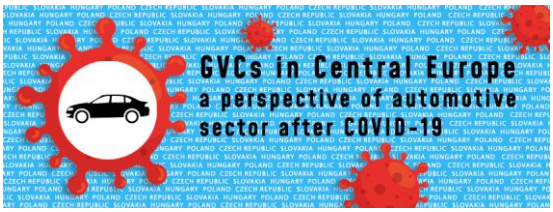

Visegrad Fund

Increasing the value by upgrading within GVCs

A case study by Iveta Černá & Eva Křenková

The case was developed with support of the Prague University of Economics and Business and by the Visegrad Fund in 2022. It is intended to be used as a base for discussion in courses focusing on Global Value Chains, International Business and Marketing.

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Technological changes pose continuous challenges to the firms. “The challenge to management is to create the strategies and structures, resources and capabilities, and to use the new technologies efficiently, to encourage this cross-disciplinary, cross-sectoral, and cross-technology synergy” (Dogson et al., 2008, p. 307). By upgrading, firms develop their products, increase efficiency in their operations or proliferate into new industries by using their skills while developing new capabilities.

There are four different forms of upgrading:

(a) process upgrading by reorganization of activities or implementation of new technologies,

(b) product upgrading by the increase in the value of the product,

(c) functional upgrading by gaining new roles in the value chain,

(d) inter-sectoral upgrading by entering new production activities (Humphrey & Schmitz, 2002).

The key to upgrading is innovation. In the V-4 automotive industries, the situation within GVCs is more favourable for process and product innovations (Antal et al., 2015). The important aspect is the collaboration in creating innovations along the value chain, especially between the OEM and TIER 1 suppliers. In the said industry, the research emphasizes the role of buyers (Humphrey & Schmitz, 2002). Companies involved take different approaches to the innovation strategy. Companies that update based on the specifics provided by their customers apply a passive innovation strategy. Innovating suppliers can adopt reactive, active, or proactive innovation strategies, the latter being the most demanding in terms of resources and innovation capabilities (Dodgson et al., 2008). Conditions favourable for upgrading include a stable business and political environment, knowledge, skills, and education (Antal et al., 2015).

Electromobility in Europe – step by step

If we neglect the very first attempts to construct an electric vehicle (EV) that date back to the 19th century (Deal, 2010), the world’s first mass-produced hybrid passenger vehicle was the Toyota Prius, launched in Japan in 1997 (Toyota, 2021) and worldwide in 2000 (Department of Energy, 2014). Yet Tesla company pushed the process of EV proliferation forward in 2006 by announcing the plans to produce a luxury electric sports car. Tesla received a loan from the US Department of Energy for its production worth nearly USD 500 million in 2010. The subsequent Tesla’s headway and success made the other carmakers join the ‘race’. They speeded up their efforts to develop their own electric cars (Department of Energy, 2014).

After several efforts with hybrid (plug-in hybrid vehicles; from now on referred to as PHEV) or fully electric vehicles (battery electric vehicles; BEV) produced in tiny series in the 1990s or early 2000s, the European carmakers were somewhat slower in starting mass production. For instance, Volkswagen debuted with e-Golf not earlier than in 2013 (Volkswagen UK, 2021), while Renault in 2012 (Renault Group, 2021) and BMW in 2013 with the BMWi sub-brand (BMW group, 2012). The gradual increase in EV stock is demonstrated in Tab. 4.1. A significant momentum that multiplied the EV stock was given in 2008 when Tesla Roadster (first generation) was launched. In April 2010, the regular production of the said model commenced (Tesla, 2021).

