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Introduction

Since manufacturers started focusing on electric vehicles, electric cars are capturing the automotive market. Top vehicle manufacturers around the world have already declared their electric mobility strategies. The growth of electric vehicles opens opportunities for the electric car business. This paper will review the strategies for entrepreneurs in the field of electric vehicles.

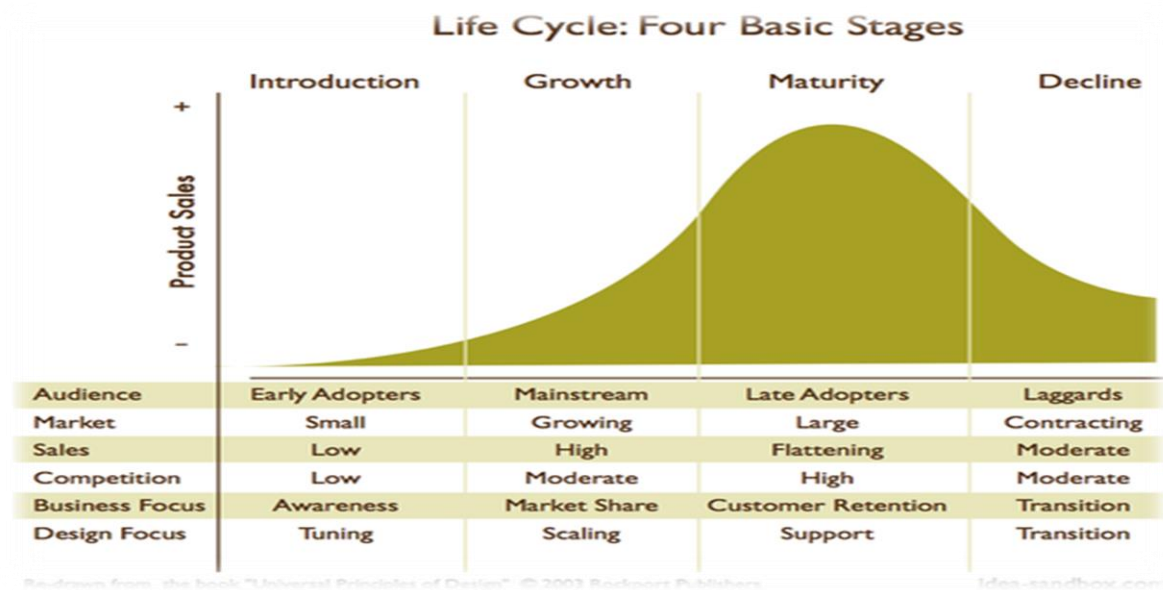
In this essay, I will explore new businesses and future opportunities, marketing of electric cars, features of major trading groups, the product life cycle of EV, basic economic concepts within the McKinsey's case study "Electric vehicles in Europe gearing up for a new phase?" and EVs industry in the national and global run.

EVs and Product life cycle

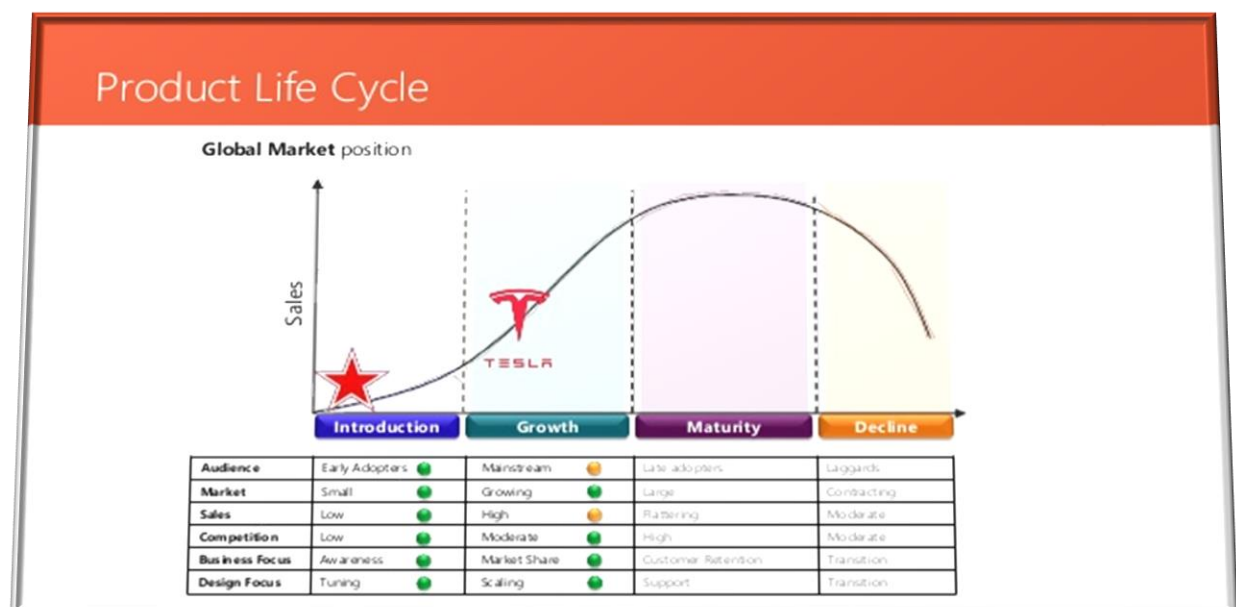
An electric vehicle (EV) is a propulsion vehicle powered by one or more electrical or traction engines. An electric vehicle may be driven from off-vehicle sources through a collector network, or it may be self-contained with a battery, solar panels, or electrical generator to convert fuel into electricity.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

