Transmission Planning and Cost Allocation Workshop

Feb. 23, 2025, Washington, D.C.

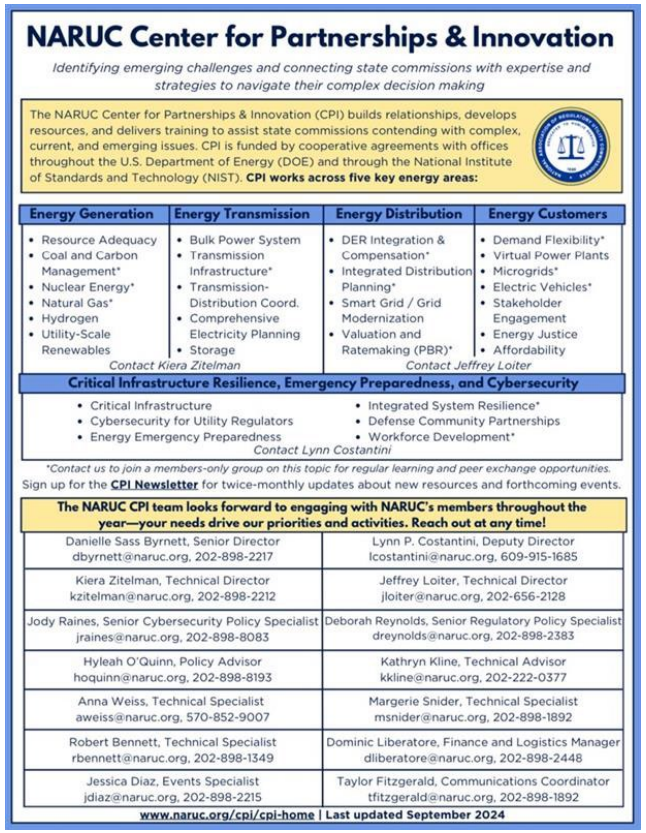
NARUC Winter Policy Summit

THE NARUC CENTER FOR PARTNERSHIPS & INNOVATION

Background & Focus

- NARUC staff dedicated to providing technical assistance to members.
- CPI identifies emerging challenges and connects state commissions with expertise and strategies to inform their decision making.
- CPI builds relationships, develops resources, and delivers trainings.
- All CPI support is federally funded via cooperative agreements (grants) with U.S. Department of Energy and U.S. National Institute of Standards and Technology.

CPI fact sheet with recent publications, upcoming events, member working groups located at: http://www.naruc.org/cpi/



NARUC Center for Partnerships & Innovation

Identifying emerging challenges and connecting state commissions with expertise and strategies to navigate their complex decision making

The NARUC Center for Partnerships & Innovation (CPI) builds relationships, develops resources, and delivers training to assist state commissions contending with complex, current, and emerging issues. CPI is funded by cooperative agreements with offices throughout the U.S. Department of Energy (DOE) and through the National Institute of Standards and Technology (NIST). **CPI works across five key energy areas:**

Energy Generation	Energy Transmission	Energy Distribution	Energy Customers
• Resource Adequacy • Coal and Carbon Management* • Nuclear Energy* • Natural Gas* • Hydrogen • Utility-Scale Renewables	• Bulk Power System • Transmission Infrastructure* • Transmission-Distribution Coord. • Comprehensive Electricity Planning • Storage	• DER Integration & Compensation* • Integrated Distribution Planning* • Smart Grid / Grid Modernization • Valuation and Ratemaking (PBR)*	• Demand Flexibility* • Virtual Power Plants • Microgrids* • Electric Vehicles* • Stakeholder Engagement • Energy Justice • Affordability
Contact Kiera Zitelman		*Contact Jeffrey Loiter*	

Critical Infrastructure Resilience, Emergency Preparedness, and Cybersecurity

- Critical Infrastructure
- Cybersecurity for Utility Regulators
- Energy Emergency Preparedness
- Integrated System Resilience*
- Defense Community Partnerships
- Workforce Development*

Contact Lynn Costantini

*Contact us to join a members-only group on this topic for regular learning and peer exchange opportunities.

Sign up for the **CPI Newsletter** for twice-monthly updates about new resources and forthcoming events.

The NARUC CPI team looks forward to engaging with NARUC's members throughout the year—your needs drive our priorities and activities. Reach out at any time!

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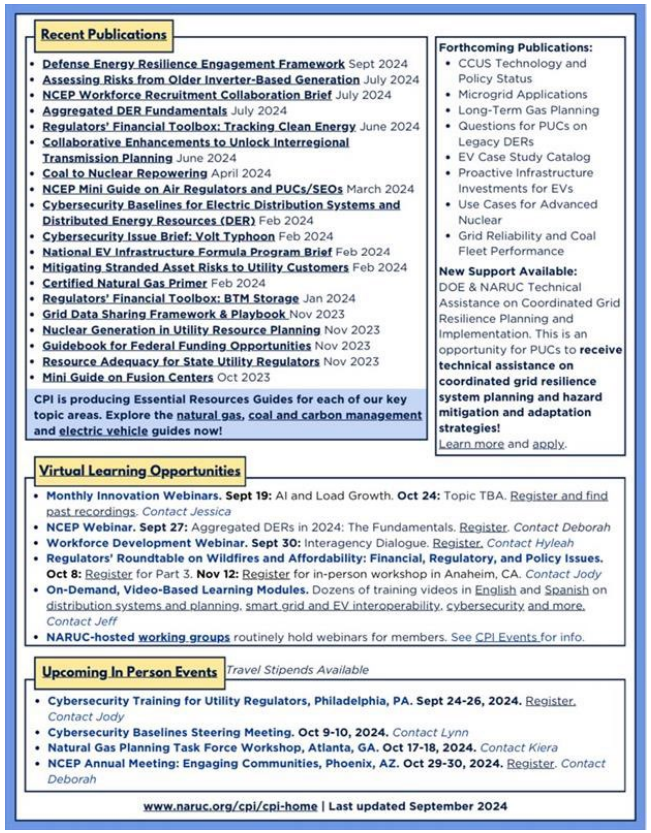

Recent Publications

- **Defense Energy Resilience Engagement Framework** Sept 2024
- **Assessing Risks from Older Inverter-Based Generation** July 2024
- **NCEP Workforce Recruitment Collaboration Brief** July 2024
- **Aggregated DER Fundamentals** July 2024
- **Regulators' Financial Toolbox: Tracking Clean Energy** June 2024
- **Collaborative Enhancements to Unlock Interregional Transmission Planning** June 2024
- **Coal to Nuclear Repowering** April 2024
- **NCEP Mini Guide on Air Regulators and PUCs/SEOs** March 2024
- **Cybersecurity Baselines for Electric Distribution Systems and Distributed Energy Resources (DER)** Feb 2024
- **Cybersecurity Issue Brief: Volt Typhoon** Feb 2024
- **National EV Infrastructure Formula Program Brief** Feb 2024
- **Mitigating Stranded Asset Risks to Utility Customers** Feb 2024
- **Certified Natural Gas Primer** Feb 2024
- **Regulators' Financial Toolbox: BTM Storage** Jan 2024
- **Grid Data Sharing Framework & Playbook** Nov 2023
- **Nuclear Generation in Utility Resource Planning** Nov 2023
- **Guidebook for Federal Funding Opportunities** Nov 2023
- **Resource Adequacy for State Utility Regulators** Nov 2023
- **Mini Guide on Fusion Centers** Oct 2023

CPI is producing Essential Resources Guides for each of our key topic areas. Explore the natural gas, coal and carbon management and electric vehicle guides now!

Forthcoming Publications:

- CCUS Technology and Policy Status
- Microgrid Applications
- Long-Term Gas Planning
- Questions for PUCs on Legacy DERs
- EV Case Study Catalog
- Proactive Infrastructure Investments for EVs
- Use Cases for Advanced Nuclear
- Grid Reliability and Coal Fleet Performance

New Support Available: DOE & NARUC Technical Assistance on Coordinated Grid Resilience Planning and Implementation. This is an opportunity for PUCs to **receive technical assistance on coordinated grid resilience system planning and hazard mitigation and adaptation strategies!** Learn more and apply.

Virtual Learning Opportunities

- **Monthly Innovation Webinars. Sept 19:** AI and Load Growth. **Oct 24:** Topic TBA. Register and find past recordings. *Contact Jessica*
- **NCEP Webinar. Sept 27:** Aggregated DERs in 2024: The Fundamentals. Register. *Contact Deborah*
- **Workforce Development Webinar. Sept 30:** Interagency Dialogue. Register. *Contact Hyleah*
- **Regulators' Roundtable on Wildfires and Affordability: Financial, Regulatory, and Policy Issues. Oct 8:** Register for Part 3. **Nov 12:** Register for in-person workshop in Anaheim, CA. *Contact Jody*
- **On-Demand, Video-Based Learning Modules.** Dozens of training videos in English and Spanish on distribution systems and planning, smart grid and EV interoperability, cybersecurity and more. *Contact Jeff*
- **NARUC-hosted working groups** routinely hold webinars for members. See CPI Events for info.

Upcoming In Person Events *Travel Stipends Available*

- **Cybersecurity Training for Utility Regulators, Philadelphia, PA. Sept 24-26, 2024.** Register. *Contact Jody*
- **Cybersecurity Baselines Steering Meeting. Oct 9-10, 2024.** *Contact Lynn*
- **Natural Gas Planning Task Force Workshop, Atlanta, GA. Oct 17-18, 2024.** *Contact Kiera*
- **NCEP Annual Meeting: Engaging Communities, Phoenix, AZ. Oct 29-30, 2024.** Register. *Contact Deborah*

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In partnership with DOE, NIST, and members NARUC CPI work spans five key topical areas

Energy Generation

- Resource Adequacy
- Coal and Carbon Management*
- Nuclear Energy*
- Natural Gas*
- Hydrogen
- Renewables

Energy Transmission

- Bulk Power System
- Transmission Infrastructure*
- Comprehensive Electricity Planning
- Storage

Contact Kiera Zitelman and Deborah Reynolds

Energy Distribution

- Distributed Energy Resources
- Integrated Distribution Planning*
- Virtual Power Plants
- Grid Modernization
- Ratemaking / PBR*

Energy Customers

- Demand Flexibility*
- Microgrids
- Data Centers
- Electric Vehicles*
- Stakeholder Engagement
- Affordability

Contact Jeffrey Loiter

Critical Infrastructure Preparedness, Response, and Resilience

- Critical Infrastructure
- Cybersecurity for Utility Regulators
- Energy Emergency Preparedness
- Integrated System Resilience*
- Defense Community Partnerships
- Workforce Development*

Contact Lynn Costantini

**Join a members-only group on this topic for regular learning and peer exchange opportunities.*

Transmission State Working Group

NARUC facilitates the Transmission State Working Group to support commissioners and commission staff in exploring state commission roles and influence on transmission development and evaluation.

Topics last year covered interconnection, interregional planning, and ways to engage in transmission planning, which led to this workshop.

Open to all NARUC members.

For more information, or to join the working group, contact Deborah Reynolds.
Dreynolds@naruc.org

Core Sector: Electricity/Energy

- Electricity/Energy
  - Bulk Power System
  - Coal and Carbon Management
  - Nuclear Energy
  - **Transmission Infrastructure**
    - **Transmission Resource Library**

Transmission Infrastructure

Development of new transmission is essential to prepare for the deployment of large amounts of new energy resources to meet emerging large loads on the grid. State and federal utility regulators are tasked with addressing issues of how to plan and pay for new transmission development and navigating related jurisdictional issues. For this reason, NARUC offers opportunities for collaboration and cooperation between state utility commissions, subject matter experts, impacted stakeholders, and federal regulators to identify barriers to and opportunities for transmission expansion.

