



NOVEMBER 29, 2018
WORKSHOP
SACRAMENTO, CA

Public Workshop

Assessment of a Hydrogen
Station Verification
Requirement for Public
Hydrogen Stations

Workshop Goal and Agenda

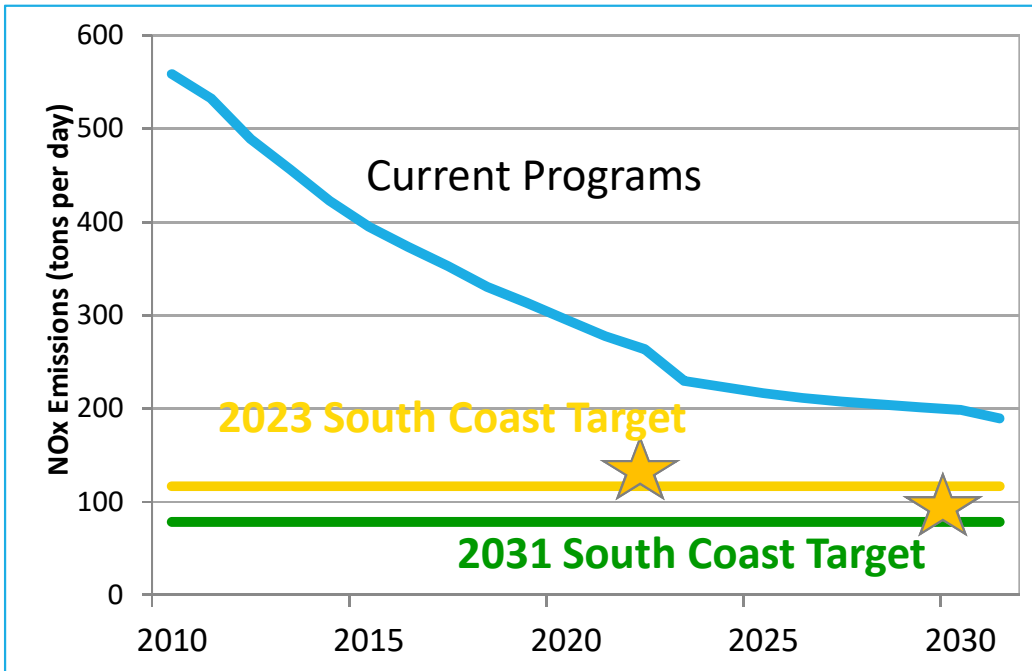
Goal: Stakeholder input on public light duty hydrogen fueling station verification requirements

- Background
- Existing regulations, codes and standards
- Current interim verification process
- Station verification scope, purpose and need
- Third-party testing
- Discussion
- Next Steps

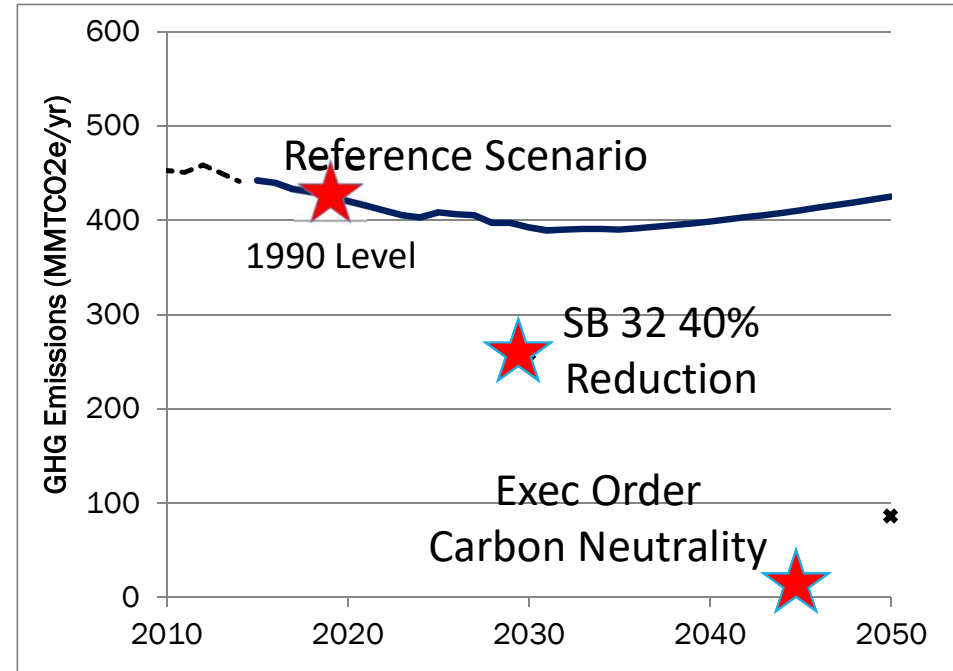
BACKGROUND

State has aggressive targets to meet for GHGs and criteria pollutants

NOx, South Coast, All Sources



GHGs, Statewide, All Sources



Governor Brown's Executive Order B-48-18

- Instructed California agencies to work towards a new hydrogen fueling infrastructure goal of 200 stations by 2025
- Set ZEV deployment goal of 5 million vehicles by 2030

