

February 2020

# Shift to Electric Vehicles-How will it impact GCC Automobiles sector

## GCC Electric Vehicles Growth & Demand

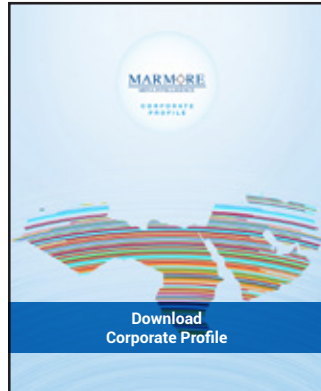


### Research Highlights:

Advancements in EV technology, high gasoline prices and lower operating costs for EVs expected to generate increasing demand for EVs in GCC.



# About Marmore



## Organizational Background

Marmore MENA Intelligence provides research-based consulting solutions to help understand current market conditions, identify growth opportunities, assess supply/demand dynamics, and make informed business decisions.

Marmore is a fully-owned research subsidiary of Kuwait Financial Center 'Markaz'. Since 2006, Markaz Research has been at the forefront in disseminating thought-provoking, hard-data backed research reports. Marmore continues that legacy with a focused approach to providing actionable solutions for business leaders and policymakers.

Since its inception, Marmore has published over 700 research reports and covered more than 25 varied industries and infrastructure segments; all focused primarily on the GCC economies. (To view our Research Library, please [click here](#))

With over 30 policy and regulatory research studies published, Marmore has partnered with renowned regional think-tanks and opinion-leaders to publish some of these intellectually provoking policy research papers. These research studies aim to initiate dialogue and propose better solutions to existing economic conundrums. (To view our Policy & Regulatory research report, [click here](#))

Almost on a weekly basis, Marmore publishes thematic economic, industry, policy and capital market reports. Marmore has been recently conferred **"Research Provider of the Year - 2018" award by Global Investor, a Euromoney Group company**. To learn more, visit [www.marmoremna.com](http://www.marmoremna.com)

## Experience/Qualifications

Marmore is the only regional firm providing niche research based on strong analytics in areas that are less researched. Marmore provides full range of financial market, sector specific and economic and policy researches, as well. The different types of researches are availed based on the client's requirements. It is notable that Marmore research reports have regularly been used by various renowned institutions to better understand the MENA region.

*Marmore's strengths can be summarized as follows:*

- » Consistent track record of quality, in-depth research offerings;
- » Skilled team with extensive experience in advanced quantitative and qualitative analysis techniques;
- » Deep understanding of MENA market and access to wide-ranging database
- » Delivers high quality, client specific, insightful research reports; highlighting key client issues and uncovering key answers/opportunities for the clients.

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Chapter 1

# Executive Summary

Automobiles have a prominent place in the life of GCC residents and the sector's prominence was supported with subsidized fuel prices given the abundant availability of fossil fuels in the region. The automobile market in the GCC countries boasts of the presence of all top international brands operating in the region for decades. GCC does not have automobile manufacturing facilities, but it is presently taking small steps in this direction.

As part of the larger drive to move away from subsidized goods and services towards market prices, Saudi Arabia and other GCC countries have hiked motor fuel prices in recent years and the markets are expected to see full implementation of market prices for motor fuels in the next few years. Therefore, like in the rest of the world Electric Vehicles (EVs) have entered the automobile market. The EVs are found to have advantage of lower fuel cost (electricity cost per km) and lower maintenance costs, while the manufacturing cost of EV is coming down and miles per recharge are going up with improvements in battery technology. More important than the fuel economy is the global initiative to switch to use of electric Vehicles (EV) in place of conventional IC engine-based automobiles with a view to reduce carbon emissions as part of the goal of Climate control and clean environment. Consequently, there is an encouragement by the governments including from those in the GCC to promote shift to Electric Vehicles.

Table 1.1: Stakeholders in GCC Automobile Sector

Stakeholders of Ecosystem of the GCC Auto sector	Impact of shift to EVs on the stakeholders
A. Local operations of international car manufacturers exporting automobiles to this region	Frame appropriate promotional schemes to enable the shift to EVS by the consumers.
B. Local companies acting as the dealers and distributors and their financiers	Train their key personnel at suppliers’ plants to absorb the new technologies in EVs
C. Banks and other firms involved in financing of the automobile purchases by individuals	Auto finance companies will need to re-examine the loan eligibility norms given the higher cost of EVs compared to IC vehicles and the shorter life and differences in resale value of the EVs
D. Institutional players like the car rental companies and corporations owning automobile fleets.	The car rental companies to re-examine the EV share in their fleet based on expected demand for EVs by their customers

# Electric Vehicles Market – Impact Analysis

Stakeholders of Ecosystem of the GCC Auto sector	Impact of shift to EVs on the stakeholders
E. Insurance companies and brokers providing protection to car owners	The auto insurance providers will need to reassess the loss ratios to price their insurance policies as costs from damage and useful life of the EVs will be different from that of Internal Combustion engine vehicles
F. Auto repair, maintenance and service outlets.	The spare parts suppliers will need to stock a different type and value of items required by the EV users
G. Car accessories providers operating in the sector, the fuel and lubricants marketing companies to the automobile sector	Their products and specifications need to be revisited to suit the requirements of EVs

Taking into accounts what is discussed above, Marmore has developed this report on Electric Vehicle market in the GCC as well as giving estimates relevant to each of the member countries.

This report is a part of Marmore's larger report on the GCC Automobile Sector which is available at the link provided below.

## Why Electric Vehicles over Gasoline fueled Automobiles

The internal combustion engine (ICE) has been the dominant power source for passenger vehicles for over a century. Even in 2017, over 98 percent of the vehicles sold in USA had an ICE. The world is however, seeing a widespread global initiative to switch to use of electric Vehicles (EV) in place of conventional IC engine-based automobiles. The EVs are found to have advantage of lower fuel and maintenance costs, while the manufacturing cost of EV is coming down and miles per recharge are going up with improvements in battery technology. Preference for EVs can be expected to result in quicker replacement of aged vehicles thereby boosting demand for new vehicles

Automobile sector globally is under the scanner, since the recent past, for their adverse effect on the environment due to Green House Gas (GHG) emissions that has made all nations to seek alternative fuels that do not cause these ill effects. This has brought into limelight Electric Vehicles (EV) as alternative to Internal Combustion (IC) engines in automobiles. Consequently, the world is witnessing a widespread global initiative to switch to use of electric Vehicles (EV). Likewise, in GCC also, EVs are increasingly being looked at as an alternative to IC vehicles to reduce GHG emission goal set for themselves by the nations in the region. Another global concern has been the fear of running out of fossil fuels like gasoline and diesel that are used in IC based automobiles. This is also therefore a driving force globally for EVs as it can dispel fears of running out of fossil fuels.

