GTI ENERGY
solutions that transform

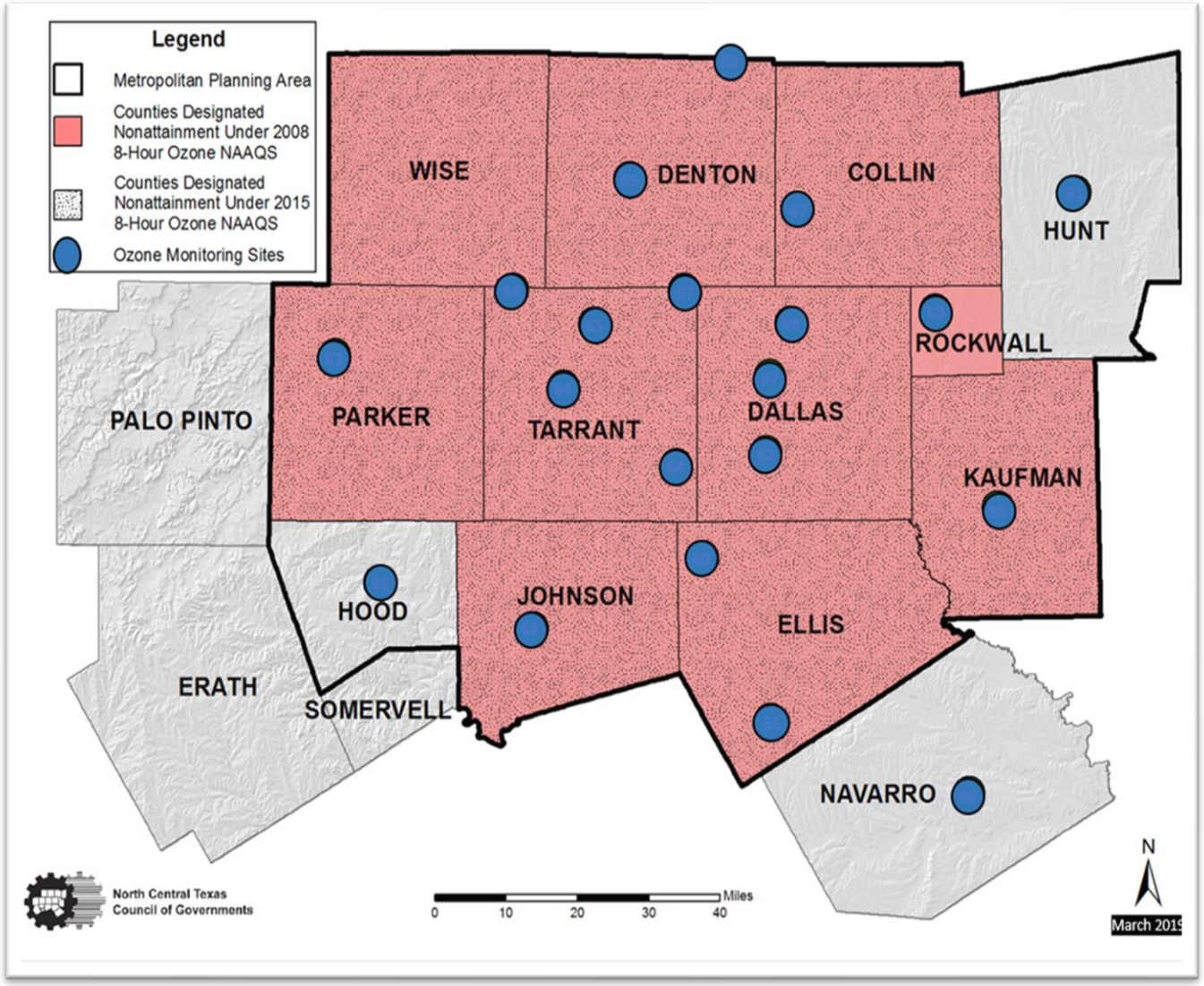
North Central Texas Council of Governments

Dallas-Fort Worth CLEAN CITIES

Houston to Los Angeles (H2LA) Local Project Advisory Group Kick Off Meeting

April 9, 2024

Who We Are



North Central Texas Council of Governments

Regional Planning Agency

Regional Transportation Council

Metropolitan Planning Organization (MPO)

