GOLD COAST TRANSIT DISTRICT

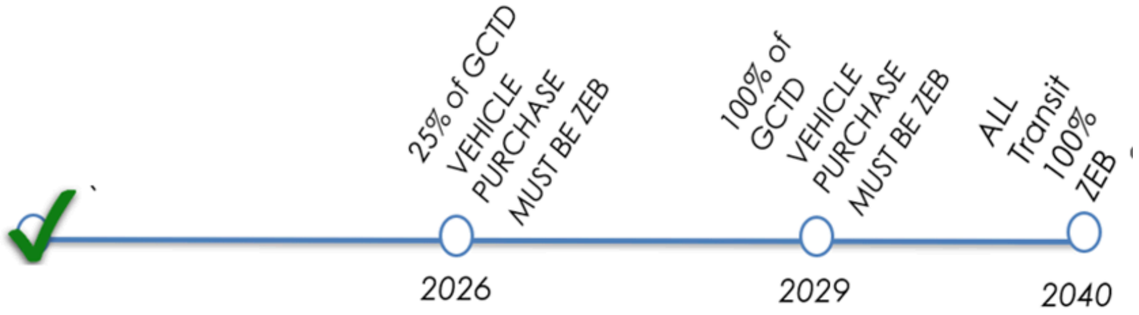
OJAI
OXNARD
PORT HUENEME
VENTURA
COUNTY OF VENTURA

November 6, 2024

GCTD Hydrogen Fueling Station Update

CARB's "ICT" RULE & WHAT IT MEANS?

- In 2018, California Air Resources Board (CARB) adopted "Innovative Clean Transit" Rule (ICT).
- GOAL: Transition to Zero Emissions by 2040.
- 2026: ICT regulation states 25% of all buses purchased by GCTD must be zero-emission.
- 2029: All purchases must be 100% zero-emissions for small transit agencies (fewer than 100 buses).
- 2040: All transit agencies transition to <u>100% zero-emissions</u> fleets.



ZERO EMISSIONS PLANNING

HIGHLIGHTS

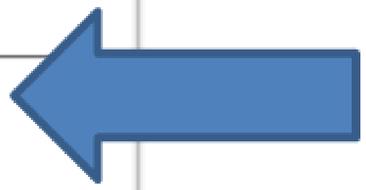
GCTD Zero Emissions Transition Planning

- 2018 - Board adopted a “Zero/Near Zero Emissions Policy”
- 2019 - CARB Adopted Innovative Clean Transit (ICT) rule requiring agencies set a goal of zero emissions fleets by 2040
- 2019/2020 - GCTD completed “near zero” engine replacements
- 2020 - Purchased 9 electric sedans (relief cars)
- 2022 - FTA Grant $12,100,000 (Hydrogen Station, 5 Buses, Workforce Development)
- 2022 - Zero-Emission Rollout Plan Complete
- 2023 – Hydrogen Fueling Station Project Kick-Off
- 2024 - Hydrogen Station Design Build Contract Award

ZERO emissions

FUEL TECHNOLOGY COMPARISON
Summary for GCTD Fleet

Trade-Off	Fleet Concept A (BEB concept)	Fleet Concept B (FCEB concept)
Scheduling and planning	★★☆	★★★
Operations and dispatching	★★☆	★★☆
Training and agencywide adoption	★★☆	★★★
Technology availability/ OEMs/ procurement	★★☆	★★☆
Depot infrastructure	★★☆	★★☆
Other infrastructure	★☆☆	★★★
Other	★★☆	★★★
Overall best fit	★★☆	★★★



FUEL TECHNOLOGY COMPARISON
Best Overall Fit for Gold Coast Transit Fleet

BEB Stantec **HFCB**

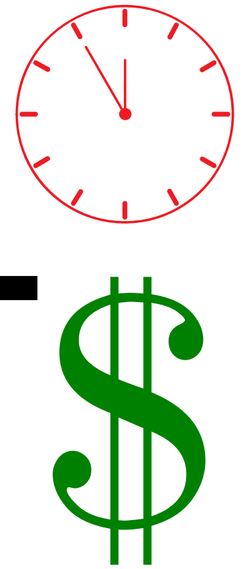
★★☆ ★★★

300-340 miles
Proven range
(300 to 340 miles, with advanced fueling technology that can extend this range by almost double)

Significant reduction in vehicle weight
and vehicle axle weight to maximize passenger loads

