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THE TRUTH ABOUT THE NEED FOR ELECTRIC TRANSMISSION INVESTMENT & HOW DOES ELECTRIC TRANSMISSION BENEFIT YOU?

prepared for a briefing session sponsored by
WIRES and the Environmental and Energy Study Institute

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LEI prepared two papers to raise public awareness about the need for transmission investment and its benefits

A WIRES Report

THE TRUTH ABOUT THE NEED FOR ELECTRIC TRANSMISSION INVESTMENT: SIXTEEN MYTHS DEBUNKED



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A WIRES REPORT



HOW DOES ELECTRIC TRANSMISSION BENEFIT YOU?

IDENTIFYING AND MEASURING THE LIFE-CYCLE BENEFITS OF
INFRASTRUCTURE INVESTMENT

JANUARY 8, 2018



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It is time to separate fact from fiction in the 21st century and recognize the many myths about transmission investment

POWER DEMAND	Transmission is only built to meet current demand	1	Transmission can help manage evolving consumer behavior and new economic activities
	Demand is not likely to grow, no need for more transmission	2	Demand will grow as new consumer uses in new locations
POWER SUPPLY	Generating plants retire and new ones can use the same transmission lines	3	New power plants are not always built in the same place as the retiring power plants
	No grid congestion, no need for more transmission	4	Transmission needs arise even in uncongested energy markets
ALTERNATIVES	Local reliability issues can be addressed using alternatives	5	Non-transmission alternatives ("NTAs") are not always perfect substitutes for transmission
	Transmission is the most expensive option for resolving local reliability issues	6	NTAs may be more expensive when viewed in the context of the larger system in the long term
	Customers tend to opt for new technologies and bypass the grid if they can	7	The Transmission grid serves as a reliability backstop for most distributed generations and storage consumers
	New technologies are working well and can be easily scaled up to address grid stress	8	Intermittent distributed generations can impose reliability issues to the grid; storage can be more costly
COSTS	There has already been enough investment in transmission so we don't need more	9	Assets are aging and some need replacement or refurbishment
	Transmission projects are large and lumpy with high price tags	10	Construction costs of new transmission projects are recovered gradually, with only modest impacts on consumers
	Large transmission investment might end up underutilized	11	Large projects are subject to detailed cost/benefit analyses to help ensure their ultimate usefulness
	Large transmission projects may be prone to overbuilding	12	Transmission projects go through stringent and comprehensive cost-benefit evaluations to avoid overbuilding
	Large transmission investments involve complex cost allocation schemes that are unfair to consumers	13	Cost allocation issues are not insurmountable and can be resolved with both standard and customized solutions
BENEFITS	Customers on the receiving end are the only ones benefiting	14	Benefits can be geographically and demographically widespread
	Transmission should only be built for resolving reliability issues -- benefits are uncertain for non-reliability projects	15	A transmission project initiated for reliability reasons may have other economic benefits and vice-versa
	Transmission investment is risky because the costs are certain but the benefits are not	16	Transmission investment risks can be managed through prudent analysis and decision-making

Myths are commonly based on some factual element, but also contain embellishments and false notions

“Transmission is only built to meet current demand, which is not likely to grow. Constructing more transmission in anticipation of the unforeseeable future is a waste of resources.”

“Customers on the receiving end of a new transmission line are the only ones who benefit and should be the only ones who should pay for it.”



“Market resources alternatives (“MRAs”) can provide, at a lower cost, the same services as transmission.”

“Consumers will be required to pay for the large costs of transmission projects regardless of whether or not benefits materialize. Large transmission investments should therefore be avoided or deferred.”

“Transmission investments are prone to overbuilding. Therefore, transmission investments should be avoided.”

MYTH

Transmission is only built to meet current demand, which is not likely to grow

TRUTH

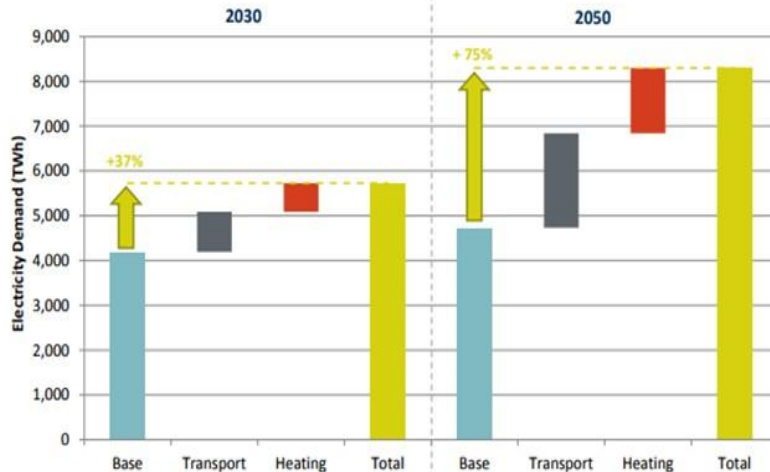
THERE IS MORE TO LOAD THAN MEETS THE EYE