ZEV Trajectories from Plans

CARB Mobile Source Strategy and Scoping Plan

- 4 to 5 million LDV ZEVs + PHEVs on road by 2030

CARB Sustainable Freight

- 100,000 ZEVs and pieces of equipment by 2030

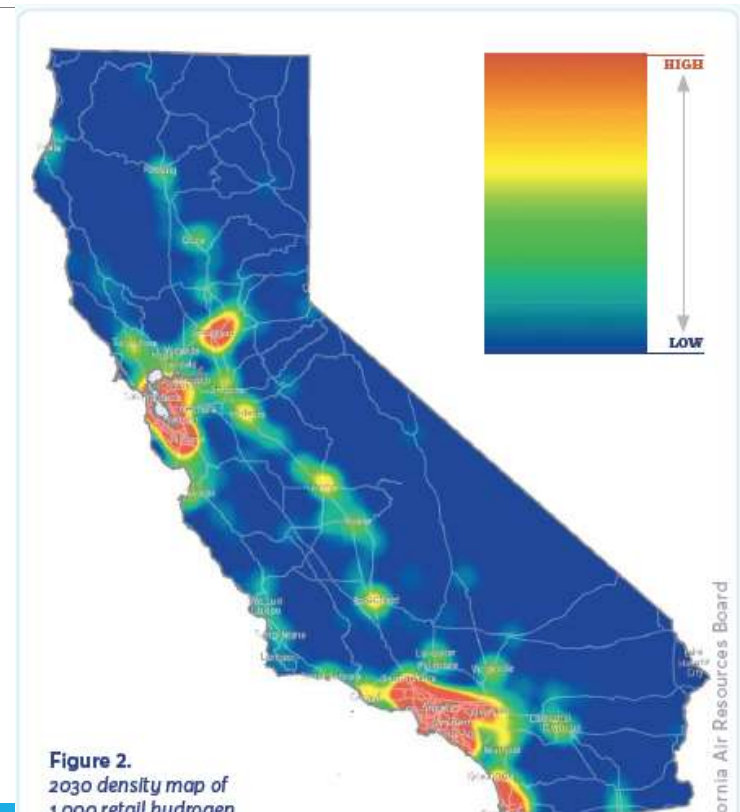
Governor's ZEV Action Plan: Key barriers to ZEV market

- Consumer awareness
- Vehicle costs

- **Fueling infrastructure available**

California Fuel Cell Partnership 2030 Vision

- 1,000,000 FCEVs
- Fueling network of **1,000** hydrogen stations



Stations Need to Roll-Out Quickly

- Clear requirements
- Stations that perform
- Testing that makes sense

Current Regulations, Codes & Standards

Regulations

- Fuel Quality
- Dispenser Accuracy
- Fueling Protocol

Code

- Station Safety
 - NFPA 2

Key Standards

- Fueling Protocol
 - SAE J2601
- Fueling Protocol Field Test
 - ANSI/CSA HGV 4.3
- Station Design
 - CSA HGV 4.9

Why should CARB regulate station fueling?

- NFPA 2 covers core safety elements of fueling
- Industry would still pursue SAE J2601 listing
- Why not leave room for alternative protocols so long as fueling is safe?

