



# Electric Vehicles in the UAE: High potential but challenges to navigate

MARCH 2020





**BENEDIKT UNGER**

Energy, transport and  
decarbonisation expert

[benedikt.unger@afry.com](mailto:benedikt.unger@afry.com)



**BRENDAN CRONIN**

Head of AFRY Management  
Consulting Middle East

[brendan.cronin@afry.com](mailto:brendan.cronin@afry.com)



## INTRODUCTION

EVs have the potential to revolutionise the transport sector

Electric Vehicles (EVs) are increasingly visible on the UAE's roads. This number is set to expand rapidly in the coming years and will interlink the transport and electricity sectors like never before.

This article examines some of the challenges to EV deployment in the UAE.

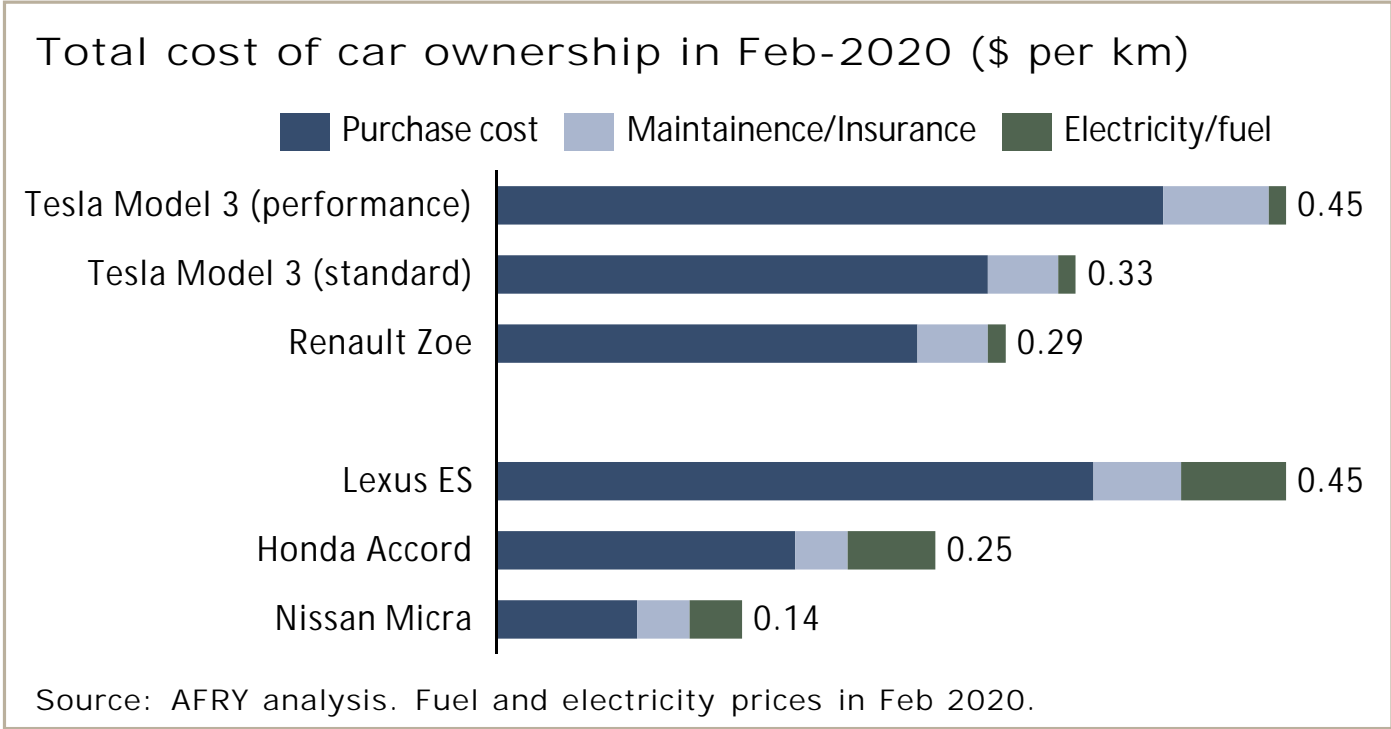
We start the article by dispelling one important myth surrounding EVs.