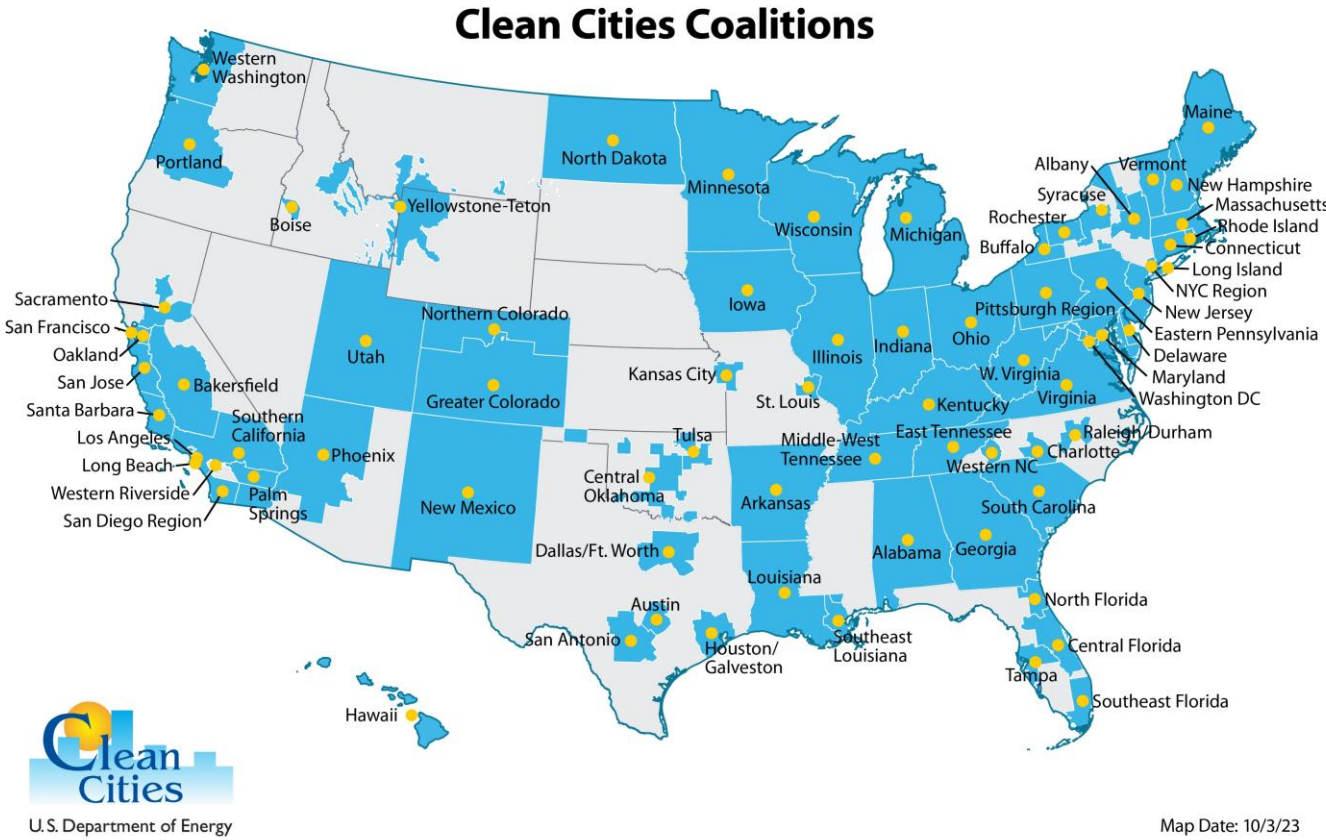
Dallas-Fort Worth CLEAN CITIES

Local Clean Cities Coalition

National Network of Clean Cities Coalitions

More than 85 Clean Cities coalitions with thousands of stakeholders, representing ~90% of U.S. population

Designated by the Department of Energy



Clean Cities Portfolio

Light-, Medium-, and Heavy-Duty Vehicles

Alternative and Renewable Fuels and Infrastructure

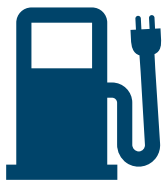
Idle Reduction Measures and Fuel Economy Improvements

New Mobility Choices and Emerging Transportation Technologies

Key Focus Areas & Goals

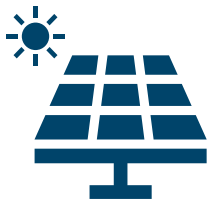
Clean Vehicle Initiatives

- Support Transition to Zero Emission Vehicle and Other Alternative Fuel Technologies Through Education and Technical Assistance
- Assist Deployment of Clean Vehicle Technologies by Identifying, Promoting, and Providing Funding



Alternative Fuel Infrastructure Initiatives

- Build and Support EV Charging Infrastructure Installations that Fill Gaps or Increase Equitable Access
- Support Increased Reliability and Resiliency of EV Charging Infrastructure
- Build and Plan Publicly-Accessible Infrastructure Network to Support ZEV Transition in Medium- and Heavy-Duty Sector



Energy Integration & Community Readiness

- Educate Local Governments on How to Support Local Adoption of Clean Transportation Technologies
- Minimize Negative Electric Grid Impacts Associated with Transportation Electrification and Advance Energy Conservation to Offset Increased Load
- Increase Local Adoption, Safety, and Resilience of Renewable Fuels (electricity, natural gas, hydrogen, biodiesel)
- Plan and Support Workforce Development to Support Clean Transportation Technologies and the Electric Grid

