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The California Fuel Cell Revolution

Advancing California's Economic,
Social & Environmental Priorities

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How it all began – *2012 California Roadmap*



First 100 stations statewide

- Establish initial network coverage
- Clusters in big cities
- “Connectors” and “destination” stations across the state
- Vision for starting commercial rollout



Where we are today

INNOVATORS

Tech Adventurous



Vehicle Cost
Higher than gasoline cars

Vehicle Performance
Close to gasoline cars

Vehicle Emissions
Better than gasoline cars

Vehicle Range
Close to gasoline cars

Fuel Cost
Higher than gasoline

H2 Network Coverage
Worse than gasoline

NASCENT MARKET

Development
fuel cell cars

First
H2 stations

Sparse
H2 network

Customer adapts
to technology

TODAY

Numbers as of July 2018

4,926 fuel cell cars

35 retail hydrogen stations

24 fuel cell buses

—MISSION—

Accelerate commercialization of
hydrogen and fuel cell vehicles

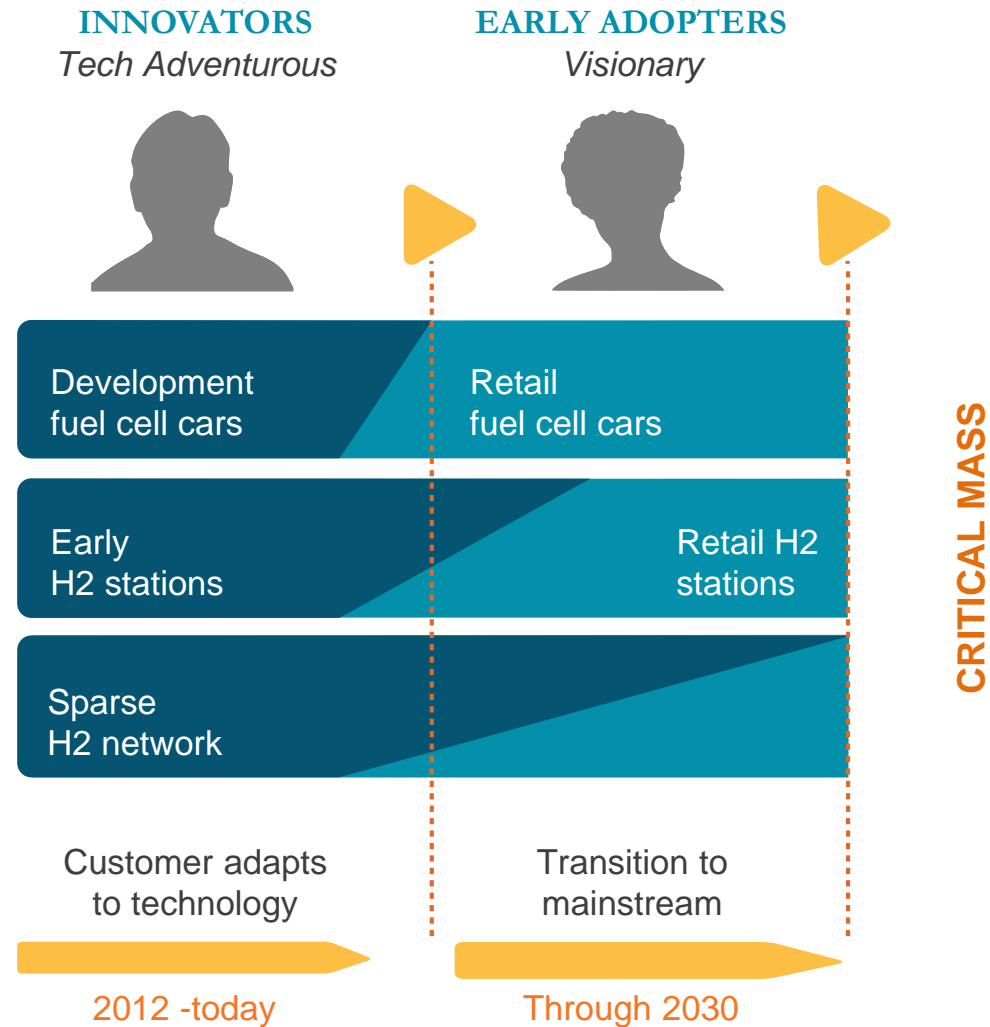




**What is the
revolution?**



Evolution of customer adoption





—CaFCP Goal—

Enable market conditions to support:

