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Drive2Transform

D 1.1.2 MAP OF DEVELOPMENT OPPORTUNITIES, TECHNOLOGY AND SKILLS GAPS IN EACH PROJECT REGION

Inventory of automotive transformation capacities (Joint report)

Version 3

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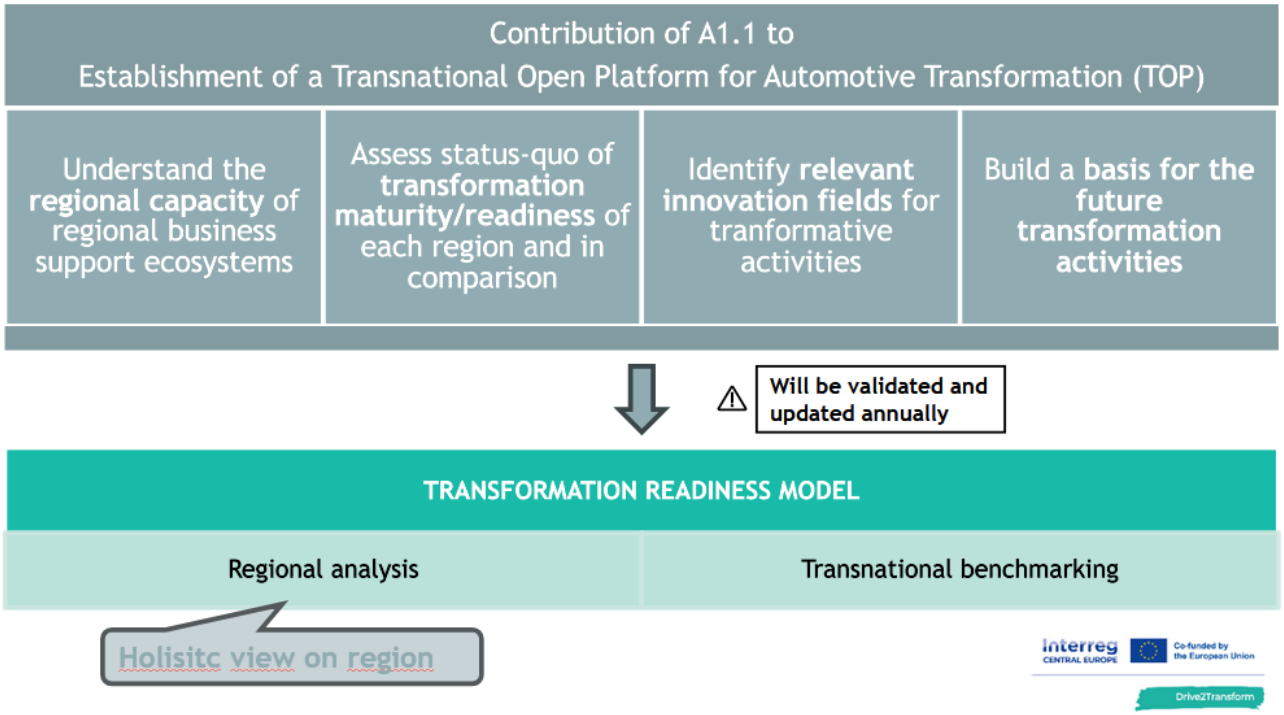
Draft 1 V1	30.10.2024	First Draft	R-Tech
Review	14.11.2024	Partners review and include regional analysis	all
V2	27.11.2024	Upload final version	R-Tech
V3	29.11.2024	CCIS changes 174, p.175, and p. 180, upload updated version	CCIS, R-Tech

Introduction

Objective

The objective of A.1.1 is to develop a Transformation Readiness Model that enables the **assessment of capacities of regional business support ecosystems** to foster the transformation of SMEs in automotive industry. Therefore, different dimensions and indicators were selected with which transnational benchmarking is possible. The assessment of the transformation readiness of each region aims at **identifying relevant innovation fields for transformative activities** and therefore **build a basis for future transformation activities**.



