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Demonstration and Framework for H2@Scale in Texas and Beyond

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H2@Scale Session - Fuel Cell Seminar

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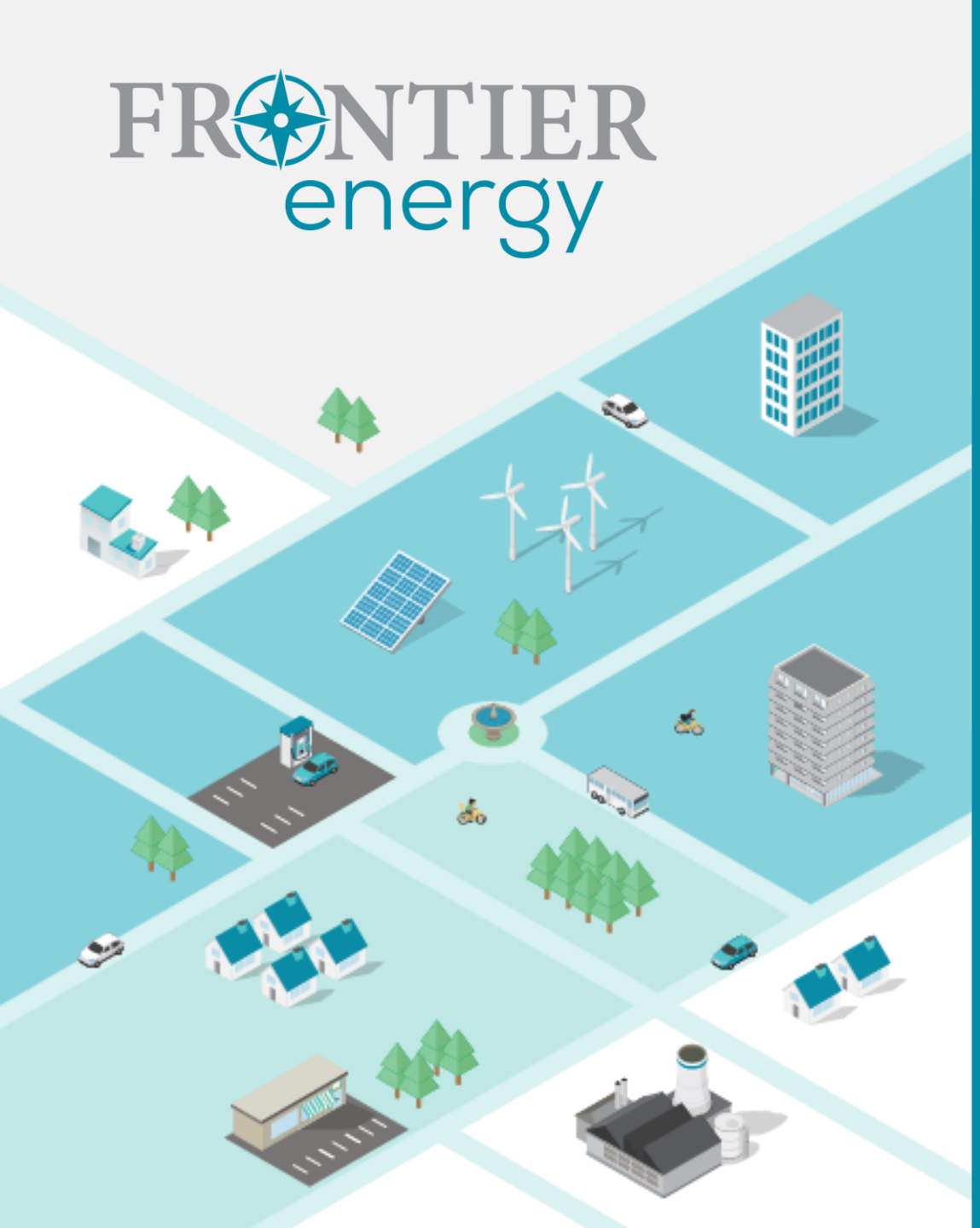
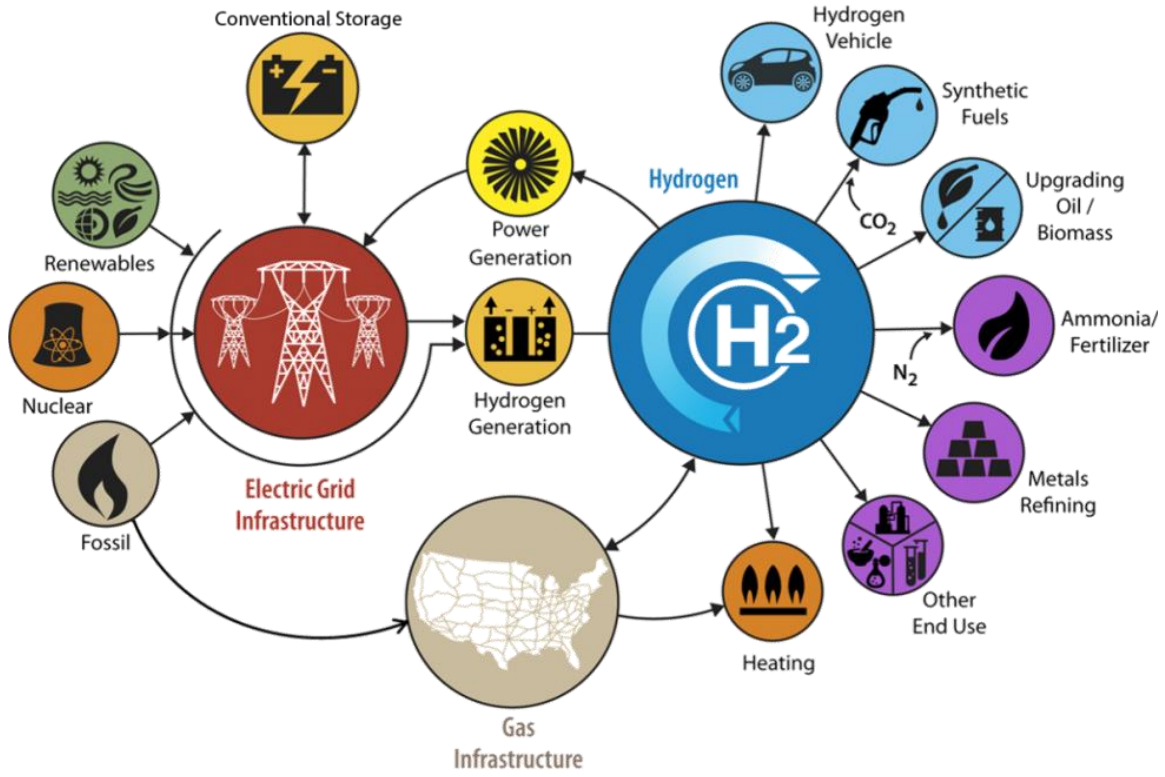