NARUC facilitates the Transmission State Working Group to support commissioners and commission staff in exploring state commission roles and influence on transmission development and evaluation. The working group is open to all NARUC members. For more information, or to join the working group, contact Deborah Reynolds.

www.naruc.org/core-sectors/electricity-energy/transmission-infrastructure/

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NARUC Workshop on FERC O1920: Welcome and Level Setting

Lauren Azar
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February 23, 2025

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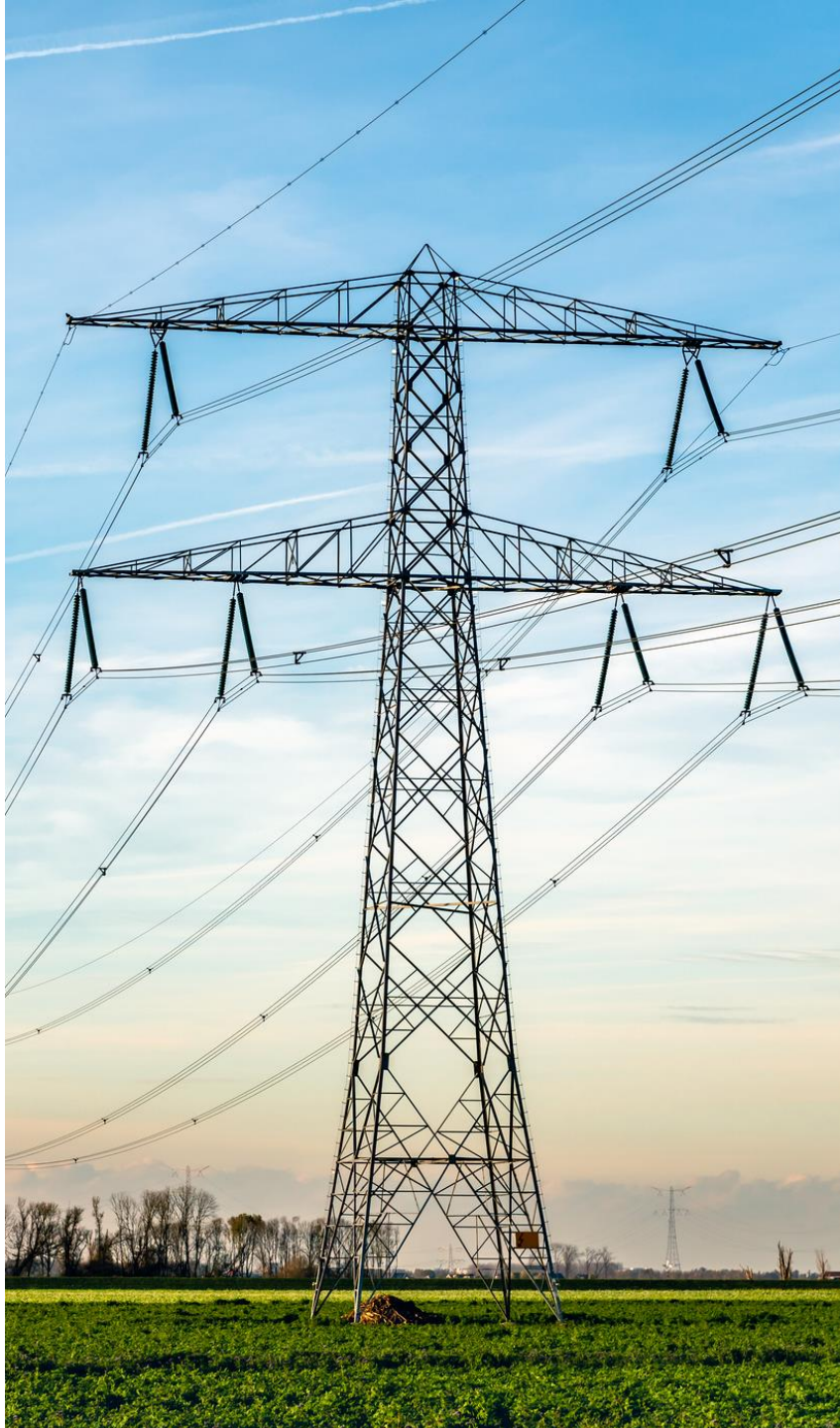
Today's Goals: Carpe Diem

States can shape transmission planning and cost allocation via Orders 1920/1920A compliance

What will we discuss today?

1. Cost Allocation (CA) Methods –
   - Before and potentially after compliance

2. Role of Relevant State Entities (RSEs) in Planning
   - Facility Evaluation Process and Selection Criteria –
     - Developed before compliance
   - Scenario Development –
     - Developed after compliance during the planning cycle



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What is the “Engagement Period”?

A 6-month period (with a potential 6-month extension) before compliance when the RSEs meet and may:

1. Provide input to the Transmission Providers (TPs) on CA Methods:
    - *Ex* Ante CA Method
    - Voluntary Funding CA Method
2. Create an RSE-designed CA method and propose it for adoption through the TPs on compliance
3. Design a State Agreement Process (SAP) that is run after compliance
4. Provide input to the TPs on the Facility evaluation process and selection criteria
5. Provide input to the TPs on other provisions that will be included within their proposed tariffs.

TODAY'S DISCUSSION ON

COST ALLOCATION METHODS

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Three Order 1920 CA Methods

1. *Ex Ante* Method – submitted on compliance

2. Voluntary Funding Method – submitted on compliance

3. State Agreement Method - submitted after compliance through the State Agreement Process (SAP)

Today we will only be discussing CA methods applicable to:

- *Ex Ante* Method and
- State Agreement Method.

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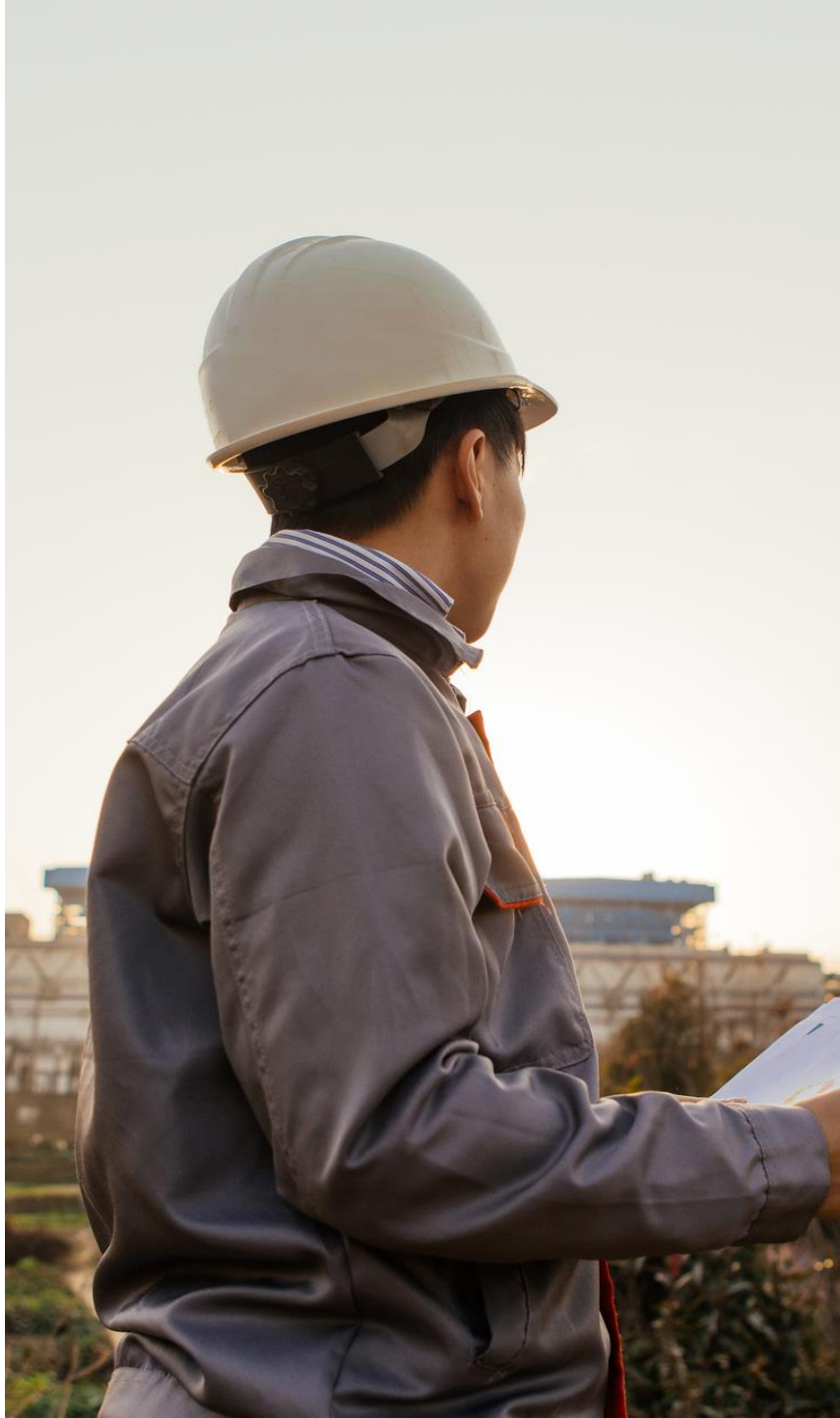
What is the *Ex Ante* Method?

- *Ex Ante* Method(s) is
  - default CA method for Facilities planned and selected under O1920
  - will be applied unless FERC approves a State Agreement Method

- <u>Role of RSEs in the *Ex Ante* Method(s):</u>
  1. RSEs have the "opportunity" to provide input on the *Ex Ante* Method(s) or
  2. RSEs can also propose their own *Ex Ante* Method(s) and the TPs must submit it to FERC.



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What is the State Agreement Method?

- RSEs may design a **PROCESS** that is run after the Engagement Period called the ”State Agreement Process” or ”SAP”

- The SAP is run sometime before but no later than 6 months after the TPs select O1920 Facilities for regional CA.

- During the SAP, the RSEs and anyone else they have invited may design a CA **METHOD** for the selected O1920 Facilities (“State Agreement Method”)

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TODAY'S DISCUSSION ON

1. FACILITY EVALUATION AND SELECTION
2. SCENARIO DEVELOPMENT

What is the RSEs' Role in Developing the Evaluation Process and Selection Criteria?

On compliance, TPs must submit to FERC a process and criteria "to ensure that more efficient or cost-effective facilities are selected"

During the Engagement Period,

- TPs must "consult with and seek the support of" RSEs on this process and criteria
- TPs are "encouraged" to consider any selection criteria supported by RSEs.

Process must include such things as:

- Timelines for accepting proposed solutions from stakeholders
- Process for estimating costs and measuring benefits
- Qualitative or quantitative selection criteria, and
- Timelines for selecting Facilities.

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What is the RSEs' Role in Scenario Development?

During the planning cycle, the TPs must develop at least 3 Scenarios during which TPs must "consult with and consider the positions of" states relating to:

- States' laws, policies and regulations when determining the assumptions in Scenarios
- Whether a specific state policy must be accounted for as a factor within each category of factors, (i.e., if the specific state policy will likely affect Needs),
- How to adjust the treatment of the specific state policy across Scenarios (e.g., assume certain policy-related outcomes materialize in some but not all Scenarios).
- For states with integrated resource plans (IRPs), include at least one of the states' preferred "trajectories"

The Engagement Period is a Significant Opportunity for States to Influence Their Future

...Start Now

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Thank you!

For additional assistance and technical support, please contact Great Plains Institute & Azar Law LLC

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Cost Allocation Methods for Large Regional Facilities under Order 1920

Lauren Azar
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February 23, 2025

Cost Allocation under Order 1920

Legal Standard: Order 1920 cost allocation methods must:

1. Be just, reasonable, non-discriminatory, and non-preferential
2. Result in the costs being allocated **“roughly commensurate”** with the benefits received

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Allocating Costs in a Roughly Commensurate Manner Requires Iterative Collaboration

Five Steps:

1. Understand limitations of tools used by your transmission provider (TP) when measuring benefits and identifying beneficiaries.
2. Discuss directional goals for deciding who should pay
3. Considering 1 and 2 above, begin to narrow the allocation methods
4. Revisit directional goals
5. Further narrow allocation methods until finalization

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GRANULARLY ALLOCATING COSTS FOR LARGE REGIONAL LINES IS MORE DIFFICULT THAN FOR SMALLER LOCAL LINES.

WHY?

Everyone wants a precise calculation of the costs and benefits of large regional transmission

Estimating costs for Selected Facilities = EASY

Estimating savings & ID'ing beneficiaries over the 60 years of their asset lives = HARD

…Why can we NOT precisely and accurately calculate the benefits flowing from large regional lines over their asset lives?