1,000 hydrogen stations

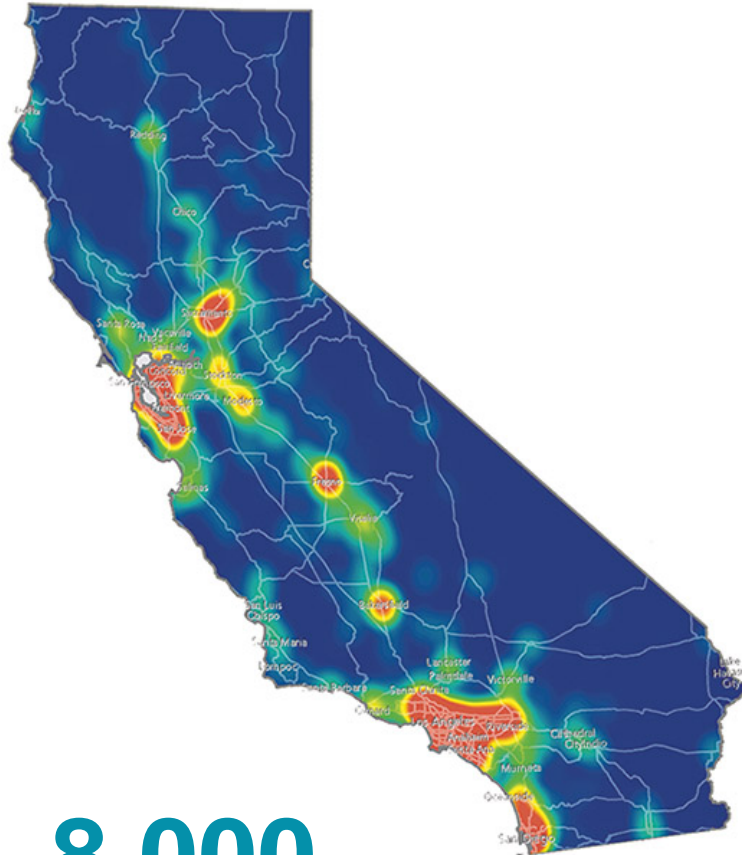
and

1,000,000 fuel cell vehicles

by **2030**

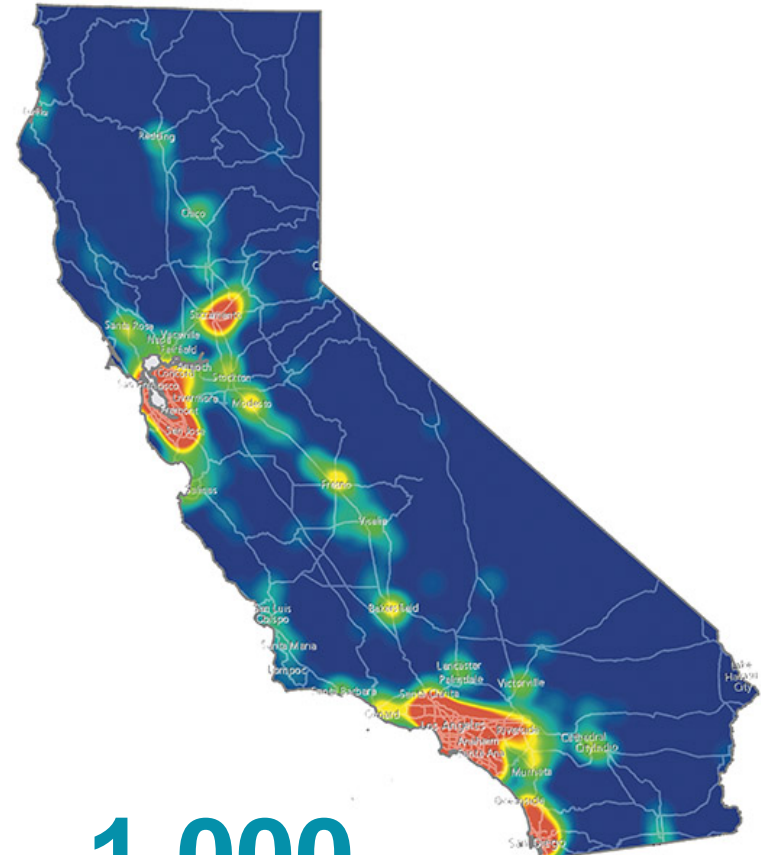


