ENERGY
FUTURES
FINANCE
FORUM

EFI FOUNDATION

Regional Planning & Cost Allocation

Energy Futures Financing Forum (EF^3)
Pre-Launch Seminar
April 11, 2024

EF³'s focus is intra-regional backbone lines that are now <u>underweighted</u> in transmission capex

Transmission Segment
Generator interconnection point
Low- and medium-voltage lines within LSE territories (new & upgrades)
Short-term reliability and economic upgrades/replacements of ISO/RTO controlled lines
Long-term expansion of intra-regional backbone lines within ISOs/RTOs (higher voltage such as 345-765kV)
Inter-regional HVAC lines—long distance and at "seams"
Inter-regional HVDC lines

>90% of $$ per Brattle & Grid Strategies

Current spending ratio leads to inefficient capital deployment

<10%

Greater regional investment would lower costs and increase reliability

Timeliness of EF³'s Transmission regional planning & cost allocation study (RP/CA)

ENERGY FUTURES FINANCE FORUM

- **FERC's Order 1000** (July 2011) set forth RP/CA suggested practices, which have been implemented in different ways by ISO/RTOs.
  - The existing long-term RP/CA template under Order 1000 was not crafted to meet modern needs. Large Generator Interconnect Procedures a poor substitute, hence a 2.6 million MW interconnection queue.
- **FERC's May 2022 NOPR,*** which will soon generate a final rule updating Order 1000:
  - The May 2022 NOPR outlines best practices, based on regional successful precedents and expert consensus.
  - Effectiveness of the final rule will depend on strength of *requirements* for implementation of best practices.

* FERC's "Building for the Future Through Electric Regional Transmission Planning and Cost Allocation and Generator Interconnection,, Docket No. RM21-17-000" as the "May 2022 NOPR"

EF^3's High-Level Conclusions

ENERGY FUTURES FINANCE FORUM

1. Long-term regional planning of transmission: not new bureaucracy or top-down industrial policy. A critical complement to conventional annual capital budgeting for reliability and congestion.
2. Decisions about who pays for transmission can be simplified by integrating the planning process i.e., identifying, evaluating, and selecting the projects) and the cost allocation process (i.e., deciding how costs should be spread)
3. Transmission investment is necessary to facilitate decarbonization. But <u>climate benefits of decarbonization are not necessary to justify a massive grid buildout.</u>

Today's spiral: "regional planning" failing, creating unworkable over-reliance on "interconnect process" (see May 2022 NOPR (#36))

ENERGY FUTURES FINANCE FORUM

Expanding main grid requires L-T regional planning & allocation to beneficiaries (Order 1000, etc.)

RTO stakeholders dispute benefits, i.e., "policy" & claims "costs not commensurate w/ benefits"

Dissatisfied RTO stakeholders intervene (FERC) and sue in (Federal) courts

Available high voltage capacity for new generation & new load evaporates, no long-term planning

Failure → Over-reliance on Order 2003/2023 generator interconnect process

LGIP assigns "network upgrade" to generators (high/low/med volt) (cost causality)

LGIP is an inefficient, clumsy way to expand the main regional grid

Analysis and reanalysis of shifting clusters of generators causes delay and risk.

Generation growth stalls, projects die, & interconnect queues grow longer

Failure leads FERC to attempt changes to 1000

?

(See detailed FERC description of issues w/ RP/CA vs. interconnection process in Appendix)

EFI FOUNDATION

FERC's principal solutions at the highest level & nexus to Federal Power Act

"[W]e preliminarily find that reforms are needed to the Commission's existing <u>regional transmission planning and cost allocation requirements</u> because they fail to require public utility transmission providers to:

A. **perform a <u>sufficiently *long-term* assessment</u> of transmission needs;**

B. **adequately account on a <u>forward-looking basis</u> for <u>*known determinants* of transmission needs</u> driven by <u>*changes in the resource mix and demand*</u>; and**

C. **consider the <u>*broader* set of benefits and beneficiaries of transmission facilities</u> planned to meet those transmission needs.**

…We believe that these deficiencies may be resulting in unjust and unreasonable and unduly discriminatory and preferential Commission-jurisdictional rates."