1. Measurement Challenges: Many tools provide only rough estimates of benefits
2. Temporal Challenges: Measuring specific benefits is usually completed once when Facilities are selected and usually measures only 20 years of benefits, but:
   A. Regional lines provide an additional 40 years of benefits that are not calculated; and
   B. Flows over regional lines change second-by-second over those 60 years causing the benefits and beneficiaries to also change

THE RISK OF DEMANDING GRANULAR MEASUREMENTS WITH INADEQUATE TOOLS

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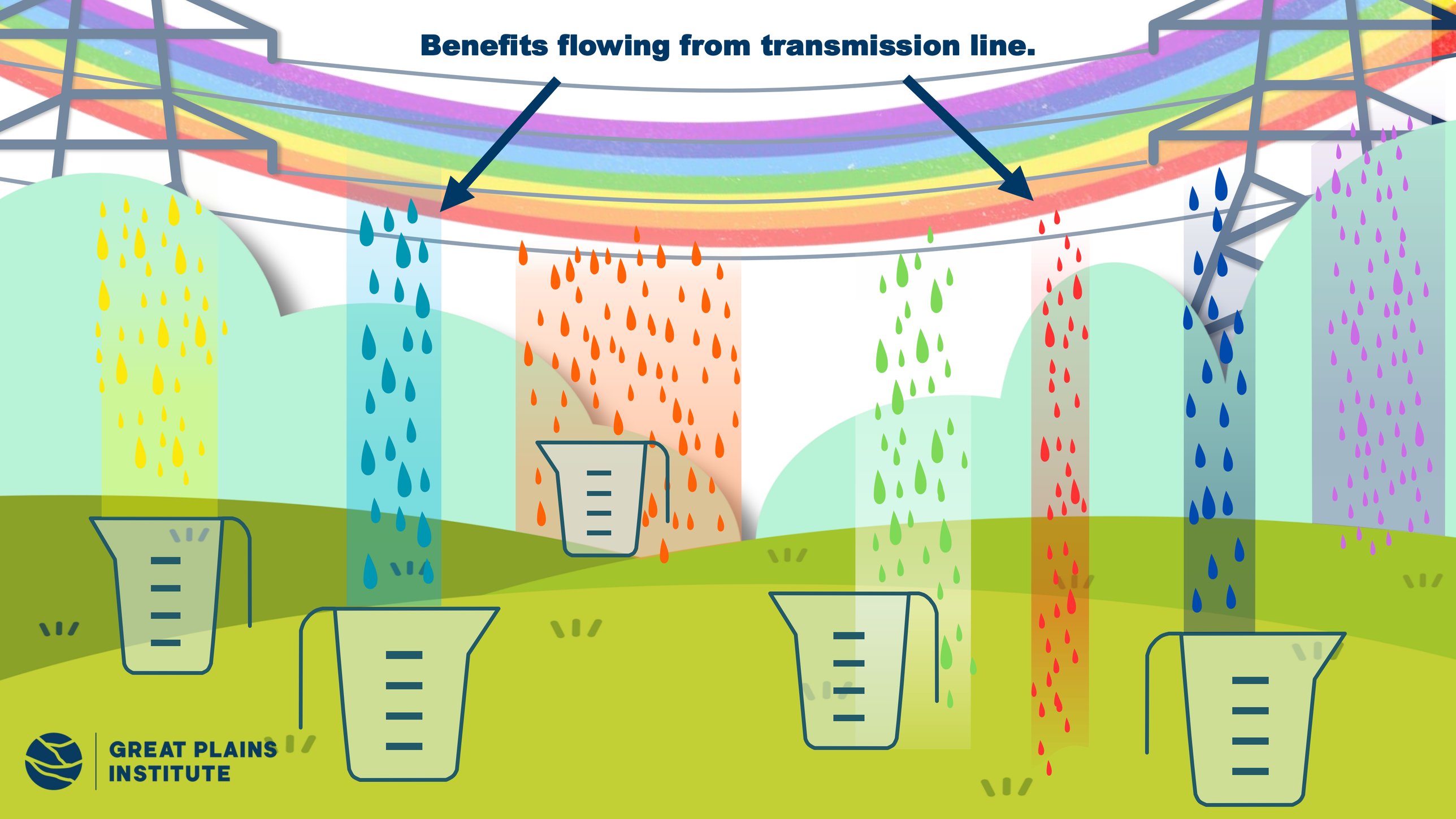
Benefits flowing from transmission line.
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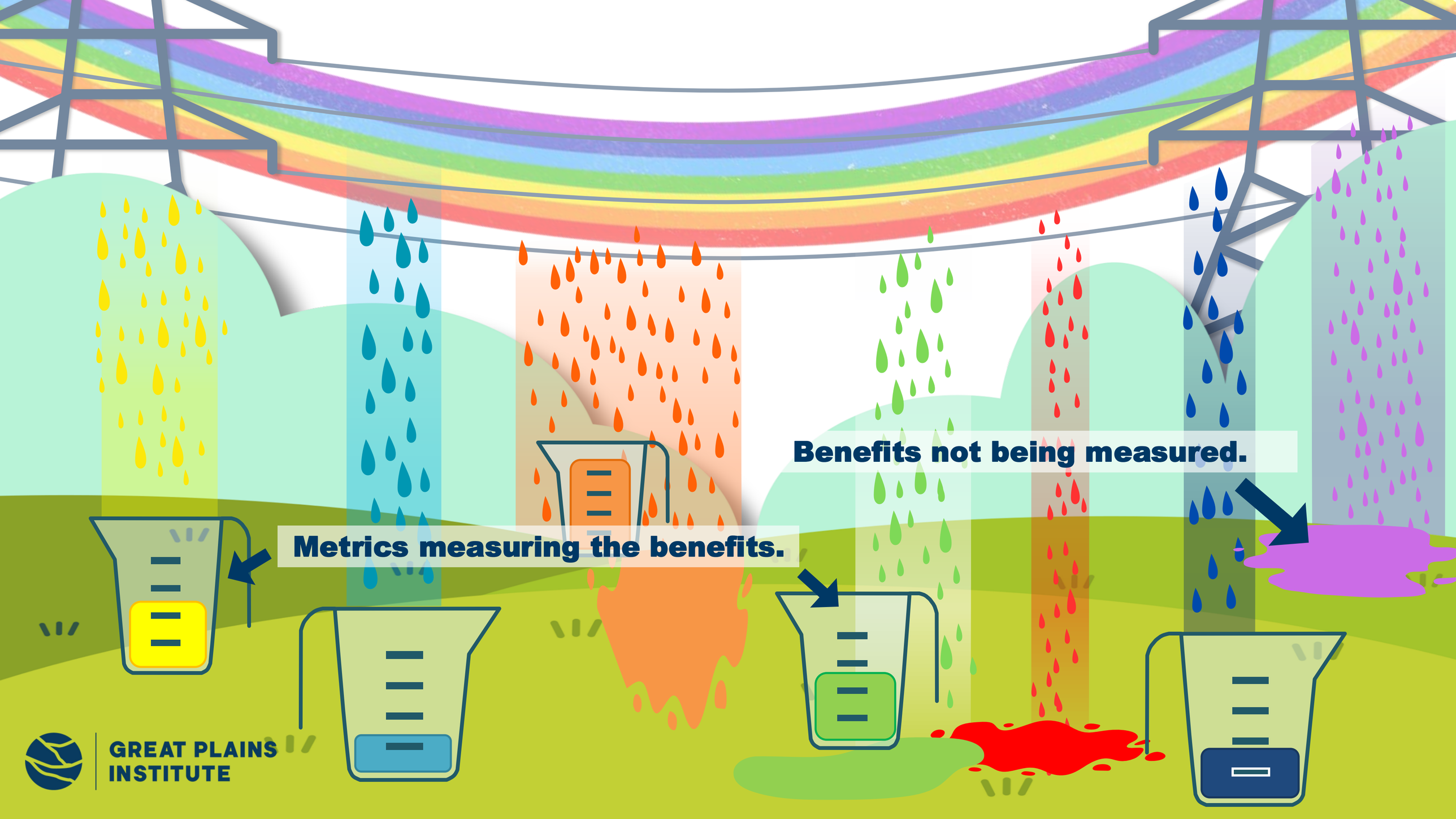
Benefits not being measured.
Metrics measuring the benefits.
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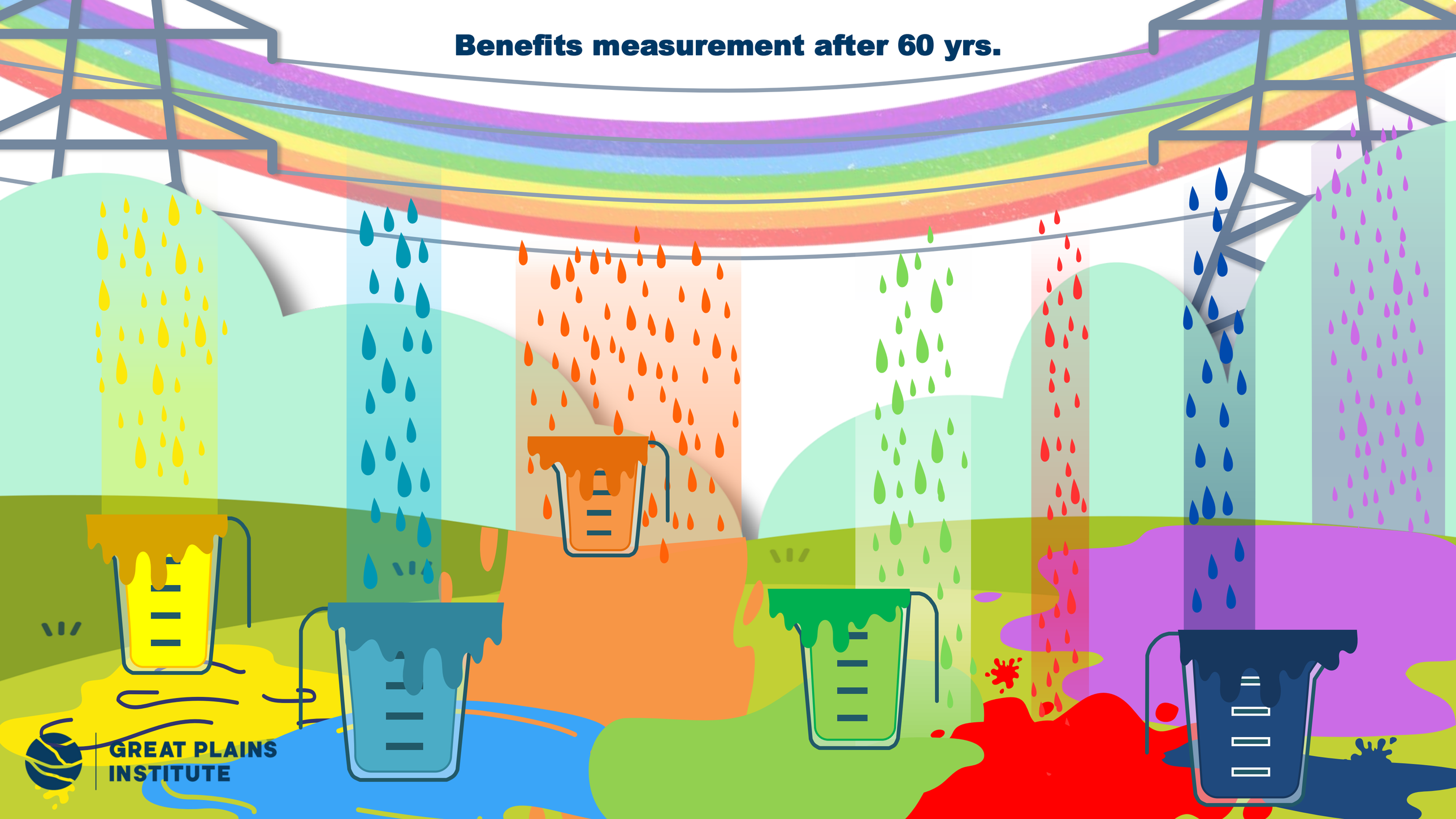
Benefits measurement after 60 yrs.



LIMITATIONS OF TOOLS TO MEASURE BENEFITS GRANULARLY

If we had better tools, allocating costs would be easy!

