

# **Governor's Council on Climate Change (GC3) MEETING MINUTES**

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**Meeting Date:** June 16, 2016

**Meeting Time:** 2:30-4:30 p.m.

**Meeting Location:** UConn Law School

Starr Reading Room

39 Elizabeth St., Hartford

**ATTENDANCE**

<b>Council Member</b>	<b>Title</b>	<b>Organization</b>	<b>Present</b>
George Bradner (on behalf of Commissioner Katharine Wade)	Director, Property & Casualty Division	Connecticut Insurance Department	Y
Jay Bruns (on behalf of David Robinson)	V.P. for Public Policy & Corporate Responsibility	The Hartford	Y
Melody Currey	Commissioner	Department of Administrative Services	N
Garrett Eucalitto	Undersec. for Trans. Policy & Planning	Office of Policy and Management	Y
Bryan Garcia	President and Chief Executive Officer	Connecticut Green Bank	Y
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
Evonne Klein	Commissioner	Department of Housing	N
Tom Maziarz (on behalf of Commissioner James Redeker)	Chief, Bureau of Policy & Planning	Department of Transportation	Y (by phone)
James O’Donnell	Executive Director	Connecticut Institute for Resilience and Climate Adaptation	Y
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

<b>Associated Staff</b>	<b>Title</b>	<b>Organization</b>	<b>Present</b>
Tracy Babbidge	Chief	Bureau of Energy & Technology Policy, Department of Energy & Environmental Protection	Y
Katie Dykes	Deputy Commissioner for Energy	Department of Energy & Environmental Protection	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
Art Marin	Executive Director	Northeast States for Coordinated Air Use Management	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
Michele Manion	Senior Associate	Abt Associates	Y

## AGENDA & MEETING NOTES

### Welcome and Introductions

*Welcome by UConn Law School Dean Timothy Fisher*

*Welcome by Commissioner Klee*

- Meeting will be devoted largely to discussion of fundamental questions for the LEAP modeling.

### Review & discussion of key questions for scenarios and sensitivity analysis for LEAP modeling

*Facilitated by Paul Miller and Jason Rudokas, NESCAUM*

- Need GC3 to make some key decisions about scenarios and sensitivities.
- Background — terminology
  - Reference case: Projected GHG emissions, based on Annual Energy Outlook (AEO), business as usual.
  - Scenario: Any group of technologies and measures capable of achieving the goal of 80% reduction by 2050.
  - Sensitivity analysis: Variation of scenario under different economic/policy/system assumptions.
    - Example of hypothetical sensitivity analysis: CT AEO reference case with bounding sensitivities
- Background — Key transitions are critical in all scenarios
  - Efficiency and conservation across energy sectors
  - Fuel switching in transportation and buildings (e.g., electrification)
  - Decarbonization of electricity – required to obtain maximum GHG reductions from electrification
  - Decarbonization of fuels (gas & liquids) – e.g., for aviation and marine vehicles
- Key questions for discussion
  1. *What technologies and measures should be used to balance the electric grid with large amount of intermittent renewable energy – both over the long term and short term?*
    - Storage and demand response
    - Geographic diversity of renewables
    - Imported hydro
    - Natural gas combined cycle
  2. *What is the future role of nuclear power?*
    - Pending retirements: Pilgrim (2019), Seabrook (2030), Millstone 2 (2035), Millstone 3 (2045)
    - Assume retirement when licenses expire?
    - Analyze scenarios in which:
      - plants are retired early?
      - licenses are extended?
      - new plants are commissioned?
  3. *How should we prioritize technologies and measures for residential/commercial buildings?*
    - Renewable thermal choices – e.g., ground source heat pump, air source heat pump, solar thermal, biomass thermal, advanced biodiesel
    - Sector interactions – e.g., electrification of space heating (via heat pumps) shifts some emissions to electricity grid

