

This document represents the collective response of the Department of Mathematics and Engineering of the Northern Caribbean University to the OUR report on EV penetration in Jamaica.

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### **Question 1: Barriers to EV Ownership**

- (a) What are your views on the relevance of the identified barriers to EV ownership in our jurisdiction?

One of the identified barriers to initial uptake of the EV is the upfront cost, which is estimated at 30% more than ICE vehicles. This is somewhat misleading in that ICE vehicles are mostly second-hand and can be purchased without an extensively large auto loan. The newer EV will be typically purchased with an auto loan and the additional insurance costs would increase the initial outlay.

- (b) Are there other relevant barriers not contemplated? If so, please provide details?

The public perception of the availability of charging stations or the cost of home charging.

- (c) What measures would you suggest surmounting these barriers?

The GOJ must make an explicit move to using renewable energy sources to reduce the country's reliance on JPS-delivered electricity.

### **Question 2: Jamaica's Road Network**

- (a) What are your views on the appropriateness of Jamaica's Road Network to support the location of charging infrastructure for EVs?

The energy usage analysis provided by the report is not crystal clear. Many problems are unique to a mountainous island in the developing world. Absence of rapid-recharging stations in the most remote locations may deter potential EV owners from traversing such routes. The elevation climbed by the EV, for example, from Santa Cruz to Mandeville is not apparently accounted for on the calculations for range, hence there may be a demand for more recharging points in hilly and remote areas. The accompanying winding roads would also nullify the published range of the EV under those circumstances.

- (b) What would you consider to be an appropriate distance between EV charging stations in Jamaica to mitigate range anxiety?

I quote "EV technology possesses characteristics suited for the transportation needs in a small jurisdiction like Jamaica where travelling distances are relatively short." Is misleading, most journeys are short, but no one in Jamaica wants to downgrade from a vehicle that would have carried them through two parishes to one that can only take you within one. This is a cultural issue and as such the

vehicle-owning populace will need to be educated in this reduction in energy usage as a lifestyle change.

- (c) Should the Jamaican Motor Vehicle Registry be allowed to share EV registration and owner's location with JPS?

Unnecessary, because the demography of dormitory communities is already in the public domain.

- (d) If the response to (c) is positive, do you think privacy concerns will act as a barrier to EV ownership?

### **Question 3: Regulatory Approaches and Incentives**

- (a) Do you think that the GOJ and its agencies are doing enough to encourage the uptake of EVs?

The GOJ has not really understood the reason behind the deathbed need for a country such as ours to reduce its reliance on fossil fuel entities. The approach of first modelling appropriate behaviour is completely absent from the GOJ mantra.

- (b) Please provide detailed reasons for your response. What steps, in your view, are required to implement the proposed incentives/ approaches?

The GOJ needs to begin by immediately now only purchasing hybrid vehicles for the more labourious duties and fully electric vehicles for less strenuous duties within the corporate area.

- (c) What are your views on the proposed approaches and incentives considerations to encourage EV take-up locally?

The immediate reduction in importation duty is almost impossible without international help. The GOJ is over reliant on the duties it places on imported vehicles. So, one alternative would be to allow banks to provide low-interest eco-friendly auto loans, which would be delivered to the EV purchaser under international ISO directives:

#### **ISO 14067:2018 Greenhouse gases — Carbon footprint of products**

**ISO 14001:2015 Management of environmental responsibilities in a systematic manner that contributes to the environmental pillar of sustainability.**

- (d) Are there any other appropriate incentives and/or approaches not identified? Please provide details. Do you share the view that GOJ should mandate EV targets for its own vehicle fleet?

The incentives to switch are limited as Jamaica is an endpoint for vehicles. New vehicles that are now being purchased should be subject to a significant green tax encouraging the purchase of low-carbon emission ICE, hybrid and EVs. For the most part, modelling good behaviour is essential in developing trust, but can one imagine the fateful scenario of an EV pursuing an ICE only to run out of charge?

- (e) What difficulties do you think the GOJ will experience in implementing the proposed incentives or adopting the proposed approaches?

The lack of trust from the vehicle-owning populace, they need to see the change in behaviour within the GOJ. They must be disciplined in implementing the rules to its workers by not allowing concession rates on high carbon emission SUV for anybody currently serving.

#### Question 4: Business Models for Infrastructure Ownership

(a) What policy options adopted in other mature EV markets would be appropriate for Jamaica?

The alternative to EV is hydrogen, the waste product would be steam which would not cause a problem. The only concern would be that the production of hydrogen on a large scale is energy consuming and thus we would be in a catch 22 situation, A fiscal compensation for the scrapping of ICE vehicles or when converting to a zero-emission vehicle would require international help, but it is not an impossibility.

The other major policy change required by the GOJ is to offer a financial incentive of lower duties on EVs with a motor capacity of about 100 hp and follow the other Barbadian lead in partnership with the country's utility company in electrifying its own fleet.

(b) What other challenges can you identify that may be unique to Jamaica and would require a different set of policy options or variations to other jurisdictions?

Several R&D institutes need to be built to facilitate EV research in harnessing the available PV power available. The rural areas in Jamaica where very few EV charging stations are proposed need to have solar farms.

(c) What are your views on the appropriateness of the integrated and the independent business models for Jamaica?

This is solely dependent on the Electricity Act. If it is amended to excluded EV charging stations, then independent business models can flourish.

Are you of the view that both approaches are permissible in Jamaica?

Both approaches should be available, whether they would flourish is another matter.

(d) Please provide reasons for your answer. If you are of the view that neither of the approaches in (c) is applicable, what business models for infrastructure ownership do you think would be suitable for Jamaica to successfully deploy EV charging infrastructure?

