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Environmental Analysis of a car manufacturing industry

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Introduction

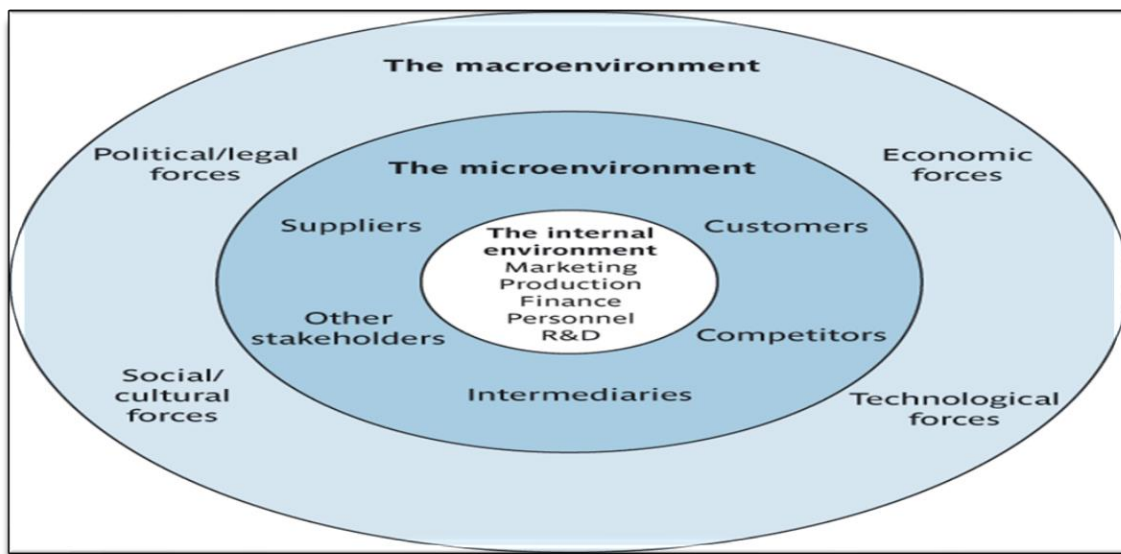
Reducing the impact of ground vehicles on the environment is one of the most significant issues facing modern society. Efficiency of vehicles has become a major issue in recent decades due to the requirements of pollution regulation. (Donateo, 2017, p. 3)

In this essay Environmental analysis of a car manufacturing industry will be analysing major forces shaping global business environment and will applying to McKinsey's case study 'Electric vehicles in Europe gearing up for a new phase?'. Also, will discuss attractive side and changes in car manufacturing. The focus on competitive advantages of electric vehicle and recommendations will be providing.

Global business environment

The global business environment can be described as the world in various sovereign countries, with influences that are exogenous to the organisation's home setting, affect decision-making on the use of resources and capabilities. The current market climate can be separated into the external world and the internal setting. (Worthington and Britton, 2006, p.4)

The global business environment includes three levels: macro, micro and internal environment.



(cclifford7, 2014)

An electric vehicle (EV) is a car used for propulsion by one or more electrical motors or traction motors. An electric vehicle may be powered from off-vehicle sources via a collector network, or it may be self-contained with a battery, solar panels, or electric generator to convert fuel into electricity. (Wikipedia, 2019)

Now is time to investigate the Macroenvironment of EVs and car manufacturing industry in the context of a case study.

PESTLE analysis of EVs

PESTLE factors that examine macro-environmental factors by six main types: political , economic, social , technological , environmental, and legal. There are both market and non-market aspects to these factors. (Johnson *et al.* 2017, p.34)

❖ **Political**

Businesses are directly affected by government actions and other political events. (Sloman *et al.* 2019, p.5)

According to the case study, market demand, industry innovations and government support are three key factors driving the adoption of electric mobility in Europe.

Governments across Europe are encouraging EVs to varying degrees by offering a range of discounts and other incentives, both on the demand and supply side. Governments in Europe have already spent several years devoting funds to EV-related research and development.

Many European countries are offering subsidies, for example, UK refunds a one-time government monetary of £4000 to £7000 for all EV emitting less than 75g/km.

Tax cuts are another aspect of stimulus to EV demand. Taxes on sales, lease , and road taxes are among the pressures that governments relieve. The income tax levied for full electric lease cars in the Netherlands was 0 per cent in 2013 and 4 per cent in 2014.

In Norway, EVs subsidies includes release from purchase tax, VAT, toll road charges, annual circulation, and registration taxes.