Transformation Readiness Model (TRM) – Structure & Objectives

Partners used a semi-structured TRM catalogue of questions to analyse companies and BSO's perspectives on the **regional transformation need and readiness**. In a second step, which will be described in D.1.1.3, a **transnational benchmarking is done** to guarantee the quality of the analyses obtained and to ensure a **transnational holistic approach.**

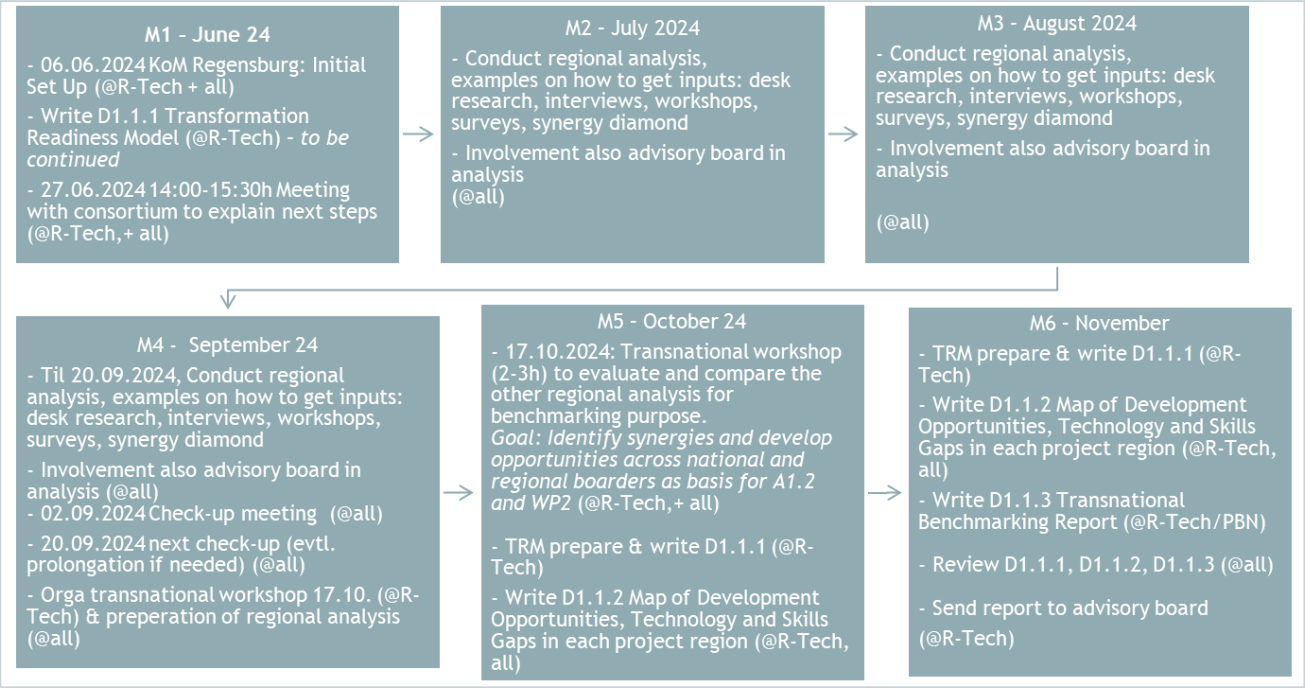
TRM - Process

This joint report will precisely focus on each project region:

- Creating an inventory of existing automotive transformation capacities
- Mapping development opportunities
- Mapping technology and skills gaps
- Analysing areas of specialization in the context of transformative activities
- Providing a transformation readiness score per region

Planning and methodology

The suggested planning for the regional and transnational analysis in A.1.1 using the Transformation Readiness Model was as follows:



A.1.1 Planning / Timeline

The whole methodology of the TRM is summarised in D.1.1.1. **The key elements for the regional analysis have been as followed:**

- Collection of inputs for the regional analysis by using the TRM catalogue of questions (each partner)
- Descriptive statistical analysis of the answers of the TRM catalogue of questions (task leader R-Tech)
- Qualitative analysis of the TRM catalogue of questions, especially the open questions (each partner)
- Meeting in Pilsen to discuss the survey results; preparation of a short presentation per region (each partner); slide deck contained the following topics (template is in appendix 1):
  - #1 Overview of companies and BSO that answered the catalogue of questions

- #2 Regional factsheet summarizing a description of the region and business support ecosystem, risk factors, skills and technology gaps, and missing services for business support
- #3 Key takeaways
- #4 Mapping of challenges, risks, and other hindering factors appear across the 4 focus topics in the regions to prepare for using the synergy diamond method

- Summarizing the results in the report D.1.1.2 as well as adding more information by conducting desk research and using each partners regional knowledge

The report follows the structure of the TRM catalogue of questions with some additional information added with regard to the regions. Each region has its own chapter in this report. The transnational comparison will be published in D.1.1.3.

