



# Houston to Los Angeles (H2LA) Hydrogen Project Advisory Committee Kick Off Meeting

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April 10, 2024

# Who We Are & What We Do



Regional Planning Agency



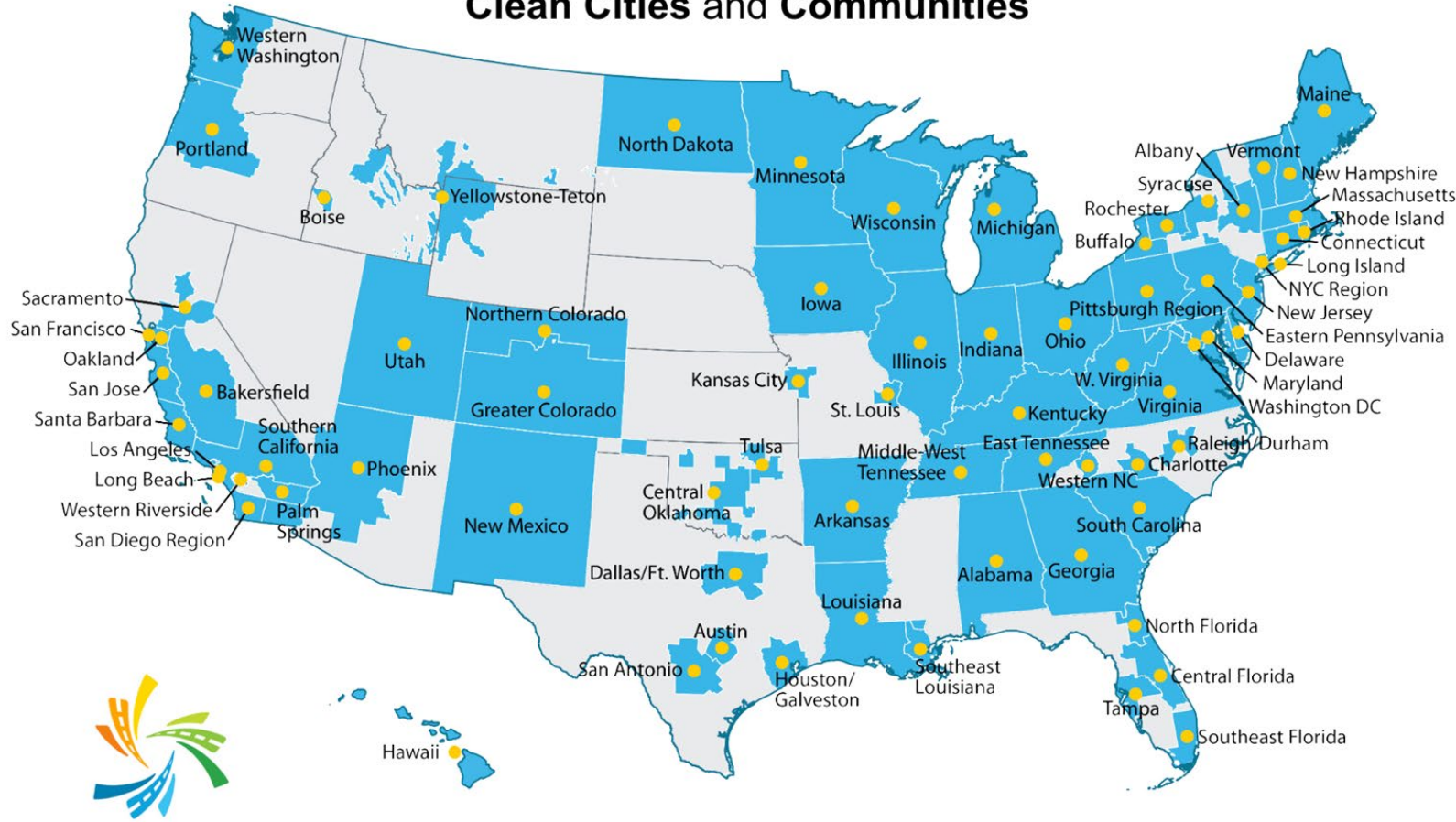
Photochemical Modeling & Air Quality Research



Outreach & Education - Local Clean Cities Coalition

# Clean Cities Coalition Network

## Clean Cities and Communities



Advancing affordable, domestic transportation fuels and technologies

- Forums for local stakeholders to connect and collaborate
- Provide grassroots support and resources
- Identify cost-effective solutions that work locally



Clean Cities and Communities

Map Date: 10/3/23

# Vehicle Technologies Office

Advanced domestic transportation fuels and technologies:

- ✓ Improve energy *efficiency*
- ✓ Increase domestic energy *security*
- ✓ Reduce operating *cost* for consumers and business
- ✓ Improve global *competitiveness* of U.S. economy



Technology Integration



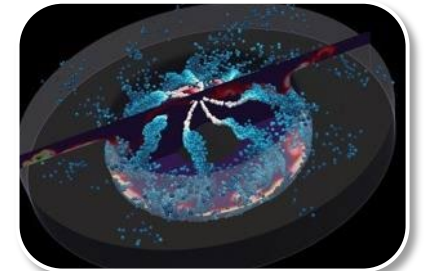
Materials Technologies



Energy Efficient Mobility Systems



Batteries and Electrification



Advanced Engine and Fuel

# Technology Integration

Provide objective data and real-world lessons learned that inform future research needs and support local decision-making