Exhibit 3.2

In many countries, policy initiatives support the development of charging infrastructure today

Overview of policy initiatives for EV charging infrastructure by country¹

Country	Description	Non-residential ² charging points installed, 2013
 UK	EUR ~44 million for charging points for residential, street, railway, and public sector locations (available until 2015, plans to install 13,500 domestic and 1,500 on-street points)	- Slow charger: ~3,000 - Fast charger: ~150
 FRA	- EUR 50 million to cover 50% of EV charging infrastructure (cost of equipment and installation) - Local administrations are involved in EV infrastructure projects and stimulating sales by increasing the EV share of their fleets and initiating car-sharing projects	- Slow charger: ~1,700 - Fast charger: ~100
 GER	- Four regions nominated as showcase regions for BEVs and PHEVs - German government supports R&D activities for inductive and quick charging technologies and encourages local authorities to establish charging infrastructure - However, build-up of charging stations seen as task of private economy	- Slow charger: ~2,800 - Fast charger: ~50
 NED	- The Netherlands currently has roughly 1.1 charging stations per vehicle, the most EVSE per capita worldwide - Government introduced tax incentives to support creation of charging infrastructure	- Slow charger: ~6,000 - Fast charger: ~120
 PT	- Subsidy of EUR 5,000 for the first 5,000 new electric cars sold in the country - EUR 1,500 incentive if the consumer turn in a used car as part of the down payment for the new electric car	- Slow charger: ~1,000 - Fast charger: ~70
 ESP	- Public incentives for a pilot demonstration project. Incentives for charging infrastructure in cooperation between national and regional government - Movele program (2008-2011, investments EUR ~10 million) targeted ramp up of infrastructure and dispersion of EVs in Barcelona, Madrid, and Seville - Spain's national government sets the goal of putting 343,510 charging points throughout Spain until 2015	- Slow charger: ~800 - Fast charger: ~20
 SWE	No general support for charging points besides RD&D (Research, Development and Demonstration) funding (EUR 1 million in 2012)	- Slow charger: ~1,000 - Fast charger: ~20
 DEN	EUR ~10 million for development of charging infrastructure	- Slow charger: ~3,800 - Fast charger: ~120
 FIN	EUR 5 million reserved for infrastructure as part of the national EV development program, ending in 2013	- Slow charger: n/a - Fast charger: n/a
 NO	EUR 1,200 as a subsidy if you put up a EV charging station in Oslo	- Slow charger: ~1,300 - Fast charger: ~87

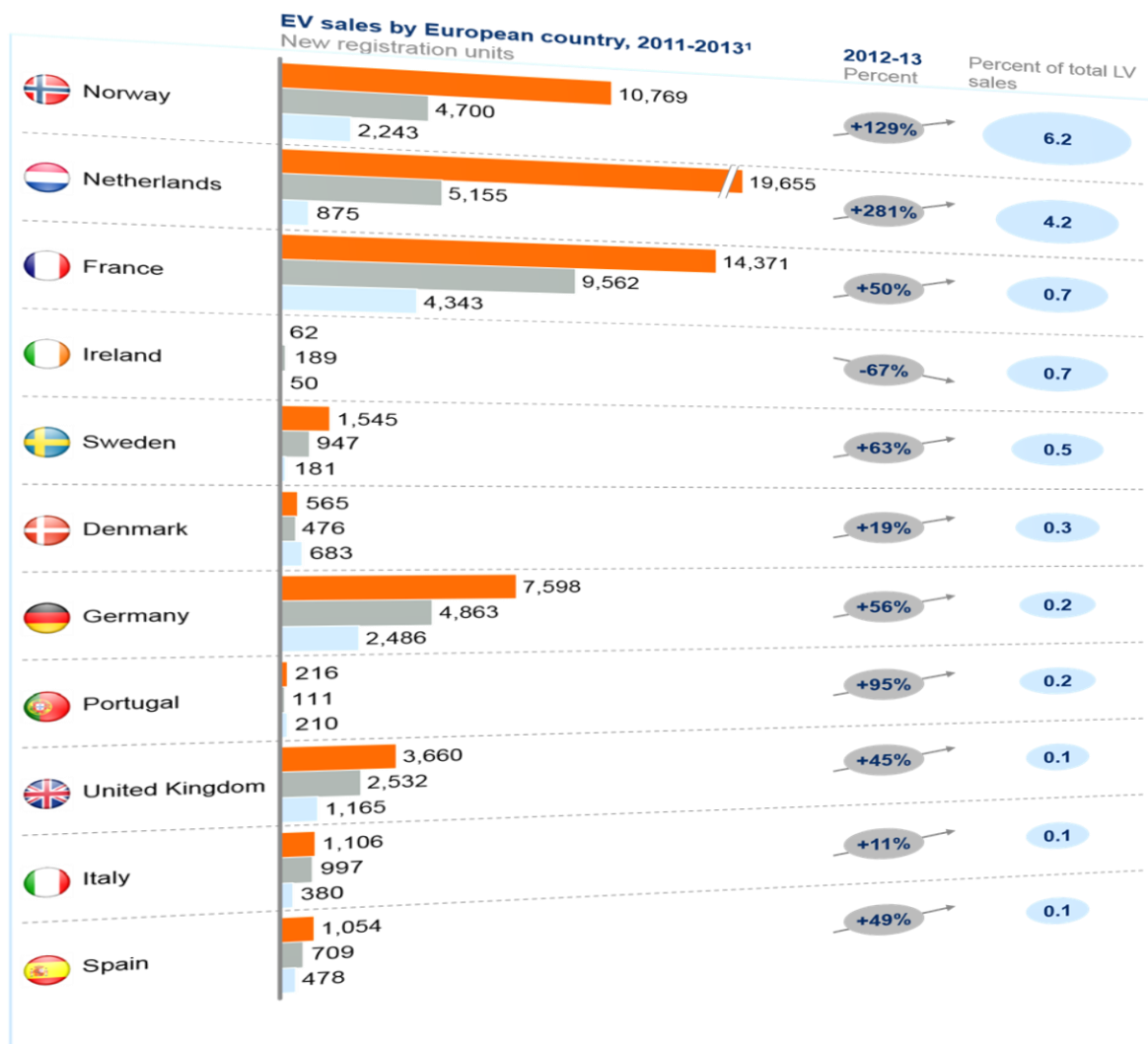
(McKinsey and Company, 2014)

