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BCG BOSTON CONSULTING GROUP

REPORT

How will e-mobility change the Polish labour market?

Green sectors of the future

Warsaw 2021

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Summary

Historically, the automotive industry has, directly and indirectly, been a strong and stable motor for various kinds of jobs in Poland. But recent developments have led stakeholders within and outside the industry to question whether this will continue. Have we reached an inflection point?

The next ten years promises to be a time of transition for the automotive industry. Prior to the COVID-19 pandemic, automakers produced approximately 0.6 million light vehicles in Poland. Production fell sharply during the pandemic and is not expected to rebound to historical levels. Electric vehicles (EVs) will play a major role in the industry's recovery, as people and organizations throughout society recognize the urgency to achieve net-zero carbon emissions. The transition to EVs is already underway and accelerating. Forecasts indicate that by 2026 EVs will account for more than half of light vehicles sold globally, whereas for Poland this is expected by 2025.

Although the actual driving experience of EVs feels similar to passengers, the underlying technology and supporting infrastructure are tremendously different. Indeed, replacing an internal combustion engine (ICE) and fuel tank with an electric motor and battery cell is having massive effects on the entire automotive industry and beyond. A tangible example is the need to set up public and private electric charging infrastructure across Poland.

A recent BCG study explored how these tremendous changes will affect jobs in Poland as well as in Europe. The study is distinctive for considering not only core automotive industries (such as OEMs, suppliers, and maintenance providers), but also adjacent industries (including equipment providers, fuel and electricity producers, and providers of fuel and charging infrastructure). The comprehensive scope allowed us to fully assess the net development of automotive jobs in Poland.

Contrary to what some observers expect, we found that EVs will have only a slight impact on the total number of jobs through 2030. Drilling down to the level of specific industries and regions, however, reveals a more varied picture. While the core automotive industry will certainly suffer significant job losses, some new industries that support electrification will experience tremendous job growth over the next ten years. As a consequence, massive employment transitions will occur over time, between industries and job profiles, and across regions.

Our findings have important implications for governments, companies, and individual workers. Governments should create the framework conditions that enable the automotive industry to master the enormous shift in qualifications. Companies should conduct Strategic Workforce Planning to identify requirements for up- and reskilling as well as goals for recruitment and retention. Individuals should focus on lifelong learning to constantly acquire new skills, and take a more flexible approach to their career paths.

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A Comprehensive Study

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To gain an in-depth understanding of how e-mobility will affect jobs, the study took a holistic approach encompassing a total of 26 industries grouped into eight clusters. The clusters fall into two categories of industries – **core automotive** and **adjacent**.

Core Automotive

Four clusters encompass the core automotive industries that directly relate to vehicles. For the most part, these clusters have been covered in previous studies:

OEMs

European automotive producers that are well-known engines of the economy and major employers.

ICE-focused Suppliers

Suppliers specializing in ICE or components that are closely related to them, such as gear boxes or pumps for injection systems.

Non-ICE Suppliers

Suppliers producing components that are mostly independent from the type of propulsion system – for example, headlights, seats, or navigation systems.

Maintenance and Repair

The entire maintenance and repair industry, encompassing activities such as performing oil changes or repainting after damage.

Adjacent Industries

The other four clusters are indirectly related to cars and are thus considered to be adjacent. Previous studies have not comprehensively considered how e-mobility will impact jobs in these clusters:

Equipment and Services

Producers of equipment and machinery directly used in manufacturing, testing, or research and development (R&D), as well as providers of industrial service offerings related to consulting, legal compliance, real estate, communications, storage, or processing.

Energy Production

Companies involved in the production, transmission, and distribution of electricity that is consumed by EVs, as well as companies that refine oil into gasoline or diesel. For each industry, our analysis included only the share of the workforce whose jobs relate to automobiles.

Energy Infrastructure

Companies that manufacture and service or install and operate electrical charging and fueling infrastructure.

Material Recycling

Companies that process materials from used vehicles into secondary raw materials, typically using a mechanical or chemical conversion process.

Across all of the eight industry clusters, people work in very different kinds of jobs, and the shift toward EVs affects these jobs to different degrees. A salesperson, for example, might not experience much difference in selling an EV versus an ICE-powered vehicle. But for employees involved in producing EVs, the work is very different. To take into account such differences, our study distinguished a total of 31 different job families.

We aggregated these into five job categories:

Engineering

R&D related to vehicles, components, features, software, and systems, and the management of such projects.

Procurement

The purchasing of materials, facilities, services, and parts, as well as associated controlling and accounting functions.

Production and Service Operations

The performance of production and service operations by, for example, machine operators, logistics workers, and maintenance staff, as well as the planning of such activities.

Sales

Sales, after-sales, and marketing of the products and services covered by the study, including positions such as market analysts and sales managers.