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

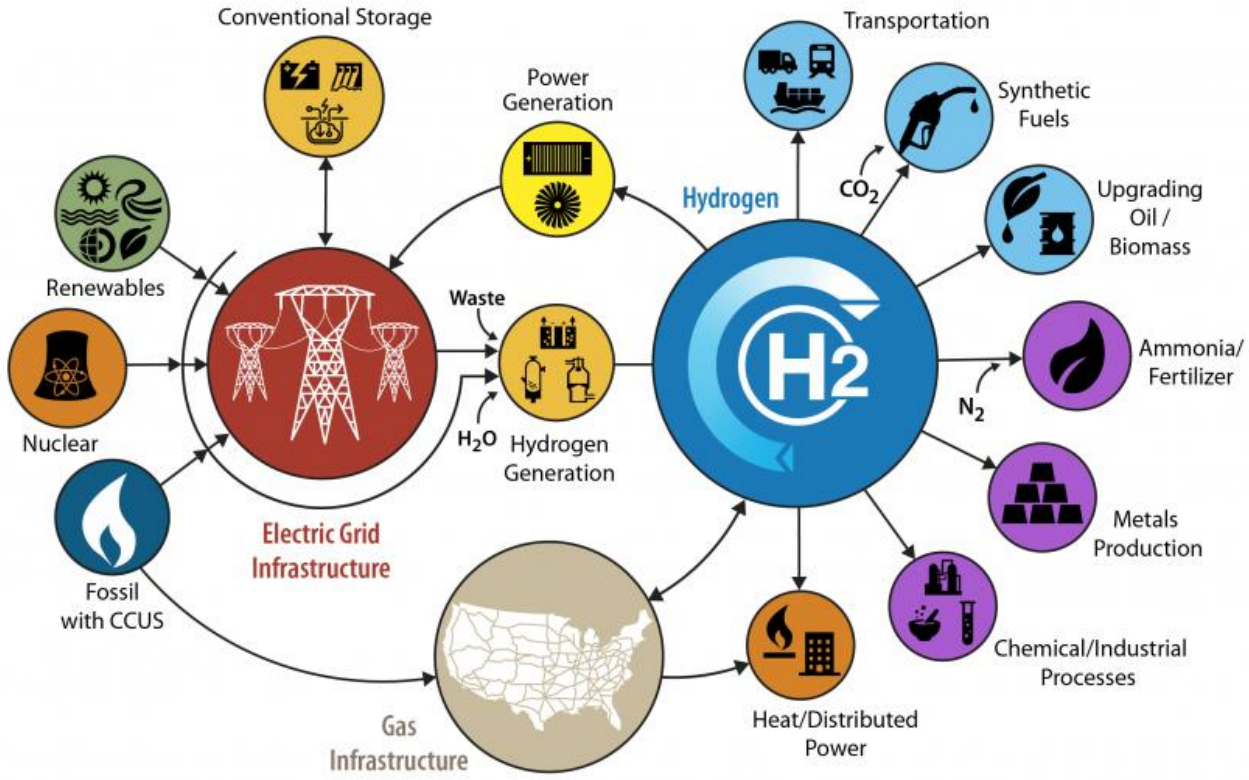


Image Source: Department of Energy

Current State of Heavy-Duty Hydrogen Fueling

- **Port of Oakland NorCal Zero Project**
  - $52M Class 8 hydrogen truck refueling station constructed by FirstElementFuel
  - Station is currently under construction, near completion
  - 18,000 kg per day capacity (200 heavy-duty trucks per day)

- **Port of Los Angeles "Shore to Store" Project**
  - $82M total project cost to build 2 hydrogen stations and deploy 10 fuel cell trucks in local fleets, project also funded electric yard tractors and equipment
  - Kenworth trucks and Shell stations in service since 2021

- **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

NCTCOG/DFW Clean Cities' Involvement in 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

- UT Arlington Hydrogen User Forum – June 11

UT Austin H2@Scale Project

- Attending ribbon cutting on April 23 for a hydrogen proto-hub with vehicle fueling capabilities