Information and Tools



Technical Assistance



Clean Cities and Communities

Network of Coalitions



Financial Assistance



Training, Outreach, and Partnerships



# Hydrogen Fueling 101

- Hydrogen can either be delivered to a station or produced onsite
  - Produced via electrolysis or steam methane reforming
  - 95% of hydrogen today is produced via steam reforming of natural gas
- Most hydrogen today is produced at large plants and distributed with special hydrogen trailers
- Hydrogen is dispensed as a pressurized gas
  - If it arrives in liquid form, needs to be converted into a gas
- Hydrogen sits in storage tanks above ground at fueling stations

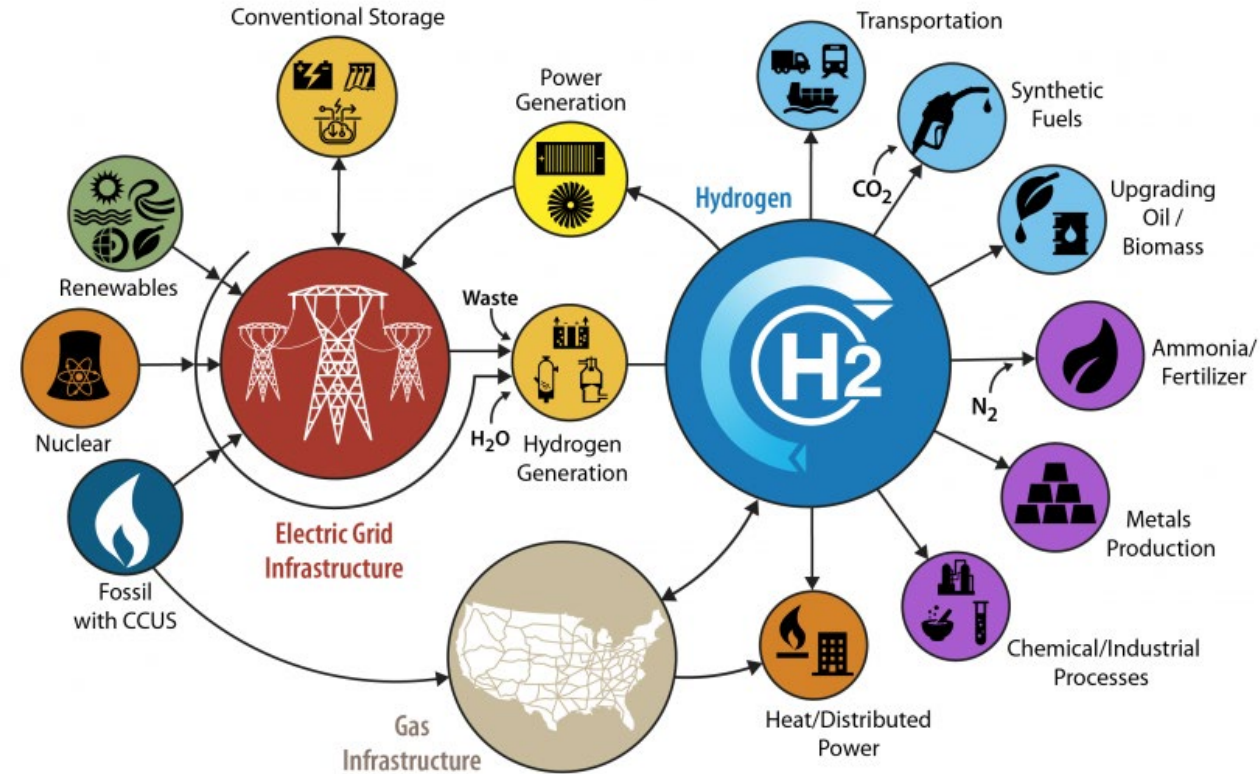


Image Source: Department of Energy

# Current State of Hydrogen Fueling

- **Port of Oakland NorCal Zero Project**
  - \$52M Class 8 hydrogen truck refueling station under construction, near completion
  - 18,000 kg/day capacity (200 HD trucks per day)
- **Port of Los Angeles “Shore to Store” Project**
  - \$82M total project cost: 2 hydrogen stations and 10 fuel cell trucks in local fleets; electric yard tractors and equipment
- **Nikola Hyla Hydrogen Fueling Station Award**
  - Awarded \$41M in 2023 to build 6 heavy duty hydrogen refueling stations
  - Planned to facilitate refueling for 80 to 100 trucks per station per day



Image Source: Alternative Fuels Data Center

63 hydrogen refueling stations combined in the U.S. and Canada  
62 for light-duty vehicles, 1 for medium-duty vehicles

# H2 Projects

## Houston to Los Angeles (H2LA) – Interstate 10 Hydrogen Corridor Project

- Led by GTI Energy; Assisting in infrastructure planning for hydrogen truck fueling around the Texas Triangle and full Interstate 10 Corridor

## HyVelocity Gulf Coast Hydrogen Hub

- Investing in clean hydrogen production centered in Houston to leverage the region's abundant resources to bring down the cost of hydrogen

