



# Sectoral Human Capital Study

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# Automotive and electromobility (moto) industry

Results from the second  
edition of the study

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## Information about the study

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### Project name:

Sectoral Human Capital Study Automotive and electromobility industry – 2<sup>nd</sup> edition



### Objective:

To increase awareness of current and future demand for skills in the automotive and electromobility (moto) industry



### Respondents:

**Qualitative research:** employers, industry experts, representatives of educational institutions, labour market analysts

**Quantitative study:** automotive and electromobility employers (excluding self-employed) and employees in key positions



### Dates:

**2<sup>nd</sup> edition of research:**

March 2022 to May 2023

**Including quantitative research:**

November 2022 to January 2023

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## Information about the sector

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The sector includes:



Vehicle production



Production of electrical  
equipment



Trade and repair of vehicles

The moto sector is:



152,800  
businesses












175,200  
employees

Source: Statistics Poland, 2022.



## Main business processes and key positions

Main process		Key professional position
projects	—	 product engineer
production	—	 process engineer
	—	 maintenance engineer
sale	—	 seller
	—	 marketing specialist
exploitation	—	 electrician / electronic engineer
	—	 panel beater
renovation	—	 car mechanic
disassembly and recycling	—	 disassembling and recycling technician

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## Changes in moto industry companies due to the country's socio-economic situation in the last 12 months

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In the opinion of the respondents of the 2nd edition of the qualitative research, the automotive and electromobility industry is extremely exposed to external factors. Importantly, the current socio-economic situation is evolving so dynamically that significant changes are discernible since the 1st edition of the study.

### Difficulties experienced by moto companies in the last 12 months:

- » **75%** experienced an increase in functional costs
- » **60%** experienced an increase in operating costs
- » **42%** reported a drop in product or service sales
- » **41%** saw a drop in the number of orders
- » **39%** had problems with suppliers

### Changes considered by companies to strengthen their market position:

- » **52%** increase in sales margin
- » **26%** increase in expenditure on advertising and marketing
- » **26%** establishing cooperation with new suppliers
- » **21%** creation of a new service or product
- » **21%** increase in investment in innovation
- » **16%** investment or increased investment in new production technologies, modern machinery and software, and the automation of selected processes



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## Trends affecting the automotive and electromobility industry

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**Dynamic electrification of the automotive sector**, the first stage involving optimisation of hybrid drive technology (including plug-in and hydrogen-fuelled hybrids)

**Increasing “connected car” level**, using Internet-of-Things technology and advanced data analytics (Big Data) to improve the comfort and safety of car use (aiming for vehicle autonomisation)

**Increased robotisation and automation of production processes**

**Increased collaboration with the ICT industry** to provide products and services related to the vehicle’s ability to communicate with the user and the environment, and related to digitalisation

**Modification of the customer’s purchase path** related to the increased importance of omnichannel (complementarity of online and offline channels) in the purchasing process, and to the change in the function of existing brick-and-mortar outlets (transformation into showrooms)

**Increased interest in retrofitting used cars**

**The growing importance of so-called sustainable urban mobility**, part of which is the primacy of public transport over individual car transport and the associated increased demand for low-emission buses

