



DOE Technical Conference

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Office of Electricity Delivery
and Energy Reliability
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Congestion Study

- **Requires DOE to issue a national transmission congestion study by August 2006 and every three years thereafter**
- **Identifies areas**
 - **with important transmission needs**
 - **where major transmission enhancements, or some suitable equivalent, are either needed now or will be needed to meet future requirements.**



Congestion Study Scope

- **The study will cover the US portions of the Eastern and Western Interconnections**
- **ERCOT is exempt, per EFACT**
- **Data and information related to Canada's bulk power system and cross-border trade will be incorporated into the analysis using the following:**
 - **Historical analysis**
 - **NERC Multi-area Modeling Working Group Load flow cases**
- **Transmission Corridor for purposes of modeling is a complex transmission path between two hubs/nodes**



Review of Existing Studies

- **Identify congested areas based on historical analysis**
- **Understand metrics and methodologies used to assess congestion**
- **Over 50 data sources, plans and studies reviewed**
- **Additional information being reviewed based on the comments to the Notice of Inquiry**
- **The analysis of the West will also include an assessment of contractual congestion based on hourly ATC and reservation data from OATI**
- **The results of this review will be compared with the modeling results**



Modeling

- **Model Years:**
 - 2008, 2011 in the East
 - 2008, 2015 in the West
- **The modeling is based on load flow cases provided by NERC's multi-area modeling working group**
- **Monitored constraints were collected from:**
 - NERC flowgate book
 - Coordination councils
 - ISOs/RTOs
 - Contingency analysis performed by GE and CRA
 - Historically binding constraints monitored by CRA



Modeling Scenarios

- **East**
 - **Low, base, high cases for Crude Oil and Natural Gas**
 - **New wind capability in the Midwest**
- **West**
 - **High efficiency**
 - **Renewable Energy**
 - **Clean Coal**
 - **Low Hydro**



Congestion Indicators/Metrics

- **All hours shadow price: average shadow price over all hours in a year**
- **Binding hours shadow price: average shadow price over hours during which the flowgate was binding**
- **Congestion rent: shadow price * flow * number of hours the flow gate was binding**
- **Binding hours: # of hours (or percentage of time annually that) the constraint was binding**
- **U90: # of hours (or percentage of time annually that) the transmission element was loaded in excess of 90% of its limit**



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