- Overall growth in electricity demand across the US has slowed down in recent years; however, new features of the market require new transmission infrastructure

1

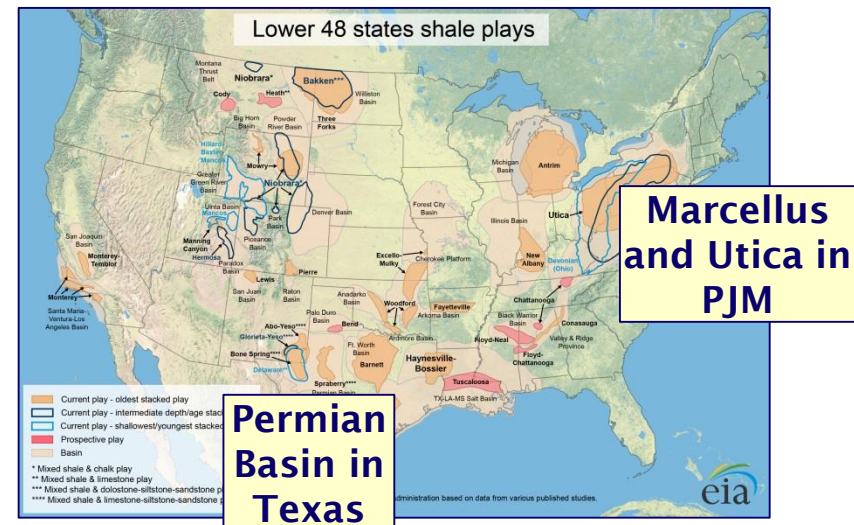
Changes in load patterns

Incremental electricity sales due to electrification of heating and transport



2

New economic activities



New transmission investment is needed to manage evolving consumer behavior and new economic activities

MYTH

Market resources alternatives (“MRAs”) can provide the same services as transmission but at a lower cost

TRUTH

MRAs ARE NOT PERFECT SUBSTITUTES

		Transmission	Energy Efficiency	Demand Response	Distributed Generation	Energy Storage
What	Energy	●	◐	◐	◐	●
	Capacity	●	◐	◐	◐	●
	Ancillary Services	●	○	◐	◐	●
	Reduce system losses	●	◐	◐	◐	●
When	Long lifespan	●	◐	○	●	●
	Continuous basis	●	◐	○	○	●
Where	Regional	●	◐	◐	○	○
	Local	●	●	●	●	●
	Micro	●	●	●	●	●
How	System/Wholesale	●	○	○	○	●
	Customer/Retail	○	●	●	●	○
	TOTAL	●	◐	◐	◐	◐

● Provided ○ Not provided

While MRAs can improve the reliability of the electrical system, they are rarely capable of providing all the same services that transmission provides for the same tenure and geographical dimensions

MYTH

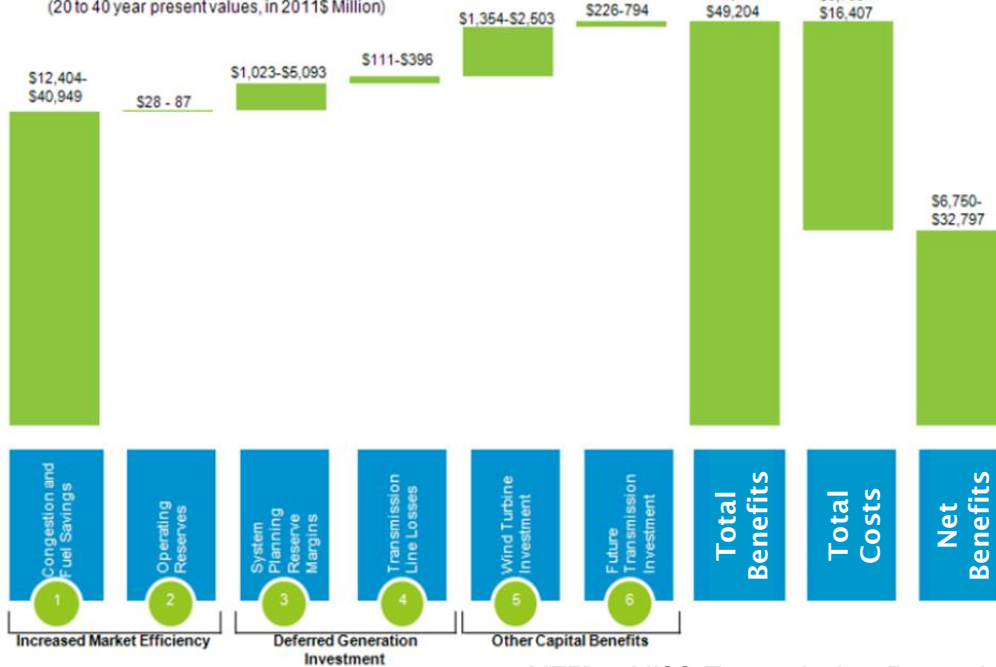
Transmission projects are large and lumpy with high price tags, and prone to overbuilding