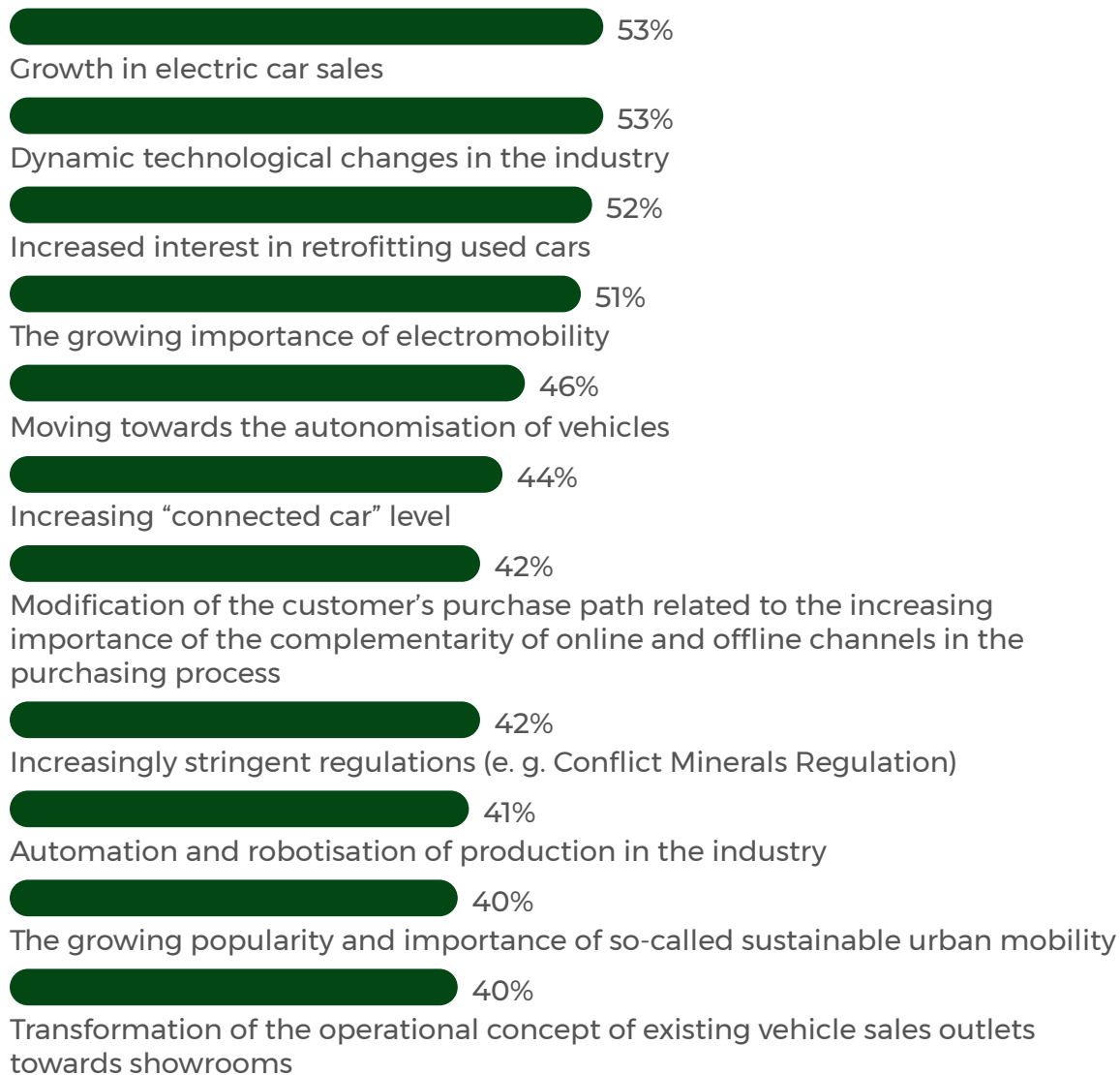
## The impact of trends on companies

Most employers see their businesses being affected by the trends identified.

All trends are having a greater impact on companies manufacturing vehicles and electrical equipment for the industry than on companies distributing or repairing vehicles.

Medium and large companies are more susceptible to the trends than smaller players.

### Percentage of companies declaring at least a moderate impact of selected developments on the company's operations



## Companies' preparation for changes

The vast majority of employers indicating that the factors analysed have a moderate or greater impact on their company declared that they were at least partly prepared for these changes (at least 84% for each factor).

Companies are most prepared for:

- » increased interest in retrofitting used cars
- » modification of the customer's purchase path related to the increasing importance of the complementarity of online and offline channels in the purchasing process
- » the growing popularity and importance of sustainable urban mobility

Companies indicated less often, although still with high frequency, that they are prepared for:

- » increasingly restrictive regulations
- » transformation of the concept of existing vehicle sales outlets towards showrooms
- » increase in sales of electric cars



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## The impact of trends on the demand for skills

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According to employers, the following competencies will be in demand in their companies in the next 3 years:

- » related to diagnostics and servicing of alternative propulsion systems, fuel cells and their accessories (39%)
- » remote sale of cars and accessories (36%)
- » operation of charging stations (34%)
- » design of electric cars (34%)

The appearance in the company of each of the analysed groups of competencies was forecast more frequently by representatives of companies producing vehicles and electrical equipment for the industry than by companies in the subsector of vehicle trade and repairs.



## Impact of trends on job demand

Positions that will increase in importance due to the observed trends\*:

- » designer of alternative drives
- » innovative solutions designer
- » IT developer
- » specialist in the area of Industry 4.0, including the Internet of Things
- » specialist in power supply infrastructure for alternative-propulsion vehicles
- » legal/environmental specialist/environmental advisor
- » designer of robotic lines
- » programmer of automated production equipment
- » controller of automated production equipment
- » data analyst, including distributed data (Big Data)
- » autonomous car engineer
- » IoT service technician
- » customer advisor specialising in „connected cars“
- » specialist in 3D printing (using aluminium alloys, plastics)
- » car/bus charging station operator
- » battery and electrical component recycling technologist
- » diagnostician/service technician of alternative drives
- » specialist for website design and e-commerce development
- » specialist in handling websites and online sales services