❖ Economic

Government shows a main role at national and local level in the economy and its actions help to affect both demand and supply. Nevertheless, there are a variety of other economic considerations that are worthy of consideration about market activities. (Worthington and Britton, 2006, p.7)

In 2013 EV sales moved beyond the margin of 1% in Norway and Netherlands.

France, Germany, and the United Kingdom report strong EV revenue growth levels of ~50%, but EVs have a smaller overall market share.



Norway is a number one in Europe with EVs 6.2% of total car sales in 2013. The pick time for selling BEVs is in September, October and December, and November reached 12% of sales in Norway.

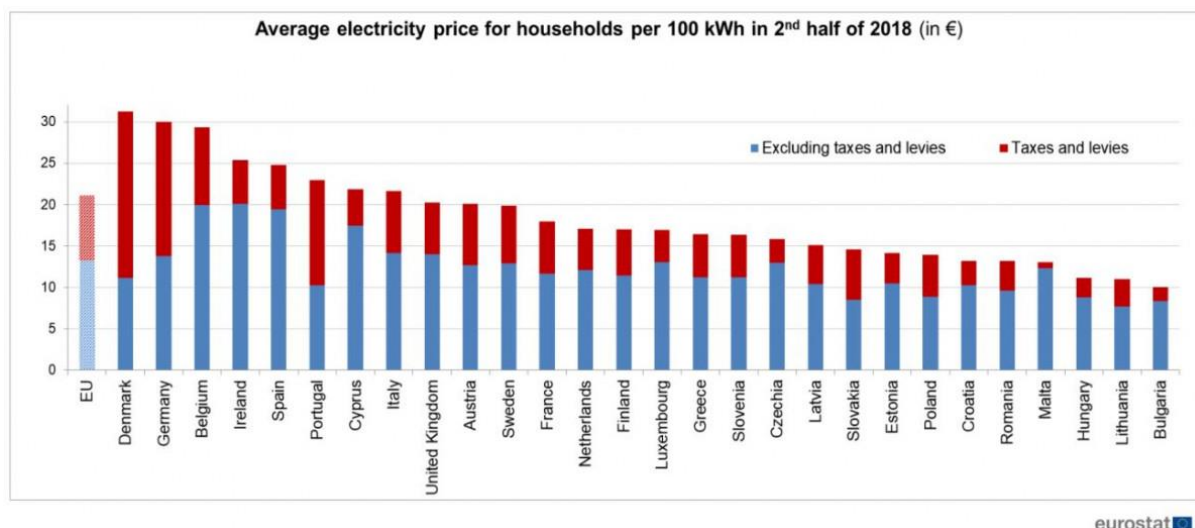
Compared to 2012, the number of EV product releases doubled in 2013 and is projected to grow by 50% in 2014.

Toyota sold out around 6 million EVs, which 10% of them in the European market. Nissan sold 100,000 fully battery-electric units in 2013 and Tesla sold 25,000 of their S Model.

The important role of EVs is the cost of batteries.

Battery prices are decreasing because of economies of scale but are not yet able to make EVs competitive. But for example, Tesla's battery prices are cheaper than for large packs.

Another economic significant factor is higher demand for electricity.