CURRENT INTERIM VERIFICATION PROCESS

Hydrogen Station Equipment Performance (HyStEP) Device



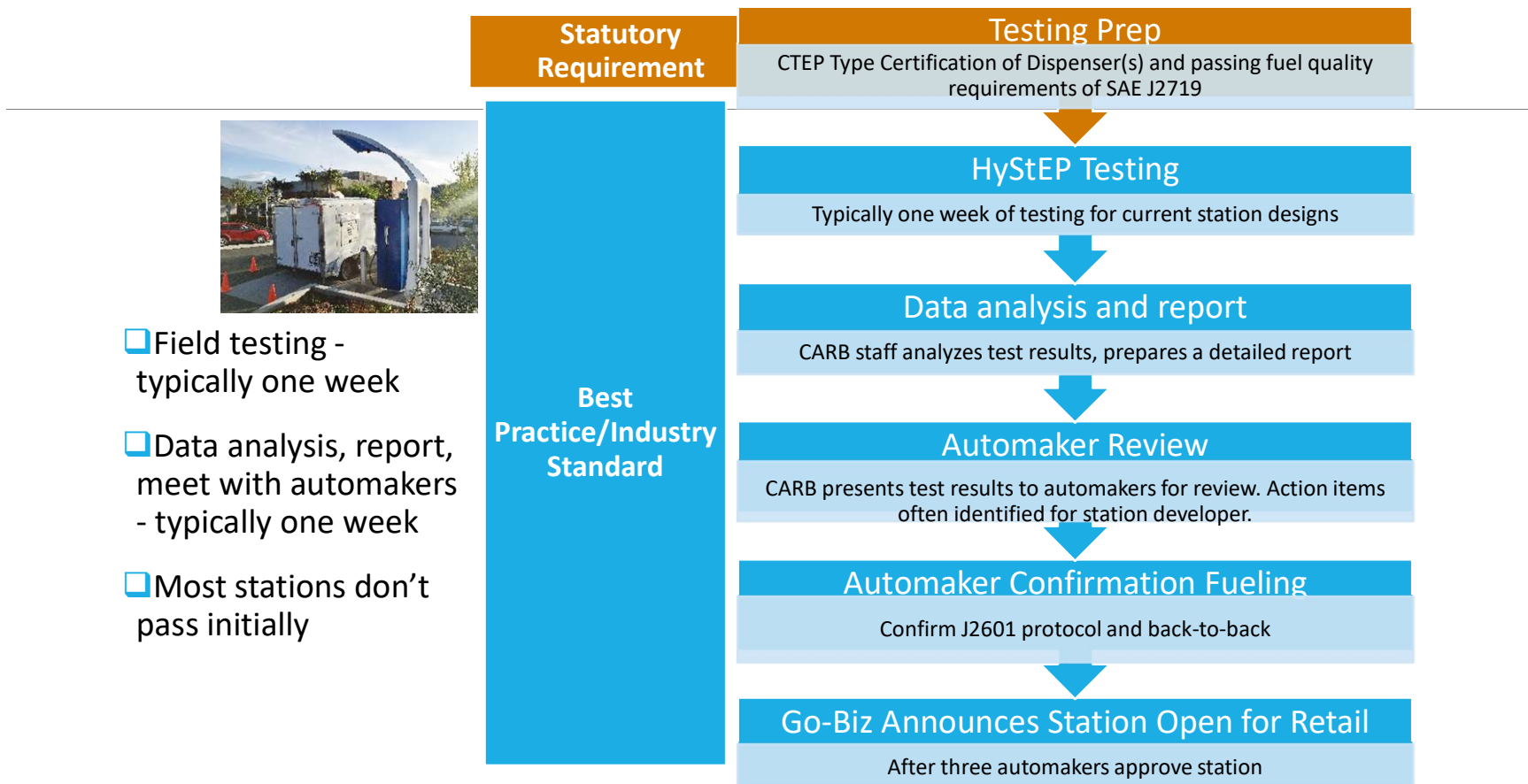
H2FIRST Identified station fueling verification (CSA HGV 4.3) as a key priority

For CARB, HyStEP purpose has been:

- Help vehicle providers verify stations
- Help validate SAE J2601 & HGV 4.3
- Regulatory fact finding



How are stations currently verified?



Issues with current process?

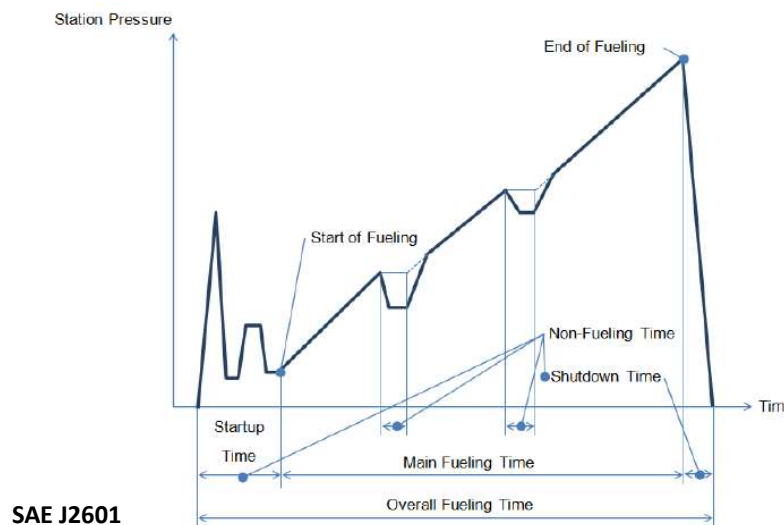
- Discretionary approval by automakers
- CARB testing involvement not formalized
- Time consuming & exclusively field based

