Estimating Emission Reductions from Energy Efficiency in the Northeast

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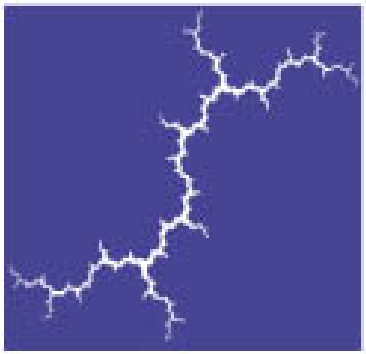
Presentation to

ACEEE Summer Study

Asilomar, California; August 2004



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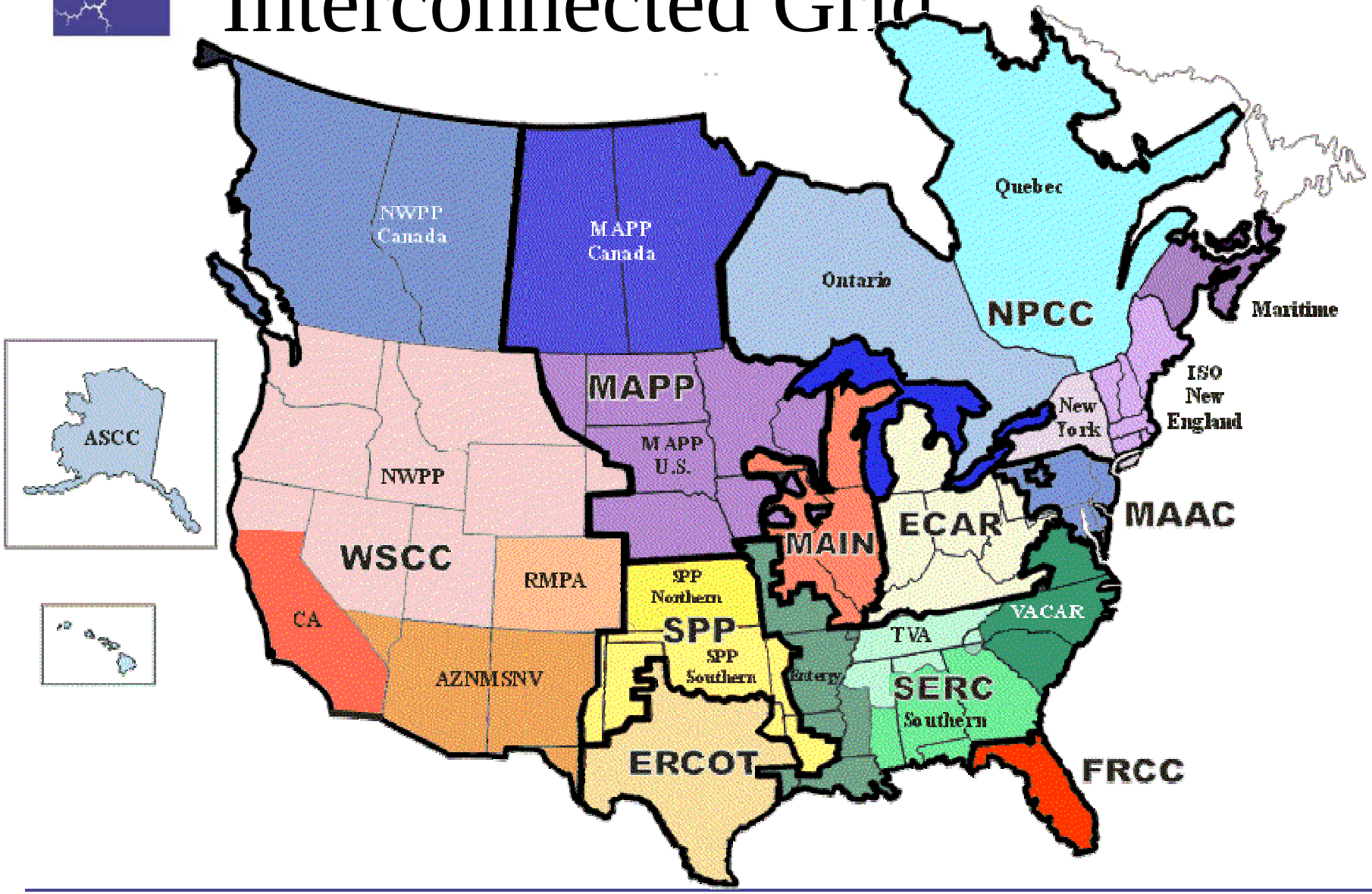
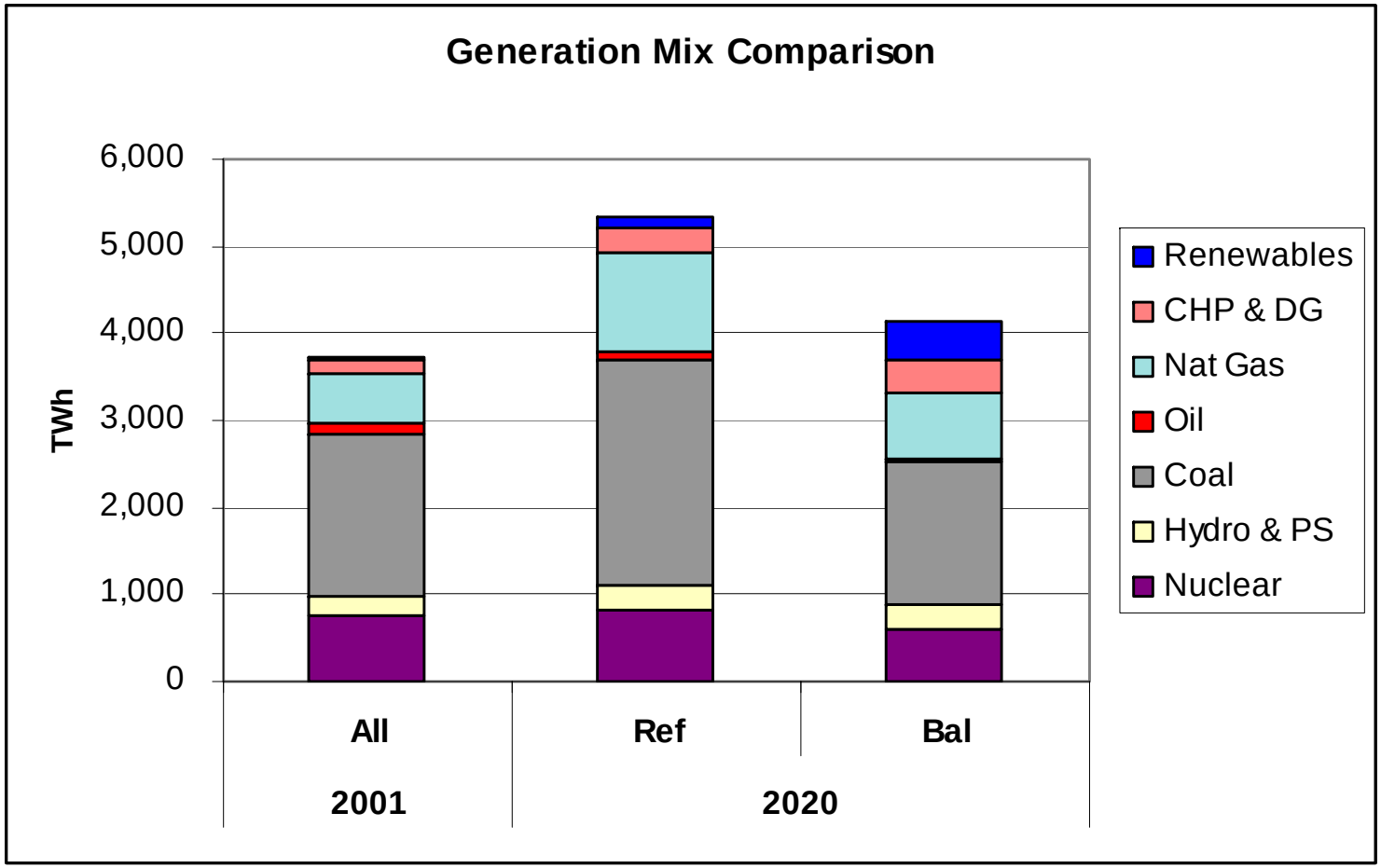
Challenges in Emissions Reductions Calculations

1. **Geographic scale.** Electric grids are large regional interconnected systems.
2. **Time scale.** Resource additions and retirements are made on the basis of complex financial and strategic considerations.
3. **Complexity.** Electricity markets are complicated, subject to physical constraints, economic factors, and market rules (while emission rates vary greatly by generator and time period.
4. **Cost.** Computer models can be expensive.