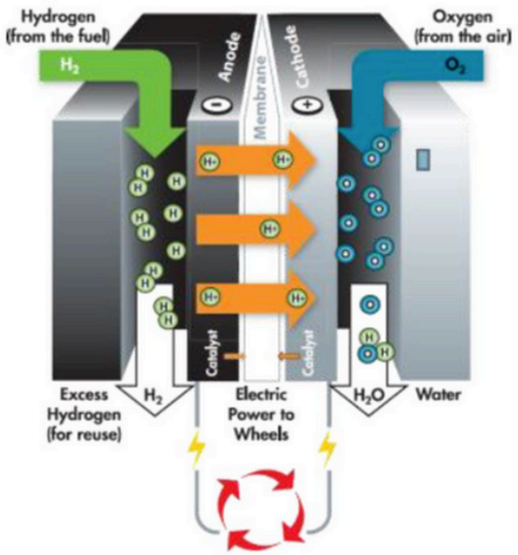
Fast refueling speeds
comparable to conventional diesel and CNG buses

1:1 replacement of conventional buses
enabling full flexibility for route planning and operations



HYDROGEN

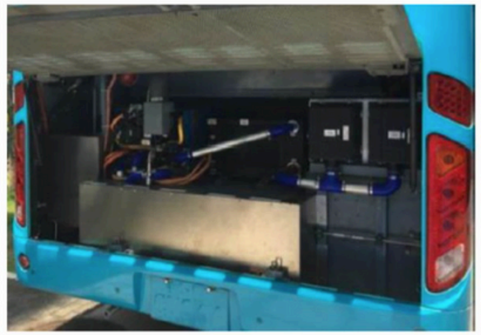
FUNDAMENTALS



Unit Cell:

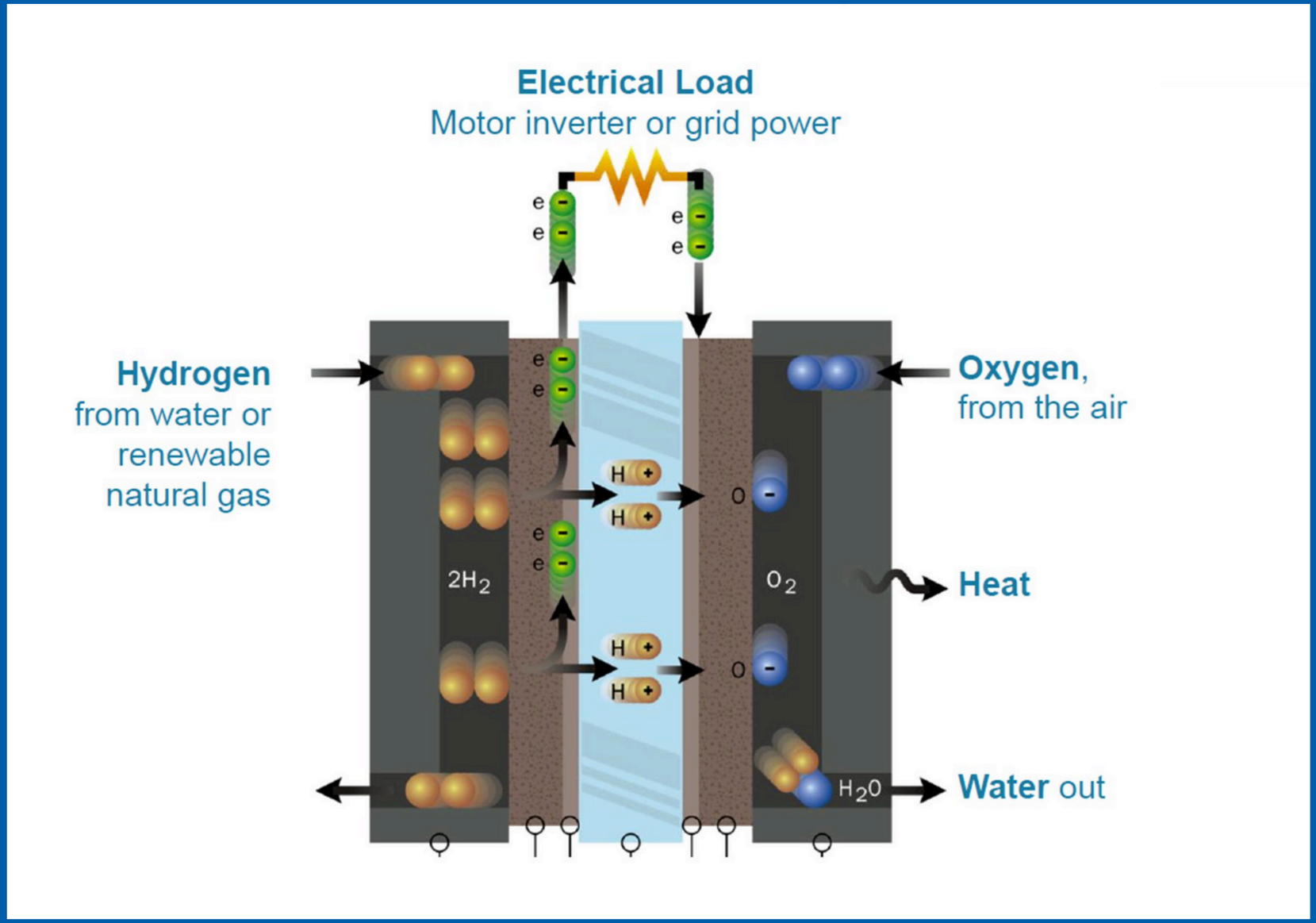
Flow Plate/ MEA/
Flow Plate

Fuel Cell Stack



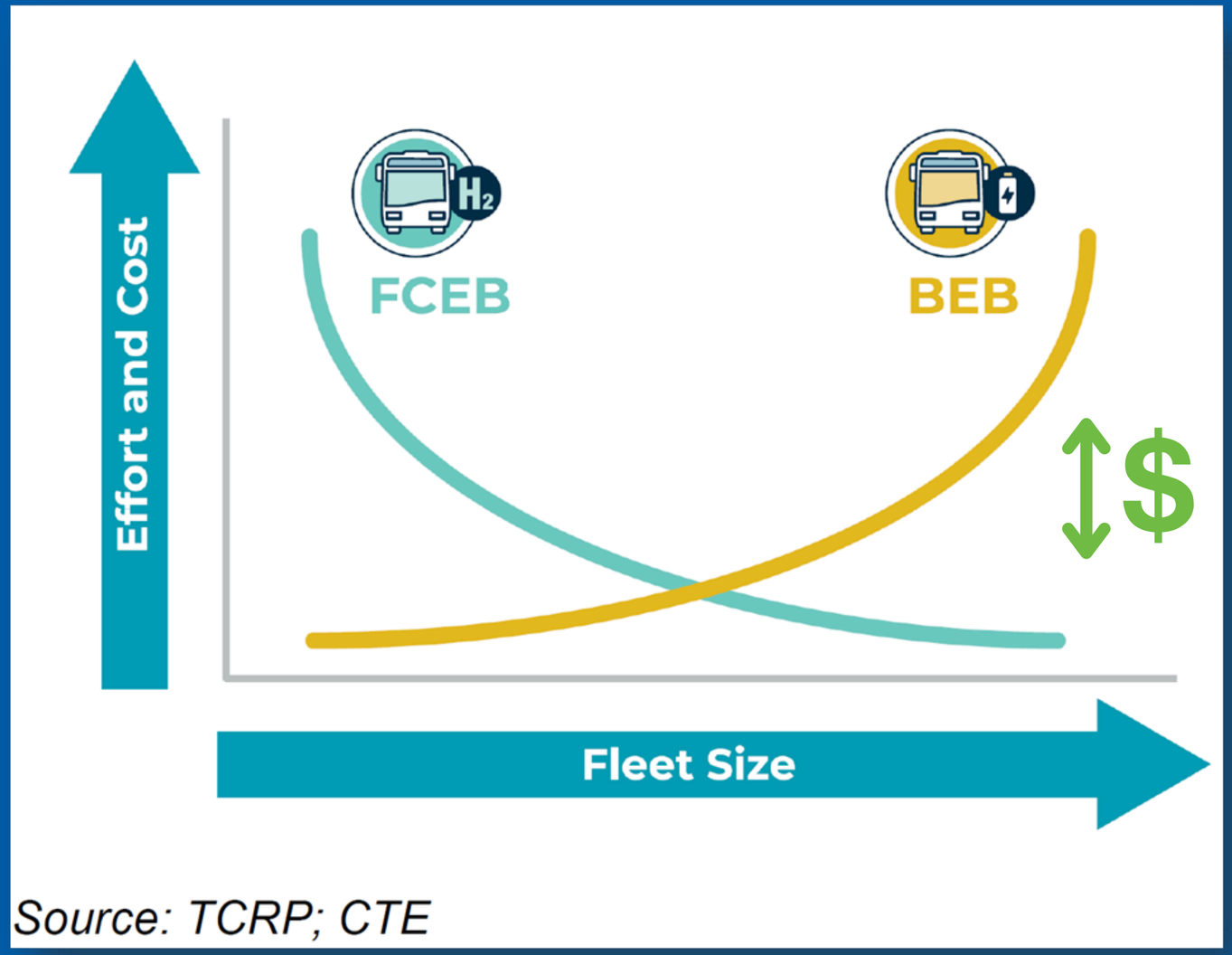
HYDROGEN

FUNDAMENTALS



ZEB TECHNOLOGY

HYDROGEN vs ELECTRIC



Source: TCRP; CTE

PARTNERSHIP BUILDING

GOLDCOAST TRANSIT — cte — NEW FLYER

In July of 2022, GCTD partnered with the Center of Transportation and the Environment and bus manufacturer New Flyer on the application for the Low or No Emission Grant Program and were successfully awarded $12.1 Million.

GCTD plans to leverage other funding for a total estimated project cost of over $16 million.

HYDROGEN STATION PROJECT

FUNDING

FTA Low-No Grant Includes:

- Hydrogen Fueling Station Design and Build
- 5 Hydrogen Fuel Cell Buses
- Workforce Training
- Facility Upgrades

TRANSIT TESTIMONY

GCTD is receiving real time data from transit agencies leading the U.S in Hydrogen Full Cell roll-outs. Lessons learned from these deployments will help ensure a successful GCTD roll out.

BALLARD

GET Selected 100% FCEBs in their ZEB Rollout Plan

"The final composition of the fixed route fleet will be **100% fuel cell electric buses**. Modelling analysis found that a small percentage of the routes currently operated by GET could be satisfied by battery electric buses as a 1:1 BEB:CNG bus replacement. However, **operating one type of vehicle offers significant benefits** to the agency as all buses can be operated and maintained efficiently and economically. It also means the **buses are interchangeable and can be dispatched on any route as required**."

Golden Empire Transit District

GET bus
GOLDEN EMPIRE TRANSIT DISTRICT

Zero Emission Bus Rollout Plan

BALLARD

Sunline Transit fleet will be zero emission by 2035 with 85% fuel cell buses

Sunline transit has been operating fuel cell buses since 2000. It now operates 16 hydrogen buses in one the hottest region of the US

The final fleet composition – 67 fixed route fuel cell buses, 18 fixed route battery-electric buses and 39 paratransit fuel cell vehicles – was determined to maximize performance and **minimize cost**

Sunline ZEB roll out plan 2020

SunLine TRANSIT AGENCY

BALLARD

OCTA plans to transition 100% of its 500+ buses to fuel cell vehicles

"The 100 percent FCEBs scenario showed a slightly **lower overall cost** than the mixed technology fleet given current vehicle, fuel, and support infrastructure pricing. …FCEBs offer an **extended range and better match to OCTA's current operating parameters**. In comparison, the current range of BEBs may require more vehicles and drivers to meet similar service levels."