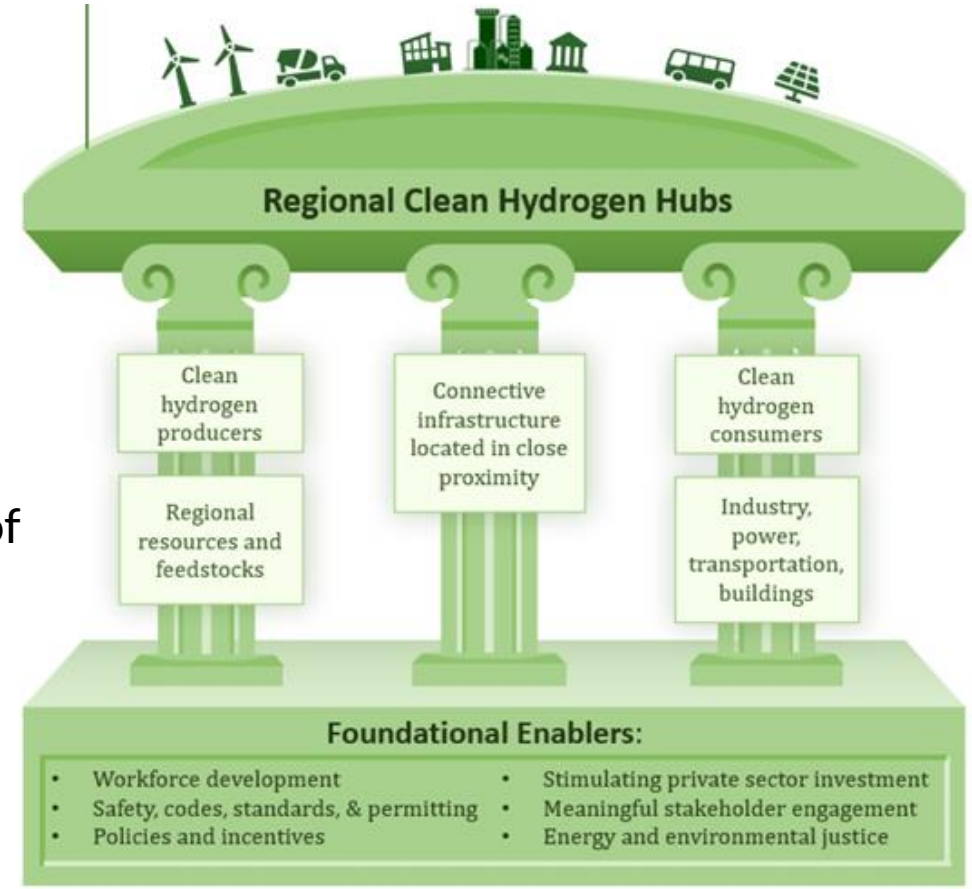


Image Source: Department of Energy

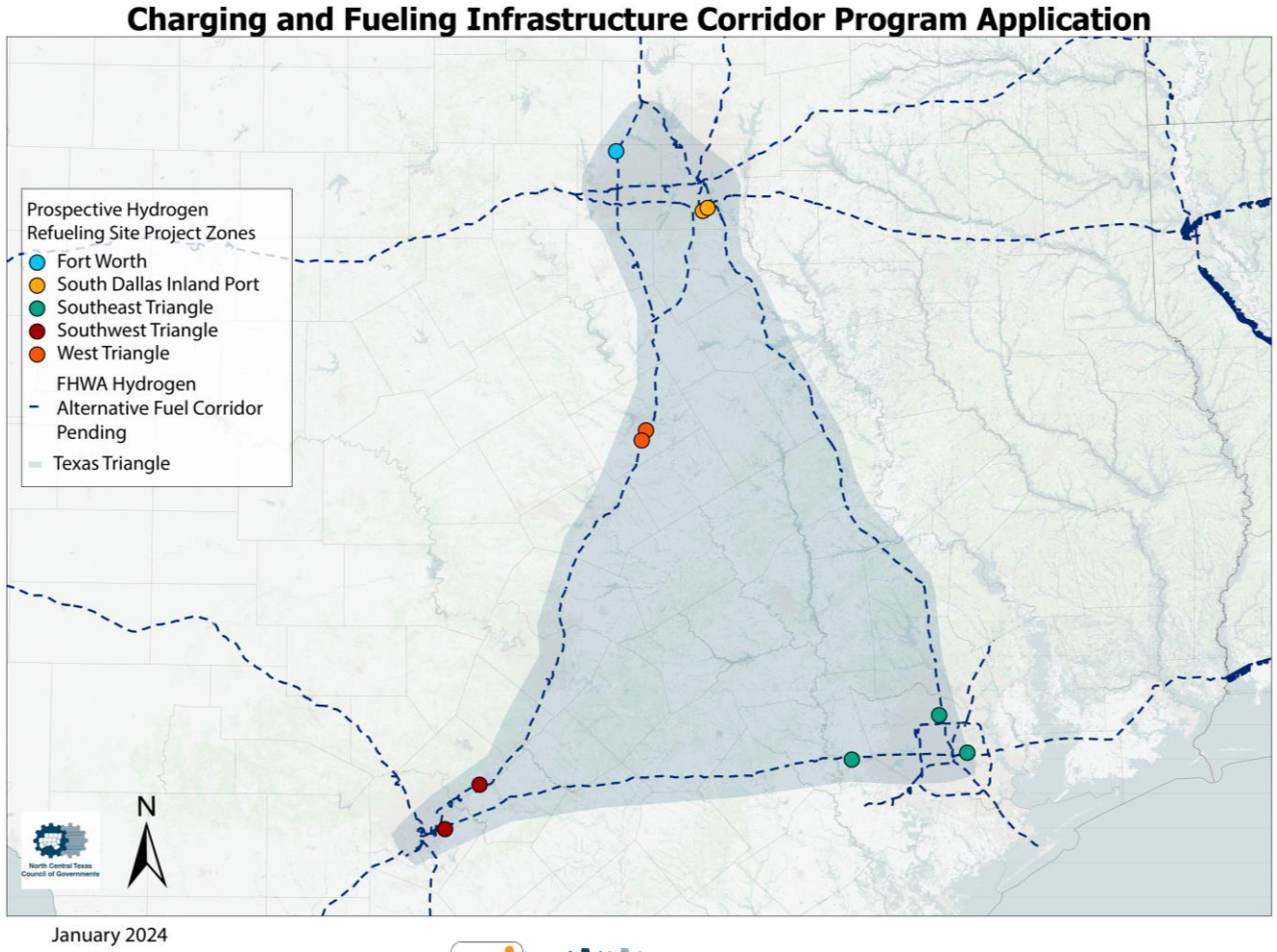
Charging & Fueling Infrastructure Corridor Program

