

## GSEP Working Group

Meeting Date: November 6, 2023 (held virtually)

### Minutes

Final Minutes – Approved at January 19, 2024 Meeting

#### Attendees:

- Jamie Van Nostrand, Department of Public Utilities (“DPU”)
- Carol Pieper, Senior Counsel, Legal Division, DPU
- Senator Michael Barrett, Senate Chair, Joint Committee on Telecommunications, Utilities, and Energy
- Mary Gardner, Assistant Attorney General, Office of the Attorney General (“AGO”)
- Sharon Weber, Deputy Division Director, Air & Climate Programs, Department of Environmental Protection (“MassDEP”)
- Shevie Brown, Gas Policy Analyst, Department of Energy Resources
- Amy Smith, Director, Gas Division, National Grid
- Lynne Nadeau, Regulatory Affairs Manager, National Grid
- Steve Woerner, President, National Grid
- Bill Akley, President, Eversource Energy
- Kristen Jardin, Director of Rates and Regulatory Affairs, Liberty
- R.J. Ritchie, Esq., Liberty
- Robert Hevert, President, Unitil
- Meggan Pena (on behalf of Chris LeBlanc), Unitil
- Alex Soter, Esq., Berkshire Gas
- Ken Pleasant, Manager of Construction, Berkshire Gas
- Jenifer Bosco, Senior Attorney, National Consumer Law Center (“NCLC”)
- Pete Dion, General Manager, Wakefield Municipal Gas and Light Department
- Jocelyn Jones, Esq., USW

- Jerry Oppenheim, LEAN
- Heather Takle, President and CEO, Power Options
- Audrey Schulman, HEET, Co-Founder and Co-Executive Director, HEET
- Jonathan Buonocore, Research Scientist, Boston University School of Public Health
- Priya Gandbhir, Staff Attorney, Conservation Law Foundation (“CLF”)

**Moderator** – Carol Pieper, DPU – Welcome remarks. Noted that meeting is likely being recorded via Zoom by member of public. Took roll call. Approved draft minutes from October 20<sup>th</sup> meeting.

**Presentation: Massachusetts Greenhouse Gas Inventory** – Sharon Weber, MassDEP

Presenting on how compliance with the established sublimits (82% by 2025 and 2030) for the natural gas sector is determined. A letter issued by former Massachusetts Energy and Environmental Affairs Secretary Bethany Card established the limits and sublimits. [see <https://www.mass.gov/doc/2025-and-2030-ghg-emissions-limit-letter-of-determination/download>]

**Senator Barrett** – 82% of what?

**Sharon Weber, MassDEP** –

82% reduction from baseline year of 1990 (1990 was specified under the Global Warming Solutions Act, or GWSA).

We have a spreadsheet [at <https://www.mass.gov/doc/appendix-c-massachusetts-annual-greenhouse-gas-emissions-inventory-1990-2020-with-partial-2021-2022-data/download> with text documentation at <https://www.mass.gov/lists/massdep-emissions-inventories?greenhouse-gas-baseline-&-inventory->] of all the inventory that shows the overall progress on the front page. The spreadsheet shows the calculations on how we’re doing, starting with 1990 (which is the GWSA baseline year). Looks at emissions in the natural gas sector in the categories of distribution and post meter emissions, and transmission and storage. We derived emissions for those subsectors and calculate the changes as we head towards the 2025 and 2030 sublimits.

To calculate emissions, we use emissions factors multiplied by activity factors. Generally, some type of activity (for example, miles of cast iron pipe) is multiplied by an emission factor (for example, emissions per mile of cast iron pipe).

If we look at the distribution tab, there is a summary at the top, then activity factors. For each kind of pipe, it’s how many miles are installed by material type, and for services, it’s number of services by material type.

There is a picture of the miles of pipeline at the bottom of the distribution tab, and at the side are the different kinds of materials of pipe (plastic, steel, cast iron), which shows the # of miles of

leak-prone pipe is going down. Similarly, for services, we have a picture with the total number and then the # by material type, which shows the # of leak-prone services is going down.