(Clean Energy Wire, 2019)

For example, in Netherlands driving an EV 15,000 km per year and household's electricity from 3,500 kWh will increase to 6,500 kWh per year. According to electricity rates in diagram above this mean from €630 will increase to €1170 yearly. This will not have negative effect, because the economy and exchange rate in most European countries are stable.

❖ **Social**

This dimension relates to social attitudes and values. Various ethical issues, particularly regarding environmental protection, are also having a growing impact on the actions of businesses and on the image that many companies are seeking to present. (Sloman *et al.* 2019, p.9)

Although several factors, such as design, brand, and performance, are all important consumer considerations, there are three key reasons for early adoption of EV: reducing carbon footprint, driving and consumption benefits, and saving on costs.

McKinsey's research shows that early EV adopters are with high salary, well-educated, looking to save money, or eco-friendly.

Car rental agencies, customers who operate vehicle fleets are among the early adopters of EVs.

Buyers enjoy by choosing EVs, also because of the driving benefits, such as reduced toll and parking fees, driving in the bus and taxi lanes.

In Norway, 29% buy EVs to keep the environment and 41% are buying for cost savings reason.

Auto sharing is another main example of mobility as a service and according to McKinsey's report in 2014, the number of auto-sharing customers in Europe will rise to 15 million this year.

❖ **Technological**

Technology and innovation investment is often seen as a key to an enterprise's success and was used to explain differences in the relative competitive nature of various countries. (Worthington and Britton, 2006, p.8)

Technological developments and cost savings are helpful for EV adoption across the value chain. For example, charging infrastructure (slow and fast chargers) has become standardised, and because of growing economies of scale, costs are coming down.

The EVs are designed to accept modern technologies. Recent EV batteries are basing primarily on Li-ion technology. The difference comes in the size of the cells and the type of cathodes used: Li-ion-based battery cells (small format cells) and large format cells.

In the EV's market we can see few types of charging: battery swapping, wireless charging, and wired charging.

By 2013, over 20,000 electric EV charging stations and over 1,000 electric fast-charging stations have been built throughout Europe. The leading countries are UK, France, Germany, Denmark, and the Netherlands.

Tesla aims to build corridors across Europe by building 120 kW Supercharger stations along the main corridors of traffic. In Norway, Germany, the Netherlands, Austria, and Switzerland 14 stations have already been installed.

Another new technology, used by BMW is the app ParkNow, which is overview for parking solutions.

Technological innovations which improve the driving range of BEVs could change the charging behaviour and the need for future charging infrastructure. (McKinsey & Company, 2014)

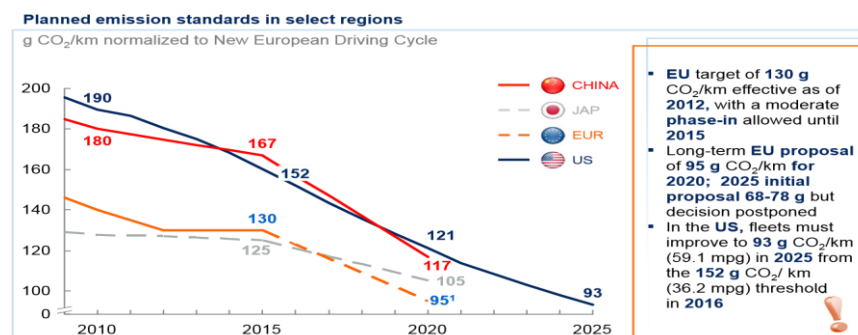
❖ Legal

Legal factors include industrial relations legalisation, product safety standards, government regulations. (Sloman *et al.* 2019, p. 10)

The Government has taken measures to increase the production of electric and hybrid engines.

In 2013, the EU Clean Fuel Directive set a goal of 800 000 public accessible EV charging stations to be built by this year.

From the side of customer protection and environment relations, the EU regulatory environment aim to reduce emissions Carbon footprint and NO_x, as we see in the table below.



The EU has set the target of reaching 20% increase in energy quality as part of its environment and security goals.

The European Commission is explicitly demonstrating financing for the continued introduction of EVs by introducing a proposal on the deployment of renewable fuel systems in 2013, which fully promotes the transport of clean fuel. (McKinsey & Company, 2014)