## Texas Hydrogen Alliance Activities

- Based in Austin, Texas

## UT Austin H2@Scale Project

- Hydrogen proto-hub with vehicle fueling capabilities

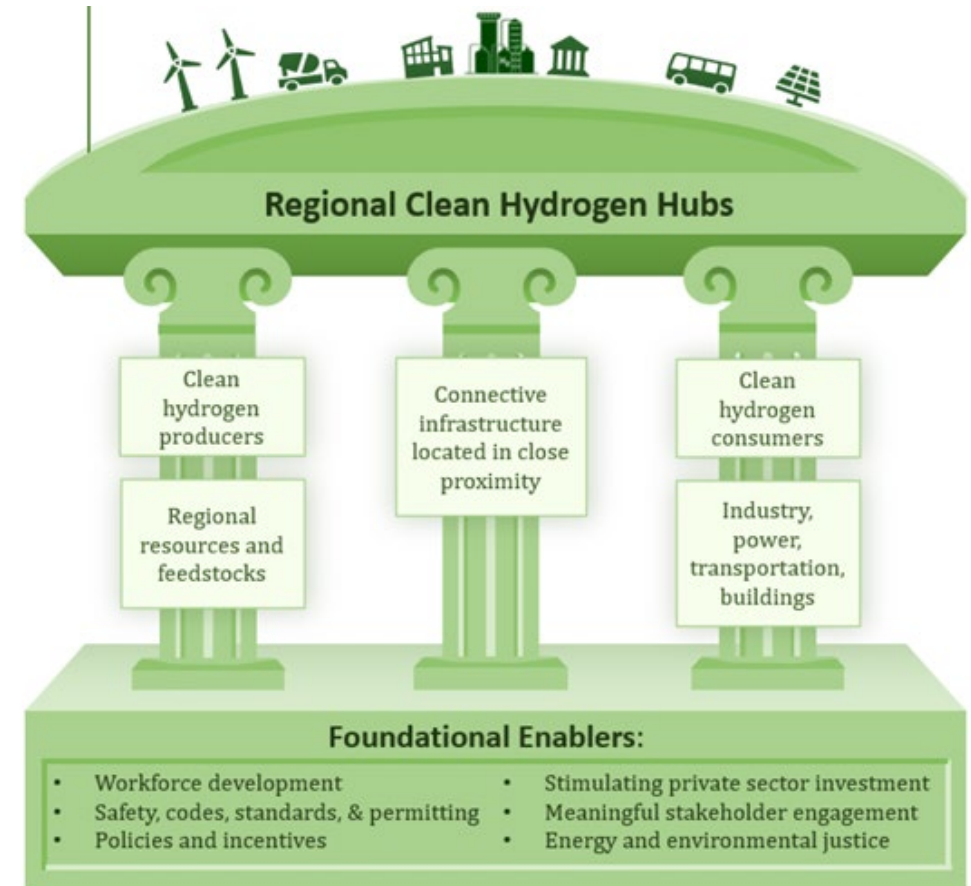


Image Source: Department of Energy



# Charging & Fueling Infrastructure Corridor Program

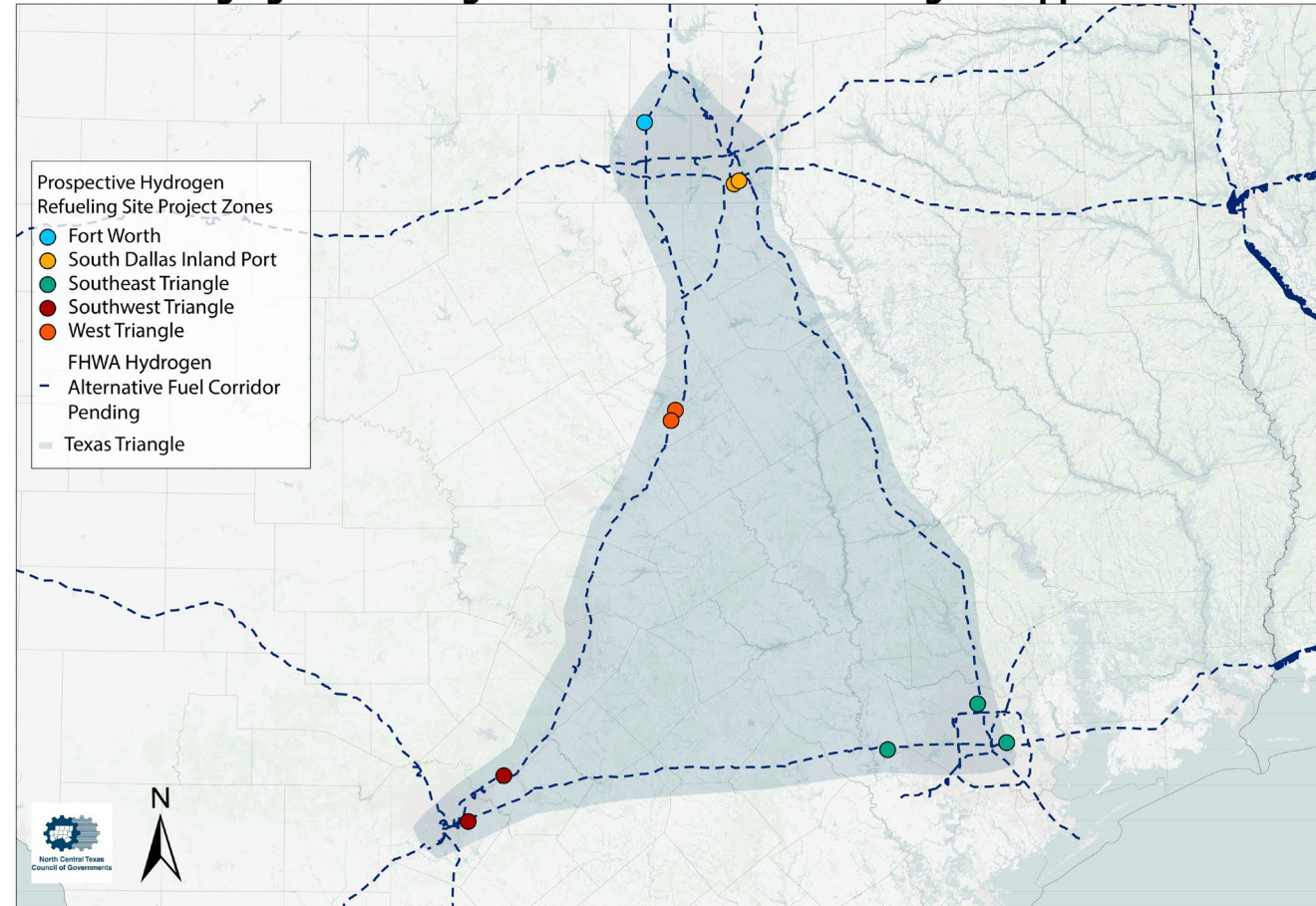
## Texas Hydrogen and Electric Freight Infrastructure Project (Tx-HEFTI)