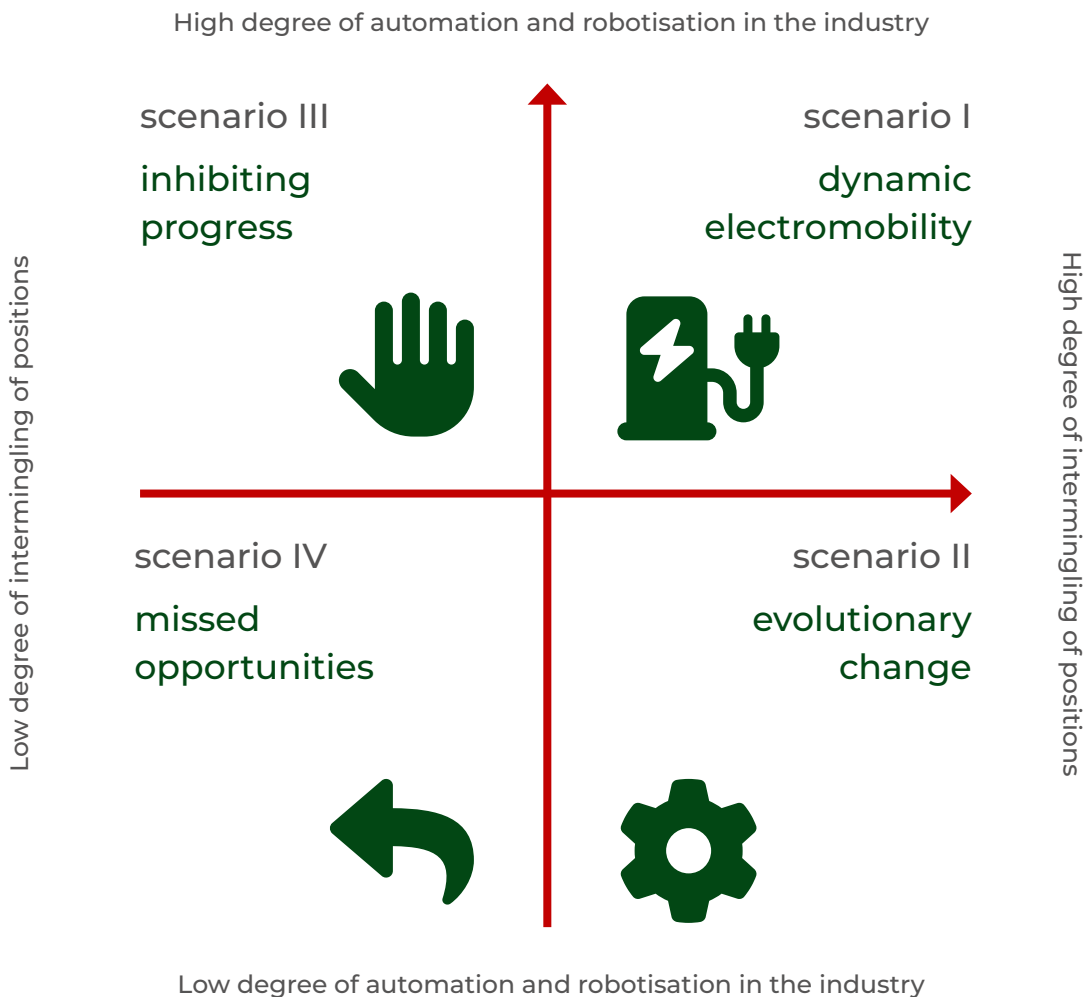
\* Opinion of experts participating in qualitative research

## Scenarios of industry development

Based on the results of the study, two variables were identified that determine the industry's development directions:

1. Increasing levels of automation and robotisation, resulting in a need for new competencies among workers, including in robotics, electronics and broad digital competencies
2. The development of electromobility resulting in the intermingling of positions between the automotive and electromobility industry and other industries, including recycling, environmental protection, legal, and ITT

Four scenarios of the industry's development were drawn up on this basis:



## Scenario I: Dynamic electromobility

**High degree of job intermingling, high degree of automation and robotisation in the industry. This is the most desirable scenario**

Poland's vocational education system will undergo significant change, driven by technological progress. Among other things, the changes will involve enabling the ongoing adaptation of curricula to the needs of the labour market, and the equipping of practical vocational training labs in vocational schools. In this scenario, it is assumed that both appropriate changes in the law and adequate funding for educational institutions will be ensured. The importance of research and development activities and collaboration between science and business will increase, and as a result Poland's moto industry will be able to introduce innovative solutions in line with global trends. One of the elements of this scenario will also be the start of production of the Polish electric car, which will demonstrate the involvement of public funds in building innovation and competitive advantage in the Polish automotive industry. As a consequence of the materialisation of this scenario, the automotive industry will become one of the leading engines of the Polish economy.

### Factors on which the scenario depends:

- » new legislation
- » systemic changes in curricula
- » collaboration between science and business
- » dissemination of training
- » growth of R&D activities

### Consequences of this scenario materialising:

- » dynamic growth in electromobility
- » high level of skills and competencies of staff
- » increased interconnectedness with other industries
- » popularisation of vocational education
- » production of a Polish electric car
- » collaboration between science and business

### Experts predict an increase in the importance of, primarily:

- » knowledge of IT systems
- » programming skills
- » creation of algorithms
- » the ability to operate electronic equipment
- » the ability to remotely control production machines and equipment, as well as the ability to service them

## Scenario II: Evolutionary change

### High degree of job intermingling, low degree of automation and robotisation in the industry

Advances and technological changes in the industry will necessitate the need for vocational education and continuing education, among others, to keep up. This will entail significant financial costs, which will not be fully provided in this scenario. The process of change in vocational education will thereby slow down, and thus the workforce needed for the growing market in the automotive and electromobility industry will not be provided. These constraints will cause automation and robotisation in the industry to be slowed by the lack of personnel with the required competencies in the market. However, the intermingling of positions from other industries will make it possible to respond to other needs related to global trends, such as those related to the development of electric drives and vehicle networking.