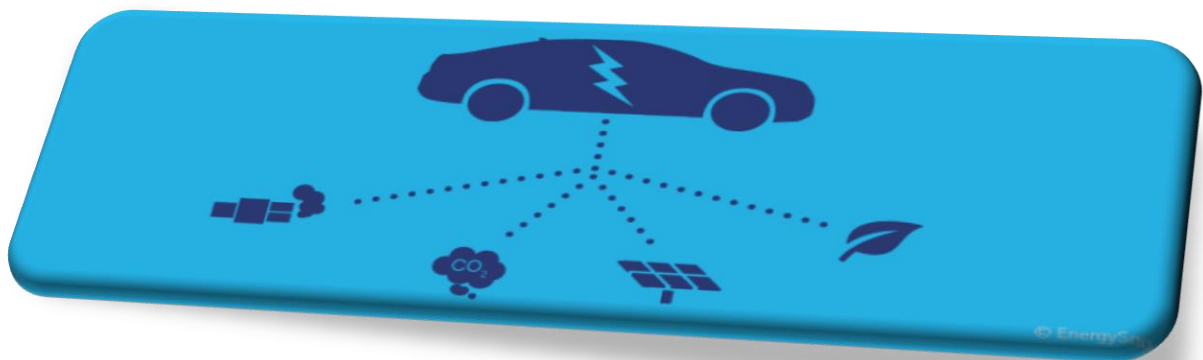
❖ **Environmental**

This is the area where the request for businesses to behave in a more socially conscious manner and to recognise the effect they could have on people their societies and the natural environment is evident. (Worthington and Britton, 2006, p.9)

One of the main factors in EV's configuration is to be eco-friendly.

Although the carbon footprint is low, even some costumers want to pay for zero-emission. As we discuss in social factors, the purchase of EVs' main reason is "environment".

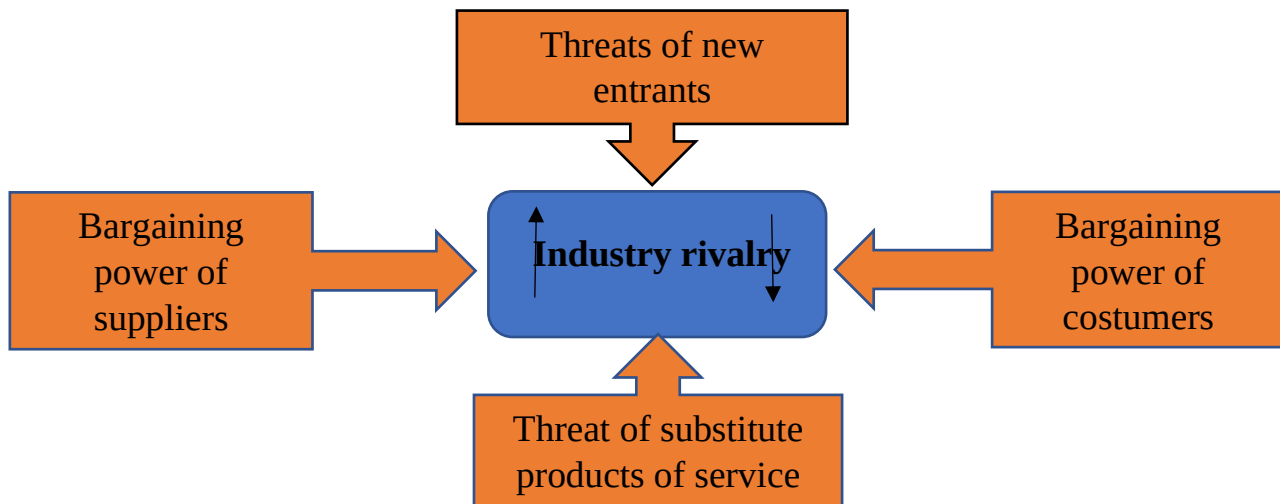
Air Quality Directive takes strict regulation of NOx and taking steps to promote EVs. (McKinsey & Company, 2014)



Buyers can generate renewable energy in their properties. Apart from the fuel used to generate electricity, another explanation of why the electric vehicle is considered more efficient than conventional vehicles are that the performance of electric cars is higher. (Energysage, 2019)

Porters Five Forces Analysis of EVs

Competition management is the nature of strategy preparation. The condition of competitiveness in an organisation relies on five fundamental powers. The strongest competitive force or power defines the productivity of the industry and is therefore of the utmost importance in the formulation of the strategy. (Porter, 1980, p.34-35)



(Porter, 1980, p. 36)

Now is time to investigate the Microenvironment of EVs and car manufacturing industry in the context of a case study.