- Energy Engineering
- Electric Transportation
- Energy Efficiency Programs
- Advanced Power Generation
- Foodservice Energy & Water
- Cloud-based Software

FrontierEnergy.com

H2@Scale Vision

- H_2 enables zero emissions in transportation, stationary, remote, and portable power
- H_2 used as a grid “responsive load” for grid stability and GWh energy storage, and increase power generators utilization
- H_2 critical feedstock for entire chemicals industry
- Domestically sourced H_2 for multiple sectors or export

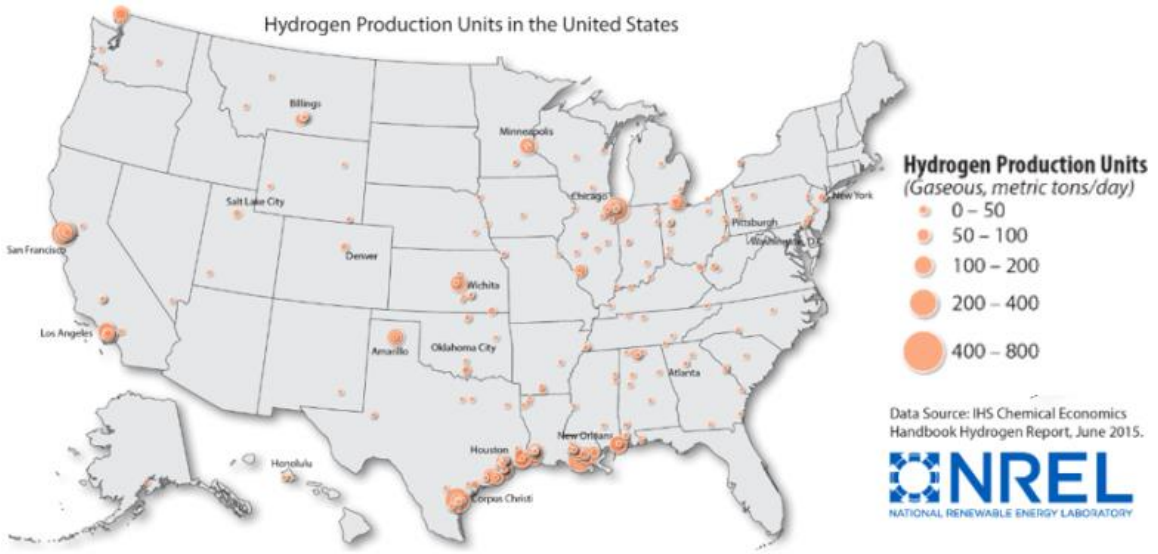


https://www.energy.gov/eere/fuelcells/h2scale

H2@Scale in Texas

Texas ideal to lead H_2 production for a sustainable energy system

- Excellent resources of natural gas, solar and wind for RH_2
- Largest H_2 producer in the nation
- Major industry leaders on Hydrogen Council have significant presence in Texas
  - Toyota, Shell, and Air Liquide



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US DOE Award for H2@Scale in Texas

Two unique RD&D tracks to understand the potential of integrating hydrogen with multiple co-located platforms and existing resources

