2. Battery electric vehicles (BEVs) have been introduced to consumers as an alternative way to reduce the environmental effects caused by use of internal-combustion engine (ICE) vehicles. A comparison of both vehicle types can help determine whether the use of BEVs would be beneficial in the future. Where calculations are required, show your work.

**(a) Identify** THREE strategies that the federal government could implement to encourage the use of BEVs.

(b) Assume that the fuel efficiency of the ICE vehicle is 25 miles per gallon (mpg) and that gasoline costs $3.75 per gallon (gal). **Calculate** the cost of gasoline per mile.

(c) The charger supplies energy to the BEV battery at an average rate of 4.0 kilowatts (kW) and fully charges the BEV battery in 7.0 hours. The car will run for 100 miles on a full charge. The cost of electricity is $0.11 per kilowatt-hour (kWh).

i. **Calculate** the cost of the electricity to fully charge the battery. Assume that the battery is not charged to begin with.

ii. **Calculate** the cost of electricity per mile to drive the BEV.

When it is driven 100 miles, the ICE vehicle contributes 72.8 pounds (lb) ofCO2 from the burning of the gasoline. The drilling, refining, and transportation costs of getting the gasoline to the gas station add an additional 17.7 lb of CO2 per 100 miles. The BEV does not emit anyCO2 itself, but the extraction, transportation, and combustion of the coal that produced the electricity at the power plant add 63.6 lb of CO2 for the same 100 miles.

(d) **Calculate** the difference in the amount ofCO2 that would enter the atmosphere if both cars were driven 100 miles.

(e) **Describe** TWO economic impacts (excluding costs related to climate change resulting from CO2 emissions or the cost of gasoline at the pump) that result from an increased number of BEVs on the road.