Most products go through four periods of the life cycle of the product: introduction , growth , maturity, and decline. It will depend on the point the product has reached in its life cycle, in terms of pricing and other product-related policies.

EVs' product life cycle is in the growth stage, where extremely rapid growth is occurring at this stage which attracts the first competitors to market. The industry is finding the latest models or improvements to some existing ones to prolong their life cycle. The profits that are beginning to be made can be used to support those investments. (Griffiths and Wall, 2011, pp. 133 – 135)



(Bakhshi, 2014)



(Udovitskaya, 2015)

Maturity stage - This makes refinements and aesthetic improvements to have a competitive advantage and sustain revenue rates. Replacement goods are likely to have been launched. Scale economies resulting from high volume output would help to keep unit costs low and profits high. (Griffiths and Wall, p. 134)

According to McKinsey's 2014 study "Going beyond the initial 'hype,' the next few years will be a time of further growth of the EV industry, nurtured by government funding."

Based on Product Life cycle stage requirements and According to Tesla's product life cycle diagram we can recognize that the EV industry after 5 years will be in the Maturity stage.

The industry already covers some of the requirements of the Maturity stage: competition is already High, the market is large, sales are increasing, new EV models are introduced, which I will explore them through marketing models.

New Businesses opportunities

Top 25 Electric Cars start-ups

EVs	Country	Funding	Description
TESLA	USA	\$16B	Manufactures home batteries, solar roof and manages huge solar stations with energy.
Nio	China	\$3.5B	global designer and developer of autonomous EV.
Faraday Future	China	\$2B	Design and technology company develops best solution that re-imagine transport, material, and ownership.
Rivian	United States	\$1.8B	An automotive development business that designs products and services to push towards sustainable mobility.
WM Motor	China	\$1.2B	Develops an electric vehicle that is not a truck, is not sluggish but is a well-designed, 100 % electric vehicle targeted at the mass market.
Lucid Motors	United States	\$1.1B	Silicon Valley business that designs, develops, and manufactures electric cars
Proterra	United States	\$527.2M	Makes zero-emission, battery-electric buses which help to eliminate dependence on fossil fuel and cut prices.
Ola Electric	India	\$306.3M	EVs leasing company.
StoreDot	Israel	\$146M	Develops a fast-charging battery to replace the lithium-ion elements used on mobiles, electric cars, and other unwired equipment.