STATION VERIFICATION POTENTIAL SCOPE & OUTCOMES

Potential Core Scope

Public light duty stations

- What - SAE fueling protocol requirement
- How - verification & compliance testing
- Who – CARB or third-party verification



Standard Designation		H35		H70	
Storage Capacity Classification		Small Capacity (e.g. Motorcycle) (< 1.2 kg)	Light Duty (1.2 - 6.0 kg)	Small Capacity (e.g. Motorcycle) (< 2.0 kg)	Light Duty (2.0 - 10.0 kg)
SAE J2601 Fueling Protocols	T40	Not Included	Included	Not Included	Included
	T30				
	T20				
	T10				
Station Dispenser Type Category	T_Ambient				

Potential Secondary Scope

Public light duty stations

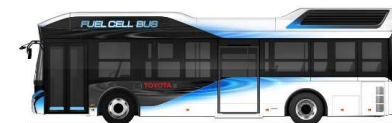
- Station capacity (daily, hourly)
- Back-to-back fueling performance

Additional Scope to Consider

- SAE fueling protocols developmental for heavy duty transit buses, vehicles, and industrial trucks
- Ambient fueling
- Liquid fueling



Plug Power



Toyota



Nikola

Potential Outcomes of Station Verification Regulation

BENEFITS

- ✓ Consumer satisfaction
- ✓ Uniform fueling performance
- ✓ Reduced discretionary burden for automakers
- ✓ Reduced risk & uncertainty for station developers
- ✓ Incentivizes station preparedness
- ✓ Control of who verifies
- ✓ Additional?

DRAWBACKS

- ❖ Locked into specific J2601 version until regulatory update
- ❖ Additional cost to the State and potentially to station developers
- ❖ Could reduce innovation

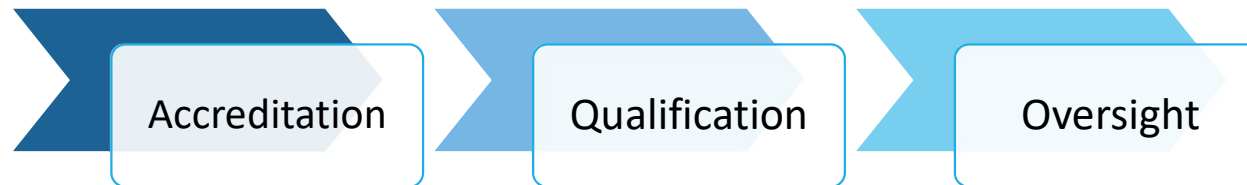
THIRD PARTY VERIFICATION

Third Parties – why?

- Station construction rate expected to increase rapidly
- Large CARB testing program needed without third parties
- Interested in verification market
- Can do factory certifications

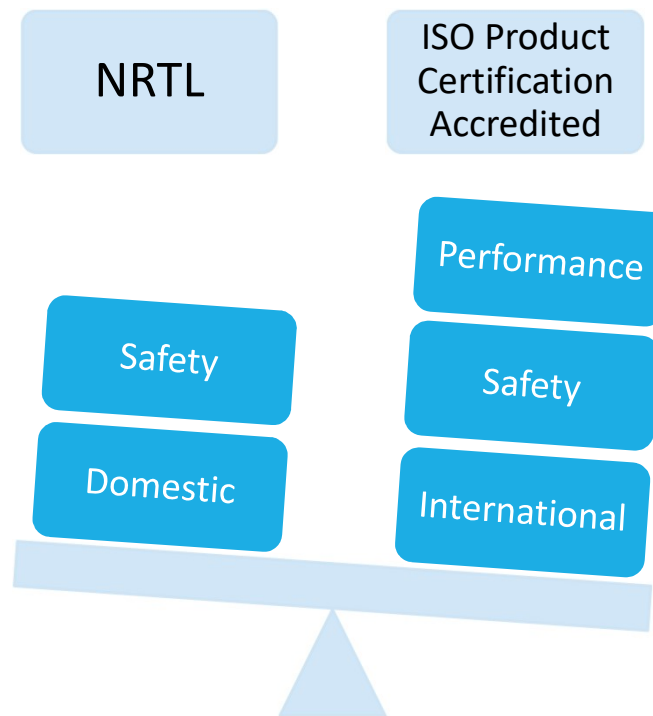
Third Parties – How?

