

Fiji's Tax Credits for the Importation of Hybrid Cars: The Unintended Consequences of Environmental Policies

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Given the international movement on climate protection following the United Nations Framework Convention on Climate Change (UNFCCC) whose goal is reducing worldwide carbon emissions, many governments now offer a diverse range of financial incentives to consumers to elevate the sale of electric vehicles. In most countries, these include hybrid vehicles capable of driving solely on electric power. Since 2014, the Fiji Government has implemented tax incentives for the importation of 'environmentally friendly vehicles'. The tax incentives provide concessions on excise duties and value-added tax for importers and buyers of electric cars, hybrid cars, gas-operated cars (LPG and CNG) and solar-powered vehicles not older than 8 years ([Fiji Budget Address 2013, 2014, 2015](#)).

As a result of the new tax incentives, new car registrations in Fiji have significantly increased since 2014 and almost doubled between 2013 and 2018. The total numbers of cars registered rose from 89,000 in 2013 to almost 120,000 in 2018, an increase of 35 per cent; in 2013, about 7,600 cars were newly registered. In 2014, this number rose to 10,800 and to more than [14,300 in 2018](#).

According to [CarHubJapan \(2018\)](#) and [The Globe and Mail \(2016\)](#), as a result of the tax incentives, used hybrid cars are said to be the most popular cars in Fiji. The vast majority of these cars are second-hand hybrid-powered vehicles sourced from Japan, one of the largest hybrid-powered car markets in the Asia-Pacific region ([Japanese Times 2019](#)). Japan's car culture and strict regulations concerning safety inspections led to an enormous number of vehicles exported to secondary markets [sold as used cars](#).

Fiji seems to be on track to meet its political goals as outlined in its [National Development Plan 2017](#) and the [Fiji Low Emission Development Strategy 2018-2050](#).

However, adverse policy implications and subsequent consequences do not seem to have been considered. The mass importation of second-hand hybrid vehicles with [limited warranty and aging engines and batteries](#) creates one of these unintended consequences, with the potential of leading to an immensely negative environmental impact if not addressed.

What is a hybrid car?

A hybrid car is the outcome of the first and overall successful intent to integrate electrical power into a still petrol-powered car, helping improve its performance and reducing carbon emissions. The most commonly applied hybrid system is comprised of a petrol engine and an electric motor, which are able to work independently. In this arrangement, the batteries are charged by the petrol engine or brake recuperation while in strain-free highway driving. The electric motor for its part can, by itself, manage short distances solely on battery power and generally helps the petrol engine in acceleration; thus enabling engineers to reduce the size of the petrol engine and thereby [reduce emissions and fuel consumption](#). This system is applied in the Toyota Prius, the most sold hybrid vehicle in the world and in production for almost 23 years. The Toyota Prius is also the [most popular](#) car sold in Fiji since the country's adoption of tax incentives for hybrid cars.

Talking Batteries!

Most of the hybrid cars imported into Fiji are second-hand vehicles with [part of its "battery-life" gone](#). Within a range of 10 years or 200,000 km (whichever comes first) reliable hybrid batteries fall out of warranty (in older vehicles in even less time and kilometres) and transparent manufacturers will define the [maximum possible life span of their batteries at 15 years](#). Realistically speaking, an imported five-year-old car has a "guaranteed" life of 5 years left in its batteries. For a car already 10 years old, every year without needing maintenance is a lucky year for its owner and when it finally needs repairs the costs are likely more than the market value of the car.

What will happen to the batteries? Most new hybrid batteries are composed of small individual lithium-ion battery cells that create the electric power necessary for the electric motor. Alternatively, some models are equipped with [nickel-metal-hydrate cells](#). When aging cells fail, they must be replaced to assure the functionality of the vehicle. This can be done individually by a trained technician for a price much lower than changing the whole battery pack, which costs upward of US\$4000 ([in the case of a Toyota Prius](#)).

Normally, hybrid cars within their regular battery life-span do not need more maintenance than regular petrol-powered cars, given the simplicity of the electric powertrain with few moving parts. Only regular maintenance of the petrol engine in the hybrid vehicle is required, while the electric powertrain should remain service free. However, once the battery cells start to fail, high repair and replacement costs arise. Well trained technicians for hybrid cars are still rare, hence their high labour cost. Replacement parts are also rare and usually, with some few exceptions, must be bought at high manufacturer prices since an aftermarket is still pretty much non-existent.

Environmental Impact

A hybrid car battery cell in its composition is [comparable](#) to a modern mobile phone battery. And these are tricky little beasts. Their toxicity makes them a no-go for regular waste treatment procedures. It has been also observed that they have a tendency to auto-ignite over time due to ongoing chemical processes within them, generating enormous heat. This can lead to fires or even explosions – putting nature and humans in avoidable [danger](#).