Starting each regions chapter with a brief description of the region and inventory of companies and BSOs that have been answering the TRM catalogue of questions a more detailed analysis per question category is provided. This includes:

- Transformation risks, pressure and readiness for business continuity in 2024-2030 (Q10-14)
- Transformation opportunities and strategic approaches to ensure business continuity in 2024-2030 (Q15-17)
- Regional resources and business support ecosystem (Q18-22, 26-27)
- Specialisation level and development perspectives (Q23-25)

Each regional chapter is concluded with some key findings for regional transformation capacities in the automotive sector. The brackets behind the subchapter titles, eg. (Q15) reflect the question number from the TRM catalogues of questions that is also included in the appendix 2.

In total, 9 regions are analysed covering eight countries in Central Europe. In table 1 is an overview of regions that are covered in this project and its related project partner covering that region.

It must be mentioned that when speaking of regions a precise geographical area is meant in this report and also in Drive2Transform project. Drive2Transform project partners regional outreach varies depending on each national structure, size, company landscape, and business support ecosystems. E.g. in Germany there are two separate regions covered as the landscape in Germany is more fragmented and therefore also the project partner's outreach. For smaller countries like Slovakia or Slovenia it is enough to keep the analysis on national level. This may be a limitation of the analysis but seemed the most practical one for the project. Therefore, each project partner is clearly related to one region that is analysed and also described in more detail in this report. In the following table you can see how the regions are coded in the further analysis. In the future, the catalogue of questions should be adapted in such way so that the respective NUTS level can be ticked directly to make the evaluation easier to automate.

#	Project Partner		NUTS 0 Country	NUTS 1 Region	NUTS 2 Region	NUTS 3 Region	Code in analysis
1	LP1 Cluster Mobility & Logistics (R-Tech GmbH)	Cluster M&L	DE Germany	DE2 Bavaria	DE23 Upper Palatine	-	**GER-BY**
2	Business Upper Austria - OÖ Wirtschaftsagentur GmbH	Biz-Up	AT Austria	AT3 Western Austria	AT31 Upper Austria	-	**Austria**

3	Regional Development Agency of the Pilsen Region	RDA Pilsen	CZ Czech Republic	CZ Czech Republic	CZ03 Southwest	CZ032 Pilsen Region	**Czechia**
4	Pforzheim University	PU	DE Germany	DE1 Baden-Württemberg	DE12 Karlsruhe	DE127 Northern Black Forest	**GER-BAWÜ**
5	Pannon Business Network Association	PBN	HU Hungary	HU2-Transdanubia	HU21 - Central Transdanubia & HU22-Western Transdanubia & HU23 - Southern Transdanubia	-	**Hungary**
6	NOI S.p.A	NOI	IT Italy	ITH1 Provincia Aut Bozen	ITH10 Bolzano	-	**Italy (IT-H)**
7	Katowice Special Economic Zone SA	KSSE/SA&AM	PL Poland	PL2 South Macroregion	PL22 Silesia	-	**Poland**
8	Chamber of Commerce and Industry of Slovenia	CCIS	SI Slovenia	-	-	-	**Slovenia**
9	SEVA – Slovak Electric Vehicle	SEVA	SK Slovak Republic	-	SK01 Bratislavský kraj	SK010 Bratislavský kraj	**Slovak republic**

Project partners and related regions

When conducting interviews and workshops with the TRM catalogue of questions sometimes the definition of the **four main thematic areas** of Drive2Transform was not always clear to the respondent. Therefore, a reference model for each of the four thematic areas was added with an overview of each areas main products (for connectivity and platform economy also services), critical production technologies and critical competencies. Nevertheless, it needs to be mentioned that specially the area "automation" was sometimes understood also as automation in production whereas Drive2Transform refers to automated vehicles, advanced driver assistance when speaking of automation. To be more precise a short description of the thematic areas is given as well as the extensive reference model can be found in the appendix of the survey and on the Drive2Transform website[1].

Thematic area	Description
Electrification	Focuses on the transition to electric powertrains, including the development and integration of electric motors, batteries, charging infrastructure, and related systems. Key components include power electronics, battery management systems, and energy recovery systems.

[1] https://www.interreg-central.eu/wp-content/uploads/2024/07/D2T_A1.1_TRM_Annex-1-Reference-Model.pdf

Automation	Encompasses technologies enabling autonomous operations, such as sensors (Lidar, radar, cameras), control systems, software algorithms, and machine learning models. It includes systems for automated driving and advanced driver assistance.
Connectivity	Involves integrating communication systems to enable data exchange between vehicles, infrastructure, and other entities. This includes Vehicle-to-Everything (V2X) communication, data processing, cloud connectivity, and telematics for real-time diagnostics, remote services, and infotainment.
Platform Economy	Focuses on leveraging digital platforms to deliver mobility services, such as ride-sharing, vehicle rentals, and fleet management. It includes in-vehicle services, remote diagnostics, and data-driven optimization of transportation services for enhanced user experience and operational efficiency.