4. *What is the best end use for advanced biofuels that are in limited supply?*
  - Federal fuel standard is driving development of these biofuels, but supplies will be limited.
  - Potential applications include airplanes and thermal loads in buildings, but heavy-duty road transport probably cannot be electrified.
  - Trends are driven at national and international scale
- Discussion of key questions
  - Current levels of natural gas use for electricity and heating is incompatible with the 2050 goal, however, it is important to distinguish between natural gas to generate baseload electricity and natural gas to “balance” the grid.
  - The reference case assumes nuclear plants remain on line through 2050, but this is worthy of additional discussion.
  - The reference case also includes CT’s current natural gas expansion policies for heating demand.
  - Relative costs of fuels and technologies (nuclear and natural gas) are important in this context; and in the Comprehensive Energy Strategy and other planning efforts the state should be emphasizing policies that help priority fuels and technologies achieve cost parity. Narrowing the broad range of possibilities into a small set of modeling options (e.g., natural gas for baseload vs. natural gas for grid balancing) would help inform the discussion of policy options.
  - General discussion on state’s current efforts to increase natural gas capacity to alleviate peak constraints that lead to high electricity costs and increased emissions.
  - How can the state ensure that natural-gas generation will eventually ramp down to meet climate goals? Concerns about continued expansion of natural gas being incompatible with climate goals.
  - If nuclear plants are retired according to schedule, hydropower could be viewed as an alternative for baseload power — both large-scale from Quebec and small-scale from run-of-river plants in CT.
  - What about pumped storage for grid balancing? Both small hydro and pumped storage would have good economic development potential within CT, however need to look at large impact solutions, not micro-solutions, for 2050 goal. Pumped hydro is not panacea but could be a piece of puzzle.
  - Do we need to “retain nuclear option” — perhaps a 4<sup>th</sup> unit at Millstone?
  - Achieving 80% reduction by 2050 is “huge challenge,” and the modeling we are currently doing is only directional.
  - Consensus that NESCAUM should only model scenarios that include a reduction in natural gas use, with a maximum increase in energy efficiency and renewable energy, since we already know that it will otherwise be impossible to reach the 2050 goal. Agreement that this decision should be explicitly noted in the final report, since readers may question why scenarios maintaining a reliance on natural gas were not evaluated.
  - Based on the discussion and feedback received NESCAUM will prepare draft scenarios for review at the next ADM meeting in July.

## **Mid-term target setting process and meeting schedule through fall 2016**

*Facilitated by Rob Klee and Keri Enright-Kato, DEEP*

- For the foreseeable future, DEEP's staffing resources are limited. Agency's budget was cut \$10 million (14%), producing serious personnel constraints. The agency is unlikely to be able to hire for years, even when people retire. Plus it is also training people bumped from other agencies.
  - *Analysis, Data, and Metrics Working Group, July 26* — review GHG inventory; review initial scenario modeling results; discuss mid-term targets
  - *Stakeholder engagement event, July 26*
  - *GC3, September 8* — finalize mid-term targets; review final modeling results; finalize plans for economic modeling
  - *Stakeholder engagement, October, date TBA*
  - *GC3, October 19* — review economic modeling results; finalize recommended GHG reduction scenarios; begin discussion of policies and measures
  - *GC3 (possible), November and/or December, date TBA* — review policies and measure to actualize recommended reduction scenario
  - Additional stakeholder events, date(s) TBA — to review GC3 draft recommendations
- Other activities
  - DEEP draft of climate strategy/report, December-February
  - GC3 review of draft climate strategy/report, February-March

### **Public comments**

*Jerry Silbert (Watershed Partnership)*

Will send three book chapters that are relevant to current discussion; climate change is symptom of defects in economy; authors' perspectives would be helpful to GC3 members for this discussion.

*John Calandrelli (CT Sierra Club)*

Must ramp up energy efficiency for old housing stock. More EVs, with PV parking lots. Have now hit 407 ppm CO<sub>2</sub> and will not go below 400 ppm in our lifetimes. Any investment in dirty fuels and infrastructure is contrary to obligations. "Intermittent" is a red herring; use "variable." "Can the bottled water." It's embarrassing.

*Mike Morrissey (Alternative Fuels Coalition)*

Propane is terrific way to reduce GHG emissions, esp. in transportation sector. Torrington, 105 school buses. Waterbury, 145 school buses. Danbury, 125 school buses. Simsbury, 5 buses. New Milford, placing order. AAA, 20. Yale, dispensing system. For locations where natural gas cannot reach, propane is ideal solution.

*Scott Guilmartin (NuPower)*

Someone stated that district heating has little potential. Putting citywide system into Bridgeport. Need to revisit CES analysis on this. The rest of the world is going this direction. Key way for cities to reduce emissions. Customers on district heating reduce emissions 80%, because powered by waste-heat. Fuel cells also have good potential with district heating. Should be seriously considered, despite modeling complications.

*Mark Scully (People's Action for Clean Energy)*

Not getting to 80% with natural gas, yet we are building tracks to do that. Urge group to find policies to build tracks that we will have to break later. Also, an important sector interaction: electrification of vehicles = good storage potential for load balancing and short-term frequency corrections.

**NOTE:** Slides are available on GC3 web page: [www.ct.gov/deep/gc3](http://www.ct.gov/deep/gc3)