### Construct 5 publicly accessible medium/heavy-duty hydrogen refueling stations

- Alliance Texas Mobility Innovation Zone
- Southern Dallas County Inland Port
- West, Southwest, and Southeast Texas Triangle

**Awarded \$70 million**

Charging and Fueling Infrastructure Corridor Program Application



January 2024

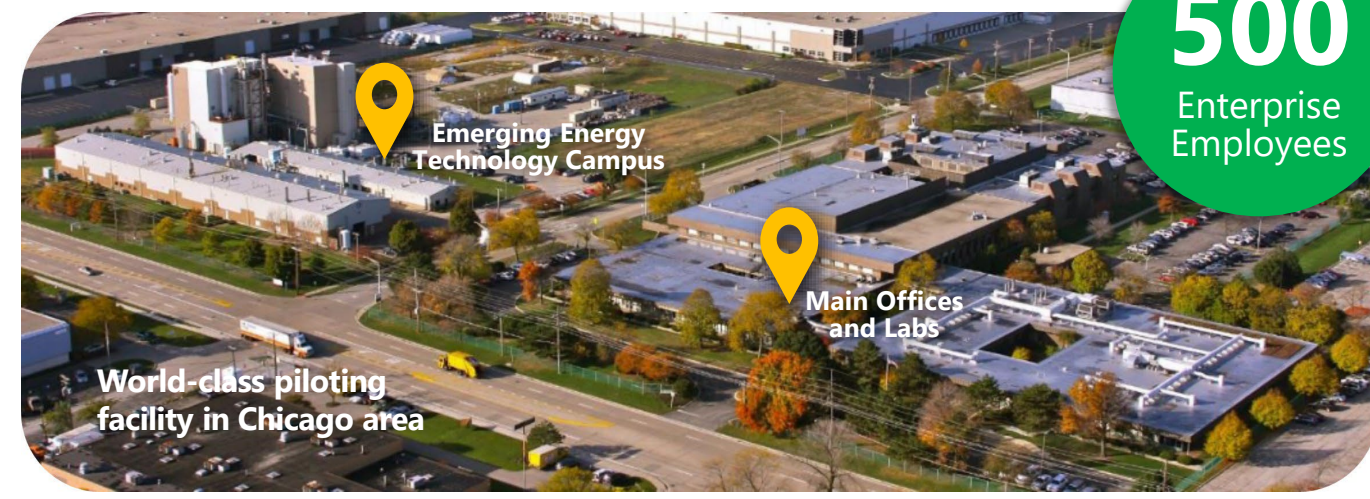
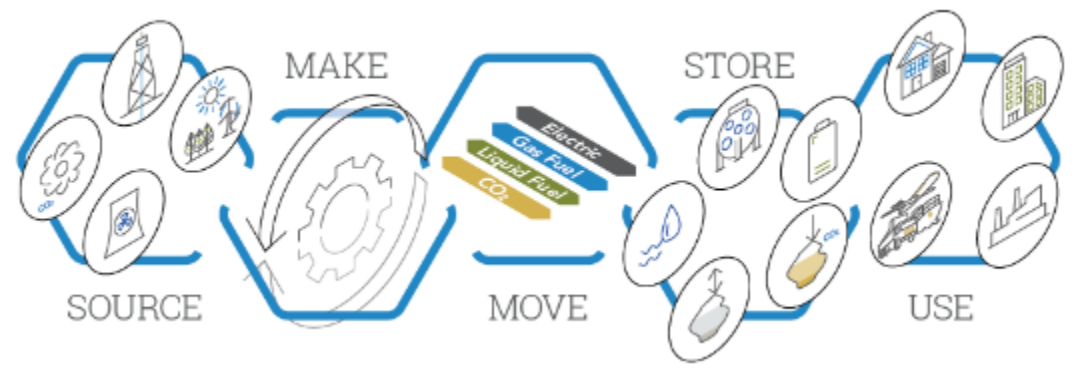
# H2LA Project Team

CORE TEAM

GTI Energy	Overall study coordinator and prime applicant. Leads Diversity, Equity and Inclusion Plan and activities.
Oak Ridge National Laboratory, UT Austin	Data collection, modeling, and analysis of transportation systems.
ExxonMobil	Contribute input from large scale clean hydrogen producer.
Walmart	Contribute fleet operational data and needs.
Dallas-Fort Worth, Alamo Area, and Western Riverside Councils of Governments	Incorporate community and coalition stakeholders needs into plan. Provide outreach and dissemination plan.
Nikola, Hyundai, Toyota Motor	Provide truck requirements and fueling needs data.
Air Liquide	Support real-world data and logistics for hydrogen supply.
Center for Houston's Future	Incorporate community needs into plan.
Dallas-Fort Worth, Alamo Area, Land of Enchantment, Valley of the Sun, and Western Riverside County Clean Cities Coalitions	Incorporate community and coalition stakeholders needs into plan.
Trillium, member of the Love's Truck Stop Family of Companies	Siting, operating, previous station development experience in CA.
Hydrogen Fuel Cell Partnership (HFCP)	Utilize expertise in hydrogen corridor planning and industry connections.