## Plans of International Vehicle Manufacturers for Electric Vehicles

Most global automakers that have ambitious plans for EVs, can be expected to influence the sales growth of the Electric vehicles globally as well as in GCC. This is because these auto companies are expected to commit higher outlays for advertisements & promotions as well as easier and more accessible financing avenues for vehicle purchases that are important factors which play a large role in determining consumer choice of the automobile brands and vehicle types like IC, Hybrid Electric Vehicles or Battery vehicles.

Global automakers current plans for EVs involve investing heavily for Electric Vehicles and most of them have strong commitment to electric vehicle production as follows.

- Toyota that has largest market share in GCC, globally sold 13 million Electric Vehicles (EVs) up to 2018, plans to sell 5.5 million EVs annually by 2030 and offer all zero-emission vehicles by 2050.
- Renault-Nissan has sold nearly 500,000 LEAFs globally—the highest volume of any automaker—and expects zero-emission vehicles to make up 20 percent of its sales by 2020
- BMW plans to offer 12 fully electric vehicles by 2025.
- Daimler plans to sell 100,000 electrified vehicles by 2020.

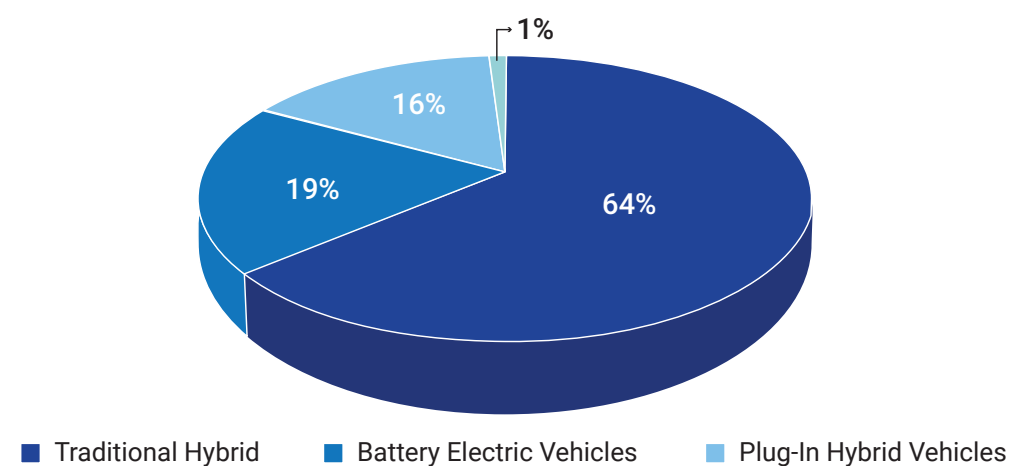


- GM will offer 20 all-electric models by 2023.
- Ford is spending \$11B and plans to offer 40 electrified vehicles by 2022.
- Honda announced two electric vehicles in 2017 and planned to have two-thirds of its lineup electrified by 2030.
- Mercedes is planning an electrified version of every model it sells
- Tesla is planning to build 500,000 all-electric Model 3s annually by 2020—which would be six times the total number of EVs sold by it in 2016.
- VW is investing \$11.8B to roll-out 80 new electric models across all of its brands by 2025.
- Volvo announced it would only launch electrified vehicles after 2019

### Electric Vehicle Purchases influenced by Gasoline Prices

US data shows that electrified vehicle (HEV, PEV, and BEV) sales and market share are highly correlated with gasoline prices. In 2013, the U.S. market achieved record high electrified vehicle sales (nearly 600,000 vehicles or 3.8 percent of market share) during a period of relatively high gasoline prices. In 2017, after a three-year dip in sales as gasoline prices dipped, electrified vehicle sales rebounded when gasoline prices rebounded, and market share for electrified vehicles reached 3.3 percent. The composition of EVs by type in 2017 are shown in Figure 2.1. Among the 567,000 electrified vehicles sold in 2017, near two-thirds were traditional HEVs such as the Toyota Prius and the Ford Fusion Hybrid. PHEVs such as the Chevrolet Volt and the Ford Fusion Energi accounted for only 16 percent of U.S. electric vehicle sales in 2017. BEVs such as the Chevrolet Bolt, the Tesla Model S, and the Nissan Leaf, accounted for 19 percent of the electrified vehicle market.

**Figure 2.1: US Market Share: Electrified Vehicles 2017**

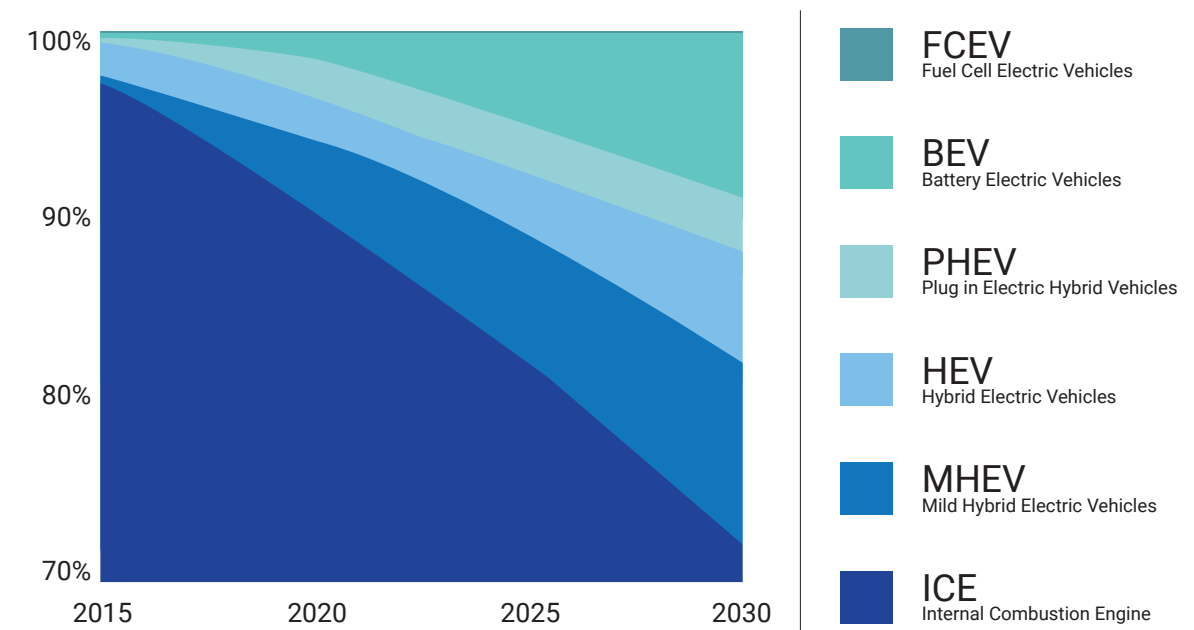


Source: Center for Automotive Research, Hybridcars.com

### Global Electric Vehicles Market Share (2015-2040)

Among the EVs, hybrids are preferred first followed by Plug-In Hybrid, full electric and fuel cell in that order. See Figure 2.2: Global Power Train Market Share 2015-2030, for understanding the expected shift towards electric vehicles globally.