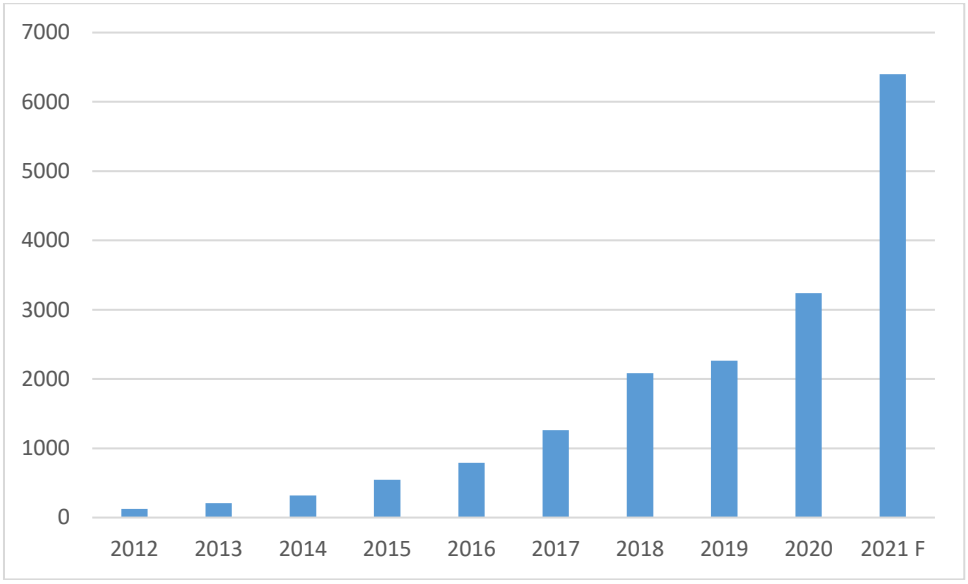
Table 1. Electric car stock (BEV and PHEV) by country over 2005-2019 (in thousands)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia							0.0	0.3	0.6	1.9	3.7	5.1	7.3	10.9	20.1
Canada							0.5	2.5	5.7	10.7	17.7	29.3	45.9	90.1	141.1
China					0.5	1.9	7.0	16.9	32.2	85.3	292.7	628.7	1207.7	2288.8	3349.1
Finland							0.1	0.2	0.5	0.9	1.6	3.3	7.2	15.5	29.4
France	0.0	0.0	0.0	0.0	0.1	0.3	3.0	9.3	18.9	31.5	54.5	84.0	118.8	165.5	226.8
Germany	0.0	0.0	0.0	0.1	0.1	0.2	1.9	5.3	12.2	24.9	48.1	72.7	109.6	177.1	258.8
India				0.4	0.5	0.9	1.3	2.8	2.9	3.4	4.4	4.8	7.0	9.1	11.2
Japan					1.1	3.5	16.1	40.6	69.5	101.7	126.4	151.2	205.3	255.1	294.0
Korea						0.1	0.3	0.8	1.4	2.7	6.0	11.0	25.7	60.6	92.4
Netherland				0.0	0.1	0.3	1.1	6.3	28.7	43.8	87.5	112.0	119.3	146.7	214.8
N Zealand						0.0	0.0	0.1	0.1	0.4	0.9	2.4	5.9	11.4	17.7
Norway			0.0	1.7	1.8	2.7	3.9	8.4	15.7	35.4	69.2	114.1	176.3	249.0	328.6
Portugal						0.7	0.9	1.0	1.1	1.3	2.5	4.3	8.7	17.0	29.7
Sweden						0.0	0.2	1.1	2.7	7.3	15.9	29.3	49.7	78.6	97.0
Thailand		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.4	9.0	19.4
UK	0.2	0.5	1.0	1.2	1.4	1.7	2.9	5.6	9.3	24.1	48.5	86.4	133.7	184.0	259.2
U.S.	1.1	1.1	1.1	2.6	2.6	3.8	21.5	74.7	171.4	290.2	404.1	563.7	762.1	1123.4	1450.0
others	0.6	0.6	0.6	0.6	0.7	0.9	3.6	7.7	13.4	27.0	51.6	85.5	146.2	220.1	328.5
Total	1.9	2.24	2.70	6.60	8.89	17.03	64.32	183.64	386.32	692.63	1235.73	1988.18	3136.78	5111.92	7167.83