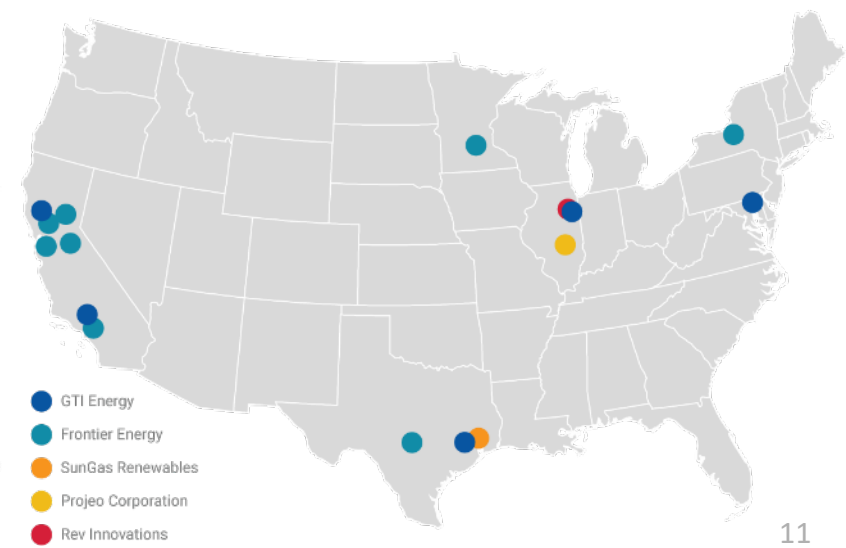
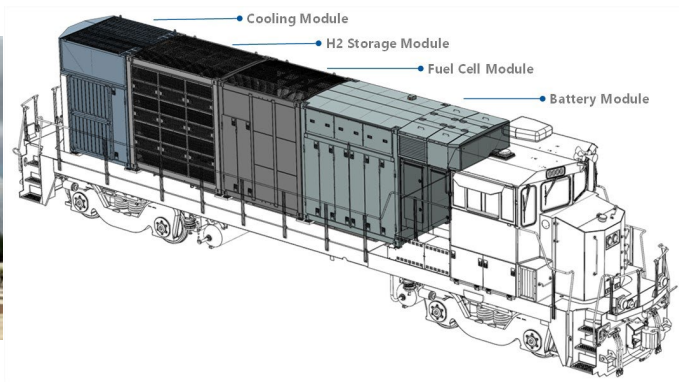
- + Collaboration with ORNL on I-5/CA-99 LA to SF Corridor
- + Collaboration with Cummins on *MD-HD ZEV Infrastructure Planning with focus on I-80 Midwest (IN-IL-OH) corridor*
- + dozens of prospective collaborators from the industry, local governments, and hydrogen hub teams

# GTI Energy develops, scales and deploys solutions in the transition to low-carbon, low-cost energy systems

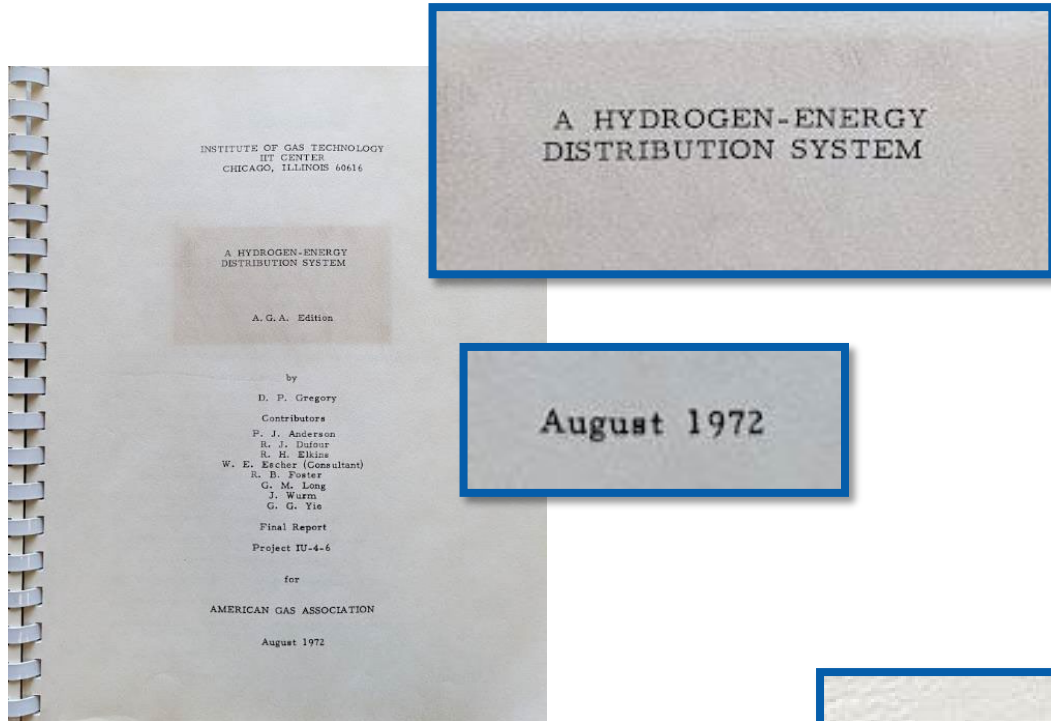


**500**  
Enterprise Employees

We work collaboratively to address critical energy challenges impacting gases, liquids, efficiency and infrastructure