# THE MYTH

## Myth: EVs are not cost competitive

There has been a sharp drop in the cost of EVs in the last 5 years. At current electricity and petrol prices in the UAE, EVs close to cost parity with their conventional alternatives when factoring in the savings in fuel costs. Global production and competition will increase in the coming years and this will drive further falls in the cost and improve the economics further.



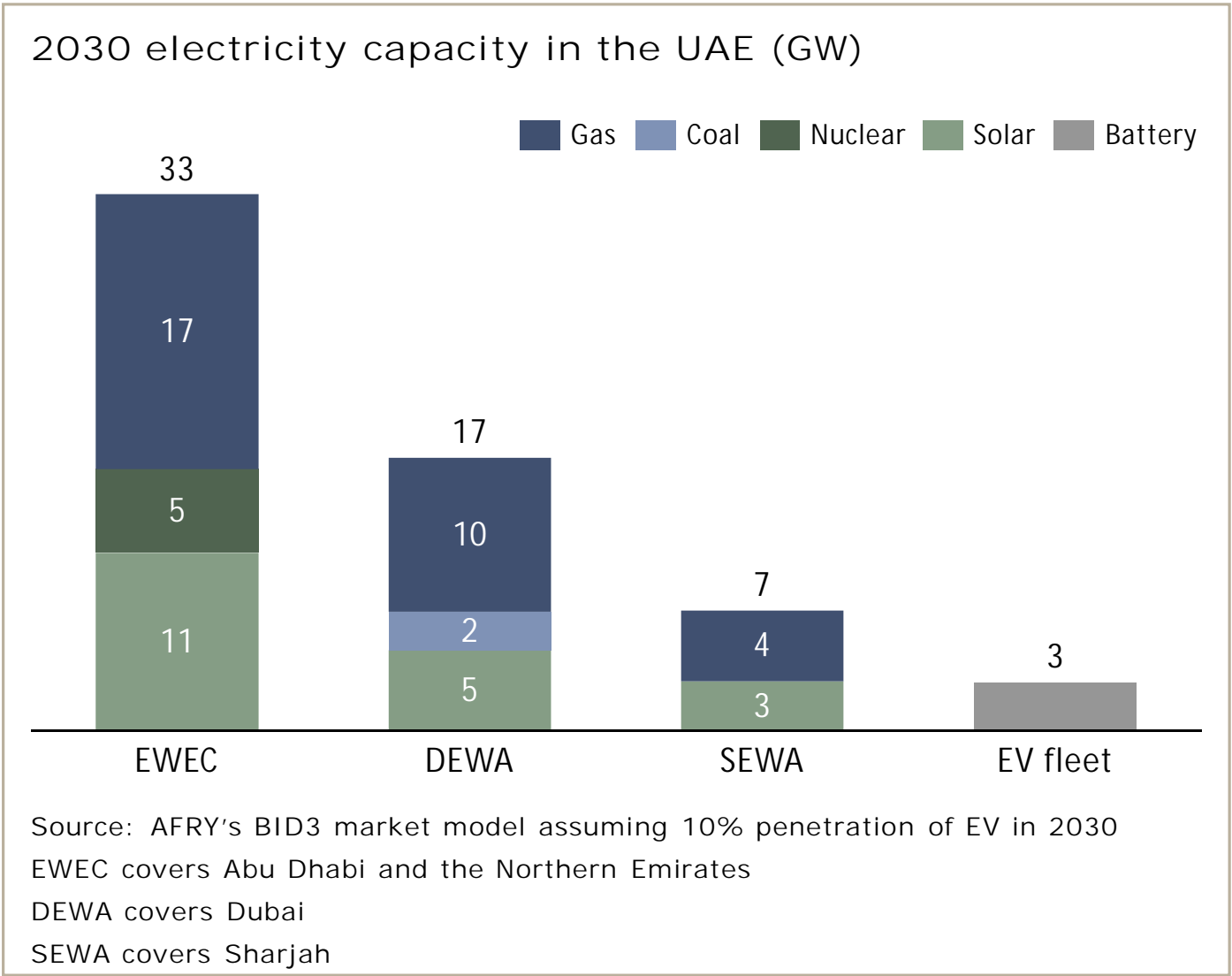
# THE POTENTIAL

EVs offer additional benefits through reduced air pollution from NOx and Ozone associated with petrol and diesel vehicles.

