

Quantifying Emissions Impacts of Clean Energy Initiatives

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Overview

- ▶ Massachusetts Energy Efficiency and Renewable Energy programs
- ▶ NEEP Regional Evaluation, Measurement and Verification (EM&V) Forum
- ▶ US Department of Energy (DOE) *Uniform Methods for Evaluation, Measurement and Verification of Savings from Energy-Efficiency Programs* Project

MA Commitment to Energy Efficiency

- ▶ Three-year Energy Efficiency Plans: Lifetime benefits of \$6 billion in avoided energy cost due to \$2 billion in investments by programs and participants in 2010–2012, for net benefits of \$4 billion
- ▶ *Efficiency as Our First Fuel: Strategic Investments in Massachusetts' Energy Future The 2010 Report of the Massachusetts Energy Efficiency Advisory Council*
www.mass.gov/eea/docs/doer/energy-efficiency/eeac-2010-report-ee-advisory-council.pdf
- ▶ Estimated greenhouse gas (GHG), nitrogen oxide (NO_x) and sulfur dioxide (SO₂) benefits

Emission Estimates Build on Previous Work

- ▶ For NO_x and SO₂, used average 2006–2008 system wide emission rate for the New England electric grid from ISO New England *2008 New England Electric Generator Air Emissions Report*
www.iso-ne.com/genrtion_resrcs/reports/emission/2008_emissions_report.pdf
- ▶ For GHG, used average 2006–2008 MA electricity consumption–based emission rate (includes emissions associated with imported power)
- ▶ Used 3 year average because did (and do) not yet have 2010 emissions, and do not need inventory–quality data

Consumption-based GHG Emissions Rates

- ▶ Developed for 2 purposes:
 - MA GHG emissions inventory
www.mass.gov/dep/air/climate/gwsa_docs.htm#implement
 - GHG emissions reporting by MA retail sellers of electricity
www.mass.gov/dep/air/climate/reporting.htm#rse
- ▶ MA imports a quarter of the power it uses, so looking solely at in-state generation underestimates emissions associated with electricity used
- ▶ MA 2008 Global Warming Solutions Act required consideration of imported power in GHG emissions reporting
- ▶ Methodology discussed at public meetings and posted for public comment; reporters have provided ongoing feedback

Challenges

- ▶ Timeliness: time lag on data availability
- ▶ Environmental staff learning energy import lingo and municipal power plant electricity reporting procedures
- ▶ Learning equivalent environmental lingo for another country, since some MA power is imported from Canada
- ▶ Learning new databases at US DOE
- ▶ Allowing credit for clean power purchases while preventing double-counting
- ▶ Ensuring integrity of renewable energy credit tracking
- ▶ Need for regulation to evolve as learn

Northeast Energy Efficiency Partnerships (NEEP)

- ▶ Regional Evaluation, Measurement and Verification (EM&V) Forum neep.org/emv-forum
- ▶ 11 states
- ▶ Funded by public utility commissions and energy offices
- ▶ “supports the development and use of common and/or consistent protocols to evaluate, measure, verify, and report the savings, costs, and emission impacts of energy efficiency”

NEEP EM&V Forum

- ▶ Objectives
 - Reduced emissions improve air quality for residents
 - Ensuring air quality is part of EM&V process
 - Consistency
 - Documenting air quality benefits
- ▶ How decided: still working on methodology
- ▶ Factors considered: marginal vs. average
- ▶ Consultation: air colleagues (e.g., NESCAUM nescaum.org)
- ▶ Challenges: terminology
- ▶ Evolution: need EM&V methodologies first, before being able to grapple with emissions estimation (i.e., need sufficiently accurate energy reduction values before trying to marry to emission factors)

Uniform Methods Project

- ▶ *Uniform Methods for Evaluation, Measurement and Verification of Savings from Energy-Efficiency Programs*
- ▶ Sponsored by US Department of Energy and National Renewable Energy Laboratory (NREL)
- ▶ 1 year project (Sep 2011–Aug 2012)
- ▶ Starting with protocols for 7 measures
 - Commercial lighting
 - Commercial unitary HVAC systems
 - Lighting controls
 - Refrigerator recycling
 - Residential boilers and furnaces
 - Residential lighting
 - Whole-house retrofits

Questions?

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