

H₂USA

H₂USA Growth

- ▶ In two years, H₂USA has grown to 45 full and associate members, including major automakers, states, national laboratories, industry groups, and others

Current Signatories on the Letter of Understanding



H₂USA Organization Chart



Goals

- ▶ Establishing necessary hydrogen infrastructure and leveraging multiple energy sources, including natural gas and renewables
- ▶ Deploying FCEVs across America
- ▶ Will result in...
 - *Improving America's energy and economic security*
 - *Significantly reducing greenhouse gas emissions*
 - *Developing domestic sources of clean energy and creating jobs in the United States*
 - *Validating new technologies and creating a strong domestic supply base in the clean energy sector*

Market Support and Acceleration Working Group Updates

- ▶ Held outreach events with Washington, D.C. groups
 - U.S. Conference of Mayors
 - U.S. Department of Transportation
 - America's Natural Gas Association
 - EV Everywhere
 - Clean Cities Coalition
- ▶ Representing H2USA at International Code Council meeting with PNNL and CaFCP
 - Focused on outreach to building officials within ICC on hydrogen fueling and safety training
- ▶ Developing next draft of H2USA Action Plan, delivered to working group chairs in August 2015
- ▶ Helping develop D.C. Hydrogen Refueling Capability
- ▶ Developing national first responders training resource

Locations Roadmap Working Group

Updates

- ▶ Working with CCAT to draft Northeast Regional Fuel Cell Vehicle Fleet Deployment Action Plan
 - ▶ Evaluating potential infrastructure deployment scenarios, including various locations, demand potential, and timeframes
 - ▶ Distributing to working group chairs
- ▶ NREL Collaborating on National Roadmap Document
 - ▶ Identified criteria for a successful initial market and for potential follow on market regions most suitable for FCEV adoption
 - ▶ Identified the top potential market regions and urban centers for their FCEV market readiness
- ▶ Reviewing H2USA Action Plan

Investment & Finance Working Group

Updates

- ▶ Analyzing AB8 Report from California
 - ▶ Adapting FCEV deployment projections
 - ▶ Encouraging further private investment
- ▶ Developing Hydrogen Fueling Financing Analysis Scenario Tool (H₂FAST)
- ▶ Developed the Business Case Scenario Tool (BCS) to identify lowest-cost scenarios for station development
- ▶ Conducting outreach to the investment community wall
 - ▶ • Wall Street Green Summit
 - ▶ • New York International Auto Show
 - ▶ • Renewable Energy Finance Forum - Wall Street
 - ▶ • Hydrogen Fuel Cell Refueling Investment Summit
 - ▶ • Los Angeles Auto Show

Hydrogen Fueling Station Working Group

Updates

- ▶ Providing updates on Sensitivity Analysis
 - Identifying cost effective stations to deploy(Reference Station Design efforts, modeling tools workshop, etc.), key station cost drivers
- ▶ Developing draft paper for component R&D
 - Analysis of component reliability based on real-world data
 - Requires further input regarding on-site reformers
- ▶ Facilitating station improvement and deployment through H2FIRST projects
 - Improving station operational reliability and maintenance
 - Analysis ongoing for contaminant detectors
- ▶ Facilitating station deployment via codes & standards updates and coordination
- ▶ Joint Regulations, Codes & Standards Task Force
 - Outreach to code adoption directors to facilitate adoption of NFPA 2