**Figure 2.2: Global Powertrain<sup>1</sup> Market Share 2015-2030**



Source: Center for Automotive Research

### Electric Vehicles Characteristics considered Important by Consumers

Ultimately success of electric vehicles depends on consumer conviction since consumers treat new technologies with caution, and therefore the automobile manufacturers need to address their concerns about safety, reliability, and high costs. A JD Power<sup>2</sup> survey reveals that in US, only 40% of the respondents showed interest in EVs and their biggest consumer concerns are driving range, availability of charging stations, time it takes to charge, cost to own (maintenance and battery charge), actual purchase cost and performance and acceleration. Among the EVs, hybrids are preferred first followed by Plug-In Hybrid, full electric and fuel cell in that order. Therefore, ICE vehicles that enjoy advantages of a low cost, high performance, and utility and may continue to be favored especially in low-cost energy regions like GCC.

The infrastructure creation is still a long way in the GCC, and it can add to costs and reduce margins for the EV suppliers. People living in apartment blocks or houses without private parking spaces require designated stations erected across cities. Tesla is actively rolling out its Supercharger network at motorway service stations across various markets it operates in. Overall, sales of EVs though on the rise, are yet to offset fully

<sup>1</sup> Powertrain comprises the main components that generate power and deliver it to the road surface, this includes the engine, transmission, drive shafts, differentials, and the final drive.

<sup>2</sup> <https://www.jdpower.com/business/resource/ev-offerings-are-rise-will-consumers-buy-them> shafts, differentials, and the final drive.

costs of development and production for automakers. For most of the traditional automakers, EVs may not represent a successful business case, unless EV volumes increase significantly in the future<sup>3</sup>. The methods for charging electric vehicles continue to evolve. In China which accounts for about 60 per cent of all newly licensed and electrically powered vehicles registered worldwide, there are 330,000 public charging points available in the country for around 2.6 million vehicles. Also, online-electric vehicle (OLEV) technology is currently undergoing pilot tests. OLEV enables transferring power from tracks embedded in roads to electric vehicles (using magnetic transmitters). A city in South Korea first deployed two OLEV buses in 2013<sup>4</sup>.

Technological Advancement helping shift to Electric Vehicles

On the flip side, there is positive evidence for likely shift to EVs. Development of advanced batteries is a critical enabler for the successful adoption of PEVs. Lithium-ion batteries used in EVs are seeing their cost decreasing rapidly for over a decade. Cost-per-kilowatt-hour estimates for lithium-ion batteries vary but are thought to be approximately \$200/kW currently. Lithium-ion battery costs could be below \$100/kW by 2025. Such cost reductions would make BEVs much more purchase-price competitive with ICE vehicles. Also, technology is influencing operating efficiencies of electric vehicles. The first-generation Nissan Leaf had 24 kWh battery and could drive 180 km, while its current second-generation Leaf has a 40 kWh and can drive 400 km. EVs come with a variety of savings, like lower operating and maintenance costs, compared to fuel-powered vehicles. Today, most BEVs have a range of over 300 kms and this is positive as most motorists in the GCC drive less than 70 km a day.

A sample of the Operating features of some of the battery electric vehicles in the market in 2019 are shown in Table 2.1 given below.

Table 2.1: Sample of Operating Features of Electric Vehicles

Battery Capacity	Driving Range	Price (USD)	Battery Capacity	Driving Range	Price (USD)
28 kwh	200 km	30,000	58 kwh	420 kms	44,000
32 kwh	260 km	20,000	72 kwh	360 kms	50,000
39 kwh	277 kms	37,000	77 kwh	450 kms	N.A.
45 kwh	330 km	N.A.	77 kwh	550 km	N.A.
50 kwh	330 kms	34,000	80 kwh	530 kms	55,000
52 kwh	395 km	22,000	90 kwh	470 kms	70,000

Source: <https://www.evspecifications.com/en/brand/95aeb>

<sup>3</sup> Automotive Association for Middle East and North Africa  
<sup>4</sup> Strategy& Building Smarter Transportation Networks in GCC

On another note, GCC is also preparing itself for Fuel Cell driven automobiles. Cars powered by hydrogen are also considered EVs because oxygen and hydrogen are converted to electric energy, which then powers the electric motor with a battery. They can also recapture the energy that is lost during braking and store it in a battery. As a first step, supported by Toyota , Saudi Arabia opened the first hydrogen fueling station .The facility will fuel an initial fleet of six Toyota Mirai fuel cell electric vehicles (FCEV) that utilize hydrogen and oxygen to generate electricity onboard the vehicle using a fuel cell, where only water vapor is emitted in the process.

Current Status of Electric Vehicles Shift in the GCC Markets

Compared to developed economies, the number of electric vehicles operating in the Middle East is however lower. The infrastructure creation is still a long way in the GCC, and it can add to costs and reduce margins for the EV suppliers. However, Toyota and Nissan two large auto players in GCC have been promoting hybrid cars in the region. The first electric vehicle in the GCC was introduced in 2008 by Toyota with a Hybrid electric model of its Corolla brand. Plug-in electric vehicle sales are still at a nascent stage, but demand for these vehicles is expected to increase, especially in the UAE where the government is promoting the shift to EVs. Approximately 35,500 electric vehicles were sold in the region in 2018, of which nearly 30,000 were hybrid electric vehicles (HEVs). In 2019 a new hybrid EV of Corolla brand was introduced by Toyota in GCC and Toyota proposes to bring a greater number of HEV models for GCC in the coming years. Nissan, a major car supplier to GCC, was one of the first when it brought “LEAF” an entirely 100 percent electric car to the international market. Roads and Transport Authority (RTA), of Dubai has endorsed an initiative to transform 90% of limousines operating (6,500 limos) in Dubai into hybrid/electric vehicles by 2026.

Since US data shows that electrified vehicle (HEV, PEV, and BEV) sales and market share are highly correlated with gasoline prices, similar consumer behavior can be expected in the GCC countries where currently, motor fuel prices are going up in GCC countries due to removal of fuel subsidies and this can drive the shift in preference of GCC customers towards electric vehicles. ICE vehicles that enjoy advantages of a low cost, high performance, and utility may however continue to be favored especially in a low-cost energy region like GCC. However, the low base of EVs currently in GCC, means that the EVs have a steep growth ahead given the ambitious targets set by the international automobile manufacturers like Toyota and Nissan the main auto suppliers to the GCC and other players of repute in the GCC.

