PROMOD Economic Analysis

Update, Results & Case Study

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Introduction

- Since our last meeting
  - Updated to the latest NewEnergy Associates (NEA) data and PROMOD version
  - Analysis year changed from 2012 to 2013 to be consistent with the latest Ten Year Assessment (TYA)
  - Updates based on your feedback:
    - 2002 hourly load shapes
    - Mid-June to end of August maintenance blackout period
    - NEA's latest control area peak loads and energies in PROMOD

Introduction

- Since our last meeting
  - Generation within the ATC footprint increased by about 900 MW (~1500 MW with Elm Road 3)
    - New units were added including the Sheboygan Energy Center and multiple wind farms
    - Increased the capacity for some ATC generators because of new MISO Day 2 rules (e.g. Fox Energy from 235 to +600 MW)
  - February 14 presentation describes other model updates

Introduction

- Since our last meeting
  - Initial runs with the updated data were inconsistent with previous runs
    - Imports into ATC dropped by 75% (from about 12 to 3% of total energy)
    - Cost savings dropped dramatically
  - Backed out some of NEA's data updates to try to figure what caused the discrepancies

Review of NEA's Updates

- Natural Gas Costs
  - NEA's/Platts updated natural gas prices for Wisconsin for Summer 2013 are around $3.70
  - The NYMEX has natural gas prices for Summer 2010 of about $5.40 (not including transportation costs)
  - Last year's NEA natural gas prices for Wisconsin for Summer 2013 were about $5.25—similar to NYMEX
  - Each utility reviewed their natural gas prices last year and said that they were in a reasonable range
- Using last year's NEA natural gas forecast—seems more reasonable
  - Informed NEA of our concerns and they contacted Platts

Review of NEA's Updates

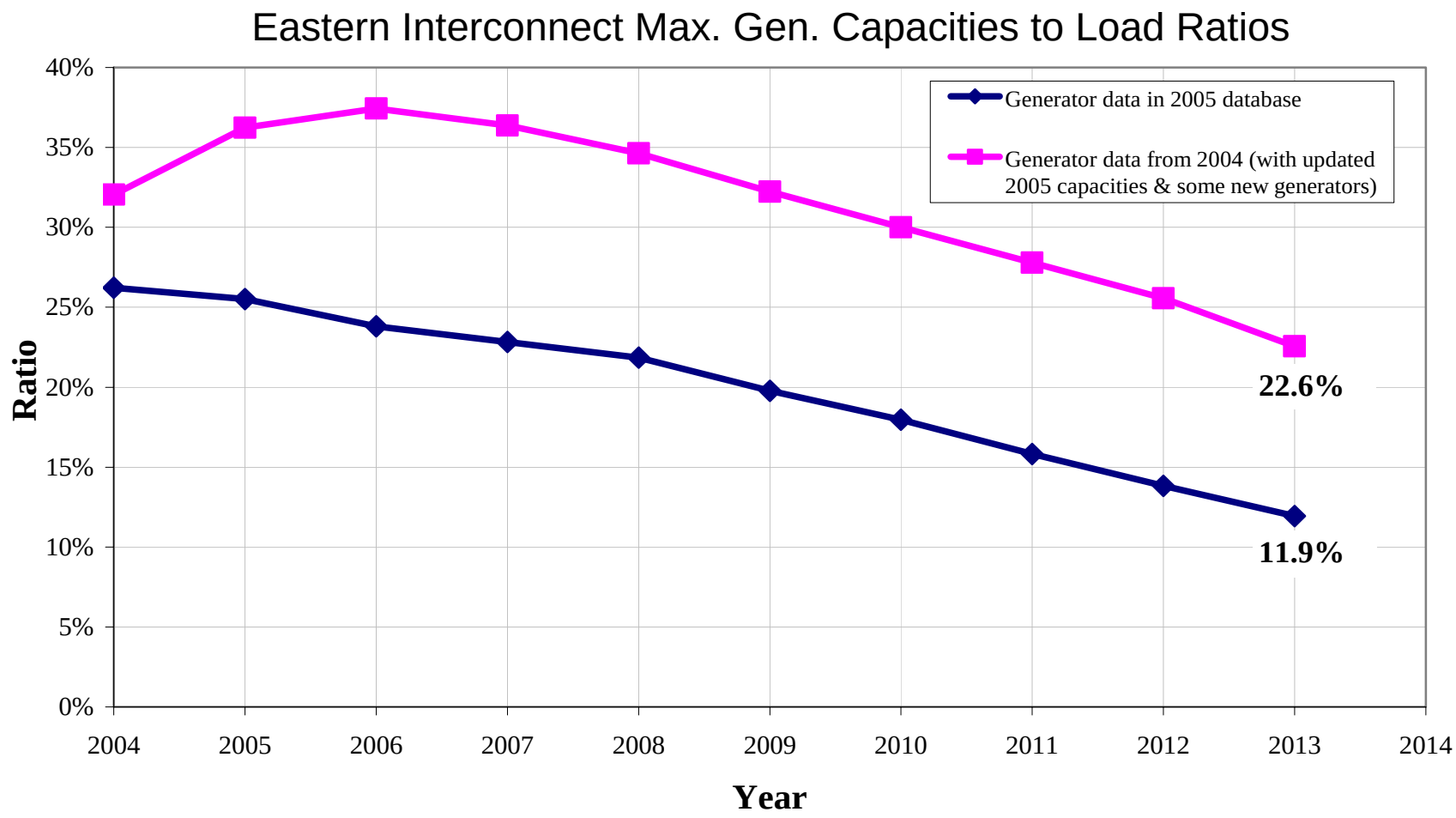
- Coal Costs
  - NEA updated coal costs using Platts spot market prices
  - Mine-mouth coal-fired units in the Dakotas ended up with similar coal costs to those in Wisconsin (some capacity factors in the Dakotas plunged to 65%)
    - However, typically over half (~ 60%, 2.5 X) of the delivered cost of coal in Wisconsin is transportation
  - Platts acknowledged that there may be a problem with the transportation component for their coal cost estimates
  - Each WI utility reviewed their own coal costs last year
- Using last year's NEA coal cost forecasts

