

## Fighting Range Anxiety: US increase incentives for EV charging stations

The mobility shift toward electric vehicles is rolling forward and players in the two biggest markets today – Europe and the United States – are eager to develop the most successful business models and strategies.

But for electric vehicles (EV) to become mainstream, certain challenges need to be overcome. People have concerns the driving range of electric vehicles won't be enough to meet their needs, a problem known as *range anxiety*. As more EV models have been introduced over the past several years – including plug-in electric vehicles, battery electric vehicles and plug-in hybrid electric vehicles – EVs are limited by driving range, which is related to battery capacity. Current driving ranges are usually between 60 and 200 miles before recharging.

Still, the common notion is this: EVs are fine for people who tend to make short trips and who are not afraid of a little charge rage while being on the road. To fight this anxiety and to stimulate market players, many States are offering increasing incentives such as tax credits to create networks of charging stations all around the country.

At least 22 plug-in electric vehicle models were available in the US by 2014. But the lack of a dense affordable and user-friendly grid of public and semi-public charging stations remains the biggest challenge for the adoption of EVs. Therefore manufacturers, automakers, utilities, and state and federal agencies are rapidly expanding their efforts to provide this much needed charging infrastructure. Today, according to the US Department of Energy, more than 9.000 nationwide electric charging stations now exist, more than half of which have been built since 2012.



Source: [energy.gov](http://energy.gov) / *Alternative Fuels Data Center*

## Nationwide Incentives

Various forms of policy incentives can contribute to making electric vehicles more attractive to consumers. Direct subsidies, such as tax credits and rebates, or indirect incentives, such as carpool lane access and public charging infrastructure, can reduce the effective total cost of electric vehicle ownership through direct financial savings and through time savings.

Currently, the US federal government offers a tax credit for up to \$7,500 for electric vehicles, substantially reducing the purchase price. Before 2014, it also offered a tax credit of up to \$1,000 for charger installation in homes and up to \$30,000 for businesses.

## Statewide Incentives

In addition to federal efforts to promote electric vehicles, state and local governments have begun offering electric vehicle incentives in recent years. But what is the total value of state-level actions terms of per-vehicle consumer benefits that could tip the scales toward higher electric vehicle sales. Further, are the various state electric vehicle incentives beginning to significantly influence electric vehicle adoption rates? In this early stage of electric vehicle market development, governments could benefit from an improved understanding of best-practice policies emerging to cost-effectively spur electric vehicle sales.

Many states offer subsidies for home chargers and public chargers in the form of tax credits, rebates, and grants. Generally, a state covers a percentage of the cost, capped at a certain amount. Some states subsidize both hardware and installation cost, while some only subsidize hardware or only installation cost.

## California

In its quest to get 1.5 million EVs on the road by 2025 California is at the forefront of adding financial incentives for car owners and inviting utilities to invest in infrastructure for charging electric cars (during 2014, California surpassed 100,000 EVs). One major plan to facilitate traveling with electric vehicles is to install recharging stations at convenient intervals on major travel corridors, resulting in a network of fast chargers every 25 to 50 miles. California, by far the biggest market for EVs in the US, plans to add charging stations along its length, extending what state governments have called the “West Coast Electric Highway” all the way to Mexico.

According to its *Zero Emission Vehicle Promotion Plan* California established the following benchmarks:

- By 2015, all major metropolitan areas in California will be able to accommodate ZEVs and have infrastructure plans and streamlined permitting in place;

- By 2020, the state will have established adequate infrastructure to support one million ZEVs;
- By 2025, there will be 1.5 million ZEVs on the road in California and clean, efficient vehicles will displace 1.5 billion gallons of petroleum fuels annually; and
- By 2050, greenhouse gas emissions from the transportation sector will be 80% less than 1990 levels.

In December 2014, just before Christmas, California saw another milestone with the California Public Utilities Commission (CPUC) overturning previous policy and allowing the state's utilities to participate in providing electric vehicle charging infrastructure. The PUC envisions California utilities taking on a critical role in the transportation sector. This decision represents a new direction for the utility business model. It allows utilities to become, under certain conditions, the procurers, deliverers and suppliers of transportation fuel - in this case, electricity.

It's going to be interesting to watch how this will play out in practice. In its decision the CPUC noted that some market segments (such as EV charging infrastructure) are particularly challenging for third parties to penetrate. Utilities may be better positioned to develop those market segments, or to support third-party providers in doing so. In the big picture, even limited utility involvement in accelerating the EV infrastructure market could improve the business case for third parties.

But there is reason for concern over utility entrance into competitive market sectors. Therefore, the CPUC is setting some limits on how they're lifting the broad prohibition on utility ownership of EV charging infrastructure. In reviewing utility applications, the CPUC will consider these factors:

- The nature of the proposed utility program, and its elements.
- The level of competition in the market which the utility program would enter.
- Potentially unfair utility advantages, if any.
- If the CPUC deems that a given utility might be unfairly competitive, the Commission will determine whether rules, conditions or regulatory protections are needed to effectively mitigate anticompetitive impacts or unfair advantages.

### State Actions for EV incentives

At least 37 states and the District of Columbia have current incentives to foster the adoption of EV and the necessary charging infrastructure. The incentives provide high-occupancy vehicle lane exemptions, financial incentives, vehicle inspections or emissions test exemptions, parking incentives or utility rate reductions.

Financial incentives including tax credits and registration fee reductions are popular ways to promote adoption. State rebates or tax credits range from \$1,000 in Maryland to \$6,000 in Colorado. At least 20 states have considered legislation in 2014 to encourage the purchase and increased use of hybrid and

EVs. Minnesota passed legislation requiring investor-owned utilities to offer consumers discounted rates to charge electric vehicles during off-peak hours. Additionally, Maryland repealed a state income tax credit for electric vehicle recharging equipment, but legislation established a new recharging equipment rebate program, which provides rebates to offset the cost of installing equipment. Federal incentives are also helping boost hybrid and EV use. A federal tax credit of up to \$7,500 is available in addition to state incentives for electric vehicles. The tax credit will expire once 200,000 qualified EVs have been sold by each automotive manufacturer. Other incentives include electric charging infrastructure tax credits, research project grants, alternative fuel technology loans, and establishing requirements for federal fleets.



Source: national Conference of State Legislatures

Additionally, eight states released an action plan in May 2014 detailing an agreement originally announced in 2013 to put 3.3 million zero-emission vehicles (so called ZEVs) on the road by 2025. That's more than 15 times as many ZEVs projected to be on the road in the entire U.S. by 2015. The plan—agreed to by California, Connecticut, Maryland, Massachusetts, New York, Oregon, Rhode Island and

Vermont—calls for consumer incentives to promote ZEVs such as high-occupancy vehicle (HOV) lane access and building additional charging stations. The plan also requires establishing rates for charging vehicles that are competitive with gasoline and supporting the adoption of public and private ZEV fleets.

## Conclusion

In order to cure today's wide spread *range anxiety* incentives, laws and regulations are playing a significant role in both reducing the effective cost of ownership and driving electric vehicle sales AND developing an affordable and convenient charging infrastructure. Some types of incentives will be more effective in driving sales and expanding the charging network than others. Further research on these factors may help explain how some national and regional markets are more or less effective at accelerating electric vehicle adoption in the future.

## Sources:

U.S. Department of Energy: Alternative Fuels Data Center: [Electric Vehicle Charging Stations Locations](#)

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[CPUC says California Utilities can own charging infrastructure, January 12, 2015](#)

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The International Council on Clean Transportation: [Evaluation of state-level US electric vehicle incentives, October 31, 2014](#)