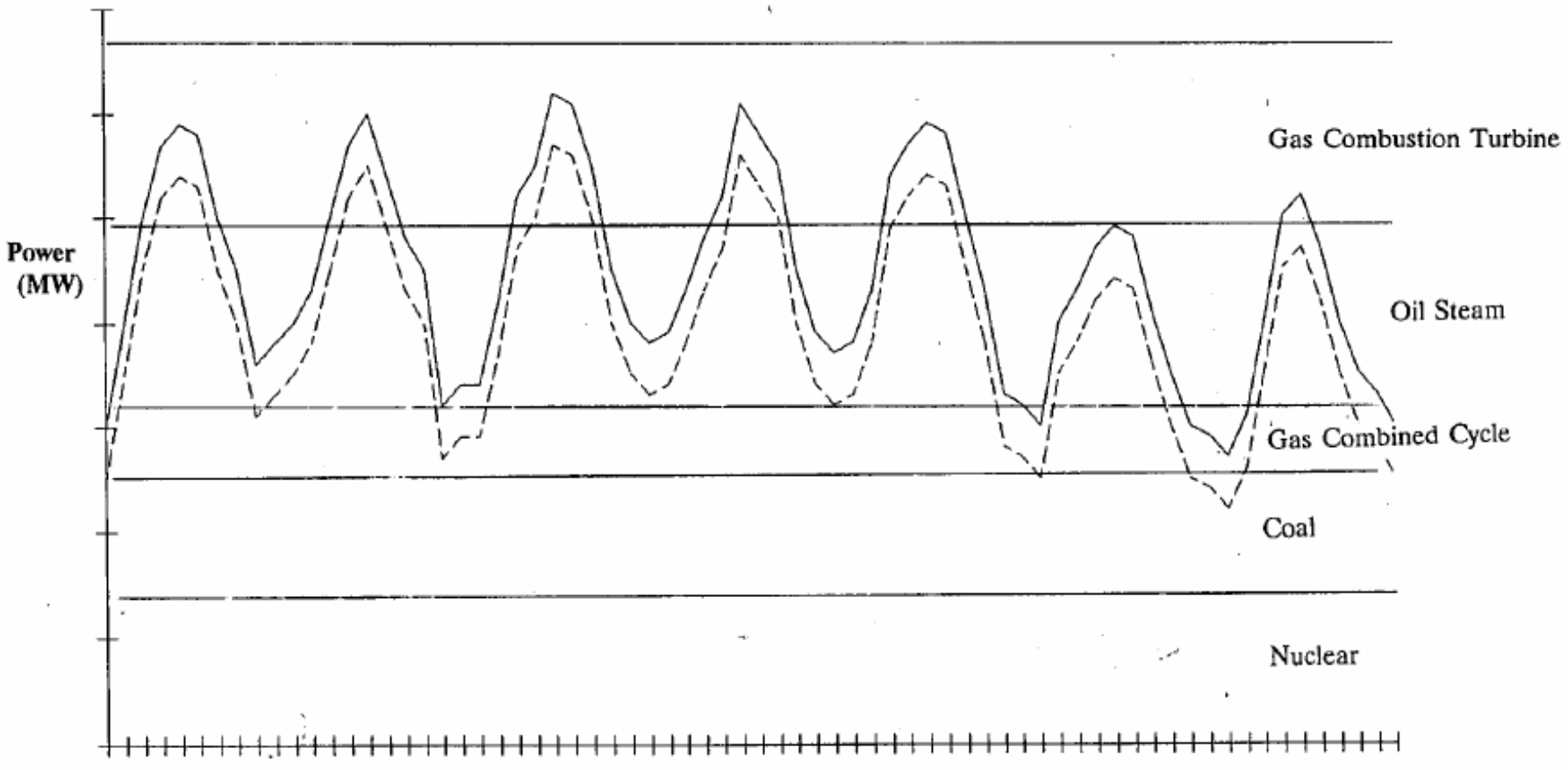
Interconnected Grid