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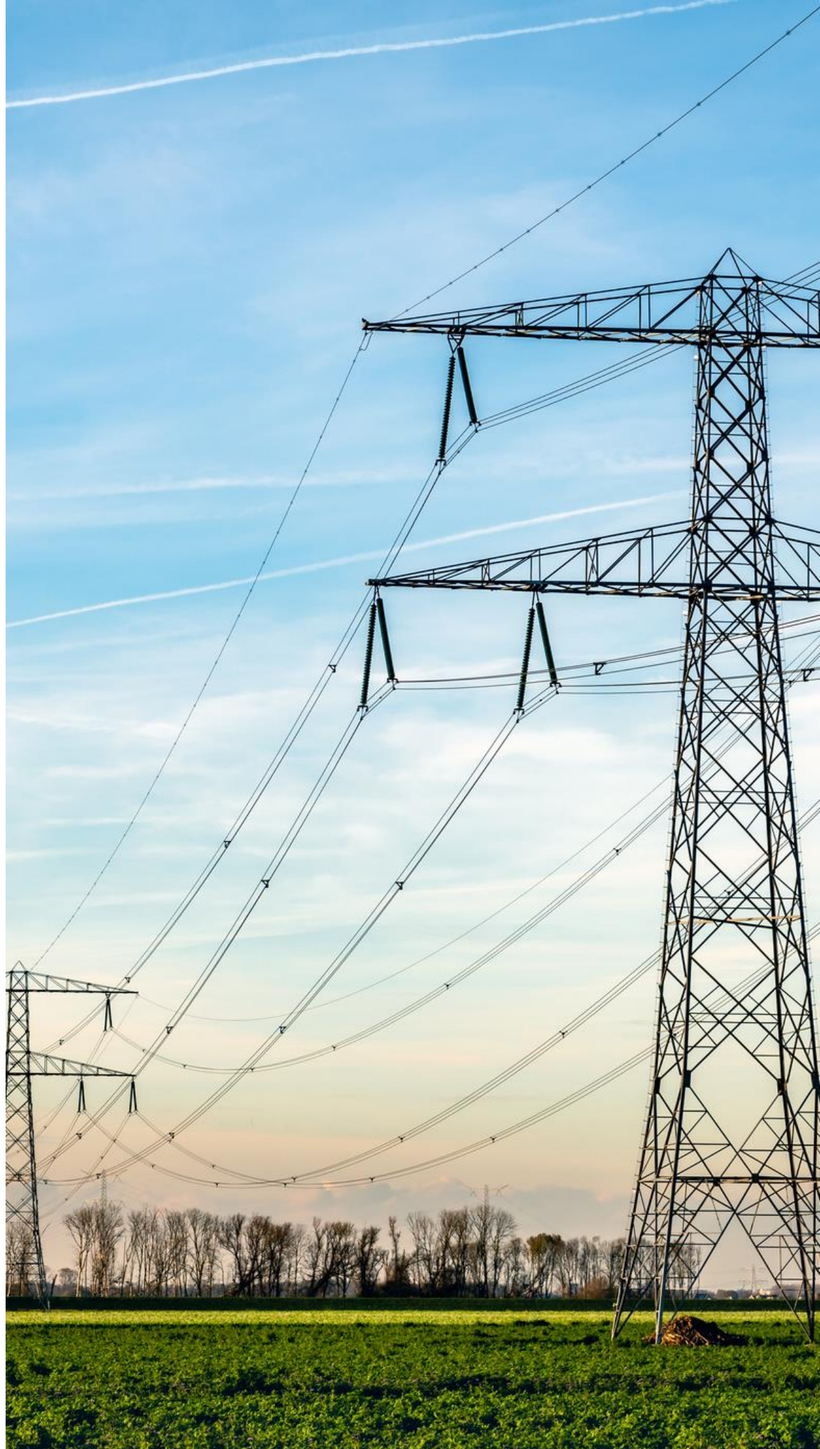
All Models are Just that, Models, and Each Model has its own Limitations

1. Necessary data is unavailable or untrustworthy
2. When models are:
    1. highly sensitive to assumptions that have variable trends
    2. dependent on discrete and hypothetical events, such as extreme weather events.
3. Some models cannot identify specific beneficiaries but only calculate benefits for the region
4. More than one model is used to calculate a specific benefit; each model has imprecision and uncertainty so adding models compounds that imprecision and uncertainty

There can be an inverse relationship between granularity and accuracy.



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What are Other Limitations in our Tools?

As noted above

1. We don’t have tools to measure all benefits flowing from large regional lines

2. Often, allocations are based on a snapshot in time when the Facilities are approved and do not reflect future changes of:
   a. transmission,
   b. generation and
   c. load.

3. While the asset lives is 60+ years, usually benefits are only measured for the initial 20 years ... so 66% of the benefits are ignored.

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DIRECTIONAL GOALS FOR ALLOCATING COSTS

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Don’t Get Stuck Designing Directional Goals

1. Goals for allocating costs will likely change as more information is gathered

2. Consider the initial discussion of goals to be **directional**, not definitive

3. Initially setting too many or definitive goals will likely hamper the ability to investigate various allocation methods

4. Initially, consider naming up to 3 or 4 directional goals

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Example Directional Goals

1. Maximize simplicity
2. Minimize free-ridership and ensure the right load pays
3. Reflect changing benefits and changing beneficiaries over time
4. Allocate some costs to generators if allowed under O1920
5. Apply a granular methodology if it is reasonably accurate
6. If using a granular method, assign some of the costs more broadly in addition to those costs assigned granularly
7. Recognize unmonetizable benefits
8. Recognize that the larger the Facility size (geography and/or voltage), the broader the spread of benefits even if benefits are not monetizable and/or the beneficiaries cannot be partitioned

THIS LIST IS NOT EXHAUSTIVE

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NARROWING ALLOCATION METHODS FOR LARGE REGIONAL LINES

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What are Example Cost Allocation Methods?

1. Granular Approach - Identify specific beneficiaries and monetize the savings for them.
2. Usage Rate (a/k/a Postage Stamp) – Same rate over specified region but charges allocated on based on volume of energy (MWh) or demand (MW)
3. Highway Byway – allocation based on voltage.
   - As voltage ⇧ so does geographic scope and % of applied usage rate
4. Voluntary (cannot be used for *Ex Ante* Method): parties voluntarily offer to pay.
5. Zonal (a/k/a License Plate): Geographic demarcations based on physical location of something, e.g. the Facility, the violations to be solved, etc.
6. Energy flows: Measures flows from the new Facility, e.g. DFAX, LODF

Granular Method

Advantages	Disadvantages
Proponents believe granular is politically preferable because the cost estimates can be compared with specific benefit estimates, and it is therefore easier to justify approving the expenditures.	Opponents believe granular is • not accurate, • mis-allocates costs • unfair.
Benefits/beneficiaries are usually calculated/identified once when the Facility is approved which is a simple approach. (Though the calculations can be quite complex.)	Granular allocations neither minimizes free ridership nor ensures the right load pays over the asset life, nor captures unmonetizable benefits.
Combination of Methods: Yes, including allocating costs to generators if O1920 allows it.	Fails to reflect changes in the benefits/beneficiaries over asset lives
Proponents believe it is reasonably accurate and can meet the roughly commensurate standard for large regional lines.	Opponents believe it is not reasonably accurate and cannot meet the roughly commensurate standard for large regional lines.
	Results can be "gamed" by those controlling the inputs to the benefit calculations.

Usage Rate

Advantages	Disadvantages
Because it is based on the beneficiaries' use of the regional grid, proponents believe • Easy to calculate, • Ensures the right load pays, • Minimizes free ridership, • Recognizes changes over time, and • Captures unmonetizable benefits.	The same rate is applied throughout the region and opponents would prefer different rates based on where the specific benefits are flowing.
Can be combined with other allocation methods, including granular and/or, if O1920 allows it, allocating costs to generators.	Because it applies the same rate throughout the region, opponents believe it is unfair.

Highway-Byway: combo of Usage Rate and Zonal

Advantages	Disadvantages
Proponents believe the usage rate portion: • Is easy to calculate, • Ensures the right load pays, • Minimizes free ridership, • Recognizes changes over time, and • Captures unmonetizable benefits. Byway Portion: • With a few exceptions, simple	Opponents of usage rate will likely reject a high % allocated on usage
if O1920 allows it, allocating a % of costs to generators is possible	With the exception of a % allocated to generators, adding a third methodology to this hybrid method would be complex
Easy to explain and, with a few exceptions, simple to administer	

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Voluntary

Advantages	Disadvantages
State Agreement Methods designed during the State Agreement Process (SAP) can be voluntary if they meet the requirements of O1920.	O1920 explicitly prohibits using a voluntary payment approach for the *Ex Ante* method. O1920 ¶ 1408 and FN 3008. Nothing in O1920A overturned that prohibition.
If states volunteer to pay for Facilities, the likelihood of obtaining that state approval is high.	No guarantee that all beneficiaries will agree to pay for it. So could lead to free ridership and the wrong load paying.
Simple.	Will not reflect temporal changes in benefits or beneficiaries.
	Negotiating agreement will likely take time (regulatory lag). Will need good facilitation.
	If the State Agreement Method is voluntary, it could increase the application of the *Ex Ante* Method when insufficient parties agree to pay for a Facility.

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Zonal

Advantages	Disadvantages
Can be combined with other allocation methods to meet the roughly commensurate standard	Zonal based on physical location of the Facility AND as a standalone method and will: • Not ensure the right load pays • Increase free ridership • Not reflect changes over time • Not capture unmonetizable benefits • Not likely meet the roughly commensurate standard.
Simple if based on the physical location of the Facility.	

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Flow - some consider it a subset of Zonal

Advantages	Disadvantages
Flow can be combined with other allocation methods	Flow may not meet the roughly commensurate standard if not combined with another method.
Flow – there are many flavors to measuring flow that will determine whether it • Ensures the right load pays, • Minimizes free ridership, • Recognizes changes over time, and/or • Captures unmonetizable benefits.	For Facilities that meeting a need that is non-flow based (such as a stability problem), it may not meet the roughly commensurate standard.
	Flow is quite complex.

Steps after applying the directional goals to each potential method

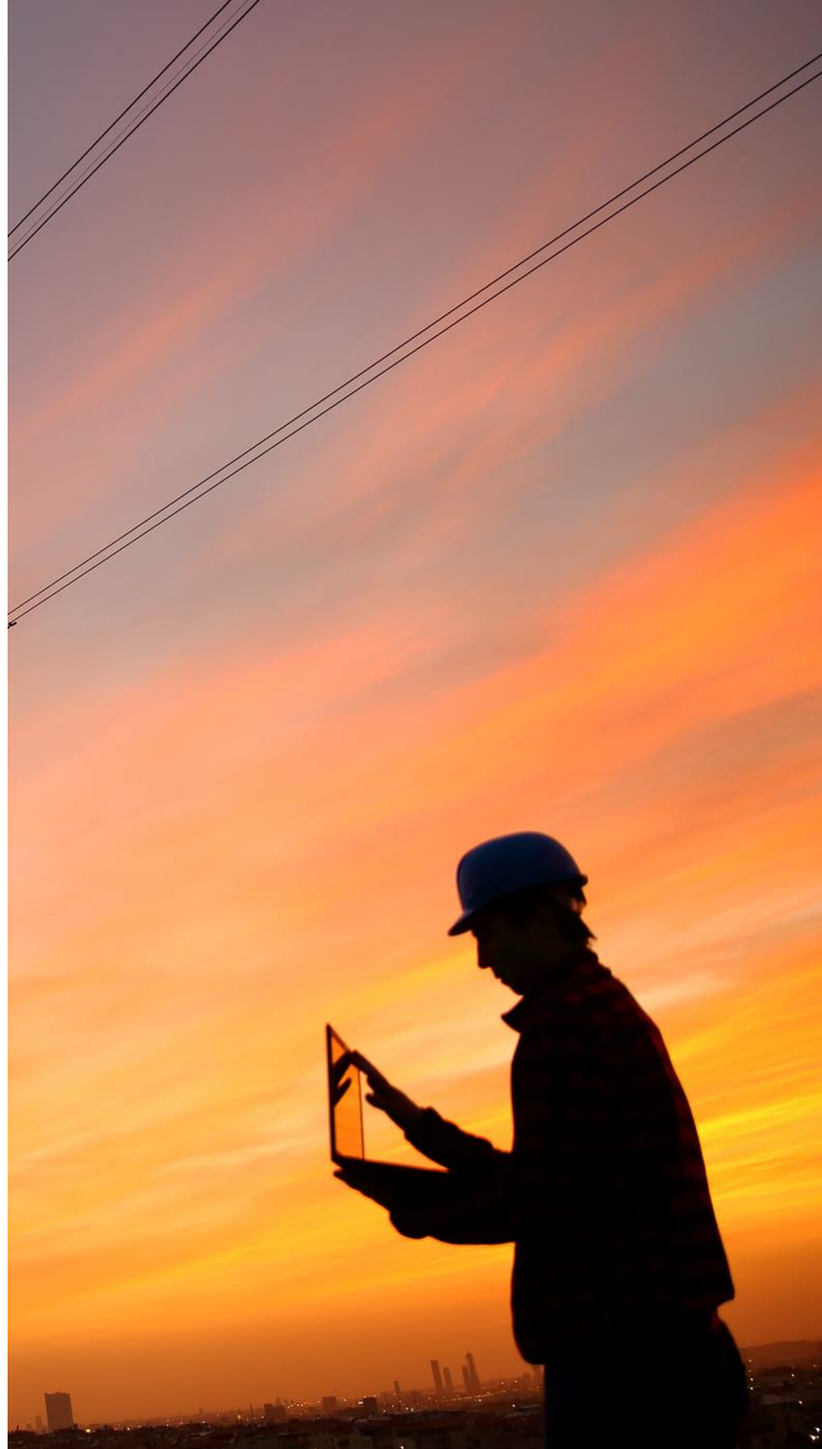
- Determine which of the methods deserve further consideration

AND

- Revisit your directional goals to see if any changes or refinements are warranted

THEN

- Further refine which methods you'd like to design.