Important Considerations



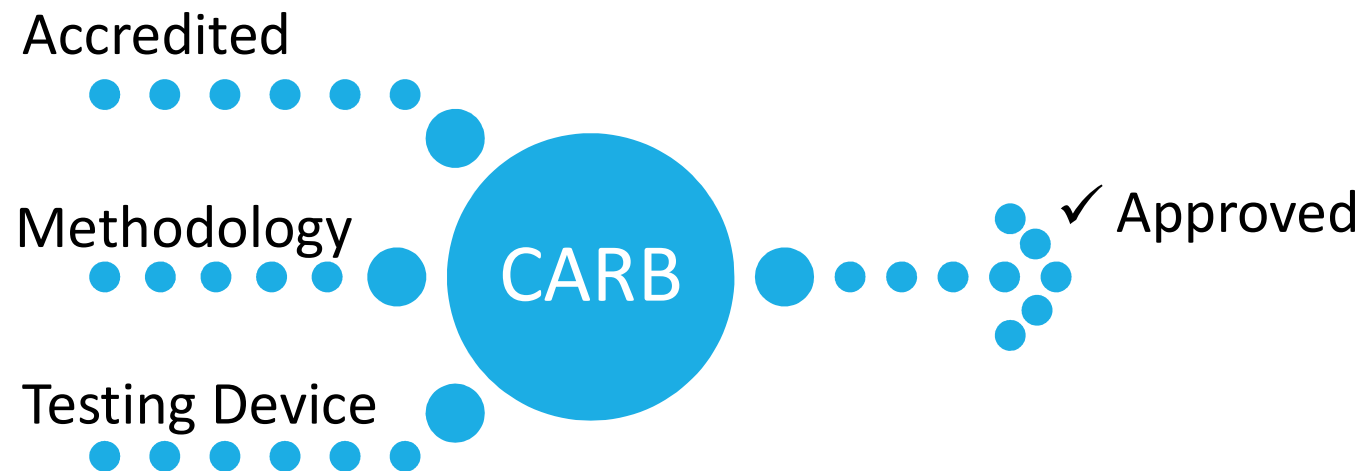
Third Parties

Accreditation



Third Parties

Qualifications – CARB approval may be needed



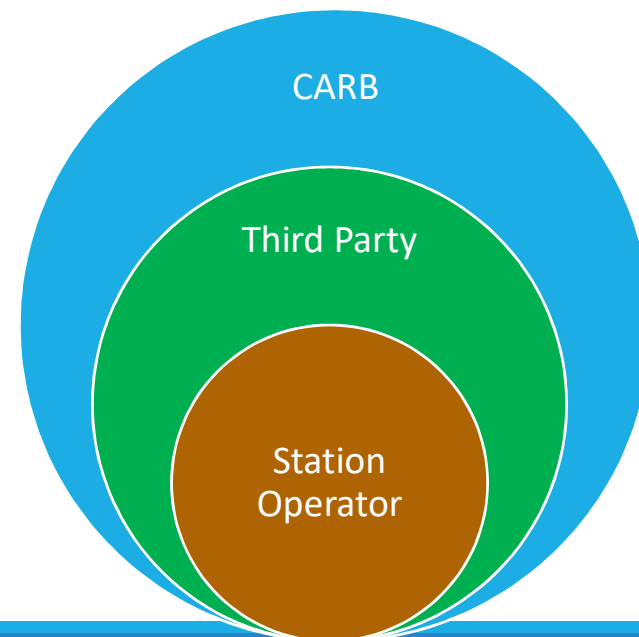
Third Parties - Hierarchy

Oversight

- CARB oversees third parties
- Third parties oversee station operators

Compliance, Enforcement

- CARB compliance check capability
- CARB enforcement capability



Comments

There is no formal comment period for this workshop

- Comments welcome throughout preliminary process
- Welcome input from individuals and groups



THANK YOU!

Questions

- What accreditation should third parties have? Why?
- What level of oversight over third parties?
- What is core scope of station verification?
- How does compliance testing fit into station verification?
- Do third parties have experience with in-use compliance testing?
- What would station verification look like without CARB regulation?
- Should CARB approve third parties, or just require accreditation?