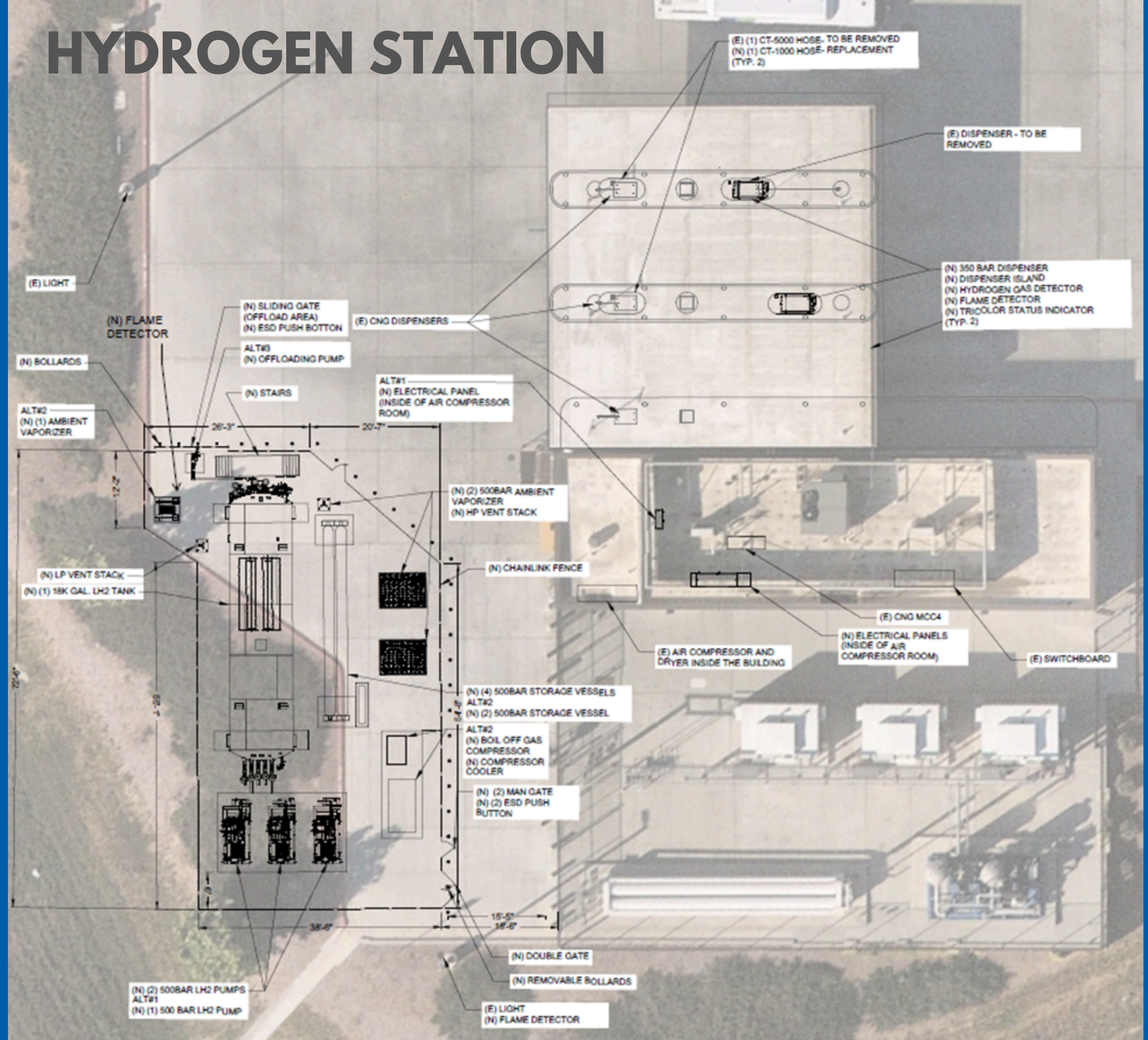
OCTA Zero Emission Bus Rollout Plan
Orange County Transportation Authority

OCTA

AC TRANSIT

Foothill Transit

HYDROGEN STATION



HYDROGEN STATION PROJECT

SITE

CHALLENGES

A review of challenges ahead:

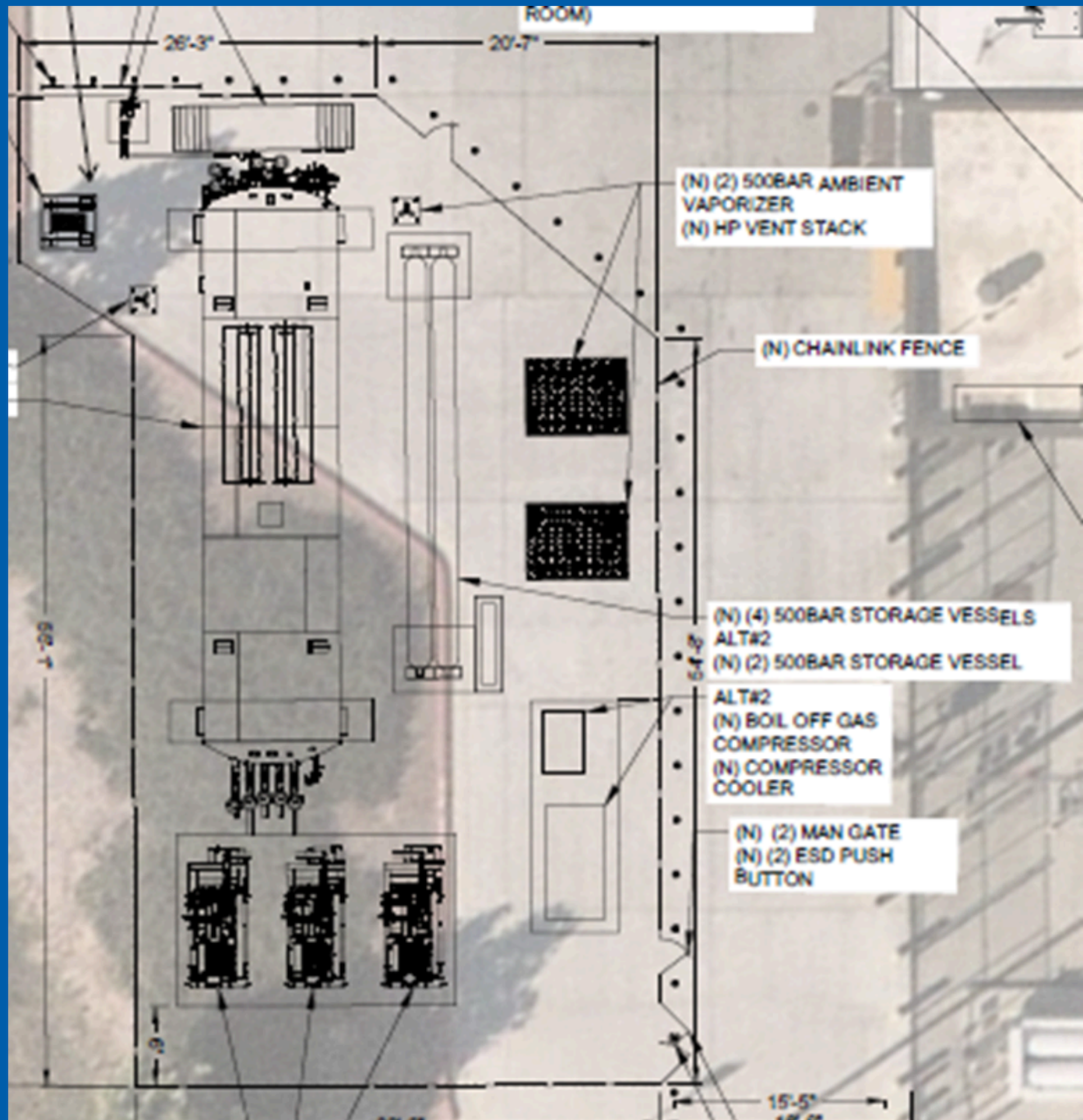
- Boil-Off of Hydrogen
- High Cost of Buses
- Ongoing Facility and Bus Maintenance
- Consistent Supply of Green Hydrogen

SOLUTION FOR:

BOIL - OFF

B.O.G Compressor

- Captures, compresses and stores hydrogen that would otherwise be lost
- Has the potential to save 20-30% in fuel costs
- Up-front cost of this compressor is $969,640
- Recoup cost in 4-6 years, depending on the size of the fleet



SOLUTION FOR:

HIGH COST OF HFC BUSES

Pursue additional grant funding - get creative

- FTA's Low-No Bus Emissions Grant for Bus Purchase ($6.4 Million)
- California's Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) (Approx. $240k per bus purchase)
- Volkswagen (VW) Environmental Mitigation Trust Funds (Amount TBD)

Federal Transit Administration

CALIFORNIA HVIP

California VW Mitigation Trust

SOLUTION FOR:

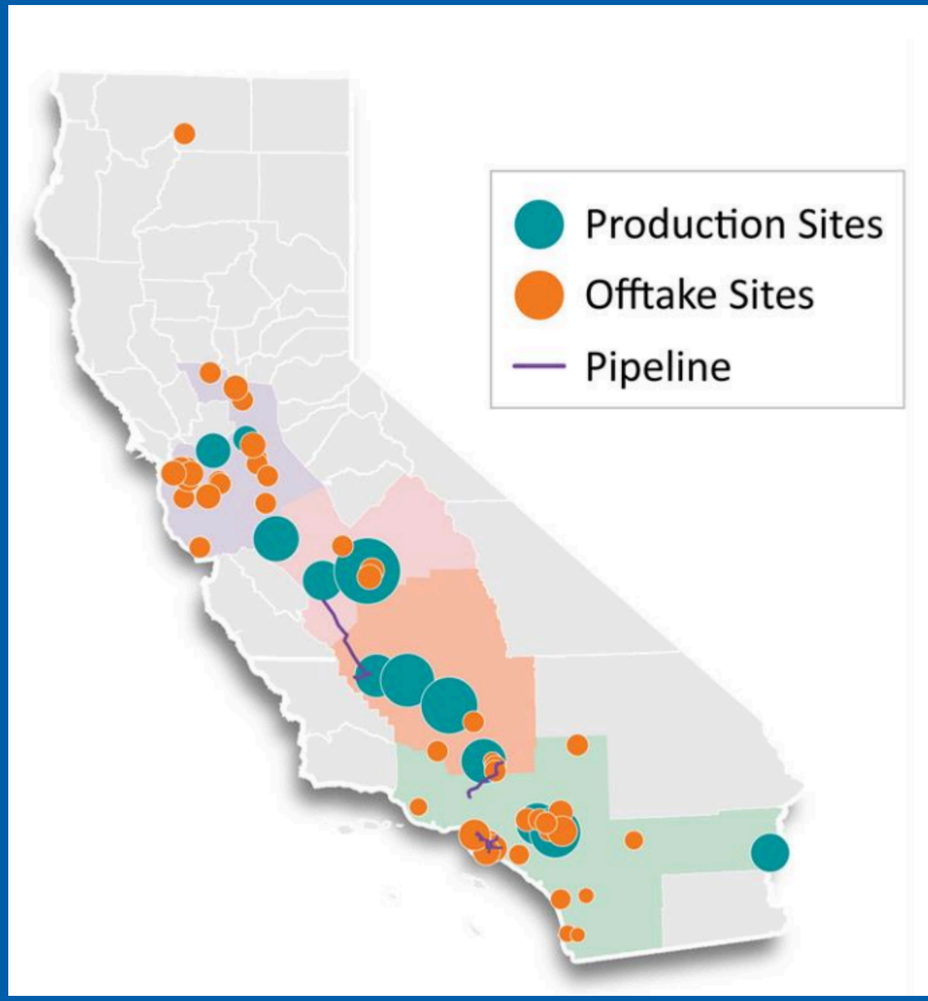
FACILITY/BUS MAINTENANCE

- Station training provided by station contractor
- Bus training provided by New Flyer
- Training funds from Low-No Grant for additional workforce training and a regional training consortium

SOLUTION FOR:

CONSISTENT SUPPLY OF GREEN HYDROGEN

- Joined the Department of Energy (D.O.E) CA Hydrogen Hub Through the Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES)
- 1 of 7 national hubs awarded by D.O.E.
- Gold Coast Transit District is one of 13 California transit agencies that have entered into a ground floor agreement for a future, steady supply of affordable green hydrogen

