

# BUSINESS ANALYSIS

## FULLY ELECTRIC VEHICLES

**Purpose:** To determine the feasibility, cost effectiveness and demand to support the inclusion of Fully Electric Vehicles (FEV) in the statewide contracts for sedans.

**Background:** The South Carolina Energy Office has requested that the State place FEVs on statewide contract so that our customers will have that option when making vehicle purchasing decisions. Both the Division of Procurement Services (DPS) and the State Fleet Management office (SFM) have rejected the idea for several reasons including (but not limited to) lack of demand for the vehicles, difficulty in preparing a specification that will permit maximum manufacturer participation, and the lack of infrastructure to support the state wide use of FEVs that is convenient to the State's employees.

It is important to note that while South Carolina can, and does, research what other states are doing in the same area of concern, we are restricted by South Carolina laws and those will play a significant role in our decision making.

**Bottom Line Up Front:** DPS and SFM agree that placing FEVs on statewide contract at this time is not in the best interests of the State. Without sufficient infrastructure to support the statewide use of FEVs there is not sufficient demand to justify the expense of solicitation and administration on a contract that is not expected to produce enough revenue to "pay for itself" let alone be profitable.

**Current Situation.** DPS has not previously solicited for FEVs on a statewide contract for the reasons provided in the Background paragraph above and there is no significant changes to those reasons that would cause this office to reconsider.

To date, there have been no requests by any agency, at least as far as we are aware of, for the purchase of FEVs outside of a statewide contract. This is not unusual since if an agency wanted to purchase one the total potential value of the purchase would most likely fall below the statutory \$50,000.00 threshold or the agencies certification level.

### **Research and Factors Considered.**

Both DPS and SFM conducted extensive research into this topic before making a determination. The factors considered and the results of that research are described below.

#### 1. Specifications

- a. SFM performed significant research to determine if it would be possible to create vehicle specification that would permit maximum participation among multiple vendors. The State's vehicle procurements are divided into classes within each category of vehicle class. For example, in the Sedan category we have compact, intermediate and large classes, and specifications that differ for each class so that we can permit maximum competition for the vendors and options to our customers.
- b. The FEV market is small and there are no standard classes for FEV vehicles. Each manufacturer who makes one (not all of them do) has their own design and specification and they range from a very compact Smart Car to the grossly expensive Tesla models. This makes it difficult to create specifications that will be broad enough to permit multiple vendors to make an offer.
- c. SFM has determined that they are able to create a specification broad enough to include multiple vendors given the current models available in the marketplace. However, research indicates that some of those models may not be available in subsequent years (our contracts require a two year commitment in order to make an offer), or they may vary enough in their redesign that the subsequent model of the vehicle may not meet the specifications as they were awarded to the current model.

#### 2. Offer Evaluation

- a. Even more important than a good set of specifications is the ability for the State to properly evaluate an offer to meet the requirements of South Carolina Law. SC Code § 1-11-310(H) states "Preference in purchasing state motor vehicles must be given to hybrid, plug-in hybrid, biodiesel, hydrogen, fuel cell, or flex fuel vehicles *when the performance, quality, and anticipated life cycle costs are comparable to other available motor vehicles* (emphasis added)."
- b. To meet the requirements of the code above, DPS uses a method to determine Life Cycle Costing (LCC) for all non-law enforcement vehicles below 8500 GVRW. LCC are not performed on law enforcement vehicles or vehicles larger than 8500 GVRW because the EPA does not provide mileage estimates for those vehicles.
- c. Factors considered in LCC are the Bid Price (considering all ADDs & DEDUCTS), the resale value, EPA Mileage estimates, lifetime depreciation, and estimated lifetime fuel costs. The State has used this method consistently since 2008 and has not received any indication from the manufacturers that this method favors any one manufacturer or somehow is not a fair and equitable method of evaluation.
- d. FEVs cannot be evaluated in the same method for the following reasons.

