



## Meeting Minutes<sup>1</sup>

Tuesday, November 22, 2022  
12:00 p.m. – 1:00 p.m.

The first meeting of the Infrastructure Working Group was held on November 22, 2022.

All participants joined via the Teams conference call.

### **Task Force Members Present:**

Digaunto Chatterjee (Eversource), Shannon Laun (Conservation Law Foundation), Joel Rinebold (CCAT)

### **Others Present:**

Jordan Ahern (Strategen), Enrique Bosch (Avangrid), Ben Butterworth (Acadia Center), Sarah Harari (CT Green Bank), Nina Hebel (Strategen), Andrea Lubawy (Toyota), Callyn Priebe, Lidia Ruppert (DEEP), Collin Smith (Strategen), Becca Trietch (DEEP)

### **1. Call to Order**

- Collin Smith, a Senior Consultant at Strategen providing technical support for the Infrastructure Working Group, called the meeting to order at 12:03 p.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.

### **3. Review of Working Group Schedules**

- Mr. Smith reviewed a schedule of upcoming working group meetings through December.

### **4. Review Updated Hydrogen End Use Evaluation**

- Mr. Smith reviewed the prioritization buckets, as presented in previous working groups.
- Mr. Smith noted that in accordance with the past working group meetings, end uses were identified based on importance of presentation to the legislature.
- Mr. Smith presented the highest priority use cases for additional investigation.
  - Mr. Smith noted that these are end uses that are likely to use hydrogen and would be opportunities for scale to drive significant societal benefits.

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

- The highest priority uses included aviation, marine shipping, critical facilities, material handling, long haul trucking, power generation, and high heat industrial processes.
- Digaunto Chatterjee asked, with regards to marine shipping, if regional and international use cases should be separated from one another.
  - Mr. Smith responded that regional and international shipping could be broken into separate end uses. He noted that a hydrogen powered ship would need supporting infrastructure in its point of destination as well. He cited the green shipping corridor between Shanghai and the port of Los Angeles.
    - a. Mr. Chatterjee noted that long haul trucking requires a much higher amplitude of coordination, where shipping would require just one partner as with the LA to Shanghai corridor that Mr. Smith mentioned.
  - Joel Rinebold noted that there have been conversations with the shipping industry to coordinate something like what is in development in California. Mr. Rinebold noted pushback from the ports in Connecticut in response to emissions regulations as Connecticut doesn't have sufficient market power to impose its will on shippers.
- Andrea Lubawy noted that Toyota is considering how and where to expand both light and heavy-duty applications and is entertaining a pull system, so if customers are interested in adoption, they are encouraged to make contact through Mr. Rinebold or Ms. Lubawy. She cannot guarantee that Toyota will expand to Connecticut next, but she mentioned that they are currently in the process of deciding where to expand next.
- Mr. Rinebold suggested aviation not be noted as a use, but rather as an area of research and development for local manufacturers. He added to this, citing Sikorsky as a potential manufacturer of hydrogen powered aircraft fleets in Connecticut, but not specifically for use within the state.
  - Mr. Smith noted that hydrogen powered planes are not the only consideration in the aviation end use. Sustainable aviation fuel (SAF) is created through synthesizing hydrogen and is considered as a potential use.
- Mr. Smith presented high priority use cases for additional investigation.
  - Of these end uses, long distance busses, ferries, freight rail and fleet vehicles were identified as end uses at a smaller scale with strong financial cases for hydrogen due to parameters of operation.
  - Hydrogen blending in natural gas pipelines for non-core customers such as power generators and industrial heat users could be an economical decarbonization option, but technical demonstrations are needed.
  - Shannon Laun asked which busses are considered long distance, and which fleets are under consideration.
    - Mr. Smith responded that long distance busses refer to coach busses that travel interstate routes, citing Boston to New York as an example. He added that specific fleet vehicles include police cruisers and ambulances.
  - Sarah Harari asked if these applications are mentioned as hard to electrify due to operational logistics.
    - Mr. Smith confirmed that this is a primary element of this category.

- Mr. Smith presented the final set of end uses, categorized as other valuable applications.
  - Such end uses included those where hydrogen has value as a decarbonization tool, but where economics do not clearly support hydrogen currently. These applications should be kept in view by policy makers, but not prioritized unless systems level analysis determines hydrogen is the lowest cost option.
    - Such use cases included hydrogen blending for commercial and residential customers, commuter busses, heavy duty trucks with lower driving ranges, privately owned light vehicles, and low heat industrial processes.
    - Ms. Laun raised concern on the framing of the slide and believed that referring to these applications as valuable could be misleading to legislators and policy makers. Ben Butterworth noted his agreement.
  - Lidia Ruppert noted that one possibility is remaining for other potential applications. Further, citing speed of hydrogen refueling over battery charging, Ms. Ruppert mentioned that commuter busses should be in the second category, and that heavy duty trucks that travel shorter distances should be placed in the same category as longer distance applications.
  - Mr. Rinebold agreed with Ms. Rupert regarding the naming conventions and the categorization of commuter busses.
  - Mr. Rinebold noted that surplus energy can be curtailed or used to produce hydrogen, and that hydrogen can be introduced into the system and blended in low percentages. Mr. Rinebold went on to mention that at low levels of blending, existing infrastructure can be used, which is aligned with legislation that attempts to avoid stranding existing infrastructure investment.
  - Mr. Chatterjee voiced support for analysis into the degree of state funding in addition to existing federal funding that would be required to drive commercial bus adoption. Further, Mr. Chatterjee encouraged analysis into blending limitations as part of the Infrastructure Working Groups. Assuming supply is not a constraint, Mr. Chatterjee encouraged estimates regarding pipeline demands.
  - Enrique Bosch voiced his support for commuter busses being considered a higher priority, due to the ease of duplication across numerous locations and the relatively small investment required. Mr. Bosch also voiced his agreement with Mr. Chatterjee's comments on hydrogen blending.
  - Mr. Smith noted a shortage of time and acknowledged the opportunity to submit written comments.
- Mr. Smith presented information regarding a deep dive on hydrogen blending.
  - Mr. Butterworth noted that the customer segments receiving the hydrogen is the critical distinction prioritization grouping. He added that onsite blending is a different application than statewide blending, and when considering non-core customers there must be a distinction between these applications.
- Mr. Smith presented a preliminary hydrogen demand assessment that shows estimated hydrogen demand for six of the highest priority end uses in 2030, 2040, and 2050.
  - Mr. Smith noted that demand is projected to stay relatively low in 2030 but has the potential to scale up quickly in 2040 and 2050, particularly for long haul trucking and power generation.
  - Mr. Rinebold requested citations for the demand analysis.

- Mr. Smith presented the demand assessment methodologies and accompanying references.

## 5. Adjourn

- Mr. Smith adjourned the meeting at 1:02 p.m.