DOE Hydrogen and Fuel Cell Program H2 AMR 2018

State-Funded Hydrogen and Fuel Cell Activities Panel California Energy Commission

Jean Baronas

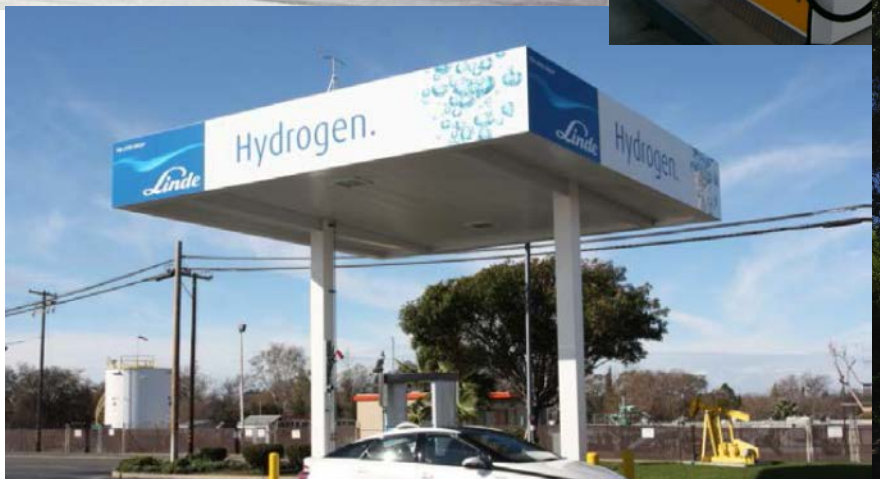
June 14, 2018

Focus on Hydrogen Refueling Infrastructure

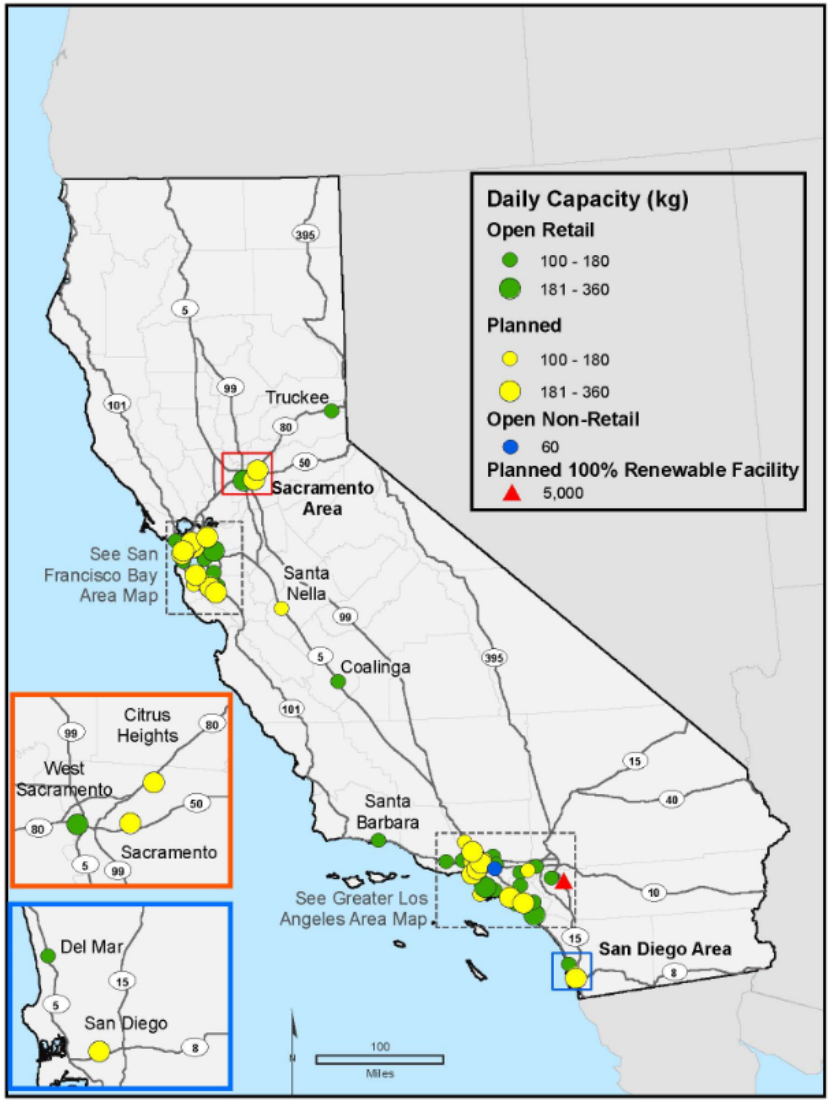
- The consumer's acceptance of fuel cell electric vehicles (FCEVs) correlates with the availability of reliable fueling.

