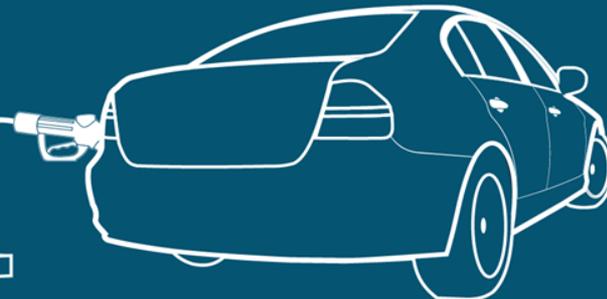
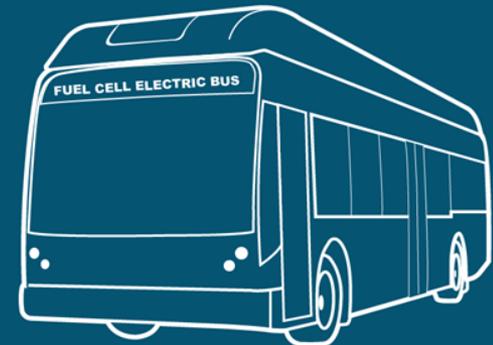


Fuel cell electric vehicles and hydrogen fuel in California

CPUC ZEV Rates Forum

June 8, 2018





| Numbers as of June 6, 2018 | Total |
|---|-------|
| Fuel cell cars sold and leased | 4,819 |
| Fuel cell buses in operation in California | 21 |
| Retail hydrogen stations open in California | 35 |
| Fuel cell buses & shuttles in development in California | 36 |
| Fuel cell trucks in development in California | 35+ |
| Retail hydrogen stations in development in California | 29 |