TRANSMISSION PROJECTS GO
THROUGH STRINGENT COST-BENEFIT
EVALUATIONS

TRUTH

Portfolio of economic benefits for Multi-Value Project in MISO's MTEP 2016

Benefit by Value Driver
(20 to 40 year present values, in 2011\$ Million)



- MISO requires all its Market Efficiency Projects (“MEPs”) to have a benefit/cost ratio of at least 1.25
- MISO also imposes a higher hurdle rate (at least 1.8 to 3.0) for Multi-Value Projects (“MVPs”)

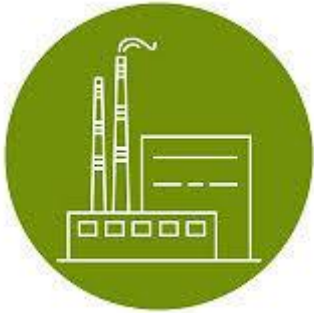
Investment uncertainties around new transmission infrastructure can be quantified and analyzed comprehensively to mitigate the chances of a “bad” decision



Consumers on the receiving end of a new transmission line are the only ones who benefit



BENEFITS ARE MULTI-FACETED AND HAVE VARYING BENEFICIARIES, TIMEFRAMES, AND DURATIONS



“Source” regions benefit from the construction of the transmission line, and potential for more revenues for local power plants that now have expanded market opportunities



“Transit” regions see benefits from local economic spending during construction, tax revenues or other payments for land use collected from the transmission operator in addition to potential electricity cost savings, and environmental benefits