**Senator Barrett** – Could you define services?

**Sharon Weber, MassDEP** – Services are smaller length of pipe, which goes from the street to the meter hooked up outside the building or home.

**Senator Barrett** – Is the # of pipe and services growing? There is a continued growth of natural gas infrastructure?

**Sharon Weber, MassDEP** – Yes. Also note that a subset of MA companies are subject to GSEP, but the inventory includes pipeline and services for all distribution companies, even those that don't have a GSEP because some companies don't have any leak-prone pipeline left.

**Senator Barrett** – Why do some companies not have any leak-prone pipeline? What proportion of the whole does this represent?

**Sharon Weber, MassDEP** – Don't know why, but Blackstone for example doesn't have any leak-prone pipe left.

**Senator Barrett** – Is this a good thing?

**Sharon Weber, MassDEP** – Yes, it's good that they've removed all leak-prone pipe.

**Senator Barrett** – And the proportion?

**Sharon Weber, MassDEP** – Doesn't know, but can figure it out.

[Determined after the meeting that:

- 90% of MA distribution pipeline miles are from gas companies with GSEPs
- 98% of MA number of services are from gas companies with GSEPs
- 98% of methane from MA distribution pipeline miles is from gas companies with GSEPs
- 99% of methane from MA number of services is from gas companies with GSEPs
  
- GSEP gas companies: NGRID, Eversource (NSTAR), Eversource (EGMA/Columbia), Until, Liberty (which acquired Blackstone in the last few years), Berkshire

Non-GSEP gas companies: Holyoke, Wakefield, Middleborough, Westfield, Westfield Coop]

The next type of activity factors are for metering and regulating stations, which are broken up into categories that match the available emission factor categories. Note that for the years 1991 – 2013, there are no separate numbers of metering and regulating stations because we asked the distribution companies for the number of metering and regulating stations starting in 2014.

The next type of activity factor is customer meters (residential, commercial, industrial). A relatively new inventory category is post meter leaks, which are leaks from equipment inside

buildings (stoves, furnaces) and from natural-gas fueled vehicles. The activity factor for households is the number of residential meters through 2016, while the 2017 and beyond activity factor is based on census data. The commercial post meter activity factor is the number of commercial meters. The industrial and power plant post meter activity factor is the volume of natural gas used by those facilities. The natural gas vehicle post meter activity factor is the small number of natural gas vehicles. MassDEP collects this data through the Vehicle Inspection and Maintenance Program, starting in 2018.

**Senator Barrett** – Looks like from 2020 to 2021, residential meters decreased (1.8 million to 1.5 million). Do you know of anything that would account for this?

**Sharon Weber, MassDEP** – Doesn't know the reason for this.

There are sometimes data corrections to prior years, don't know if this is something that will be revised.

The above-described activity factors are then multiplied by emission factors. There are a set of emission factors for methane. The activity factor multiplied by the emission factor = the emissions for methane. Since natural gas also contains a small amount of carbon dioxide, it's the same story for carbon dioxide emissions, with a different set of carbon dioxide emissions factors multiplied by activity factors to get carbon dioxide emissions.

Although this GSEP group doesn't tackle the transmission side of emissions, we do have a similar data analysis tab in the inventory spreadsheet for the transmission side. There is some reporting to EPA (their system is called FLIGHT), which started in 2010. Towards the bottom of the transmission tab in the inventory spreadsheet, we marry the data we have at a detailed level from EPA starting in 2010 with estimates prior to 2010 without the same level of detail, being careful not to double count emissions.

**Senator Barrett** – Could you define FLIGHT?

**Sharon Weber, MassDEP** – It's an acronym for Facility Level Information on GreenHouse gases Tool.

### **Q&A on MassDEP Presentation**

**Heather Takle, PowerOptions** – I would love to understand the 'why' to know what's driving emissions standards. Is the change from 1990 to 2010 due to activity usage decline or emissions factor calculations?