Matching the coverage of gas stations



8,000

retail gas stations



1,000

retail H2 stations



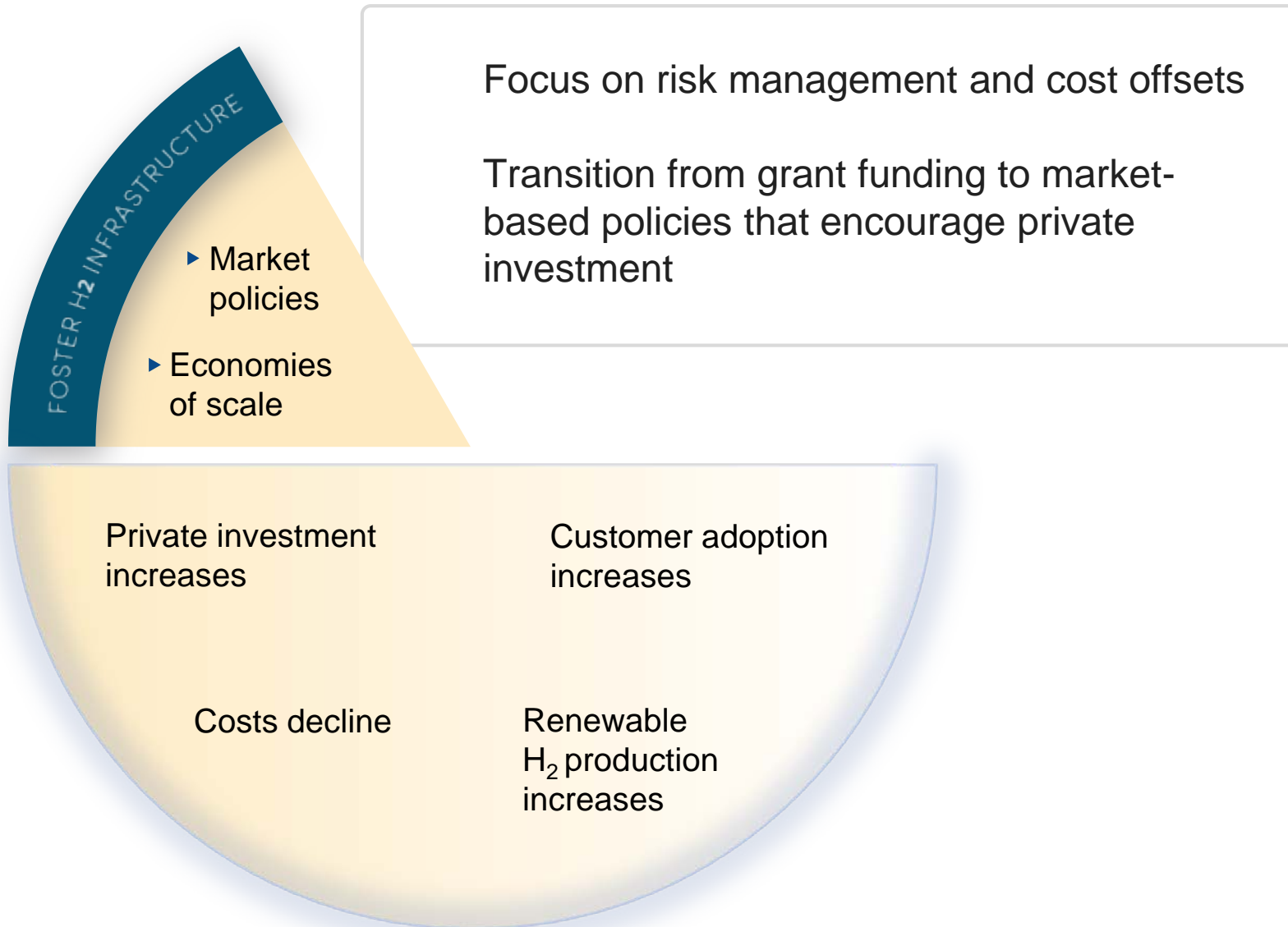
How do we
get there?