#### Factors leading to this scenario:

- » systemic changes in curricula
- » dissemination of training, including remote training
- » noting the need for collaboration between science and business
- » external funding

#### Consequences of this scenario materialising:

- » evolutionary development of electromobility
- » high level of skills and competencies of staff
- » increased industry interdependence with other industries
- » popularisation of vocational education
- » effective collaboration between science and business

#### Experts predict an increase in the importance of, primarily:

- » IT and programming knowledge
- » specialised skills in designing user-friendly web solutions for potential customers
- » skills in planning activities undertaken in real space and online



## Scenario III: Inhibiting progress

### Low level of job intermingling, high degree of automation and robotisation in the industry

The partly enforced restriction of production to electric-powered vehicles only will result in the search for solutions to reduce the cost of cars, and increased automation and robotisation will be the answer. However, due to the unresolved problems of Poland's vocational education system and the low degree and extent of upgrading workers' competencies, the expected and desired intermingling of positions from other industries will not occur. As a result, the industry will rely on foreign solutions for automation and robotisation. Poland will remain a country where a number of vehicle factories using innovative solutions are based, but the benefits of their commercialisation will be for foreign investors. The domestic industry will not create and implement its own innovative solutions to a significant degree.

#### Factors leading to this scenario:

- » insufficient changes in curricula
- » low degree of collaboration between science and business
- » insufficient supply of desired competencies
- » low spending by enterprises on R&D activities
- » lack of state support in the development of innovation

#### Consequences of this scenario materialising:

- » reduced innovation in the Polish moto industry
- » low level of collaboration between education, science and business
- » implementation of innovations developed abroad
- » the risk of factories relocating outside of Poland

Experts predict an increase in the importance of interdisciplinary competencies and maintaining the importance of competencies related to the operation of internal combustion vehicles.

## Scenario IV: Missed opportunities

### Low level of job intermingling, low degree of automation and robotisation in the industry

This is the most pessimistic scenario, as its materialisation will mean stagnation of the Polish automotive and electromobility industry, and in the long run its regression.

Neither the institutions responsible for formal and non-formal education nor the employers themselves will ensure staff with the competencies that will be in demand. As a consequence, the Polish automotive industry will not go through the changes needed to respond to the observed trends. Thus, the level of production will gradually decrease, as the hitherto advantages of locating production in Poland (low labour costs, high level of qualifications, strong internal demand, proximity to major sales markets) will cease to be relevant, and will not be replaced by other advantages desired by manufacturers (availability of modern technology, competencies in automation and robotisation, or knowledge of innovative solutions)

#### Factors leading to this scenario:

- » no changes in the way curricula are modified
- » low degree of innovation among Polish businesses in the industry
- » low level of support for innovation from public institutions
- » low outlay by businesses on improving employees' qualifications

#### Consequences of this scenario materialising:

- » mismatch between staff competencies and the businesses' expectations
- » low interest among students in vocational education in the sector
- » decreasing expenditure on innovation in Polish industry
- » withdrawal of car manufacturers from Poland

The high cost of purchasing electric vehicles will lead to an increase in the use of public transport and greater popularity of car sharing.

The segment of used car refurbishment services will grow, leading to very old vehicles being kept in running order:

- » competencies related to car refurbishment will gain in importance
- » the demand for competencies related to the repair of combustion-powered cars will persist



## Employment in the industry

**19%** of employers were looking for employees in the 12 months preceding the study

Employees sought most frequently in the 12 months preceding the study:

### vehicle manufacturing

- » process engineer - **21%**
- » marketing specialist - **21%**
- » maintenance engineer - **20%**

### vehicle trade and repair

- » car mechanic - **45%**
- » electrician/electronic engineer - **21%**
- » panel beater - **19%**

### electrical equipment manufacturing

- » car mechanic - **30%**
- » electrician/electronic engineer - **26%**



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## Difficulties finding employees

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**72%** of companies looking for employees in the past 12 months had problems hiring suitable people, including:

- » **73%** in the vehicle trade and repair subsector
- » **44%** in the vehicle manufacturing subsector
- » **42%** in the subsector of companies manufacturing electrical equipment for the industry

### Most common reasons for recruitment difficulties:

- » candidates not happy with the terms offered - **50%**
- » failure to meet employers' expectations - **43%**

