

US Green Vehicle Council

- ▶ A non-profit organization to foster the technological, business development and deployment of electric vehicles, while promoting a clean and healthy environment for our present and future generations.
- ▶ USGVC and partners (Cleantech Institute and EV Centers of America) are developing open source DC fast charging station infrastructure that support the fast and widespread usage of electric vehicles in the USA and worldwide.



Cleantech Institute

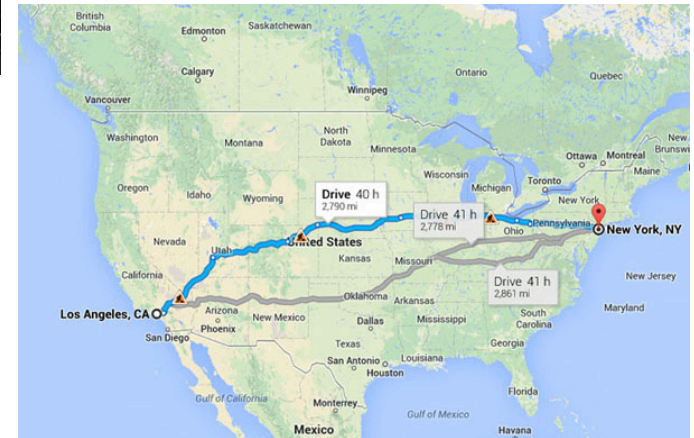


- ▶ Cleantech Institute is a leading research, consulting and training organization in emerging clean & renewable energy industry.
- ▶ To help make the world a better place by deploying clean and healthy transportation- while replacing the fossil fuel economy with the green and sustainable economy.
- ▶ Cleantech Institute and its sister company IANT have been awarded multimillion dollars in government grants over the past years.



EV Centers of America

A one-stop shop for EV repairs services, distributing EV fast chargers and building EV fast charging stations across America



So ... Why the current interest in EVs ?



- The United States imports more than 50 percent of the petroleum needs of the country each day;
- In 2013, the net deficit of the United States in petroleum trade amounted to more than \$40 Billion, or nearly 40 percent of the total trade deficit;
- The US has no defense when events beyond our control interrupt the flow of oil.
- Oil demand from developing countries will cause prices to average \$100 a barrel between now and 2015, and to double by 2030
- *Ref: Electric Drive Transportation Association*

Problems with Internal Combustion Engine



- Low efficiency: 15% efficiency, 85% loss in heat
- Exhaust fumes causes pollution and health problems
- CO₂, CO and NO gases causes respiratory diseases
- Expensive gasoline: > \$4.00 per gallon
- Energy security: dependence on foreign oil suppliers
- Lead poisoning, leaking gasoline storage tanks.