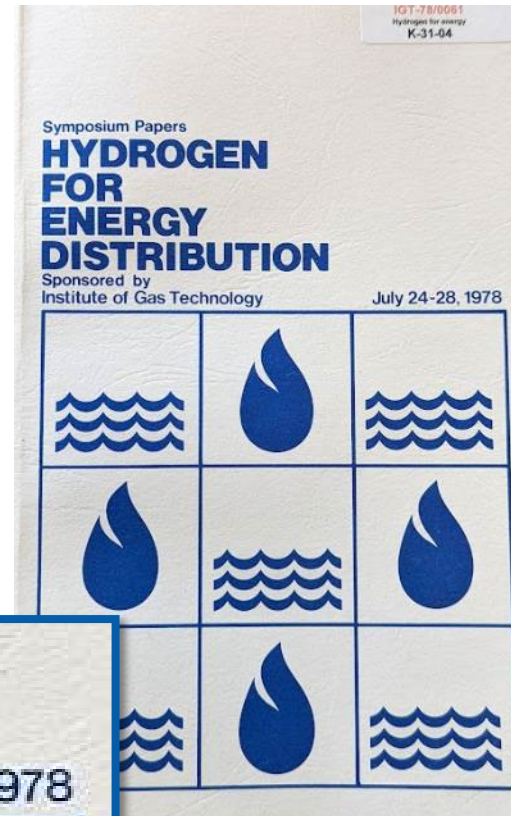
# Decades of experience with Hydrogen



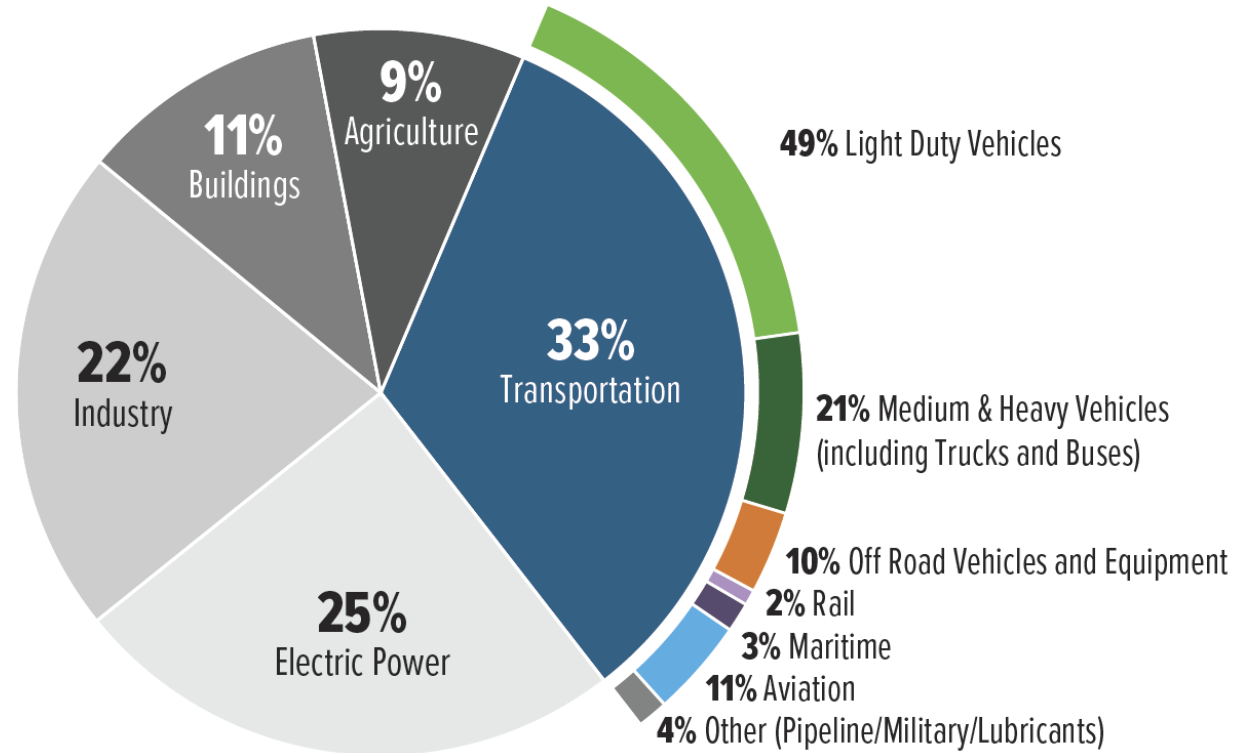
A HYDROGEN-ENERGY  
DISTRIBUTION SYSTEM

August 1972

July 24-28, 1978



# Decarbonization Will Not Be Simple



*Total 2019 U.S. GHG emissions with transportation and mobile sources breakdown. Data derived from the EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks. 2019 used as a baseline since impacts due to COVID-19 complicate the use of later data.*

# Project Overview

## Objectives

- Build computer models for vehicle, fueling infrastructure, and operational data
- Establish a hydrogen fueling and heavy-duty freight truck network leveraging this fueling infrastructure in the Texas Triangle and I-10 corridor from Houston to Los Angeles