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

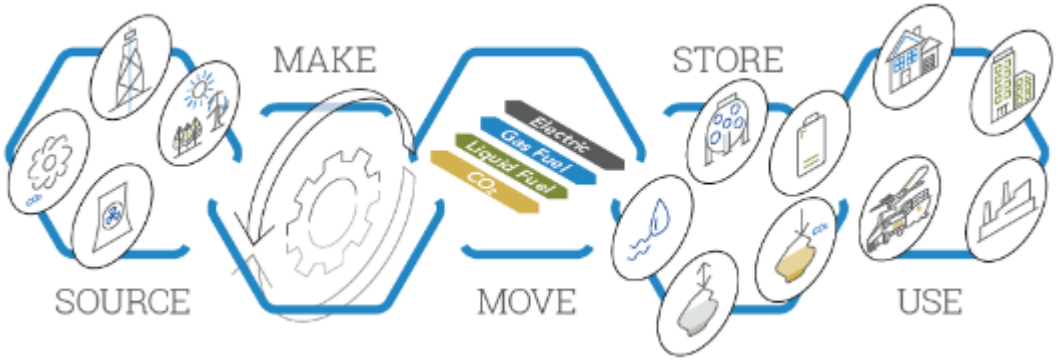
Construct 5 publicly accessible medium/heavy-duty hydrogen refueling stations

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

Awarded $70 million

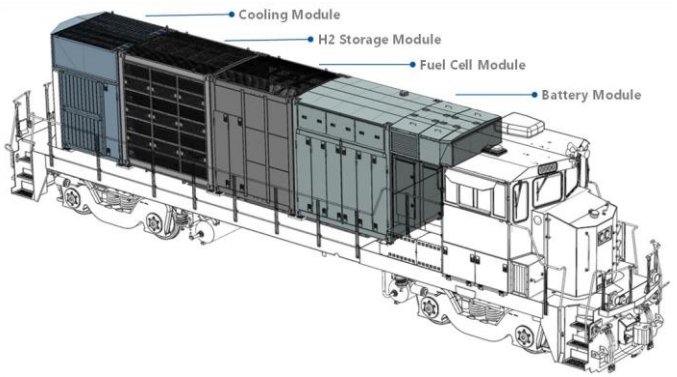


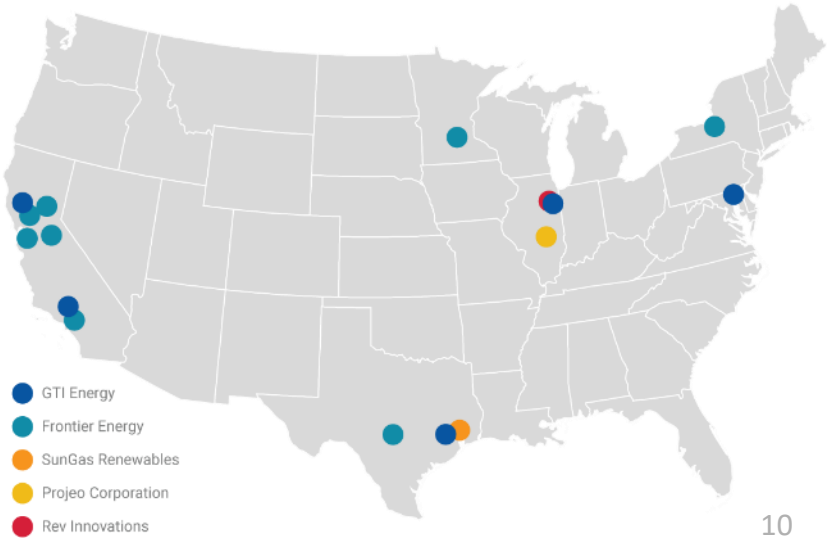
GTI Energy develops, scales and deploys solutions in the transition to low-carbon, low-cost energy systems