- The consumer's ability to reliably fuel FCEVs and drive to their destinations are integral to decisions to purchase and lease FCEVs.

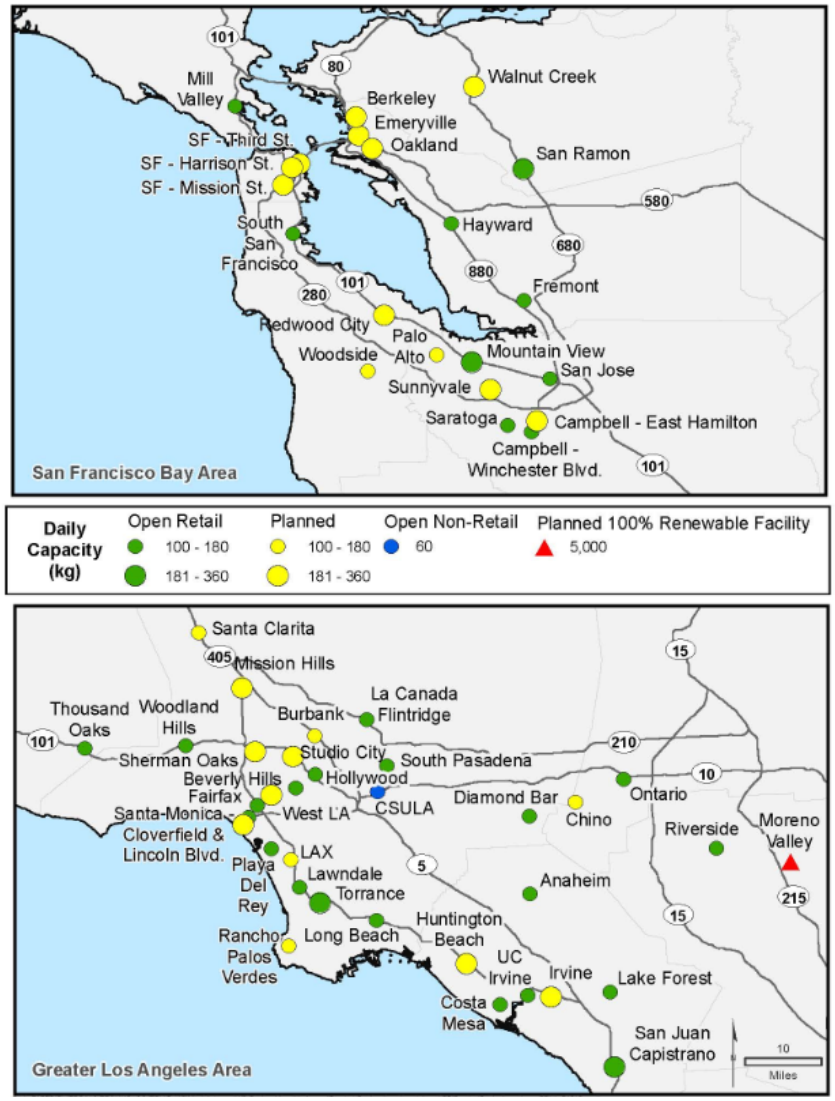
California Energy Commission



35 open retail hydrogen refueling stations
fuel over 4,200 fuel cell electric vehicles (FCEVs)



Statewide view of the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP) funded stations (4 regions)



View of the locations of the core market areas around the San Francisco Bay and Greater Los Angeles

Network Activities

- Community outreach
- Station capacity evaluation
- Quantitative and qualitative performance assessments
- Location streamlining
- Permitting streamlining

Nick Barillo, Hydrogen Safety Panel,

Station Nameplate Capacity
Hydrogen Station Capacity Model (HyC)

- Compression and dispensing
- Pre-cooling
- On-site and delivered sources of hydrogen
- Station storage for each pressure level