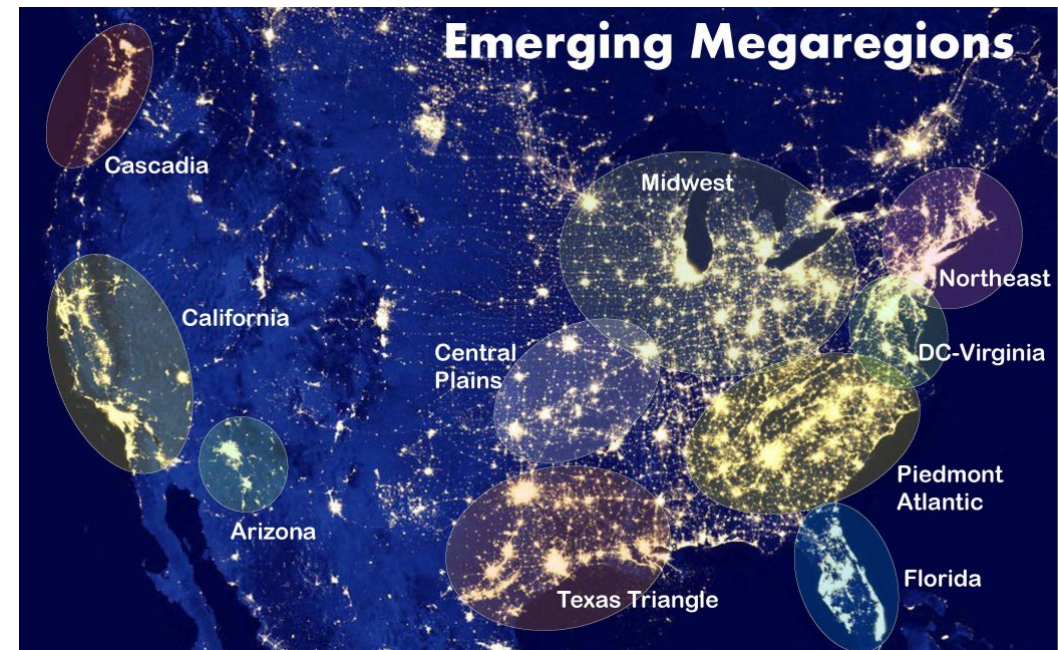


This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under the Vehicle Technologies Office (VTO) Fiscal Year 2022 Vehicle Technologies Office Program Wide Funding Opportunity Announcement Award Number DE-EE0010650.

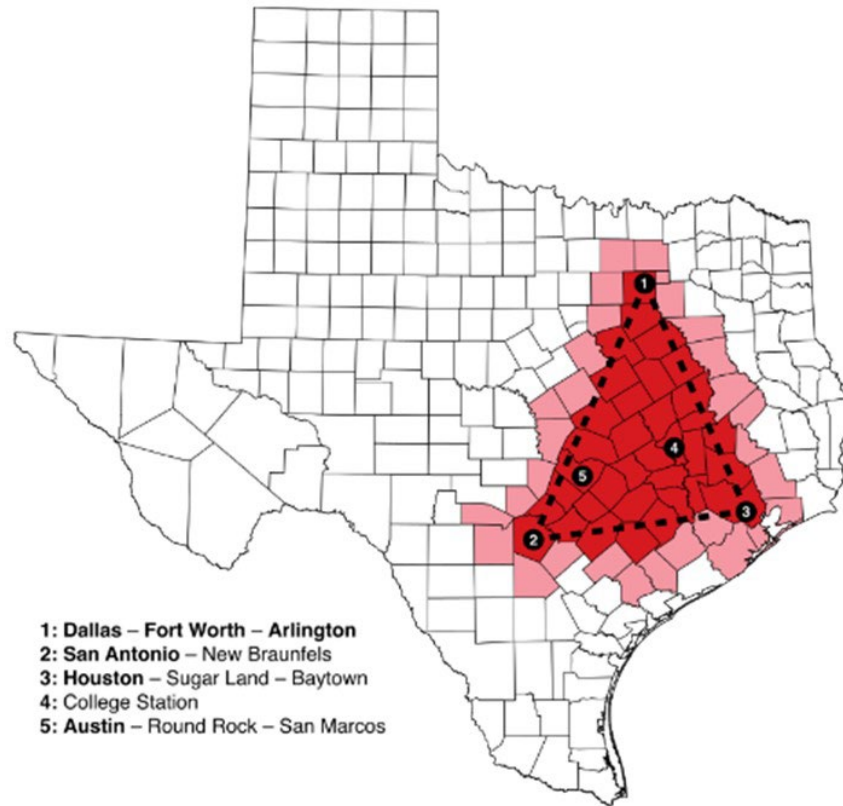
# Project Overview

## Objectives

- Assess community needs and benefits through Diversity, Equity, Inclusion and Accessibility (DEIA), Energy Equity (EE) and Workforce Implications (WI) effort
- Engage impacted communities to gather input and conduct outreach
- Develop a replicable and catalytic blueprint for other corridors and megaregions
- Disseminate findings to relevant stakeholders
- Q3 2025 completion



# Texas Triangle Megaregion



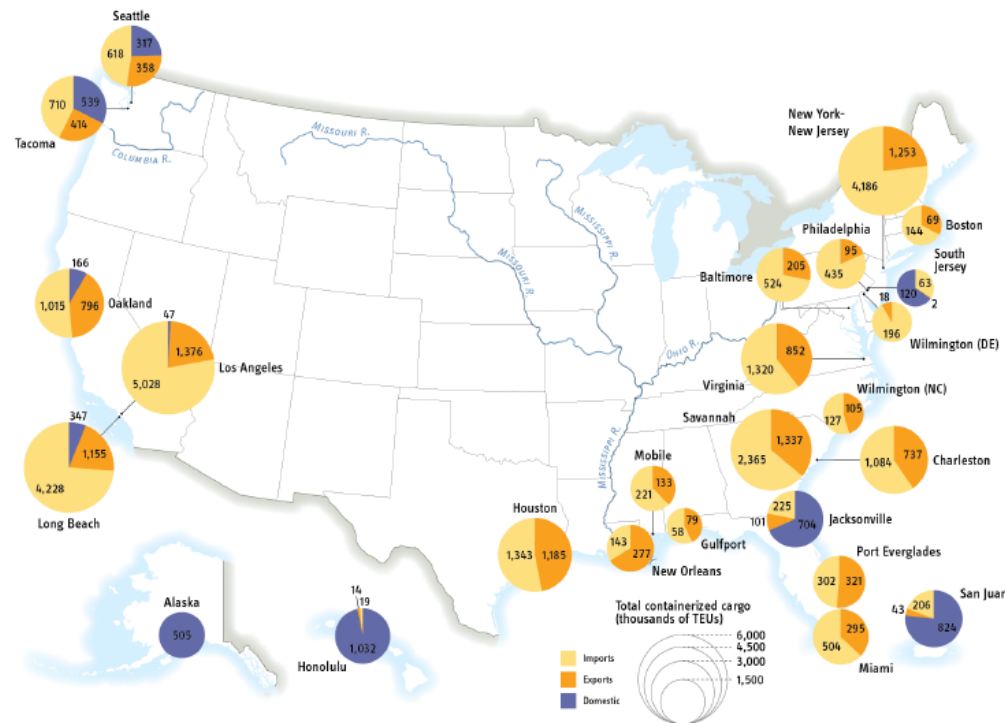
## Texas Triangle Megaregion encompasses:

- 5 of the largest 20 U.S. cities and is home to more than 70% of Texans, nearly 21 million people
- 5.3% of the total U.S. truck freight through an average of 35.7k miles of daily commercial VMT
- I-10 freight corridor from San Antonio to Los Angeles, adds 2.1%



# Major Ports Connector

Top 25 Container Ports by TEU: 2020



SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, based upon 2020 data (latest available) provided by U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center. Special tabulation as of November 2022.

TABLE 2-4 List of Top 25 Container Ports by TEU (Ranked by TEU)

1. Los Angeles	14. Honolulu
2. Long Beach	15. Baltimore
3. New York, NY & NJ	16. Port Everglades
4. Savannah	17. Philadelphia Regional Port
5. Houston Port Authority, TX	18. New Orleans
6. Virginia, VA, Port of	19. Alaska, AK, Port of
7. Oakland	20. Mobile, AL
8. Charleston	21. Wilmington, NC
9. Tacoma	22. Wilmington, DE
10. Seattle	23. Boston
11. San Juan	24. South Jersey, Port of, NJ
12. Jacksonville	25. Gulfport
13. Miami	

- Ports of Los Angeles, Long Beach and Houston are 3 out of top 5 container ports in the U.S.
- These ports carry approximately 38% of the import/export volume in the US, on a Twenty-foot Equivalent -TEU basis.

# Community Benefits Plan

## GTI Energy

Community Benefits Team with expertise in community and stakeholder engagement, planning, and environmental engineering to successfully address environmental, societal and economic needs during the energy transition.

North Central Texas Council of Governments (NCTCOG)

Alamo Area Council of Governments (AACOG)

Western Riverside Council of Governments (WRCOG)

## SMART Goals

1. Local Project Advisory Group (LPAG) to identify concerns and priorities of community organizations and stakeholders
  - a. Plan community efforts, both rural and urban
  - b. Community benefits and disbenefits
2. Develop community and public safety guidelines
  - a. Identify updates to safety and health protocols
  - b. Identify needed skills training, credentialing, and educational curricula to meet workforce needs
3. Public dissemination of information about the project
  - a. Accessible information with minority serving institutions

# LPAG Exercise

Concerns and priorities for your community

Public Health and Safety topics

Workforce needs, training, education needed to succeed?

# Next Meetings

## **Proposed HPAC Meeting Topics:**

**Today:** Introduction and overview

**July 2024:** Understanding hydrogen corridors & refueling stations, gather concerns and priorities

**October 2024:** Jobs and community benefits and disbenefits/risks

**January 2025:** Safety and health considerations

**April 2025:** Address any site-specific concerns

**July 2025:** Wrap-up

# Hydrogen Informational Resources

## Alternative Fuel Vehicles Data Center, Department of Energy

### [Hydrogen](#)

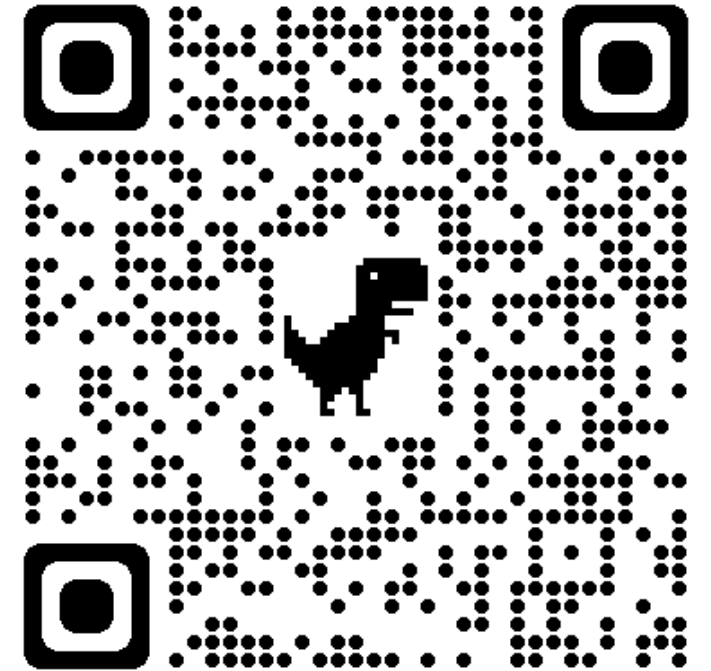
- Provides basic hydrogen information
- Addresses benefits and considerations

### [Hydrogen Storage](#)

- Explains hydrogen fuel storage systems
- Provides insight into challenges and research goals

### [Safety, Codes and Standards](#)

- Provides information on mitigation of hydrogen fuel dangers



# Contact Us



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