## Exhibit 1: Commitment to EV Production by TOYOTA largest automobile supplier in GCC

### TOYOTA- A New Push to Popularize Electrified Vehicles by 2030

In December 2017, Toyota announced its plans to sell more than 5.5 million electrified vehicles per year globally by 2030. As part of the Toyota Environmental Challenge 2050, launched in 2015 to contribute to the realization of a sustainable society, it set for itself the New Vehicle Zero CO2 Emissions Challenge, under which it aims to reduce its global average new vehicle CO2 emissions in 2050 by 90% compared with the 2010 level. This new initiative to popularize electrified vehicles is one of its medium to long-term measures to achieve this target. Toyota believes that eco-friendly vehicles can best help protect the environment if they are in widespread use. To consistently provide products that meet customer expectations and needs as a mass manufacturer, a diverse lineup of electrified vehicles is essential. At the same time, Toyota is advancing initiatives on all fronts, including technological innovation as well as social infrastructure development tailored to the energy and usage conditions of specific countries and regions. Toyota regards the current once-in-a-century transformation of the automobile industry—including the promotion of electrification—as an unparalleled opportunity to deliver new value to its customers and expand its business.

Toyota aims to sustainably grow while steadily solidifying its business base through the three values of safety and peace of mind, Waku-doki (excitement and exhilaration that wows), and environmental sustainability. By doing so, it hopes to contribute to the creation of a sustainable mobility society and bring smiles to its customers' faces. Electrification will be indispensable to reducing vehicle CO2 emissions and thus addressing global warming, a challenge facing by the entire planet.

Toyota is steadily advancing efforts in this area under the Toyota Environmental Challenge 2050 established in October 2015.

To popularize electrified vehicles, Toyota is aiming for at least 50% of all the vehicles it sells globally in 2030 to be electrified, and, of those, for more than 10% to be battery electric vehicles (BEVs) or fuel cell electric vehicles (FCEVs). To this end, it set the following three intermediary targets. First, from 2020 onward, it will advance the full-scale roll-out of BEVs. Specifically, Toyota will launch mass-market BEVs developed by it for the Chinese market in 2020, then expand sales to Japan, India, the United States, Europe, and around the globe. It plans to introduce more than 10 BEV models in the first half of the decade. Next, while expanding its lineup of dedicated electrified models, such as the Prius and Mirai, it will make electrified versions available for other models, as well, aiming to have no models lacking an electrified option by around 2025.

Basing calculations on its current global sales, by 2030 it aims for annual sales of more than 5.5 million electrified vehicles, including hybrid electric vehicles (HEVs), plug-in hybrid vehicles (PHEVs), BEVs, and FCEVs. Of this total, it is aiming for more than 1 million to be BEVs, FCEVs, or other zero-emission vehicles. In the 20 years since launching the Prius in 1997, Toyota has sold more than 12 million electrified vehicles around the world, helping to cut CO2 emissions by more than 94 million tons.\* Today, Toyota offers 36 electrified models in more than 90 countries and regions, maintains an electrified vehicle development staff numbering 4,500 within the Company alone, and sells more than 1.5 million of these vehicles each year. These figures are a testament to the trust that customers have in these vehicles' quality, durability, and reliability; customer support for this type of vehicle over the years; the vast technological expertise built up by the Group; and Toyota's successful establishment of electrified vehicle mass production technologies in Japan and around the world. The electrified vehicle technologies and expertise it has accumulated over the decades are a vital strength of Toyota and will provide a solid foundation for the popularization of electrified vehicles going forward.

# Demand Forecast for Electric Vehicles in GCC

The estimation of future EVs demand in the GCC is assumed to be determined by Toyota's electric vehicles strategy. Toyota has set itself the target of meeting 50% of its passenger vehicles sales to be met out of electric Vehicles by 2030. Assuming the GCC automobile market which imports bulk of its vehicles from Japan and that too from Toyota, to fall in line with this expected global trend being planned by Japan, its Electric Vehicles share of total vehicles purchased, which was 3.7% in 2018 will require to grow at a CAGR of 24.3% (It was reported recently that UAE is expecting growth of electrical vehicles demand to grow at a CAGR of 25%). Accordingly, the total EVs demand is expected to grow from 3.7% of total passenger vehicle demand in 2018 to 10.9% of total passenger vehicle demand by 2023.

The next step is the estimation of BEV demand, which is estimated based on the estimated trend exhibited by the sales of Nissan's fully electric vehicle "LEAF" (from an estimated 0.3% of total Nissan passenger vehicles sales in 2012 to 5.3% of total Nissan Sales in 2018). Assuming the same trend in growth to be exhibited by the BEV demand in GCC, the current share of BEV in GCC is expected to grow from 0.5% of total passenger vehicles sales in 2018 to 5.9% in 2023. On this basis the EV sales in GCC is expected to grow to 166,375 vehicles in 2023 comprising of 76,472 hybrid vehicles and 89,903 battery electric vehicles in 2023. The expected electricity demand for charging the battery vehicles population in GCC is estimated at 740 million kwh in 2023 This assumes 25,000 kms travelled per year per vehicle and consumption of one Kwh per 10 kms for battery electric vehicles.

Thus, the population of electric vehicles in 2023 will be 590,002 vehicles in GCC out of which battery vehicles population will be 296,023. China has 330,000 charging stations for 2.6 million battery vehicles. On this basis the GCC will require 37,573 charging stations installed by 2023. (Please see Table 3.1).