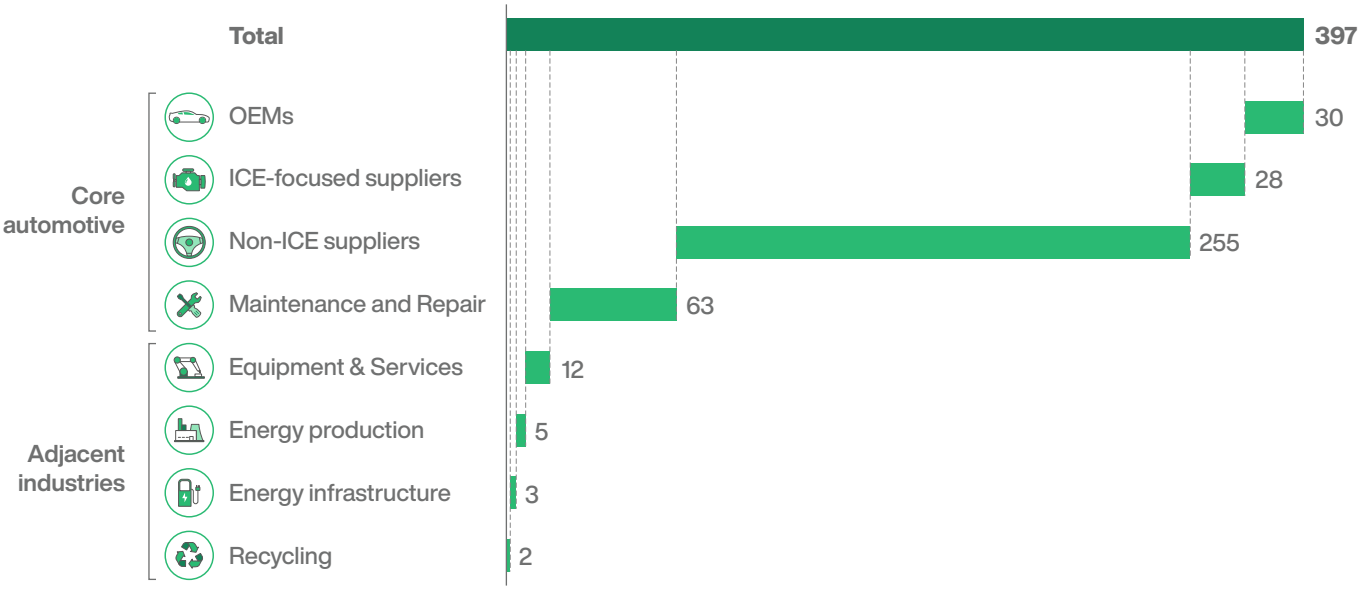
Other Functions

Those jobs – mostly central indirect functions such as HR or IT – that do not fall into one of the previous categories.

Spanning the scope of these eight industry clusters and five job categories, the study covered a total of 397,000 jobs within Poland. Exhibit 1 shows their distribution across the industries.

Exhibit 1 / 397k employees across automotive and adjacent industries

Number of employees (2020, in thousands)



ICE – internal combustion engine; OEM – original equipment manufacturer
Source: Eurostat, BCG

Six Trends Will Drive Massive Disruptions Over the Next Ten Years

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Technological developments and changes in customer demand and preferences are not the only trends bringing massive disruptions to the automotive industry. The study considered eight trends that are impacting employment within the affected industries. (See Exhibit 2.)

Exhibit 2 / Six major trends are driving job changes

Major trends	Assumptions on development of trends		
Market volume	-0.2% Production volume (p.a.)*	-0.6% Sales volume (p.a.)*	1.0% Car parc (p.a.)*
Technology evolution	11% Demand for software engineers (p.a.)		
Product mix	1.9% Content per car (p.a.)	0% Car portfolio (p.a.)	
Productivity	1.6% Productivity (p.a.)		
Shift to EV	68% BEV vehicle production (p.a.)*	100% High value-add in battery production	
Job offshoring	-1.4% Offshoring of jobs (p.a.)		

● Positive impact on job demand ● Negative impact on job demand ● No impact on job demand

* 2019 as baseline year
Source: IHS Markit, BCG

1 Market Volume

A major driver of employment is, of course, the overall number of cars that are produced, sold, and in use. We expect that the development of car production volume will not fully recover to pre-COVID levels. The market is not likely to recover but remains constant at approximately 0.6 million cars per year through 2030. Overall, until 2030, production volume will decrease by 0.2% per year. We expect sales volume not to recover fully either and to decrease by 0.6% per year until 2030. Because the Polish market is already quite saturated, sales volume will stay constant at approximately 0.6 million cars in 2030, from a slightly higher level in 2019. Consequently, we expect that the car parc in Poland will increase by only 1.0% per year over the next ten years—resulting in approximately 30 million cars on the road in 2030.

2 Technology Evolution

Autonomous driving, greater connectivity, and the migration from analog to digital will have a strong impact on the technological development of cars over the next decade. This trend is especially important from a software perspective: we expect the value of the software within a car to increase by approximately 11% per year – rising from approximately €329 per vehicle in 2020 to around €900 per vehicle in 2030. This steep increase will, in particular, promote higher demand for software engineers.

3 Product Mix

Two aspects of the mix of cars produced are relevant to the development of jobs. The first is how the mix of vehicle categories is shifting. These categories, in terms of the cost of content per car, are entry (less than €30,000), mid (€30,000 to €50,000), and premium (more €50,000). A rising share of mid or premium cars increases the average content per car. Based on an analysis of the average content per car across various vehicle categories and the projected production mix, we expect the content per car to increase by approximately 1.9% per year through 2030. The second important aspect is the number of vehicle platforms used to produce these different kinds of cars. This number strongly influences the demand for R&D engineers. Across all European car manufacturers, we expect that the number of vehicle platforms will not increase over the next ten years, resulting in stable demand for R&D engineers associated with vehicle platforms.

4 Productivity

Productivity gains in the automotive industry were lower over the past ten years than during previous decades. Despite this trend, we expect that digitization and automation will promote a steady increase in productivity over the next ten years. We analyzed the gross value added per employee – also referred to as apparent labor productivity – on a sector level. Based on this analysis, we expect an average productivity gain across the industries covered in our study of approximately 1.6% per year. Growing industries, such as battery production or charging infrastructure, are in a position to achieve significant productivity gains – the gross value added per employee could reach up to 7.5% per year in these industries.

