



Hydrogen Power Study Task Force: Policy & Workforce Development Working Group Meeting #3

Hosted by Strategen Consulting
November 29, 2022

Meeting Logistics

- + Mute Microphone – in order to prevent background noise that disturbs the meeting, if you aren't talking, please mute your microphone or phone.
- + Chat Box – if you aren't being heard, please use the chat box or raise your hand to ask a question. Please try to limit comments in the chat as these may not be officially captured in the record.
- + Recording Meeting – we will record and post the meetings at www.ctgreenbank.com/hydrogentaskforce and you can also access meeting dates and dial-in information through Secretary of State.
- + State Your Name – for those talking, please state your name for the record.

Agenda

- + Welcome and Introductions (5 mins)
- + Overview of Workforce Development Best Practices (15 mins)
- + Discussion of Key Findings & Policy Recommendations in Alignment with Other Working Groups (35 mins)
- + Overview of Next Steps (5 mins)



Reminder: Strategen's Role

- + The Strategen team will handle meeting logistics including scheduling and recording meeting minutes.
- + The Strategen team will coordinate with Working Group Co-Chairs to develop meeting agendas which will be provided to participants a week before Working Group meetings.
- + The Strategen team will provide technical assistance (including research), where appropriate, for the Working Group.
- + It is expected that this working group will meet on a monthly cadence. Meeting recordings and meeting minutes will be publicly available.

Introductions

Please share your name, title, and organization for the public record



Working Group Statutory Responsibilities

A report will be submitted to the legislature on January 15, 2023. This Working Group's responsibility is to ensure we provide:

- + A review of regulations and legislation needed to guide the development and achievement of hydrogen economies of scale
- + Recommendations for workforce initiatives to prepare the state for hydrogen-fueled energy-related jobs

It should be noted that the efforts of the Hydrogen Power Study Task Force and associated Working Groups are not intended to replace the stakeholder engagement process used to develop and vet updates to state policy; rather, these efforts are intended to surface new ideas for consideration regarding how to develop a clean hydrogen economy in Connecticut.

Overview of Workforce Development Best Practices



Overview of Workforce Development Best Practices



| Local Engagement | Community Benefit Agreements | Needs Assessment | Workforce Training |
|--|---|---|--|
| <ul style="list-style-type: none"> + Engagement with communities, groups, institutions should begin as early as possible + Outreach efforts should be accessible for local stakeholders to enable participation + Need for transparent and continued communication, including education on clean hydrogen | <ul style="list-style-type: none"> + Commitments to use local workforce + Offer prevailing wages + Partnerships with apprenticeship and training programs + Ensure accountability and/or enforceability | <ul style="list-style-type: none"> + Examination of workforce needs, gaps, and impacts + Identification of transferable skillsets + Just transition for displaced fossil fuel workers + Enable opportunities in parallel sectors (e.g. insurance) | <ul style="list-style-type: none"> + Should be developed specific to identified needs + Key competencies and trade certifications for clean H2 industry + Invest and partner with universities with H2 expertise + Opportunities to involve underrepresented populations |

Legislative Mandate: Recommendations for workforce initiatives to prepare the state for hydrogen-fueled energy-related jobs

- + **Preparing Connecticut's hydrogen workforce can be advanced through the following key actions:**
 - + Engagement with local experts including the trades, universities, and local community groups to understand workforce development needs and potential.
 - + Development of a skilled labor pool, ideally converting existing fossil fuel jobs.
 - + Building on Connecticut's expertise in hydrogen technologies by investing in and partnering with local universities with expertise in hydrogen technologies.
 - + Understanding the key components of existing labor and workforce development programs and skills needed for a hydrogen economy.
 - + Establishing rules for the insurance of hydrogen infrastructure to enable standardized hydrogen insurance products that can be marketed nationally.

Discussion of Key Findings & Policy Recommendations in Alignment with Other Working Groups



Key Working Group Findings and Policy Best Practices Will Inform Final Recommendations

- + **The five Task Force Working Groups have engaged in comprehensive research and stakeholder engagement to develop key findings**
 - + These key findings will inform Policy and Workforce Development Working Group recommendations
- + **Policy Guiding Principles should be utilized to inform all recommendations**
- + **Cross cutting issues such as environmental justice and safety should be incorporated into all policy findings**