**Sharon Weber, MassDEP** – There are two things going on: (1) more leak-prone equipment existed during that time period (more leaks due to more leak-prone equipment); and (2) the data set collected for emissions factors was not updated for a decade. So, when data collection efforts happened, new emission factors derived a decade later were lower. Technologies are improving, and the oldest pipes have gone away. That's why you see a big drop.

**Heather Takle, PowerOptions** – So real emissions changes, not just change in how we measured emissions?

**Sharon Weber, MassDEP** – It's both. Improvements in methodologies and lowered emissions.

**Audrey Schulman, HEET** – The studies are based on average leaks they found on certain types of pipes. They measured average amount of emissions from those leaks. Unclear how much this is pertinent to Massachusetts. We have much better data than the average number of leaks, we have utilities reporting actual number of leaks – so why don't we use that data? Also, the estimated emissions are based on 100-year emissions impact, rather than 20-year timeframe, which may be more pertinent with methane. Methane's impact radically declines after the first 20 years. So, those 20 years are the more pertinent ones. Additionally, the IPCC found a higher global warming potential for 100-year data. The EDF study discarded the super-emitting gas leaks emission data, assuming it was an error. Eversource and Grid comprise over 90% of gas customers in Massachusetts – in terms of that part of reporting. There is an ongoing top-down study done at Boston University measuring the emissions in the atmosphere that does not reflect the MA DEP estimated emission reductions, or any statistically significant methane emission reductions for the past eight years.

**Jonathan Buonocore, Boston University School of Public Health** – There is a strong argument that we should be using the 20-year global warming potential, because it's the relevant timeframe. On the top-down study, 1) with these emissions factors, I don't know where/if unusual circumstances are accounted for in this? Methane leaks across life cycle, and there is a certain amount of leakage when everything is behaving normally, but when something goes wrong, there are big deal leaks that drive emissions substantially. So I'm wondering is this super emitter phenomenon accounted for when developing emissions factors and methane monitoring done and emissions numbers don't add up to what's in the atmosphere (i.e., methane gap). Is this considered?

**Sharon Weber, MassDEP** – We did look at different global warming potentials, when we set up the inventory over the years. The inventory's 'Summary by Gas' tab allows selecting global warming potentials from newer and older international reports over shorter and longer time horizons, to see the effect on the inventory. We need climate modeling and the inventory to match in which global warming potential they use, so planning and progress are an apples-to-apples comparison. We use the 100-year now but expect we will consider options in future modeling. On the methane gap question, this is something EPA is working on and trying to think about how to account for these things, so it's a work in progress. For some gases like hydrofluorocarbons, it's easier to correlate gaps because all the emissions are due to humans. It's harder for methane because there are other sources of methane. Methane emissions are the part of the inventory that has seen the most change over the years as data has improved and been updated.

**Jonathan Buonocore, Boston University School of Public Health** – The study seems sure that distribution leaks were source of methane and ethane.

**Sharon Weber, MassDEP** – EPA will be updating emissions calculations and methodologies – this is out for comment. I don't have a specific summary of those but we look at EPA's proposals every year.

**Jonathan Buonocore, Boston University School of Public Health** – Would you diverge from EPA?

**Sharon Weber, MassDEP** – Yes, we're not afraid to be different than EPA if we can find the data set to use.

**Audrey Schulman, HEET** – The Sargent et al Boston University paper I referenced measures the emissions with a variety of gas analyzers across Greater Boston. It only picks up natural gas emissions, and measures in the atmosphere over Boston 3x more than this formula. The impact of those emissions are bigger when you multiple by a 20-yr timeframe global warming potential. This calculator is one reasonable method, but we need to true it up with what we're actually finding in the atmosphere.