However, perhaps the most interesting benefit is the potential for EVs to integrate the transport and electricity sector like never before. Dubai has stated a target of having 10% of all vehicles being electric or hybrid by 2030. Should the UAE achieve 10% EV penetration by 2030, AFRY estimate there would collectively be 3GW of battery storage in the vehicle fleet.

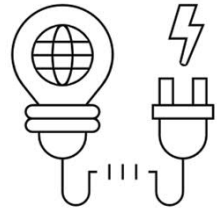
Most vehicles spend most of their time stationary. Stationary vehicles could be connected to the grid using emerging Vehicle-to-Grid ('V2G') technology. This could yield benefits of over \$100m per year to the electricity sector by through avoided investment in thermal and stationary battery capacity.

Solar PV capacity will increase quickly in the coming 5 years. System operation challenges associated with this will soon emerge. There will be a need for increased inertia, reserve and ramping services. EV battery capacity could contribute to the flexibility the electricity system will need.





## THE CHALLENGES



### Challenge 1

There are not yet appropriate models that can appeal to the UAE mass-market

In the UAE, a car is considered a status symbol for many people. Cars such as the Tesla Model 3, Jaguar i-Pace, Nissan Leaf, Chevy Bolt and Renault Zoe are only going to appeal to niche parts of the driving population. A greater number of SUV models with GCC specification are needed to appeal to wider section of the population.

Alongside new models, the dealer and maintenance network will need to give prospective buyers and owners the information and services they need throughout the EV lifecycle. It will inevitably take time to build collective knowledge within the UAE car industry.

### Challenge 2

People don't want to change the way they drive

In order to consider the switch to an EV, drivers in the UAE need to be confident that they do not need to materially change their driving habits.

If a petrol tank is nearing empty, a stop at the pump may only take 5 minutes. In contrast, an EV can take 40 minutes to charge to 80% at an ultra-rapid charging station. Most drivers will not accept this and will simply stick to their conventional vehicle. In order to make the switch more attractive, drivers need to be able to charge their car at locations they already spend long periods of their time.

Most EV charging will be done at home. However, drivers will want to be confident that there is a sufficient public charging network to support them.

There are around 650 charging points in the UAE. However, many of these are located at government buildings and hotels which are not convenient for most EV owners. Data on driving and charging patterns needs to be collected and analysed in order to identify the correct location and roll-out of charging stations. Machine learning techniques to analyse large datasets an obvious tool to aid such analysis.