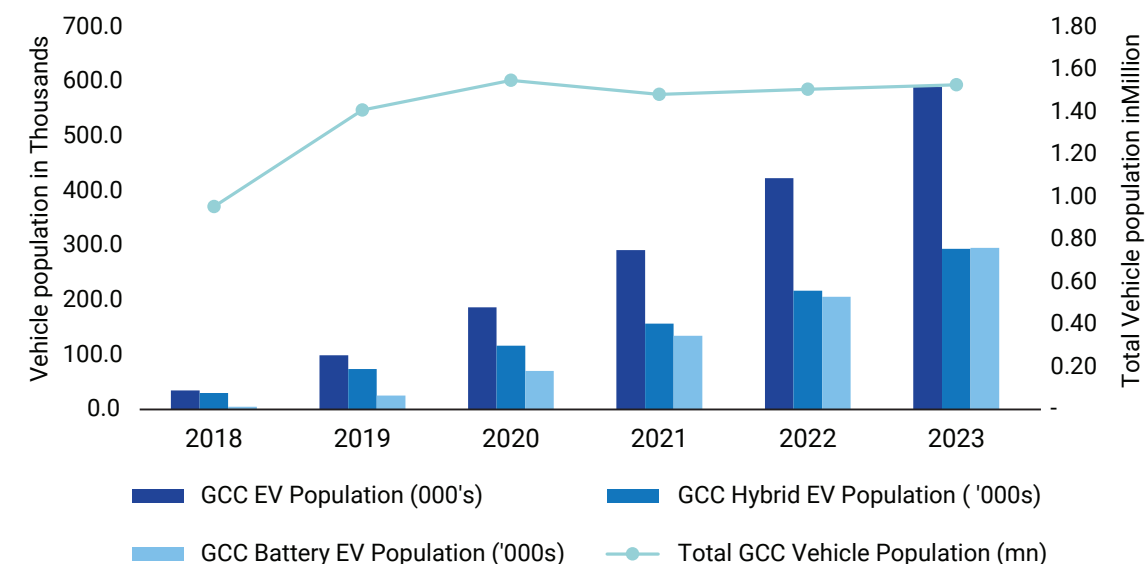
**Table 3.1: GCC's Demand and Population of Hybrid and Battery EVs 2019-2023**

Battery Capacity	2018	2019	2020	2021	2022	2023
Total EVs demand	35,000	64,240	87,791	104,525	132,072	166,375
Hybrid EVs (HEVs) Demand among EVs	30,000	43,957	42,709	40,278	60,564	76,472
Battery EVs (BEVs) demand among EVs	5,000	20,282	45,082	64,247	71,508	89,903
Share of EVs in Total Demand	3.7%	4.6%	5.7%	7.0%	8.8%	10.9%
Share of HEV in EVs	85.7%	68.4%	48.6%	38.5%	45.9%	46.0%
Share of BEVs in EVs	14.3%	31.6%	51.4%	61.5%	54.1%	54.0%
Electricity Demand from EVs (Million kWh)	13	63	176	337	515	740

Source: Marmore Analysis

The trends in EV population broken down by Hybrid Vehicles population and Battery Vehicles population over the period 2019-2023 is presented in Figure 3.1 below.

**Figure 3.1: GCC Population of EVs/ Hybrid EVs and Battery EVs ( 2018-2023.)**



Source: Marmore Analysis

## Exhibit-2: GCC Consumers Opinions on Electric Passenger Vehicles

### Survey Results of Yella Motors' Electric Vehicles Survey

Yella Motor conducted an Online Survey to analyze the factors affecting consumers' willingness to purchase an Electric Vehicle. Yella Motor is a subsidiary of the Middle East's well known job site Bayt.com, was launched in 2012 and has grown to become well visited automotive portal in the region.

Out of GCC car buyers, only 9% have ever driven a pure electric vehicle. 14% have driven a hybrid (petrol + electric), while 77% have never been in the driver's seat of a hybrid or electric vehicle. Motorists in Saudi Arabia and Bahrain have driven the greatest number of electric vehicles at 11%, followed by Kuwait at 10%, UAE at 8%, Oman at 7% and Qatar at 6%.

About perceived advantages of electric vehicles, better fuel economy and reduced carbon emissions topped the charts at 51% and 49% respectively. Other factors such as lower maintenance costs, better performance, ease of driving and positive image of owning/driving all made the cut but weren't as popular. When it comes to the perceived disadvantages of purchasing electric vehicles, the biggest concern continues to be long charging times (45%) followed by the high initial cost of purchase (37%) and inconvenient charging options (34%). The unavailability of proper infrastructure and the limited offerings from manufacturers are also roadblocks for potential electric vehicle buyers. Nearly 25% of respondents



do not know enough about electric mobility and its advantages and disadvantages. Several motorists are still unclear on how many kilometers they can drive in an electric vehicle, charging durations and locations, how to maintain an EV and the final on-road price of the vehicle-

Current electric vehicle owners seem to be a lot more flexible with the pros and cons of electric mobility. The biggest advantage according to electric vehicle owners is the ease of driving, which outranked factors such as fuel economy and reduced carbon emissions. While long charging times and the high initial cost of purchase is something current and potential EV owners highlighted, current owners pointed out the limited offerings in the market and how a wider choice of products would have addressed their needs better.

Due to the lack of information in the GCC, potential buyers are currently uncertain if electric vehicles make for a good return of investment. For instance, 40% of respondents stated that they are unaware if an electric vehicle will be a good return of investment. Electric vehicles are perceived to be significantly pricier than their petrol-powered equivalents. For instance, the most affordable EV in the market (the Renault Zoe ) costs a whopping AED 137,000 negating its advantages of lesser running and servicing costs when compared to its petrol-powered rival (the Chevrolet Spark ) at AED 46,500.

Moreover, while car buyers have a vague understanding of the lesser running costs involved with EVs, there are several factors that stand in the way of them deciphering whether EVs provide a good return on investment. A few major concerns include the resale value of the vehicle and the price / frequency with which the batteries need to be replaced. At a country-specific level, respondents in the United Arab Emirates and Saudi Arabia believe that electric vehicles are a good return on investment. In contrast, majority of motorists in Bahrain, Qatar, Oman and Kuwait are unaware about whether EVs offer a good return on investment. With regards to the price point of electric vehicles, 39% of respondents said they will pay the same amount for an electric vehicle as they would for a standard car, while 35% of respondents said they would pay less.

31% of GCC car buyers expect a driving range between 300 and 500 kilometers, while 20% of buyers expect to complete between 100 and 300 kilometers on a single charge. When it comes to charging times, 32% of GCC motorists expect their EV to be fully charged in one hour - a stark contrast from the current reality. That said, if we consider a wider time frame, we can see that 72% of respondents are willing to spend between one and four hours charging their vehicle.

While 27% of car buyers in the GCC are uncertain whether they will purchase an electric vehicle in the next two years, 44% are likely and very likely to do so. More interestingly, a whopping 61% will also opt to have it as their primary vehicle.

Demand Forecast for Electric Vehicles in Saudi Arabia

The estimated demand for Electrical Vehicles in Saudi Arabia was done using the same methodology explained in the section relating to demand forecast for electric vehicles in the GCC. Since the electrical vehicles in Saudi Arabia is not known, we assumed electric vehicles share of Saudi equal to its share of total passenger vehicles purchased in the GCC. The results based on this analysis are shown in Table 3.2 below.