#driveH2

#driveH2

#driveH2

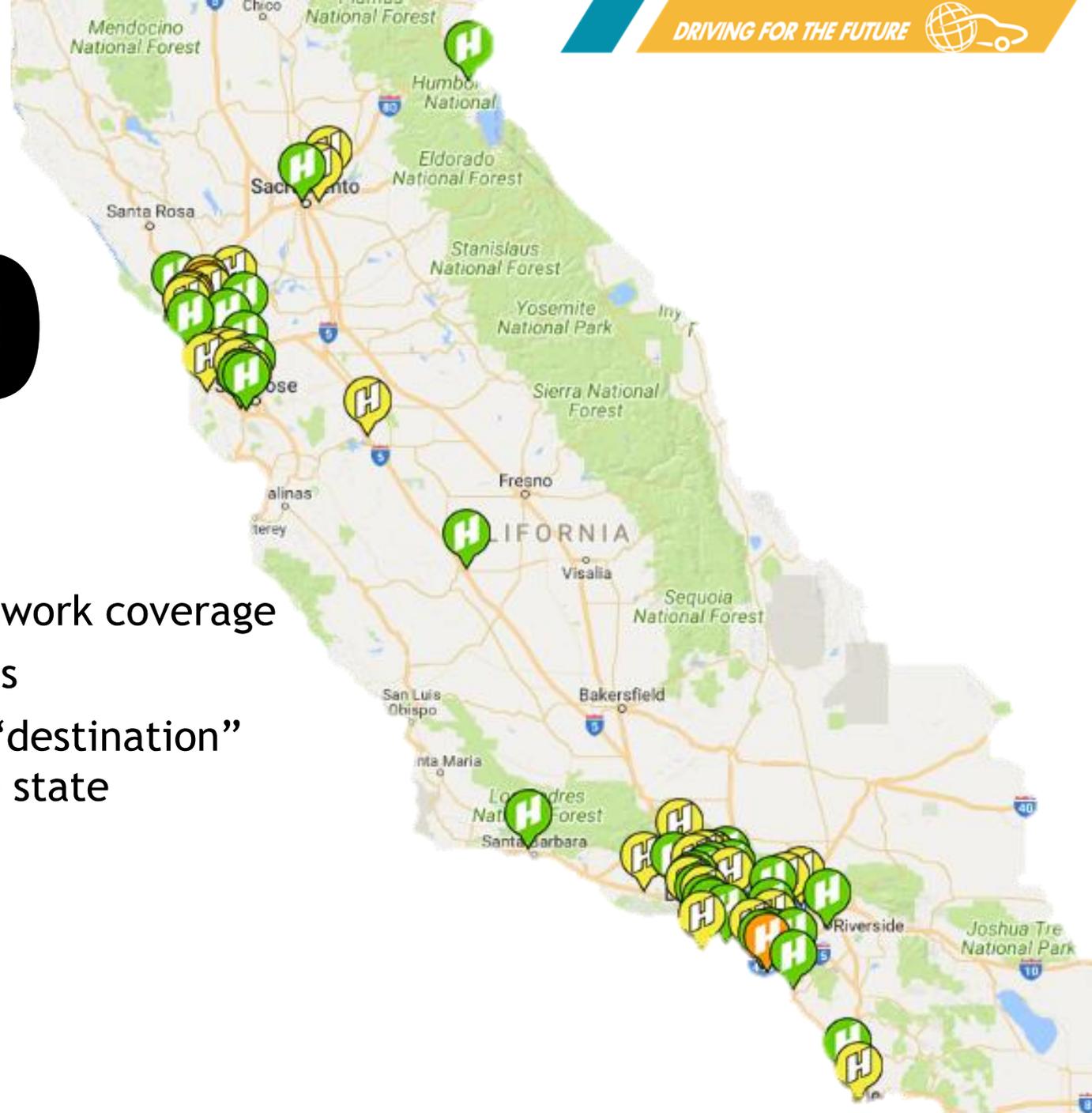
#driveH2



100

stations

- Establish initial network coverage
- Clusters in big cities
- “Connectors” and “destination” stations across the state





State Leadership/Industry Opportunity



ENSURE

charging and hydrogen fueling are affordable and more accessible to all drivers.



RECOMMEND

actions strengthen the economy and create jobs in California and expand infrastructure.



UPDATE

2016 ZEV Action Plan to expand private investment in ZEV infrastructure, particularly in low income and disadvantaged communities.



5 million

Zero-emission vehicles on California roads by 2030.



200

spur the construction and installation of 200 hydrogen fueling stations.



250,000

spur the construction and installation of 250,000 chargers.