Given the prime materials used to produce them are extremely rare – why would you risk NOT to recycle and return them into production cycles?

Recycling

Lithium-ion battery recycling creates another complication with electric/hybrid cars. There still exists no functional solution on how to automate this process of separating the battery cell components, due to non-existing manufacturing design standards. The components therefore must be separated by hand, which imposes heavy safety precautions due to the dangers of handling toxic, carcinogenic and even heavily flammable/ explosive materials. Hence it is very costly in labour. In its [report](#) issued in 2014, the Mineta Transportation Institute (San José, California) specifically defines problems in the recycling process and presents results of a forecasting model that calculates re-manufacturing may not be profitable until the year 2035.

Ways out

To avoid unsightly heaps of non-repairable cars, toxic waste in and around the Fiji Islands, and victims of electrocution from unsafe repair or maintenance, Fiji finds itself confronted with finding viable ways to cope with the following:

- Training of specialized and certified personnel for maintenance and repair of electric/ hybrid vehicles; management of hazardous materials;
- Organization of a functioning recycling system for this kind of (and similar) hazardous materials;

- Identification of alternative re-purposing of still functioning battery cells.

Fiji does not currently have the human capital and skillset needed to repair or maintain hybrid cars, operate recycling facilities, or the re-installation of used battery cells for other purposes. The shortage of qualified technicians specialised in this field is a global issue. British studies reveal that [97%](#) of mechanics do not have the skillset to maintain battery systems in hybrid vehicles. Companies and governments [call for the education](#) of sufficient personnel to cope with the dangers of this new demand. For example, the Tesla Corporation has developed an [educational program](#) and since 2018 offers partnership to universities around the world to take forward its technical know-how. In Fiji, the National Training & Productivity Centre of the Fiji National University (FNU) has identified the need for skilled technicians and has introduced a [basic training program](#). However, the training program is not accredited by Toyota or other hybrid car manufacturers and is not based on international best practice standards. To cope with the actual and future lack of sufficient institutionally-trained personnel, a much more serious effort, especially by the legislature, is needed.

Fiji [does not have recycling facilities](#) in place for batteries of any kind, especially not for hybrid car batteries.

The need for solutions for recycling options for hybrid car batteries is even more important in the long run as Fiji seeks to introduce electric cars within the next 15 to 20 years as outlined in the country's [National Development Plan 2017](#) and the [Fiji Low Emission Development Strategy 2018-2050](#).

Waste management is essential for a modern society living in a precious and endangered environment. More so is the management of toxic waste. Although little in amount compared to regular waste, the level of toxicity in terms of its impact on humans and nature is tremendously damaging and eventually fatal. This is especially true for a country like Fiji which relies on its natural beauty as one of the largest tourism providers in the South Pacific, and its precious natural resource Fiji Water, which is sold all over the world. To avoid these being impacted by toxic waste, the finite handling of hazardous materials, like car battery cells, requires the installation of adequate collection and treatment facilities and specialized transportation means. Legislative action and regulation will be necessary, given the nature of this service, to regulate/control safety standards and initially possibly its operation (which could eventually be transferred to the private sector). The report [Hazardous waste in Australia](#), prepared for the Australian Department of Environment and Energy (2019) providing profound insights into the technicalities, difficulties, and options. The presence of a Toyota representative on the island would open up the possibilities to handle the collection of these car battery cells and open the way for participation in Toyota's [battery buy-back program](#).

[Repurposing](#) represents an interesting alternative that might provide a short-term solution until a functioning recycling system has been installed. A lithium-ion battery cell, although losing its usability in a vehicle, has about 70 per cent of its life remaining – it can easily be tested, and if approved as functioning, armed into new battery packs for solar power storage purposes. In this way, the public and private sectors can significantly contribute to cleaner air and fewer emissions – and in addition, reduce the usage of and dependency on imported fossil fuels. There presently are a variety of companies, such as [‘re-electrify’ of Australia](#), that offer energy storage [solutions](#) based on reusable car battery cells.

While Fiji has taken the first step in achieving its National goals, it needs to take the next step to ensure that the possible adverse consequences of aging hybrid cars can be avoided. This discussion also shows that there are plenty of opportunities for Australian and New Zealand businesses and for the Australian and New Zealand Governments to assist Fiji in building capacity for overcoming the current gaps in policy and environmental challenges. As such Fiji can be a successful example for the Pacific and strengthen its position as the South Pacific hub.



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