**May 2022 NOPR @ paragraph #47. Emphasis and underlining added.*

Process flow of FERC's principal RP/CA solutions in May 2022 NOPR

SG0

ENERGY FUTURES FINANCE FORUM

PLANNING COMPONENTS

1. PARAMETERS:
Time frame & assumptions about future

2. EVALUATION:
Benefits vs. Costs. All or some benefits? Single project vs. portfolio?

3. SELECTION:
If "selected for allocation", will costs to LSEs be "roughly commensurate w/ benefits"?

ALLOCATION:

Is the "allocation" method a simple *ex ante* or a contentious *ex-post* renegotiation among states?

EFI FOUNDATION

*This graphic draws heavily on various papers done singly or jointly by Rob Gramlich (Grid Strategies) and Johannes Pfeifenberger (Brattle).

Slide 7

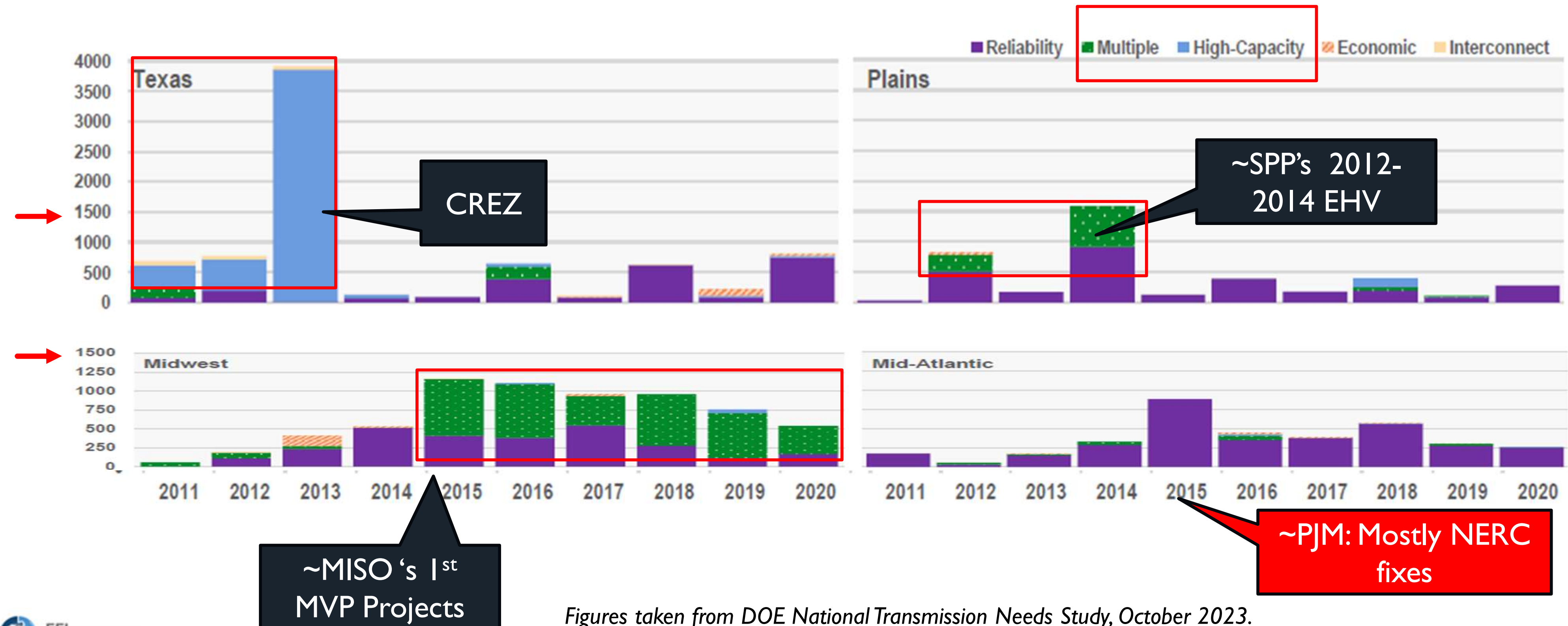
SG0 Delete

Sonia Griffen, 2024-04-09T17:44:50.511

#1 Parameters: 20-year long-term planning is complementary to short-term

ENERGY FUTURES FINANCE FORUM

- Today's big grid buildouts sporadically happen in big, laboriously assembled portfolios, if at all. On a routine basis, regions build transmission due mostly to near-term reliability violations.



Figures taken from DOE National Transmission Needs Study, October 2023.

EFI FOUNDATION

#1 Parameters: What is "known" about "*changes in the resource mix and demand*"?