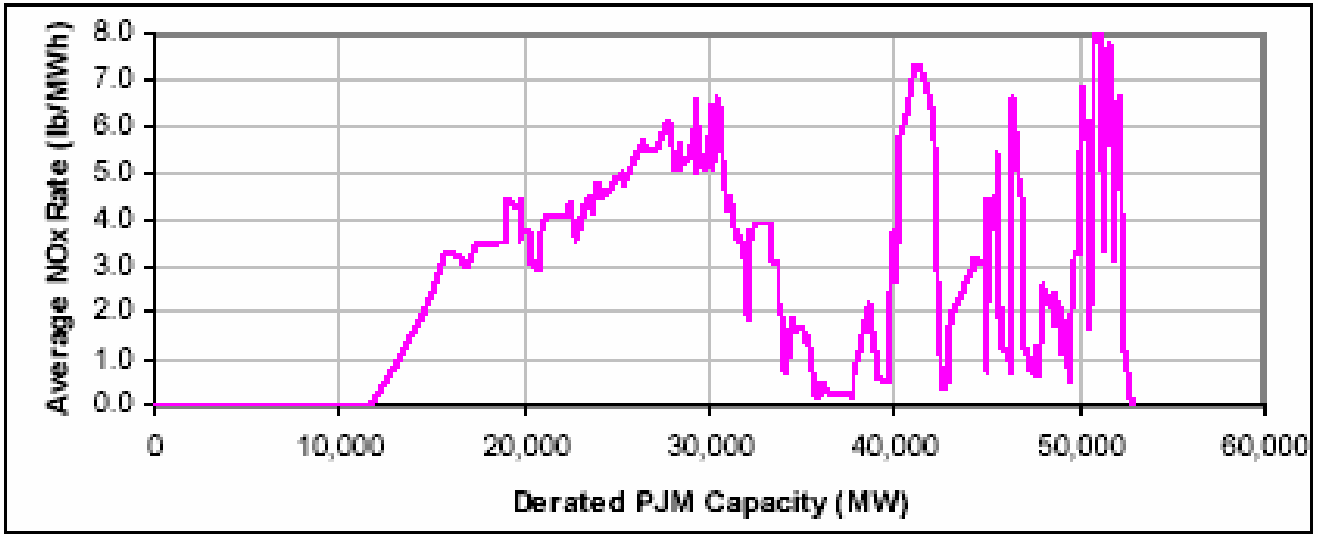
Resource additions and retirements over the long-term