- Demonstrate multiple RH_2 generation options, co-located with vehicle fueling and a large base load consumer to enable cost-effective H2 energy solutions
- Develop framework for actionable H2@Scale pilot plans in Texas, Port of Houston and Gulf Coast region, including energy storage

Project Duration: 3 years, beginning early 2020

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Demonstration activities at UT

Renewable H_2 generation

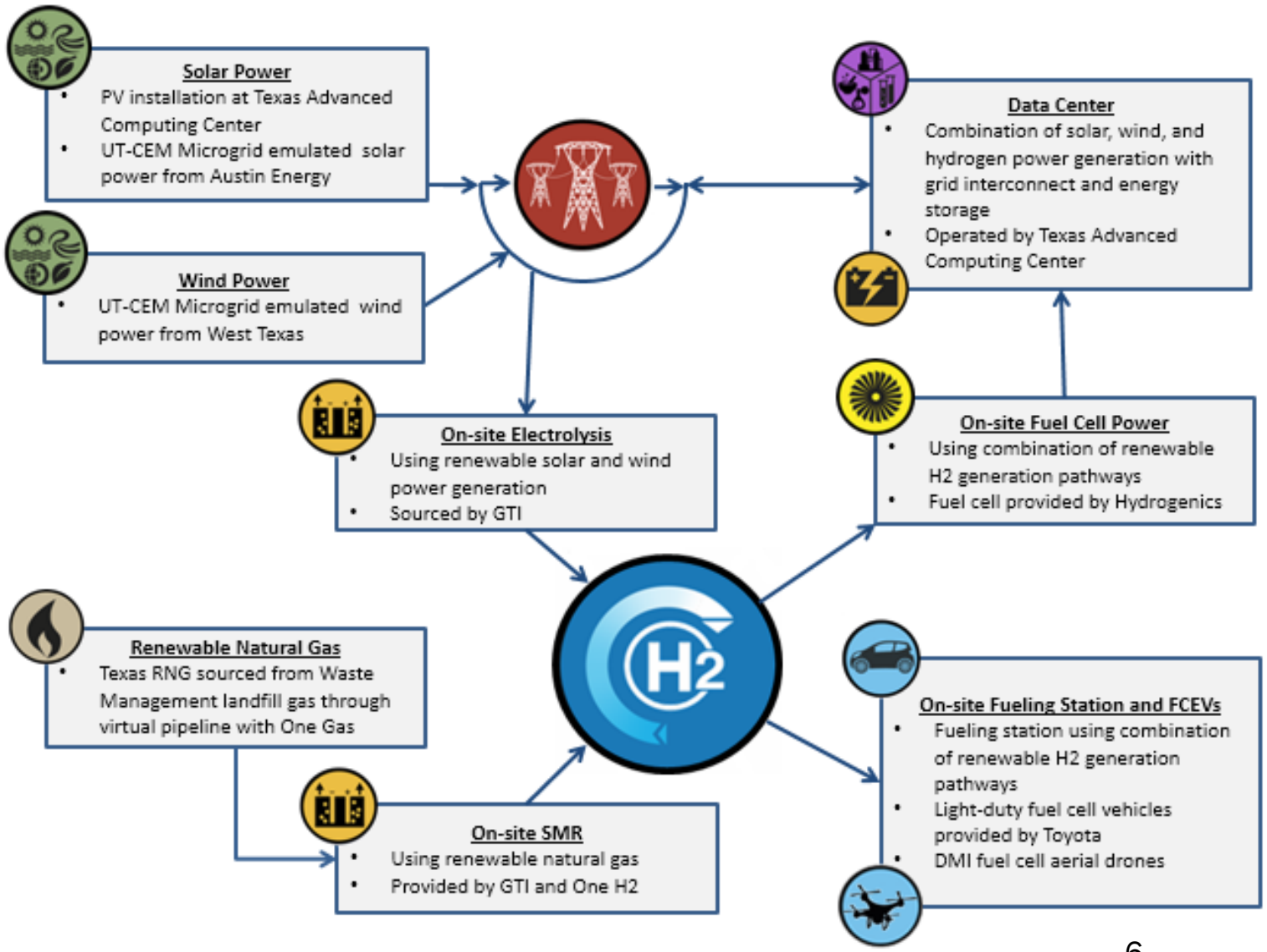
- SMR using RNG
- Electrolysis using wind and solar power

Large scale, industry H_2 user

- Fuel cell powering Texas Advanced Computing Center

Vehicle refueling

- Light-duty vehicles
- Unmanned aerial vehicles



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Port of Houston H_2 Framework

- Identify key stakeholders, existing H_2 infra and business in region
- Identify policy and regulatory barriers
- Define use and implementation plans leveraging existing industry resources
- Develop actionable plan for H2@Scale and FCEV rollout in region

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Program summary

Period of performance: 36 months

	Key milestones & deliverables
Year 1	•Demonstration site planning and construction •Technoeconomic H2@Scale models in Texas
Year 2	•Commence demonstration activities •Complete framework for H2@Scale in Texas
Year 3	•Complete demonstration and assess ability to provide cost-effective hydrogen

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Questions?

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