5 Shift to electric vehicles

Over the next ten years, automotive production will switch from internal combustion engines (ICEs) to battery electric vehicles (BEVs). In 2020, around 75% of vehicles produced in Poland were equipped exclusively with an internal combustion engine. Driven by the climate pledges announced in recent months, this share will drop dramatically by 2030, to an expected level of around 28%. By then, the share of battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs)) will be around 20%. The remaining 52% will be hybrid electric vehicles (HEVs). The amount of work required to produce BEVs is significantly less than that required for internal combustion vehicles. However, BEVs require additional components – one of the most important of these is the battery pack. Given its importance for the performance and safety of BEVs, the production of batteries, modules and cells will in all likelihood also take place in Poland to some extent, creating an upside potential in employment.

6 Job offshoring

The migration of jobs, especially to countries with lower labor costs, has long been a trend in the automotive industry. In this context, the number of employees at European automotive manufacturers increased by around 3.5% per year between 2015 and 2018. However, the proportion of Polish jobs has fallen continuously over the same period. Consequently, there is a migration of jobs out of Poland to other European countries, with this affecting an average of around 1.4% of jobs per year.

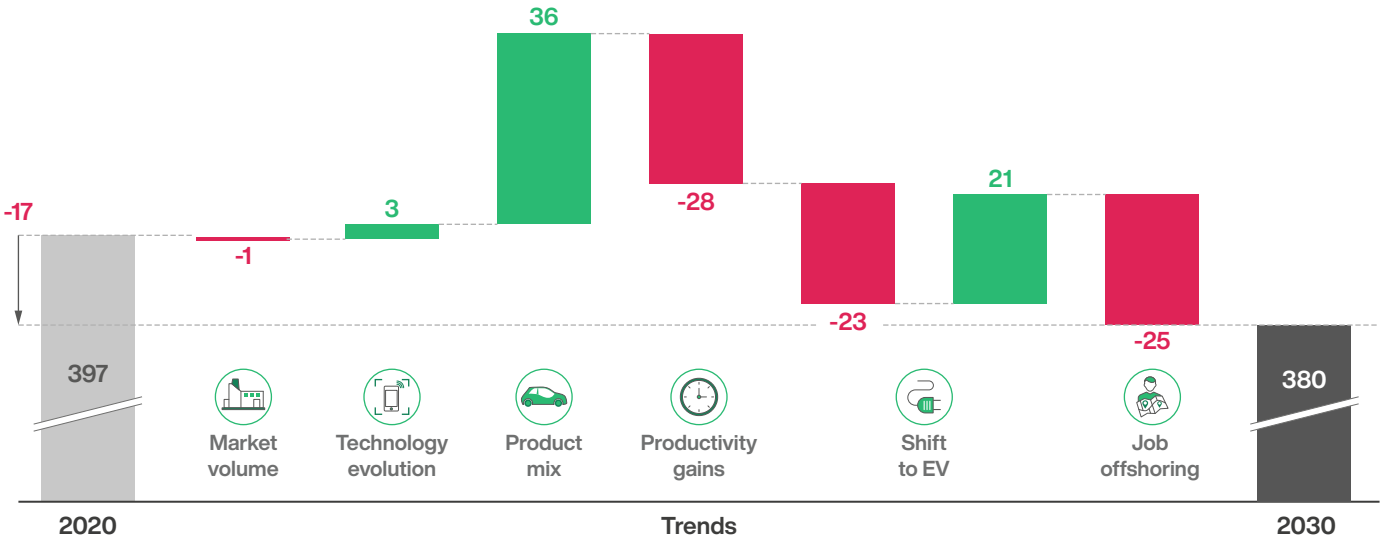
The Net Impact on Job Development through 2030

The Net Impact on Job Development through 2030

The eight industry-specific trends, acting in combination, will lead to nearly flat job development in the automotive industry through 2030. (See Exhibit 3.) Starting from our baseline of 397 thousand jobs in 2020, we expect to see 380 thousand jobs in the covered industries by 2030 – the loss of 17,000 jobs represents a substantial decrease of more than 4%. Furthermore, at this level of detail, even small changes in the production volume significantly affect the results.

Exhibit 3 / Job losses through decreasing volume and offshoring

Job losses and job gains (in thousands) **due to various trends**



Source: BCG

Looking at the impact of individual trends, we expect market volume to lead to a slight decrease of 1,000 jobs, resulting from declining production and sales volume as well as only small growth of the car parc. Thereagainst, only a small increase of 3,000 jobs will come from technology evolution, owing to demand for engineers responsible for the development of the increasing amount of technology and software content in vehicles. Changes in the product mix will lead to a bigger increase of 36,000 jobs. A continuous increase in the production of mid and premium cars will lead to higher labor effort, especially in supplier industries that provide advanced components, such as for interior design.

However, part of these positive effects will be offset by the anticipated increases in productivity across the affected industries, which we expect to reduce the number of jobs by 28,000.

Furthermore, the shift to EV will lead to a net loss of 2,000 jobs. But this relatively small figure obscures massive changes resulting from this trend. The reduction in labor effort required for OEMs and ICE-focused suppliers, among other industries, will result in a loss of 23,000 jobs, while demand for batteries and charging infrastructure, among other parts and services, will promote the creation of 21,000 jobs.

Last but not least, the ongoing job offshoring will be the largest single change driver, expected to lead to a loss of 25,000 jobs.

Summing up, the combination of all the six trends, will have a significant net impact on jobs, reducing the total number of jobs in the affected industries around 17,000 (-4%) in 2030 compared with 2020. In other words, every 25th job in Poland will be affected in the analyzed industries till 2030.