Review of NEA's Updates

- Generation
  - NEA removed a significant amount of generation, but did not review reserve margins for future years (e.g. 2013)
  - MAIN recommends a planning reserve margin of 16-19%. MAPP recommends at least 15%
  - Some jurisdictions require higher reserve margins: Wisconsin-18%, NEPOOL-21%, NYISO-18%
  - ATC has asked NEA to do a reserve margin sanity check for the Eastern Interconnect
    - Incomplete PowerBase data prevents this from being done

Review of NEA's Updates

- "Ratio" sanity check of the max gen. capacities to load



Review of NEA's Updates

- Alternate "Ratio" Sanity Check
  - Asked NEA to update their database to include/correct Summer capacities for all generators and to do reserve margin sanity checks
  - At least for 2013, last year's NEA generation appears to be more reasonable than this year's

Refinements

- Refinements
  - Transmission
    - Analyze alternatives in greater detail
    - Optimize each alternative (add cost-effective “fixes”)
    - Refine capital costs
  - Generation
    - Review capacity factors (posted on the Access Website)
    - Several utilities previously commented that the capacity factors on their coal-fired units were too high—will contact you to get your input on how best to model these generators

Refinements

- Refinements
  - Production cost savings will change somewhat as the generator and transmission system characteristic are refined
  - Capital costs will also change as “optimized” packages for each alternative are formulated

Review Results

- Compare the carrying costs for each alternative to the "production cost" savings from PROMOD

Costs for each Representative Project–Results From May 2005

Project	Total Capital Costs (2005$ Mil.)	Approximate Annual Carrying Cost (2005$ Mil.)	"Production Cost" Savings Relative to the Base Case (2005$ Mil.)
Base Case	$0	N/A	0
Base Case (Plus 2 Fixes)	$2	$0.2	$1.8
Low Voltage (Plus 1 Fix)	$15	$1.3	$3.2
Low Voltage (Plus 2 Fixes)	$25	$2.3	$1.5
South: Byron–NMA (Plus 2 Fixes)	$190	$17.1	$12.0
Southwest: Salem–NMA (Plus 2 Fixes)	$351	$31.6	$10.9
South: Paddock–Rockdale (Plus 2 Fixes)	$68	$6.1	$9.5

- Recently discovered several modeling issues with hurdle rates and nuclear units that will be addressed in the next round of runs

MapAgent Video

- Side-by-side MapAgent comparison between the BaseCase and Byron-North Madison

What's Next?

- Further refine the generation and transmission portions of the model
- Use the PAT tool to further drill down into the details and refine our analyses
- Do sensitivity analyses
- Further analyze the NCA issue