Danny Terlip, NREL,
Researcher and Engineer

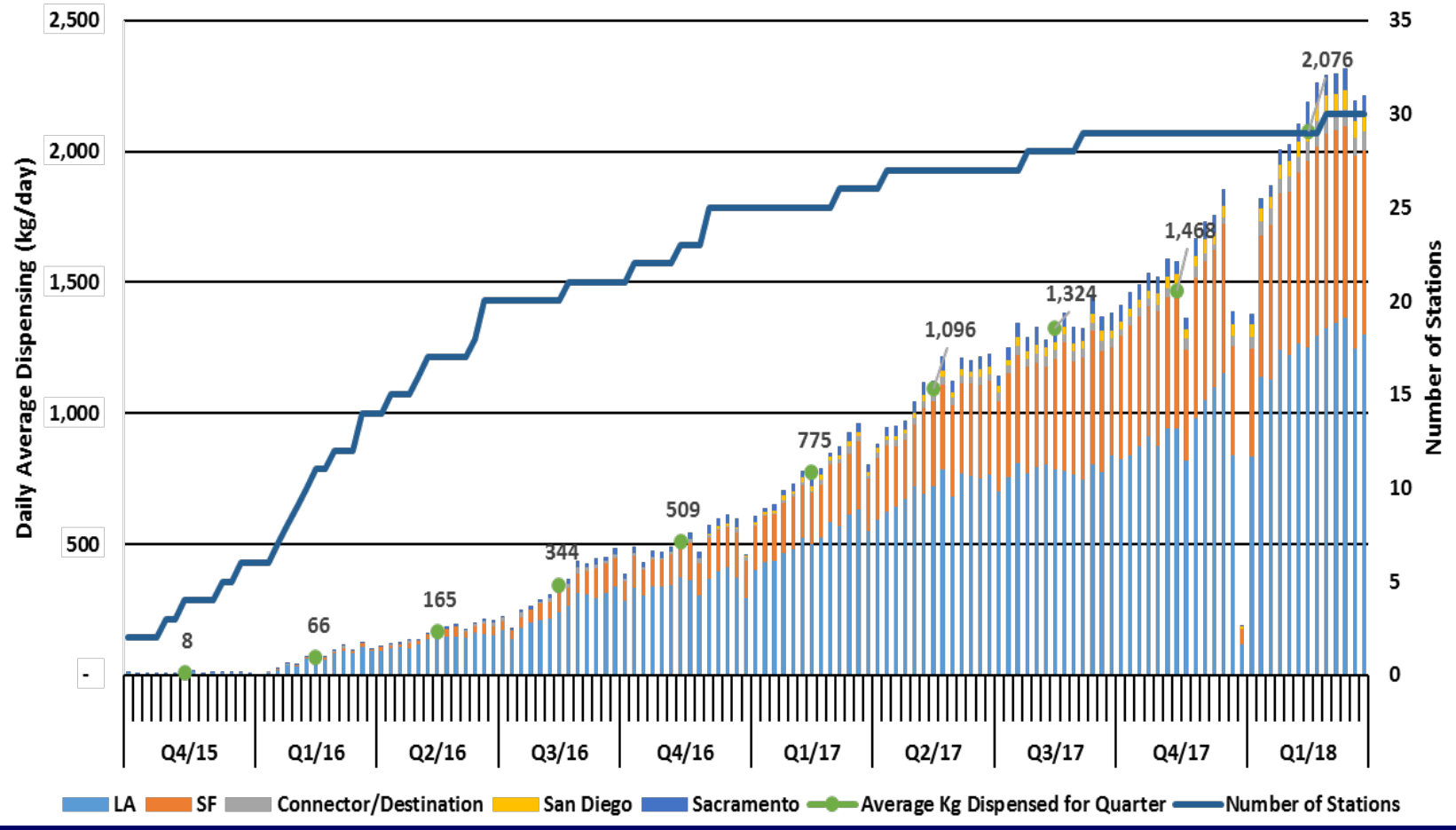
Jennifer Kurtz, NREL,
Laboratory Manager

Public and Private Sector Collaboration On Station Reporting

- National Renewable Energy Laboratory (NREL) data collection tool
  - Amount of hydrogen stored, compressed and dispensed
  - Energy consumption
  - Fuel logs
  - Parts replacement and cost
  - Monthly operating costs