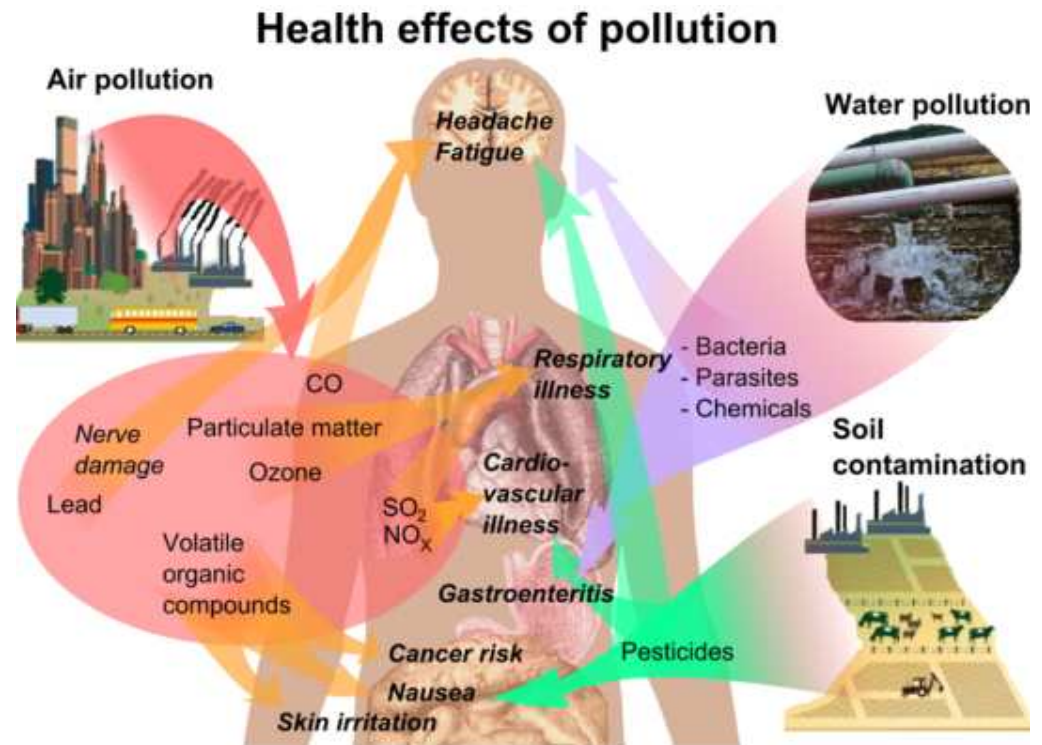


Health Effects of Air Pollution



Exhaust fumes contains CO_2 , CO , NO_2 and SO_2 cause:

- Headache
- Respiratory diseases
- Cardiovascular diseases
- Lung Cancer



Benefits of Electric Vehicle Adoption

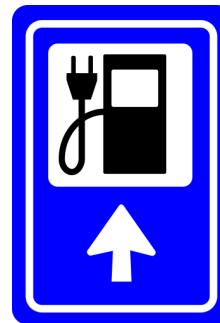
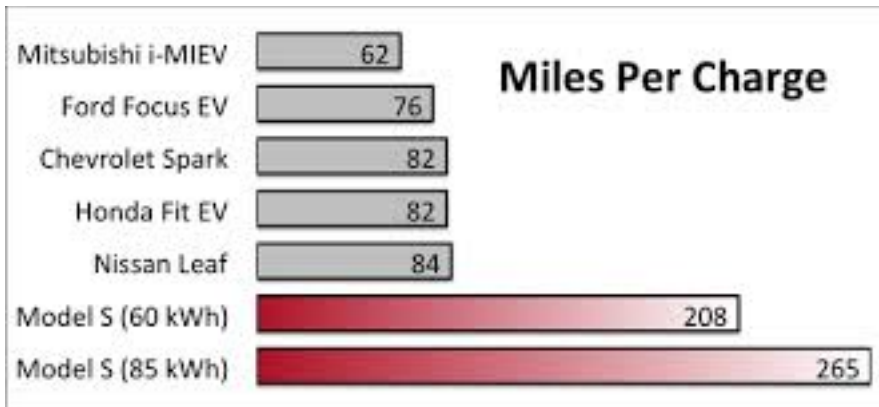
- ▶ Electric cars have no emission, no air pollution like gasoline cars
- ▶ Electric motor is very efficient, 95% vs. 15% internal combustion engine
- ▶ Electric car is quiet and fast with higher torque than ICE car
- ▶ Electric car gives you freedom to “refuel” at home, no gasoline needed
- ▶ Electric car requires little maintenance and repair
- ▶ Saving an average of \$2,500/year in gasoline and maintenance