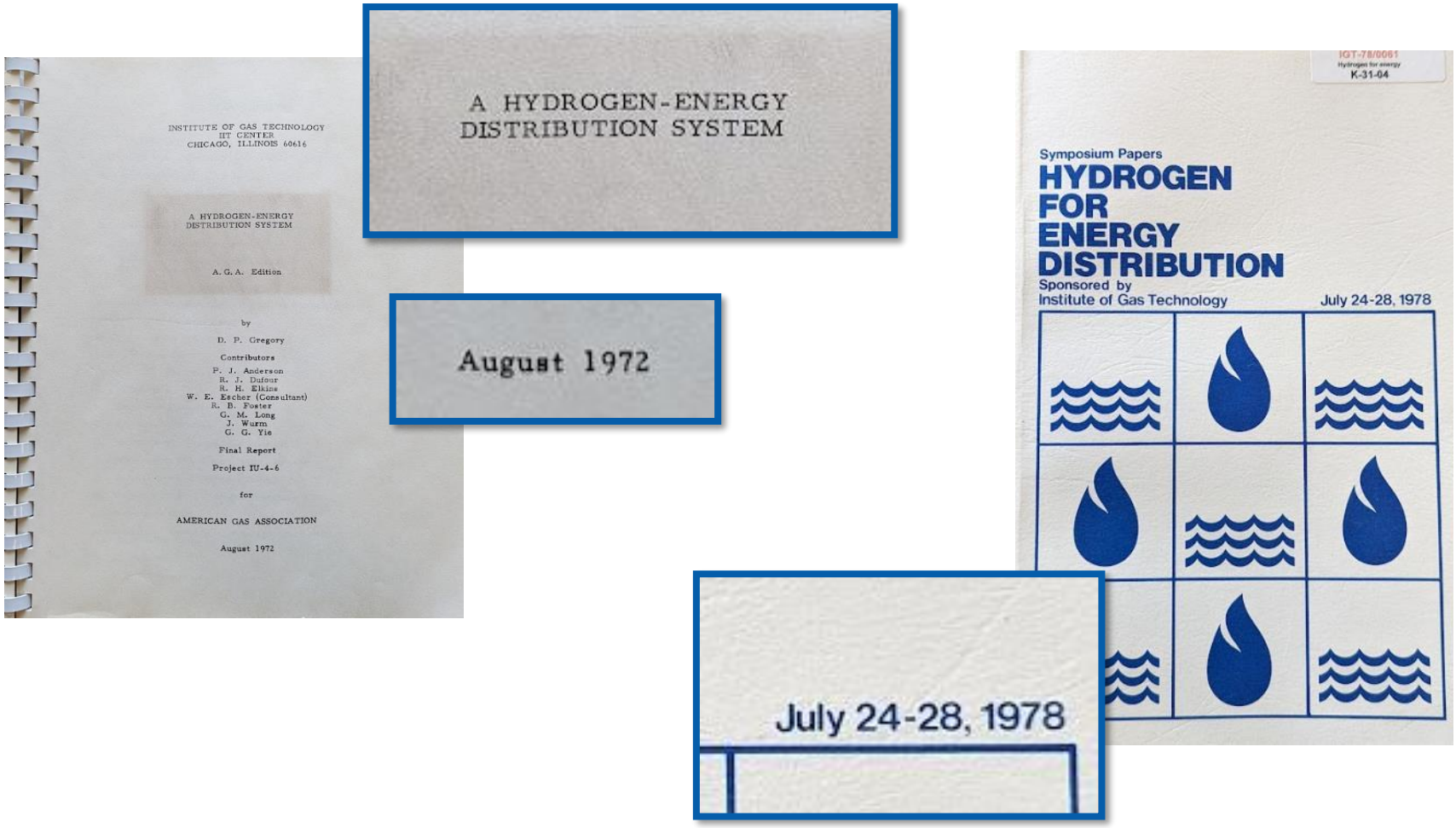
500 Enterprise Employees

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

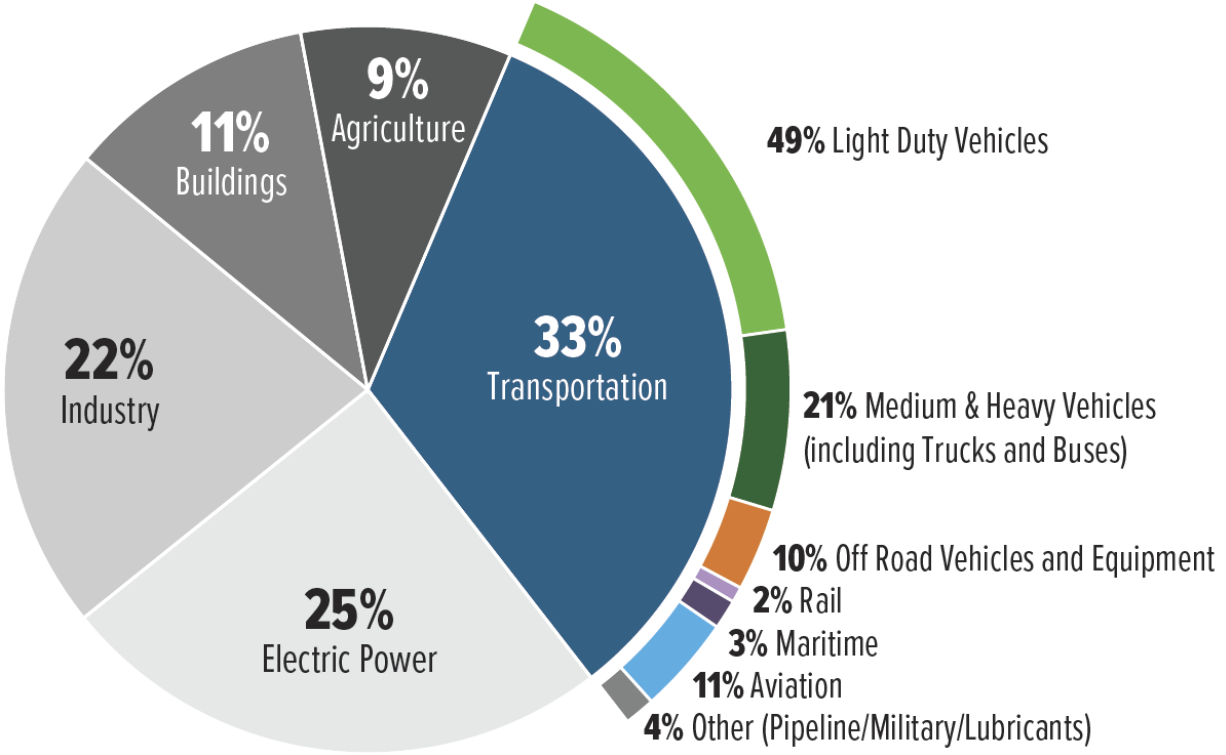




Decades of experience with Hydrogen



Decarbonization Will Not Be Simple

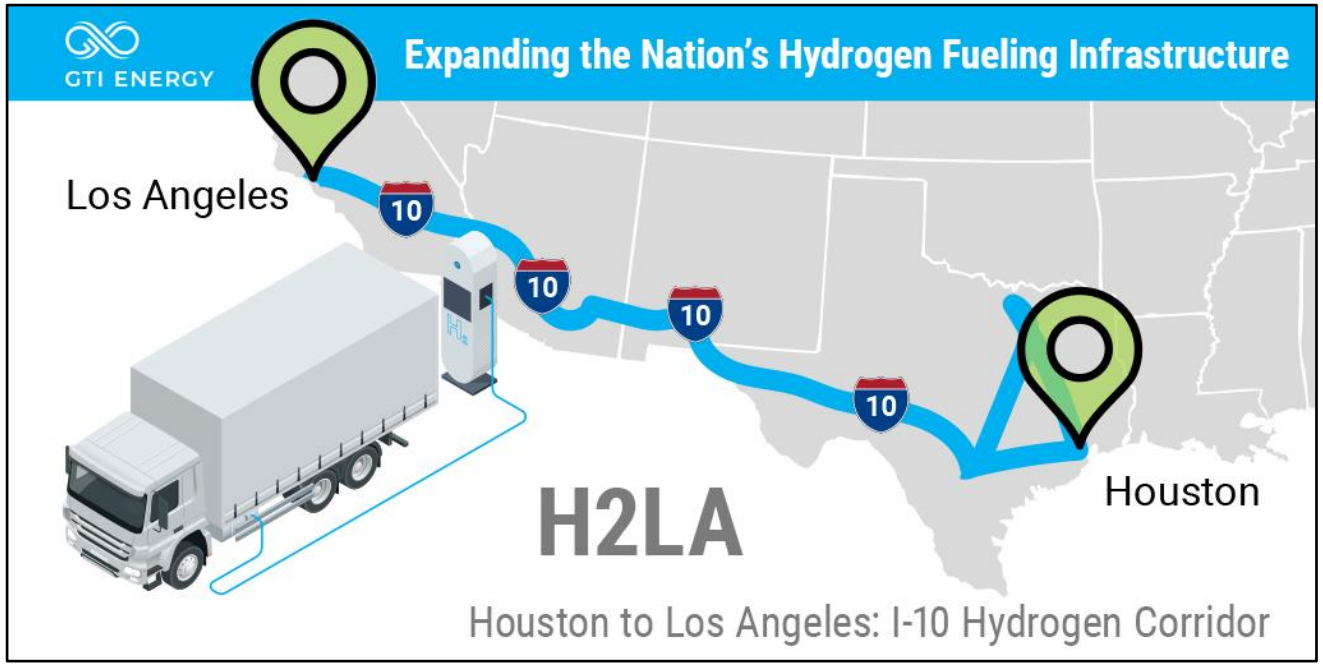


Total 2019 U.S. GHG emissions with transportation and mobile sources breakdown. Data derived from the EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks. 