**Senator Barrett** – I'm interested in isolating the proportion of this graph that deals with 2014 (GSEP original) onward. Downward slope ends in 2012-2014 and then continues at a steady state with no additional reductions in methane right up to 2020. The downward slope is a comfort, but that has ended and I'm interested in why that's the case? Is it staying steady or trending up? Also, I don't see the Columbia gas explosions represented in the graph. Wouldn't there be an upward blip for that extraordinary release?

**Sharon Weber, MassDEP** – In the other direction, part of the Columbia system was then shut down for a number of months. The emissions factors update in 2011 is a reason for the emissions drop from the time of the original emissions factors development in 1992 to the updated emissions factors in 2011. Interpolated emissions factors are used for the intervening years, then after 2011 emissions go fairly flat. The increase in plastic miles of pipe as they replace older miles also contributes leak emissions, though at a lower level than leak prone pipe. Two opposite trends are occurring: we've gotten rid of leak prone pipe which reduces emissions, but added in more overall miles of plastic pipe (above and beyond replacing leak prone pipe with plastic pipe), so the distribution system has been growing, which increases emissions. Over time won't have as much leak prone pipe left to replace to reduce emissions. As plastic pipe continues to grow, it will tend to increase the distribution sector's emissions over time.

**Senator Barrett** – So we're not gaining ground?

**Sharon Weber, MassDEP** – Right, we're staying pretty flat.

### **Presentations: Anticipated completion dates and costs – Gas LDCs**

- **Amy Smith, National Grid**
  - 2024 GSEP filed
  - Replace 134 miles of leak-prone miles
  - Sealing 1,046 joint using CISBOT
  - Retire all leak-prone pipe by 2034 for Colonial Gas service area and 2039 for Boston Gas service area – challenges include inability to obtain permits
  - Exploring options other than pipe replacements such as geothermal and other non-pipeline alternatives

- Bill impacts – increases to peak and off peak periods
  - Prioritize replacement of cast iron main for public safety reasons
  - Meet climate change goals by using advanced leak repair technologies
  - Reduce methane emissions over the next 5 years
  - Highlighting 2 networked geothermal projects and a pilot for electrification for a specific area where Grid is both the electric and gas company in lieu of replacing leak-prone pipe with more pipe
  - Shows how number of miles and costs is going to change over next 5 years
  - Analysis of what it would look like for remaining GSEP work to be completed
  - 3% annual increase in pricing (inflation)
  - 9% increase on contract renewal
  - Dependent on obtaining the resources required and permits
- **Bill Akley, President, Eversource Energy**
    - No presentation yet but will go through the talking points
    - NSTAR and EGMA
    - For Colombia Gas, filed program that replaced 49 miles of leak-prone pipe
    - NSTAR, 2024 program that replaced 62 miles
    - Program includes CISBOT, leak repairs, and lining, and retiring assets where we can
    - EGMA, 474 miles of cast iron and unprotected steel, complete in 9 years (2032) at current pace. We also model 2034 (1.4 billion to complete) – includes associated service replacements
    - NSTAR – 2034 to complete; have range of 2034 on the current track
    - From 2014 to today, 70% reduction in type I and type II leaks for both companies
    - Risk scores declined over decade of investments in GSEP
    - Actively building geothermal network in Framingham
    - For large more risky cast iron mains, looking at deferring those replacements and assessing alternatives so long as risks are mitigated
    - High emitter repairs every year and substantive leak reductions
    - 90% of leaks on NSTAR and EGMA system driven by legacy infrastructure
    - Will get powerpoint
    - \$2.4 billion for NSTAR
    - \$1.4 billion for Colombia
- **Meggan Pena, Unutil**
    - 271 miles of pipe within the Massachusetts distribution system
    - Of that, 11% cast iron and 3 miles bare steel unprotected steel
    - 2022 through 2030 projection
    - Started replacing pipe in 2020
    - Projecting ahead, to complete in 2030
    - 2028 6.4 to 10.4 miles remaining
    - Depends on municipality improvement projects
    - 2029 and 2030, incorporate 1 mile of Aldyl A pipe