Summary of Key Working Group Findings

| | |
|-------------------------|---|
| <h2>Sources</h2> | <p>On-shore and off-shore wind, as well as solar, represent the most abundant and lowest cost sources for hydrogen production in Connecticut. However, compliance with the state’s existing decarbonization policy may present competition for limited non-fossil fuel resources.</p> |
| <h2>Uses</h2> | <p>Highest priority applications for hydrogen include end uses that are:</p> <ul style="list-style-type: none"> • Very likely to use hydrogen due to underlying economics • Have the potential to create substantial societal benefits; or • Are end uses where hydrogen is the only known zero-carbon energy source |
| <h2>Infrastructure</h2> | <p>Development of a cost-effective hydrogen economy will be dependent on the deployment of at-scale hydrogen infrastructure and offtake opportunities.</p> |
| <h2>Funding</h2> | <p>Significant federal funding is available for hydrogen. Connecticut should capitalize on its competitive advantages to maximize access to federal resources.</p> |

Legislative Mandate: A review of regulations and legislation needed to guide the development and achievement of hydrogen economies of scale

- + Connecticut policy provides general ecosystem support for the development of clean hydrogen
- + Connecticut has some existing policies or programs that specifically reference hydrogen, but these are limited
- + Further policy or regulatory action could help drive the development of an at-scale hydrogen ecosystem, including potential actions that:
 - + Provide support for workforce development and labor transitions (recommendations previously discussed)
 - + Incorporate community engagement principles in hydrogen development
 - + Encourage general market development
 - + Support priority hydrogen end-uses

An investigation of national hydrogen policy has informed Working Group recommendations



Definitions

States are defining clean hydrogen eligibility in similar ways.

Increasingly, definitions based on a carbon intensity range are emerging.

Additional specification focuses on feedstock type (i.e., must be renewable or must be non-fossil fuel).



Legislation

In the last 3 years, hydrogen specific legislation has skyrocketed. Hydrogen bills have typically been focused on a particular end use, such as:

- Mobility
- Gas and Electric Generation
- Industrial Uses

A smaller set of hydrogen related bills provide specific grant funding, authorize specific studies, or address safety provisions



Market Development

Over 50 public and private renewable hydrogen activities have been identified, with this number growing every week. This includes research studies, pilots, demonstrations, and full-scale deployment.

Key topics include production, pipeline injection and distribution, power generation, and LDES.

Connecticut could explore the following actions to incorporate community engagement principles in hydrogen development

- + **Consider funding to increase community engagement such as:**
 - + Intervener compensation for community participation in hydrogen-related proceedings.
Example: [Minnesota PUC](#)
 - + To overcome transportation challenges, funding may be needed for community members to access/work on hydrogen related job sites
 - + Funding for development of community benefits agreements (ex: technical expertise, compensation for time)
- + **Include hydrogen within Public Act 21-43 and lower the required threshold to 1 MW to align with the IRA ITC prevailing wage requirements for projects above 1 MW.**
- + **Establish a working group of state and local government representatives, environmental justice groups, and community representatives to further address hydrogen related topics.**
- + **Develop a community impacts framework that outlines both a vision and goals to be incorporated into hydrogen policy development.**

Connecticut could consider the following enabling policy actions that would support hydrogen development and deployment across all end use applications

- + Develop a state-wide vision for establishing a Connecticut clean hydrogen backbone.
- + Expand support for existing policies and programs that can enable hydrogen deployment and explore incorporation of hydrogen within relevant existing policies and programs.
- + Establish a definition for clean hydrogen consistent with the federal guidance to enable eligibility and participation from a wide range of resources and feedstocks, as well as to enable import of hydrogen from other states within the Northeast Regional Hub.
- + Establish a more rigorous definition for renewable hydrogen that acknowledges the reduced carbon footprint of specific production sources and encourages development of hydrogen production sources that are able to maximize hydrogen Production Tax Credit benefits.
- + Establish a multi-agency workgroup of state and local government representatives with expertise in decarbonization, renewable energy, hydrogen, permitting and siting, transportation, and utility regulation, that can collaborate with one another and with other states in the region on addressing the multi-sectoral opportunities and barriers associated with renewable hydrogen.