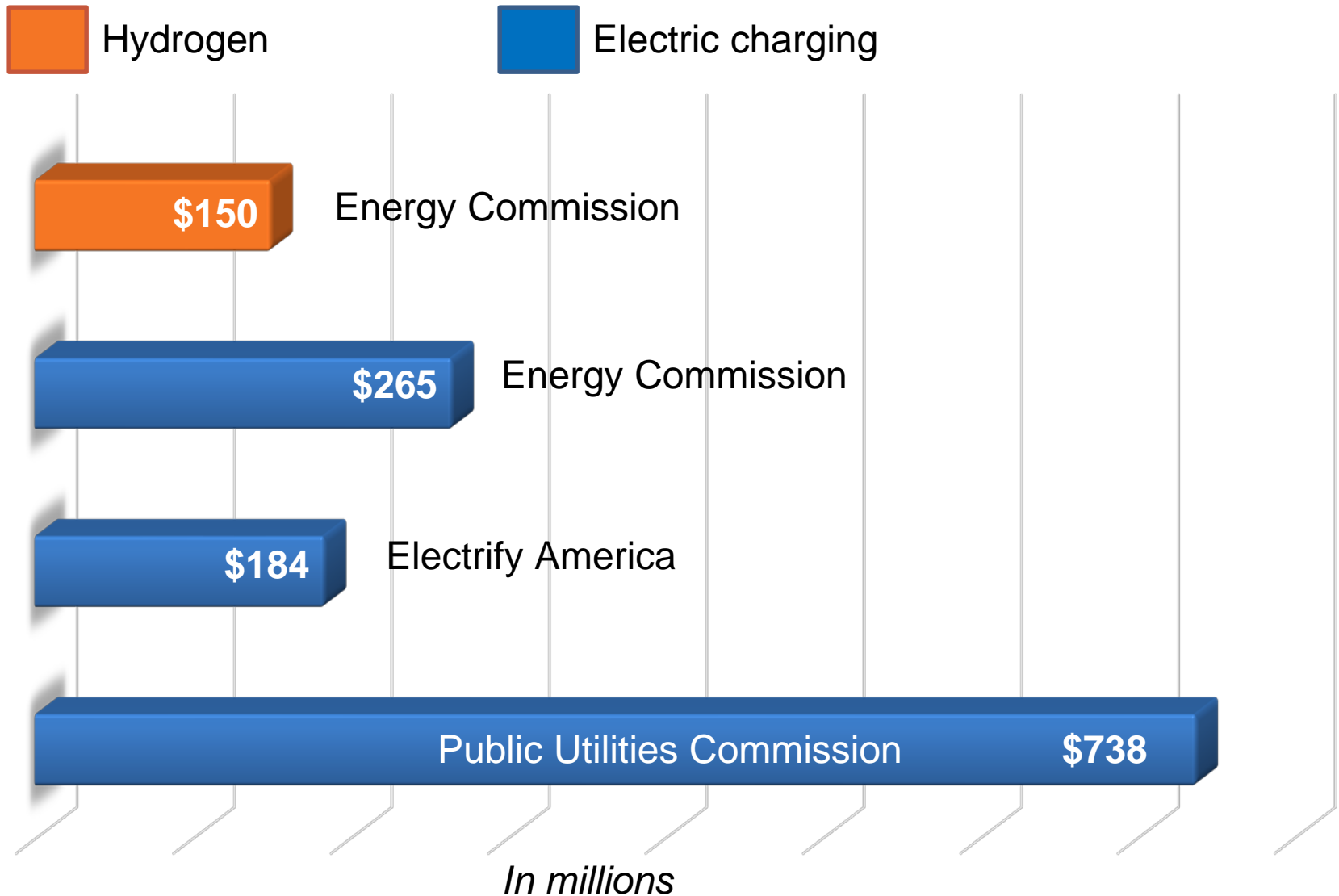
- ✓ Enable the market by attracting capital investment in infrastructure