Source: own calculations from IEA (2020), p. 247

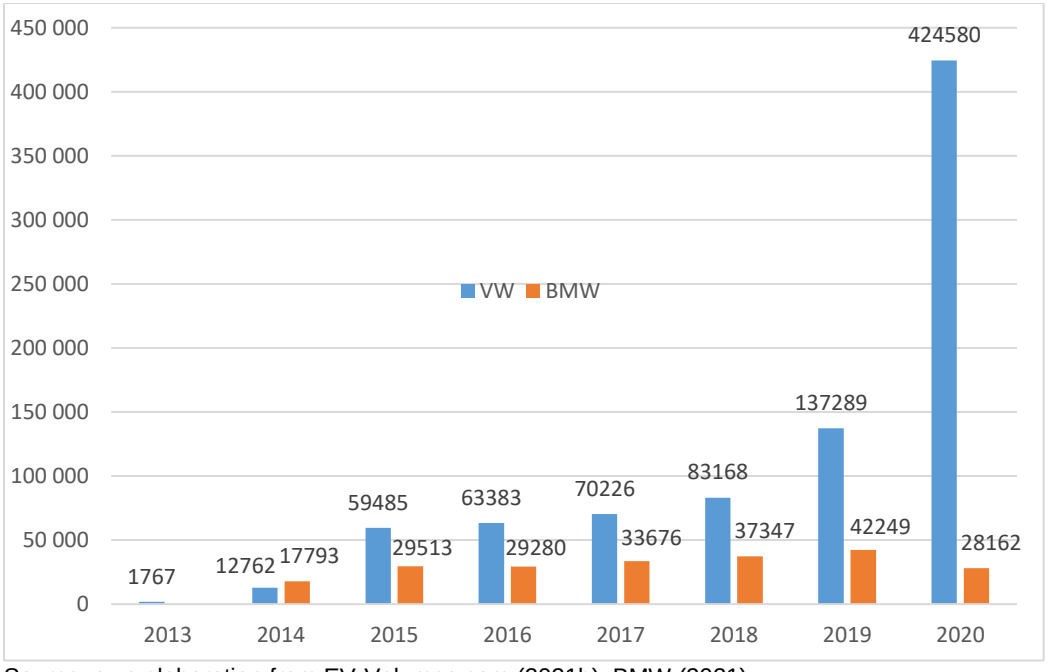
The EV sales gradually rose from 2012 to 2021, with the highest year-on-year hike in 2021 (according to forecasts); Fig. 4.1. As for Volkswagen only, the most significant year-on-year rises can be seen in 2013/2014, 2014/2015, and 2019/2020; Fig. 4.2. The market share of BMW is much lower in comparison.

Figure 1. Global EV sales (HPEV and BEV) over 2012-2021 (thousands of units)



Source: own elaboration from EV-Volumes.com (2021a).

Figure 2. EV worldwide sales of Volkswagen Group and BMW group (i series) over 2013 – 2020 (in units)



Source: own elaboration from EV-Volumes.com (2021b); BMW (2021).

Indeed, the EU legislation and EU member states' tax incentives gave additional impetus to the process that Tesla started. The 'sustainable tomorrow' initiatives and related EU and national legislation constitute stepping stones for European carmakers when projecting their respective R&D efforts and investments into EV production. They create and expand the future

market potential and demand. We can highlight the role of emissions limits for passenger cars and tax incentives for electric vehicles in these terms.

The regulatory framework

The Directive 2006/32/EC of the European Parliament and of the Council on energy end-use efficiency and energy services stipulated in the preamble: “The motor fuel and transport sectors have an important role to play regarding energy efficiency and energy savings.” And in Annexe III, the Indicative list of eligible energy efficiency improvement measures involved “motors and drives (e.g., increase in the use of electronic controls, variable speed drives, integrated application programming, frequency conversion, the electrical motor with high efficiency)”; (Directive 2006/32/EC). The aforesaid Directive was replaced by the Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency, which is still in effect in its consolidated version of January 2021.

Directive 2009/33/EC of the European Parliament and of the Council of April 23, 2009, on the promotion of clean and energy-efficient road transport vehicles, is still in effect in its consolidated version of August 2019 (Directive 2009/33/EC). It gives legally binding minimum targets for shares of clean and energy-efficient road transport vehicles in total numbers of purchased, leased, or rented road vehicles in public procurements; (Directive 2009). In other words, it pushes public sector bodies to respect the mandatory shares of clean and energy-efficient road transport vehicles when expanding the public road transport fleet hard forward.