### Positions for which recruitment was most difficult for employers:

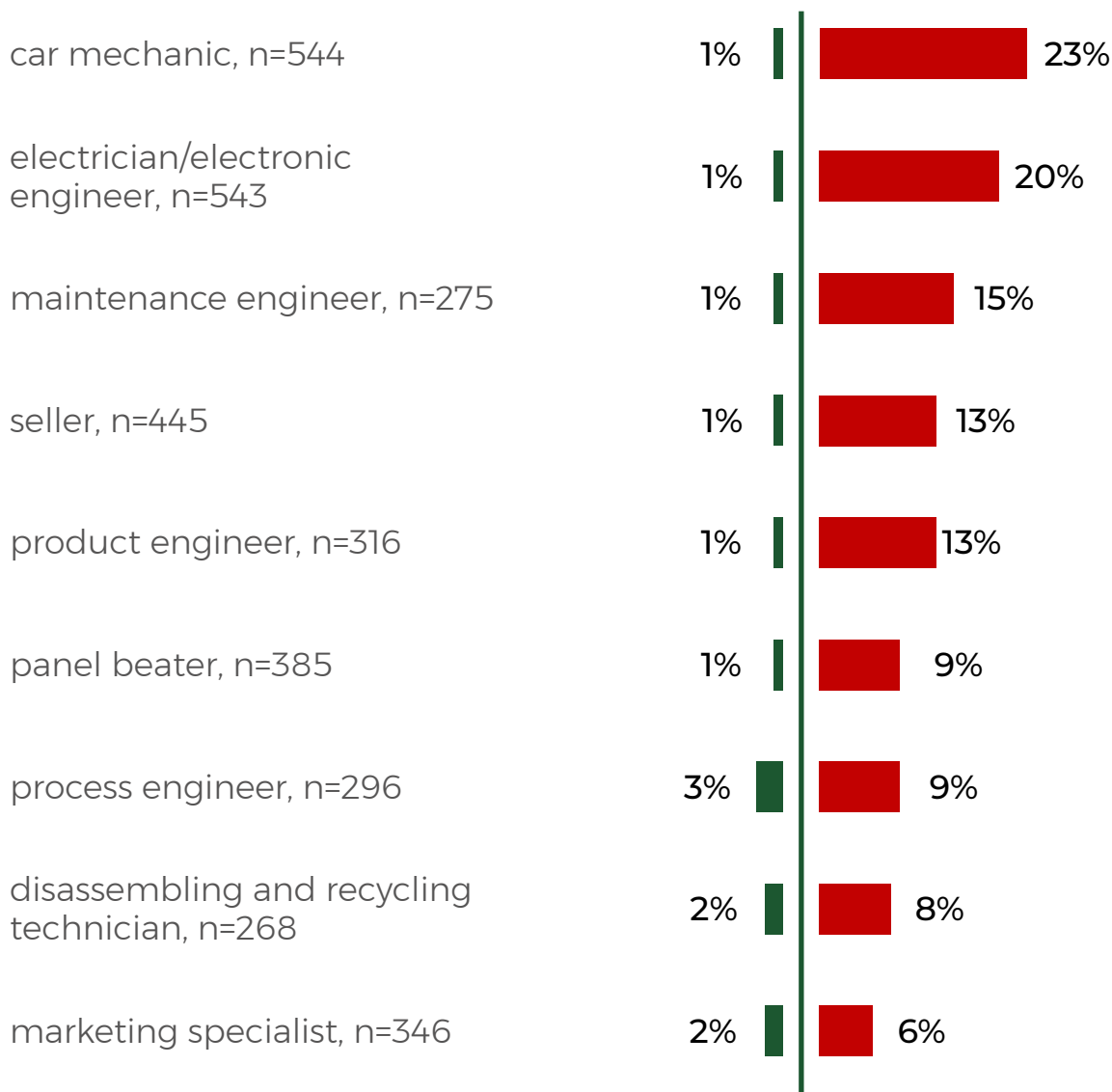
- » car mechanic - **46%**
- » electrician/electronic engineer - **22%**
- » seller - **12%**
- » panel beater - **10%**



## Forecast changes in employment over the next 3 years

14% of employers expect employment in the industry to increase

### Projected changes in employment in key positions over the next 3 years



employment  
will decrease

employment  
will increase

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## Assessing employee skills

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**38%** of companies assess what skills employees need

**20%** conduct regular competency assessments, i.e. at least once a year

Competency verification is most often conducted for maintenance engineers and dismantling and recycling technicians.