Enable large-scale infrastructure



Market-based policies build confidence

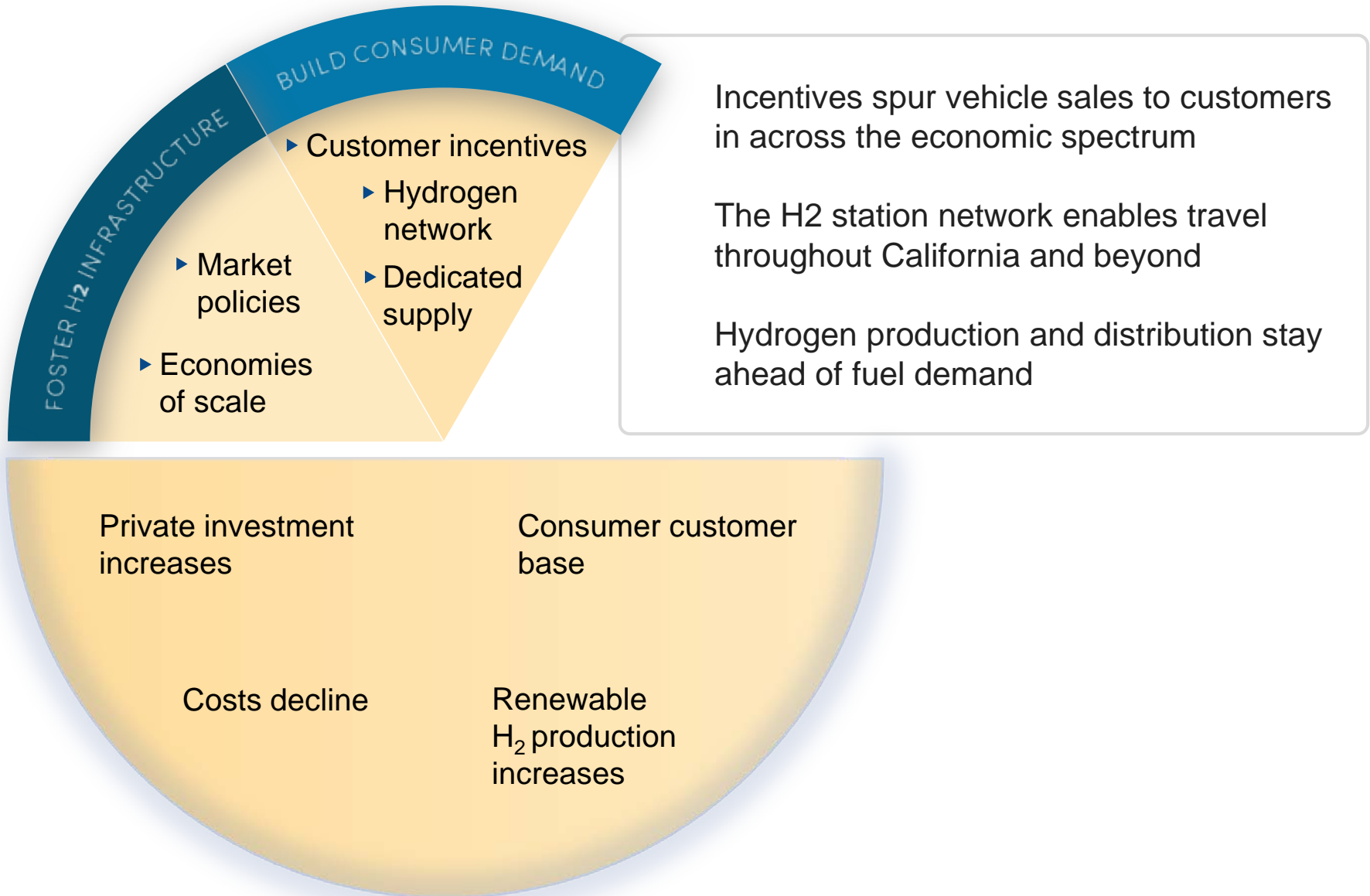




- ✓ Establish the market with a competitive value proposition to increase consumer demand

