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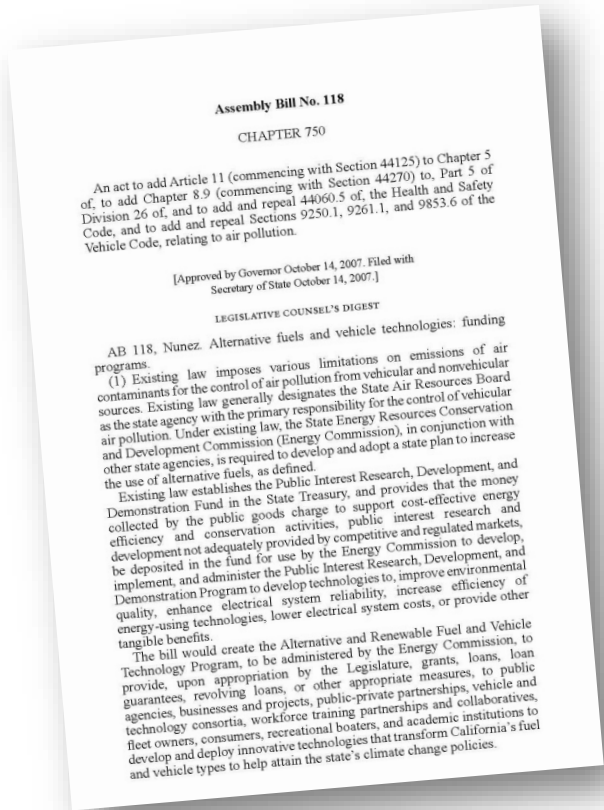
## Manufacturing and Workforce Development Program Activities of the ARFVTP

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**Tami Haas and Tim Olson**  
Fuels and Transportation Division  
California Energy Commission

August 6, 2018

# ARFVTP Origins In Statute



Established by Assembly Bill 118  
(Nunez, 2007)

“...to develop and deploy innovative technologies that transform California’s fuel and vehicle types to help attain the state’s climate change policies.”

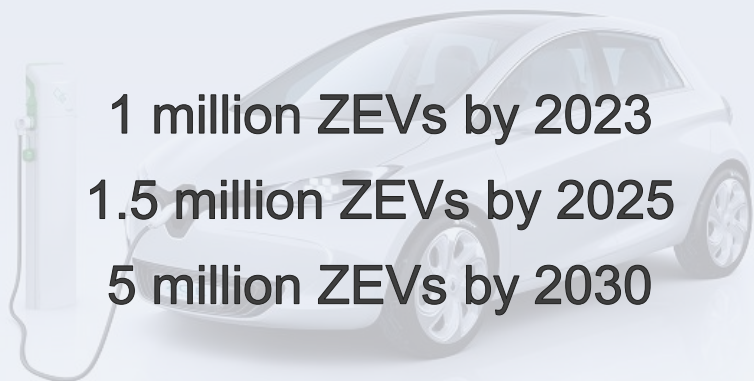
California Health and Safety Code 44272(a)



# Guiding Policies and Regulations



E.O. B-16-12  
SB 1275 (2014)  
E.O. B-48-18



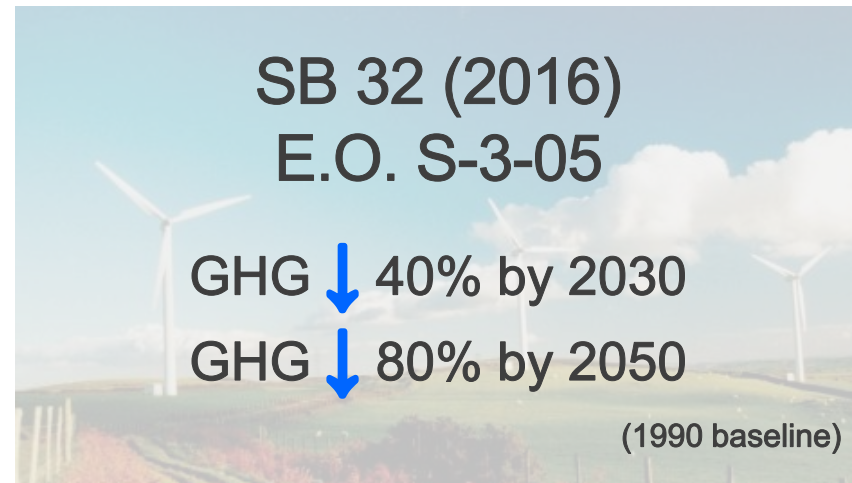
1 million ZEVs by 2023  
1.5 million ZEVs by 2025  
5 million ZEVs by 2030