### Ways of assessing employees' skills

- » conversation with superior/supervisors **69%**
- » employee tests **19%**
- » descriptive assessment **18%**
- » evaluation questionnaire **16%**
- » obtaining information from colleagues, immediate supervisor, senior superiors, subordinates, customers, etc. **15%**
- » evaluating the achievement of their own goals **12%**

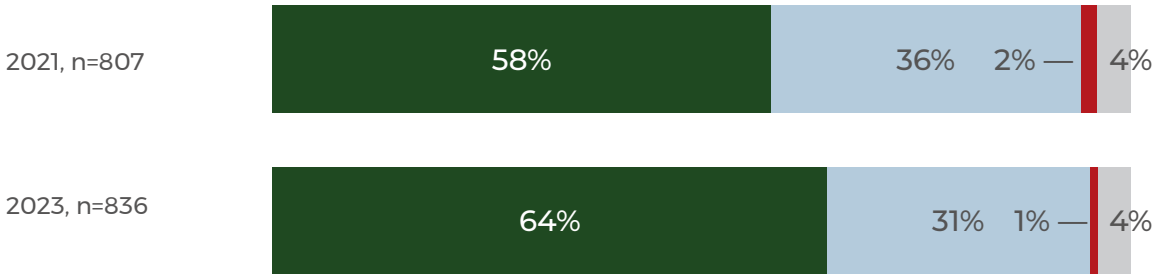


## Rating employers' satisfaction with employees' skill levels

**95%** of employers are satisfied with the skills possessed by their employees

**64%** of employers believe there is no need to improve them

### Assessment of satisfaction with the level of employees' skills, % of employers' indications – for 2021 and 2023

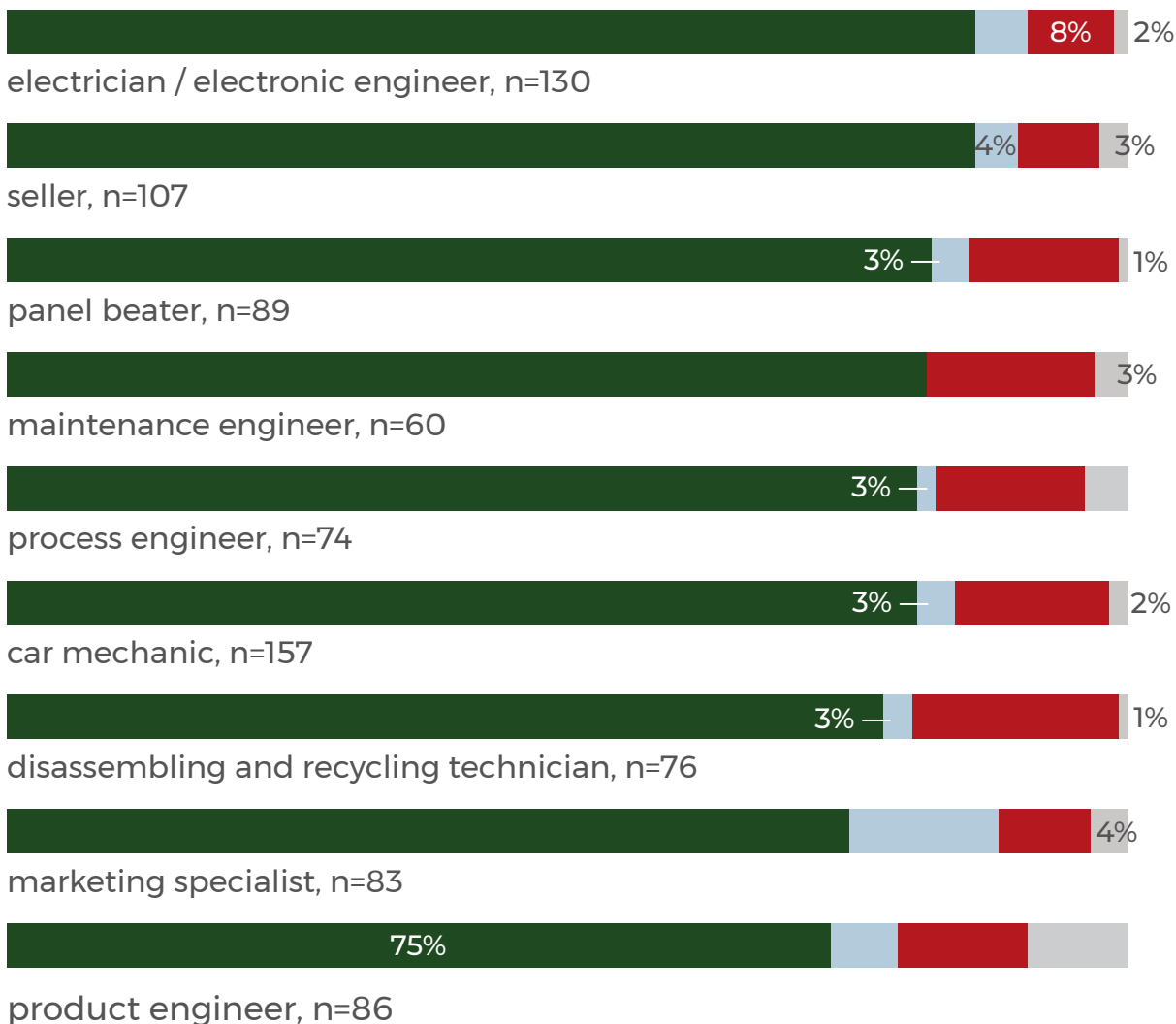


- skills are fully satisfactory, there is no need for employee improvement
- skills are satisfactory, but employees need to improve in certain areas
- skills are insufficient, employees require training
- hard to say/refusal to answer

