GTI ENERGY

HEX@TEX

Hydrogen Emissions eXchange at the University of Texas at Austin

September 30 – October 1, 2025 | Austin, Texas

2025 Highlights

Beyond the Hype: Hydrogen is Still Relevant

Following on last year's success, over 60 people from around the world gathered at The University of Texas at Austin to talk about hydrogen emissions. With more speakers and tours, we fulfilled our promise of making HEX@TEX 2025 bigger and better than before, without compromising the intimacy that made the first event so successful. Last year's HEX@TEX 2024 was held at the peak of the hydrogen hype cycle; HEX@TEX 2025 showed that hydrogen has now moved beyond the hype. With real projects being commissioned all over the world, hydrogen is still relevant.

I. Hydrogen remains relevant all over the world

- We need more energy with fewer emissions; hydrogen offers a unique role beyond electrons.
- Hydrogen is not new: we have been mixing hydrogen with other gases since the 1800s.
- Hydrogen remains a critical energy carrier with the conversation beginning to focus on the highest impact pathways.
- Global demand and export opportunities drive U.S. hydrogen development and growth.
- Chile, Finland, and Norway are active clusters for electrolytic hydrogen development.
- Middle Eastern countries are investing in long-term hydrogen strategies to adapt to global demand shifts.

II. Hydrogen will continue to grow in the U.S. despite "pendulum swings"

- U.S federal support is important but not the sole driver of growth in the hydrogen market; defense, industry and states are filling funding gaps.
- Public-private partnerships are sustaining deployment despite political changes.
- Hydrogen fuel cell buses and trucks are gaining traction, especially for rural and long-distance applications in California; however, million-dollar buses are not financially sustainable and vehicle costs need to be reduced for them to become more popular.
- California pilots clean energy technologies, but Texas deploys them at scale.
- Texas leads with over 500 hydrogen projects past Final Investment Decision, focusing on strategic site selection and robust offtake strategies.
- Hydrogen at the pump may be very expensive compared to diesel, but for the DOD supplying fuel to military bases and the frontlines, the costs are comparable.
- The DOD is investing in hydrogen because they want to be able to produce fuel on site; DOD cannot produce diesel on site, but small electrolyzers may enable them to convert water to hydrogen for their vehicles.

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III. Hydrogen's environmental impacts pose challenges and opportunities

- We know hydrogen has indirect global warming impacts: climate scientists are focusing on the magnitudes, trying to narrow down the uncertainty, the biggest being the soil sink.
- Like HyRes, scientists are using energy systems models to contextualize hydrogen's net climate impacts.
- LCAs provides an opportunity to measure progress towards cleaner fuel targets.
- Data quality, models, and policies contribute to differences in life-cycle carbon intensity measurements; third-party verification is essential to ensure uniform and accurate use.
- Attributes like carbon intensity influence commodity value.
- Litigation and evolving standards (e.g., EU IMO vote) are expected.

IV. Hydrogen isn't methane, but we can learn from years of methane sensing

- Lessons from methane emissions inform hydrogen leak detection and repair (LDAR).
- Hydrogen's GWP is influenced by methane; soil is a major hydrogen sink.

V. Hydrogen sensing is advancing steadily

- There is steady progress in hydrogen emissions monitoring and quantification.
- Advances in hydrogen sensing (ppb-level detection, carbon nanotube sensors, ML/AI for data interpretation) are critical.
- Continuous emissions monitoring and integration into facilities are emerging priorities.
- New sensor technologies are moving toward field testing and deployment with collaborations accelerating progress.
- EU and UK are developing best practices and standards for hydrogen emissions.

VI. Hydrogen sensing needs for the industry are evolving, but sensor demand is low

- Exxon's Baytown blue hydrogen facility is a testbed for sensor development.
- Diverse applications require tailored sensor solutions.
- Companies like GE Vernova and Serinus are advancing sensor networks and field surveys.
- The demand for sensors is too small for sensor developers to achieve economies of scale.

VII. Hydrogen storage and geologic production are the next frontier

- Salt caverns and depleted fields are key for large-scale hydrogen storage.
- Naturally occurring hydrogen is difficult to trap; stimulated production is more accessible.
- Understanding subsurface interactions is critical for scaling hydrogen storage.