- i. The EPA provides estimated Miles Per Gallon Equivalent (MPGe) for FEVs which could be used in an evaluation. However, since FEVs do not consume fossil fuels, there is no way to accurately evaluate the MPGe versus the total fuel costs and be used as a measurement for other comparable vehicles. Meaning, we cannot compare “apples-to-apples” when evaluating against other sedans.
        - ii. The lack of an estimated lifetime fuel costs impacts other formulas in the evaluation and skews the results of the evaluation formulas as they are currently established.
      - e. One evaluation option that may be possible is to apply the logic used in not evaluating LCC for law enforcement and larger vehicles to FEVs. The EPA does not provide MPG factors for vehicles over 8500 GVWR or law enforcement vehicles that will permit the LCC evaluation, so we could potentially evaluate and award based on price considerations only.
3. Infrastructure
  - a. This has been the main point prohibiting the widespread use of FEVs and not just in State government, but in the civilian sector as well. South Carolina does not have the widespread infrastructure to support the large scale use of not only FEVs, but most of the alternate fuel vehicles throughout the State. Certain portions of the State that border larger cities in neighboring states (Rock Hill for example) have the benefit of large metropolitan areas where the necessary infrastructure exists and flows outward to smaller cities.
  - b. The lack of infrastructure makes it difficult for widespread use of FEVs for anything other than local use in the agency’s location.
4. How Other States Purchase FEV.
  - a. South Carolina requires that we write the specifications for our vehicles to permit the most competition possible, with very few examples of writing specs for just one manufacturer’s vehicle. An example of this would be pursuit rated law enforcement vehicles. Very few manufactures make a pursuit rated law enforcement vehicle so we have to write our specifications to what the market will provide, and sometimes that is just one vehicle.
  - b. Research indicated two basic scenarios from the other State’s researched; The State’s fleet management would prequalify certain FEVs for use by State agencies, or the State would buy specific vehicles rather than specifying in such a way as to ensure competition across manufacturers. Neither of these options is available to South Carolina.
5. Availability of FEVs.
  - a. The State reached out to all vendors currently on contract or previously on contract with the State to determine the availability of FEVs on a large scale basis in South Carolina. Only one vendor (Chevrolet) responded and stated that they would make the vehicle widely available in the State.
6. Customer Needs
  - a. The State directly emailed all State agencies who are currently participating in the vehicle specification process. Then, we sent a message through SCAGPO that reaches almost all members of government procurement in the State. Both emails asked the customers to provide the State with their current or intended use of FEVs.
  - b. The State received seven responses to our inquiry with the following results:
    - i. No need/desire at all – five (5)
    - ii. Would support if sufficient infrastructure was in place – two (2)
    - iii. Currently have an FEV – None
    - iv. Intend to buy an FEV - None
  - c. Infrastructure is the biggest reason against the use of FEVs.
  - d. Another issue that is repeatedly raised is the inconvenience posed by FEVs.
    - i. Are there sufficient charging stations at my destination so my vehicle can charge while I’m there?
    - ii. How close are the charging stations to my destination? If they are not collocated, how do I get from one place to the other?
7. Cost Effectiveness – Range of Vehicles
  - a. Cost effectiveness is very difficult to determine because no direct comparison between FEVs and other vehicles can be made. This restricts the State’s ability to properly evaluate FEVs as required by SC Code § 1-11-310(H).
  - b. It is difficult to even compare the different FEVs against each other due to:
    - i. No specific classes of FEVs exist as with other vehicles. Manufacturers make what they want, mostly in the smaller to intermediate vehicle class.
    - ii. So many factors must be taken into consideration when trying to compare the different types of FEVs to each other. Size and type of batteries (none of the vehicles on the 2017 EPA report use the same battery), charging times, MPGe and estimated ranges. Of the five vehicles the State believes would qualify for our potential specification, the estimated range varies between 89 miles and 238 miles.

**Conclusion**

There is no demonstrable demand for FEVs by the State’s customers, mainly due to a lack of infrastructure throughout the State, and until such demand exists it is not cost effective to the State to explore the FEV option further.

**The following comments were provided by State Fleet Management on 6/5/2018.**

We have reviewed the document and believe it outlines the reasoning very well.

We do believe the time is coming for Hybrid, Plug-In Hybrid and Fully Electric Vehicles, but the market and infrastructure is not there yet as you have stated. Many manufacturers have outlined plans to electrify their offerings including Ford, Jeep, Volvo, and BMW and we think our vendors/manufacturers will be ready to fill these categories in the next few years. That said, we suggest the Energy Office continue its work to build and enhance the charging infrastructure. We work with the Energy Office on multiple committees to promote this agenda including the building/promoting of other alternative fueling infrastructures such as Propane Autogas, CNG, etc.

We also suggest, and have suggested previously, that the Energy Office strive to communicate to the Federal Government to change the EPA standards to reflect the Automotive industries move toward Hybrids, and Plug-In Hybrids by updating EPA 92 to allow for a full credit for hybrids instead of the ½ credit they receive now. The technology shift towards electric vehicles must be recognized by the US Department of Energy. In reviewing the E-85 Flexible Fuel offerings over the last few years, there are only 52 model/engine configurations offered in MY18 compared to almost 80 only 5 years ago. This includes vehicles that do not meet the State's vehicle specifications and brands that are not competitively priced (i.e.: Mercedes-Benz, Jaguar). In fact only 30 are models that could be bid on Contracts, but many of these models compete with each other.

By building the infrastructure and access to more FEV and PHEV manufacturer offerings will help drive down the non-competitive cost of Electric and PHEV's, however, we will not be able to meet the EPA requirements unless laws are updated.