"…[S]ome transmission planning regions do a better job than others in accounting for *changes in the resource mix and demand**…[N]one do so in a manner that ensures the consideration of more efficient or cost-effective transmission facilities to meet transmission needs driven by *changes in the resource mix and demand*." (#51)

Factors that are "*known* in advance and have reasonably predictable effects …in the aggregate*" (#51):

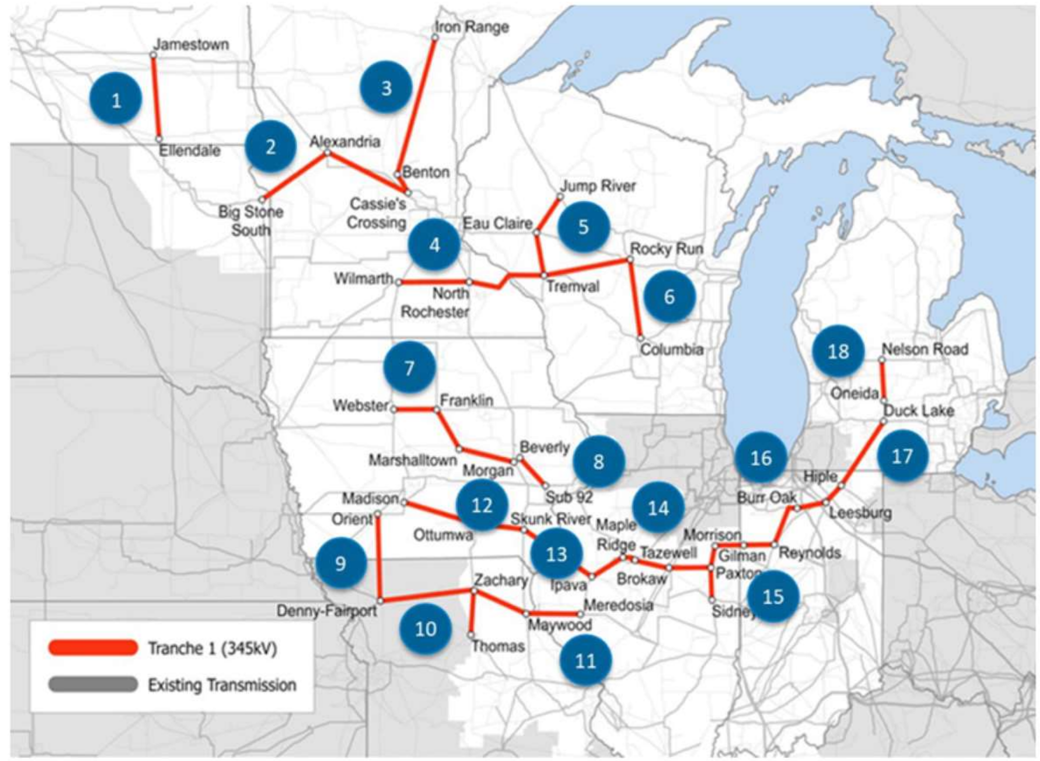
- Economics of new and existing generating facilities (i.e., renewables are cheap)
- State laws, utility IRPs, & other regulatory actions
- Electrification trends, energy efficiency improvements, demand response

* Phrase count in NOPR: "known" factors, determinants, or inputs (6x); changes in resource mix and demand (127x);

#2 Evaluation: An equitable, geographically distributed portfolio of projects, (regionally & sub-regionally)

ENERGY FUTURES FINANCE FORUM

- Economics: Important for demonstrating that "costs are commensurate with benefits" across all subregions of an RTO/ISO region.
- Politics: Spread jobs, growth, and other benefits of spare grid capacity across the region.