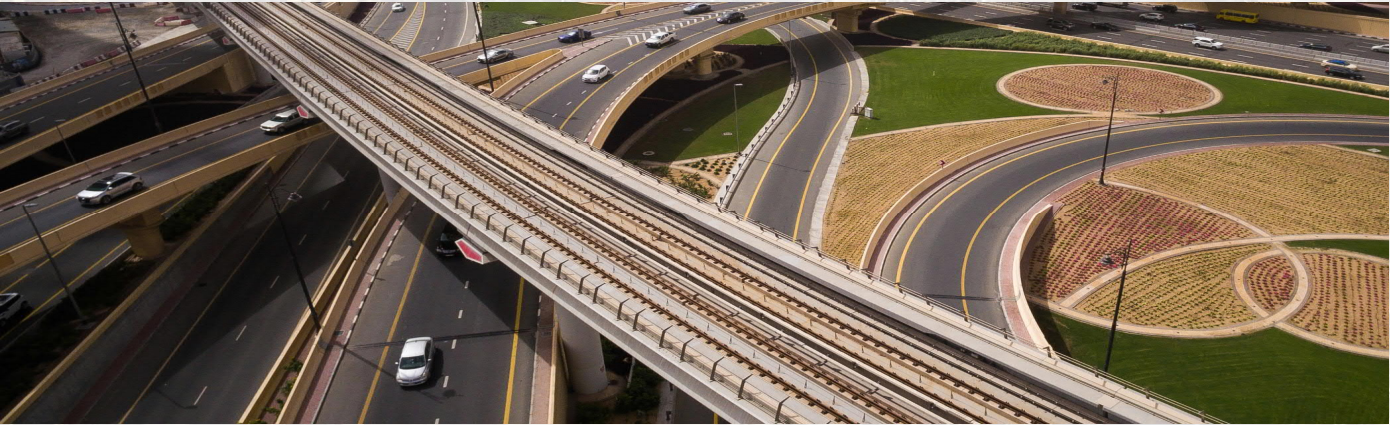
### Challenge 3

EV charging tariffs need to reflect the system cost

Tariffs for the electricity used to charge EVs should be reflective of the system conditions across the day and year. In Dubai, DEWA have set a flat tariff for EVs of 29 fils/kWh\* (waived for non-commercial users until end-2021) at their charging stations. Home charging in Dubai will be cost the at the standard retail tariff of 29.5 to 44.5 fils/kWh\*\* (depending on which residential slab is applied). In other Emirates, there is no specific tariff for EV charging.

The EV tariff needs to be closely linked to the underlying marginal cost (i.e. the cost of generating one more unit) of electricity rather than a single flat value. This may seem unnecessary – however, our modelling of the UAE’s electricity sector suggests that in the next 5 years the marginal cost will become much more variable due to the expansion of solar and even fall to zero in some periods with high solar output. The UAE should be aiming to have tariffs that incentivise EVs to respond to changing system conditions.

The EV tariff structure could also potentially incorporate a payment (or credit which can be offset against future charging costs) to EVs which provide for providing reserve and generation to the grid.



The tariff structure will also need to reflect congestion on distribution networks. Distribution companies will face major problems if many EV owners simultaneously connect to fast chargers in the early evening. Smart tariffs and EV charging could be used to manage potential distribution congestion.

\*\$79/MWh    \*\*\$80-120/MWh

### Challenge 4

Private sector participation in charging ownership and operation is limited

Currently, the vast majority of charging points are owned and operated by government entities (such as DEWA’s 240 charging points in Dubai).

Private sector participation could encourage innovation and lead to more rapid roll-out and better siting of charging points. There are different models and consideration needs to be given as to the most appropriate ones for the UAE. There are likely to be multiple models employed if the regulatory framework allows.

Charging model	Capex funding & ownership	Operation	Example
Site led	Site owner	Site owner	Hotel / Malls provides EV charging as complementary service
Privately led	Private provider	Private provider	Pod.point or Polar in the UK
Public-Private Partnership	Government	Private provider	Government tenders a set of charging points to be operated by a third party under contract
Government (non-utility)	Government	Government	DoT or RTA installs and operates charging points
Government (utility)	Utility	Utility	DEWA, SEWA or ADDC installs and operates charging points

In the UAE, the electricity sector is regulated at an Emirate level. There are very different arrangements in place in Dubai and Abu Dhabi. Cars and charge point operators will want to be able to drive and do business across the UAE. There is therefore a need for co-ordination between relevant policy and regulatory bodies for the full benefits of EVs to be recognised.



## THE WAY FORWARD

The energy and transport sector must get ready for EV deployment

In the next 3 years, automotive manufacturers will launch a larger range of EVs more suited to the UAE market.

The increase in EVs will inevitably be gradual as car dealers, maintenance networks and the general public learns about the technology.

At a policy level, there are several areas that need to be considered:

- A framework and roadmap for EV tariffs should be established
- An assessment of what different charging models should be supported should be undertaken
- Clear responsibilities for relevant stakeholders must be defined
- There must be co-ordination between Emirates of EV policy

These actions would aid the adoption of EVs and allow the UAE to realise the full benefits they can deliver.

## AFRY MANAGEMENT CONSULTING

In 2019, AFRY Management Consulting delivered over 1200 projects in 68 countries providing market, strategic, economic and regulatory advice to the world's capital intensive industries. We believe we have evaluated more energy infrastructure projects in more markets than any other advisor.

AFRY has advised directly on EV issues in 7 different countries. We have advised policymakers on the regulatory framework and impacts of EVs. We have advised the private sector on the opportunities arising from the expansion of EVs.

We would to thank the UAE EV community who contributed thoughts and comments on this article.