Enable
the market

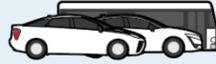
Establish
the market

Expand
the market

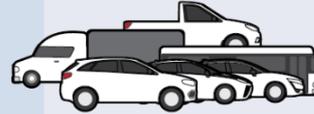
Self-
sustaining

California Today

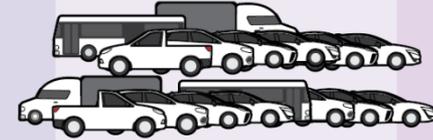
Fuel Cell Vehicle
Deployment



10,000s



100,000s



1,000,000

Hydrogen Station
Growth

1 Station = 740 Cars



200 Stations

1 Station = 1,200 Cars



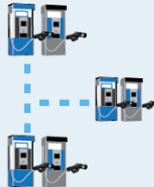
500 Stations

1 Station = 2,500+ Cars



1,000 Stations

Hydrogen Station
Network Planning



Increase coverage,
reduce costs



Increase capacity,
reduce costs

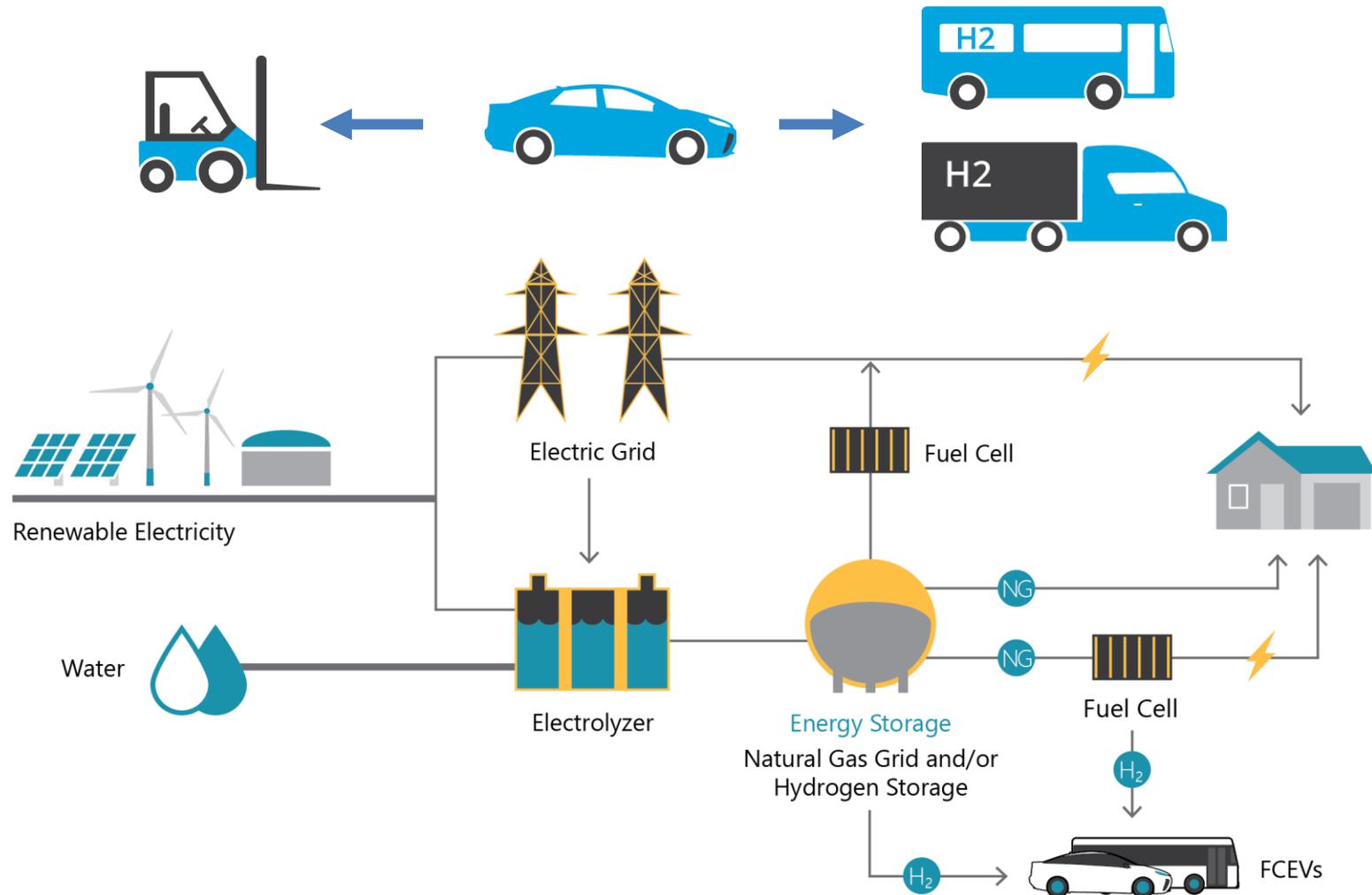


Statewide
Capacity

Convenience similar to
gasoline, business case

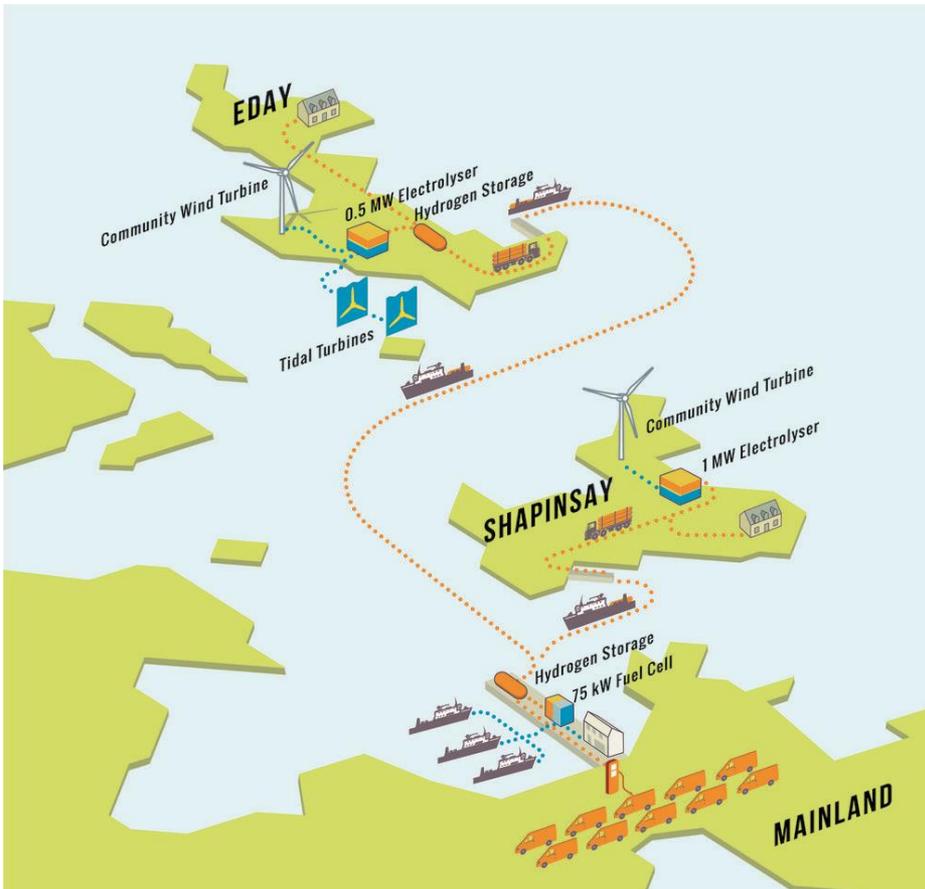


Economies of Scale and Scope





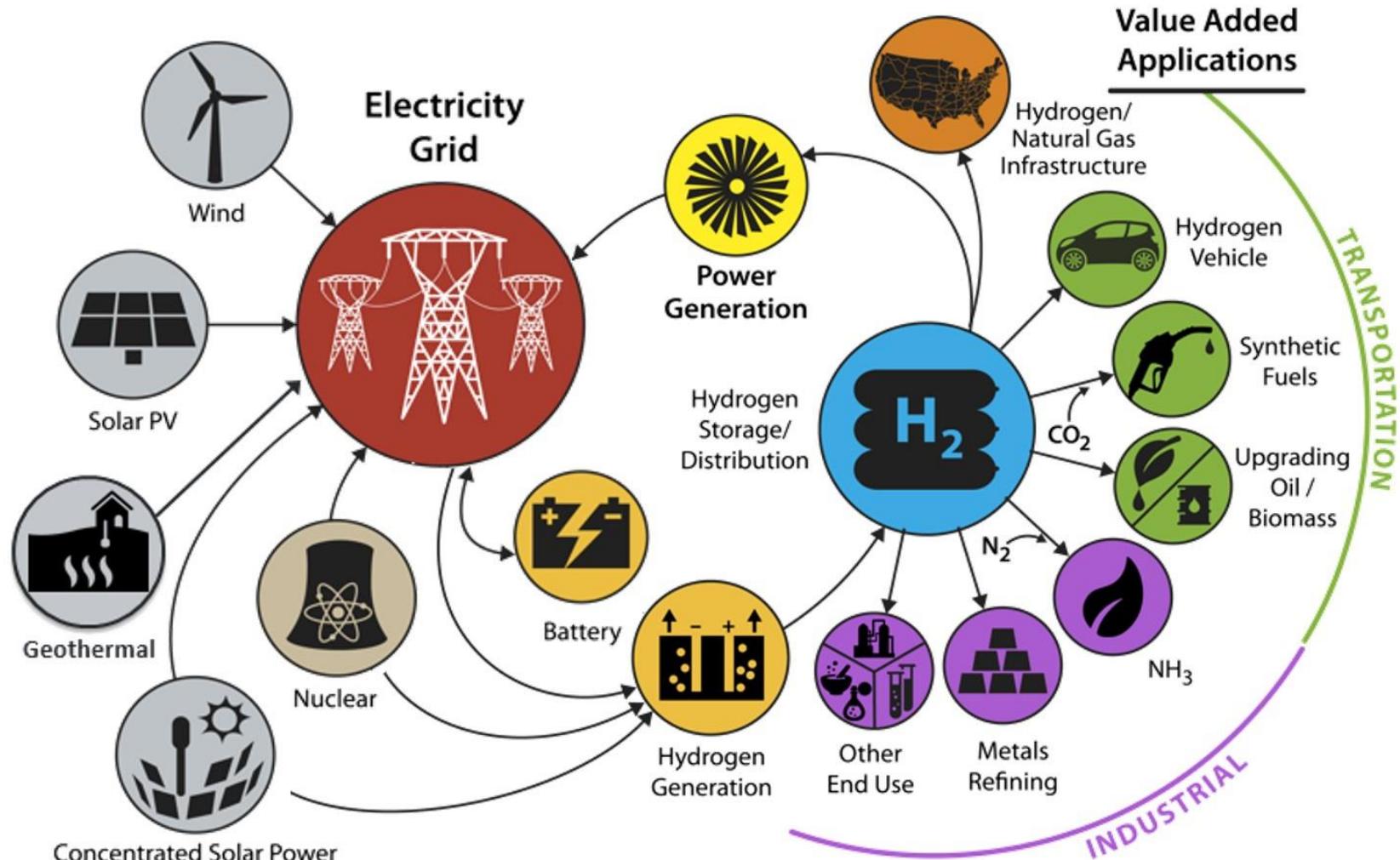
Power to Gas to Fuel



- Uses constrained wind power to make hydrogen
- Provides heat and power for buildings and docked ferries
- Provide fuel for FCEVs



U.S. DOE's H2@Scale





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