Sam Sprik, NREL, Researcher and Engineer

Weekly Hydrogen Dispensing

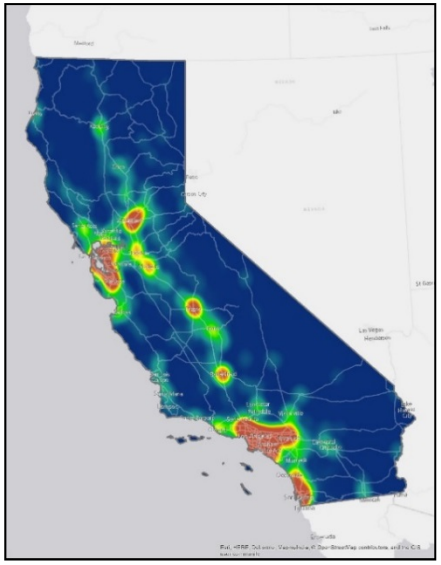


Source: Energy Commission staff

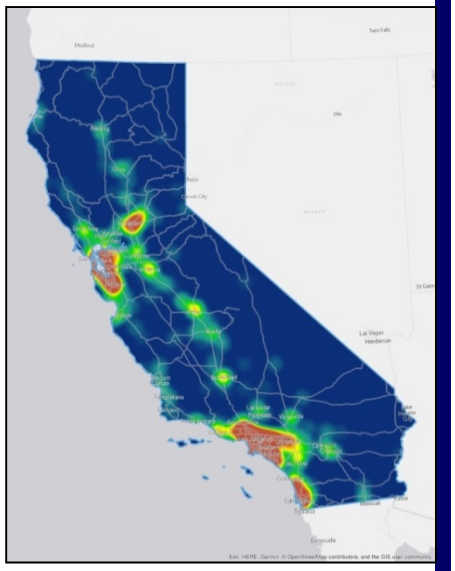
Streamlined Station Location Techniques

- CARB is working to project the station network development through 2030 and the proposed CaFCP Roadmap may include.

Andrew Martinez, CARB, Air Resources Engineer



Density map of approx. 8,000 retail gas stations (actual)



Density map of approx. 1,000 retail hydrogen stations (potential) (2030)

Source: CARB

Trend Toward Larger Stations

- Higher capacity in GFO-15-605
- Multiple fueling positions and serving more customers is a ***future*** trend

Funding	Number of Stations Funded	Total Capacity Funded (kg/day)	Average Station Capacity (kg/day)
PON-09-608	10	2,140	214
PON-12-606	4	730	183
Upgrade Contract	3	480	160
PON-13-607	27	4,745	176
GFO-15-605	20	6,420	321
Network Totals	**64**	**14,515**	**227**

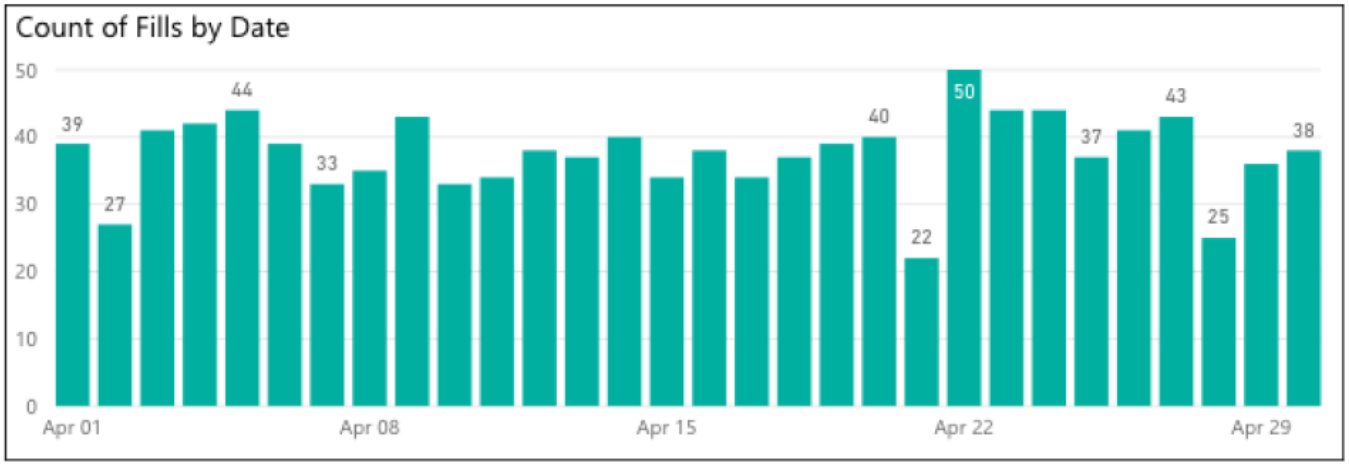
Source: California Energy Commission

Station and Network Performance

- Monthly progress reports

ARV-15-030: Long Beach-Long Beach Blvd.

- 1127 Fills – 3.68k Total Kgs



- Quarterly NREL Data Collection Tool

Monthly Report figure example from FirstElement Fuel

Streamlined Administration, Local Planning, and Permitting

- Partner with Governor's Office of Business and Economic Development (GO-Biz)
  - Permitting Guidebook
  - Outreach to local officials
  - Community outreach
- Coordinate with other California agencies

Gia Brazil Vacin,
GO-Biz, Project Manager

Tyson Eckerle,
GO-Biz, Deputy Director

Conclusions

- Network coverage, capacity, and performance impacts vehicle uptake
- Network activities include outreach, capacity evaluation, performance, location streamlining, and permitting streamlining
- Significant collaboration is needed with public and private sector

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