Rimac Automobili	Croatia	\$123M	EV elements company and hyper cars
Sono Motors	Germany	\$71.9M	Focuses on alternative technology and services
Electreon	Israel	-	developing an intelligent transportation technology for underground electric coils that wirelessly recharge EVs as they travel
EV Connect	USA	\$25.9M	Provides applications and solutions for business level, electric car charging.
Aquarius Engines	Israel	\$18.5M	The engine-generator, and is significantly cheaper, smaller, safer, and more powerful than current generators. It is about disrupting the Power Generators and Electric cars market in general.
POD Point	UK	\$12.3M	Electronic vehicle charging stations are provided by Ltd. The Business provides public sector or private companies charging stations that plan to have their own charging stations.
ELEXTRA	Switzerland	-	redefines the supercar
Innolith	Switzerland	-	This will provide new ways to store and utilise electricity for grid, automotive, and industrial uses.
Volta Trucks	Sweden	-	is constructing an electric truck
Electriphi	United States	\$3.5M	Simplifies planning and operation of electrification of commercial vehicle fleet.
Nikola Motors	United States	\$1.7M	work on the fuel cell membrane electrode assembly (MEA)
Axiflux	Australia	\$825K	creator of the Adaptive Magnetic Flux Array — the first modular electric motor and generator in the world, software that can be reconfigured in real time. Relative to a conventional electric motor, the advanced design and control of the AMFA provides substantial scale, weight and price reductions, thus increasing power output, performance and reliability.
AEV robotics	Australia	-	Has designed a modular town vehicle network
Weave grid	United States	-	Committed to enabling electrification of large-scale transport through direct and efficient system integration. The business gathers data from charging electric

			vehicles and can optimise EV charging for customers such as utilities.
Enercent	India		Enercent is establishing a platform for the management of the EV infrastructure.

(energystartups, 2020)

According to McKinsey's research, the players in the industry and manufacturers are working on new business models: Vertical OEM offerings, battery leasing, and charging infrastructures. From the electricity and delivery viewpoint, other business models are developing: Smart grid applications, Aggregating demand-side response, and monetizing flexibility and Stationary storage using EV batteries.

Requirement for totally electric and zero-emission vehicles is on the rise, with the UK market estimated at £ 5 billion and the European market estimated at £ 50 billion by 2025.

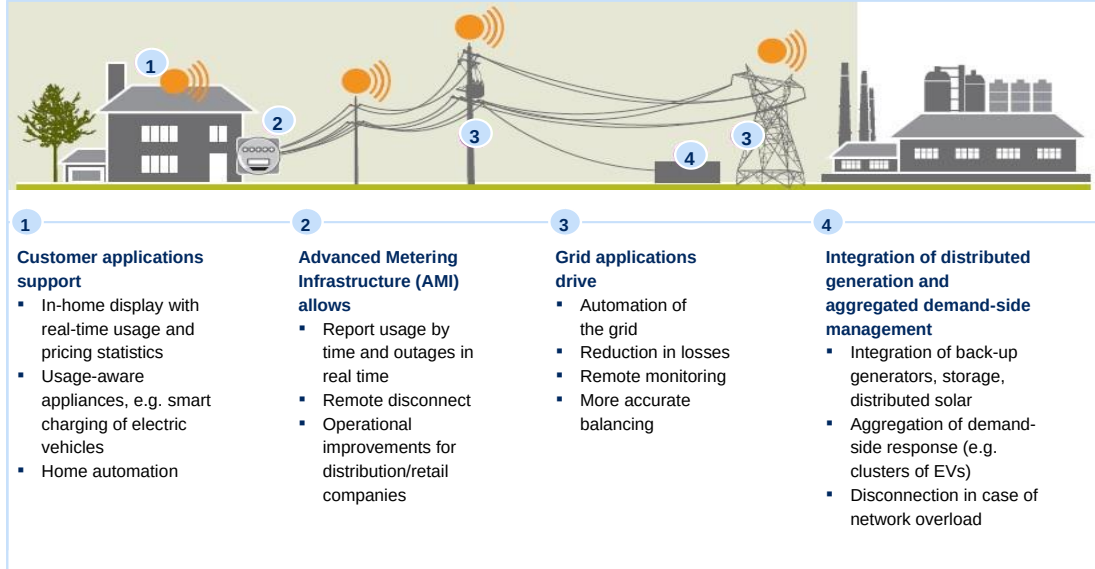
The Faraday battery challenge is an expenditure of £246 million on moving ahead with next generation of electric vehicles. They will be powered by cost-effective, high-performance, robust, lightweight, and stable recyclable batteries.