2019 used as a baseline since impacts due to COVID-19 complicate the use of later data.

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

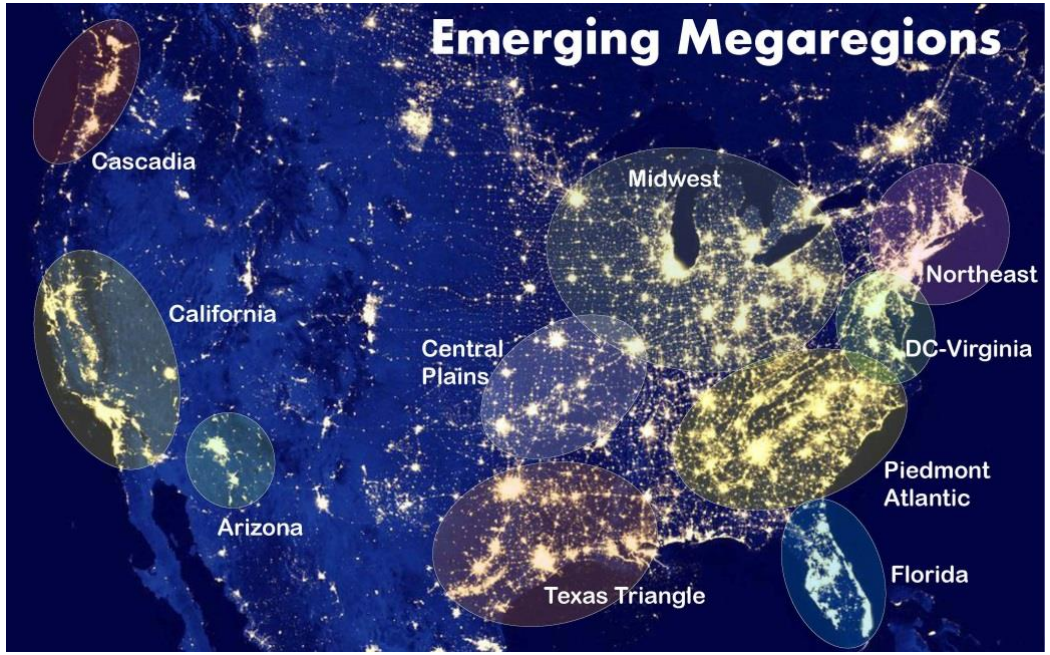


This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under the Vehicle Technologies Office (VTO) Fiscal Year 2022 Vehicle Technologies Office Program Wide Funding Opportunity Announcement Award Number DE-EE0010650.