## Matching of employees' skills to the tasks performed

**81%** of the employees surveyed usually perform tasks that match their skill level

### Matching of employees' skills to the tasks they perform



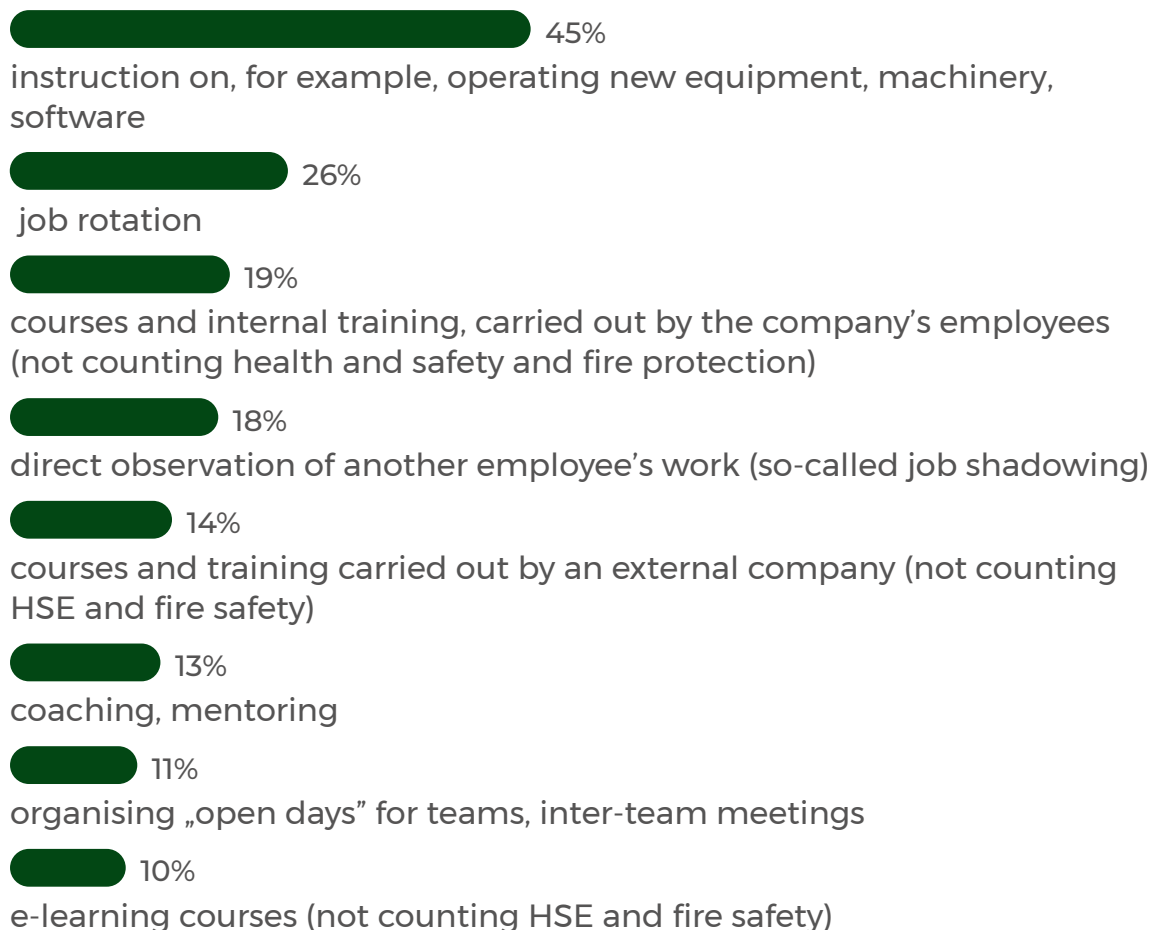
- I usually perform tasks that match my skill level
- I often have to perform tasks that are too simple for my skills
- I often have to perform tasks that are too difficult for my skills
- I often have to perform tasks hard to say/refusal to answer

## Forms of employee skill development in the workplace

59% of companies offered their employees at least one form of development activity (in or outside the workplace) in the 12 months preceding the study.

Forms of developing employees' skills in the workplace in the 12 months preceding the study – employers' indications

### Forms of employee development



N: 836

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## Incentive system and job satisfaction

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The most common ways to motivate employees beyond the basic salary in the moto industry:

- » bonuses (**73%**)
- » nurturing a good atmosphere between employees (**66%**)
- » a well-organised workplace (**65%**)

**91%** of the studied employees in key positions claimed overall satisfaction with their jobs

**92%** of the respondents indicated a desire to stay at their current job for the next 12 months. This is a 6-p.p. decrease compared to the results from the first edition (98%)

Employees who declared their willingness to stay for another 12 months at their current place of employment said their decision was motivated primarily by:

- » the good atmosphere at work (**33%**)
- » good working conditions (**26%**)

The employees were most positive about the following in the automotive and electromobility industry:

- » working conditions (**92%**)
- » relations with colleagues (**91%**)
- » relations with superiors (**91%**)
- » job security (**90%**)



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## Assessment of the fit between education and employers' needs

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Employers are satisfied with the current curricula in schools and higher education, with a higher percentage declaring the curricula match the skills needs of employees at their companies (up from 59% to 76%) than in the 1st edition of the study.