Another major impetus to electromobility was given in 2019 by Regulation 2019/631 of the European Parliament, and of the Council setting CO2 emission performance standards for new passenger cars and for new light commercial vehicles. It sets emission targets for vehicles registered in the EU for the first time that have not previously been registered outside the EU (Regulation 2019/631). The main target is to live up to achieving net-zero greenhouse gas emissions by 2050. Contemporarily, the European Green Deal, a set of policy initiatives of the European Commission aimed at making the EU climate neutral in 2050, represents a hot topic of political, ecological, economic, and social debates. Suppose the proposed measures are adopted by the European Parliament and EU member states and become legally binding. The average CO2 emissions of every new passenger car have to be decreased by 55 % by 2030 and 100 % by 2035 (in comparison to 2021 levels); (European Commission, 2021a). That would mean that any new passenger car with a combustion engine could not be registered in the EU from 2035 onwards. Indeed, if this political decision is transposed into binding legislation, even hybrid cars would be prohibited, leaving entire space for fully electric vehicles

and hydrogen cars. Yet, given comparatively much higher prices of EVs and a still limited density of the network of charging stations (The Automotive Disruption Radar by Roland Berger, 2021), the total number of cars sold is very likely to shrink, making independent car transport less affordable. In addition, imports from abroad (i.e., from countries less ambitious on climate) will likely not help affordability. They are planned to be subject to the particular import barriers countervailing the lesser environmental protection rules in the country of production, resulting in a lower price. The so-called 'Carbon Border Adjustment Mechanism' is meant to obstruct (in fact, increase the allegedly dumped price) imports of products manufactured under lesser carbon-emissions-responsible conditions (European Commission, 2021b).

To date, carmakers are under growing pressure regarding CO2 emissions limits. In 2021, the emission limit per average car was 95 g per km. If the carmaker does not respect the limits, it is subject to penalties for every vehicle sold. Indeed, the high share of EVs in total sales of the given carmaker can countervail cars' emissions with a combustion engine. Hence the average emission per car is decreased. To conclude, the carmakers with a high percentage of EVs in total car sales are better off (iDNES.cz, 2019).

EU member states give additional momenta to the EV market expansion through purchase or tax incentives for EV owners in the form of exemption from ownership taxes of various kinds and road taxes. In 2011, the provisions involved personal income tax reductions, corporate income tax bonuses, cash incentives for purchasing EVs, exemptions from fuel consumption tax, vehicles tax, registration tax, road tax, or company car tax (ACEA, 2011).

As of 2021, except for Estonia, which does not provide any stimulus, each EU member state provides either tax benefits or/and purchase incentives related to EVs. The purchase incentives are available in 17 member states in the form of cash grants, bonuses, or cashback, whose amounts vary according to the type of EV purchased. BEVs are mostly preferred and eligible for the higher bonus. Yet the incentive is typically available only for less expensive vehicles, i.e., the eligible list price is capped. The cap ranges from €44,000 in Hungary to €62,500 in Portugal. The tax benefits can be related to the acquisition or/and ownership of private or/and company cars; (ACEA, 2021b). Tab. 4.2 details the situation in V-4 countries.

Table 2. Snapshot of EV-related tax benefits and purchase incentives in V-4 in 2021

	Tax benefits			Purchase incentives
	Acquisition	Ownership	Company cars	
Czechia	Exemption from registration charges, vignettes and toll fees	none	yes	none
Poland	Yes, but capped by 2,000 cubic centimetres in engine displacement volume	none	none	none
Slovakia	Max.charge of €33 for BEV, depreciation of 2 years for BEV and PHEV	yes	none	none
Hungary	yes	yes	yes	Grant of €7,350 or €1,500 in case of gross price of up to €32,000 or between €32,000 and €44,000, respectively

Source: ACEA (2021b)

Targeting investments to increase the value-added and competitiveness globally

Valeo is a French world-leading producer celebrating its 100th anniversary of operations in 2023. The global company operates in 33 countries. The company's tremendous growth needs to be mentioned, but we will focus mainly on the product innovations. The company has an established presence in the central European countries and contributes to the added value growth by investing in innovations in this region.