In the former Faraday Battery Challenge Competition, Brill Power is leading the project starting with renewable energy. Battery control and management technology could increase lithium-ion battery life by 60 percent, manage individual cells in a battery pack and replace them where necessary. (Government funding programs, 2018)

Four thousand sq. Located in central London, the ft showroom opened its doors in July 2017 for the first time and is one of a range of campaigns introduced by the Milton Keynes Council to help inspire more people to think about and purchase EVs. (Hailstone, 2017)

The implementation of the smart grid would go together with the deployment of mass PEVs. The smart grid will permit values to monitor vehicle charging on the grid and allow for peak and off-peak hour billing. (Todd, International

Transmission and distribution environment



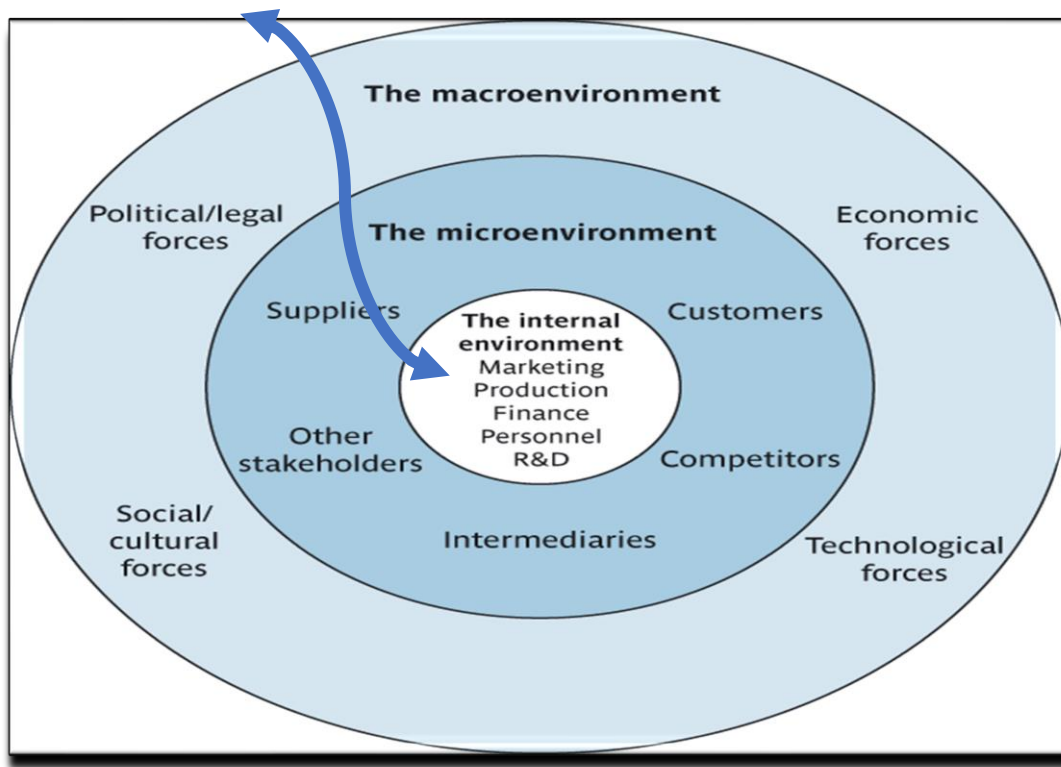
Another opportunity is “mobility as a service”, which will attract more costumers and will put the EVs environment is highly competitive. Such as car-sharing and full mobility. (McKinsey & Company, 2014)

Tesla introducing pickup truck shocks the world and their accounts are 17.6% of the US automotive market, which has a huge opportunity of growth in EVs. (Loveday, 2019)

Due to the economic impact of the Covid-19 crisis, EV sales are set to be 1.7 million off, but analyst Bloembergen predicts that it will be less of a hit than the expected fall in conventional car sales, increasing the penetration of electrical models into the overall market. However, the analyst expects the Covid-19 effect on traditional car sales to be much more drastic, with this year's global sales falling by 23 percent, leading to a rise in EV market penetration even as renewable energy gained ground in fossil fuel power generation during a pandemic that saw a downturn in electricity demand. (Hall, 2020)

Innovative business models such as those explained above allow the industry to develop and deliver the basis for the further adoption of EVs. However, increasing the sales of this new industry is very important for the analysis of the organizations' internal environment.