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Thank you!

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Granular Method – more details

	Short Explanation
Politically desirable	Some believe a granular allocation is politically preferable because giving precise benefits to consumers is clear, can be easily compared against the cost estimates, and appears to be fair. Others believe a granular allocation, while it may be politically expedient, does not reflect the benefits/beneficiaries from large regional lines and therefore misrepresents reality. Opponents also note that specific results can be driven by those controlling the inputs.
Maximize simplicity	Sort of. Granular benefits are usually calculated only once, which is simple; however, the calculations themselves can be quite complex and controversial.
Minimize free ridership & Ensure Right Load Paying	No. For large regional lines, given the tool limitation, a granular allocation is unable to measure the full stream of benefits/beneficiaries coming from those lines over their asset lives. As a result, there is free ridership and some load is paying more than they should.
Reflects changes over time	No. Granular allocations are usually based on a snapshot in time when the Facilities are approved.
Compatible with allocating some costs to generators	If O1920 authorizes assigning costs to generators, a granular allocation can be combined with a partial allocation to generators.
Reasonably Accurate	Because of the tool limitations, strictly allocating costs based on benefit metrics will not be precisely accurate. As to “reasonably accurate” - THAT is in the eye of the beholder
Can combine granular allocation with another method	Yes. The percentage assigned granularly will need to be decided to ensure the roughly commensurate standard can be met.
Recognizes unmonetizable benefits	No. But a granular allocation can be combined with another method that would recognize unmonetizable benefits.
Reflects that the larger the line (voltage and geography), the broader the benefits/beneficiaries	Only insofar as the metrics capture the broader benefits.

Usage Rate Method – more details

	Short Explanation
Politically desirable	Some prefer the usage rate method because it recognizes the broad benefits from large regional lines and reflects changes over time as to benefits/beneficiaries. Others reject usage rate method because the same rate is applied throughout the region. The opponents would prefer different rates based on where the specific benefits are flowing.
Maximize simplicity	Mostly. Usage rates are based on the beneficiaries' use of the regional grid which is easy to calculate. However, the calculations are usually redone regularly (every year or few years).
Minimize free ridership & Ensure Right Load Paying	Yes. Usage Rates are broadly spread and if calculations are done regularly the right load should be paying.
Reflects changes over time	Yes, but only if the volume calculations are regularly updated.
Compatible with allocating some costs to generators	If O1920 authorizes assigning costs to generators, a usage rate method can be combined with a partial allocation to generators.
Reasonably Accurate	For large regional lines, many experts believe a usage rate is reasonably accurate over the life of the Facility. But again "reasonably accurate" is in the eye of the beholder.
Can combine Usage Rate with another method	Yes
Recognizes unmonetizable benefits	Because it is broad allocation based on the use of the regional grid, it captures unmonetizable benefits.
Reflects that the larger the line (voltage and geography), the broader the benefits	Only in so far as the usage rate is a broad cost allocation over a region.

Highway-Byway Method – more details

	Short Explanation
Politically desirable	Because the highway-byway method is easy to explain, this method will likely be politically desirable for those who are willing to apply a usage rate. Opponents of a usage rate will likely find Highway-Byway as politically undesirable.
Maximize simplicity	Simple to explain and relatively simple to calculate.
Minimize free ridership & Ensure Right Load Paying	Assuming that the large regional lines are long and higher voltage, then it is likely the usage rate would apply to them. The usage rate component is based on the beneficiaries' use of the regional grid and, as long as the usage is regularly re-calculated it will minimize free ridership and ensure the right load is paying.
Reflects changes over time	If the usage rate is mostly applied, yes. The usage rate component reflects temporal change if the volume calculations are regularly updated.
Compatible with allocating some costs to generators	If O1920 authorizes assigning costs to generators, Highway-byway could be combined with a partial allocation to generators. The percentages allocated under the usage rate and/or zonal method would need to be downwardly adjusted to give a percentage to generators
Reasonably Accurate	Those that support the usage rate method would likely find the highway-byway method reasonably accurate. Those that oppose the usage rate would probably object to the accuracy of this method.
Can combine Highway Byway with another method	Highway-byway is already a hybrid method, so adding a third method would be complex.
Recognizes unmonetizable benefits	The usage rate component certainly captures unmonetizable benefits.
Reflects that the larger the line (voltage and geography), the broader the benefits	Yes.

Voluntary – more details

Note: O1920 explicitly prohibited the use of a voluntary *Ex Ante* Method. O1920 ¶ 1408 and FN 3008.
Therefore, this only applies to State Agreement Methods.

	Short Explanation
Politically desirable	This method may be politically desirable because it is easy to explain and appears fair. AND it may be politically undesirable if it does not result in the building of necessary large regional lines.
Maximize simplicity	Simple to explain and relatively simple to calculate.
Minimize free ridership & Ensure Right Load Paying	There is no guarantee that all those benefiting from a Facility will volunteer to pay for it.
Reflects changes over time	No.
Compatible with allocating some costs to generators	If O1920 allows for an allocation to generators, then yes, some costs could be allocated to generators
Reasonably Accurate	There is no guarantee that all those benefiting from a Facility will volunteer to pay for it.
Can combine Voluntary with another method	Yes.
Recognizes unmonetizable benefits	Probably not.
Reflects that the larger the line (voltage and geography), the broader the benefits	No.

Flow and Zonal Methods – more details

	Short Explanation
Politically desirable	Used as stand-alone methods for large regional lines, neither the Flow or Zonal Methods have resulted in many new Facilities and, therefore, they are probably not politically desirable.
Maximize simplicity	Flow method is quite complex. If based on the physical location of the Facility, zonal is simple.
Minimize free ridership & ensure right load pays	Flow method has many different flavors and so it is unclear whether it will minimize free ridership and identify the right load. If based on the physical location only, zonal method will increase free ridership because it fails to recognize the benefits from regional flows and there is no assurance the right load will be paying.
Reflects changes over time	If the flow measurements are done regularly, then it will reflect changes over time. If based on the physical location only, zonal method does not reflect temporal changes.
Compatible with allocating some costs to generators	If O1920 authorizes assigning costs to generators, either the Flow or Zonal methods could be combined with a partial allocation to generators.
Reasonably Accurate	Neither the Flow or Zonal methods may be found “reasonably accurate” as a stand-alone method for large regional lines.
Can combine Flow/Zonal with another method	Combining the Flow and Zonal methods with another allocation method will increase the likelihood of meeting the roughly commensurate standard.
Recognizes unmonetizable benefits	Probably not.
Reflects that the larger the line (voltage and geography), the broader the benefits	No.

Order No. 1920

Long-Term Planning & Scenario Development

Presented by: Drew Siebenaler,
Senior Manager, Transmission Planning, Utilities

ELECTRIC POWER ENGINEERS

Agenda

- **Session One:**
  Evaluation Process & Selection Criteria
  - Learning Objectives
  - Context & Connection
  - Importance of Facility & Portfolio Evaluation
  - Evaluation Process & Selection Criteria
  - State Influence in the Evaluation Process
  - Discussion / Q&A
- **Session Two:**
  Scenario Development
  - Learning Objectives
  - Overview of Orders No. 1920/1920A
  - Scenario Development Specifics
  - Best Practices
  - Case Study
  - Discussion / Q&A

Session One:

Evaluation of Facilities & Portfolios

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Learning Objectives

- **Requirements of transmission facilities and portfolios evaluation.**
- **Summarize the seven required benefits for assessing transmission projects.**
- **Identify how Relevant State Entities (RSEs) can engage in the development of an evaluation process.**

Context & Connection

RSE Role: To Determine HOW & WHEN State, Local and Tribal Regulations & Policies are Incorporated

Scenario development lays the foundation for need identification & solution evaluation

Scenario development is part of planning process, evaluation criteria is decided in process development

Transmission planning decisions must be based on robust, forward-looking scenarios.

This ensures that evaluation incorporates Federal, state, local and tribal laws and regulations as well as stakeholder priorities.

Scenario outputs help determine which facilities and portfolios are necessary to meet future grid needs.

Even if the facilities and portfolios may not meet criteria for approvals

Result: Ensuring the evaluation incorporates laws and regulations affecting resource mix, demand and resource plans.

Importance of Facility & Portfolio Selection Criteria

“transmission providers must propose the evaluation process and selection criteria that they will use in Long-Term Regional Transmission Planning” Order 1920, Paragraph 915

Ensures Selection of Projects that Maximize Cost-Effectiveness

Identifies Projects that Align with Long-Term Transmission Needs

Helps Avoid Redundant Infrastructure or Stranded Assets

Importance of Facility & Portfolio Evaluation & Selection Criteria

Transmission providers in each transmission planning region must establish a Long-Term Regional Transmission Planning evaluation process that:

(1) Identifies Long-Term Regional Transmission Facilities that address Long-Term Transmission Needs;

(2) Measures the benefits of the identified Long-Term Regional Transmission Facilities consistent with the final rule requirements; and

(3) Designates a point in the evaluation process at which transmission providers will determine whether to select or not select identified Long-Term Regional Transmission Facilities in the regional transmission plan for purposes of cost allocation.

Order 1920, Paragraph 916

Translation:

A. **Maximize cost-effectiveness**

B. **Identify long-term solutions**

C. **Reduces risk of under/over building**

Not required to select any project, only required to have a process

What must be included in the Evaluation Process Tariff

- **Evaluation process must ID one or more Facilities or portfolios that address need.**
- **evaluation processes must (not can) compare the measured benefits of LTRT Facilities against their estimated costs**
- **may propose qualitative measures in their evaluation processes or qualitative selection criteria**
- **evaluation processes must culminate in a *determination*—not selection criteria—that is sufficiently detailed for stakeholders to understand why a particular LTRT Facility (or portfolio of such Facilities) was selected or not selected**
- **TPs must designate a point in the evaluation when they will determine whether to select or not select LTRT Facilities or portfolios. This point must be no later than three years following the beginning of the LTRTP cycle.**
- **evaluation processes and selection criteria must seek to maximize benefits accounting for costs over time without overbuilding transmission facilities. This maximization of benefits must also account for costs.**