- Aggressive about leak repair program
- 90% leak-prone pipe is associated with small diameter plastic pipe
- Overall estimate to complete \$59 million
- **Kristen Jardin, Director of Rates and Regulatory Affairs & Miguel Rodriguez, director of engineering department, Liberty**
  - Complete by 2031
  - Estimated costs \$1.64 million per mile including services
  - \$215 million to complete GSEP
  - Depending on variety of factors listed in slide
- **Ken Pleasant, Berkshire**
  - Attached slide showing footprint of territory
  - Main miles and service quantities for GSEP
  - Breakdown of emissions projections
  - 2029 close out target of GSEP
  - Cost estimates \$1.1 million per mile
  - For services it's \$6,000
  - Discussion of risk factors and emission reduction targets per year

### **Q&A on Gas LDC Presentations**

**Priya Gandbhir, CLF** – Could you clarify the use of the term retirement? There won't be anything left in ground and buildings? Or services by that pipeline are converted to some other form of heating?

**Amy Smith, National Grid** – We'd take pipe out of service, then installation, which could be pipe or non-pipe alternatives.

**Priya Gandbhir, CLF** – So the costs don't include new installations?

**Amy Smith, National Grid** – Yes they do, the costs assume new pipe.

**Ken Pleasant, Berkshire** – Same for Berkshire.

**Shevie Brown, Gas Policy Analyst, Department of Energy Resources** – Is anyone considering strategic electrification as an alternative to GSEP towards the end of GSEP?

**Ken Pleasant, Berkshire** – We've had discussions around alternatives but haven't implemented anything at this time.

**Bob Hevert, Unitil** – Same for Unitil.

**Kristen Jardin, Liberty** – Not at this time, either.



**Senator Barrett** – From 2012 to 2024, there is no net decline statewide in emissions attributable to gas. Can you comment on this? I would like to hear more from those considering conversions to electrification and how those conversations have gone and the conversion plan entertained.

**Bill Akley, Eversource** – The efforts to get this right and measure are not an easy task. We're seeing direct leaks on the distribution system. There's a broad array of what we're looking at. Reductions focused on type 1 and type 2 have seen reductions. We need to avoid damages in getting pipe out of the ground. There is a complexity with the metrics, and trying to evolve and get the true emission profile. Critical leaks are a focus. Those leak rates are down significantly (70%).

**Senator Barrett** – The general objective of the economic limits set to continue to decline in overall emissions. Seems as if the gas system is not contributing in overall emissions that need to trend down in all sectors. Instead, gas systems are holding steady instead of declining. Do the utilities wish to comment on that? Also, what might conversion of gas to electric mean for those considering this?

**Kristen Jardin, Liberty** – We have seen a decline in emissions. We report on it, and there are annual requirements, and it has been reducing.

**Bob Hevert, Unitol** – Sharon mentioned the evolution in emissions factors over time, which may make it difficult to correlate change in emissions with the replacement data we saw. We just published our own sustainability report last week, with our own company specific data showing a different pattern than what we saw in DEP's presentation. We will look at that.

**Audrey Schulman, HEET** – In response to Senator Barrett's question - DEP calculations are based on average miles of leak-prone infrastructure multiplied by the average emissions for each type of pipe. The emissions drop only from replacing leak-prone infrastructure. I'm not sure why the flat line from 2014 on because we have found through surveys around the state that in general we're finding fewer leaks and fewer super emitters. There's been some good impact and we continue to put pressure to ensure we're doing what needs to be done. In the information reported here, does anybody find any problem with what Dorie Seavey said last time? That the total cost would factor in investor payback, which would continue to 2097? Can the presentations be true along with what Dorie said?

**Bob Hevert, Unitol** – Investments now would have a payback through 2097?

**Audrey Schulman, HEET** – Yes. All costs would not get paid back until 2097. The full cost from this point on statewide with investor payback would total \$34 billion. With investor payback, would that work?