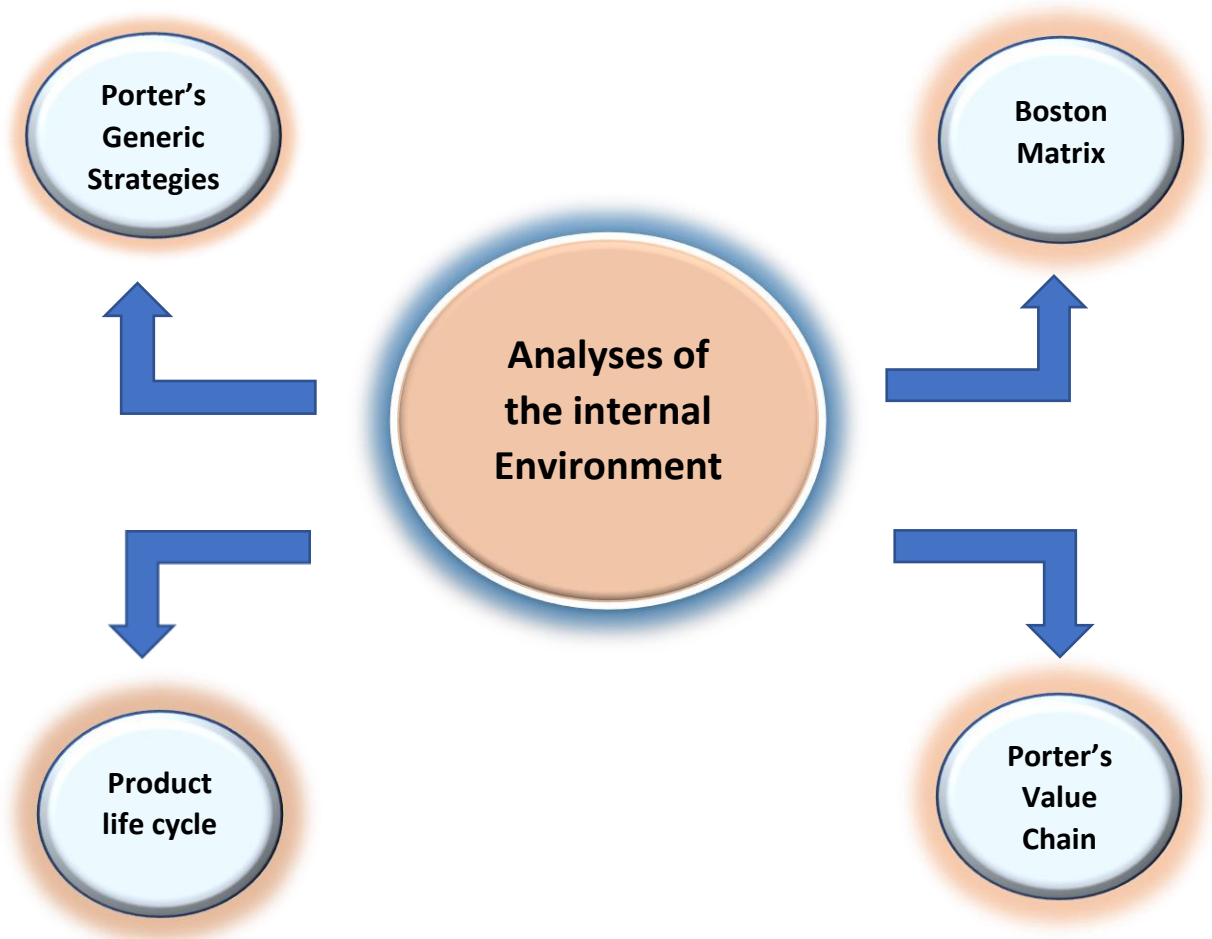
Internal business environment



(cclifford7, 2014)

Global business internal environment has functional areas such as Production , Personnel, Finance, Marketing and R&D. The central process for transforming organisational inputs into outputs is these functional areas. Management and their relation will be a key factor in the company's success and ability to respond to external demands for change. (Worthington and Britton, 2006, p. 30)