Four thematic areas of Drive2Transform

Data analysis and its limitations

The data itself was analysed using **statistical methods** in order to derive meaningful information from complex data sets. For the most part, descriptive data analysis was used to summarise the data. It also made it possible to visualise the characteristics of a data set and uncover relationships between variables. Frequencies, minima and maxima, measures of central tendency as well as measures of variability were determined.

With regard to the evaluation of the Likert scales introduced, which summarise various items, it should be noted that these Likert items individually are regarded as ordinal-scaled, whereas Likert scales are regarded as interval-scaled. This is because a Likert scale represents the average of several Likert items. To give an example, Q10.1 is a single ordinal-scaled item, whereas category “risks” Q10 is built as mean of Q10.1, Q10.2 and Q10.3, and is thus defined as an interval-scaled variable in the data analysis.

In the report, the focus lies on **visualisation** of **(a) frequency charts** for a more detailed analysis per question and question items showing the exact number of answers that were given per question item and second on visualisation of **(b) bar charts** showing the categories average rating per region in comparison to the average rating in Central Europe.

The Regional Factors Electrification, Automation, Connectivity and Platform Economy are presented in a web chart. The four thematic areas are rated on a scale from 1-5 with the following values:

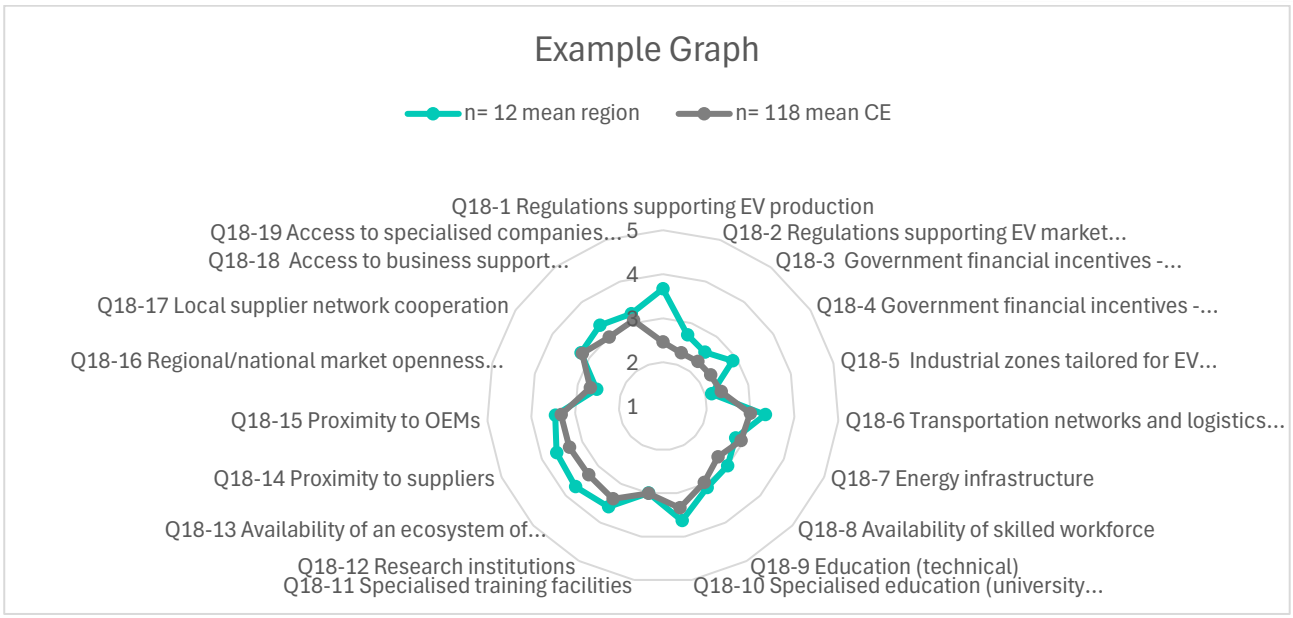
1: poor

2: unsatisfactory

3: satisfactory

4: very satisfactory

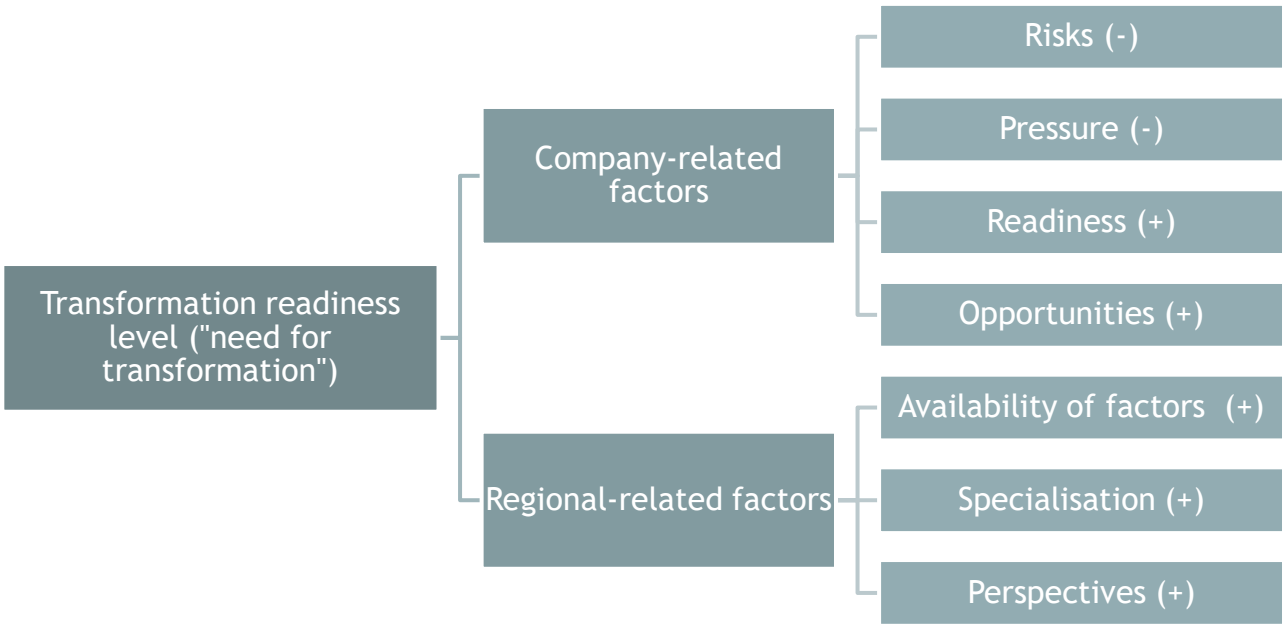
5: outstanding



Descriptive analysis is an effective way to provide a clear and straightforward understanding of the data's basic characteristics when having only a limited sample size. Some advantages are that the focus is on reporting what is actually present in the data rather than trying to infer or predict and it helps in exploring the data and identifying potential trends or areas of interest. This can be particularly useful in forming hypotheses for further research. As Drive2Transform is only at the beginning the sample size is limited with around 10 companies plus some BSO per region. The goal is to **enlarge the sample size to at least 30 per region**[2] to improve regarding statistical significance and to also be able to test the assumptions that were made for the TRM scoring (see also D.1.1.1).

For interpreting the data and building the TRM some assumptions have been done.

[2] According to the Central Limit Theorem, if the sample size is n > 30, the distribution of the sample mean can be approximated as normal, allowing the use of statistical methods that assume normality.



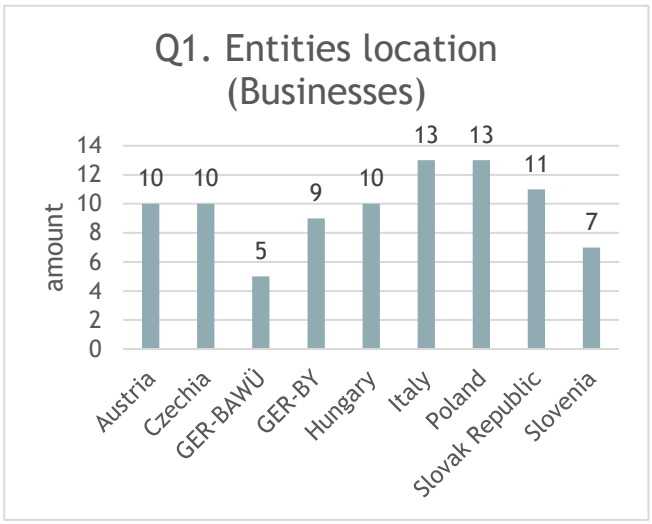
Overview of factors and their assumed effect on the transformation readiness level ("+" = positive impact, "- " = negative impact)