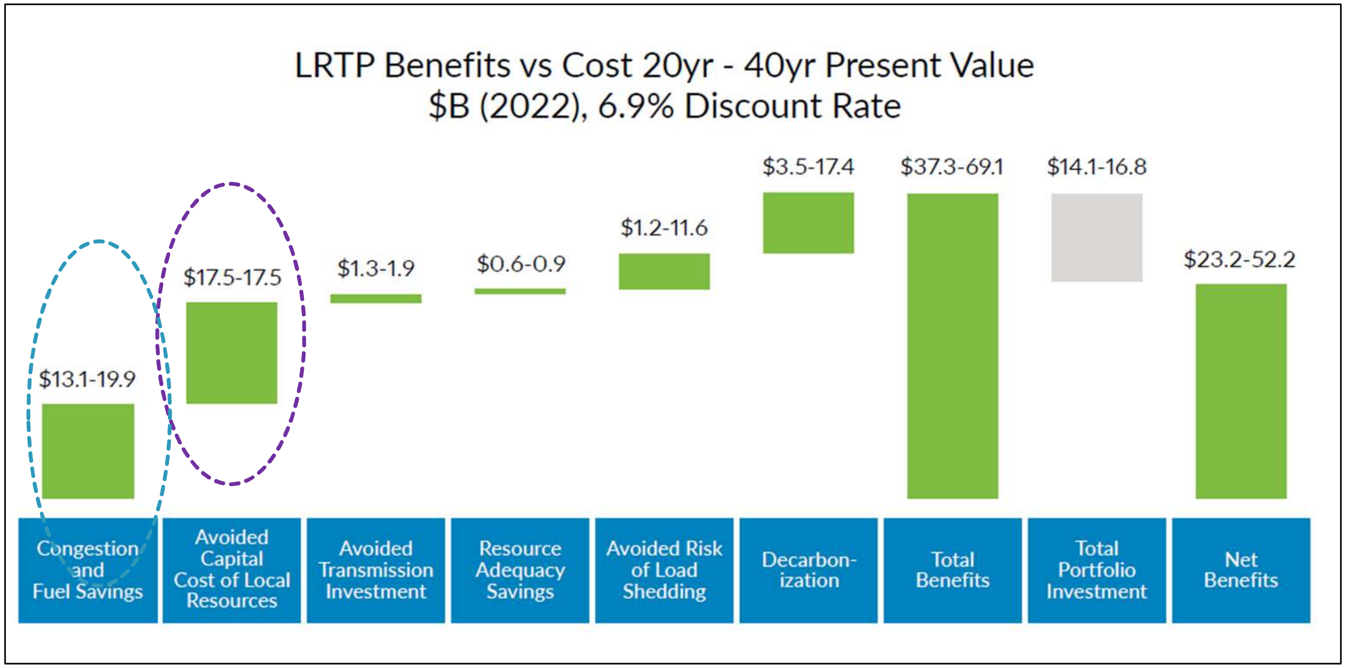


MISO's Long Range Transmission Planning (LRTP) Tranche 1 $10B of projects

#2 Evaluation: MISO full region LRTP portfolio, multi-benefit calculation. No single benefit is dominant & CO_2 portion is not make-or-break.