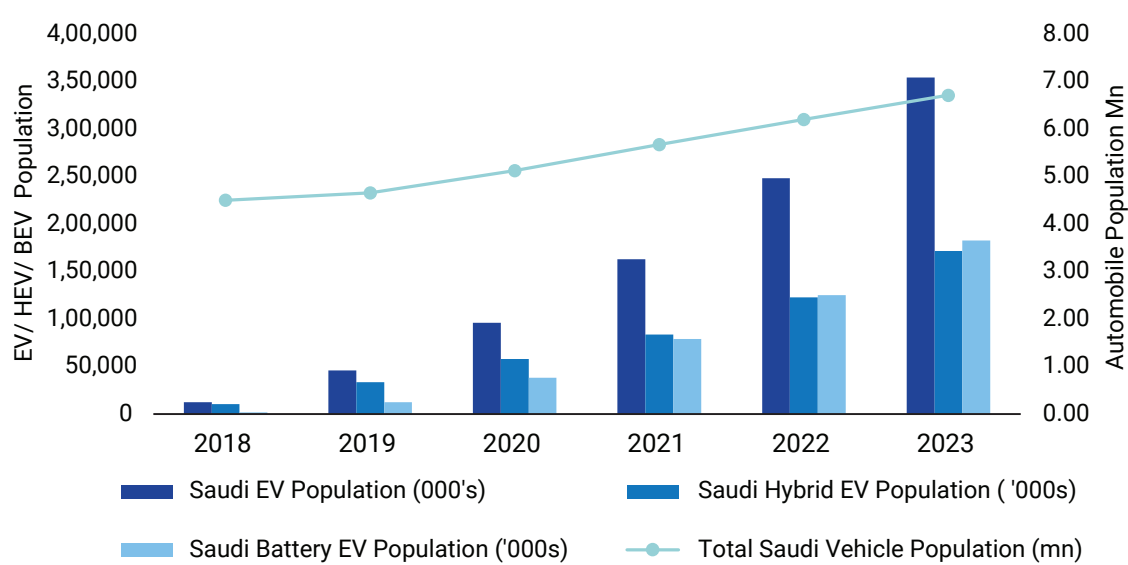
Table 3.2: Saudi's Demand & Population of Hybrid and Battery EVs 2019-2023

Battery Capacity	2018	2019	2020	2021	2022	2023
Total EVs demand	12,364	33,455	50,307	66,687	85,239	106,212
Hybrid EVs (HEVs) Demand among EVs	10,598	22,893	24,473	25,697	39,088	48,819
Battery EVs (BEVs) demand among EVs	1,766	10,563	25,834	40,990	46,151	57,393
Electricity Demand from EVs (Million kWh)	4.4	30.8	95.4	197.9	313.3	456.7

Source: Marmore Analysis

The trends in EV population in Saudi Arabia broken down by Hybrid Vehicles population and Battery Vehicles population over the period 2019-2023 is presented in Figure 3.2 below.

Figure 3.2: Saudi Population of EVs /Hybrid EVs/BEVs (2018-2023)



Source: Marmore Analysis

Demand Forecast for Electric Vehicles in UAE

The demand for Electrical Vehicles in UAE is assessed using the same methodology explained in the section relating to demand forecast for electric vehicles in the GCC. Since the number of electrical vehicles in UAE in 2018 is not known, we assumed electric vehicles share of UAE equal to its share of total passenger vehicles purchased in the GCC. The results based on this analysis are shown in Table 3.3 below.

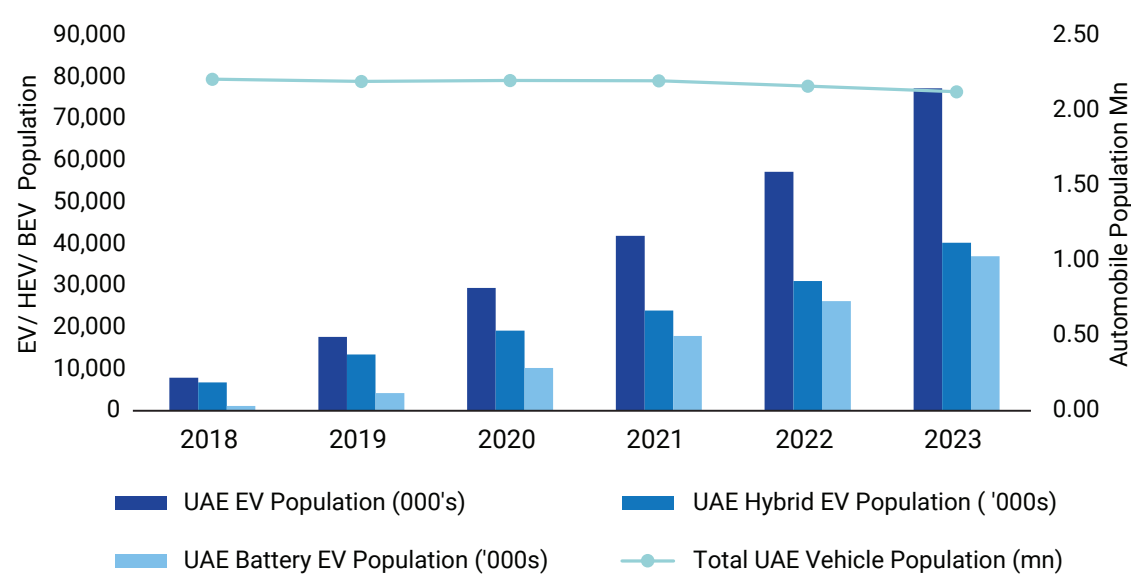
Table 3.3: UAE's Demand & Population of Hybrid and Battery EVs 2019-2023

Battery Capacity	2018	2019	2020	2021	2022	2023
Total EVs demand	7,925	9,790	11,753	12,456	15,383	19,981
Hybrid EVs (HEVs) Demand among EVs	6,793	6,699	5,717	4,800	7,054	9,184
Battery EVs (BEVs) demand among EVs	1,132	3,091	6,035	7,656	8,329	10,797
Electricity Demand from EVs (Million kWh)	2.8	10.6	25.6	44.8	65.6	92.6

Source: Marmore Analysis

The trends in EV population in UAE broken down by Hybrid Vehicles population and Battery Vehicles population over the period 2019-2023 is presented in Figure 3.3 below

Figure 3.3: UAE's Population of EVs /Hybrid EVs/BEVs (2018-2023)



Source: Marmore Analysis

Demand Forecast for Electric Vehicles in Kuwait

The demand for Electrical Vehicles in Kuwait is assessed using the same methodology explained in the section relating to demand forecast for electric vehicles in the GCC. Since the number of electrical vehicles in Kuwait in 2018 is not known, we assumed electric vehicles share of Kuwait equal to its share of total passenger vehicles purchased in the GCC. The results based on this analysis are shown in Table 3.4 below.