Seven Benefit Categories

Order 1920, Paragraph 719

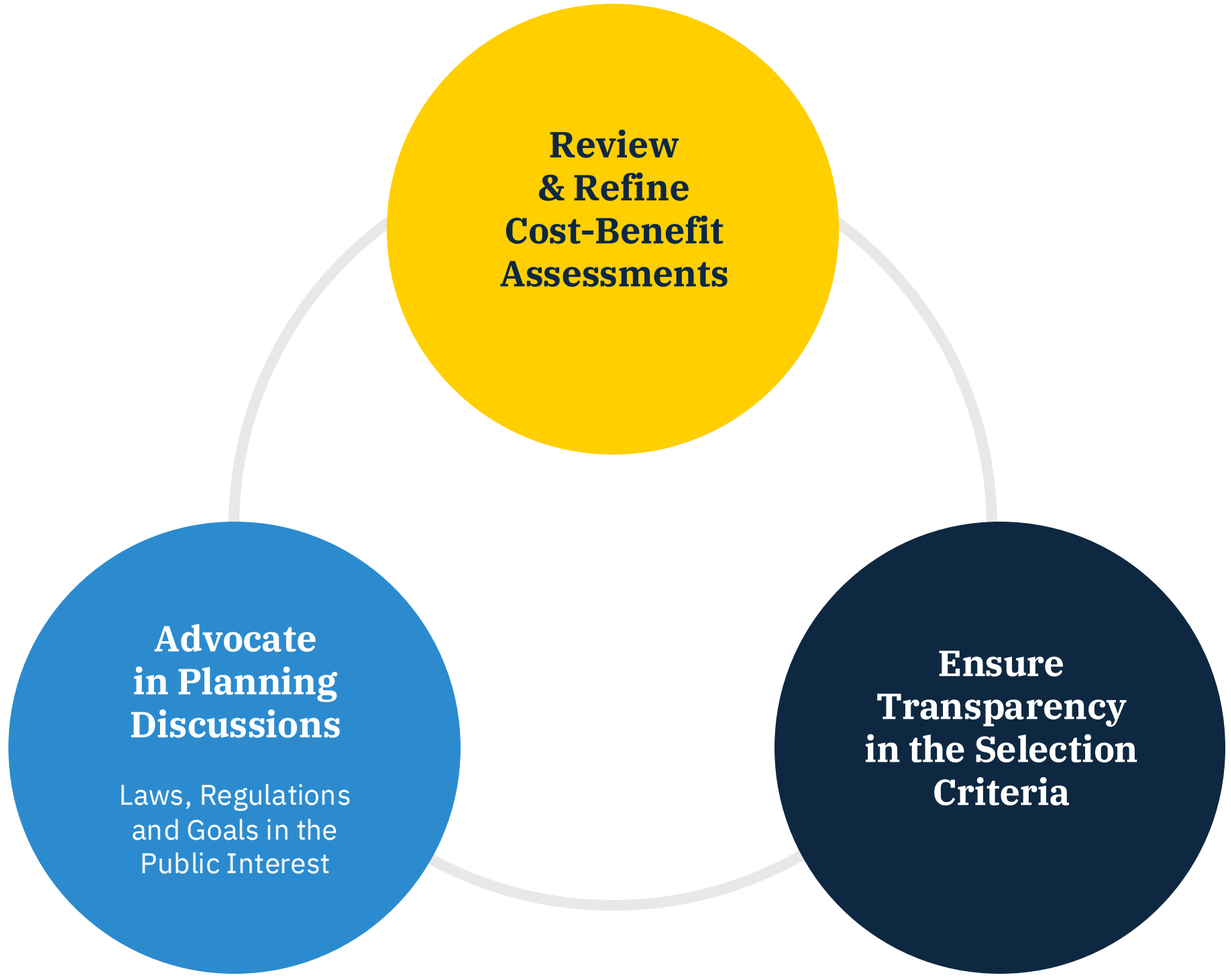
1. **Avoided reliability facility costs**
2. **Reduced loss of load probability**
3. **Production cost savings**
4. **Reduced transmission energy losses**
5. **Reduced congestion during outages**
6. **Reduced congestion generally**
7. **Capacity cost benefits from reduced peak energy losses**

State Influence in the Evaluation Process

1. **TPs are "encouraged" to consider any selection criteria supported by RSEs. (Order 1920A ¶ 459)**

2. **TPs to demonstrate that they made good faith efforts to consult with and seek support from RSEs on the evaluation processes and selection criteria.**

RSEs: Make sure the selection criteria addresses your needs!



Key concepts for State Influence in the Evaluation & Selection Criteria Development

Transparency

- **Listing of alternatives**
- **Benefits of each alternative**
- **Cost of each alternative**
- **Technologies utilized**
- **Facility impacts and potential locations**

Clarity

- **How each benefit is calculated (i.e. what are avoided reliability costs anyway)**
- **Spread of benefits and costs**
- **Type and quality of estimate used (NPV vs ISD$)**

Alignment

- **Use of existing facilities and/or co-location**
- **Public impacts (noise, land-use, EMF, etc.)**
- **Emissions reductions**
- **Renewable adoptions**
- **Future expansion**

Session Two:

Scenario Development

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Learning Objectives

- **Describe the scenario development requirements in Orders 1920 and 1920A.**
- **Identify key inputs and data sources for scenario modeling.**
- **Recognize how Relevant State Entities (RSEs) can influence scenario development.**

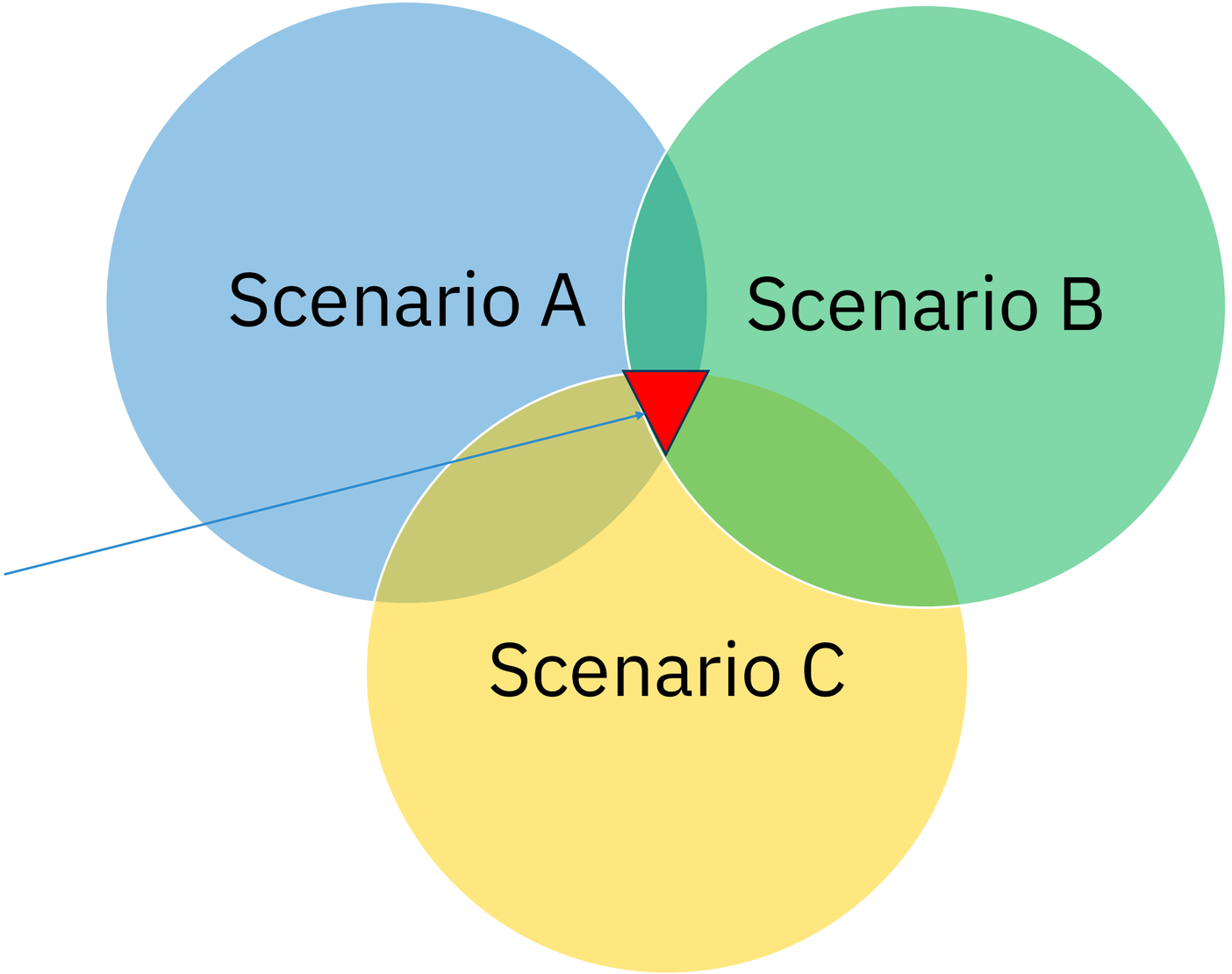
FERC Orders No. 1920 / 1920A

Long-Term Regional Transmission Planning

- **Issued May 13, 2024**
- **Mandates forward-looking scenario development to ensure grid reliability, economic efficiency, and resilience**
- **Requires at least three plausible and diverse scenarios reflecting different grid futures**
- **Must cover at least a 20-year horizon**

Why Scenario Development Matters

- **Ensures long-term grid reliability by anticipating a wide range of changes to the system.**
- **Helps avoid stranded assets and over/under building.**
- **Aligns regional planning with Federal, state, local and tribal laws and regulations.**



Why Scenario Development Matters

Ensures Long-Term Grid Reliability by Anticipating Changes to the System

Helps Avoid Stranded Assets & Overbuilding

Aligns Regional Planning with Federal, State, Local and Tribal regulations affecting resource mix, demand and resource plans

Role of RSEs in Scenario Development

- **States must have a meaningful opportunity to provide timely input on the development of Scenarios, including factors and data inputs, and to explain how their own policies and planning affect LTT Needs.**
- **Specifically, TPs shall consult with RSEs and any other authorized entities as to:**
  - whether a specific RSE law or regulation affecting resource mix, demand and resource plans must be accounted for as a factor within each category (i.e., if the specific state law or regulation will likely affect LTT Needs),
  - how to account for the specific laws and regulations affecting resource mix, demand and resource plans in the development of Scenarios (e.g., the method and data used to forecast generation resources added because of a specific state law or regulation), and
  - how to adjust the treatment of the specific state laws and regulations affecting resource mix, demand and resource plans across Scenarios (e.g., assume certain outcomes related to laws and regulations materialize in some but not all Scenarios).
- **TP should rely on a state in determining how to account for a state laws and regulations affecting resource mix, demand and resource plans in scenarios BUT if a laws and regulations affecting resource mix, demand and resource plans impact Long-Term Transmission Needs, the TP should determine how to account for that impact**
- **TPs to publish information regarding the factors to be incorporated into the development of Scenarios as part of each LTRT Planning cycle after stakeholders, including states, have had a meaningful opportunity to propose potential factors and to provide input on how to account for specific factors in the development of Scenarios. But the publication must occur before TPs finish developing Scenarios, and, in any event, well before the TP has identified LTT Needs.**

Translation:

- States have a voice, and need to be given a chance to weigh in
- TPs consult with to RSEs on:
  - How the laws and regulations affecting resource mix, demand and resource plans impact results
  - How each law and regulation affecting resource mix, demand and resource plans is accounted for
  - How and when to shift implementation
- States have the final say in how laws and regulations affecting resource mix, demand and resource plans should be incorporated
  - TP determines how to handle impacts such issues
- TPs must state their assumptions
  - After stakeholder and state input
  - Before the assumptions are finalized
  - Well before need identification

Scenario Development

Order 1920, Paragraph 409

Seven specific categories of factors must be incorporated into the development of the system scenarios:

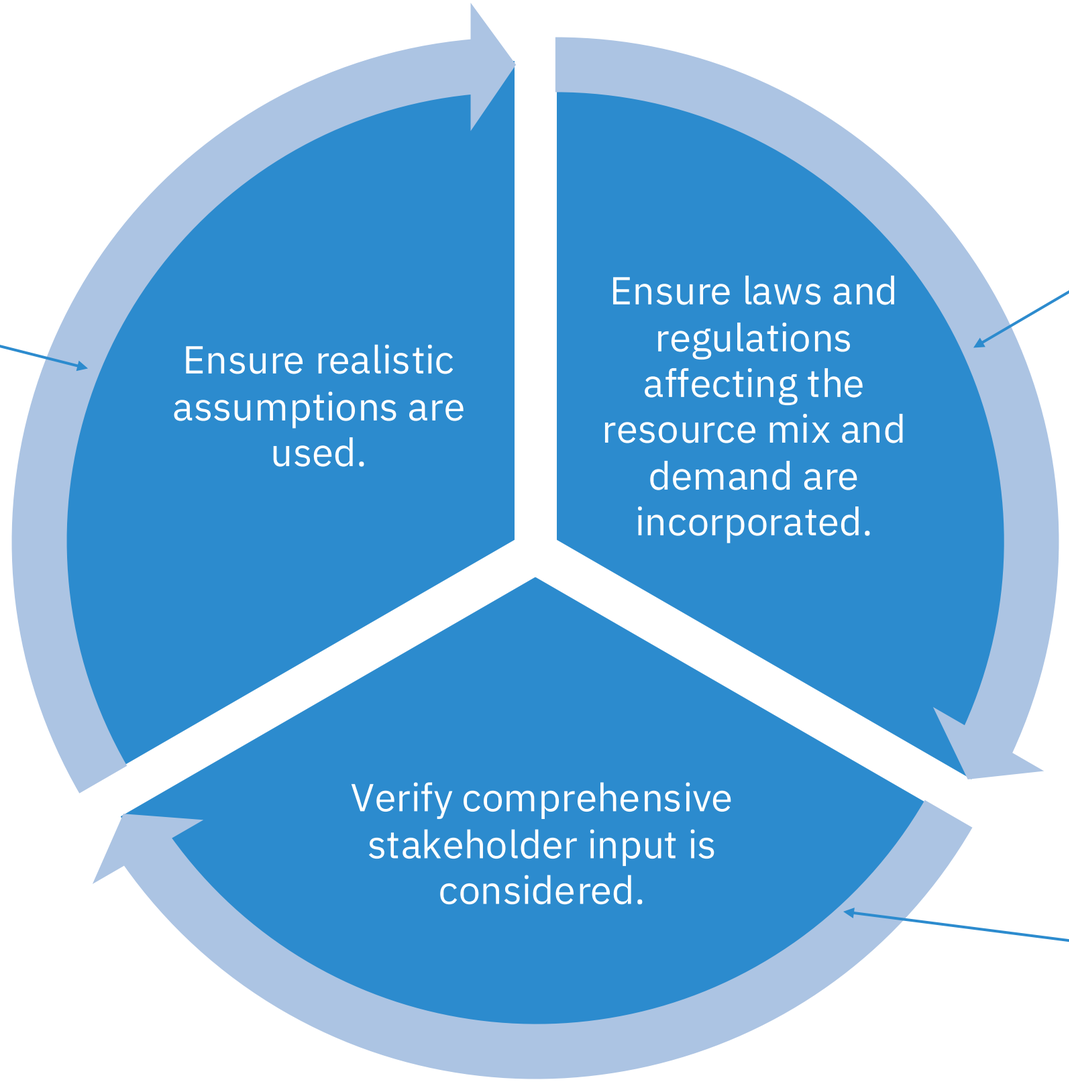
1. Federal, federally recognized tribal, state and local laws and regulations affecting the resource mix and demand;
2. Federal, federal recognized tribal, state, and local laws and regulations on decarbonization and electrification;
3. State-approved IRPs and expected supply obligations for LSE's;
4. Trends in fuel costs and in the cost, performance, and availability of generation, electric storage resources, and building and transportation electrification technologies;
5. Resource retirements;
6. GI requests and withdrawals;
7. Utility commitments and federal, federally recognized tribal, state, and local law or regulation that affect transmission needs.

Order 1920A, Paragraph 218

- **Includes considerations for:**
  - Extreme Weather
  - Generation Mix Changes
  - Economic Factors
- **Scenario diversity key to account for different futures**
- **Regular review and updates ensures scenarios are relevant**
- **Stakeholder engagement ensures scenarios are incorporate key factors and are appropriate**

Influencing Scenario Development

Requirement of the TP with specific emphasis on state participation

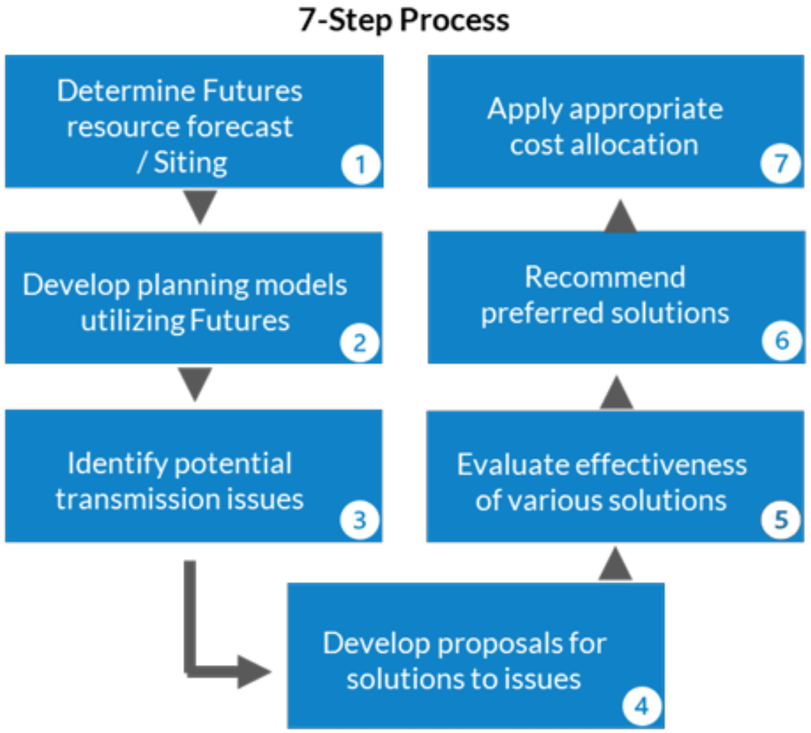


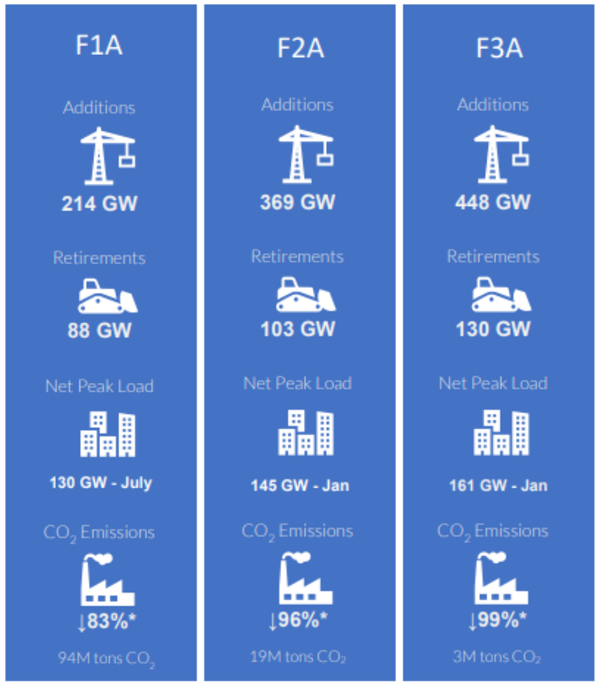
RSE is the primary driver

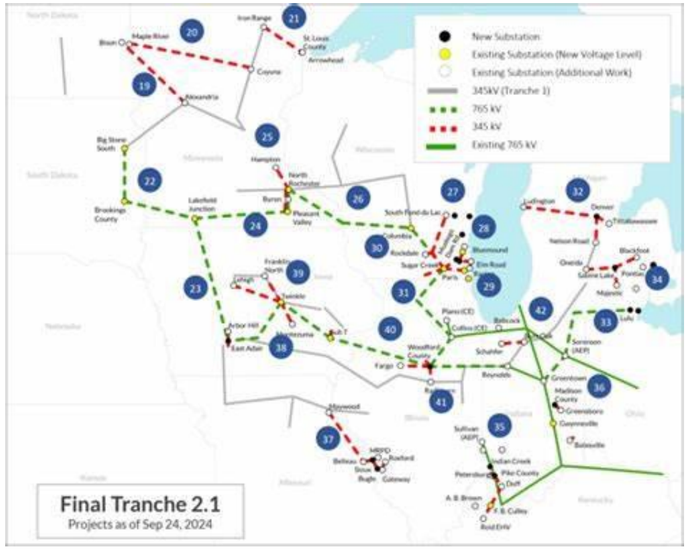
Requirement of the TP with specific emphasis on state participation

Best Practices - Example

MISO's 7-Step Process

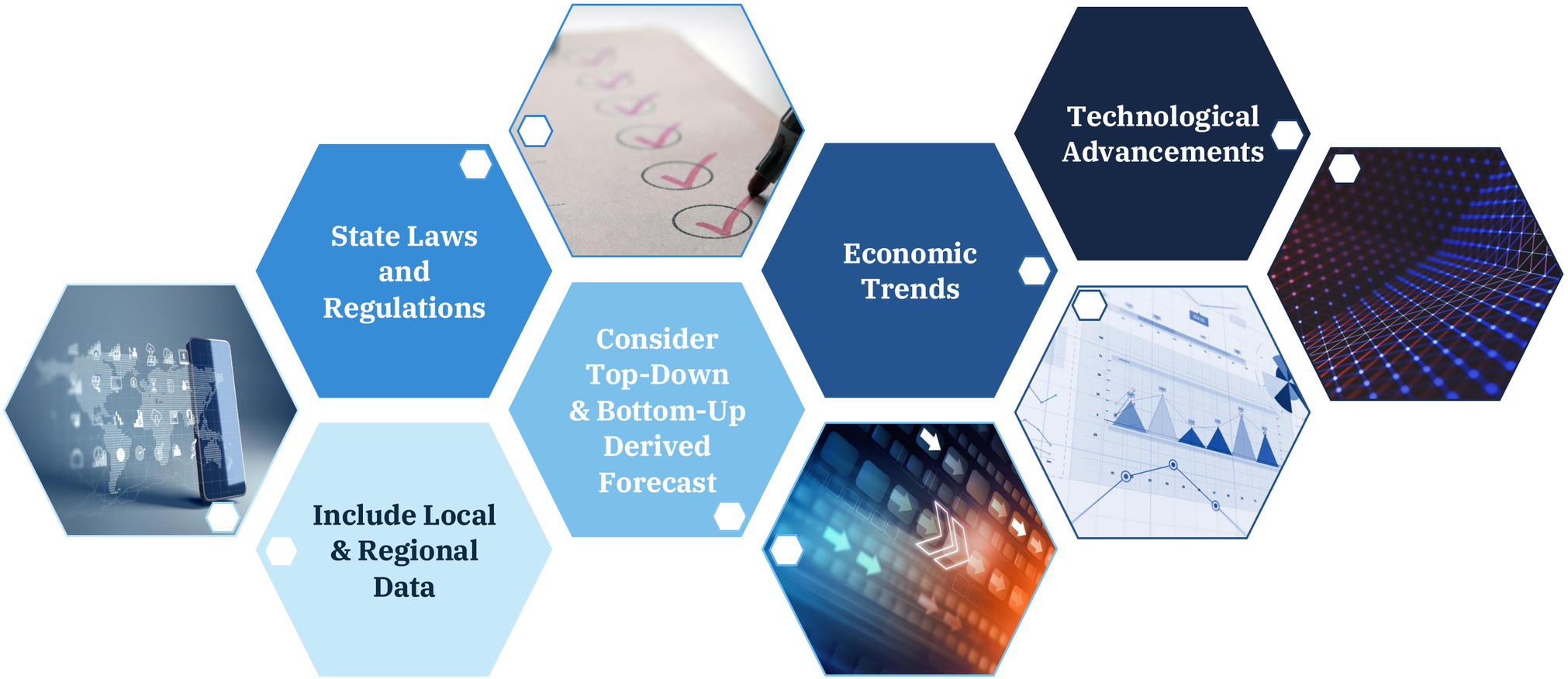






Best Practices

Data Integration



Common Challenges

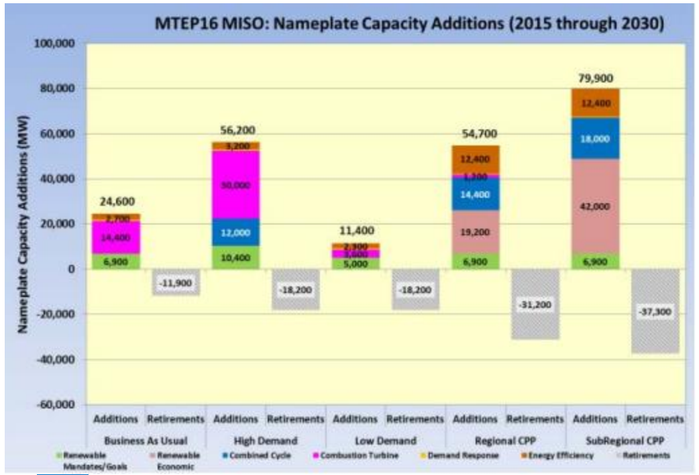
- **Data Gaps**
  - Minimum 20-year load forecast, do all utilities have this data?
- **Forecasting Uncertainty**
  - Hydraulic Fracturing: Does it stay, or does it go?
  - Large Loads: How many and where?
  - Storage: Is it cost competitive?
  - Nuclear: SMRs, are they in the mix?
  - Disruptors: Fusion, grid-forming technologies, AI
- **Regulatory Misalignment**

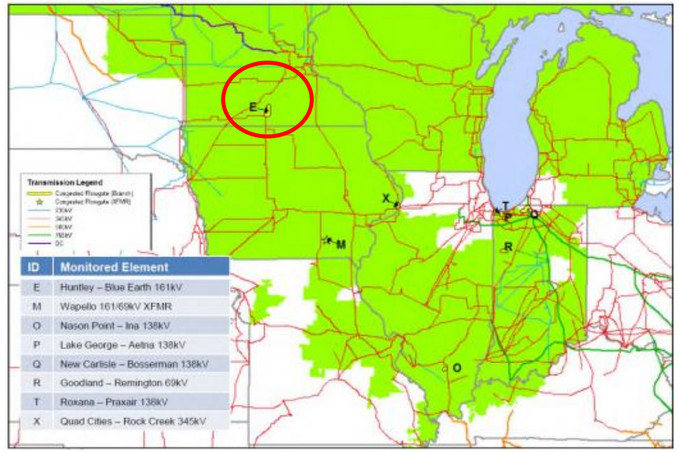
Sample Questions to Ask in the Planning Process

- **Scenario Development**
  - Does this meet local and state requirements across the footprint?
  - Will another area's requirements impact the needs in my area?
- **Resource Expansion and Siting**
  - What reserve margins are being enforced? How do they compare with State/Regional requirements?
  - Does the projected resource mix meet hourly variability and balancing?
  - Are the resources located in areas that align with local regulations and public sentiment?
- **Need Identification**
  - How sensitive are the needs to changes in generation and demand locations?
  - What are the minimum viable solutions, and what value do those produce?