Barriers to Electric Vehicle Adoption

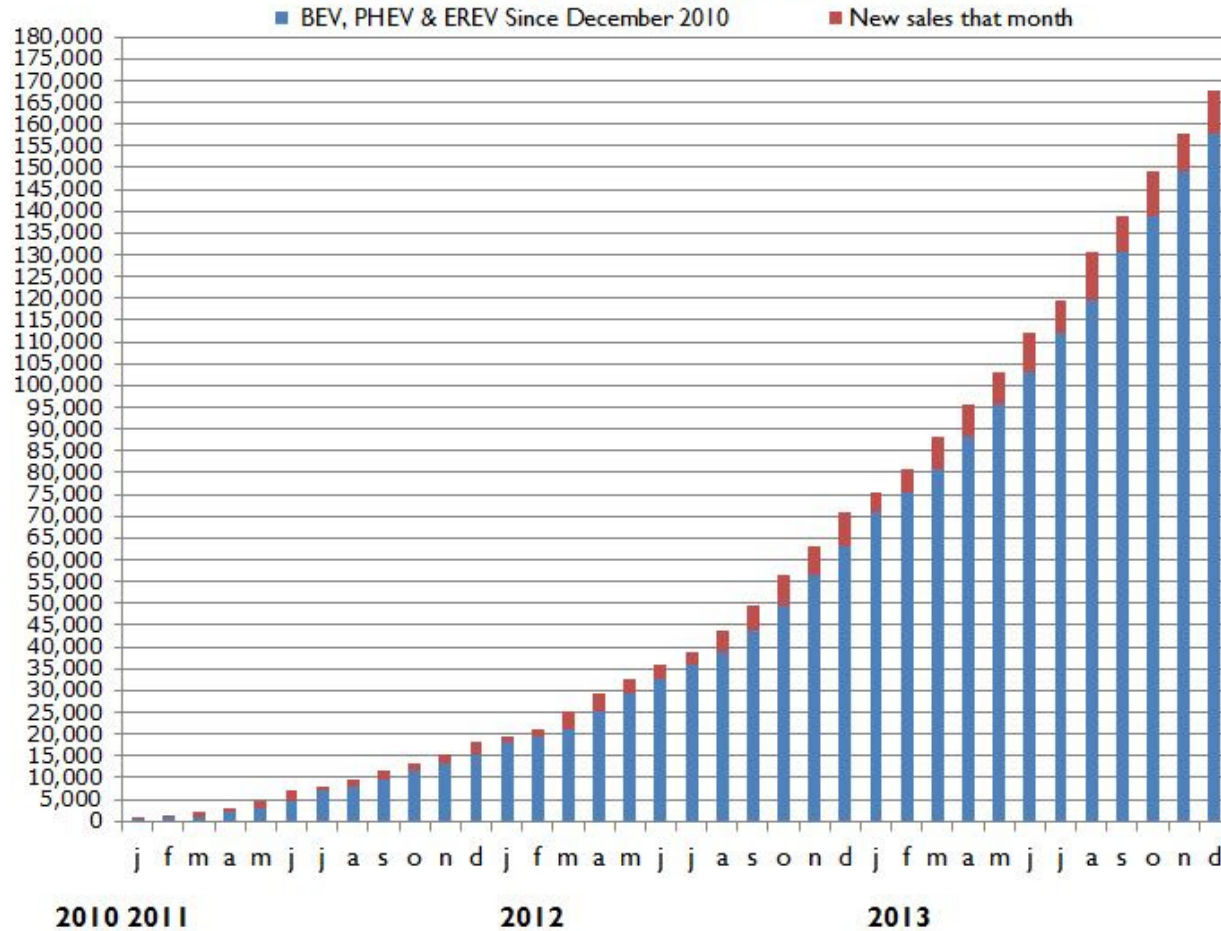


- ▶ Limited range or “range anxiety”
- ▶ Limited public charging infrastructure
- ▶ Long charge times