**Bob Hevert, Unitol** – We would have to look at this.

**Jenifer Bosco, NCLC** – Grid had bill impacts, could the other utilities make this available?

**Other LDcs** – yes.

**Chair Van Nostrand, DPU** – Bill, you mentioned Eversource is looking at alternatives, can you say anything more about that?

**Bill Akley, Eversource** – It gets more complicated when trying to eliminate sections of an integrated grid. When we look at radial systems, it's a different scenario. It's allowed us to look at the system for opportunities to defer and allow us to assess those areas for electrification. And we looked at risk profiles. There are 5 areas identified on the system on our radar to look into and see if there is opportunity there. ESMPs give us more data on electric capacity, air source vs. ground source, etc. We're doing these assessments to see where opportunities exist.

**Chair Van Nostrand, DPU** – what about non gas pipe alternatives as part of GSEP, would Eversource be comfortable with the concept of putting this into the GSEP analysis? Are you already doing this?

**Bill Akley, Eversource** – Yes, but the issue is GSEP is a program about managing risk, so it's a more wholistic look rather than project by project. Would need more time to assess and mitigate risk. For less risky assets, yes we're looking for options to electrify.

**Chair Van Nostrand, DPU** – Amy, you mentioned the Lowell networked geothermal and some others?

**Amy Smith, National Grid** – We have not announced them yet but we're getting close. We're working on a memorandum of understanding with the housing authority. And there's another entity involved. It's an incremental process to retire leak prone pipe. We think this is a reasonable approach rather than waiting for a response from everybody. On the timeline, we think we could maybe start construction in 2024 to complete in 2025. We're looking at a targeted electrification project to find areas to retire leak prone pipe and not install new pipe. We have identified 2 municipalities where we're both the gas and electric provider, and the gas system doesn't need significant upgrading. Timing and customer adoption are challenges. We're in the beginning stages, but hopeful to bring a pilot forward in 2024.

**Senator Barrett** – As a factual baseline, how many distinct municipalities are there where Eversource, Grid, and Unitil are both the gas and electric provider?

**Bill Akley, Eversource** – 50% of our system is both gas and electric.

**Amy Smith, National Grid** – Less than 50% of our gas towns overlap with electric. Around 60-65 communities.

**Bob Hevert, Unitil** – About 90% of our customers are both gas and electric within our service territory.

**Senator Barrett** – Seems there is a distinction between contribution to reducing emissions under the GSEP and overall emissions reduction trends of a given utility. Audrey, you mentioned mobile trucks going around, is the trend line negative?

**Audrey Schulman, HEET** – In general, there are fewer gas leaks being found and fewer SEIs found.

**Senator Barrett** – Are total emissions attributable to gas being found?

**Audrey Schulman, HEET** – We're spot checking, but we don't know overall. There are just places we check, and it's looking better in those places.

**Priya Gandbhir, CLF** – I have a question for Amy regarding the pilot program. Do you have any information on whether the communities that are moving forward with that are environmental justice communities?

**Amy Smith, National Grid** – Yes, it'll come down to specifically where they're located but highly likely they will.

**Audrey Schulman, HEET** – in terms of Chair Van Nostrand's question regarding electrification, there is an important point about paying for customer retrofits. The Electric Service Modernization Plans are being proposed now. National Grid is assuming an eight-fold increase in service upgrade charges per year by 2039. Given how efficient networked geothermal is, it would radically decrease the impact on the electric grid from moving buildings to electricity. Instead of spending money on sub-stations or grid power lines, we could pay for customer retrofits to allow them to move to networked geothermal. Customers have been saying yes as long as the retrofit is paid for. Maybe this is worth looking at?

**Carol Pieper, DPU** – We're going to move on to the next topic given the time. So, next we'll be discussing the written report. I'll turn it over to Chair Van Nostrand to lead this discussion.