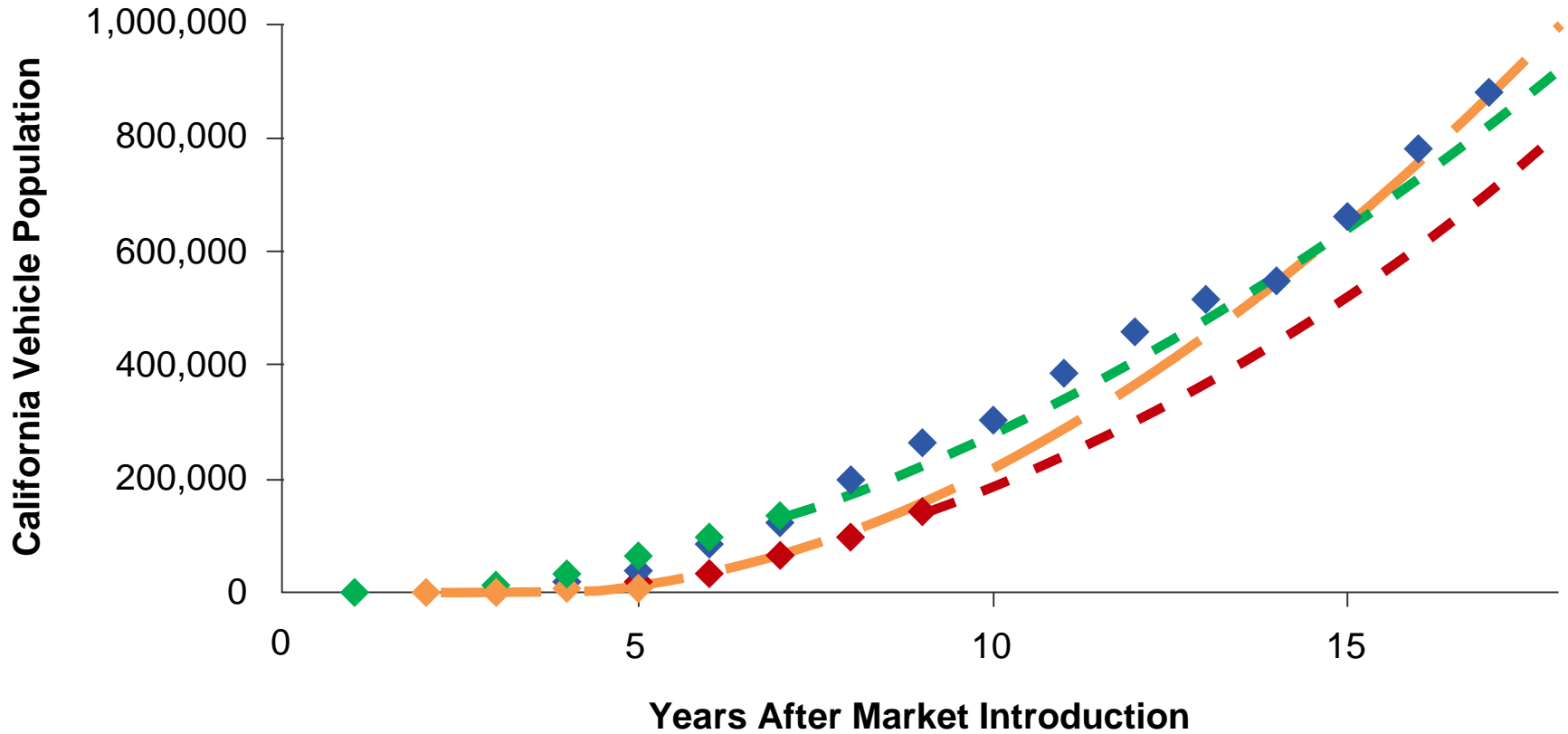


Build a strong customer base





Scaling for success



◆ HEV

◆ BEV

◆ PHEV

◆ FCEV

--- BEV Proj.

--- PHEV Proj.

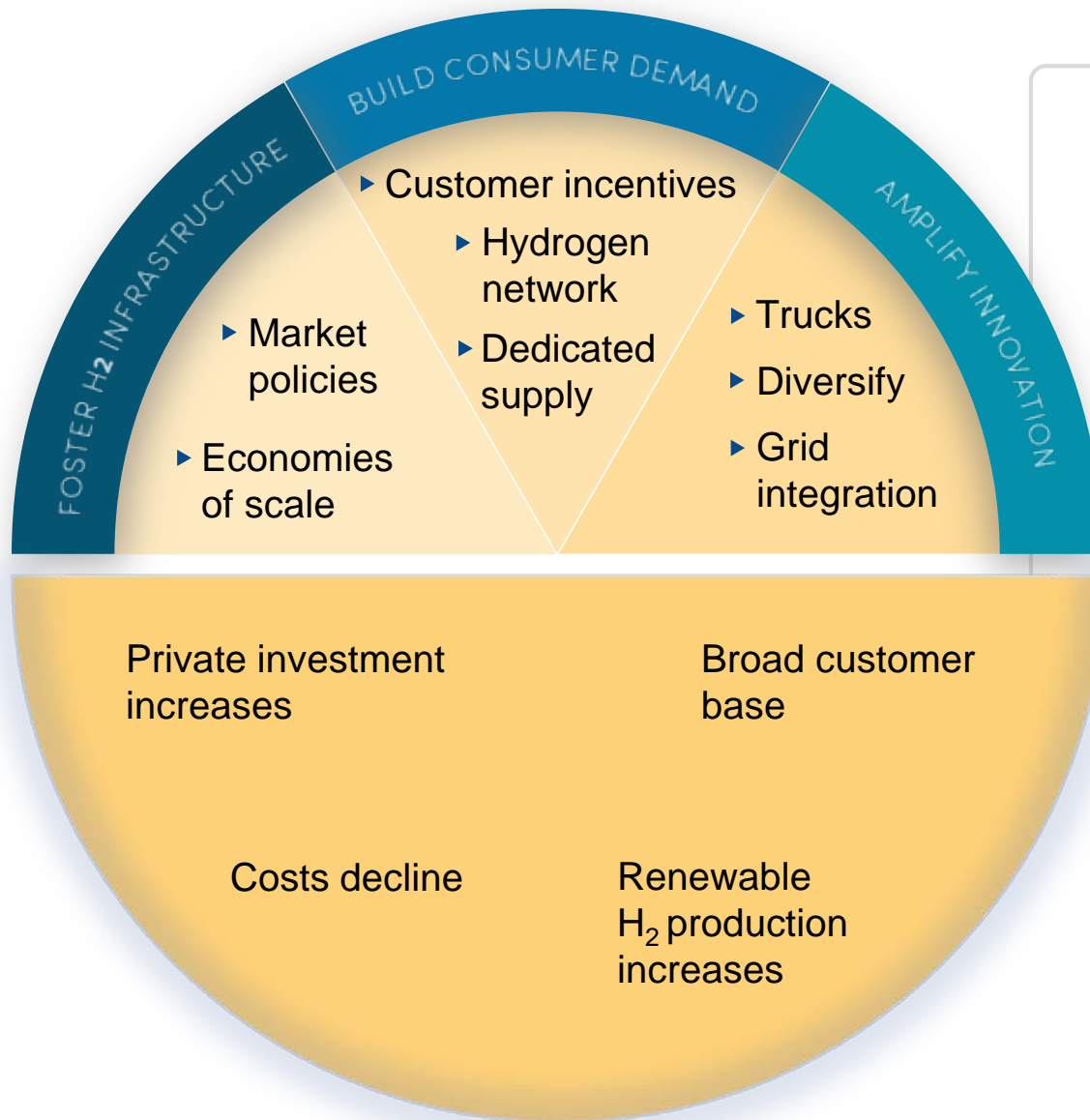
— FCEV Vision



- ✓ Expand the fuel cell and hydrogen market across the transportation and energy spectrum