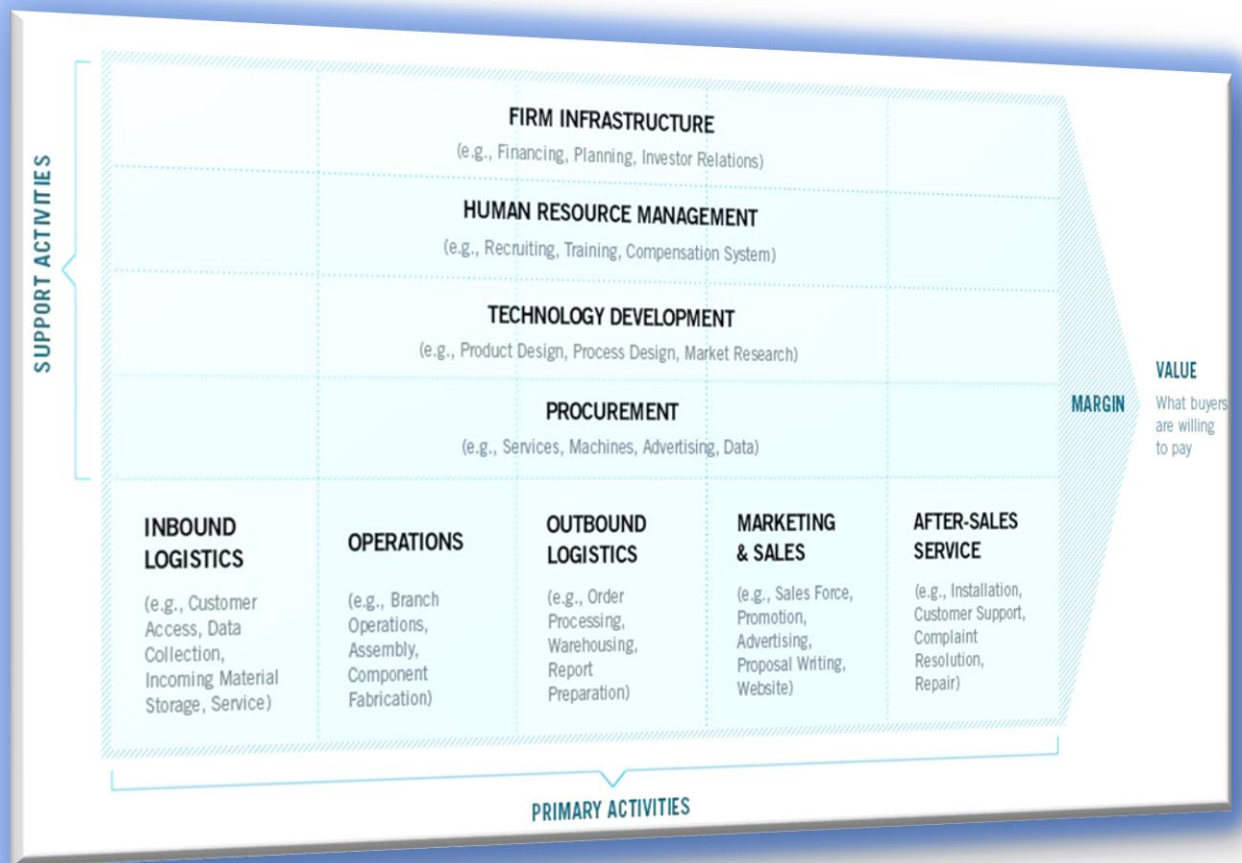
I will apply some strategic tools and analyse the industry of EVs in national and international trade by the scheme below, to diagnose the future of the industry.



Porter's Value chain of EVs

The value chain of Michael Porter is a powerful way to disaggregate an organisation into its strategically important activities, focusing on sources of competitive advantage, i.e. individual activities resulting in higher or lower prices.

The Porter Value Chain is a model which can be used as part of the operational research process of the strategic planning process and is especially useful in determining whether an enterprise has a sustainable competitive advantage. (Hbs.edu, 2019)



(Hbs.edu, 2019)

Exhibit 5.1

Impact of powertrain transformation on value chain

EXAMPLES

Raw materials	Carmaker	Changing infrastructure	Maintenance	2nd use
Manufacturing equipment	Automotive supplier			Recycling
- Increasing demand for copper and rare earth, e.g. neodymium - High investments in EV production equipment, while machinery demand mechanic operations will drop	- Carmaker and suppliers will enter into e-motor production to tap high growth potential - Turbocharger manufacturers will benefit from down-sizing trend, but will get under pressure in the long run	Utilities and infrastructure providers can benefit from investments to build up charging stations for EVs and new business models to provide ancillary services	Negative impact on after sales service providers: BEVs require less effort for maintenance than today's ICEs	New businesses around 2nd use and recycling of EV components will arise driven by increasing prices for raw materials
				

SOURCE: McKinsey –Boost! Powertrain KIP

(McKinsey & Company, 2014)

Primary and support activities of EVs industry are competitive advantages of EVs in the Global market, such as high quality in manufacturing equipment, e-motor production, existing supply chain, battery reuse and recycling (Exhibit 5.1).