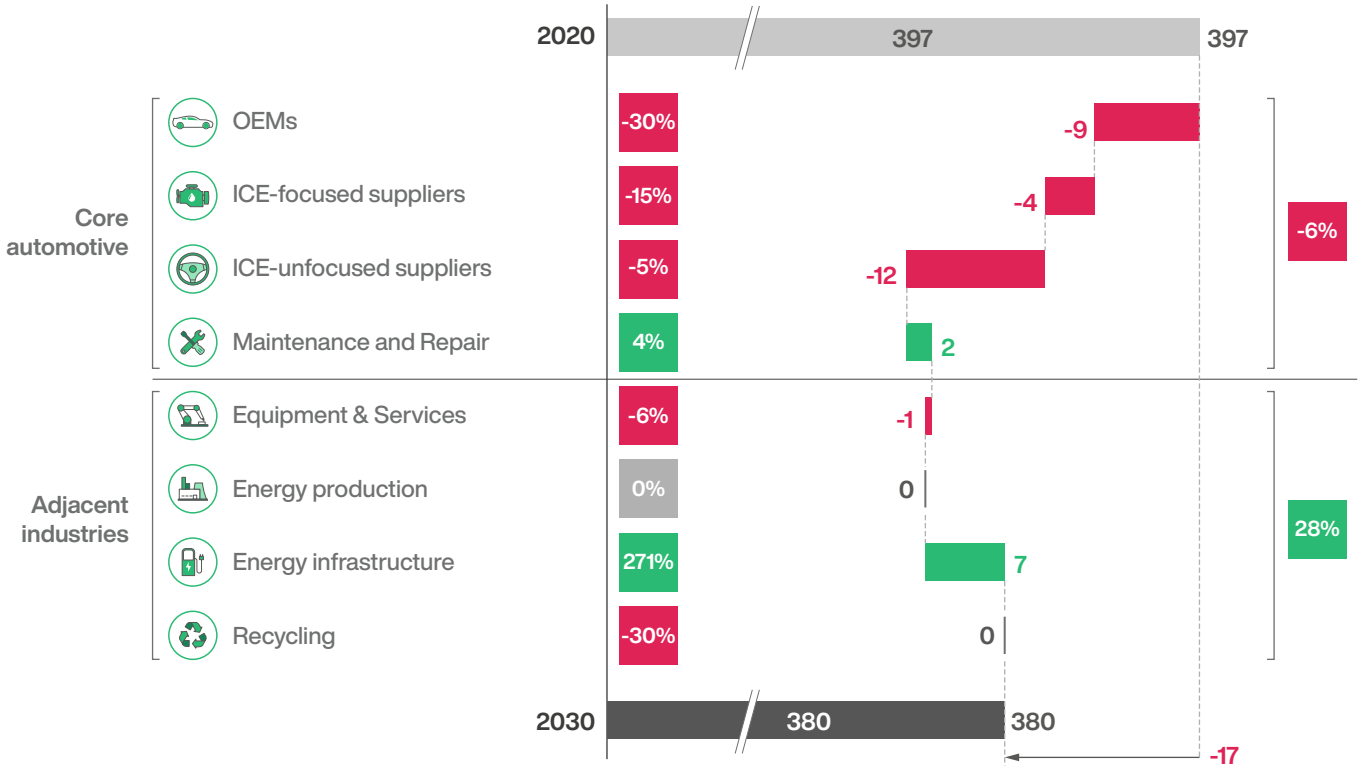
However, besides the overall number, it is equally important to analyze how these jobs are distributed across the different industries and functions. Exhibit 4 shows the overall job demand as well as the change relative to 2020 across the industries. Green boxes indicate higher job demand compared with 2020 while red boxes indicate lower relative demand.

The core automotive industries, especially OEMs and ICE-focused suppliers, will suffer significant job losses, aggregating to a decrease of 6%. On the other hand, the adjacent industries, especially those that are energy related, will see significant job gains, aggregating to an increase of 28%.

An industry-level perspective shows a variety of impact. On the one side, we expect major increases for energy infrastructure (271%). On the other side, we expect a significant decline for ICE-focused suppliers (–15%), OEMs (–30%) and recycling (30%) as well as smaller decreases for ICE-unfocused suppliers (-5%) as well as equipment & services industries (-6%). We expect stable job development through 2030 for the remaining industry cluster: maintenance and repair (4%).

Exhibit 4 / Decrease for core and increase for adjacent industries

Job losses and job gains (in thousands) **across different industries**



ICE – internal combustion engine; OEM – original equipment manufacturer
Source: BCG

Transitions Over Time, Between Industries and Job Families, and Across Regions

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As e-mobility will have only a significant impact on the overall number of automotive jobs in Poland, we expect major transitions from **three perspectives**: time, industries and job families, and regions.

Over Time

The transition over time will occur in two phases during the next decade. First, the COVID-related setback from 2020 through 2022 will lead to a massive decline in volume, as well as governmental programs to prevent job losses. The pre-COVID employment level of approximately 400,000 jobs will likely only shortly be surpassed between 2023 till 2026 mainly driven by an expected increase in production volume. Afterwards a consolidation in the market is expected which also leads to a lower production volume in Poland, thereby strongly decreasing the job demand. Comparing those developments with the previous ten years, we find that the previous growth trajectory will not be reached until 2030.

Between Industries and Job Families

We distinguish three scenarios for job transitions and the corresponding training requirements. (See Exhibit 5.)