States and national governments are beginning to adopt definitions for clean, renewable, or green hydrogen

| | Hydrogen Type (e.g. clean, renewable, green) | Based on a carbon intensity calculation | Technology agnostic (e.g. includes biomass, biogas, electrolysis, nuclear) | Electrolysis with renewables only | Excludes use of fossil fuels |
|----------------------------------|--|---|--|-----------------------------------|------------------------------|
| US DOE | Clean | X | X | | |
| Montana | Green | | X | | X |
| Washington State | Renewable | | X | | |
| Oregon | Renewable | | X | | X |
| Australia | Clean | | X | | |
| Canada | Green | | | X | X |
| Canada | Low Carbon Intensity | X | X | | |
| Chile | Green | | | X | X |
| France | Renewable | X | | X | X |
| France | Low Carbon | X | X | | |
| Germany | Green | | | X | X |
| Sweden | Renewable/Clean | | X | | |
| CertifHy | Green | X | X | | X |
| CertifHy | Low Carbon | X | X | | |

Reminder: Use Cases have been prioritized by potential for societal benefits

| Highest Priority for Additional Investigation | High Priority for Additional Investigation | Other Potentially Valuable Applications |
|---|---|--|
| <ul style="list-style-type: none"> + Focused on end uses that: <ul style="list-style-type: none"> + Are very likely to use hydrogen due to underlying economics + Create substantial societal benefits (e.g. GHG reduction, workforce development) + Proposed end uses include: <ul style="list-style-type: none"> + Critical facilities (24-hour backup need) + Aviation (long- and medium-haul) + Cargo ships + Material handling equipment (w/ long uptimes and charging space constraints) + Long-haul heavy-duty vehicles + Fuel cells for peak power generation + High heat industrial processes | <ul style="list-style-type: none"> + Focused on end uses that: <ul style="list-style-type: none"> + Have a strong financial case for hydrogen use + Create societal benefit, but on a smaller scale due to size of industry + Proposed end uses include: <ul style="list-style-type: none"> + Long-distance bus routes + Commuter buses and other heavy-duty vehicles with lower daily driving ranges + Ferries + Freight rail + Fleet vehicles with long uptimes and specific refueling locations + Hydrogen blending in natural gas pipelines for non-core customer (i.e. power generation and industrial heat) | <ul style="list-style-type: none"> + Focused on end uses that: <ul style="list-style-type: none"> + Can be kept “in view” as economics of hydrogen vs. alternatives develop + Could provide additional opportunities for market development + Proposed end uses include: <ul style="list-style-type: none"> + Hydrogen blending for commercial and residential customers + Privately-owned light-duty vehicles + Low heat industrial processes + Short-haul aviation |

A technical assessment considered a wide range of applications connected to the identified end uses (e.g. commuter rail, short-range harbor craft, forklifts with shorter uptimes) but research suggested that these end uses present stronger cases for electrifications due to economics and technological development.

Connecticut could consider the following enabling policy actions that would provide targeted support for highest priority end use applications

- + Establish a Low Carbon Fuels Standard (LCFS)
 - + Example: California's LCFS program
- + Identify and potentially expand clean transportation incentives to include on-site port handling equipment, harbor crafts, and ocean-going vessels.
- + Evaluate opening broader dockets to identify opportunities to decarbonize hard to decarbonize sectors, including aviation, shipping, industrial, etc.
- + Tax exemptions for hydrogen vehicles
- + Tax exemptions for critical facilities that produce or use hydrogen

Next Steps



Working Group Meeting Schedule

| | September | October | November | December |
|--------------------------------|----------------|------------------------|------------------------|---------------------------|
| Funding | 9/27 4-5pm | 10/26 10:30am-12 pm | 11/18 10:30am-12 pm | 12/15 10:30am-12:00 pm |
| Infrastructure | 9/28 2-3pm | 10/24 2-3pm | 11/17 3-4pm | 12/19 3-4pm |
| Policy & Workforce Development | 9/26 3-4pm | 10/20 12-1pm | 11/29 12-1pm | 12/15 12-1pm |
| Sources | 9/27 1-2pm | 10/25 2-3:30pm | 11/17 11am-12pm | 12/20 1-2:30pm |
| Uses | 9/27 12-1pm | | 11/22 12-1pm | |

Timeline

- + **Public Request for Written Comments – out now, due 12/9 at 5pm EST**
 - + Opportunity to formally submit written feedback that may be included as a stakeholder perspective into the report.
- + **Webinar & Listening Session – 12/8**
 - + Opportunity to formally submit verbal or written feedback that may be included as a stakeholder perspective into the report.
- + **Draft Final Recommendations Shared from All Workstreams – Task Force Mtg on 12/13**
- + **Opportunity for Task Force Review of Draft Final Report (mid-Dec.)**
 - + A draft of the report will be circulated for stakeholder feedback.
- + **Final Report Submitted – 1/15**

Thank You!

Feel free to reach out with any questions!
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