Competitive rivalry- High

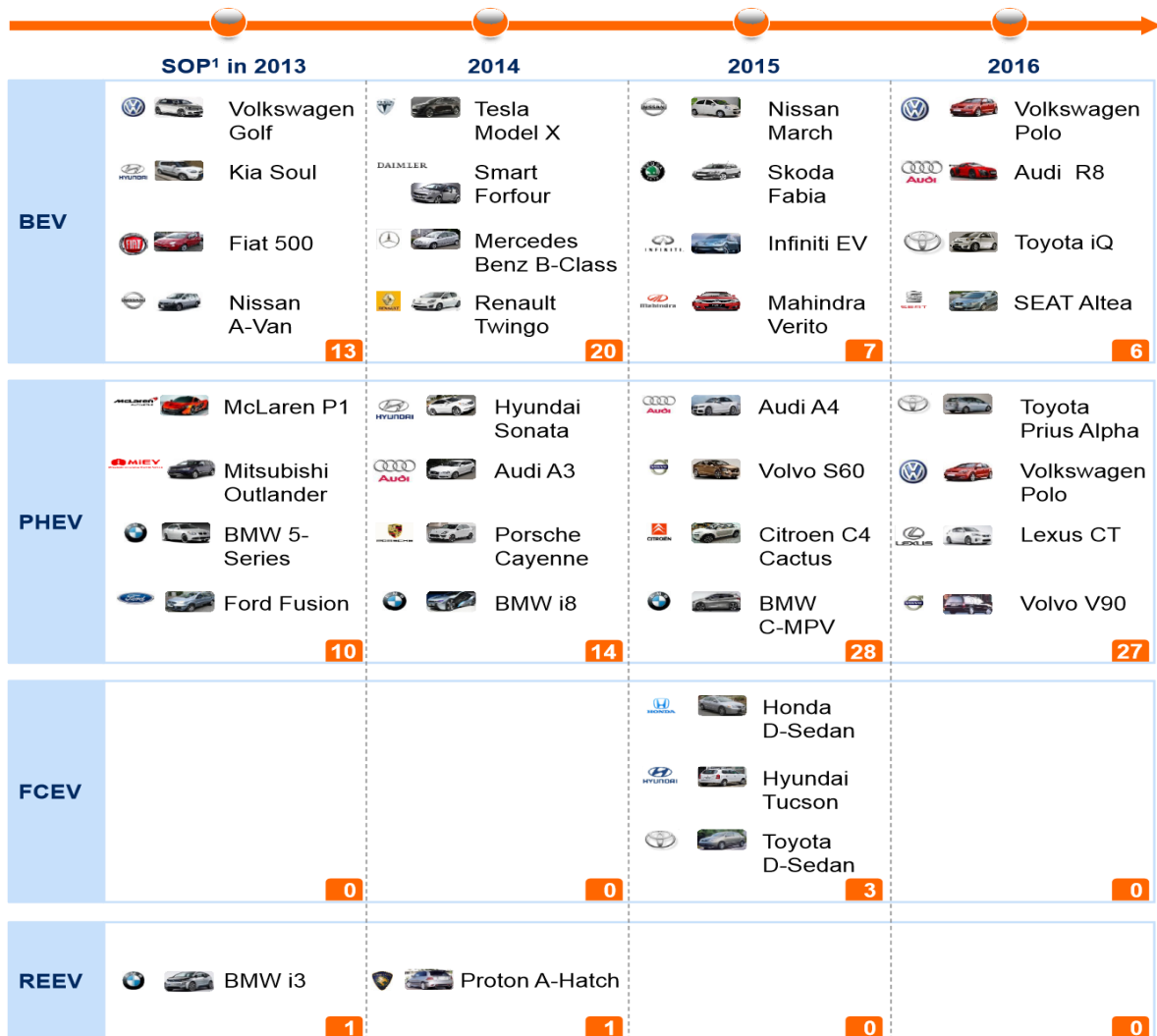
There are too many big players in the industry in the competition already, shown in the table below.

Exhibit 2.3

Upcoming model launches suggest further diversification of EV powertrain portfolio

MODELS SHOWN NOT EXHAUSTIVE

LEADING VEHICLE PLATFORMS

 Total # of models with expected SOP


¹ SOP = Start of Production, models expected to go in production as predicted by industry analysts

SOURCE: IHS Automotive DRIVEN BY Polk

(McKinsey & Company, 2014)

Margins are low, but competition is high in EV's industry. The only solution to increase demand, sales, economy, and finalize the rivalry between the big companies is the Partnerships.

Threat of new entrants- Low

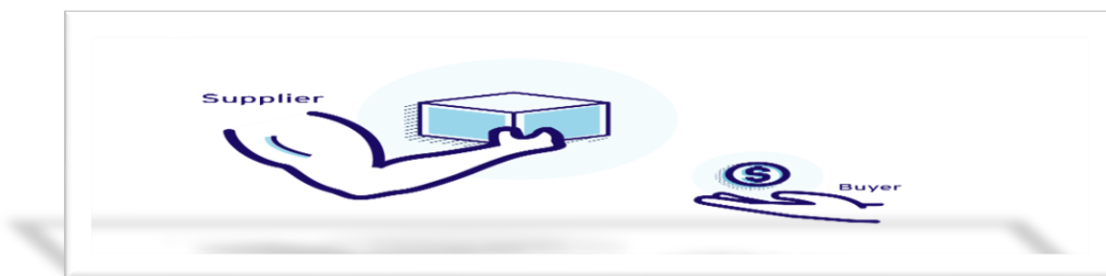
The threat is low as the start-up capital requirements are very high. New entrants are exploring new strategies and models to meet the demands of the modern value chain and to take advantage of developing opportunities for new products and services and to explore profitable positions. Prominent failures, such as ‘‘Better Place’’, have occurred in recent years. In Europe, the path and final scale of EV adoption remain uncertain. According to McKinsey's research, the industry has future potential, but for now, the threat of new entrants remains low.