250,000 EV chargers by 2025  
200 hydrogen stations by 2025

SB 32 (2016)  
E.O. S-3-05

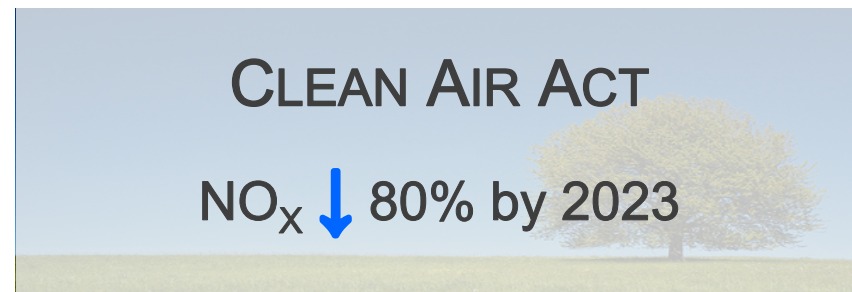
GHG ↓ 40% by 2030  
GHG ↓ 80% by 2050

(1990 baseline)



CLEAN AIR ACT

NO<sub>x</sub> ↓ 80% by 2023



# ARFVTP Funding To-Date



Fuel Type	Cumulative Awards (in millions)	Percent of Funding	Cumulative Number of Agreements
Biomethane	\$62.7	8%	21
Ethanol	\$48.5	6%	20
Biodiesel	\$51.3	7%	19
Renewable Diesel	\$21.0	4%	8
Electricity	\$219.5	29%	160
Hydrogen	\$152.2	20%	96
Natural Gas	\$99.0	13%	151
Propane	\$6.0	1%	31
Manufacturing, Workforce and Other	\$93.5	12%	110
<b>Total</b>	<b>\$753.2</b>		<b>616</b>



As of February 1, 2018



**\$8.5 million**  
Allocation in  
FY 2018-19

Support for ZEV infrastructure industry & workforce needs

Encourage new or expanded in-state manufacturing facilities

## Goals Supported:

- Indirect support for other ARFVTP project types
- Equitable economic development





Provides funding to support the in-state manufacturing of alternative-fuel vehicles, vehicle components, supporting infrastructure, and workforce development

Allocated in FY 2017-2018

\$4.9 million for manufacturing

\$3.4 million for workforce training and development



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# *Bringing Zero-Emission Infrastructure Technology Manufacturing to California*