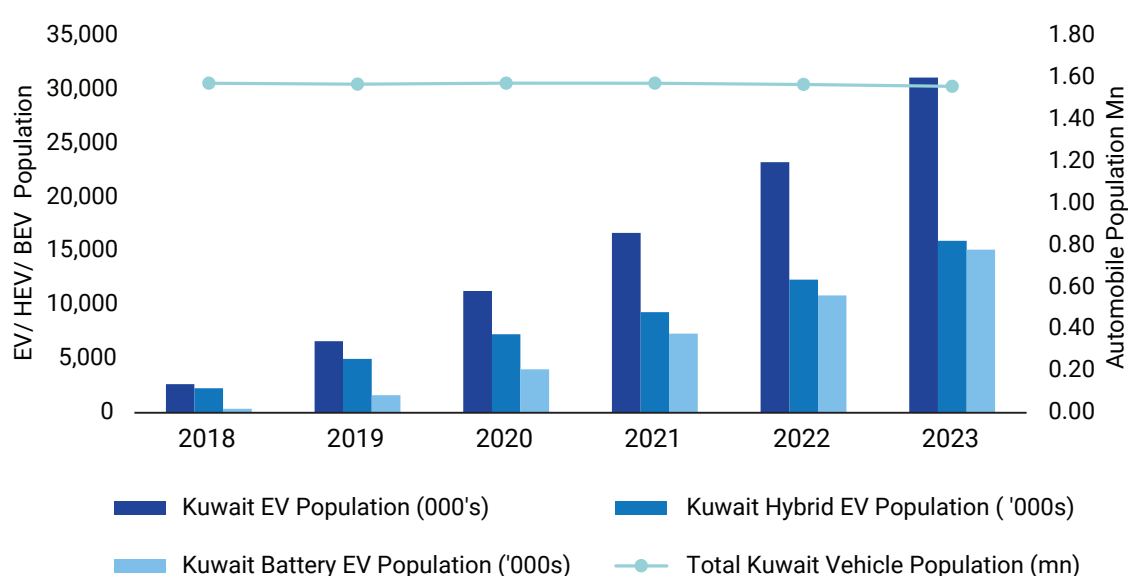
Table 3.4: Kuwait's Demand & Population of Hybrid and Battery EVs 2019-2023

Battery Capacity	2018	2019	2020	2021	2022	2023
Total EVs demand	2,640	3,985	4,668	5,361	6,572	7,847
Hybrid EVs (HEVs) Demand among EVs	2,263	2,727	2,271	2,066	3,014	3,607
Battery EVs (BEVs) demand among EVs	377	1,258	2,397	3,295	3,558	4,240
Electricity Demand from EVs (Million kWh)	0.9	4.1	10.1	18.3	27.2	37.8

Source: Marmore Analysis

The trends in EV population in Kuwait broken down by Hybrid Vehicles population and Battery Vehicles population over the period 2019-2023 is presented in Figure 3.4 below

Figure 3.4: Kuwait's Population of EVs /Hybrid EVs/BEVs (2018-2023)



Source: Marmore Analysis

Demand Forecast for Electric Vehicles in Qatar

The demand for Electrical Vehicles in Qatar is assessed using the same methodology explained in the section relating to demand forecast for electric vehicles in the GCC. Since the number of electrical vehicles in Qatar in 2018 is not known, we assumed electric vehicles share of Qatar equal to its share of total passenger vehicles purchased in the GCC. The results based on this analysis are shown in Table 3.5 below.

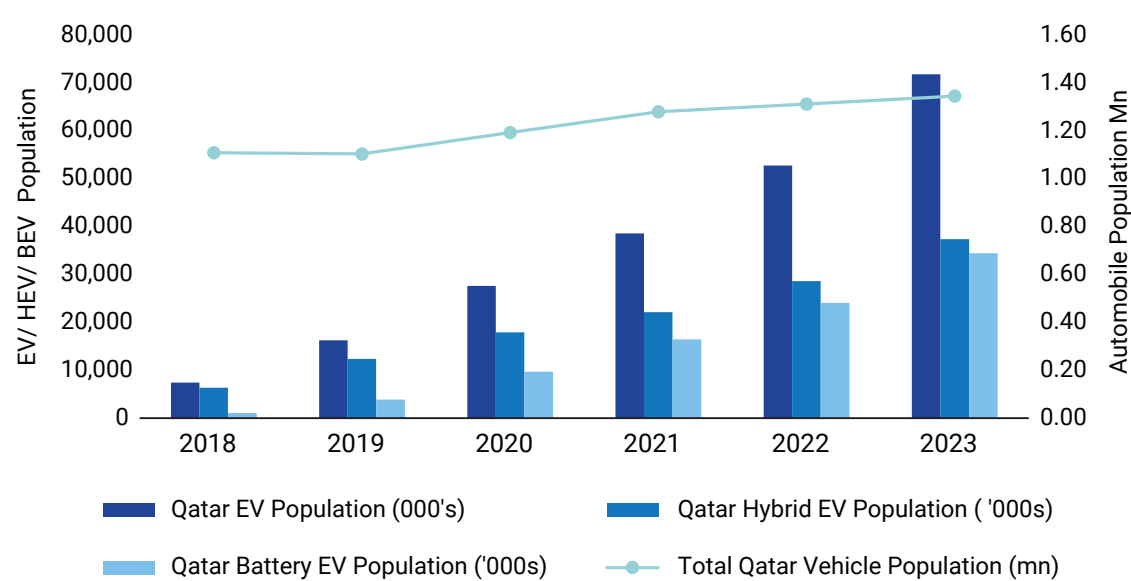
Table 3.5: Qatar's Demand & Population of Hybrid and Battery EVs 2019-2023

Battery Capacity	2018	2019	2020	2021	2022	2023
Total EVs demand	7,397	8,855	11,371	10,999	14,126	19,080
Hybrid EVs (HEVs) Demand among EVs	6,340	6,059	5,532	4,238	6,478	8,770
Battery EVs (BEVs) demand among EVs	1,057	2,796	5,839	6,760	7,648	10,310
Electricity Demand from EVs (Million kWh)	2.6	9.6	24.2	41.1	60.3	86.0

Source: Marmore Analysis

The trends in EV population in Qatar broken down by Hybrid Vehicles population and Battery Vehicles population over the period 2019-2023 is presented in Figure 3.5 below

Figure 3.5: Qatar's Population of EVs /Hybrid EVs/BEVs (2018-2023)



Source: Marmore Analysis

Demand Forecast for Electric Vehicles in Oman

The demand for Electrical Vehicles in Oman is assessed using the same methodology explained in the section relating to demand forecast for electric vehicles in the GCC. Since the number of electrical vehicles in Oman in 2018 is not known, we assumed electric vehicles share of Oman equal to its share of total passenger vehicles purchased in the GCC. The results based on this analysis are shown in Table 3.6 below.