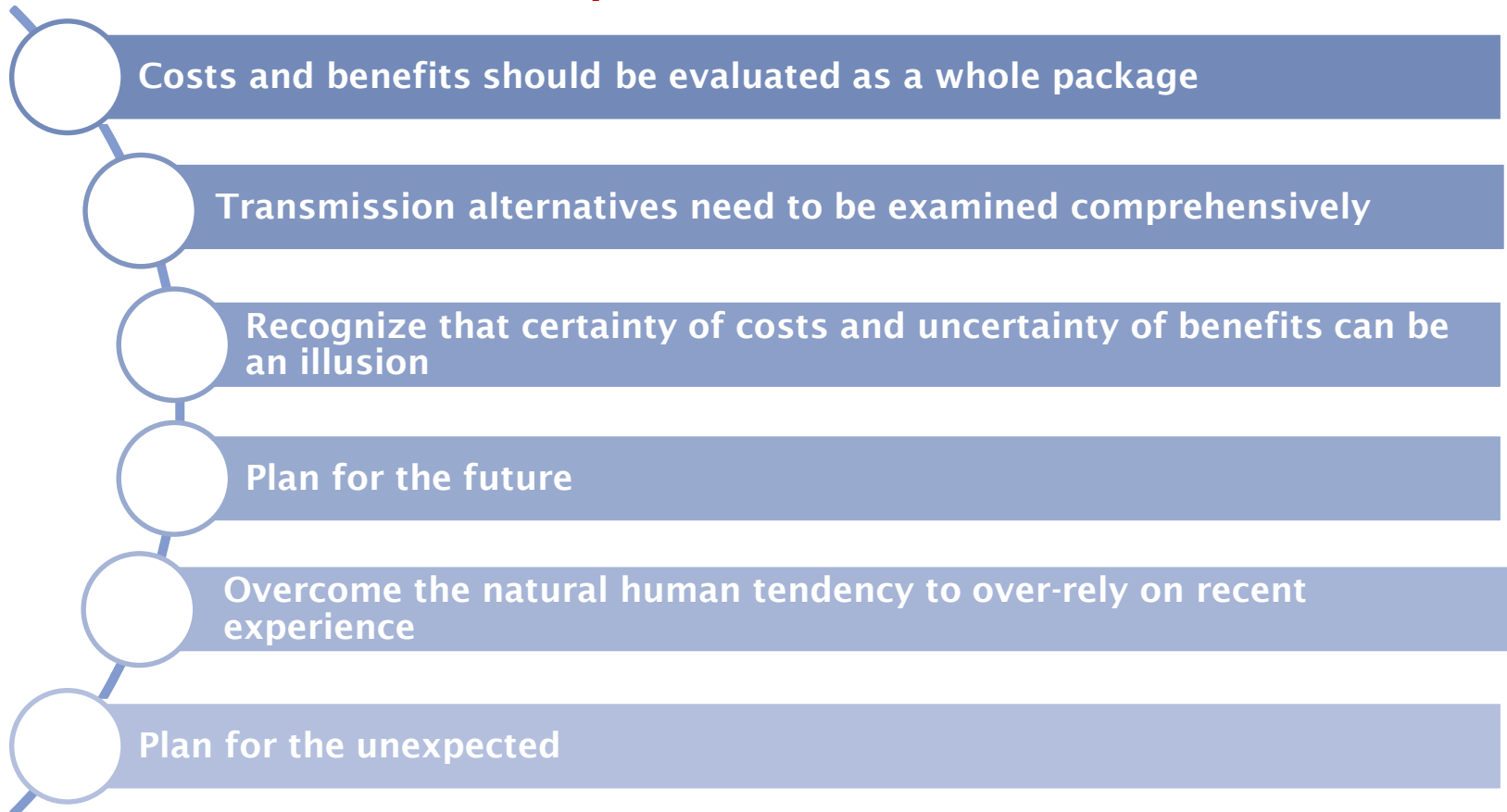


“Sink” locations see local economic and reliability benefits from more access to electric power, in addition to electricity cost savings and environmental benefits



How do we overcome outdated myths?

The “playbook” simply asks that decision-makers consider the realities of the power system so as not to overlook an opportunity to undertake an investment that provides various benefits to stakeholders



Transmission can benefit many individuals and entities with cheaper and cleaner electricity, as well as with gains in employment and local economic conditions

Whom does transmission benefit?

Transmission caters to many diverse beneficiaries, including households, retail and commercial businesses, power producers, small and large industrial customers and governments



1

When do transmission benefits arise?

Transmission can create benefits over many years – from planning to commercial operations – with these benefits lasting for many years



3

Where do we see transmission benefits?

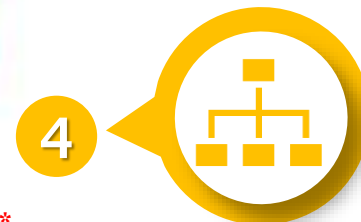
Transmission investment has propensity for widespread impacts – benefits are distributed over large geographical distances



2

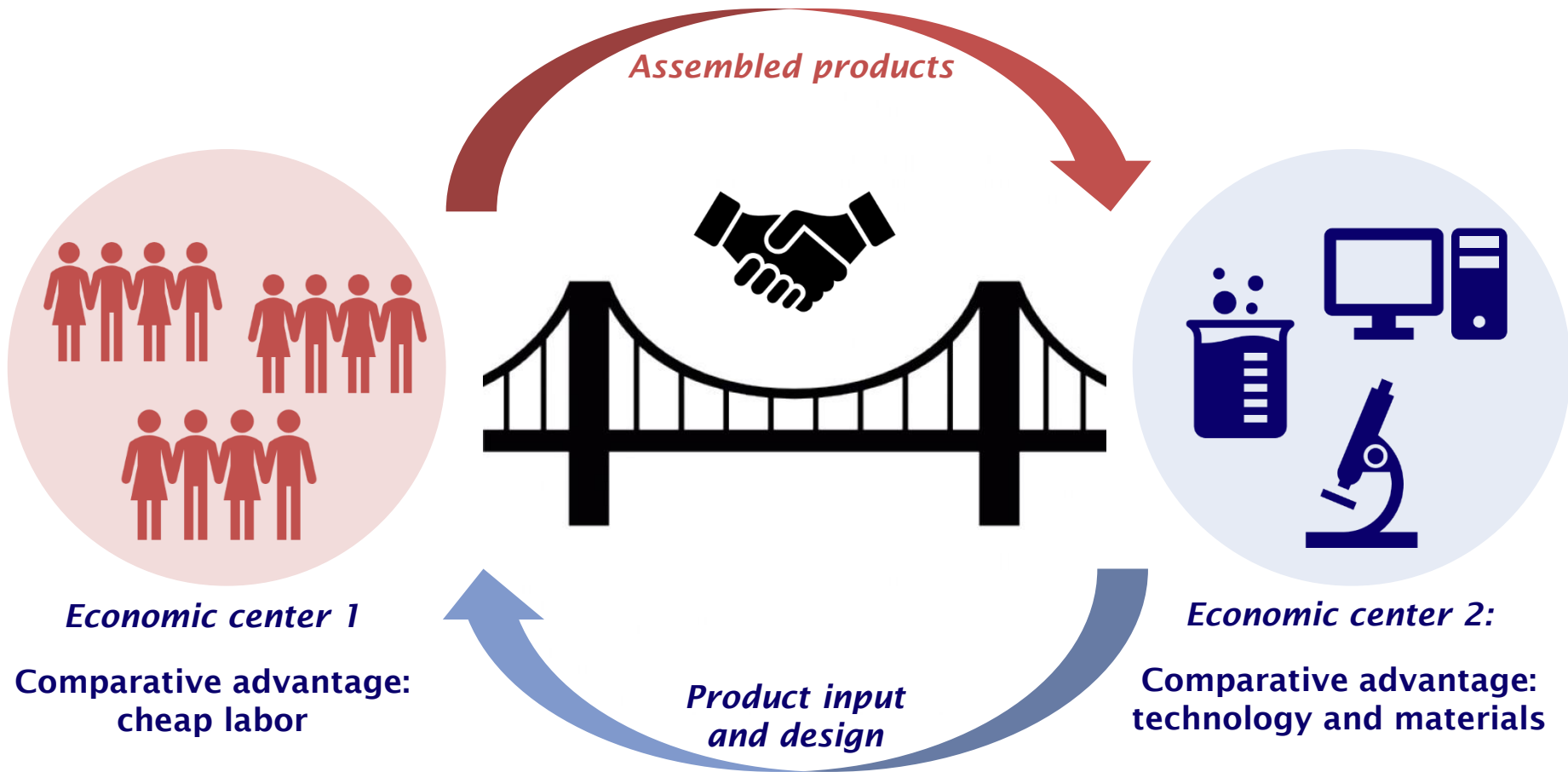
What are the transmission benefits?