(Distad, n.d.)

Bargaining power of suppliers – High

Growing manufacture of EV and used advanced technology are opportunities for the suppliers. Regardless of their chosen form of battery, almost all OEMs have collaborated with battery suppliers to accelerate the production of battery pack technology. Almost all OEMs have partnered with battery suppliers to drive the development of battery pack technology, regardless of their preferred type of battery. Suppliers are making investments more in EV manufacture stages, which differ significantly from those for ICE-based cars, thus further reducing overall EV production costs. Bargaining power of suppliers is high, because they are playing significant role in production of the car manufacturing industry.

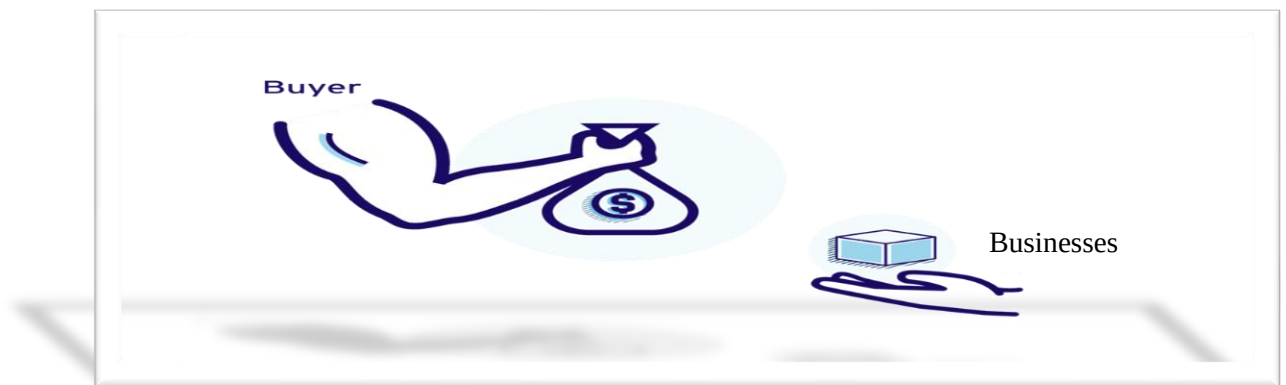


(MaRS Startup Toolkit, 2019)

Bargaining power of buyers- High

I addressed social factors already, most of the buyers are highly educated, who would like to live in a clean environment. These factors mean that highly profitable costumers are fewer cost sensitive. In Europe leaders in sales are Norway, Netherlands, and France, where the economy is high.

The EVs are still new for the globalized consumers and they are worried about future value, about the range and the charging time. This forcing the carmakers to invest in R&D to find out better technology alternatives. The fuel performance of ICEs tends to improve, with consumers expected to lose interest in EVs only.



(MaRS Startup Toolkit, 2013)