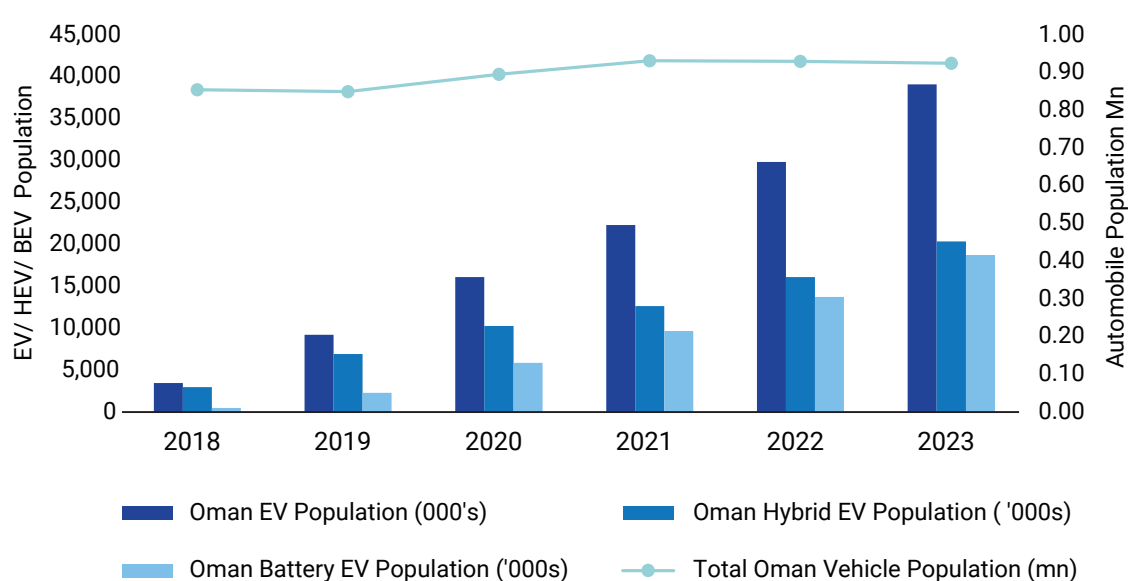
Table 3.6: Oman's Demand & Population of Hybrid and Battery EVs 2019-2023

Battery Capacity	2018	2019	2020	2021	2022	2023
Total EVs demand	3,455	5,766	6,894	6,196	7,514	9,248
Hybrid EVs (HEVs) Demand among EVs	2,961	3,946	3,354	2,388	3,446	4,251
Battery EVs (BEVs) demand among EVs	494	1,821	3,540	3,809	4,069	4,997
Electricity Demand from EVs (Million kWh)	1.2	5.8	14.6	24.2	34.3	46.8

Source: Marmore Analysis

The trends in EV population in Oman broken down by Hybrid Vehicles population and Battery Vehicles population over the period 2019-2023 is presented in Figure 3.6 below.

Figure 3.6: Oman's Population of EVs /Hybrid EVs/BEVs (2018-2023)



Source: Marmore Analysis

Demand Forecast for Electric Vehicles in Bahrain

The demand for Electrical Vehicles in Bahrain is assessed using the same methodology explained in the section relating to demand forecast for electric vehicles in the GCC. Since the number of electrical vehicles in Bahrain in 2018 is not known, we assumed electric vehicles share of Bahrain equal to its share of total passenger vehicles purchased in the GCC. The results based on this analysis are shown in Table 3.7 below.

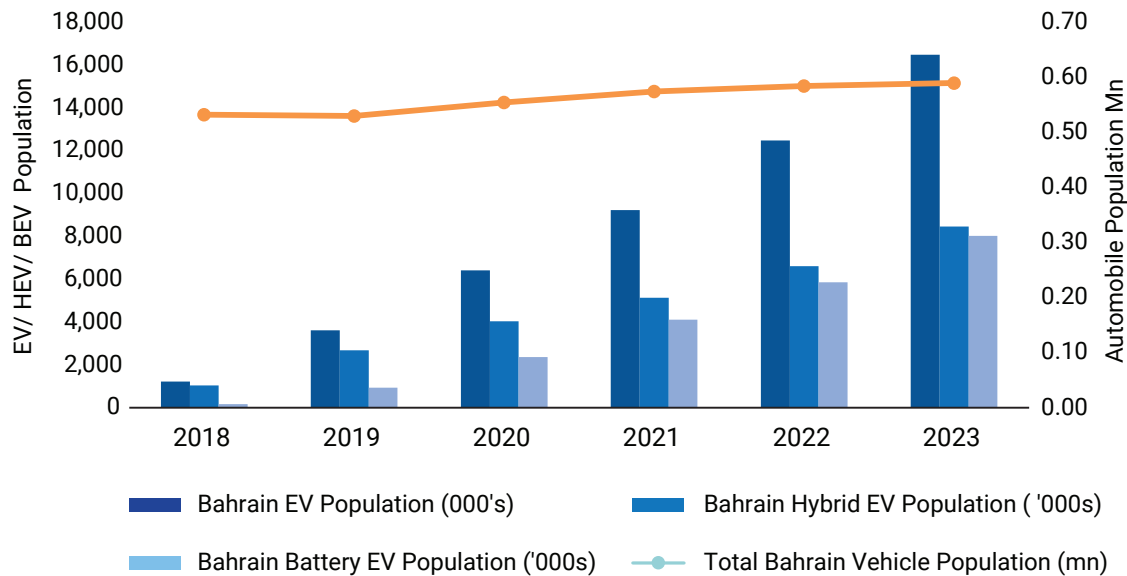
Table 3.7: Bahrain's Demand & Population of Hybrid and Battery EVs 2019-2023

Battery Capacity	2018	2019	2020	2021	2022	2023
Demand for Passenger Vehicles	33,250	52,369	49,380	40,106	36,961	36,799
Total EVs demand	1,219	2,387	2,799	2,826	3,238	4,008
Hybrid EVs (HEVs) Demand among EVs	1,045	1,634	1,361	1,089	1,485	1,842
Battery EVs (BEVs) demand among EVs	174	754	1,437	1,737	1,753	2,166
Electricity Demand from EVs (Million kWh)	0.4	2.3	5.9	10.3	14.6	20.1

Source: Marmore Analysis

The trends in EV population in Bahrain broken down by Hybrid Vehicles population and Battery Vehicles population over the period 2019-2023 is presented in Figure 3.7 below.

Figure 3.7: Bahrain's Population of EVs /Hybrid EVs/BEVs (2018-2023)



Source: Marmore Analysis

To know more of GCC and each of the member countries automobile sector i.e. its size by value and volumes, applicable growth drivers, applicable technological and regulatory developments, challenges, impact of different developments on the market demand and growth prospects over next five years see Marmore report on GCC Automotive Sector at the link given here.

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