Many companies use various marketing platforms, including both conventional and digital marketing channels, to advertise their products and brands.

Tesla, for example, presents a wide-ranging of power products, involving products and solar tiles.

In less than 48 hours, Tesla takes raw sheets of rolled aluminium and turns them, along with hundreds of other parts, into finished vehicles at its Fremont factory in California. (Field, 2020)

The organisation offers after-sales support through its vast network of retail stores and service stations in different parts of the world.

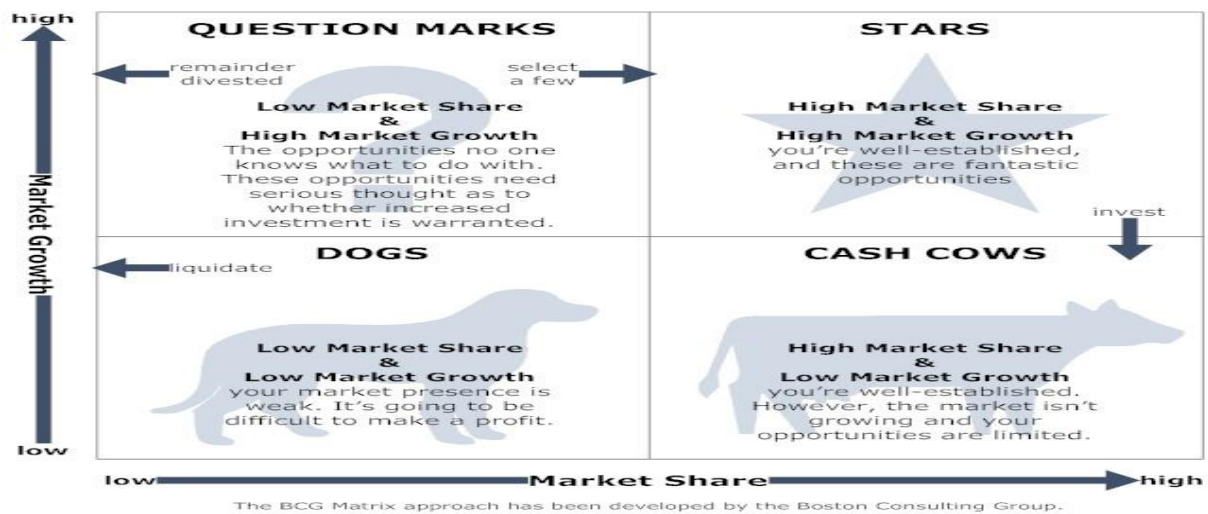
Support activities improve the primary activity's effectiveness or efficiency. The main advantage of EVs compared to TCO is the infrastructure and financing and support from the country's governments. Technology is the major differentiation source in the worldwide automotive industry. For example, Tesla in 2018, invested \$1.46 billion in R&D and this helped the company improve its products and grow its attractiveness in the international market. (Pratap, 2019)

Enterprises may purchase EVs for their corporate fleets or provide incentive programmes to encourage employees to use EVs. Incentives for training and supplying workers with the purchase of EVs and labour charges. (Todd, International Economic Development Council, 2014)