Example of Evaluation Process

Case Study: Huntley – Wilmarth 345 kV Market Efficiency Project





ID	Project Description	MISO Cost Estimate (2016 $M)	Flowgate(s) Addressed	Pass Screening
I-01	Huntley – Wilmarth 345 kV new circuit (double bundled 954 Cardinal ACSR)	$65.0	E	Y
I-02	Huntley – Wilmarth 345 kV new circuit (double bundled 1780 Chukar ACSR)	$70.0	E	Y
I-03	Huntley – Wilmarth 345 kV new circuit (2-795 ACSS)	$90.0	E	Y
I-04	Huntley – Wilmarth 345 kV new circuit (double bundled 1272 54/19 ACSR)	$67.0	E	Y
I-06	Huntley – South Bend – Wilmarth 345 kV new circuit; South Bend 161 kV substation upgraded to 345 kV and existing 161/115 kV transformer replaced by a 345/115 kV transformer, also retire Blue Earth – South Bend 161 kV	$107.0	E	Y
I-07	Huntley – Wilmarth – Cedar Mountain 345 kV new circuit	$214.0	E	Y
I-08	Huntley – South Bend – Wilmarth – Cedar Mountain 345 kV new circuit; South Bend 161 kV substation upgraded to 345 kV and existing 161/115 kV XFMR replaced by a 345/115 kV transformer, also retire Blue Earth – South Bend 161 kV	$231.0	E	Y
I-09	Lakefield Junction – Cedar Mountain 345 kV new circuit	$158.0	E	Y
I-10	Lakefield Junction – Cedar Mountain 345 kV; 3rd 345/161 kV Lakefield transformer	$167.0	E	Y
I-11	Huntley – West Owatonna – North Rochester 345 kV new circuit; West Owatonna 161 kV substation upgraded to 345 kV with a new 345/161 kV transformer	$229.0	E	Y
I-12	Huntley – N. Rochester 345 kV new circuit	$160.0	E	Y
I-13	Colby – Adams 345 kV new circuit	$99.0	E	Y
I-14	Huntley – South Bend 161 kV upgrade; South Bend – North Point – Wilmarth – Swan Lake – Ft. Ridgely – Franklin 115 kV upgrade; Franklin – Cedar Mountain 115 kV does not need to upgrade; South Bend 161/115 kV transformer replacement	$55.0	E	Y
I-15	Huntley – South Bend 161 kV reconductor, South Bend – Wilmarth 161 kV new circuit; Wilmarth substation 161 kV expansion with a 345/161 kV and a 161/115 kV transformer	$38.0	E	Y
I-16	Huntley – Loon Lake – West Owatonna 161 kV; Loon Lake substation 161 kV expansion with a 161/115 kV transformer	$59.0	E	Y
I-19	Freeborn – West Owatonna 161 kV new circuit	$27.0	E	Y

ID	Transmission Solution	Model	MISO Cost Estimate (2016 $Millions)	Benefit to Cost Ratios						20-yr PV Benefit ($ Millions)
				BAU	HD	LD	RCPP	SRCPP	Weighted	
I-2	Huntley – Wilmarth 345 kV new circuit	Base	$88-108	0.43-0.52	1.16-1.42	0.10-0.13	1.32-1.62	3.63-4.45	1.51-1.86	$210
		Queue Wind Sensitivity		1.39-1.71	2.40-2.95	0.69-0.85	2.45-3.01	2.03-2.49	1.86-2.28	$251
I-2b	Huntley – Wilmarth 345 kV new circuit, Wilmarth to Swan Lake – Ft Ridgely 115 kV upgrade	Base	$113.3-133.3	0.37-0.43	1.12-1.31	0.09-0.10	1.15-1.35	3.31-3.90	1.36-1.60	$234
		Queue Wind Sensitivity		1.13-1.33	2.08-2.45	0.55-0.65	2.02-2.39	1.73-2.03	1.55-1.83	$259
I-2d	Freeborn – West Owatonna 161 kV new circuit	Base	$154.8-174.8	0.27-0.31	0.92-1.04	0.08-0.10	0.98-1.11	3.03-3.43	1.21-1.36	$272
		Queue Wind Sensitivity		0.86-0.97	1.74-1.97	0.44-0.50	1.68-1.90	1.55-1.76	1.30-1.47	$285

ID	Transmission Solution	B/C Above 1.0?	Highest B/C Ratio?	Highest 20-yr PV Benefit?	% Congestion Relief (Year 2031)
I-2	Huntley – Wilmarth 345 kV new circuit (double bundled 1780 Chukar ACSR)	✓	✓	✓	100%
I-15	Huntley - South Bend 161 kV reconductor, South Bend – Wilmarth 161 kV new circuit; Wilmarth Substation 161 kV expansion with a 345/161 kV and a 161/115 kV transformer	✓	×	×	66%
I-19	Freeborn – West Owatonna 161 kV new circuit	✓	×	×	30%

Thank you!

ELECTRIC POWER ENGINEERS

Presenter

Drew Siebenaler

Senior Manager, Transmission Planning, Utilities

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- **Joined EPE in 2025**
- **13 years of experience in transmission system planning, including:**
  - System Modeling
  - Reliability Planning
  - NERC Compliance
  - Energy Market Analysis
  - Permitting
  - Regulatory and Ratemaking Support
- **Prior Roles**
  - Utility Planning - 10 years
  - Regional Planning, Mid-Continent Area Power Pool (MAPP) - 3 years

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Additional Resources

- **FERC Order 1920 and 1920A Final Rules: FERC.gov**
- **NARUC Transmission Planning Reports and Resources: NARUC.org**
- **Regional Transmission Planning Best Practices: DOE Grid Deployment Office**
- **Scenario Planning Guides: RTOs (MISO, PJM, CAISO, etc.)**
- **Academic Papers on Long-Term Transmission Planning: NREL, EPRI, and National Labs**

- **Today's Presenter:**
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The Engagement Period: A Critical Opportunity for States to Define their Futures

Immediate Opportunities for States

1. Prioritize the RSE regional group's (“Group”) focus for the Engagement Period. As explained today, opportunities include:
   a. Ex Ante Allocation Method – design and/or comment on
   b. State Agreement Process – design and/or comment on
   c. Evaluation Process and Selection Criteria – comment on
2. ID and gather necessary resources to support the Group's priorities
3. Resources for the Group are available from Transmission Providers (TPs)
4. Early and regular meetings among Group's members will garner trust and provide the opportunity for deep thinking

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Additional Considerations

1. The duration of the Engagement Period is limited
2. FERC has given individual states and the Group unique and useful powers under Orders 1920 and 1920A
3. The Group's interests and approaches may differ from the TPs
4. The Group may consider whether it wants to
    a. Organize its own activities or rely on the TPs to organize Group activities
    b. Identify its own priorities or rely on the TPs for the prioritization
    c. Design its own ideas or only provide feedback to ideas proposed by the TPs

Info about DOE Technical Assistance through the DOE Labs can be Found Here:

Website: https://emp.lbl.gov/projects/state-TA-program

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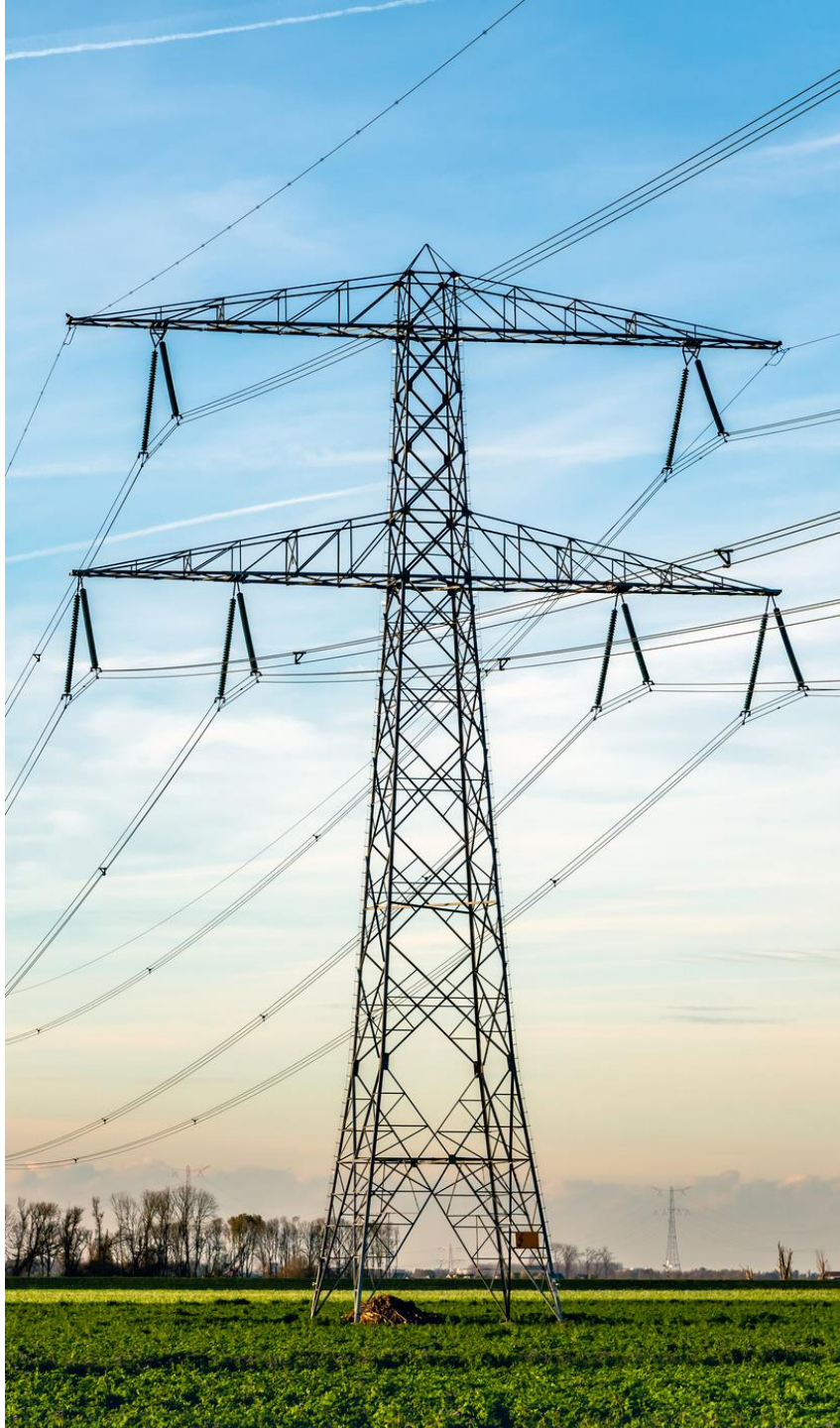

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Thank you!

For additional assistance and technical support, please contact Great Plains Institute & Azar Law LLC

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