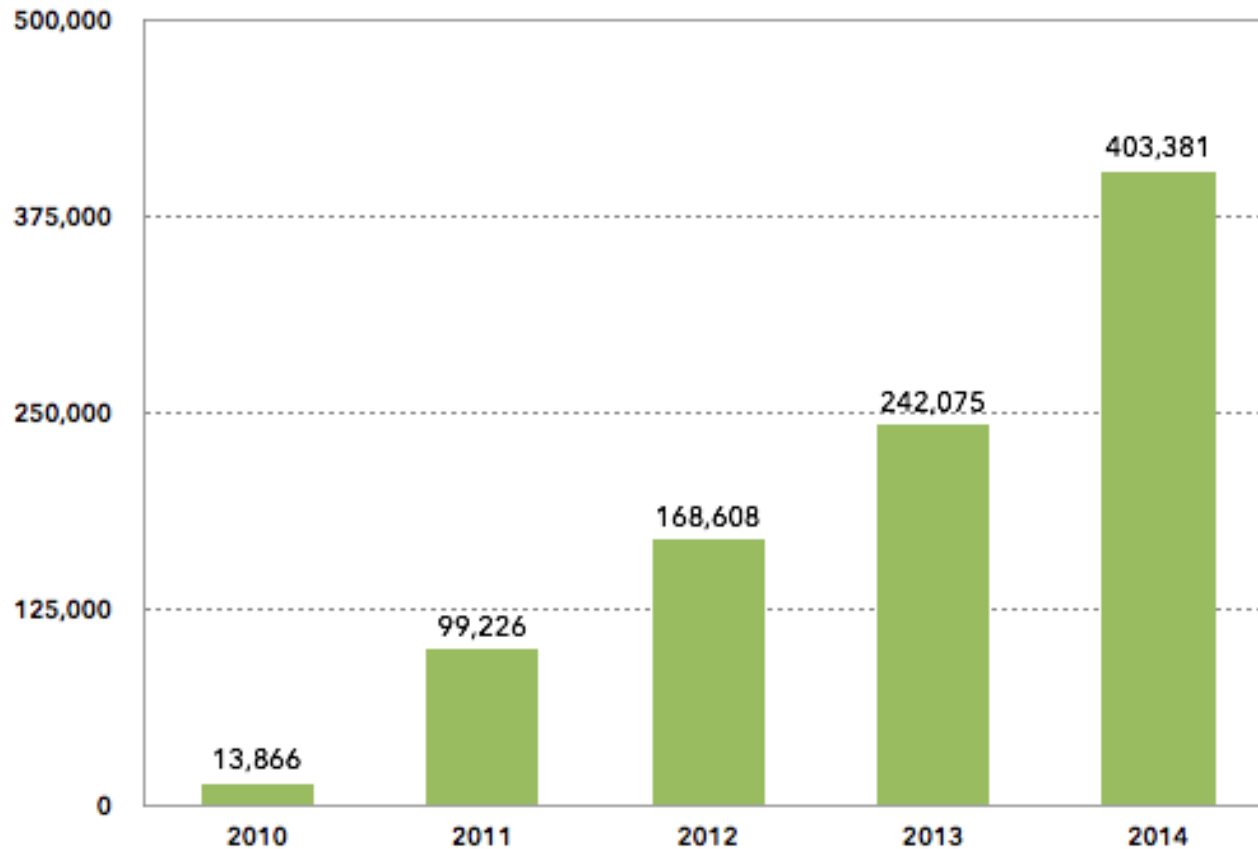
Fast Increase of EV sales

Cumulative U.S. Plug-In Vehicle Sales



Fast Increase of EV sales

**Global Electric Vehicle Production Forecast
(Battery Electric Vehicles and Plug-in Hybrid Electric Cars)**



California Corridor Charging EV Infrastructure

To build the first corridor charging infrastructure for all electric vehicles along the Interstate 5 and State Highway 99 connecting Northern California, Central Valley to Southern California.

Example:

About 50 miles between fast charges over 500 mile journey on I-5 from Sacramento to San Diego