The long path to becoming a global automotive supplier has some critical milestones. The company invested in R&D and registered its patents from the very beginning. The story started with expansion in regions of France. The further international expansion dates back to the 1960s and targeted European countries, establishing new sites in Italy and Spain. Besides developing its premises and research centres, the company grows thanks to acquisitions and take-overs. The company expanded outside Europe in 1980, opening operations in the United States; other countries followed - Mexico 1982, Tunisia 1984, Brazil 1985, Japan 1985, South Korea and Turkey 1988, and India 1997 (Valeo_Our Story, 2022). In 1994 the company entered China, which is now its most important foreign market. The most recent focus of the company is the fast-growing Asian markets (Valeo Case Study by Jacques Aschenbroich, 2020).

During its growth, the multinational did not just extend its international presence but also the scope of activities from clutches and friction materials to heating and air-conditioning systems. The company became a significant supplier of lighting and wiping systems. The long-term strategy encompasses electrical components (spark plugs, alternators, and starters), ignition, lighting and wiping systems, security systems, and autonomous and intelligent systems. Consequently, 30% of engineers in R&D are in software (Valeo Case Study by Jacques Aschenbroich, 2020). The global strategy is to develop business in visibility, thermal, powertrain, and comfort & driving assistance systems (Valeo_Our Activities, 2022). The investments in innovations were partly achieved not only by own investment in R&D but also by further acquisitions, partnerships, joint ventures, and investment in start-ups.

Valeo has been present in Central European countries since 1995 when they entered Czechia and Poland. In Czechia, the first operation was in Rakovník, a small town 45 km west of the capital Prague. In 1995, Valeo acquired a major share in the company from Siemens and, in the following year, became the only owner of the plant. The size of the plant has grown over the years, and so has the number of employees steadily increasing. The peak turnover was achieved in 2017. The other production plants are situated in Žebrák, Humpolec, and Podbořany. The newest projects in Czechia are the extension of the R&D centre in Prague, the test track in Milovice, and the extension of the Žebrák production plant with the production of battery coolers for electric vehicles (Valeo in the Czech Republic, 2022).

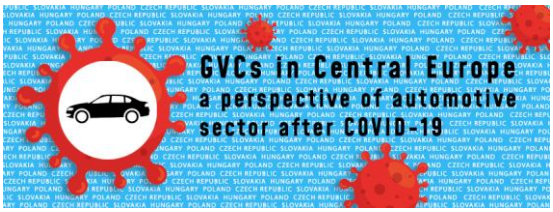
The company announced the investment into the new production plant for battery cooling modules in Žebrák in 2018 and launched the production at the end of 2019. The battery cooling systems were designed by Valeo and keep the battery at the optimal temperature to ensure its optimal performance and longevity. These cooling systems are designed to be adapted to any electric vehicle – a hybrid, plug-in hybrid, and fully electric. The capacity of the new production plant is over 1.2 million battery cooling modules annually (Valeo_Žebrák, 2022).

The newly developed product combined technological and market opportunities. Companies research and design products which are new either to their portfolio or to the market. Companies can benefit from their prior resources, e.g., prior R&D, sales and procurement network, and production sites. There is a potential to achieve synergies, but at the same time, there is the challenge of not losing efficiency. The risks to be considered include market risks (related to the development of the demand), competitive risks (behaviour of competitors), technological risks (potential technological issues), organizational risks (does the new product

require any organizational changes), operational risks (production of the product), and financial risks (considerable investments and uncertain payoffs) (Dodgson et al., 2008). When developing a new product portfolio to serve the growing electromobility market, the company can benefit from the respective expertise it gained.

Questions related to the case study:

1. What are the international growth strategies of the multinational?
2. What advantages and disadvantages are related to selected strategies?
3. Discuss the timing of the investment into the components of the electric car serial production.



Visegrad Fund

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