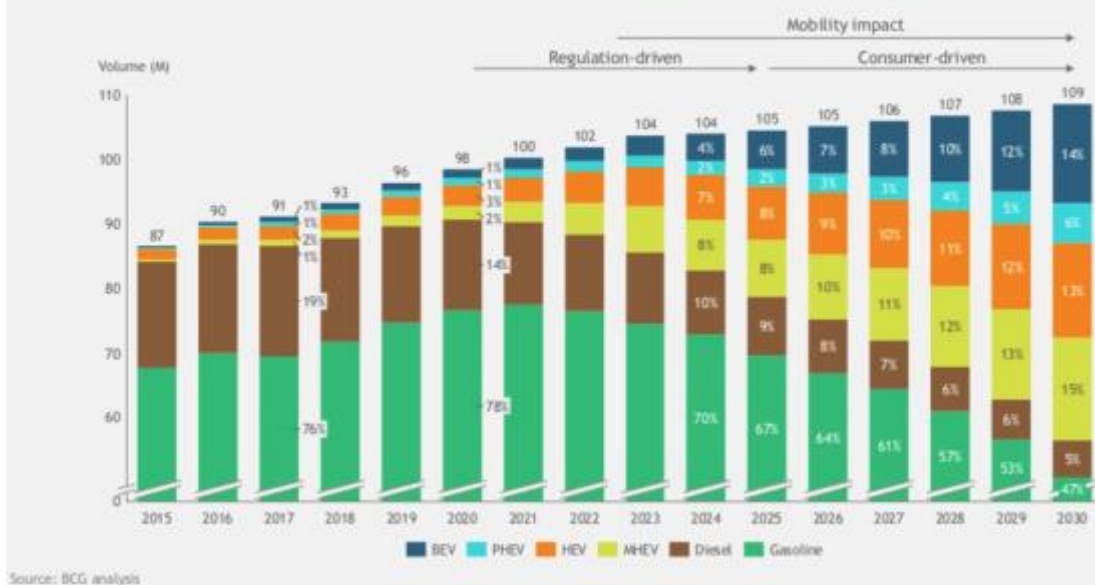
[Boston Consulting Group Matrix](#)

The matrix of the Boston Consulting Group presents a useful context for long-term strategic planning for examining the balance of a multi-product firm's portfolio of products. The product portfolio of the Company shall be evaluated in depth based on market share, growth rate and cash flow. (Griffiths and Wall, 2011, pp. 486-487)

BCG Matrix



BCG market forecast to 2030 (global view)



As the industry moves forward through the next step, electrified vehicles – a combination of complete hybrids (HEVs), mild hybrids or 48-volt hybrids (MHEVs), plug-in hybrids (PHEVs) and battery-powered electric vehicles (BEVs) – would increase their market share from around 2020 to 2025, as OEMs are forced to meet increasing fleet-wide performance and emission requirements, primarily by promoting non-ICEs sales.

(Green Car Congress, 2017)

According to BCG research EVs industry is with High Market share and is on the way to be with High Market growth. The place of the industry is in the Stars section, where are fantastic opportunities and strong competition.

Features of major regional trading groups

NAFTA and the European Union comprising 27 countries are the biggest trading companies' blocs all over the world.

Although the U.S. has distinct advantages, other nations are at an early stage in expanding domestic EV markets and increasing market share in the region. The Boston Advisory Group expects China and Europe to outperform the United States.

Table 6: U.S. Competitive Position

U.S. Competitive Position	
Advantages	Disadvantages
❑ Rising domestic demand ❑ Stimulus funds are growing domestic PEV supply chain ❑ A leader in R&D investment and performance (labs, patents, research papers) ❑ Automakers can be retooled for PEV production ❑ High quality manufacturing ❑ Skilled workforce ❑ Existing supply chains ❑ Unused facilities ❑ "Buy America" protectionist policies hinder foreign manufacturers	❑ More expensive labor and material costs ❑ Less government financing than countries like China ❑ Shorter track record of manufacturing experience in industries like batteries compared to South Korea, China and Japan ❑ Intellectual property edge may be lost if companies are required to share blueprints to sell PEVs in China ❑ U.S. market is being served by Asian companies ❑ U.S. faces protectionist policies in foreign markets

The United States is in a special place. A broad possible customer basis, innovation in R&D, government funding and a changing internal automotive market are generating fertile opportunities for EV. These investments, combined with beneficial environmental policies, would make the U.S. a runner.

The strong commitment of the European government to sustainability has powered the EV industry. The nearness of European countries provides for a competitive method to the adoption of EVs.

EV on the EU market today utilize a range of charging technologies, making it very difficult to seek to create a single charging network. The EU acknowledges this challenge and is moving forward with the Green eMotion initiative – a €41.8 million (\$57.3 million) project aimed at supporting EV safety standards and technology improvement (including smart grids) and improving urban mobility.

In April 2012, the United Nations and the EU met in Washington DC to define informal safety and development standards. This worldwide collaboration has helped financial system to accelerate the deployment of EVs to the present day. (Todd, International Economic Development Council, 2014)

Conclusion

Business models are still developing and evolving in the EV world, as they will do when adapting to changing contexts. EVs are important for the outlook of the automotive industry and the environment. Investments in the technology of EVs increased government support, and the most important these eco-friendly cars will continue to attract more new adopters. The new business opportunities and increasing sales and getting in the new phase, EVs are highly competitive in the business environment.

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