Expand the use of hydrogen and fuel cells



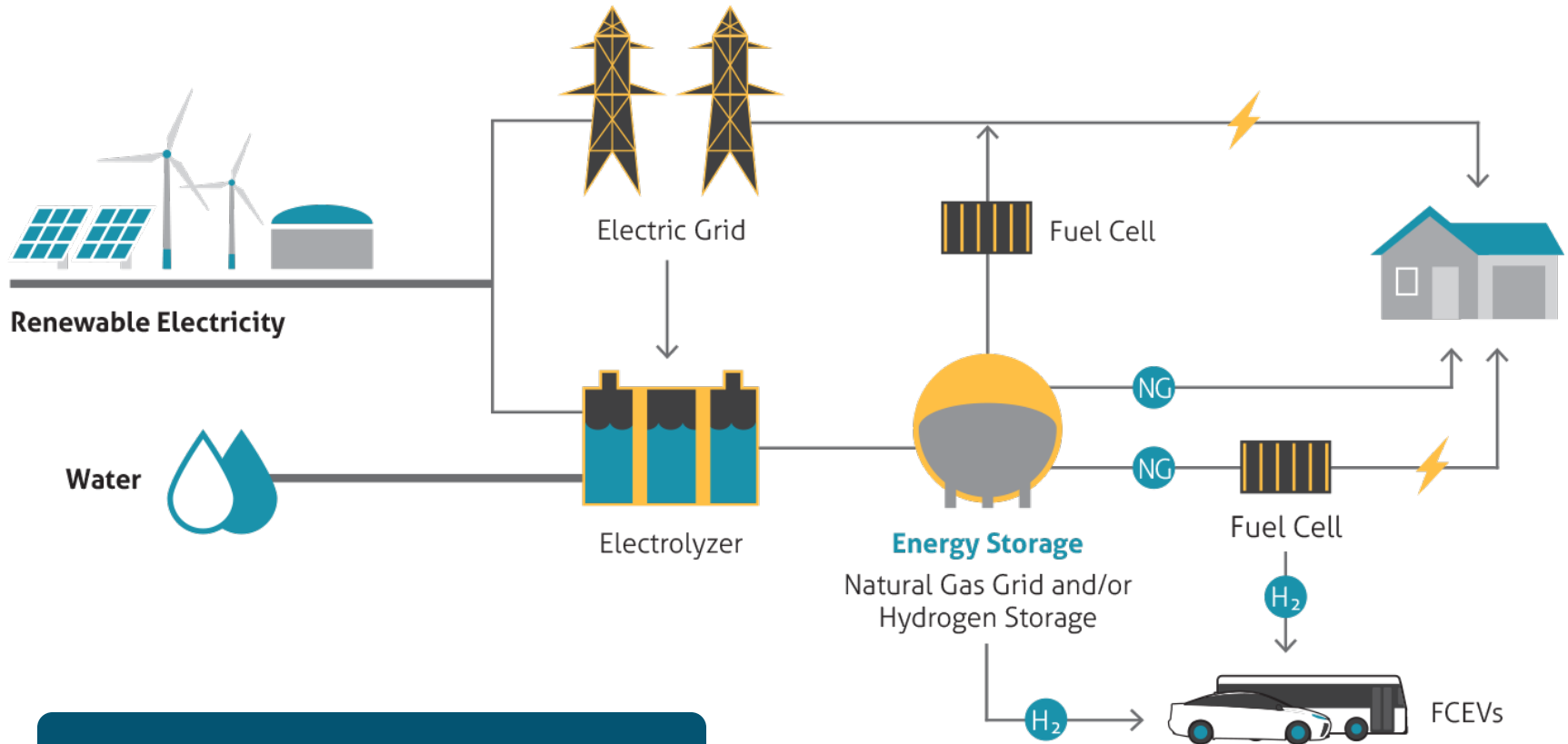
Empower fuel cell trucks and hydrogen stations along freight corridors

Broaden the portfolio of hydrogen and fuel cell applications

Connect hydrogen, electricity, and renewables



The energy system



- Grid balancing
- Demand management
- Energy storage
- Meeting renewable targets



