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

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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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SEPTEMBER 2017

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**WIREs**
Voice of the North American Electric Transmission Industry
www.WIRESgroup.com
It is time to separate fact from fiction in the 21st century and recognize the many myths about transmission investment.

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

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

2 New economic activities

Incremental electricity sales due to electrification of heating and transport

New transmission investment is needed to manage evolving consumer behavior and new economic activities
Market resources alternatives (“MRAs”) can provide the same services as transmission but at a lower cost.

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

**MYTH**

**TRANSMISSION PROJECTS GO THROUGH STRINGENT COST-BENEFIT EVALUATIONS**

**TRUTH**

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

- 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

**MYTH**

**Truth**

Benefits are multi-faceted and have varying beneficiaries, timeframes, and durations

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**“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

Costs and benefits should be evaluated as a whole package

Transmission alternatives need to be examined comprehensively

Recognize that certainty of costs and uncertainty of benefits can be an illusion

Plan for the future

Overcome the natural human tendency to over-rely on recent experience

Plan for the unexpected
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.

**Where do we see transmission benefits?**
Transmission investment has propensity for widespread impacts – benefits are distributed over large geographical distances.

**When do transmission benefits arise?**
Transmission can create benefits over many years – from planning to commercial operations – with these benefits lasting for many years.

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

Assembled products

**Economic center 1**
Comparative advantage: cheap labor

**Economic center 2**
Comparative advantage: technology and materials

*Product input and design*

...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**
  - **MISO North**
  - **MISO Central**
  - **MISO South**
  - **PJM West**
  - **Affected zones in PJM West**
  - **PJM East**

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

- **Resource Delivery Transmission Project**
  - **Rocky Mountain area of WECC**
  - **WECC**

  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.

**WHAT**

- **Short term**: Boon to local economy and job creation due to construction activities
- **Medium term**: Electricity market cost savings, Generators’ net revenues, Savings from efficient production, Societal benefits of emissions reduction, Boost to local economy & job creation due to operations activities and electricity cost savings, Increased “quality of life” from reduced carbon emissions in the region
- **Long term**: Reliability benefits–Consumer savings for a “supply shortage”, Reliability benefits–savings from avoided costly blackouts

**WHO**

- Workers, residents, local businesses
- Electricity consumers, generators, workers, local businesses, local and new residents

**WHERE**

- States where the transmission line is built
- Regions at the receiving end of the transmission line
- Regions economically and geographically connected to the affected states
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

<table>
<thead>
<tr>
<th>Benefit</th>
<th>MISO</th>
<th>PJM</th>
<th>PJM</th>
<th>PJM</th>
<th>PJM</th>
<th>MISO</th>
<th>MISO</th>
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<tbody>
<tr>
<td>250 new jobs/year in the host state</td>
<td>$110</td>
<td>$400</td>
<td>$80</td>
<td>$30</td>
<td>$150</td>
<td>$560</td>
<td>$740</td>
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<tr>
<td>Local economic benefits</td>
<td>$22</td>
<td>$1,300</td>
<td></td>
<td></td>
<td>$5</td>
<td>$300</td>
<td>$550</td>
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<tr>
<td>Wholesale electricity market benefits</td>
<td></td>
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<tr>
<td>Total electricity cost savings to consumer</td>
<td>$300</td>
<td>$1,300</td>
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<tr>
<td>Generators' net revenues</td>
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<tr>
<td>Savings from efficient production</td>
<td>$150</td>
<td>$740</td>
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<td>Carbon emissions reductions</td>
<td></td>
<td></td>
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<tr>
<td>Local economic benefits</td>
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</tr>
<tr>
<td>Savings from supply shortages</td>
<td>$110</td>
<td>$400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Savings from blackouts</td>
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**Annual levelized cost:** $32 million
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

- **Local economic benefits**: $700
- **Total electricity cost savings to consumers**: $1,200
- **Generators' net revenues**: $960
- **Annual levelized cost**: $480 million
- **Savings from blackouts**
- **Annual economic benefits**: $9,400 new job/year in California
- **Local economic benefits**: $1,940
- **Savings from supply shortages**: $100
- **Savings from efficient production**: $120
- **Carbon emissions reductions**: $23 to $112
- **Wholesale electricity market benefits**: $570

- **Short term**
- **Medium term**
- **Long term**
Well-planned transmission investment can provide benefits that are quantifiable, substantial, widespread, and long-lasting.

**Key Takeaways**

1. **Well-planned transmission investment**
   - Transmission benefits can be substantial.
   - Benefits of transmission investment are long-lasting.
   - Although benefits of transmission investment are based on a simulation, they are nevertheless measurable and quantifiable.
   - Transmission investment can deliver benefits to many stakeholders, including generators, electricity consumers, business owners, and governments.