H₂First

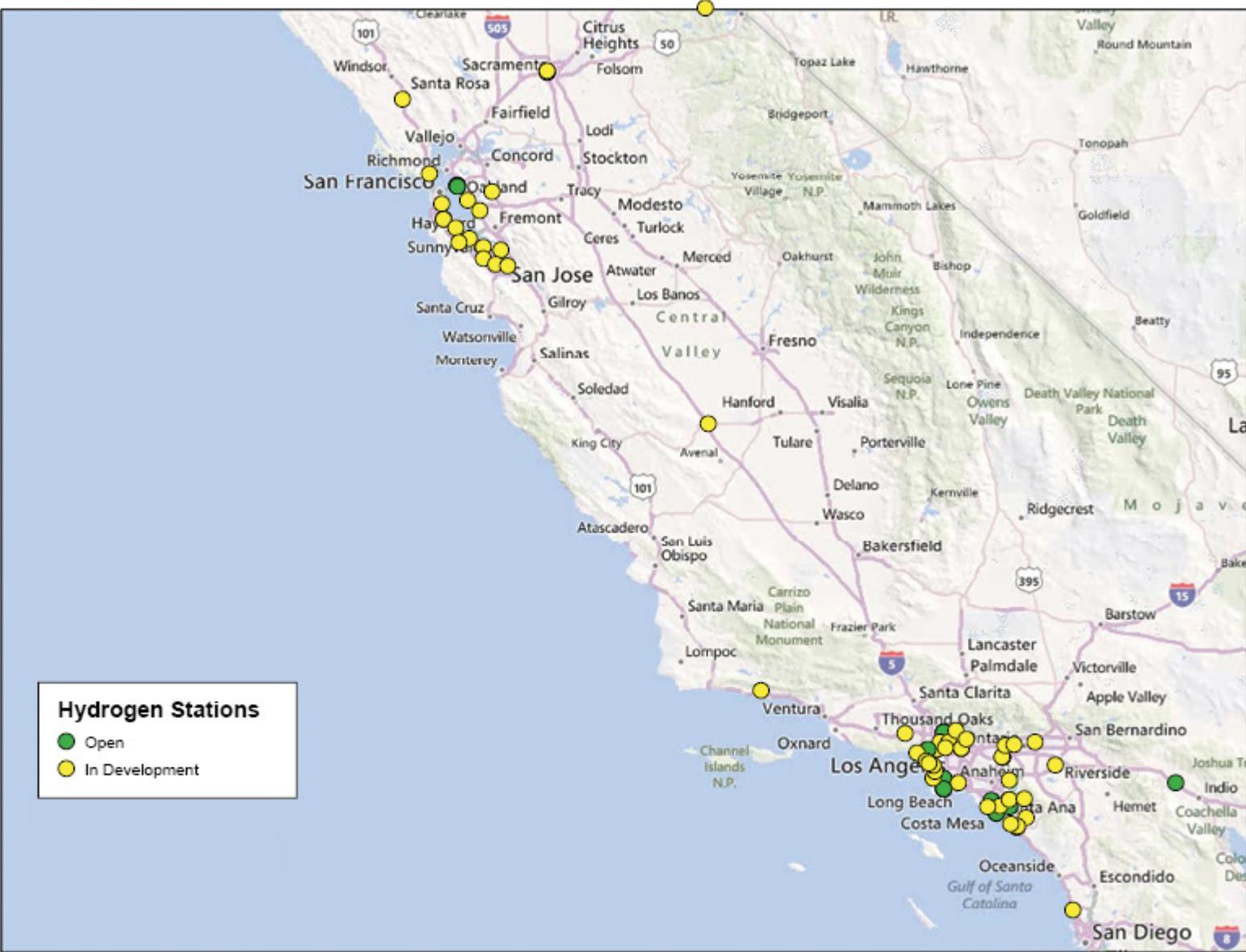
- ▶ Hydrogen Fueling Infrastructure Research and Station Technology (H₂FIRST) launched by the DOE Fuel Cell Technologies Office and National Labs
 - Addresses technology challenges associated with commercial hydrogen fueling stations
- ▶ Identifying low-cost, high performance materials
- ▶ Task teams addressing key challenges
 - Hydrogen contamination task team
 - Reference station design
 - Hydrogen station equipment performance

Hydrogen Infrastructure Progress

- ▶ As of August of 2015, 54 hydrogen fueling stations are either open, in the permitting process, or under construction in California*
- ▶ Funding has been committed for 100 hydrogen fueling stations through 2020
- ▶ Toyota and Air Liquide planning network of 12 hydrogen stations in northeastern United States

