



**Governor's Council on Climate Change (GC3)
Analysis, Data, and Metrics Working Group (ADM)
MEETING MINUTES**

Meeting Date: December 3, 2015
Meeting Time: 2:30 p.m. —4:30 p.m.
Meeting Location: Eversource
(Holcott Training Rooms 1A & 1B)
107 Selden Street
Berlin, CT 06037

ATTENDANCE

Working Group Members	Title	Organization	Present
Robert Klee	Commissioner	Department of Energy & Environmental Protection	Y
Catherine Smith	Commissioner	Department of Economic & Community Development	Y
James O'Donnell	Executive Director	CT Institute for Resilience & Climate Adaptation	Y
John Humphries	Organizer	CT Roundtable on Climate & Jobs	Y
Don Strait	Executive Director	Connecticut Fund for the Environment	Y
Lynn Stoddard	Director	Institute for Sustainable Energy	Y
Kathryn Boucher (on behalf of Arthur House)	Staff Attorney	Public Utilities Regulatory Authority	Y
Tom Maziarz (on behalf of James Redeker)	Bureau Chief	Department of Transportation	Y

Associated Staff and GC3 Members	Title	Organization	Present
Scott Jackson	Under Secretary for Intergovernmental Policy	Office of Policy Management	Y
Keri Enright-Kato	Director	DEEP Office of Climate Change, Technology & Research	Y
Tracy Babbidge	Bureau Chief	DEEP, Bureau of Energy and Technology Policy	Y
Jeff Howard	Environmental Analyst	DEEP Office of Climate Change, Technology & Research	Y
Paul Miller	Deputy Director and Chief Scientist	NESCAUM	Y
Michelle Manion	Senior Associate	Abt	Y
Guest Speaker	Title	Organization	
Watson Collins	Manager	Research and Business Development, Eversource	Y

ADM = Analysis, Data, and Metrics Working Group

AGENDA & NOTES**Welcome and review meeting agenda**

Robert Klee, Commissioner, CT Dept. of Energy & Environmental Protection (DEEP)

- Welcome from Watson Collins of Eversource
- Climate related announcements
 - Governor Malloy was in New London and announced that CT has joined the Under2MOU

- CT is also a part of the International ZEV Alliance.
- Transportation and Climate Initiative (TCI) announcement from Nov. 24th. Five Northeast States and DC Announce they will work together to develop potential market-based policies to cut greenhouse gas emissions from the transportation sector.
- LAE had an amazing stakeholder engagement workshop at the EnergizeCT center in North Haven which was very inspiring. Positive energy in the room with lots of exciting ideas coming from a great mix of individuals.
 - Scott Jackson spoke briefly about the event, mentioning that there were about 80 people in attendance; a really nice turn out. It gave some great ideas on how to expand the dialogue.
- Cancellation of the December 16th GC3 meeting and a reschedule for mid-January to allow time for NESCAUM to complete building out the LEAP model.
- Review of administrative procedures — Signing in for this meeting, accessing ADM materials on www.ct.gov/deep/gc3, making oral comments today, submitting written comments, signing up for GC3 e-mail distribution list.

Review and discussion of California emissions reduction strategies

Paul Miller, NESCAUM and Michelle Manion, Abt

- Update on where CT is compared to other states such as California.
- Transportation emissions are 40% of the state's GHG emissions inventory as of 2012
- 4 key points associated with any analysis that looks at transforming energy consumption to reduce GHG emissions:
 - Energy efficiency and conservation (includes vehicle miles traveled (VMT), building energy use, vehicle efficiency, etc.).
 - Fuel switching in transportation and buildings, all things fuel.
 - Decarbonize electricity generation.
 - Alternative fuels and decarbonization of fuels (gas/liquids)
- CT has the right building blocks in place. They include a robust experience in solar installations and energy efficiency, a ZEV mandate, incentives programs, and participation in RGGI.
- Review of CT electric vehicle purchase incentives. A unique incentive approach that CT has taken is providing incentives to dealers to sell electric vehicles. This is good incentive to motivate and engage dealers.
- Charging infrastructure incentives. CT has laid the groundwork for deploying charging station infrastructure.
- H2 fueling station incentives. CT has also begun laying the groundwork for a hydrogen highway.
- Utilities have a role to play in supporting the successful deployment of electric vehicles and the associated infrastructure.
 - Charging infrastructure deployment
 - Variable rate pricing (can help balance load depending on time of charge)
 - New demand to make up for downward trend
 - More efficient generation through load balancing
- RGGI has helped in driving down emissions; natural gas has helped, but won't do it all.
- States are moving forward with their RPS and CT continues to be in the mix.
- Solar PV installation and capacity rankings. CT is number 6 nationally. North East states tend to rank amongst the top 10. CT is number 12 in national capacity and based on CT's size and geography that is impressive.