Transmission can lower customers' energy bills, reduce system cost of producing electricity, reduce emissions, improve grid reliability and flexibility, increase total jobs, and expand local economic activities



4

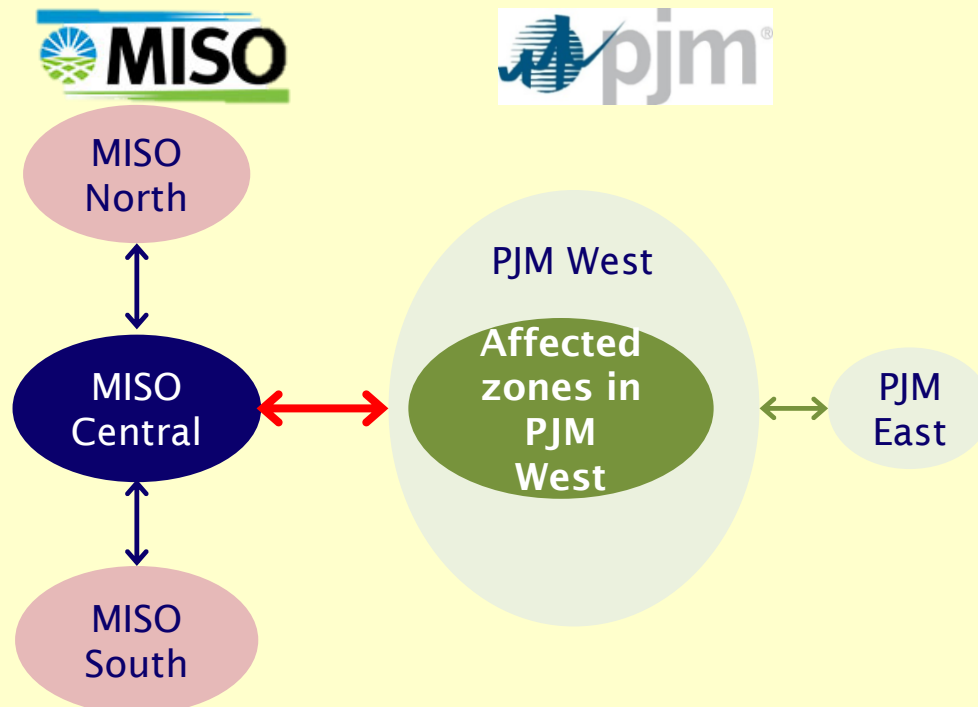
A transmission line creates trade benefits like a bridge between two cities...