ENERGY FUTURES FINANCE FORUM

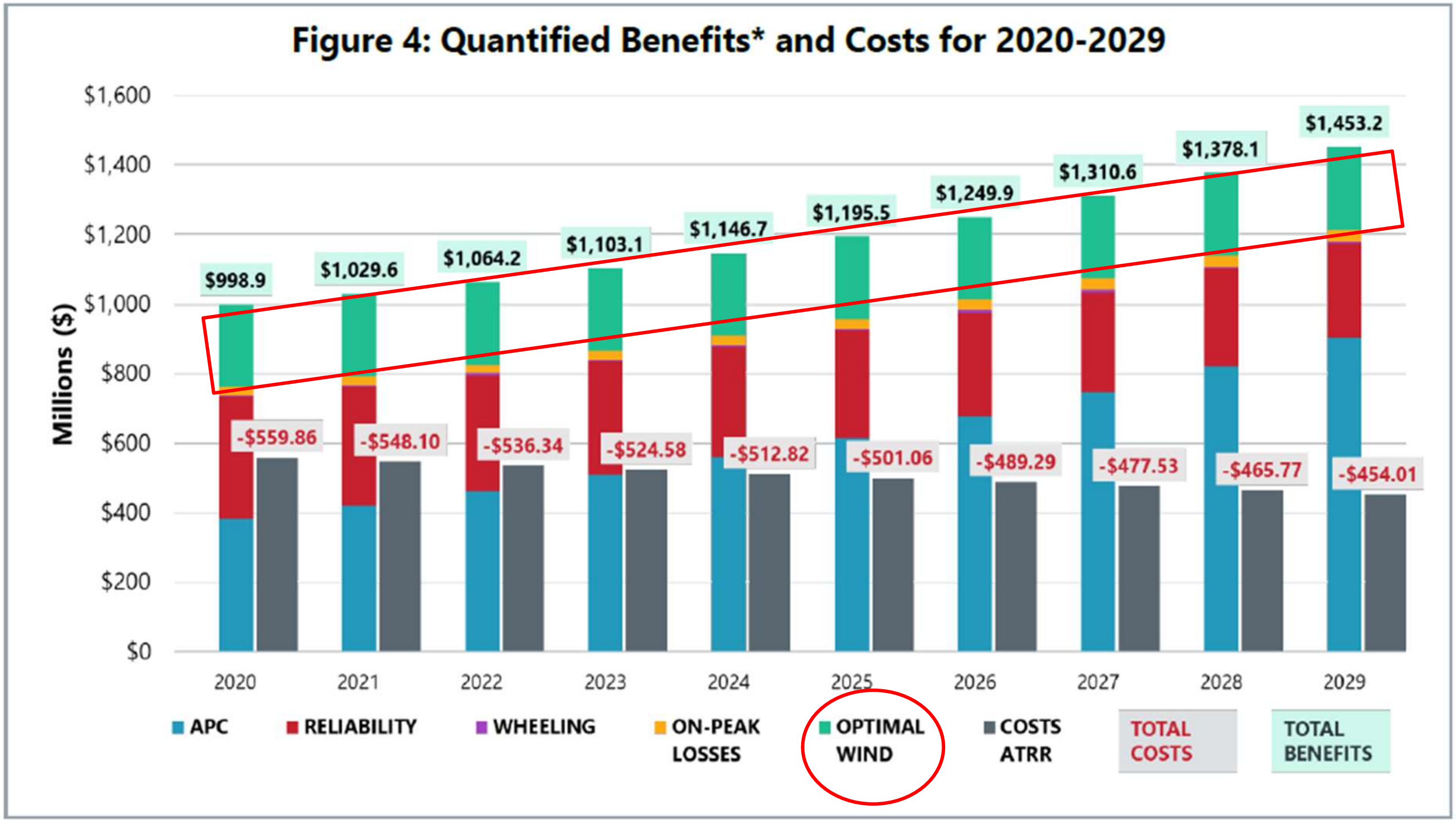
- Clearly justified: 4 business case scenarios, benefit-cost-ratios were 2.6x to 4.1x
- CO_2 benefits were of interest, but after zeroing out GHG value, the portfolio was still worth doing: 2.4x low and 3.1x high.



	20yr	40yr
Min Benefits	$37.3 benefit ÷$14.1 cost =2.6x BCR *2.4x w/o CO_2*	$46.4 ÷$16.8 =2.8x BCR *2.5x w/o CO_2*
Max Benefits	$54.2 ÷$14.1 =3.8x BCR *2.9x w/o CO_2*	$69.1 ÷$16.8 =4.1x BCR *3.1x w/o CO_2*

