

Governor's Council on Climate Change (GC3)

MEETING MINUTES

Meeting Date: Sept. 8, 2016

Meeting Time: 1-3 p.m.

Meeting Location: CT DEEP

Gina McCarthy Auditorium

79 Elm Street, Hartford, CT 06106-5127

ATTENDANCE

Council Member	Title	Organization	Present
Katharine Wade	Commissioner	Connecticut Insurance Department	N
David Robinson	Executive Vice President & General Counsel	The Hartford	Y
Melody Currey	Commissioner	Department of Administrative Services	N
Garrett Eucalitto	Undersec. For Trans. Policy & Planning	Office of Policy and Management	N
Bryan Garcia	President and Chief Executive Officer	Connecticut Green Bank	Y(phone)
T.J. Hanson	Product Director	Thule, Inc.	N
Art House	Chairman, PURA	Public Utilities Regulatory Authority	Y
John Humphries	Director	CT Round Table for Climate & Jobs	Y
Rob Klee (chair)	Commissioner	Department of Energy & Environmental Protection	Y
David Kooris on behalf of Commissioner Klein	Director of Rebuild by De-sign and National Disaster Resilience	Department of Housing	N
James Redeker	Commissioner	Department of Transportation	Y
James O'Donnell	Executive Director	Connecticut Institute for Resilience and Climate Adaptation	N
Catherine Smith	Commissioner	Department of Economic & Community Development	N
Lynn Stoddard	Director	Institute for Sustainable Energy	Y
Don Strait	Director	Connecticut Fund for the Environment	Y
Associated Staff	Title	Organization	Present
Tracy Babbidge	Chief	Bureau of Energy & Technology Policy, DEEP	Y
Katie Dykes	Deputy Commissioner for Energy	DEEP	Y
Keri Enright-Kato	Director	DEEP Office of Climate Change, Technology & Research	Y
Jeff Howard	Environmental Analyst	DEEP Office of Climate Change, Technology & Research	Y
Paul Miller	Deputy Director & Chief Scientist	Northeast States for Coordinated Air Use Management	Y
Jason Rudokas	Policy Analyst	Northeast States for Coordinated Air Use Management	Y

AGENDA & NOTES

Welcome and Announcements

Rob Klee, GC3 chair

- Commissioner Redeker is proceeding with plans for a Home Energy Solutions audit of his home, to encourage employees of Department of Transportation to follow his lead.
- John Humphries has electronically distributed a summary of results of the July 26 stakeholder event.

Review and discussion of updated scenarios and setting mid-term target(s)

Paul Miller and Jason Rudokas, NESCAUM

Reference case and mitigation wedge input assumptions

- *Underlying assumptions* — 80% overall reduction from 2001 to 2050; development of wedges for three possible 2030 targets (35%, 45%, and 55%)
- *Reference case assumptions for nuclear plants*
 - Pilgrim retires in 2019 and is replaced with natural gas.
 - Seabrook granted 20-year license renewal in 2030 and operates through 2050.
 - Millstone 2 and 3 retire at license expirations (2035 and 2045, respectively) and are replaced with natural gas.
- *Energy efficiency programs for electricity* — Based on ISO [CELT](#) data, which incorporates forecasted impacts of CT specific electricity efficiency programs.
- *Behind-meter solar* — Whereas the reference case uses CELT through 2025 but then remains stable to 2050, the scenarios included low, medium, and high BTM sensitivities.
 - Low BTM: ISO-NE PV growth forecast cut in half.
 - Medium BTM: ISO-NE growth forecast extrapolated based on 2020 – 2025 growth rate.
 - High BTM: Geostellar estimate of 650k households with rooftops suitable for PV install systems by 2050.
- *Clean grid* — After 2025, natural gas generation displaced by renewable energy (RE). Inputs are based on technical potential figures for New England from the National Renewable Energy Laboratory. Declining cost of RE is assumed to continue, via [SunShot](#) data. Reduction in soft costs is not assumed, but that could be incorporated.
- *Electrification of passenger vehicles* — Review of EV penetration rates needed for each of the GHG targets for 2030 and 2050. The more stringent scenarios show smaller EV sales percentages in 2050 than would be needed for the 35% target, because in the more stringent scenarios EV penetration occurs earlier. For instance, by 2030 the 55% target requires 200% sales, which means there would need to be twice as many EVs sold than we otherwise would expect to be sold annually. Policy tools to archive this of course are limited: financing, taxation, incentives, or restrictions on non-EV sales.
- *Residential renewable thermal* — Review of penetration rates for renewable thermal technologies, which include air-source and ground-source heat pumps. Number of devices, % of thermal load, and number of change outs per year for three 2030 targets reviewed.
- *Commercial renewable thermal* — Review of penetration rates for renewable thermal technologies, which include air-source and ground-source heat pumps. Square feet heated by air-source and ground-source heat pumps and % of heated square feet for three 2030 targets reviewed.