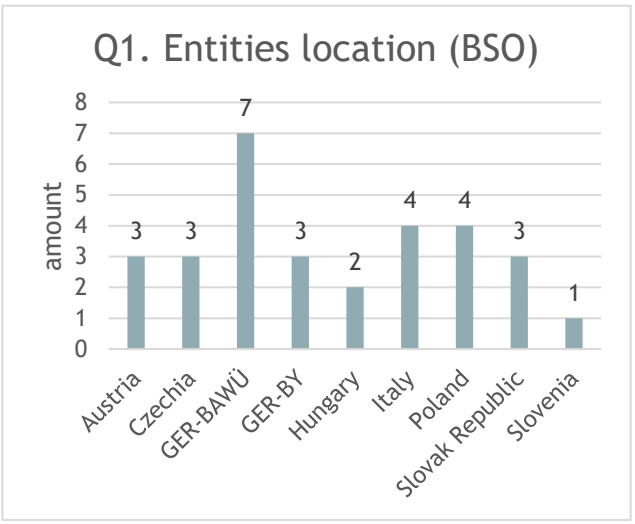
Apart from the limited sample size there are some other **limitations**. The answers are very dependent on the respondent's perspective. Age, position and experience and other factors may influence the individual perspective strongly. Furthermore, it is only a single moment perception. As could be seen all over the news the sentiment in the European automotive industry is significantly more negative than just six months ago. It cannot be guaranteed that the presented results are still representing the status-quo to another timing even though it is just some weeks later. To receive a broader picture, it might be helpful to do in addition to the cross-sectional study a longitudinal study. As the goal is to keep the survey running throughout the project it might be interesting to see in the future if trends can be identified via the increasing data set.

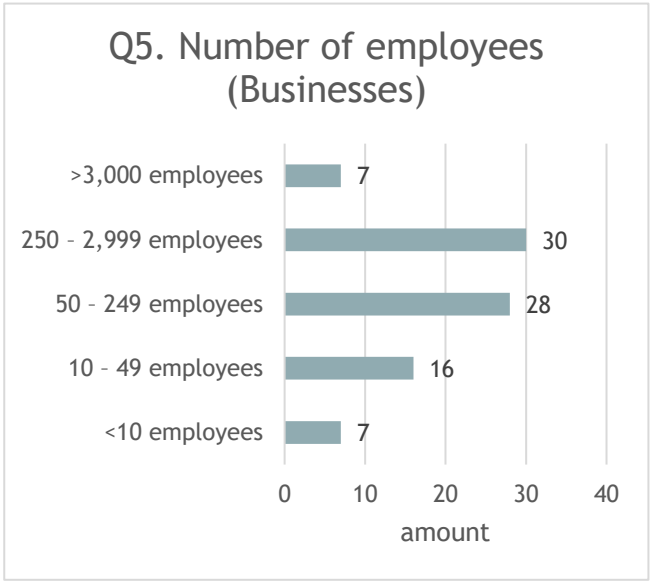
In summary, the regional analysis can be seen as a first step to show transformation risks, pressure and readiness for business continuity, transformation opportunities and strategic approaches to ensure business continuity, regional resources and business support ecosystem and regional specialisation level and development perspectives. This first regional analysis can then be further elaborated throughout the project Drive2Transform.