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

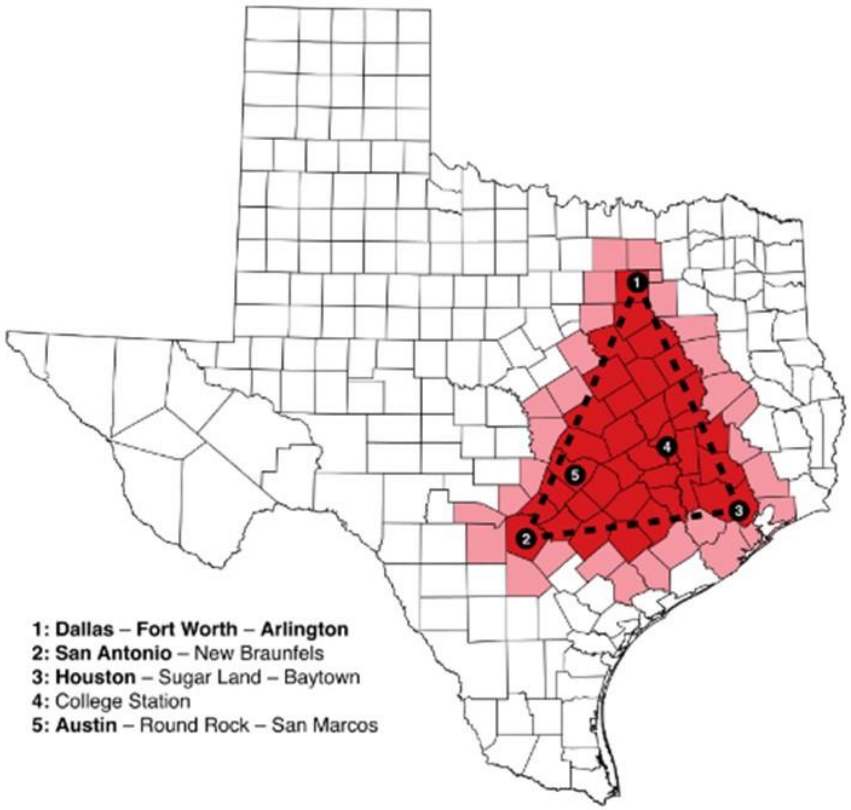


H2LA Project Team

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

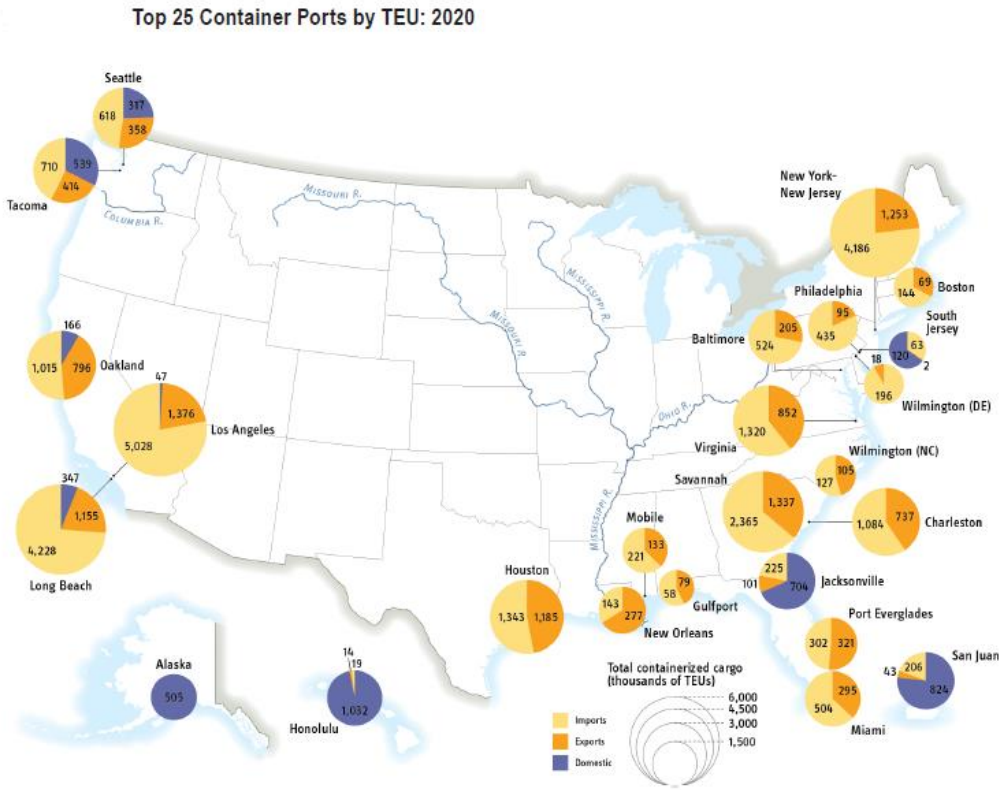
Texas Triangle Megaregion



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



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

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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

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Concerns and priorities for your community

- Presuming that freight deployment will stay within existing low-income areas
- How are we assuming the hydrogen will be created and how that effects project locations
- How to account for possibility of stranded assets

Public, Health and Safety topics

- What are safety implications when there are problems

Workforce needs, training, education needed to succeed?

- Ensure opportunities are easily accessible and integrated with existing communities

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