- Review of ACEEE statewide efficiency rankings. CT has a nationally robust and effective energy efficiency program.
- Review of key assumptions in the CA PATHWAYS study
 - PATHWAYS is a model from Europe
 - CA does not need nearly as much heating as CT
 - Continuation of current lifestyle and economic growth
 - Optimistic look at technology with technological conservatism
 - Natural retirement of equipment and penetration of new technology consistent with history
 - Biomass use is limited based on DOE estimates of sustainable supply
 - Low carbon standard- advanced biofuels assumed to have net-zero carbon emissions depends on food stock and lots of complicated arguments. Role of biomass and its indications is an ongoing debate
- There are 4 major energy transformations needed to meet CA's 2050 climate goals
 - Their energy-use efficiency needs to improve by an incremental 1.3% per year on top of what they are already doing for over 30 years in order to meet their 2050 climate goals
 - Electricity supply is nearly decarbonized
 - Most existing direct fuel use needs to be electrified
 - Fuel-switching has some forks in the road. Other aspects of fuel switching- we don't really know what that marginal cost is for a biofuel vs. bio gas, etc. don't know what will be the best and most cost effective fuel.
 - Consistent across all studies, without electrification there doesn't seem to be a way to reach the 2050 goal.
- 3 forms of decarbonized electricity each of which has potential to dominate CA electricity production
 - Renewable energy (74% max is feasible)- Highest need for installed capacity, transmission and storage.
 - Nuclear (base load) - Requires the largest export and fuel cycle infrastructure.
 - Carbon capture and storage- Requires construction of CO2 transport and storage.
- Significant amounts of uncertainty exist around future costs of technologies, fossil fuels, and cost of capital.
- Cost estimates for 2030 and 2050
 - Ranges of uncertainties are very apparent
 - Early deployment is more costly in 2030, but by 2050 it's fairly comparable to a slower increase by 2050
- In 2050 CA predicts it will need 100% sales to be ZEVs, not to be confused with 100% on the road by 2050
- Wrap up and concluding thoughts
 - Everything is on the table, not just technology components.
 - Timing matters when it comes to the strategies. Sequencing the deployment of technologies and strategies is critical.
 - CT's approach is similar to CA's, but we don't have the same geology, space, or climate as CA, so we will have to take a different approach on some things.

Role of electric utilities in deploying electric vehicles

Watson Collins, Manager, Research and Business Development, Eversource

- Battery prices have dramatically declined.

- Cars powered by fuel cells are essentially the same as today's car, but have a fuel cell instead of a combustion engine.
- Discussion of New England's carbon emissions by source and its trajectory.
- Discussion on how vehicle technology has created progress in terms of efficiency gains – higher horsepower vehicles are much higher performing than 1990, many items under the hood are electrified, light-weighting the vehicles. Right now turbo, super charging, and hybrid are the most fuel efficient non-electric options. Internal combustion engines are only about 15-20% efficient.
- Real big game with EVs is with the electric drive system - when you put in an electric engine, you replace a very inefficient device with something very efficient.
- Drivers of Carbon Emissions in Transportation
 - Vehicle Miles Traveled is usually associated to the economic vitality of the region.
 - Vehicle efficiency and carbon intensity of vehicle fuel is where ZEVs come in.
 - Plug-in EVs will lead to deep reductions in carbon emissions.
- Where to charge- infrastructure
 - 80% of vehicle charging happens at home.
 - Infrastructure costs have dropped dramatically.
 - Employees are 6 times more likely to have EVs if the work place has charging infrastructure.
 - Challenges include: multi-family housing, business/public infrastructure, urban areas (many get subsidies for using mass transit so they chose that over EV).
- Time of use rates for car charging:
 - There is a pilot program in Massachusetts that is looking at when people charge their cars. A time clock on the charging station modulates the charging during the peak and off peak hours.
 - Also, utilities are working with the auto manufactures so that the OnStar technology can send info to the car and will lower the charging pace for the time of use. There is an override button to push through and have full charging pace if needed or desired.
- There is currently no clear answer on how to develop charging infrastructure for multi-family homes/apartments. A report entitled "Accommodating Garage Orphans" is a great resource.
- The market for residential charging stations has settled around \$500-600.
- Another resource www.plugmyride.org helps keep up with what's happening in the industry.
- Threshold issues- three key issues to move forward:
 - vehicle cost (rebates and incentives),
 - infrastructure,
 - education and awareness

Questions/Comments

- What is the biggest public policy lever in CT?
 - Vehicle incentives would be the one thing to focus on. Biggest triggering factor is price. In GA when the sales incentives disappeared, the sales did too.

New Items

- Need to agree on method of approving the minutes.
- Next ADM meeting is dependent on schedules and NESCAUM completing the build out of LEAP.
- What can we put in the report now and what must we wait for?
 - We can include a summary of our activities and discussion to date. Specific policies recommendations will come later when we have more information from the full analysis NESCAUM is completing.

- Desire to see some conceptual things that we can agree on such as identifying critical areas of alignment in state strategic planning initiatives around GHG assessment and mitigation.
- What is the stakeholder engagement time line? What is it that we are asking them to weigh in and comment on? How are we designing the questions that we are asking them?

Public comments

- *Mike Morrissey, State Director of the National Propane Gas Association:* Propane is the 3rd leading transportation fuel in the world. 40% of all GHG emissions are caused by the transportation sectors. Propane and natural gas are poised to help reduce GHG emissions. Shuttle buses tend to use a lot of diesel and gas to run. We need to change that. Propane can deliver much bigger bang for their buck. If you made the EV incentives or something similar available to shuttle bus operators, you will get a big return on the investment. Any incentives for propane would be helpful. States with more aggressive incentives seem to be far more successful. Encourage you to keep in mind propane, natural gas, and other alternative fuels.

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