...and these benefits can be quantified

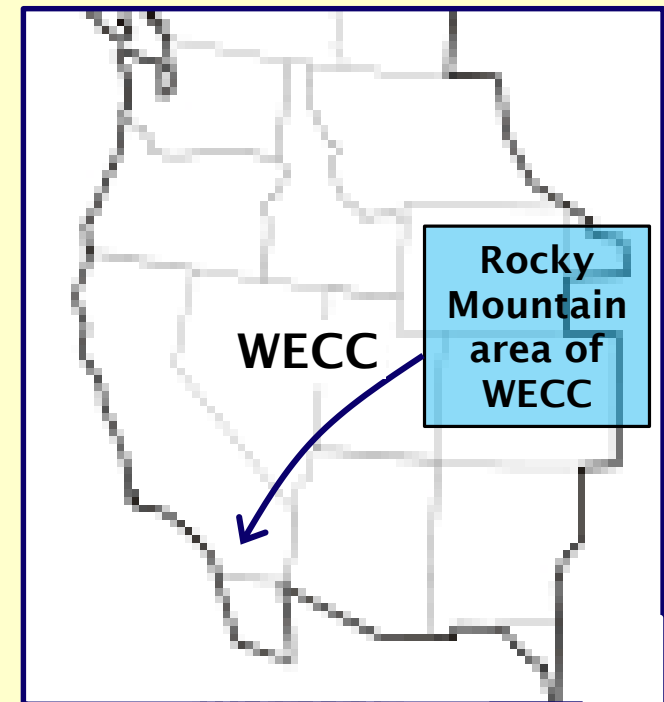
To show that benefits are quantifiable, LEI assessed the lifecycle benefits of two transmission investments

Trade-enhancing Transmission Project



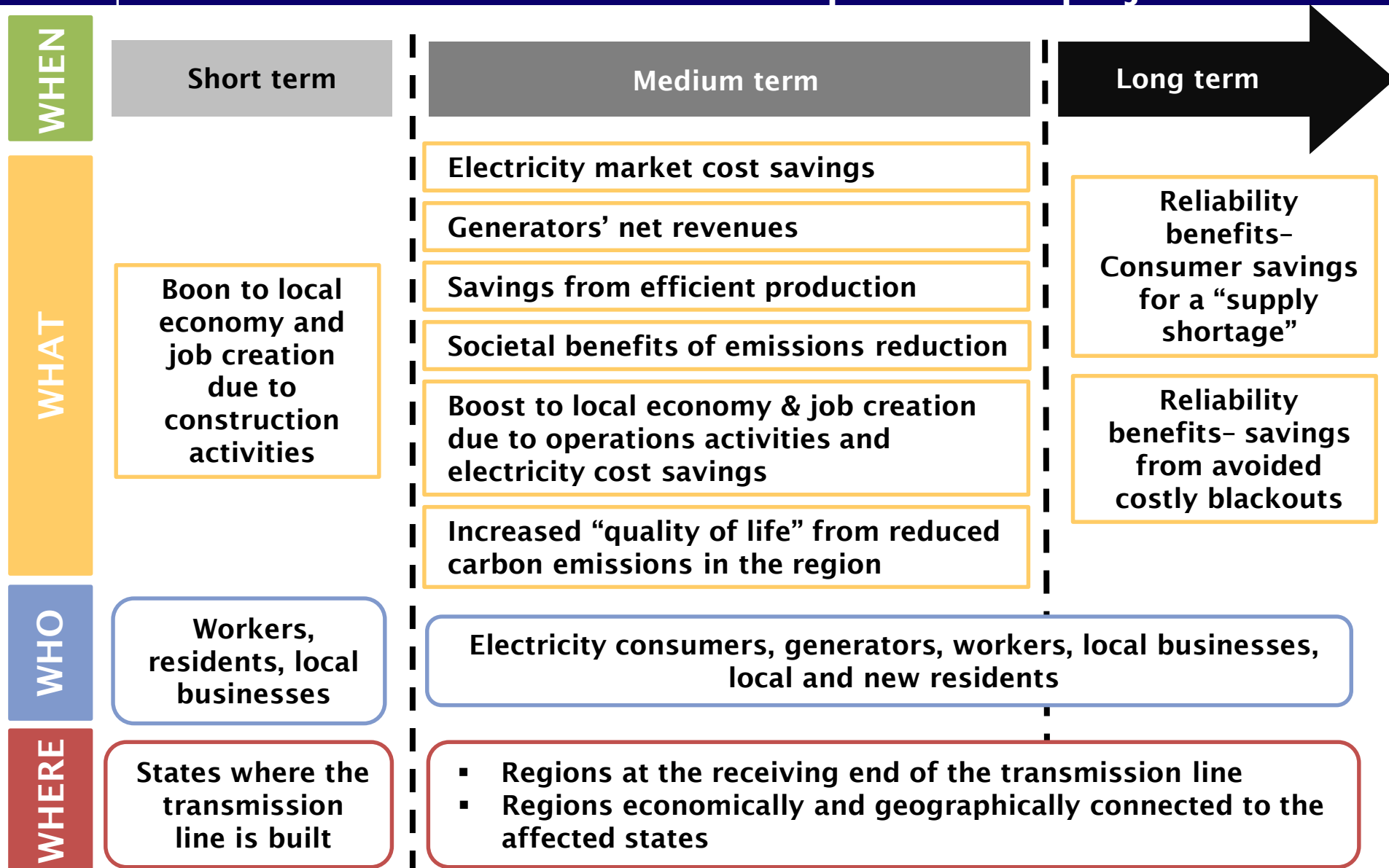
The hypothetical Trade-enhancing Project/ Eastern Interconnect Project harnesses trade opportunities between two markets, allowing buyers and sellers to benefit

