

Technology: Electric plug-in vehicles

Definition and description

Generally, electric vehicles use electricity to charge a battery and transform that energy to mechanical energy to drive the wheels of the vehicle. There are many types of electric vehicles, these include:

- Hydrogen fuel cell vehicles
- Battery electric vehicles
- Hybrid electric vehicles

The fuel cell electric vehicle obtains its power from the power grid or any other power source. However, the vehicle has a fuel cell built into it that stores energy that can be used to recharge the battery when needed. This will extend the range of the vehicle

The battery electric vehicle also gets its power from the power grid, which charges a battery. The power from the battery is used to propel the vehicle.

The hybrid electric vehicle has a small internal combustion engine. This vehicle also obtains its power from the grid, but the internal combustion engine is used to recharge the battery, if needed, thus extending the range of the vehicle.

Potential in Grenada

There are only four (4) battery electric vehicles in Grenada. However, research by the GRENLEC, which owns three of these vehicles, has shown enormous potential for these vehicles in Grenada. Since Grenada is a small island, the range issues associated with the EV can be mitigated as distances between points are generally short. Additionally, GRENLEC reports excellent fuel efficiency with 99 miles per gallon equivalent and fuel savings of about 34%. The table below shows some key relevant data on the potential of these vehicles in Grenada.

GRENLEC further reports that the vehicles are generally powerful, and in this regard, ascending the highest point on a main road on the island, is comparable to a combustion engine vehicle. The charging cycle of the vehicles, which are used every day, is also good, with the utility service van required to be charged every night, and the cars every other day.

Performance indicator	Value
Miles per US gallon equivalent	97
Fuel savings (%)	34
Miles/kWh	2.61
CO2 savings (MT)	6.91

Data taken from GRENLEC, 2016

Mitigation to climate change

The table shows that from the three vehicles about 6.91 MT of CO₂ can be avoided. Grenada national fleet consists of approximately 20,000 vehicles. Assuming that 50% of these vehicles, including cars, SUVs and other small vehicles, are replaced by electric plug-in vehicles, then approximately 20 MT CO₂³³ emissions can be prevented.

Advantage(s)

- Reduced carbon dioxide emissions
- Greater fuel efficiency
- Lower maintenance costs , compared to the combustion engine
- Opportunity to create new jobs and build new skill sets
- High public interests

Disadvantage(s)

- Higher perchanse cost compared to the conventional combustion engine vehicle
- Lack of charging infrastructure (powered by renewable energy sources)
- Lack of local dealer support
- Concerns with battery life and replacement costs

Costs and other financial requirements

³³ Assuming that each vehicle will avoid 2 MT/year of CO₂ emissions using an average of 6.91 MT/year reported by GRENLEC

In context of Grenada, the cost of EVs, are generally higher than the combustion engine vehicles. The main contributor to this high cost is the battery.

Another financial implication associated with this shift is the investment cost required to install and maintain charging stations that are powered by renewable energy sources.

Status of the technology in Grenada

There are only four (4) battery electric vehicles in Grenada. However, research by the GRENLEC, which owns three of these vehicles, has shown enormous potential for the uptake of these vehicles in Grenada.