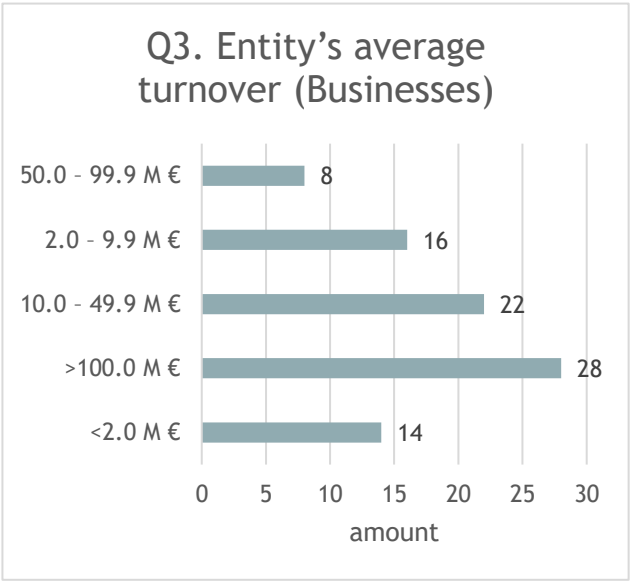
Description of the sample

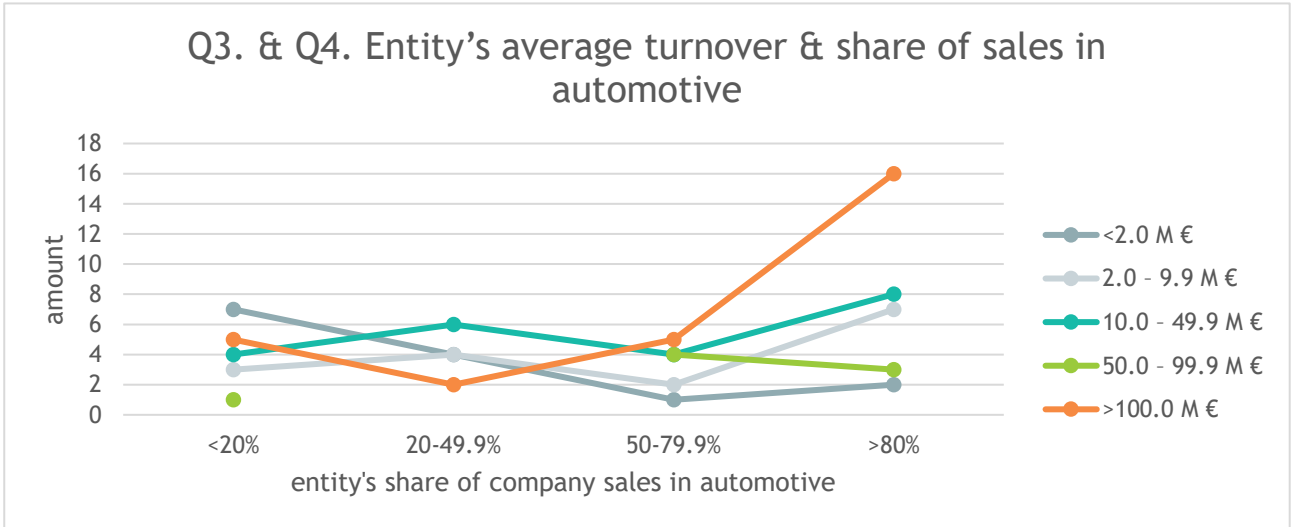
For the regional analysis employees of companies as well as BSO were surveyed. It varied from CEOs to COOs to CFOs to R&D directors, supply chain to sales management and further functions in the companies. In general, the approach was to survey persons that are on management level active and/or have a broad perspective on the company and region. **Overall, 88 businesses and 30 BSOs answered the question catalogue.** Majority of businesses were SMEs. This represents also the Drive2transform main target group. The goal was to have at least 10 businesses plus some BSO per region which was nearly achieved by every partner. Having a look at the graphic for businesses comparing entity's average turnover with share of company sales in automotive sector (Q3. & Q4.) it can be seen that there is quite a variety with one outlier. With 18% of all surveyed businesses those with an average turnover of >100 M € also had the highest shares of sales in the automotive sector with >80%.





