## **Futures Study Assumptions**

### Presented by Chris Hagman March 6, 2009



#### Updating ATC Futures Assumptions/Drivers

- Seeking input & updates for plausible "bounding" model assumptions/drivers
- Recall: Starting point for ATC's PROMOD models & futures is MISO's 2008 Joint Coordinated System Plan (JCSP) cases
  - Model years: 2018 & 2024
- Starting to incorporate futures in reliability analyses



## **Key Drivers**

- Peak Load & Energy Growth Rates
- Natural Gas (& Coal) Costs
- $CO_2$  Tax
- Amount & Location of Renewables
- Others?



# Peak Load & Energy

### Plausible bounds for load & energy

- 2008 Study Assumptions
  - Mid @ 1.75% per yr (peak demand and energy)
  - Lower @ 0.5% per year ⇒-71%,
  - Upper @ 3% per year ⇒+71%.
- "Mid" uses customer supplied forecast
- Impact of Governor's Task Force on Global Warming recommendations?
- Different peak load & energy growth rates?
- Assumptions apply for 40 years
- Adjust bounds?



# **Natural Gas Costs**

Forecast for natural gas costs & bounds:

- Method: NYMEX natural gas futures (extend out thru 2021), then use EIA escalation rate
- In spite of recent general market volatility, method's projected average costs for 2018 & 2024 are within 13% (\$8.78⇔\$7.61/MMBTU) and 11% (\$10.40⇔\$9.30/MMBTU) of previous values, respectively
- Bounds are currently:
  - Lower = 40%,
  - Upper = + 50%
- Natural gas costs often drive LMPs



# **Coal Costs**

- What trends are you seeing in coal costs and what "bounds" should ATC use?
  - Existing generator coal costs are unit specific from VENTYX
  - New coal plants, \$1.99 & \$2.24/MMBTU for MISO Central for 2018 & 2024, respectively
  - New coal plants, \$1.67 & \$1.88/MMBTU for MISO West for 2018 & 2024, respectively
  - Bounds are currently:
    - Lower = -10%,
    - Upper = +20%



# CO<sub>2</sub> Tax

 Futures assume \$0, \$25 or \$44/ton CO<sub>2</sub> tax (and 25% higher mercury cost)



### Amount & Location of Renewables

#### MISO's Reference future:

Wind added and sited based on existing state mandates

#### MISO's 20% DOE Wind Mandate future:

- Wind siting is not limited by regions' boundaries. More wind sited in regions (e.g. MISO) with better wind potential.
  - For example, some of PJM's required wind generation is sited in MISO West.
- Location-specific NREL hourly wind profiles will replace current one-per-state profiles
- ATC adopted MISO's wind modeling



## Feedback

- Would appreciate any comments and/or feedback you would like to provide—either verbally or in writing
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