—OUTCOMES—

Economic, Social,
& Environmental
Benefits

—ECONOMY—

Establish a self-sustaining market

Desirable products and services that make economic sense for customers and businesses



—SOCIETY—

**97% of DACs and
94% of Californians**

within the station network
coverage



—ENVIRONMENT—

693.5 million gallons of gas displaced
2.7 million metric tons of GHG avoided
3,900 metric tons of NOx avoided





**How are we starting
the revolution?**



CaFCP Members





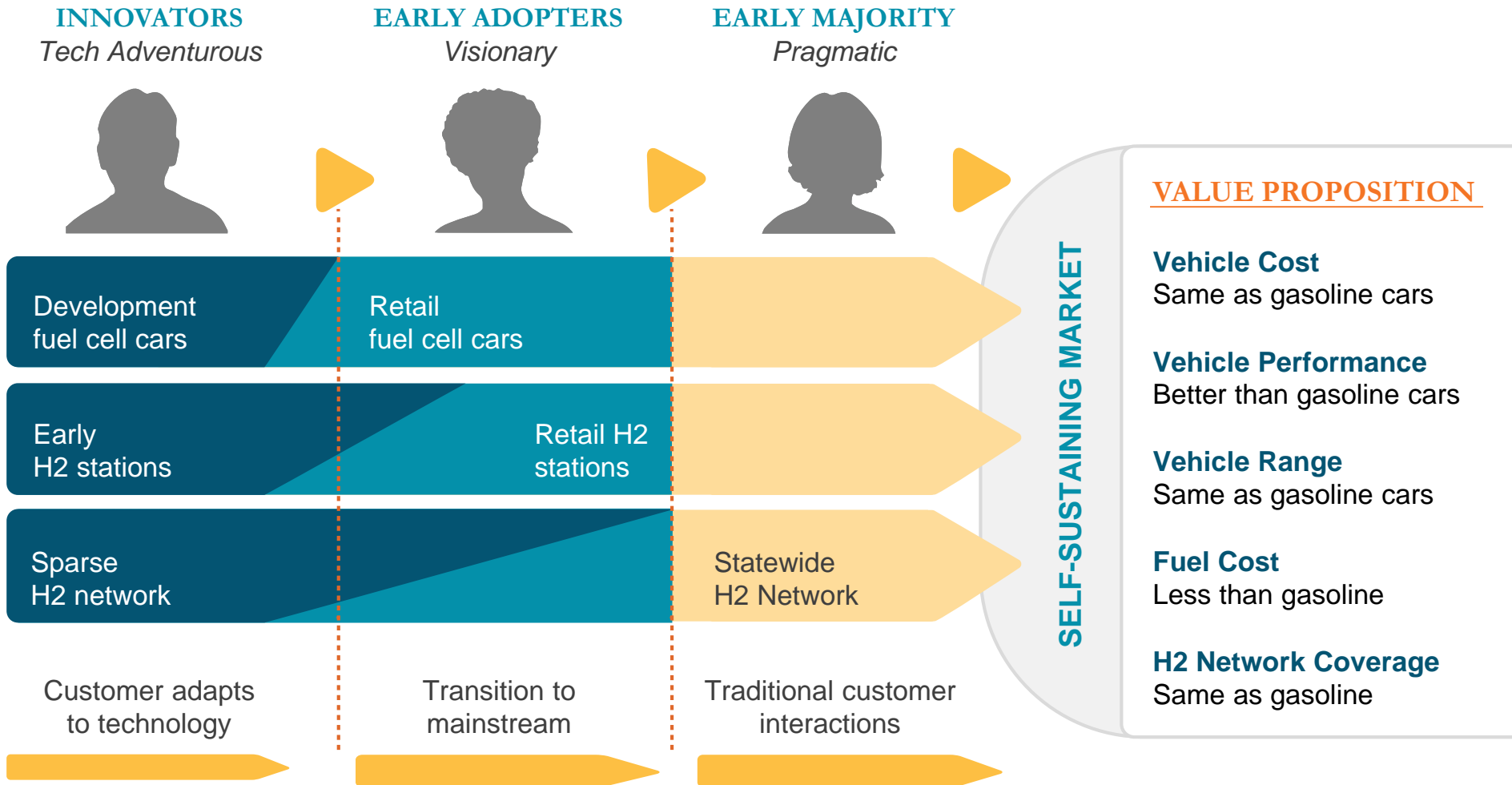
—Delivering Positive Change—

- ✓ Addressing **cost challenges**
- ✓ **Renewable** hydrogen pathways
- ✓ **Expanding** beyond California
- ✓ Sustainable **freight**





Self-sustaining



**We're creating transformative
change for a brighter,
healthier future.**

Join the revolution.