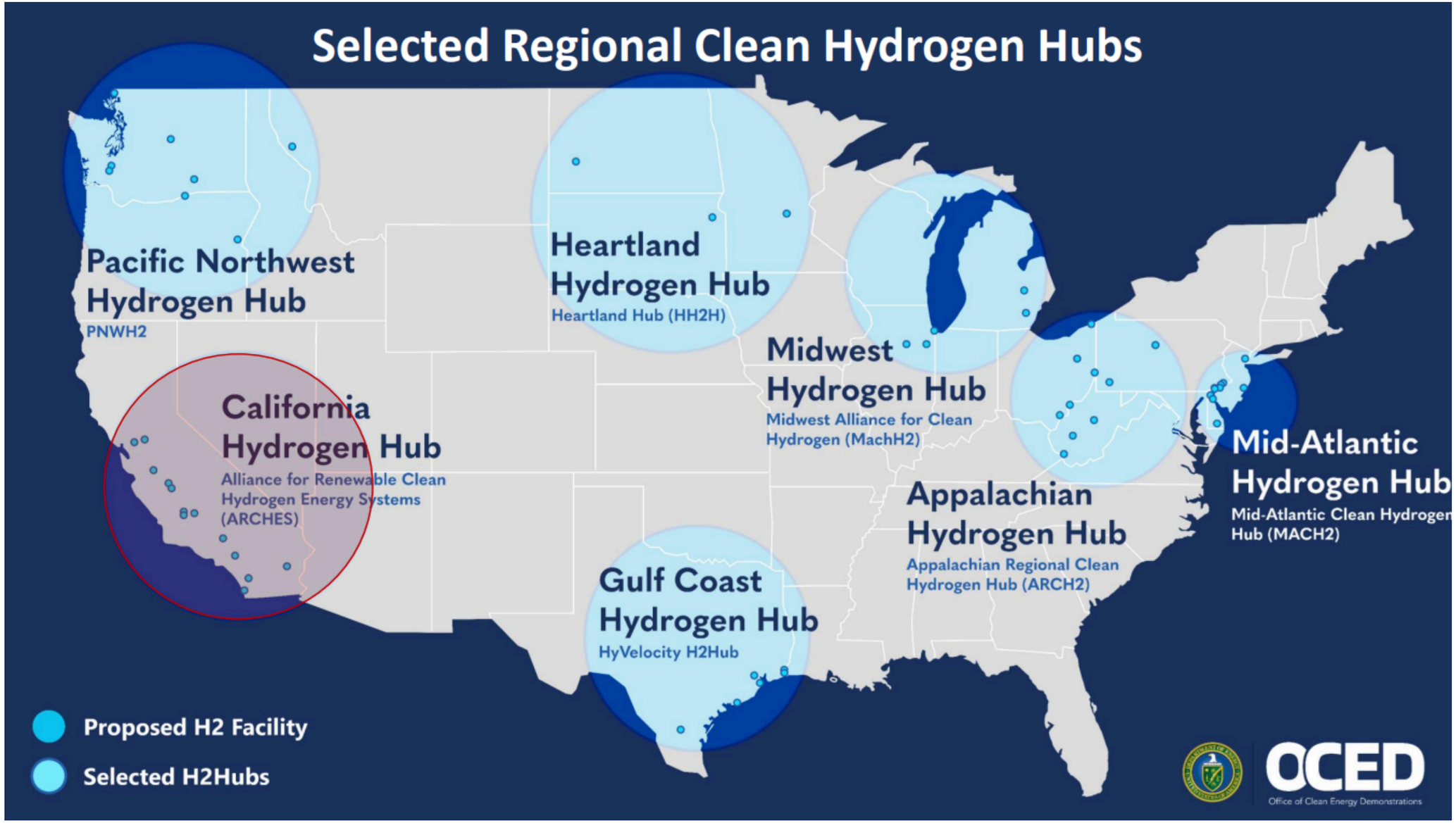


Alliance for Renewable Clean Hydrogen Energy Systems

ARCHES Working Group Sign-Up

Thank you for signing up for ARCHES' working groups. You will be added to the rosters of the working groups you selected and invited to the next meeting of each working group. Meeting cadence varies from weekly to monthly.

REGIONAL CLEAN HYDROGEN HUBS



MOVING FORWARD

COSTS

- Station Design, Build, Maintenance Service (5 years)
  $9,380,340
- Optional Item, Boil Off Recovery System
  $969,640
- Additional 5% to Cover Contingencies
  $517,499
- Total Amount:
  $10,867,479

Other Project Costs:

- Bus Purchase, 5 New Flyer HFC Buses: $6,792,640
- Facility Upgrades: $250,000
- Operations, Safety, and Technical Training: $200,000
- Regional Training Consortium: $480,500

MOVING FORWARD

TIMELINE

- November 2024 - Hydrogen station contract award
- Early 2026 - Delivery of HFC buses from New Flyer
- April / May 2026 - Hydrogen station completion
- April / May 2026 - Station and bus fueling commissioning

CONTRACT AWARD

Award of Contract for Design, Build, and Maintenance of Hydrogen Fuel Station

- RFP issued on January 31, 2024
- Three (3) contractors submitted proposals
  -Clean Energy
  -Messer
  -Trillium
- After evaluations, Clean Energy received the highest score overall
- Negotiations began with Clean Energy
- Best and Final Offer was requested on September 9, 2024

CONTRACT AWARD

Contract Cost:

- Clean Energy Project Proposal includes:
  - Initial Cost of Design and Build
  - Five (5) Years of Annual Maintenance
  - Cost $9,380,340
- 45% lower than Messer
- 28% lower than Trillium
- Option Item: Boil Off Gas Recovery System
  - Low pressure ambiant vaporizer - 120kg of LH2 per day
  - Operational Cost Savings $192,000 to $442,000 per year
  - Cost: $969,640

CONTRACT AWARD

Contract Cost:

- Staff determined Clean Energy's price to be fair and reasonable based on competitive pricing.
- Clean Energy was determined to be a responsible and responsive after responsibility determination was conducted by staff.
  - System for Award Management
  - GCTD has done business with them since 2021
  - References checked
- Request authorization for the General Manager to award the contract to Clean Energy in the amount of $10,867,479

- $9,380,340	Design, Build, and Maintenance (5 years)
- $969,640	Boil Off Recovery System
- $517,499 (5%)	Contingencies

QUESTIONS?

Thank you.