Resource Delivery Transmission Project



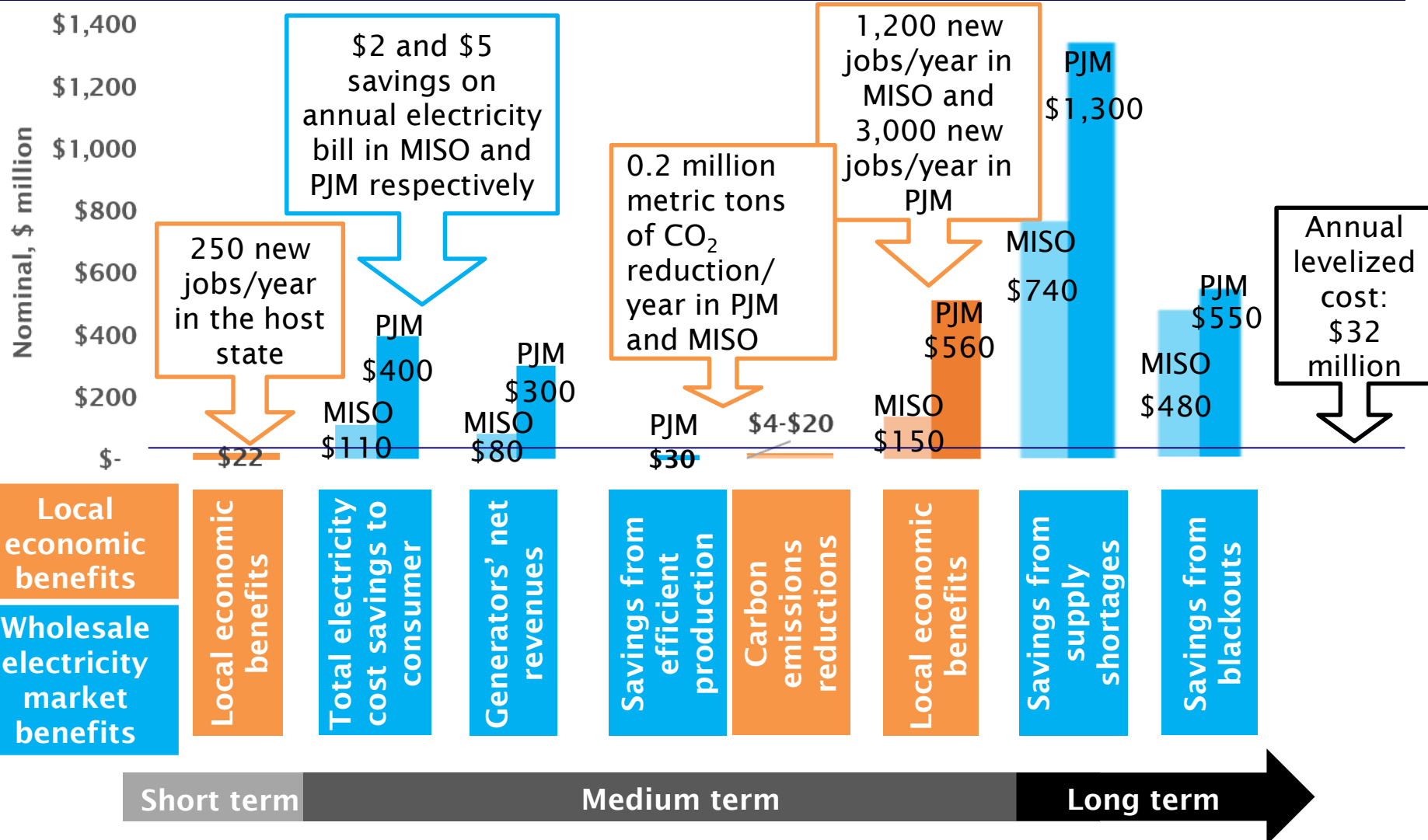
The hypothetical Resource Delivery Project/ Western Interconnect Project brings together suppliers and consumers, culminating in a mutually beneficial outcome