Threat of substitutes – Low

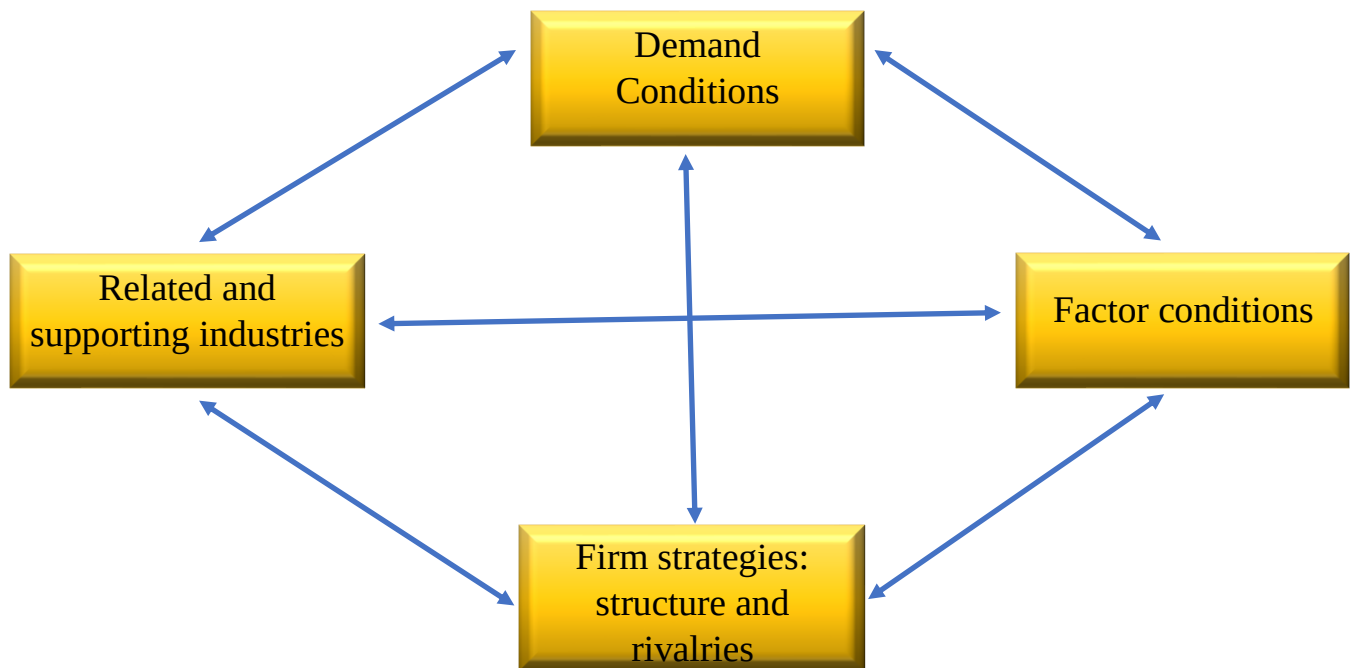
In the market product differentiation is very important, for example in Toyota range we can see similarity with Nissan. The main threat is obviously ICEs industry. Today most of the fuel sources alternatives are under research and development, and threat of substitutes is still low.



Porter's Diamond model of EVs

Michael Porter has suggested a four-pointed 'diamond' to illustrate why some locations tend more than others to produce companies that have maintained competitive advantages in some industries.

The diamond model emphasises environmental factors and structural characteristics that lead to their competitive advantage by nations and their regions. It has been used by governments seeking to increase their local industries' competitive advantage. (Johnson *et al.* 2017, p. 282)



Porter's diamond: the determinants of competitive advantage (Griffiths and Wall, 2011, p. 488)

Factor conditions

Factor conditions refer to 'the nation's position in factors of production, such as 'infrastructure'. The Norwegian government has invested heavily in financial incentives and charging infrastructure. According to McKinsey research, Norway is a leading competitor in sales of EVs, but why? The answer is simple: favourable environmental reckoning and financial incentives.

Demand conditions

Solar and wind production in Germany often need to be removed from the grid because they provide a degree of electricity that the grid cannot accommodate. For example, in the case study, we can see Sweden is also with a good percentage of EVs sales, but electricity shortages are a problem.

In Norway energy comes from hydropower and most are renewable. Combined with high expectations this strong demand holds competition high. It is this fierce rivalry that keeps the country in international highly competitive. (McKinsey & Company, 2014)

Related and supporting industries

Suppliers are critical to improving innovation through inputs that are more effective and of higher quality, timely feedback, and short lines of communication. The Li-ion-based battery cell is manufactured only by Tesla. They also concluded a deal with Panasonic as the chosen manufacturer to supply nearly 2 billion cells. Tesla has patented cutting-edge cooling and BMS technologies, and the products it has taken to market are eligible for government safety standards.

The European headquarters of Tesla is based in Amsterdam, The Netherlands. (Wikipedia, 2019) This explains, according to McKinsey study why Netherland is the second leader in EVs sales in Europe and is with a competitive advantage.

Firm strategies: structure and rivalries

Advantage bases can also be the characteristic strategies, industry structures, and rivalries in the various countries. A dynamic local market structure is also helpful: local companies may become complacent if they become too dominant in their home region and lose advantage overseas. So, some domestic rivalry may be an advantage. For example, Japanese car companies' long-run success is focused in part on government policy supporting several national players, unlike in the UK, where they were all consolidated into one because each group had to contend with many strong local rivals. (Johnson *et al.* 2017, p. 283)

Recommendations

There is a need to resolve the shortage of awareness in the general population.

The industry needs to introduce itself with advertising and public spots.

There is a need for more advanced technology for batteries with long-life and charging times.

EV industry should continue with its research and development to increase customer portfolio, to competition with ICE.

Conclusion

As addressed in the economic, social, and environmental review parts of this article, the advantages of electric cars greatly outweigh the costs.

The future for countries with low market shares in electric cars is positive.

Therefore, the understanding and sustainability of this sector is highly reliant on the global community and I believe that the public would feel motivated and empowered by programmes of digital promotion and environmental consciousness to push an electrically driven car.

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