The success of each approach would be dependent upon the role the JPS plays in the future electricity production. The deregulation the electricity supply would see the country will significantly advance.

#### Question 5: EV Charging Regulation

(a) What are your views on utility participation in the EV charging market?

It is self-evident that we cannot have an overbearing element in such a fragile, yet crucial market. Jamaica is fortunate in that it has typically over six hours per day of sunlight everyday all year. To harness this solar capacity the GOJ needs to decentralize the delivery of electricity.

(b) What, in your view, would be the benefits or disadvantages to utility participation in Jamaica?

The reduction in the importation of fuel and the reduction in GHG and the reduction of the nations carbon footprint.

(c) What are your views on charging activities being considered a 'supply of electricity' under the current legislative and regulatory framework?

Indeed, it is a supply of electricity, but to what end? The supply of electricity originally meant it was delivered as a utility and not as fuel for energizing vehicles. The caveat needs to be made and then the GOJ can make sensible progress in delivering the notion that EVs are the only viable option for the inevitable replacement of ICE vehicles.

(d) Do you think the current electricity regulatory framework facilitates or hinders the private ownership and deployment of EV charging infrastructure? Please provide detailed reasons for your response.

It clearly hinders private ownership of EV charging infrastructure, as the consensus is that JPS can hike prices as they see fit and have pegged the price of electricity to the US dollar. The commodity of electricity in the tropics should not be centralized as this reduces competition and artificially inflates prices, which will no longer be based on fossil fuel. The uniform delivery of solar energy across the country should see the decentralisation of electricity supply.

(e) In your view, do you think that there are aspects of the regulatory framework that can facilitate the rapid uptake of EVs? If yes, what aspects? What appropriate steps should the GOJ take to expressly exempt charging activity under the current legal and regulatory framework? What are your views on regulation of EV charging activities?

The Barbadian utility company has a sensible approach whereby the EV owner is not charged for electricity but charged for time at the station. The GOJ could easily make a caveat for independently owned charging stations in specific parishes to be tarified for supplying electricity to EVs. These parishes, such as St Elizabeth, Hanover, St Mary, and Portland, where there is not any currently proposed construction of JPS-controlled EV charging stations, could have private licenses delivered to qualified energy providers.

#### **Question 7: Relevant Legal and Regulatory Framework**

(a) Do you agree with the strategies proposed to incentivize EV penetration under the current regulatory framework?

No, we do not. Any strategy that allows for the continued importation of ICE vehicles is retrograde. Currently on the wharf are thousands, if not hundreds of thousands of ICE vehicles and yet the GOJ is still granting permission for the further importation of such vehicles. The first step must be to halt immediately the importation of personal use ICE vehicles.

(b) In your view, what regulatory initiatives can be employed in short order to incentive EV take up. What, in your view, are the challenges to any of the proposals identified?

Reduce the importation tax on EV AND increase the tax on ICE.

(c) In your view, what additional strategies can be employed to encourage EV take-up under the current regulatory framework?

See answers to 7a and 7b.

### **Question 8: Benefits of EVs Uptake**

- (a) Do you think that more EVs in the system will significantly reduce the dependence on imported fuel?

Most certainly, but the skepticism surrounding the GOJ underlying motives will hinder the speedy advance to reduce the production of GHG.

- (b) If yes, how? If no, why not?

Only if the initial production of electricity is from the Carbon-free sources such PV, wind power and hydropower. Otherwise, the exercise is futile and non-progressive.

- (c) Do you agree that largescale EV adoption will significantly reduce greenhouse gas emissions in the environment? If yes, how? If no, why not? Do you agree that large scale EV adoption will have a positive impact on the economy? If yes, how? If no, why not?

Please see the answer to 8b.

- (d) The economic assessment carried out indicated that the pay-back period is more attractive for EV travelling a high number of miles. Do you think that EVs would be more economical for public passenger vehicles than private vehicles?

All types of vehicles are more economical if they are carrying more persons.

### **Question 10: Impact of EV charging on Electricity Supply**

- (a) What are your views on the effect of large-scale EV adoption on the electricity supply system?

Solar panel farms in the rural areas of Jamaica are the only real environmentally friendly solution.

- (b) What do you think of charging of EVs at home and workplace?

Brilliant idea. This is really asking if energy supply should be decentralized. Charging at the workplace would reverse the anomaly of nighttime peak usage of electricity in Jamaica. It would then allow for simultaneous photovoltaic production and usage without any need to plan for storage.

- (c) Do you think high adoption of EVs in Jamaica will reduce your electricity bill?

This a loaded question, as it assumes that EV adoption should take place with the JPS being the center of the electricity universe. If the supply of electricity is allowed to proliferate throughout the country, then the electricity bill will be reduced, especially at the national level.

- (d) Do you believe that the use of smart grid charging will allow for a greater penetration level of EVs when compared to uncontrolled charging? If yes, how? If no, why not?

Again, the premise of the question is solely on the notion that JPS must remain in its current dominant position. Smart grid charging is unnecessary if the Electricity Act is amended.

- (e) What are your views on the effects of TOU billing on EV charging behaviour? What incentives should be offered for EV private home charging? Do you think that a TOU tariff option would reduce the impact of charging load on the grid?

The answer for (10 b) would also apply for workplace recharging, so that EVs, whether used primarily for transportation or for commercial purposes, TOU tariff can be used beneficially for daytime (off-peak) recharging.

- (f) What other measures do you think should be considered to smooth the demand spike that EV charging is expected to produce?

As previously stated, if charging at work is available then the peak production time and usage time can be balanced.

- (g) Should the Jamaican Motor Vehicle Registry be allowed to share EV registration and owners' locations with JPS?

Unnecessary, because the demography of dormitory communities is already in the public domain.