LEI used empirical method to estimate the benefits using well-accepted modeling tools and presented transmission investment benefits over the “lifespan” of the project



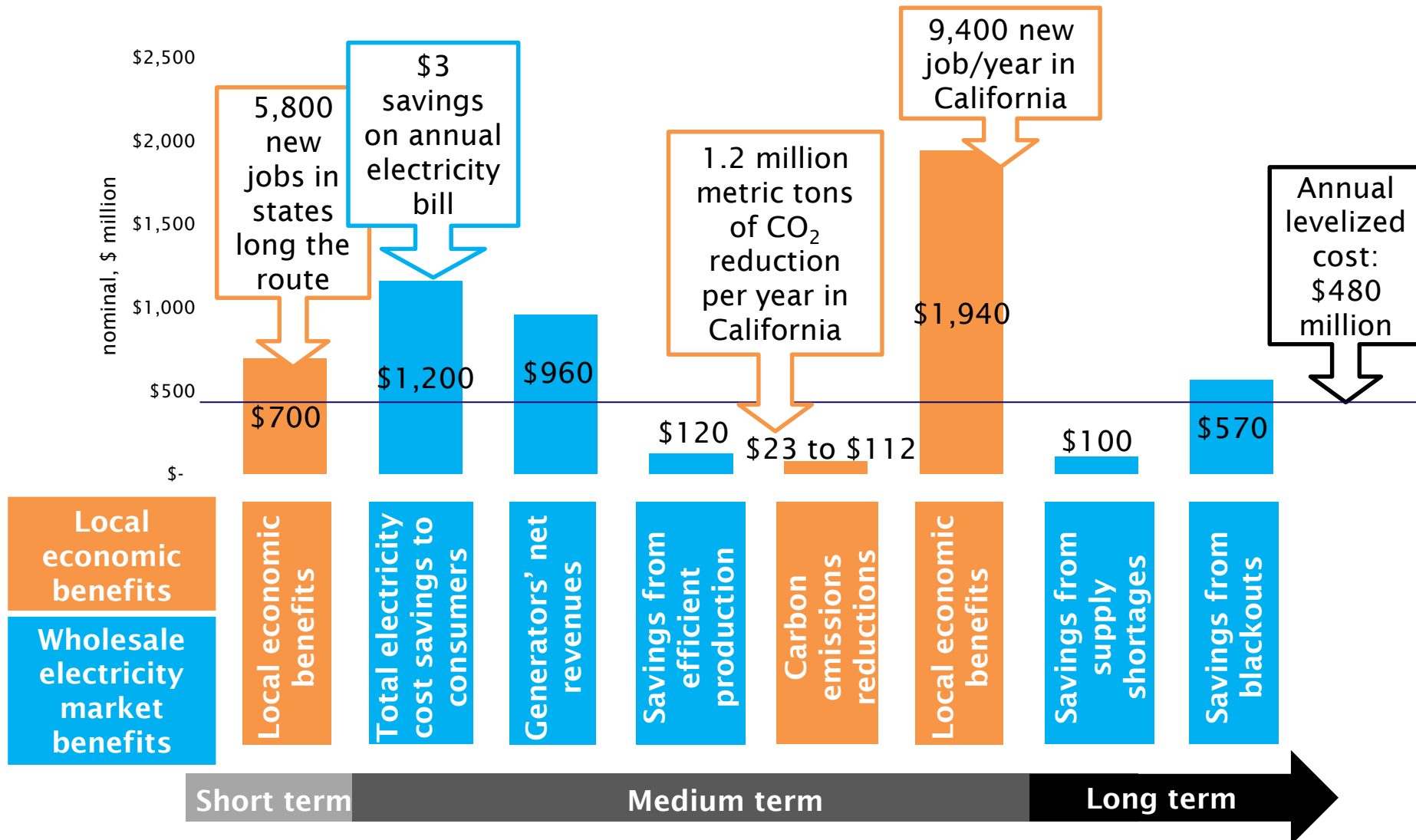
A new trade-enhancing transmission project between MISO and PJM has many categories of benefits; electricity cost savings to consumers exceed the costs by at least 3 times

Annual average benefit summary



A new resource delivery transmission project does not only create substantial electricity cost savings for CA consumers but also economic benefits to other stakeholders in WECC

Annual average benefit summary



Well-planned transmission investment can provide benefits that are quantifiable, substantial, widespread, and long-lasting