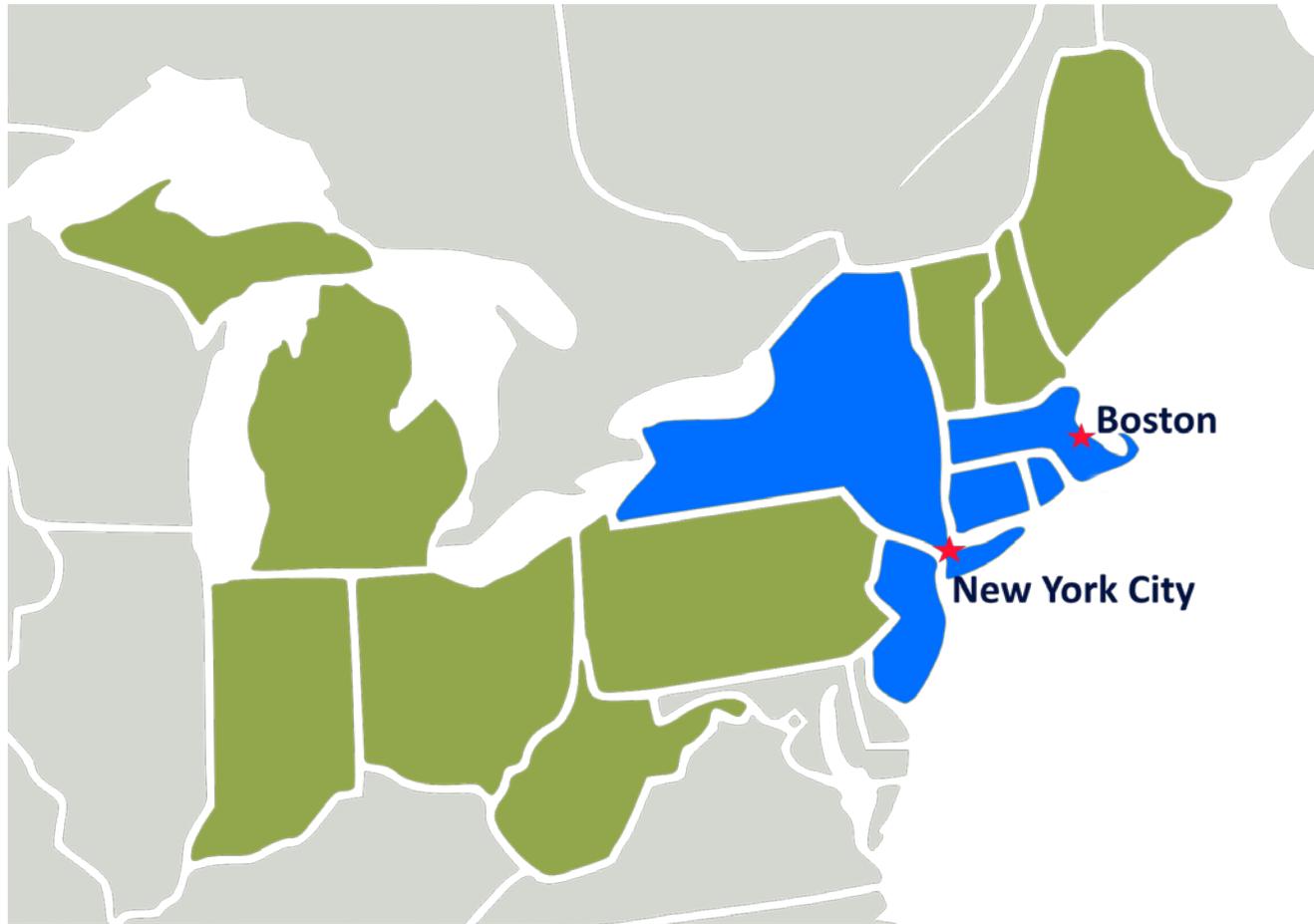
Source: CAFCP*

California H₂ Station Map



N.E. States H₂ Stations

New York, New Jersey, Connecticut, Rhode Island, and Massachusetts



FCEV Developments

- ▶ When H₂USA launched, there were zero publically available FCEVs available to purchase
- ▶ Hyundai Tucson Fuel Cell became available 2014
- ▶ Toyota to launch Mirai in 10/15
- ▶ Honda's FCEV will launch in 2016
- ▶ Several other automakers planning commercial FCEVs in next 2-5 years



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