allocation

Generation Interconnection

- GI (ERIS and NRIS) is Cost Causer pays/least cost
- What is necessary to reliably interconnect the new generator
- Does not generally identify other beneficiaries of the upgrades

Transmission Service

- Similar to GI
- Cost Causer pays
- Least Cost solution

Examples

- A GI upgrade that is a least cost solution is built even though a better upgrade for the broader needs of the system might have occurred if analyzed together
- GI studies are collapsing due to the cost of the upgrades while such similar upgrades are showing up in the planning process but not meeting the required B/C threshold.
- Customers want to avoid being the first to trip the wire of cost causation. Sometimes waiting can cause someone else to have to pay for the upgrade.

The Problem is Immense

- GI Study Collapse
- Costs of network upgrades are too high to be marketable including 765kV transmission
- Huge queues with constant restudies
- Affected System Studies are also impacted

Missing a way to Evaluate and Pay for Projects that facilitate solutions for multiple needs across Studies

- Economic Planning
- Reliability Planning
- Transmission Service
- GI

Could it be Done? Cost Sharing Concepts

- Must have a consolidation or optimization phase in assessing the design of transmission
- Least cost concepts in the GI, Reliability, Transmission Service arenas must be married with the more robust design of economic assessments
- Cost sharing based upon economic benefits to Gens for example quickly complicated by the fact that such benefits can flow both to new gens and existing gens creating uncertainty in costs for PPAs and sales of new gens
- Cost sharing based upon an assumption of cost contributions from the generators or those funding reliability upgrades can be used to calculate the remaining cost of an economic upgrade and change the B/C ratio in a positive way

Examples of this concept today

- SPP
  - Design Phase: Economic portfolios are examined to see if they address Reliability needs that have that have been identified in the reliability assessment
  - This can lead to a design that addresses the reliability issue and also brings economic benefits
  - While it does not directly address the cost allocation piece in SPP since both upgrades would have been funded under Highway/Byway, it does show the potential value of assessing GI needs in the economic planning phase and finding a cost sharing mechanism between GI and planning

How could this Work?

- Determine a contribution amount from GI Customers that can contribute to the reduction of costs in the economic planning assessment
  - Costs from the GI studies
  - Maximum realistic contribution
  - Minimum contribution?
  - Determine whether a different design can address the issues that are more optimal than when designed in one process alone or that would not have been solved without contributions from both processes.

Paths Forward are Critically Important

- DC Lines
- AC lines
  - The choice between fluid costs and stationary costs
  - Reliability, Economic, Policy upgrades
  - Energy vs. Capacity funding mechanisms
  - Cost sharing across the silos

Transmission is Important to America's Clean Energy Future

- Aaron Bloom, Chair of ESIG's System Planning Working Group: "Transmission doesn't make 100% clean electricity possible; transmission makes 100% clean electricity easier."
- https://www.esig.energy/transmission-planning-for-100-clean-electricity/
- "Transmission Planning for 100% Clean Electricity" White Paper, ESIG Press Release February 18th, 2021

“This is the Way…”

THANK YOU!

STEVE GAW