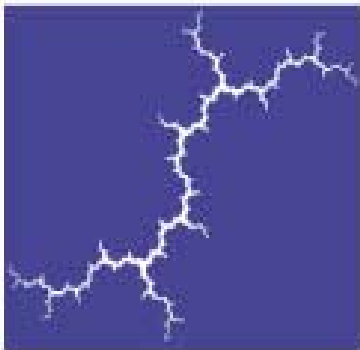


Displaced Emissions from Renewables and Efficiency in the Northeast United States

Bruce Biewald and Geoff Keith

Presentation to CEC Meeting in Washington, DC

July 17, 2003



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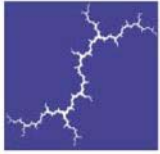


Synapse Project for OTC

Ozone Transport Commission web site has available:

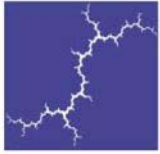
- OTC Emission Reduction Workbook 2.1 (Excel file).
- OTC Emission Reduction Workbook 2.1: Description and User's Manual.
- Multi-Pollutant Approaches in Certain OTR States.
- Predicting Avoided Emissions from Policies that Encourage Energy Efficiency and Clean Power.

<http://www.sso.org/otc/Publications/pub2.htm>



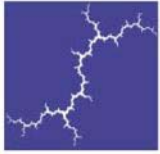
Goals of the OTC Project

- 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



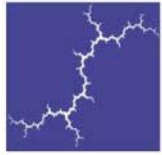
The Challenge

- Be able to predict, with reasonable accuracy, how reduced load or new generation will affect the operation of other generators
 - Highly dependent on time (day, season)
 - All generating units in a region are dispatched in order of (increasing) operating costs (or bids)
 - Changes in load and generation in one region affect generation in neighboring regions
 - There are region and unit-specific constraints



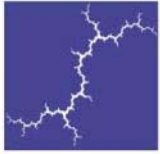
Two Steps in the Process

- Collect data on the “profile” of the energy saved or clean energy generated
 - When?
 - Where?
 - How much?
 - What emissions?
- Develop assumptions about how the regional energy system(s) will react
 - A system dispatch model is key.



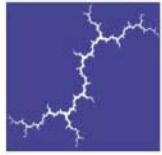
Short Term and Long Term

- Assessing avoided emissions over the short term requires different analytic methods than assessing this over the long term.
- In the short term, you know about the generating units in the system; the task is to model accurately how they interact.
- Over the long term, answering the question of what generating units will be built and retired becomes the key challenge.
- Tradeoffs...



Tradeoffs

- There are “dispatch models,” that simulate in great detail the operation of a regional electricity system (PROMOD, PROSYM, etc.)
 - Use very detailed information on load levels, generating units, forced outages, and transmission capabilities – Do not predict the future capacity mix.
- There are “forecasting models,” that predict how energy systems will evolve (NEMS, IPM, E2020)
 - Use more aggregated and simplified dispatch simulations – Do attempt to predict what will get built and retired.



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.