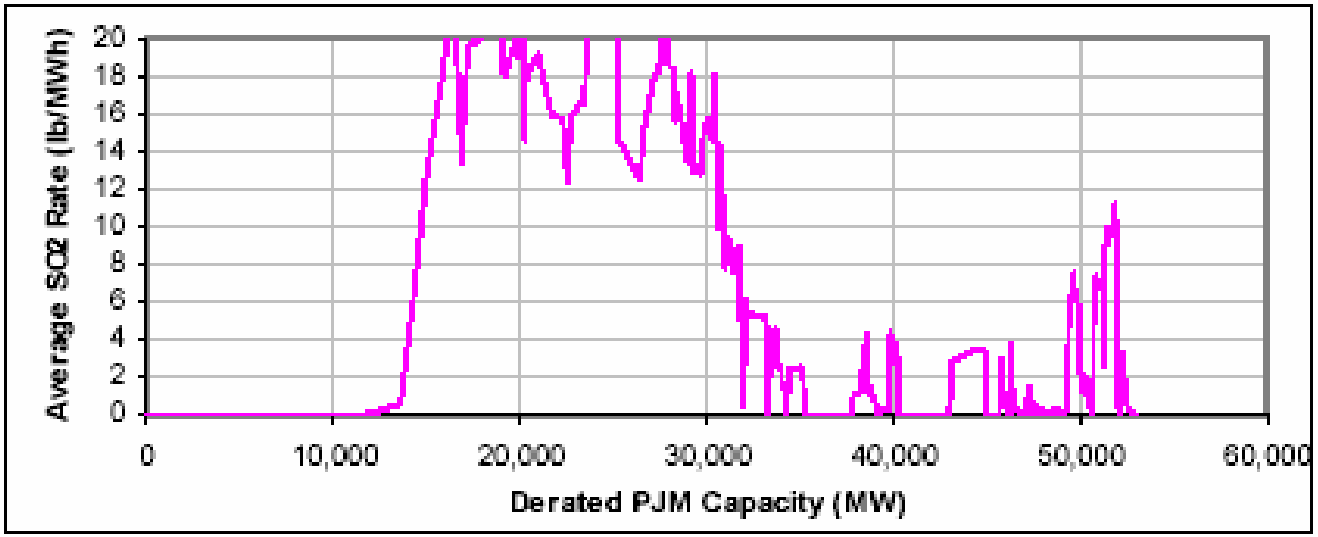


Electric dispatch simplified week

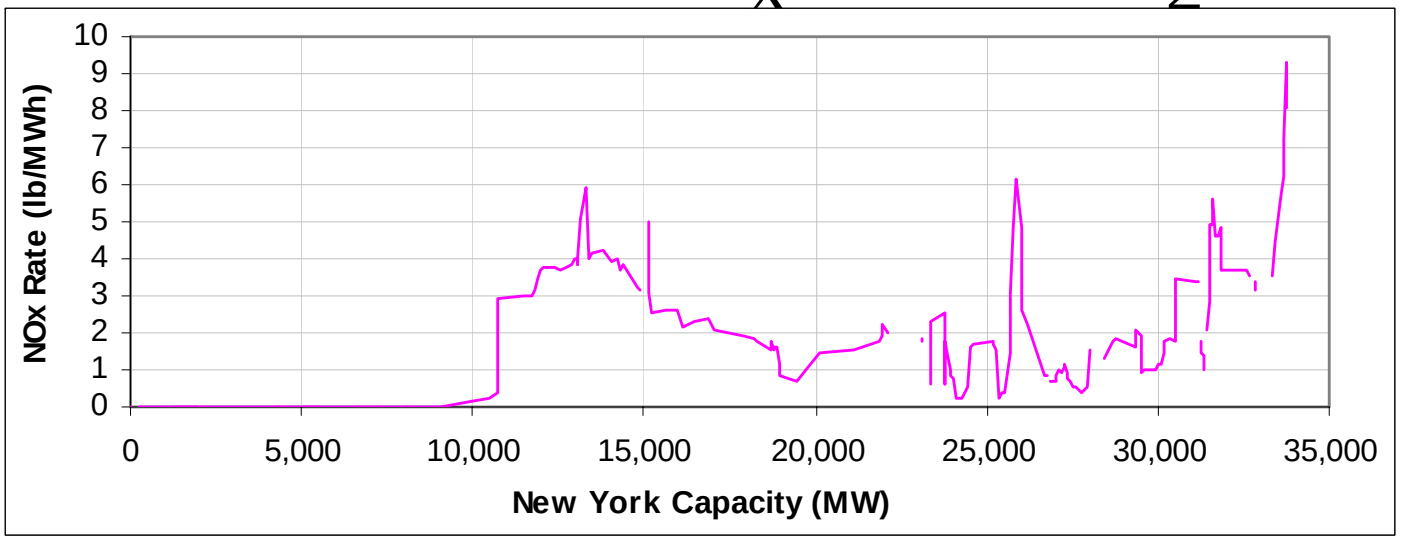


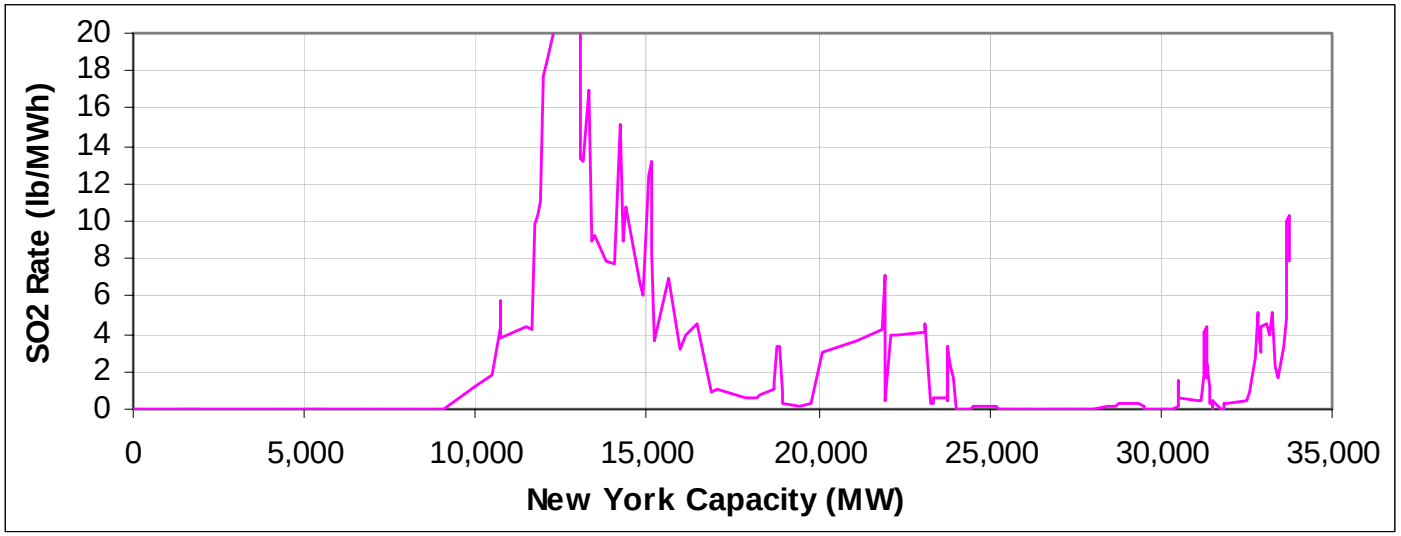
PJM NO_x and SO_2 Profiles



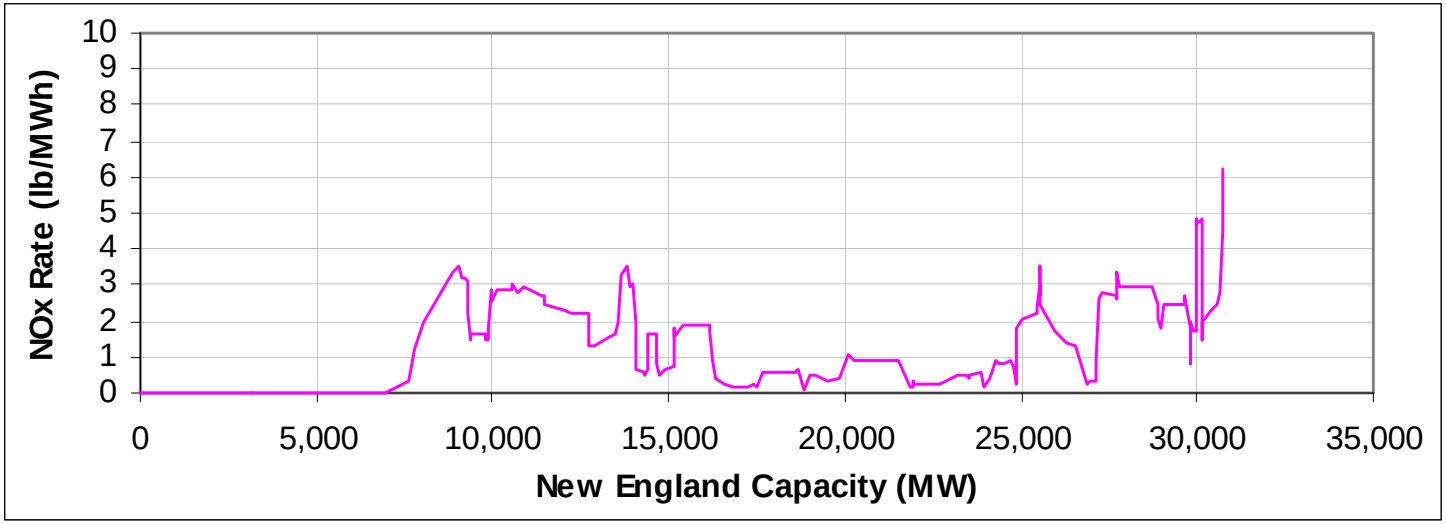


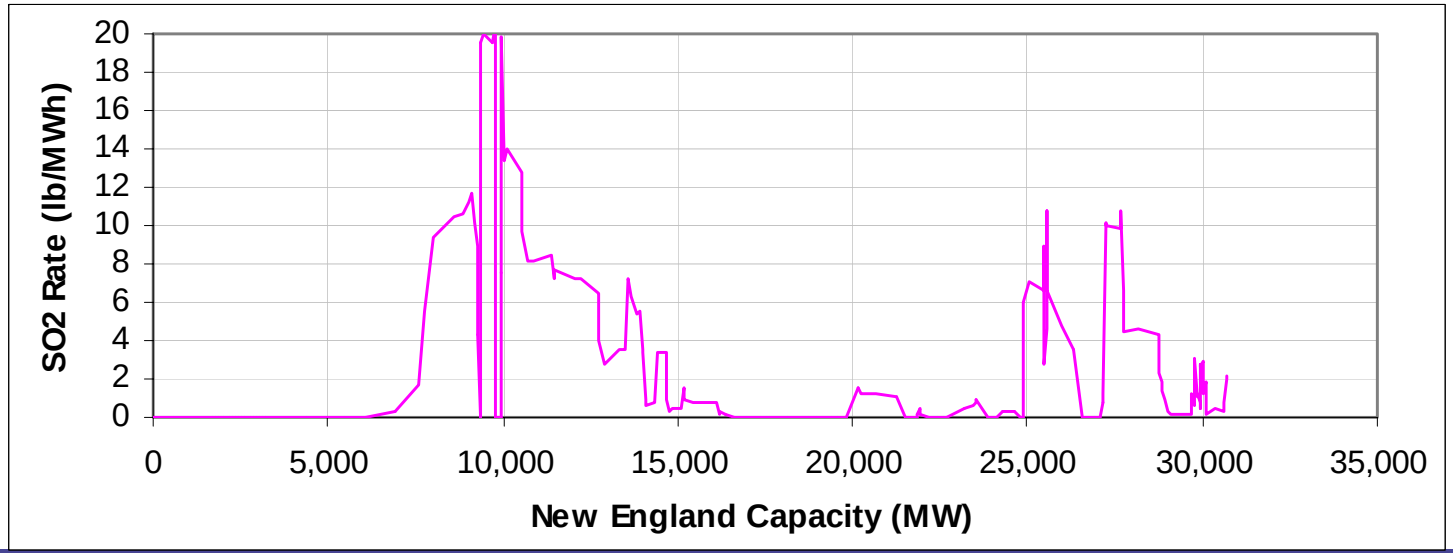
New York NO_x and SO_2 Profiles



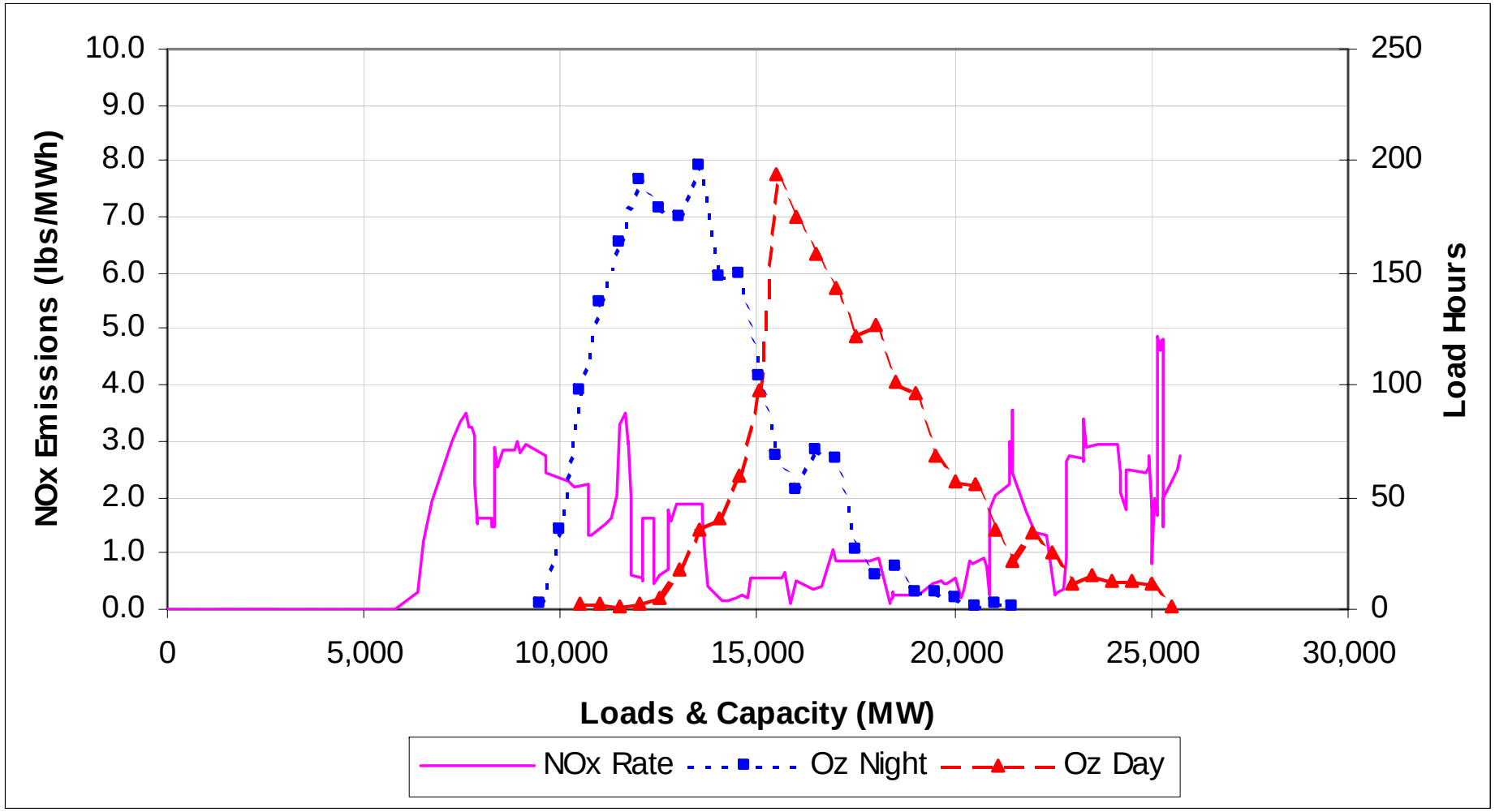


NE NO_x and SO_2 Profiles





NE NO_x Curves and Loads



Synapse Project for the Ozone Transport Commission

Objectives:

- Advance the understanding of emission reductions from energy efficiency and renewables in quantitative terms.
- Move toward a methodology robust enough to stand behind SIP credit, if desired.
  - Review models and methods for calculating avoided emissions from energy efficiency and renewables.
  - Develop a tool for calculating avoided emissions.
  - Tool should be able to assess energy efficiency, renewables, EPSs and multi-pollutant proposals.

The OTC Emissions Workbook

- Can calculate predicted emission reductions from energy efficiency, renewables, EPSs and multi-pollutant proposals
- Based in MS Excel. Simple, quick, good for scenario analysis
- Has default data in it – users can use this or enter their own input assumptions
- Default data were developed using a system dispatch model. The workbook itself is simple – only adds, subtracts, multiplies and divides.
- Does *not* forecast additions and retirements. Designed for scenario analysis.

It can be done!

1. Select a study region that is manageable size but large enough to include the significant impacts.
2. Understand the economic and other dynamics driving capacity mix changes over time.
3. “Dispatch models” are available to simulate in great detail the operation of a regional electricity system (e.g., PROSYM).
4. Use the OTC Workbook or hire a good consultant.

   www.otcair.org www.synapse-energy.com