ENERGY INFRASTRUCTURE TRENDS IN THE UNITED STATES

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Disclaimer

• MISO does not endorse and is not currently using any of the preliminary findings from the Energy Infrastructure of Future (EIoF) Project for planning purposes.
The EIoF Project has three objectives

1) Develop an extensive understanding of existing domestic energy infrastructure
   - Policy history & Inventory and valuation of infrastructure, including: Asset type, Purpose, Ownership, & Vintage/Depreciated state

2) Develop methods to model how different energy transitions might impact infrastructure requirements
   
   **Assessment Criteria**
   
   - Energy Sources
   - Investment Requirements
   - Economics for Customers, Operators, and Public Coffers (both Affordability & Profitability)
   - Access
   - Resilience
   - Environmental Stewardship
   - Domestic Energy Resources

3) Create decision support tools that assist policy formulation, investors and planning based on a **2050 horizon**
INITIAL LOOK AT ENERGY INFRASTRUCTURE TRENDS

Data:
FERC Forms 1 – Electric Utility Annual Report
FERC Forms 2 – Major/Non-Major Natural Gas Pipeline Annual Report
FERC Forms 6 – Annual Report of Oil Pipeline Companies
FERC Form 1: Electric Utility Annual Report

- Annual Report of **Major** Electric Utilities, Licensees and Others
- Primarily financial data
  - Asset values, capital spending, O&M costs, revenues
- Also some non-monetary data
  - Number of customers (residential, industrial, commercial)
  - MW, MWh, number transformers & miles of transmission (listed by voltage)
What is not in FERC Form 1? → A lot!

• No data for
  – Municipally-owned utilities
  – Most co-operative utilities
  – Wholesale (merchant) power plants
  – Customer-owned infrastructure (PV, storage)
Pole miles grow with total sales of electricity (TWh)
Pole Miles grow with peak demand (GW)

Further investigation needed to determine if amount of infrastructure scales linearly or sub-linearly (e.g., power law) with peak power.
Since 2000, transmission capital spending is driving up TDA cost

TDA cost per customer-year varies by regions

California

Florida

Midwest
Total TDA spending per customer varies from $500 to $1000 per year by regions

<table>
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<tr>
<th>Region</th>
<th>$/Customer-Year</th>
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<tbody>
<tr>
<td>MA</td>
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<tr>
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</tr>
</tbody>
</table>
Utilities’ average revenue per customer-year moderately increased since 2005
Average revenue also varies by regions

California

Florida

Midwest

Customer Category
- Residential Revenue
- Commercial Revenue
- Industrial Revenue
FERC FORM 2: PRELIMINARY RESULTS
Interstate NG Pipelines – Increased Activity & Revenue to Coincide with Shale Drilling
Thank you

energy.utexas.edu

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