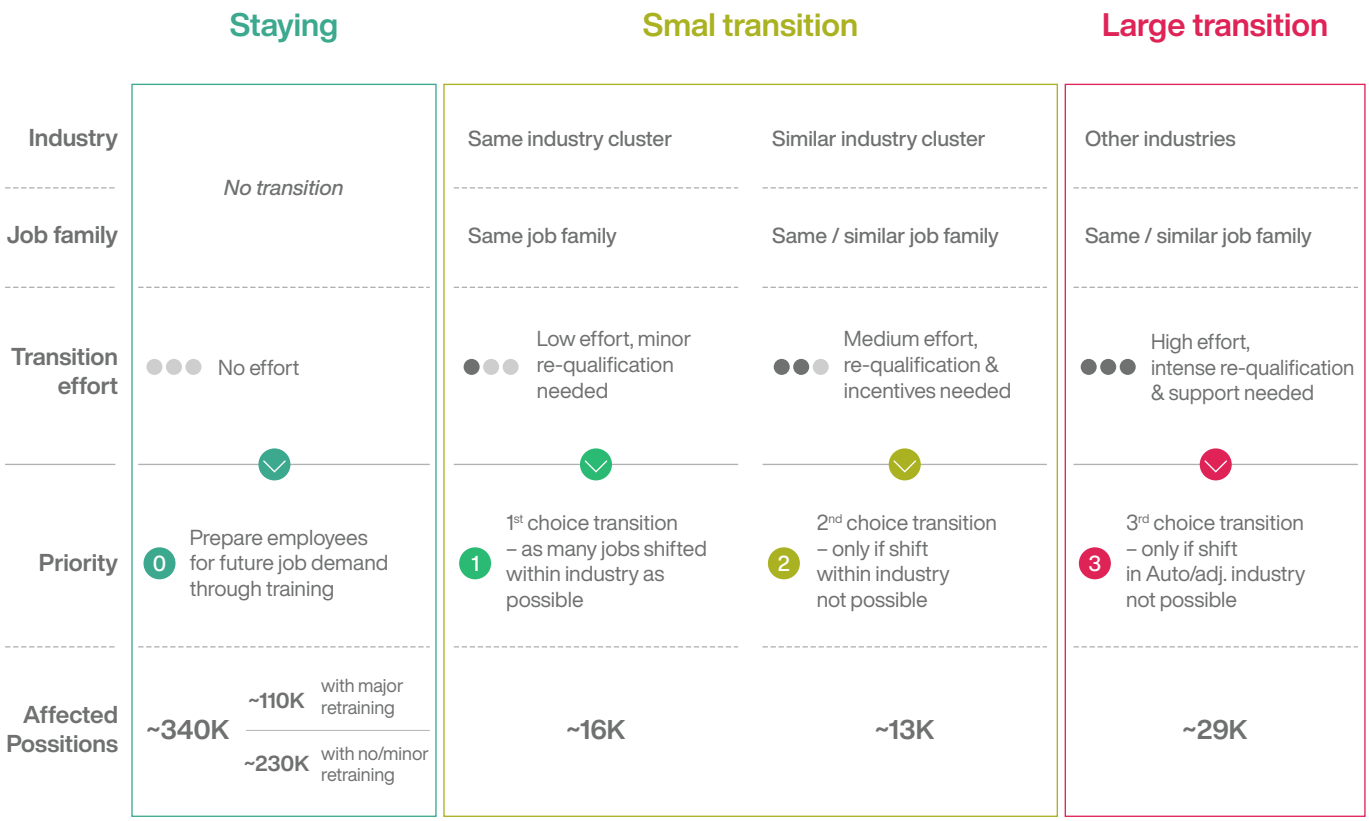
- **Staying**. Approximately 340,000 workers will stay in their current company and/or profession and not transition to different industries or job profiles. However, because job requirements will change, at least slightly, these workers will require on-the-job retraining.
- **Small transition**. Approximately 29,000 workers will transition to a similar industry and/or job profile – for example, moving from gearbox production to electric motor assembly. These workers will require retraining and may need to relocate.
- **Large transition**. Approximately 29,000 workers will transition to another industry and/or a new job profile – for example, moving from automotive assembly to battery cell production. These workers will require requalification and may need to relocate.

In total, approximately 170,000 positions will have dedicated training needs. The remaining 230,000 positions, out of the total 397,000 by 2030, will remain largely unchanged, allowing workers to perform the related tasks without special training.

Across Regions

The number of jobs is expected to decline in Poland, parallel to an expected decline in some other European countries. For Poland, we expect the outlined decrease of 17,000 jobs (-4%) by 2030 compared with 2020. During the same period, we expect, for example, the number of jobs to increase in Germany. Social and cultural barriers will likely limit the ability of workers to transition to jobs in a different country.

Exhibit 5 / 110k trainings, plus ~60k transitions with varying effort



Source: BCG

Taking Actions Today to Master the Transition

Taking Actions Today to Master the Transition

Taking control of the transition to e-mobility requires immediate actions by **governments**, **companies**, and **individuals**:

Governments

Governments need to perform whole-of-economy workforce planning on a country level, including advanced models for supply and demand. To help employees manage their transitions, it is essential to rethink education and reskilling and provide additional initiatives. The largest challenges should receive the highest priority. The public sector should also build new career and employment platforms that allow workers to navigate to jobs and training opportunities quickly and more easily. Social safety nets will need updating, so that they can promote up- and reskilling during transitions and support part-time workers and people who are unable or unwilling to adapt to the new challenges. Finally, governments should drive innovation and support small and medium-size enterprises during the transitions, because they lack the analytics and training resources of bigger companies.

Companies

The labor market will not supply enough new talent to meet companies' rapidly shifting job requirements. To meet the challenges, each company should perform Strategic Workforce Planning (SWP), including skills mapping and advanced models for supply and demand. The insights will inform efforts to up- and reskill the existing workforces on a large scale. So that these efforts pay off, companies need to devise new talent recruitment and retention strategies that allow them to keep the best suited and most talented workers in a competitive market. It is also essential to foster a lifelong learning culture that integrates constant learning in different formats into every employee's daily routine.

Individuals

Each worker should regard lifelong learning as the new normal. Constant learning and the acquisition of new skills, especially universal skills, must become a central part of the working life. Individuals should take a more flexible approach to their career paths, considering that it may be necessary to make increasingly frequent career changes into positions with similar requirements. They should also remain focused on up- and reskilling opportunities as more sources of information about future jobs and skills will become available.