### **Discussion regarding written report that is required from Working Group**

**Chair Van Nostrand, DPU** – We've proposed an outline for the final report to figure out this deliverable of making recommendations on statutory changes to the legislature. The outline is based on the cumulative proposed changes submitted by everybody in the group. In essence, the report outlines who proposed the changes, and includes a brief statement as to why, with an opportunity for others to join or oppose those changes, and an optional opportunity to explain the basis for such opposition. So we want to discuss whether others think this is a reasonable approach.

**Priya Gandbhir, CLF** – It looks reasonable. Suggests adding a place for those supporting to provide comments for why they support. Also suggests adding a 'no vote' or abstention option.

**Chair Van Nostrand, DPU** – The thought was if you do neither support or oppose, you are in essence abstaining, but we're not asking for a formal vote. Just provide supporting statements, and it can be a statement.

**Audrey Schulman, HEET** – What happens if there is something here that needs changes integrated? There are overlaps and proposals based on integrated changes. In addition, could there be some sample legislation more comprehensive of what something could look like

(version A, version B, etc.)? So, the main categories of how comprehensive legislation could look.

**Chair Van Nostrand, DPU** – Yes, that would be part of the legislative package. If we have a situation for non-pipeline alternatives to work, etc., this is fair game to include, and someone could propose this. I'll leave that up to a proponent to craft a definition that addresses that obligation to serve issue.

**Senator Barrett** – This is a helpful rubric. Is removal of accelerated recovery a topic on the list? As I read the statute, the right to receive gas service and the obligation to provide service need to evolve. Should be a right to receive heat instead of gas, because we don't want to give a competitive advantage to gas. We should remove this competitive advantage on one form of heating. I hope we can replace the word "replacement" with a more neutral term like eligible infrastructure and activity. General retirement in favor of a nonpipe alternative.

**Chair Van Nostrand, DPU** – Agrees with replacing "replacement" with a neutral term for all possible options.

**Jenifer Bosco, NCLC** – This is a great structure for the report. Procedurally, we submitted comments regarding changes to our original recommendations and want to make sure that's reflected in the draft report.

**Chair Van Nostrand, DPU** – We'll post it on working group website with any needed updates.

**Carol Pieper, DPU** – To clarify, in putting the redline together, we only incorporated redlines not comments.

**Senator Barrett** – I proposed taking out replacement but it's not reflected in the DPU redline.

**Chair Van Nostrand, DPU** – Do you recall the term you proposed?

**Senator Barrett** – Yes, act, action, or activity.

**Bob Hevert, Unitil** – I like the approach. I think you can expect opposition to the accelerated recovery issue. When we think about strategic electrification and the principle of cost effectiveness, we struggle with how we define cost. We need to capture the full array of costs when comparing one source to another.

**Chair Van Nostrand, DPU** – Are you referring to costs such as the social cost of carbon?

**Bob Hevert, Unitil** – Yes, but also the added load on system. We need to reinforce the system, need for renewable sources of energy going forward, which is all costly. So, we need to capture all costs going in that ratepayers would have to bear.

**Mary Gardner, AG's Office** – In terms of next steps, what's the best way for members to provide substantive edits? During the next meeting or should we reach out to Carol Pieper directly regarding the topics to include or changes to make?

**Carol Pieper, DPU** – Due to open meeting law, please send only to me. People should provide comments, opposition, etc., and sign off as the proponent or opponent. I think we should just come up with a deadline and I can compile something and then we can go through it at the next meeting, and I'll post it on the website.

**Chair Van Nostrand, DPU** – I'd say maybe 3 weeks from today (Nov. 27<sup>th</sup>) as a deadline for any comments on this document. Then we can discuss at the Dec. 4<sup>th</sup> meeting.

**Audrey Schulman, HEET** – Carol will you send a revised document to everybody and everyone can do redlines on the revised document?

**Carol Pieper, DPU** – Yes, I will post the outline document and send to everyone. The next meeting will be Monday, Dec. 4<sup>th</sup> at 1 pm.