**81%** of employees in the 2nd edition indicated that the school/higher education they completed prepared them well for their current position. Such opinions were voiced most often by:

- » car mechanics
- » electricians/electronic engineers
- » panel beaters

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### Collaboration between education and business

**13%** of employers confirm collaboration with educational institutions, especially vocational schools

This collaboration is more often seen among manufacturing companies, especially medium-sized and large.

Collaboration most often takes the form of:

- » teaching given by practitioners (**59%**)
- » dual education (**26%**)
- » scientific collaboration between staff and scientists (**9%**)



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## Balance of skills

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**Skills balance** – a compilation of assessments of key competencies for particular positions in the industry from the perspective of employers and employees, in order to better balance the labour market in terms of the supply of workers with relevant competencies and employers' demand for them.

**The audit was drawn up on the basis of:**

- » employers' assessment of the importance of competencies
- » the difficulty of obtaining employees with particular competencies
- » forecast importance of competencies in the next 3 years
- » employees' self-assessment of their level of particular competencies



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## Conclusions of the audit:

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Employers confirm that the identified competencies for each of the key positions are relevant to performing job tasks.

The most relevant competencies for employers include competencies specific to particular jobs.

Competencies that are difficult to access were identified primarily for:

- » product engineers
- » process engineers
- » maintenance engineers
- » marketing specialists
- » disassembling and recycling technicians

Positions with the highest number of competencies that will increase in importance in the next 3 years:

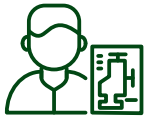
- » product engineers
- » process engineers
- » maintenance engineers
- » disassembling and recycling technicians

Employees rate the level of their competencies highly. Those who want to improve them most often indicated those competencies that employers believe will increase in importance over the next 3 years

## The analysis made it possible to identify 3 groups of job positions

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### 1. Highly qualified employees:



» product engineer



» process engineer



» maintenance engineer

Individuals in these positions have:

- » higher education in engineering
- » many years of professional experience
- » the high qualifications essential for performing their professional roles
- » a significant number of competencies whose importance will increase over the next 3 years
- » most competencies that are difficult to access
- » a wide range of competencies identified as hot skills

## 2. Employees in trade-related positions:



» seller



» marketing specialist

For employees in these positions:

- » social competencies are key, especially those related to collaborating with others and controlling the quality of work performed
- » relatively few competencies that are difficult to access were observed
- » a desire was observed for developing competencies related to their professional roles (e.g. improving customer relations or the ability to plan and develop online marketing activities).
- » for a salesperson, only one competency was identified whose importance will increase in the next 3 years (knowledge of the principles of using benefit language), which means that the position is relatively resistant to changes affecting the industry. In the case of the marketing specialist, the list of competencies gaining importance accounts for more than half of the identified competencies for the role

### 3. Technical workers



» car mechanic



» electrician/electronic engineer



» panel beater

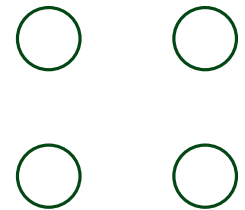
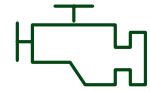
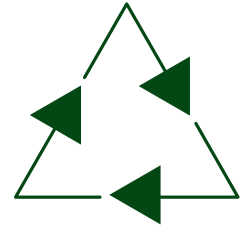
Features linking these positions:

- » these are the most numerous positions in the industry – especially in the subsector of vehicle trade and repair
- » few core competencies for these positions are difficult to access
- » for these positions, competencies that will increase in importance over the next 3 years have not been observed
- » competencies identified as hot skills for these positions are primarily related to the performance of specific tasks and are social competencies that affect the quality of work performed
- » employees evaluate highly the level of their competencies, which may be a contributing factor to their low level of interest in improving them



A specific position that does not fit into any of the above groups is **dismantling and recycling technician**:

- » a position whose importance is growing
- » the importance of almost all key competencies for this position will increase over the next 3 years
- » employees often perform tasks at work that exceed their skills
- » employees in this position want to develop about half of the competencies identified as important by businesses – primarily hot skills competencies, the importance of which will increase



**A full discussion of the findings  
can be found in the report:**

**Sectoral Human Capital Study**

**Automotive and electromobility industry**

**Report on the 2<sup>nd</sup> edition of  
the research (in Polish):**

**[https://www.parp.gov.pl/  
component/site/site/bilans-kapitalu-  
ludzkiego#wynikibadanbranzowych](https://www.parp.gov.pl/component/site/site/bilans-kapitalu-ludzkiego#wynikibadanbranzowych)**