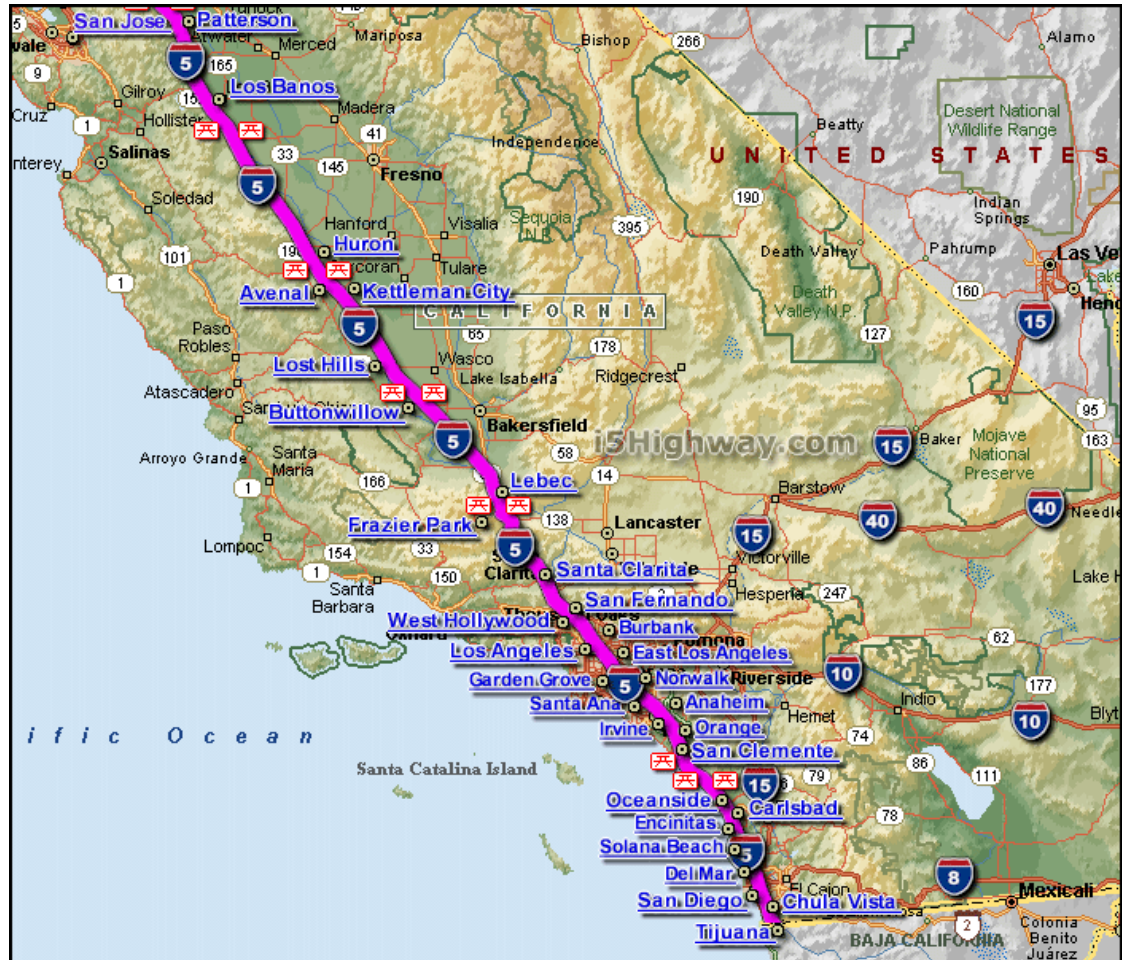


Charging EV on I-5 from North to South CA



Interstate I-5 is the main corridor connecting Northern and Southern California, through many major cities over 500 miles:

San Jose, Stockton, Lebec, Bakersfield, Santa Clarita, Burbank, Los Angeles, Norwalk, Anaheim, Garden Grove, Santa Ana, Irvine, Mission Viejo, Oceanside, and San Diego.



Charging EV on CA-99 in Central Valley



State Highway 99 (CA-99) is a major north-south highway in California's Central Valley, traversing 274 miles as it links seven of the eight counties in the San Joaquin Valley.

Major cities on CA-99 include: Stockton, Modesto, Merced, Fresno, Tulare and Bakersfield



Electric Vehicle Supply Equipment (EVSE)

Level 1



- 8-12 hours
- Overnight recharging
- Residential use
- Some work-place use

Level 2



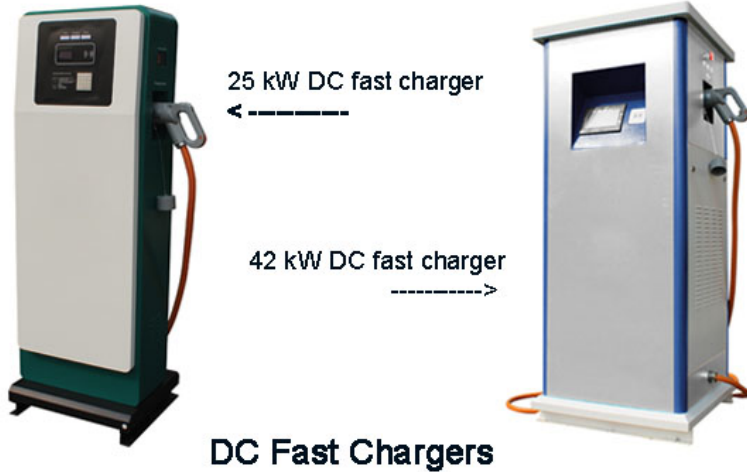
- 4-6 hours
- Destination recharging
- Residential use
- Work-place and public

Level 3



- 20 minutes
- Quick recharge and long trip
- Commercial location only
- Additional siting criteria

EV Express™ Fast Chargers



- ▶ Charging an EV within 20 minutes
- ▶ Paying with credit cards
- ▶ Can be installed at any place with available electricity
- ▶ Financially self-sustainable
- ▶ Wireless monitoring and assistance
- ▶ Flexible protocol: CHAdeMo or CCS
- ▶ Distributed by EV Centers of America in US, Canada and Mexico



Installing an EV Fast Charger at a commercial site



- ▶ Environmentally friendly is a new product feature
- ▶ EV charger offers a new competitive advantage
- ▶ EV fast charger replaces a gasoline pump
- ▶ EV fast charger can be financially self-sustained
- ▶ EV drivers will pay electricity via credit cards
- ▶ Example: Residence Inn at San Juan Capistrano features a DC fast charger



Installing an EV Fast Charger at a Hotel



For more information

If you are Interested in having a DC fast charger installed at your business location, please contact:

Cleantech Institute

Tel. 800-567-8184

Email: info@cleantechinstitute.org

Website: <http://cleantechinstitute.org>



Thank you !

Lloyd L. Tran
Chairman
US Green Vehicle Council
Director, Cleantech Institute
Tel. 800-567-8184
LTran@cleantechinstitute.org

Never doubt that a small group of committed people can change the world. Indeed, it is the only thing that ever has. (Margaret Mead)