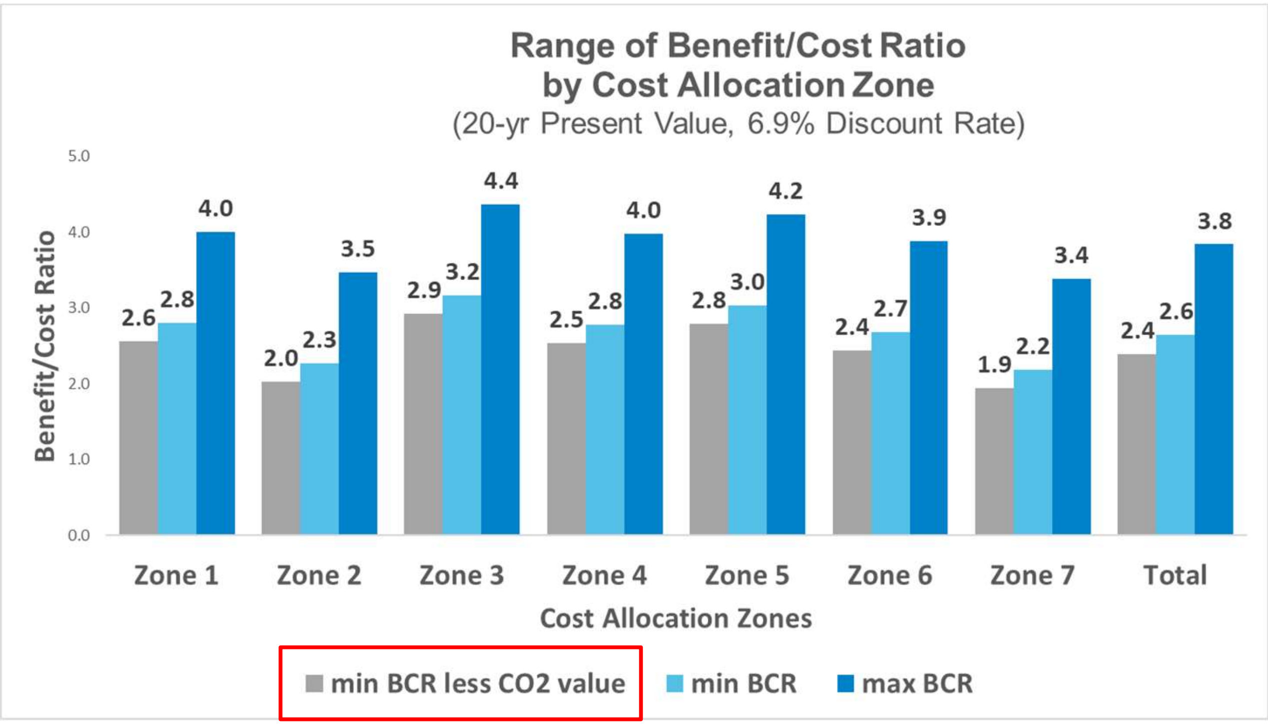
#3 Selection: SPP after-action analysis shows high benefit-to-cost ratios & implies "policy/climate" benefits do not make or break benefit-cost analysis

ENERGY FUTURES FINANCE FORUM

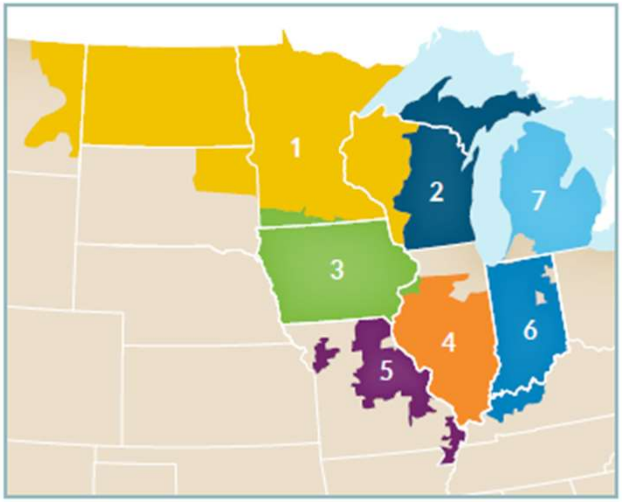


#3 Selection: <u>Subregional</u> re-analysis of benefit-cost analysis can demonstrate that subregional costs are commensurate w/ benefits. [CO_2 not dispositive either]

- Similar benefit-to-cost ratios ("BCRs") across all participating MISO <u>subregions</u>;
- All but one subregion ≥2.0x for *minimum benefits w/ zero value on avoided CO_2.*



MISO "Classic" Subregions



EFI FOUNDATION

Allocation: "Selection" component of RP/CA overlaps & informs "Allocation" negotiations. Is it really a separate matter?

ENERGY FUTURES FINANCE FORUM

- When a transmission project that is included in a regional plan is "selected for regional cost allocation," an <u>allocation methodology must be specified</u> to spread costs over RTO/ISO Load Serving Entity participants.
  - **Selection heavy/allocation light:** Use the proposed cost recovery mechanism as the "costs" in the denominator of benefit-cost analyses.
  - **Selection light/allocation heavy:** "Select" the projects and then begin negotiations over cost allocation method. Likely to fuel disagreements over who pays what.

PLANNING COMPONENTS

1. PARAMETERS: Time frame & assumptions about future

2. EVALUATION: Benefits vs. Costs. All or some benefits? Single project vs. portfolio?

3. SELECTION: If "selected for allocation", will sub-regional costs be ~commensurate w/ benefits"?

ALLOCATION: If "selected" is "allocation" method simple *ex ante or ex post* renegotiation?