May 4, 2018 Energy Commission Roundtable  
Conclusions





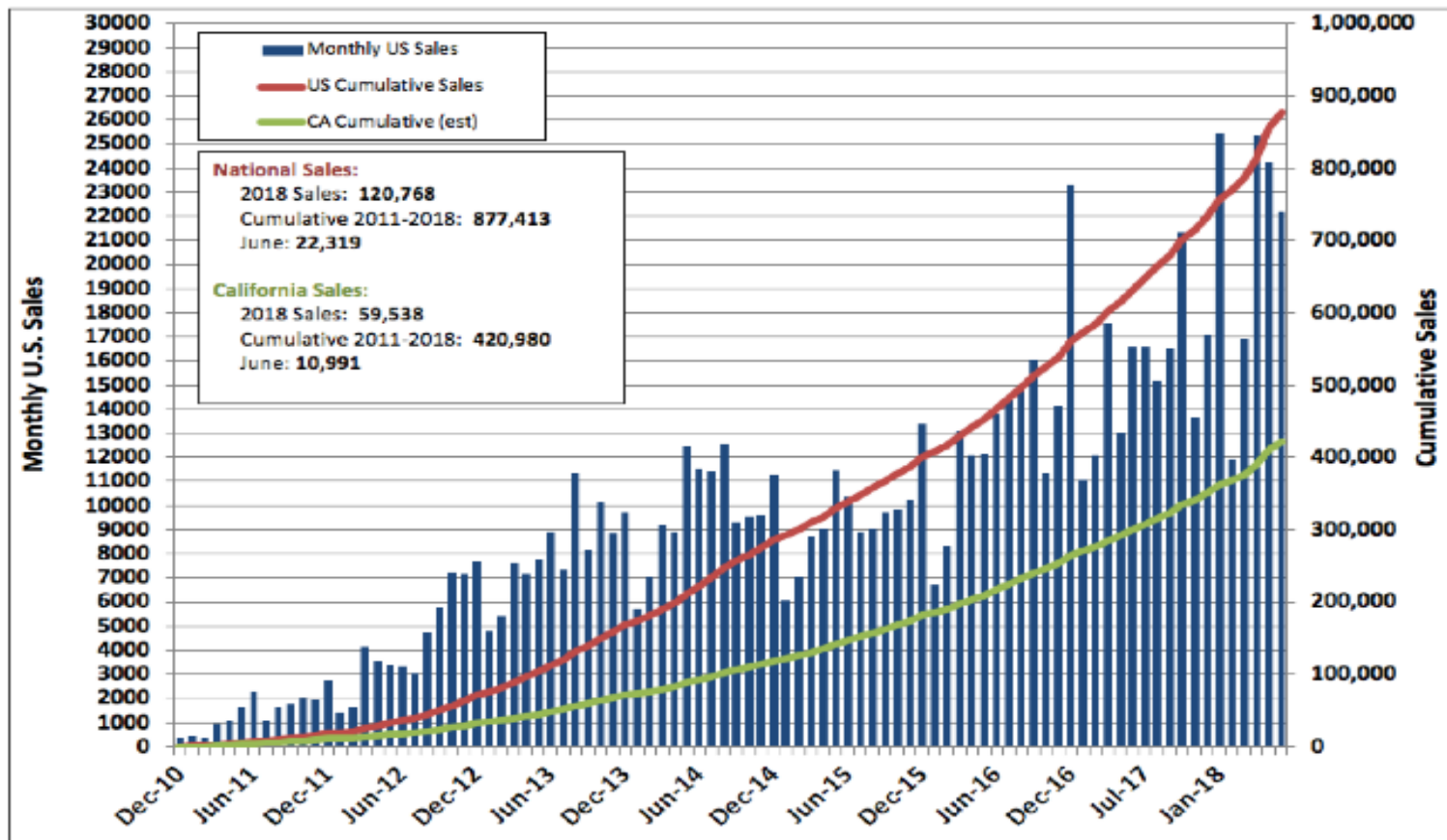
# NREL Clean Energy Manufacturing Analysis Center Studies: Factors Driving Manufacturing Growth

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- Demonstrate Growth Demand for Products
- Achieve Economy of Scale Manufacturing Threshold to Optimize Price
- Gain Access to Affordable Capital for Manufacturing Investments



# Passenger Electric Vehicle Growth



Note: Approximation assumes CA sales are 49% of national sales.  
Reference: [www.hybridcars.com](http://www.hybridcars.com)

7/19/2018



# Key Market Segments for California ZEV Infrastructure

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- Renewable hydrogen fuel production and distribution
- Hydrogen fueling equipment assembly
- Software design and development
- Distributed energy integration
- Second life battery applications
- Service and maintenance
- Installation and power upgrades
- Design and engineering for support infrastructure



# Lessons Learned from Successful Manufacturing in California

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- Decide what makes most sense to manufacture in California (or even manufacture themselves vs. contract manufacturing)
- Establish a set of reliable suppliers
- Find and establish a manufacturing or assembly site to meet needs (which when scale is achieved, may prove to be a challenge)
- Partner with a community organization or school to ensure a steady pipeline of qualified workers



# Key Barriers Impeding Growth Potential

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- Cost to a manufacturer of commercial real estate, taxes, and regulations (especially CEQA)
- Skilled workforce supply and cost of living to attract a skilled labor force to relocate
- Access to capital
- Lack of long term planning and commitment of policies and incentives
- Inconsistency and slowness of local decision making/policies



# Roundtable Recommended Actions

- Recognize California's competitive and comparative advantages over short and long term and consider shared facilities for rapid prototyping and smaller scale firm development
- Prioritize workforce training and certificate programs to develop a variety of skills, reflect a holistic perspective, increase diversification in workforce and support ZEV infrastructure manufacturing
- Create opportunities to attract in-state hydrogen production and maintain skill advantage gained through deployment of first hydrogen fueling stations
- Maintain commitments to long term state funding initiatives
- Develop concierge service to help companies navigate incentive programs and permit conditions – for manufacturers as well as fleet customers
- Include software and network development in definition of manufacturing supply chain

