New England Tracking System Project

Methodology for Tracking Generation

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Conventions for Tracking Information

- Generation sources are tracked based on the financial transactions between market participants in New England.
- Generation sources are tracked on an hourly basis -- consistent with New England market settlements.

Two Steps of Tracking

- Follow all transactions between market participants, so that all electricity sold at retail is associated with a mix of generators.
- Assign the attributes of each generator to the resource mix of each supplier.

Services Tracked by NETS

- Energy is tracked.
- Capacity is not tracked.
- Ancillary services are not tracked.
- Transactions that are cancelled are not tracked.
- All tracking based on physically measured quantities of energy.

Tracking Four Transaction Types

- Unit Transactions -- when buyer has a contract for a specific unit.
- System Transactions -- contracts between two companies that do not qualify as unit.
- Pool Transactions -- purchase from spot market or power exchange.
- External Transactions -- purchase from outside of New England.

Unit Transactions

- Unit attributes flow with the energy sold.
- Fraction(s) of unit flows to purchaser(s).
- Remaining fraction contributes to owner's system mix.

System Transactions

- Unit transactions are subtracted from system.
- System transactions are assigned the attributes of the seller's residual mix.

Pool Transactions

- Sales into the pool are assigned the attributes of the seller's system sales.
- Purchases from the pool are assigned the attributes of the average unit mix sold into the pool in that hour.
- Each kWh out of the pool has weighted average attributes of all kWh in.

External Transactions

- If data available, same approach used: unit transactions distinguished from system.
- Ideally, neighboring systems will use a similar approach to tracking.
- If not, a set of system default attributes could be developed.

Tracking Examples

- No wholesale market.
- Unit transaction.
- System transaction.
- Pool transaction.
- Two-way system transaction.
- Loop transaction.

Tracking Equations

- Challenge is when system sales loop back to seller.
- For each market participant there is a set of equations that equate sales to purchases.
- Equations can be solved simultaneously.
- For each market participant there is one equation and one unknown for each fuel type: results in one unique solution.

Hardware and Software

- Tracking software should stand alone:
  - take input data on generation and transactions from the market (i.e., ISO) software,
  - combine with attribute data,
  - solve and report.
- Tracking calculations can be done hourly.
- Tracking equations can be solved using a Pentium-based PC.

Cost Estimate

- Preliminary cost estimate for tracking calculations for New England:
  - System development and set up: $300,000 over four months.
  - Implementation: $300,000 annual budget.
  - Key uncertainties: data availability and communications.

Generation Performance Standard

- Example of policy that requires NETS support.
- GPS requires all retail sellers to maintain generation portfolios with emission rates below a certain standard.
- Legislation in MA and CT.
- Group of regulators in NESCAUM region currently working on model rules.

GPS: Massachusetts Legislation

- To address impacts from fossil-fuel facilities serving retail customers in MA.
- Emissions per unit of output (lb/MWh).
- Any pollutant, as determined by DEP.
  - Of concern to public health.
  - Produced by electric generating facilities.
- At least one pollutant by May 1, 2003.

Source: Massachusetts Department of Environmental Protection

GPS: Connecticut Legislation

- Improve air quality, attain NAAQS in CT.
- Emissions per unit of output (lb/MWh).
- Air pollutants including, but not limited to, NOx, SO2, CO2, CO, and Hg.
- Standards established and regulations adopted by January, 1999.
- In effect when adopted by 3 OTC states w/ population of 27 million.

Source: Massachusetts Department of Environmental Protection

GPS: Calculation of Standard

- Numerator:
  - Historic emission levels.
  - Future emission requirements (NOX SIP Budgets).
  - Future emission goals (CO2 reductions).
- Denominator:
  - Retail electricity sales.
  - Electricity generation.

GPS: Compliance Calculation

- Each retail electricity supplier will need to know the emission attributes associated with every resource in its portfolio.
- This requires there be some electricity tracking system in place.
- Model rule being drafted assuming same tracking approach as NETS.

GPS Issues to Resolve

- Which pollutants should be covered?
- How to define a portfolio?
- What level should the standard be set at?
- Should averaging across suppliers be allowed?
- Should trading of credits be allowed?
- Interstate and inter-region coordination.
- Compliance, reporting and enforcement.
- Availability of data and tracking system.