Targeted effort to boost electrification can reverse negative impact of transition

Targeted effort to boost electrification can reverse negative impact of transition

The above BCG report on the effects of the transition towards EV is based on the pessimistic/ conservative scenario as described in exhibit 6. This was done to ensure a realistic, yet conservative assessment of future impacts of the transition.

Nevertheless, there is potential to reach the base or even the ambitious scenario. These scenarios lead to significantly better net job impacts. The base scenario leads to a net job loss of 5 thousand and the ambitious scenario even leads to a net job increase of 6 thousand.

Key to reach these more positive scenarios is a targeted effort by governments and the industry to push EV sales and production. Most importantly the core automotive industry must be enabled to improve the electric vehicles offering at a more competitive price versus ICE.
In addition, adjacent industries need to provide the required infrastructure, such as sufficient numbers of charging stations, which could also be driven from governmental perspective. On the one hand side, the public charging infrastructure could be boosted and on the other hand side financial or regulatory incentives could be given to companies or private households in order to set up their own charging stations.

Exhibit 6 / Ambitious scenario based on boosting electrification

2030 figures shown	Production volume	Sales volume	BEV car parc	Public charging	Private charging	Net job impact
Pessimistic scenario	604k	584k	751k	95k	450k	-17k
						Basis for this report
Intermediate scenario	621k	604k	905k	95k	543k	-5k
Ambitious scenario	660k	626k	1,023k	95k	1,110k	+6k

Source: BCG

Key to reach the more positive scenarios is a targeted effort by governments and the industry to push EV sales and production. Most importantly the core automotive industry must be enabled to improve the electric vehicles offering at a more competitive price versus ICE.

Methodology

To derive the total number of jobs by 2030 a comprehensive model was developed. Based on the holistic scope of 26 industries and 31 job families, 806 different positions, as a combination of industries and job families, were considered. In a first step the overall employment figures from 2020 were broken down to the position level.

Having established this very granular employment baseline, the impact of each of the eight trends throughout 2030 on each of the 806 different positions was assessed and respective impact factors where derived. Each impact factor takes into account how strongly one of the trends actually impacts employment. For example, a 1% growth in vehicle production volume has a smaller impact (i.e. lower impact factor) on people in indirect functions, like HR, than it has on production workers in the final assembly (i.e. higher impact factor). Combining the granular employment baseline with the outlined forecasts for each of the trends and the respective impact factors allows us to forecast the expected employment on a position level by 2030 as well as distinguishing between the impact of each of the different trends.

"Polish EV Outlook 2021" – a comprehensive forecast for the development of e-mobility in Poland

The Polish Alternative Fuels Association (PSPA) has published the latest edition of the "Polish EV Outlook" cyclical report – the most important publication in Poland dedicated to the e-mobility market. The study shows that in 2025 the total number of battery-electric passenger cars and vans in Poland may be approximately twenty times higher than today and increase to almost 300,000 vehicles. At the same time, by 2025, there will be approx. 43,000 public charging points and between 90,000 and 115,000 non-public points.

"Polish EV Outlook 2021" presents the current state and development forecasts for the Polish zero- and low-emission transport market on almost 250 pages. The report contains a set of information on e-mobility, not available in any other source, both nationally and locally, in cities and districts.

According to the data of IBRM Samar, which is the expert partner of the report in the area of vehicles, in mid-2021 the cumulative number of EV registrations in Poland amounted to 28,696 BEV and PHEV passenger cars and vans. The battery-electric vehicle (BEV) fleet consisted of 13,111 vehicles (45.7% of the fleet) while plug-in hybrids counted 15,585 vehicles (54.3% of the fleet). In the first half of 2021, 7,110 new EVs were registered in Poland (i.e. 188% more than in the corresponding period of last year), as well as 1,418 imported vehicles of this type. The "Polish EV Outlook 2021" report shows that most electric vehicles – almost 1/4 of the entire fleet – were registered in Warsaw. In the first half of 2021, the capital was responsible for over 22% of BEV and PHEV sales in Poland. About 28% of the Polish EV fleet was registered in cities with 300,000 to 1 million residents, including Kraków, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Bydgoszcz and Lublin. Electric vehicles have already been registered in every Polish district, but in more than half of them the number of EVs does not exceed ten. In smaller urban centres with a population of 150,000 to 300,000, 12% of the total number of electric vehicles in Poland have been registered. Their share has slightly increased in recent months. An upward trend has also been recorded in cities of 50,000 to 150,000 people, i.e. 11.7% of all EVs. The largest number of electric vehicles per 1,000 inhabitants is still registered in Warsaw (3.82). The capital is followed by Poznań, Katowice, Kraków and Wrocław.