- *Heavy-duty vehicle electrification* — Review of penetration rates for light commercial trucks and transit buses, school buses, refuse trucks, and single unit short haul trucks. This wedge represents 8% of total GHG reductions by 2050.
- *Electrification of Passenger and Freight Rail* — Review of penetration rates of electric rail technologies to meet the 80% reduction target. This wedge represents 5% of total GHG reduction by 2050.
- Review comparison of three 2030 target trajectories on path to 2050 target– 35%, 45%, and 55%.
 - All trajectories end at the same point, however differences in trajectory may include economic cost, equity in achieving emissions reductions sooner, cumulative emissions lower if reductions occur sooner making 2050 target easier to achieve in the out years.
 - Cannot recommend a mid-term target until the Council has more information on the differences economic costs and benefits (REMI analysis).
 - Understanding the co-benefits is also an important factor, but may not be something we can assign numbers to.
- Review renewable generation sensitivities for the 45% reduction by 2030 scenario. This includes utility scale solar, onshore wind, and offshore wind.
 - Behind-meter solar is captured in the demand wedge.
 - Shared solar is captured in the solar wedge. It is a policy option that can be discussed further when we get to the policy discussion. For modeling purposes it makes no difference to separate it out.
 - Energy efficiency is included in the demand wedge, but we can look at it more specifically at a future meeting.
 - Currently energy efficiency measures result in no net electricity demand.

Review updated 2013 GHG Inventory

Keri Enright-Kato, DEEP

- After releasing the initial GHG Inventory in late July, a mathematical error in the emission factor for the regional electricity grid was brought to DEEP's attention. The analysis has since been revised to fix the error. DEEP will issue an updated inventory that reflects the corrected numbers for the electric sector. The other sectors were not affected and remain unchanged.
- 2013 economy-wide emissions were 43 MMTCO₂e utilizing the consumption-based approach– a 4% reduction from 1990 levels and 41 MMTCO₂e utilizing the generation-based approach – a 9% reduction from 1990 levels
- For the electric sector, the generation-based approach indicates lower carbon emissions than the consumption-based approach, reflecting the fact that power plants operating within Connecticut have a “cleaner” generation mix than the region as a whole.
- Further refinement of our methodologies will be necessary going forward, to ensure that a consumption-based approach can accurately account for the benefits of direct ratepayer investments in clean energy generation and/or transmission that may be made outside of Connecticut, without double-counting investments directly attributable to other states in the region.
- Connecticut is implementing a suite of complimentary strategies to ensure that the state is on a course to achieve its near-term 2020 reduction goal. The range of GHG reduction actions include direct regulations, monetary and non-monetary incentives, market-based mechanisms, and recognition for voluntary actions.

- Slide 22 provides an overview of the programs, strategies, and policy initiatives that are currently driving the state's emissions down between now and 2020.

Next Steps

- Meetings dates for November and December will be sent out soon.
- DEEP staff will begin to coordinate REMI analysis and seek input from GC3/ADM.

Public Comments*Mike Morrissey, Alternate Fuels Coalition of CT*

- Propane-powered school buses: 139 in Waterbury. CT leads NE in total propane bus deployment. This is a way to reduce GHG emissions immediately in state; not experimental; 25 million vehicles worldwide. Electrification needed in long term, but propane is positioned to help secure immediate goals. Many light- and medium-duty vehicles could be converted to propane. Infrastructure would not require government intervention. Propane needs fair consideration. It is being ignored.

Ray Albrecht, National Biodiesel Board

- Please give more attention to renewable fuels. Peak electricity load in winter and summer point to a need to incorporate renewable fuels. "Real-time RECs" are key; this would dovetail with real-time electric rates.

Chris Phelps, Environment Northeast

- There is a tension between how much GHG reductions CT can afford and how much we need to achieve. Must work backward from the end goal, not merely stagger in that general direction. The interim targets are crucial. Underpinning of 2050 trajectory is electrification. Need to have policies to prevent backsliding. Analysis so far underscores importance of getting to 100% renewable energy.

Henry Auer, Global Warming Blog

- Clarification on whether or not changes in the electric grid were incorporated into analysis before electrification of vehicles wedge. Can't achieve emission reduction targets without greening the grid first.

NOTE: Slides are available on GC3 web page: www.ct.gov/deep/gc3