



meeting minutes¹

Thursday, November 17, 2022
11:00 a.m. – 12:00 p.m.

The third meeting of the Sources Working Group was held on November 17, 2022.

All participants joined via the Teams conference call.

Task Force Members Present:

Paul Aresta (Council on Environmental Quality), Samantha Dynowski (Sierra Club), Shannon Laun (Conservation Law Foundation), Tony Leo (Fuel Cell Energy), Mary Nuara (Dominion Energy), Professor Ugur Pasaogullari (UCONN),

Others Present:

Jordan Ahern (Strategen), Enrique Bosch (Avangrid), Johnathan Feinstein (Zone Flow), Sarah Harari (Green Bank), Nina Hebel (Strategen), Sridhar Kanuri (HyAxiom), Bernie Pelletier (Peoples Action for Clean Energy), Collin Smith (Strategen), Becca Trietch (DEEP), Cary Lynch (Nature Conservatory)

1. Call to Order

- Collin Smith, a Senior Consultant at Strategen providing technical support for the Sources Working Group, called the meeting to order at 11:03 a.m.

2. Welcome and Introductions

- Mr. Smith provided an overview of the meeting agenda including attendee introductions. Each participant introduced their name and organization. Following this, Mr. Smith discussed the working group meeting schedule for the coming months.
- Mr. Smith reviewed a schedule of upcoming working group meetings through December.

3. Defining Clean Hydrogen

- Mr. Smith reviewed the new processes of defining hydrogen utilizing a carbon intensity-based framework rather than the previously used color-based definition.
- Mr. Smith presented a review of hydrogen definitions used across different states.
- Mr. Smith reviewed the federal definition of clean hydrogen with guidance from the Infrastructure Investment and Jobs Act (IIJA) and the Proposed Clean Hydrogen Standard as they pertain to access to federal funding opportunities.
- Mr. Smith discussed the possibility for the state to develop its own more stringent definition than the federal standard, given state climate goals, limited access to zero-carbon resources, and stakeholder feedback.

¹ For access to the meeting recording – <https://www.ctgreenbank.com/hydrogentaskforce/hydrogen-sources/>

- Mr. Smith discussed next steps for refining definitions in coordination with the Policy and Workforce Development Working Group.
- Tony Leo expressed strong support for adherence to the federal standard.
- Jon Feinstein noted that the Department of Energy (DOE) and Environmental Protection Agency (EPA) recognize the carbon footprints of solar and wind and asked if they will be realized in this analysis.
 - Mr. Smith responded to this, saying aspects such as the steel production needed to construct wind turbines, for example, will not be considered in this analysis.
- Bernie Pelletier and Mr. Leo both noted that the federal standard should be adopted at a minimum, and recommended a more stringent definition as well.
 - Sam Dynowski agreed, noting that even with carbon capture systems, hydrogen production through fossil fuel does not have a net benefit, and this view is supported by Sierra Club and the Acadia Center, as well as other groups.
 - Mr. Leo noted that due to potential leakage, hydrogen can be an indirect greenhouse gas and should be considered in the production standard. Further, he mentioned that while zero carbon renewable is best, biogas is not a fossil fuel and if there is low carbon hydrogen in the pipelines and the ecosystem, these opportunities should not be turned down in favor of a unique standard.
- Mr. Feinstein asked if hydrogen use will be reduced to non-dispatchable sources of electricity; If there is a more stringent definition that can only be met by solar or wind, would production be limited only to electrolysis tied to those resources.
 - Mr. Smith responded, saying this is not certain yet, and while that restriction would be the easiest way to account for adherence to the production standard, hydrogen may be able to be produced with curtailed energy and still qualify.
- Mr. Pelletier noted that in his view of hydrogen production in a renewable grid, there will be large periods of curtailment, and he believes that letting these assets produce and use excess power to fuel electrolysis will be a primary value proposition.

4. Hydrogen Supply Analysis

- Mr. Smith reviewed the Low, Medium, and High production scenarios that were developed based on technical energy production potential.
- Mr. Feinstein asked if the cost of electricity is the local price in Connecticut or if it is calculated through other means.
 - Mr. Smith responded, saying it is assumed the electrolyzer is connected directly to the generating resource in cases such as on-shore wind and solar, so the cost of electricity is the LCOE. For offshore wind, there are other accounting systems to be considered.
- Ugur Pasaogullari asked why there are price increases from 2030 to 2040, considering it is expected that prices fall over time.
 - Mr. Smith responded, noting that access to tax credits in the 2030 scenario results in a lower price compared to 2040 despite falling prices of technology.
- Wheezie Nuara asked if we are assuming the resources used for hydrogen production are dedicated only to hydrogen production or if they are in obligation to ISO New England's Markets.
 - Mr. Smith responded that these resources exist solely for hydrogen production.

- Mr. Feinstein asked what the limiting factor of production was in these scenarios.
 - Mr. Smith responded, noting varying citing restrictions for different resources. While land is the overall limiting factor, there are different implications for different resource types.
- Mr. Pelletier noted that he believes the presentation does not capture the synergistic way that he imagines hydrogen would play in an all-renewable future. Specifically, large periods of overproduction that are either curtailed, stored with batteries, or preferably used to smooth out energy production so renewable resources can be fully utilized.
 - Mr. Smith agreed, noting the scenarios are simplified and there are hybrid solutions where an electrolyzer that runs on solar and offshore wind primarily, can be oversized so in situations where there is spare capacity on the grid it can utilize that for additional production.
- Mr. Smith noted it is rarely advisable to maximize the technical potential of any project.
 - Mr. Leo noted his appreciation for the technical potential analysis. In addition, he asked if the small amount of nuclear being used for hydrogen production is due to Millstone's output going towards power production.
 - Mr. Smith confirms that Millstone is expected to operate at 100% capacity for power production.
- Mr. Pelletier suggested referring to the CT IRP to understand progress towards renewable goals by decade, specifically in the context of the seasonality associated with solar and wind resources.

5. Adjourn

- Mr. Smith adjourned the meeting at 12:03 PM