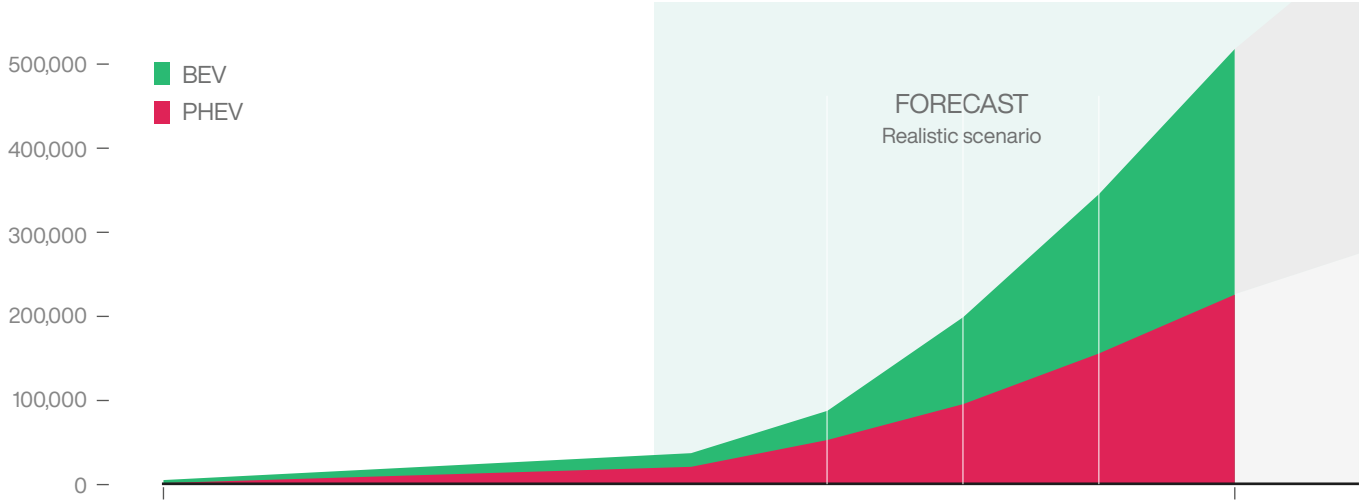
"Polish EV Outlook 2021" also contains a set of detailed data on the BEV and PHEV models available on the Polish market. Based on the report, Polish customers can choose from among 68 models of battery-electric vehicles (55 passenger cars and 12 vans) and 82 plug-in hybrids. The figures given above are even higher when all battery and drive variants are considered. Electric vehicles are already available in almost every market segment: from city and compact vehicles to sports cars and vans. The PSPA report shows that in terms of the number of registrations, the most popular BEV brands are Nissan, BMW and Tesla (no changes compared to the previous edition of the "Polish EV Outlook" report). On the other hand, in the PHEV segment, BMW, Mercedes-Benz and Volvo also stand on the podium. Tesla Model 3, Dacia Spring and Škoda Enyaq IV were among the most popular BEV models in Poland in the first half of 2021.

The authors of the report expect a further increase in the share of vehicle registrations eligible for incentives from the "My EV" program. Among the 10 most popular BEV models in Poland in the first half of 2021, only one (Mercedes-Benz EQC) was not eligible for public support. What is important, as many as 13 out of 20 battery-electric cars and plug-in hybrids most often purchased by Poles belong to the SUV/crossover segment. Based on the "Polish EV Outlook 2021" report, in 2014-2021 the share of electric vans and passenger cars in the sales of new vehicles in Poland increased from 0.04% to 2.86%. At that time, the EV fleet grew more than 80 times. PSPA forecasts further BEV and PHEV registration records in the coming years.

Various scenarios for the development of the e-mobility sector have been developed specially for the "Polish EV Outlook 2021", including variants assuming the implementation of financial or tax incentives, as well as with no state support. The forecasts also take into account dozens of different factors, such as leading trends in the automotive sector, EU, national and local legal regulations, technology development and progressing changes in consumer habits, the specificity of the Polish market and the analysis of highly developed markets. The PSPA report shows that, regardless of a given scenario, sales of electric vehicles in the current decade will increase year by year, which is guaranteed by the policy of the European Union and the EU-induced investments of automotive groups. However, the pace of this growth depends to a large extent on domestic factors: creating a favourable legislative environment and implementing an effective system of financial support. In a realistic scenario, assuming the continuation of support in the form of cash incentives from the National Fund for Environmental Protection and Water Management from the "My EV" program, the Polish battery-electric vehicle (BEV) fleet in 2025 may amount to approx. 291,000 vehicles. This is a slightly smaller number than that assumed in the previous edition of "Polish EV Outlook". The direct reasons for this state of affairs include the late launch of support for institutional buyers, as well as the crisis on the semiconductor market, which limits the supply of EVs in selected brands. Nevertheless, Polish e-mobility will develop more and more dynamically in the coming years. In 2030, the cumulative number of EV registrations in Poland will amount to 940,000, and PHEV – 668,000 vehicles.

Electric vehicle fleet in Poland

BEV + PHEV 2010-2025



	2010	2021	2025
BEV	20	17.7k	291.5k
PHEV	1	21.6k	224.7k
Total	21	39.3k	516.2k

The electric vehicle fleet will develop in Poland in the coming years and so will infrastructure. Based on the "E-mobility meter" kept by PSPA and PZPM, at the end of August 2021, there were 1,621 publicly accessible EV charging stations (3,178 points) in Poland. 31% of them were fast DC charging stations, and 69% slow AC chargers.

Over the last 12 months, the network of publicly accessible charging stations in Poland has grown by 30%. Importantly, Poland can still boast one of the largest shares of DC stations in Europe (32%). According to the latest edition of "Polish EV Outlook", the percentage of available paid chargers has increased significantly – up to 86% – recently. Similarly, there has been an increase in the share of stations operating within the network of 10 leading operators. It is already 57%. GreenWay Polska remains the leader on the domestic market with their 18.5% share. The top ten also includes PKN Orlen, Tauron, Revnet, EV+, PGE, innogy, GO+EAuto and Energa. More than half of all charging stations in Poland – 54% – are located in cities of more than 100,000 residents. The ranking of cities with the largest number of chargers is topped by Warsaw. The runners up are: Katowice, Kraków, Poznań and Gdańsk. Looking at voievodships, the largest number of publicly accessible charging stations is located in Mazowieckie, Śląskie, Dolnośląskie, Małopolskie and Pomorskie Voievodships. 32% of publically accessible charging stations in Poland are located in public parking lots, 23% in shopping malls, 17.5% in hotels, and 12% at petrol stations. The vast majority (92%) of charging stations in Poland are open 24 hours a day, and 12% of DC stations are located within the TEN-T network.

