CASE STUDY

Location: Las Vegas, NV
Company: Clark County, Nevada
Study: Electric Drive

Clark County, Nevada is located in the southern part of the state and is home to nearly two million residents. The county is also home to Las Vegas, which draws millions of visitors to the county annually. Recently, the state has instated mandates that call for fleets to reduce their emissions and petroleum consumption. These mandates have encouraged the county to include many hybrid vehicles in its fleet.

Hybrid electric vehicle. Source: NAFTC.

Hybrid vehicles allow drivers to achieve better fuel economy through a number of methods. Vehicles may be hybrid electric vehicle (HEVs), plug-in electric vehicles (PHEVs), battery electric vehicles (BEVs), or fuel cell electric vehicles (FCEVs). All of these vehicles utilize a form of electricity to increase or produce enhanced fuel economy. The vehicles used in Clark County's fleet are HEVs, which are not plugged directly into the grid.

Decisions Points

As decisions about petroleum reduction and emissions standards are handed down from Nevada state government, Clark County had to decide how to comply with these standards. The county chose hybrid electric vehicles because they offer a worthwhile investment for the funds that were available to build the fleet. Beyond this, the county is dedicated to reducing emissions from its vehicles when it can.

HEVs utilize an internal combustion engine (ICE), one or more motor/generators, and a battery pack. The batteries are charged by the ICE or regenerative braking technologies when equipped. The vehicle uses the energy stored in the batteries to propel the vehicle under certain conditions. Also, these systems can be used to power auxiliary systems, which reduce the load placed on the vehicle's ICE.

Fleet Facts

Clark County's fleet is made up of more than 2,700 vehicles, 544 of these are HEVs. These vehicles are used for varied purposes in the county, and are helping reduce the amount of fuel that is used by the fleet as a whole. These vehicles travel an average of 8,000 miles per year. The hybrid electric vehicles within the fleet achieve an estimated 30 miles per gallon over the course of the year.

QUICK FACTS

Total Number of Fleet Vehicles: 2,754

Number of Hybrid Vehicles: 544

Total Miles Driven: 8,000 per year per vehicle

Estimated Miles per Gallon: 30

Since the county utilizes hybrid electric vehicles, there is no current need for charging stations. The battery packs used in these vehicles are charged onboard the vehicle. If the county decides to use plug-in or battery electric vehicles in the future, charging stations would be necessary to charge the vehicles. Both of these types of vehicles must be plugged into the grid to fully charge their battery packs. Though Clark County HEVs are not PHEVs or BEVs, they are required to have the ability to drive in all electric mode. This means that these HEVs are full hybrids which are slightly more efficient than other mild hybrid vehicles.

Hybrid electric vehicle. Source: NAFTC.

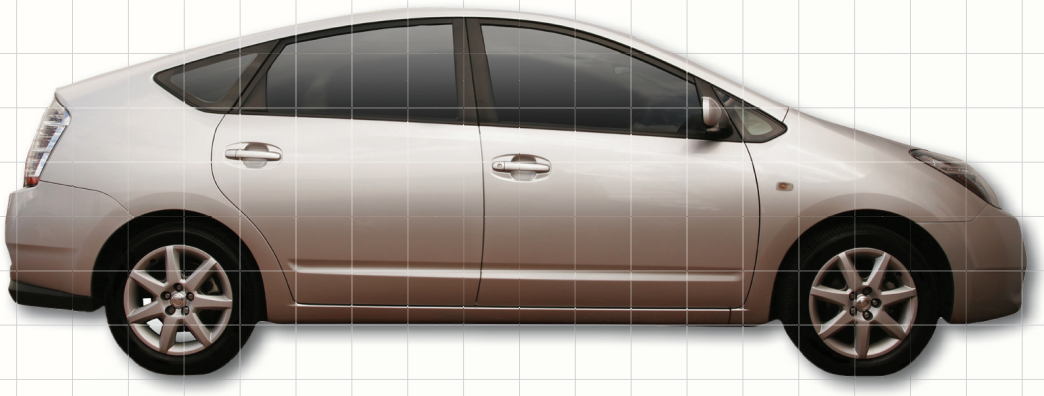
Fuel Supply and Infrastructure

As mentioned, Clark County does not utilize charging stations because HEVs do not require them to operate. BEVs and PHEVs do require these stations to fully charge their batteries. Clark County HEVs produce all of their electricity onboard through generator functions of onboard motor/generators along with regenerative braking in some cases. The fuel used by the onboard ICEs is conventional gasoline. Although these vehicles do not require special fuel, these fleet vehicles are only fueled within the Clark County fueling infrastructure.

Costs

The greatest cost advantage of using HEVs for Clark County has been reduced petroleum consumption. The hybrid vehicles that are being used achieve an estimated fuel economy of 30 miles per gallon. While this may not be much more than some conventional vehicles, it is important to remember the varied applications of these vehicles.

The initial cost of these vehicles is typically more than comparable conventionally fueled vehicles. However, the additional purchase cost can be recouped through fuel savings. In particular, Clark County estimates that it will take approximately 10 years to recover the additional costs associated with purchasing the vehicles.



Hybrid electric vehicle. Source: NAFTC.

Maintenance and Satisfaction

Hybrid electric vehicles are continually developing and evolving into the next generation of automobiles. Because of this, some of the issues with their drive systems and mechanics are also constantly changing. Clark County in particular has experienced some issues with their hybrid electric vehicles. These issues involved battery packs operation, but the manufacturer of the vehicle was able to fix the problem at no cost to the county.

Overall, Clark County has given their hybrid electric vehicles an excellent rating and everyone involved with the program has been very pleased with the results. Operators in Clark County are trained on how to properly operate the fleets HEVs. The utilization of these vehicles has helped the county save money on petroleum and reduce the amount of emissions it produces.

Summary

Hybrid electric vehicles have the ability to reduce our dependence on foreign petroleum and reduce emissions associated with conventional fuel combustion. Clark County, Nevada is a prime example of how this technology can work to save funds associated with vehicle fueling. These vehicles are often relatively similar to conventional vehicles, and implementing them in a fleet requires little or no training.