

M&V inspires innovation, new
analytical tools and litigation: a
state perspective

Chris James, CT DEP

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State GHG action plans catalyze development of improved M&V

- ◆ Traditional metrics: NO_x, Sox, PM reductions
- ◆ GHG action plans require focus on broader and medium and long term objectives: economy-wide plans include: transport, electric, ag/forest, indirect (residential, C/I)

Basis for Good Metrics

- ◆ Short-term successes build and maintain momentum
- ◆ In the short-term: develop pilot studies to test theories and hypotheses.
- ◆ Caveat: avoid focus on only short-term; tendency to cream-skim and on “quick hits”
- ◆ Use short-term success/lessons learned to maintain commitment over medium and long term

Policy and Decision Makers Need Progress Measures

- ◆ GHG reduction measures have multiple environmental, economic and energy benefits
- ◆ Implementation of GHG actions requires long-term commitments that transcend election/ business cycles
- ◆ Very important to report measured progress over short-term (even annually) as feedback mechanism to reward leadership.
- ◆ Need to unbundle/ disaggregate benefits to demonstrate the degree of progress that is occurring

M&V Concepts

- ◆ Additionality: regulatory: must comply with RSVP&E (simple compliance may not be eligible for “credit”, unless reg has set aside)
- ◆ Additionality: financial : if you would have done it anyway, should that count? If you receive substantial government \$, should that count?
- ◆ Permanance (the “P” in bullet #1 above: measure has defined life)
- ◆ Persistence (expected performance lasts over the defined life)
- ◆ Replicability (consistency)
- ◆ Maturity (metric will be different at conceptual v. implementation stage) Conceptual: education, number workshops held. Implementation: GHG reductions, MWh clean energy

Example: Adding Value to EE
Potential Attributes



Examples of Metrics Used to Quantify EE

- ◆ NO_x, SO_x: measure avoided MWh, convert to tons. Tons can be applied to SIP obligations. Tons also have economic value, so could be sold, reused, and then retired
- ◆ How are avoided MWh measured? Actual rate, average of the power pool, marginal rate of last unit dispatched. Can make argument for any of these, depending upon the specific application.
- ◆ New EE measures (achieve reductions beyond code/ standards requirement)
- ◆ EE as resource (ISO, RGGI, white tags) MWh (persistence, winter v. summer, variability)

Connecticut's GHG Plan: How to Measure Progress

- ◆ Action Item (from 2004 GHG plan): Encourage CHP
- ◆ How: reduce permitting, interconnection and standby rate barriers
- ◆ Initial Actions: CHP training course for permit engineers, DPUC docket on interconnection standards
- ◆ Direct environmental benefits: GHG, criteria pollutant
- ◆ Other benefits: energy savings (MWh), energy system benefits (reduced congestion charges, improved reliability), energy independence (reduce imported fuel)
- ◆ Other metrics: jobs created, gross state product, state revenue

Current Tools Used for M&V

- ◆ COBRA: assess criteria pollutant and public health benefits. Recommended for weighting criteria to DPUC in ranking proposals for potential new DG in state
- ◆ REMI: regional economic model to estimate benefits/impacts of GHG actions
- ◆ IPM: regional utility dispatch model to estimate potential benefits and costs from electricity policy choices
- ◆ EIA data: unit specific rate
- ◆ ISO-NE: regional power pool and marginal unit dispatched

New Tools Available or Under Development

- ◆ MARKAL: MARKET Allocation model: facilitates finer analysis of potential policy choices (NE version developed by NESCAUM with funding from EPA/DOE)
- ◆ Algorithms to measure EE performance (ACEEE), M&V protocols developed by IPMVP, CA, NY
- ◆ GIS: track intra- and inter-power pool electricity sale on MWh basis.
- ◆ Advanced metering enables remote sensing: improved demand response, large consumers track loads in real-time

Challenges Ahead

- ◆ Many existing tools do not provide adequate precision: scale is inappropriate geographically or temporally
- ◆ Resistance to change
- ◆ Analytical techniques require updating: 1) need data and information on the true cost of EE, 2) the persistence over the life of the EE, 3) discount rates applied to evaluate resources
- ◆ Attention of insurance and financial sectors would complement and guaranty performance, especially for EE.

CT's Path Forward

- ◆ M&V workshop October 2006: Goals: develop institutional capacity to measure progress, identify gaps in currently available tools, map out plan to fill them, reconvene stakeholders
- ◆ Report out at 2007 EPA conference?
- ◆ Apply results to 2006 report to legislature
- ◆ Will form basis for 2007 GHG planning effort (75-85% reduction by 2050)

For More Information

- ◆ Attend Thursday's session on EE as a resource
- ◆ Contact information: chris.james@po.state.ct.us
- ◆ 860 424 3027
- ◆ Resources: EPA set-aside guidance; COBRA manual (<http://www.epa.gov/cleanrgy/stateandlocal/resources.htm>); www.ipmvp.org (international M&V protocols)