In the coming years, infrastructure can be expected to develop dynamically. On the basis of the "Polish EV Outlook 2021" report, by 2025, almost 43,000 public EV charging points may be created in Poland. With regard to private and semi-private infrastructure, PSPA estimates the Polish potential at even 115,000 points. The latest edition of the report includes the effect of the potential implementation of incentives for the construction of public and non-public charging points provided for in the latest draft regulation of the Ministry of Climate and Environment, planned legislative changes with regard to the Electromobility Act (aimed at, among others, shortening connection procedures or facilitating the installation of private chargers in multi-family buildings), support for the development of grid infrastructure, announced by the National Fund for Environmental Protection and Water Management (NFOŚiGW) and addressed to the DSO, the most important market trends with regard to zero-emission transport (including technological development in the battery area), increasing the model range and EV supply, and progressing changes in consumer habits.

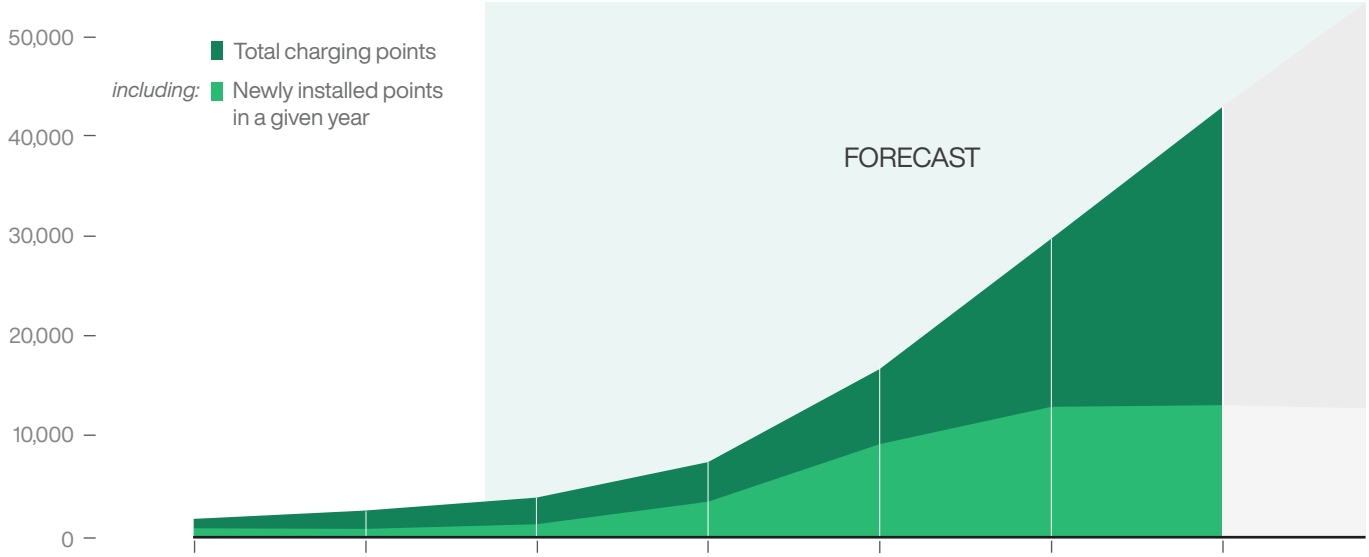
In relation to the previous edition of the "Polish EV Outlook" report, PSPA forecasts a clearly slower pace of expansion of the charging infrastructure in the coming years, both private and public. This results from a number of factors. The most important one includes the introduction of incentives to the charging infrastructure from the funds of the National Fund for Environmental Protection and Water Management at a later stage. Polish regulations in this area are still waiting to be given notification by the European Commission. An important change is also the need to amend the provisions of the Act on Electromobility and Alternative Fuels, referring to the so-called "intervention mechanism", which so far has been the main accelerator of the expansion of publicly accessible infrastructure in Polish municipalities. Furthermore, despite earlier announcements, the government resigned from incentives for private chargers from the "My Electricity" program. The authors of "Polish EV Outlook 2021" indicate that from the perspective of the operators of the publicly accessible charging infrastructure, other legislative changes are also controversial and they include the entry into force of the regulation on the amount of fees for assigning the EIPA number, recognition of the code and their maintenance in the ICT system.

Nevertheless, the planned amendment to the Act on Electromobility will also bring positive effects in the form of provisions aimed at shortening connection procedures, which are still the longest in Europe or optimizing the relationship between the operator of a publicly accessible charging station and the charging service provider. According to PSPA, the key market factor supporting the expansion of the charging

infrastructure in Poland will be the change in the structure of buyers of electric vehicles. As the number of drivers without access to private chargers grows, the demand for charging services at publicly accessible stations will increase. However, it will not be possible to make e-mobility popular on a large scale in the 2025 and 2030 perspective if the government administration fails to intensify activities aimed at supporting this sector. Regardless of the co-financing in the form of incentives from the National Fund for Environmental Protection and Water Management, it is also crucial to provide operators with optimal access to the power grid.

Network of charging points in publicly accessible stations in Poland

AC + DC 2019-2025



1.8k	3.9k	42.7k
0.9k	1.3k	13.1k

In addition to data on the vehicle market and charging infrastructure, the “Polish EV Outlook 2021” report also describes in detail legal regulations shaping the Polish e-mobility market. What is new in this year's edition is the analysis of the electric bus fleet in Polish municipalities, prepared in cooperation with IGKM, as well as the forecast of the increase in energy demand related to the development of e-mobility in Poland. The report also includes a detailed description of the structure of EV buyers, divided by individuals and institutional entities.

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