Allocation: MISO LRTP Tranche 1 subregional benefit-cost analysis as an example of "selection heavy/allocation lite"

ENERGY FUTURES FINANCE FORUM

(Fuel & Congestion Savings_x + Avoided Generation Capex Savings_x + Avoided Local Xmission Capex Savings_x + Zonal Capacity Savings_x + Avoided Blackout Savings_x + Avoided CO_2 x CO_2 Price_x)

Annual Interest, Depreciation, + O&M on Regional Xmission Package X Sub-region_x Load % of MISO Total Load

} The ex ante "cost allocation" method was baked into the arithmetic

- Allocation method negotiated in the planning stage. Then used, still in planning stage, to prove "costs roughly commensurate with benefits." There was no chronologically separate cost allocation negotiation. This sped up the pace of MISO consensus and FERC tariff approval.

May 2022 NOPR details: FERC sometimes "requires" and other times "declines to prescribe" and instead "encourages" & "gives flexibility"

ENERGY FUTURES FINANCE FORUM

	PARAMETERS	EVALUATION	SELECTION	ALLOCATION
Propose to "require" an approach	**Require**: • 20-year plan • at least 4 plausible & diverse scenarios using • Commission identified factors re changing resource mix & demand • best available data #91	**Require** PUTPs to "identify on compliance the benefits they will use in LRTP", how they will calculate benefits, and how reflect benefits of facilities to meet CRMD #183	**Requires** transparent selection criteria that: (i) 'maximize benefits . . . over time without overbuilding' & (ii) identify & evaluate facilities needed for CRMD. **Requires** state coordination. #241	**"Must"** set up [pre-file?] ex-ante cost allocation methodology in OATT & seek to get state buy-in on it. If states want a one-off "State Agreement" allocation, **require** them to act in 90 days. #302
Encouraging & giving flexibility while declining to "require"	We "**do not propose to require**" specific scenarios or that "explicit weightings" of scenarios be identified #121	We "**decline to . . . prescribe** any particular definition of 'benefits' or 'beneficiaries', nor require use of any specific benefits" & list of 12 types of benefits "may be useful" #183	Propose providing PUTPs "**flexibility**" to: "propose selection criteria" #242; "determine criteria", i.e., using BCA or aggregate net benefits; #243; & use least regrets or Expected Value scenario evaluation #251.	"**We continue to believe** that the availability of an *ex-ante* cost allocation method helps to ensure the development of more efficient or cost-effective regional transmission facilities…" #315

Recommendations re FERC order

Big Picture	Technical
Plan parameters: 20-year plans, multiple scenarios, including "known factors", all as in NOPR.	If FERC is requiring four scenarios for each 3-year refreshed long-term plan, it would be logical to express some **explicit probability** of each.
Evaluation/Benefits: Estimate, on non-double counted basis, any reasonably quantifiable benefits, with a FERC-prescribed minimum set of benefits. Require transmission planners to estimate on a portfolio basis	Benefit categories that include a **mix of climate and non-climate benefits should be transparent about the proportions of each** and calculation methodologies.
Selection: Multi-benefit regional & sub-regional BCA on a portfolio basis	**"Costs" in the BCA should match the methodology of the ex-*ante* cost allocation regime.**
Allocation: *Ex-ante* methodology determined ahead, consistent with subregional BCA calculations. Other methods constrained by tight timeline.	FERC should specify that the **ex-*ante* method is to be pre-filed** in tariffs in advance.

Recommendations re Regional Transmission Stakeholders

- **The development of 20-year plans based on "known" factors will require greater coordination, collaboration, and transparency**
  - Where feasible, ISOs/RTOs coordinate load projections, resource planning, and transmission planning (likely single-state RTOs/ISOs).
  - Multi-state markets will face challenges coordinating inputs → at least publish data, assumptions, and methodologies used in developing future projections
  - Large customers (a major driver of transmission needs) should take a more active role in sharing development plans

Recommendations re DOE and Congress

- **DOE technical assistance:** Help regional planners simultaneously optimize: (i) capacity expansion models; (ii) economic dispatch models; and (iii) transmission topology & power flow models. NETL engaged now via National Transmission Planning Study.
- **DOE can ease ratepayer shock:** Use and/or expand existing programs that permit DOE to buy excess capacity in "supersized transmission lines" and help bear the costs until demand catches up with capacity.
- **Congress:** Lower risk/ease ratepayer shock. Restore 30% investment tax credits for high-capacity projects, e.g., 300kV+ "selected" in regional plans.