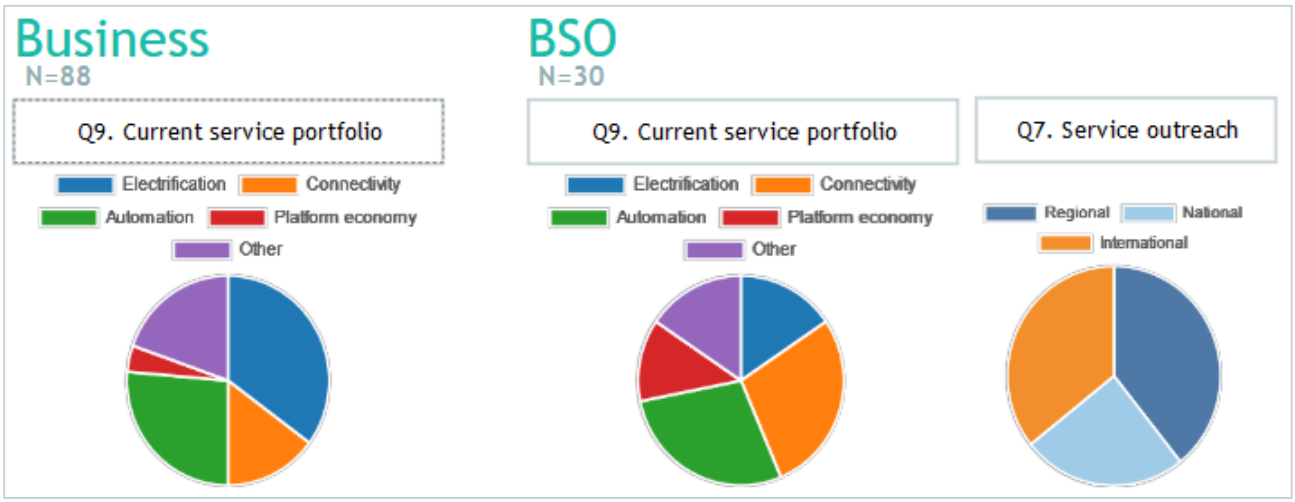






The average number of patent applications per year (2020-2024) was highly varying from 0 til 780. As the SMEs often are daughter companies, the patent applications are not done by themselves, more by their mother companies. This might be one explanation for the high variety.

Interesting was that asking companies for their focus areas to which their current product portfolio's are directed to it was clear that electrification is the winner, compared to BSO which product portfolios are more equally distributed to the focus areas. An explanation could be that BSOs often having a future perspective with their product portfolio to be able to support the ecosystem also with new trends from the beginning on.



For the further analysis BSO and business answers are analysed together with respect to the region.

Regional Analysis

Germany-Bavaria | Upper Palatinate (R-Tech/Cluster Mobility & Logistics)

Brief description of the region

Bavaria is one of the leading regions in the automotive industry in Germany and Europe. The sector has a long-standing tradition here and is strongly influenced by major players such as BMW, Audi, and MAN. These companies contribute significantly to the state's economic prosperity. According to a study by the Bavarian Business Association (vbw), the automotive industry is one of the most important industrial sectors in Bavaria, directly or indirectly securing around 400,000 jobs. The high density of automotive manufacturers and suppliers creates a strong value chain in the region.

Economic Significance of Regensburg

Regensburg, a city in eastern Bavaria, is one of Germany's booming cities. With its strong economic growth, it has been among the cities with high prospects in Germany for years. As such, it is an important hub for the automotive industry. With over 30,000 employees in the automotive sector, the city is heavily focused on this industry. The location hosts key production facilities for companies such as BMW, Continental, Vitesco/Schaeffler, and AVL, as well as numerous suppliers. BMW operates one of its largest plants in Regensburg, specializing in models such as the BMW X1 and the 1 Series. The plant serves as a central economic driver for the region, creating thousands of jobs. Additionally, Continental has its development centre for vehicle technology and electronics in Regensburg, which is one of the largest of its kind in Europe.

Role of the Cluster Mobility & Logistics and Innovation Centres in Regensburg

The Cluster Mobility & Logistics in Regensburg actively supports the shift toward electromobility by promoting innovative research projects and fostering exchange between industry, academia, and public administration. It is the only cluster in Bavaria to receive the "Gold Label" award from the European Cluster Excellence Initiative (ECEI), the highest quality label for cluster initiatives. It consists of over 105 members. By promoting projects and partnerships, the cluster significantly contributes to the region's competitiveness. It serves as a catalyst for technology transfer, bridging the gap between science, industry,

and public administration. Through these initiatives, the Regensburg region has become a prominent location for electromobility research in Germany, contributing to job creation and strengthening its position in the international market. The TechBase innovation hub offers technology-oriented companies and start-ups access to modern infrastructure, accelerating the development of new mobility solutions. It creates a supportive environment for technological innovation in areas such as electromobility, digitalization, and sustainable mobility. The R_Lab Mobility serves as a real-world testing environment where new mobility technologies can be tested under real-life conditions. Technologies such as sensors, artificial intelligence, LIDAR, camera systems, and transmission technology are utilised here. One flagship project in Regensburg is the EMIL e-bus. It serves as a research platform for the development of innovative technologies for autonomous driving in urban areas. The bus drives through the old town and collects raw sensor data to be processed for central research fields such as object recognition.

Supraregional Significance and Economic Trends

Compared to other German automotive centres like Stuttgart or Wolfsburg, Regensburg stands out for its strong focus on research and development, particularly in the areas of electromobility and driver assistance systems. This focus helps prepare the region for the future of the automotive industry as technological advancements in these areas gain global importance. A current trend is the increasing importance of vehicle electrification and digitalization, which drives demand for specialised electronic components and software solutions. Regensburg has a competitive edge in this area due to the presence of technology companies and start-ups.

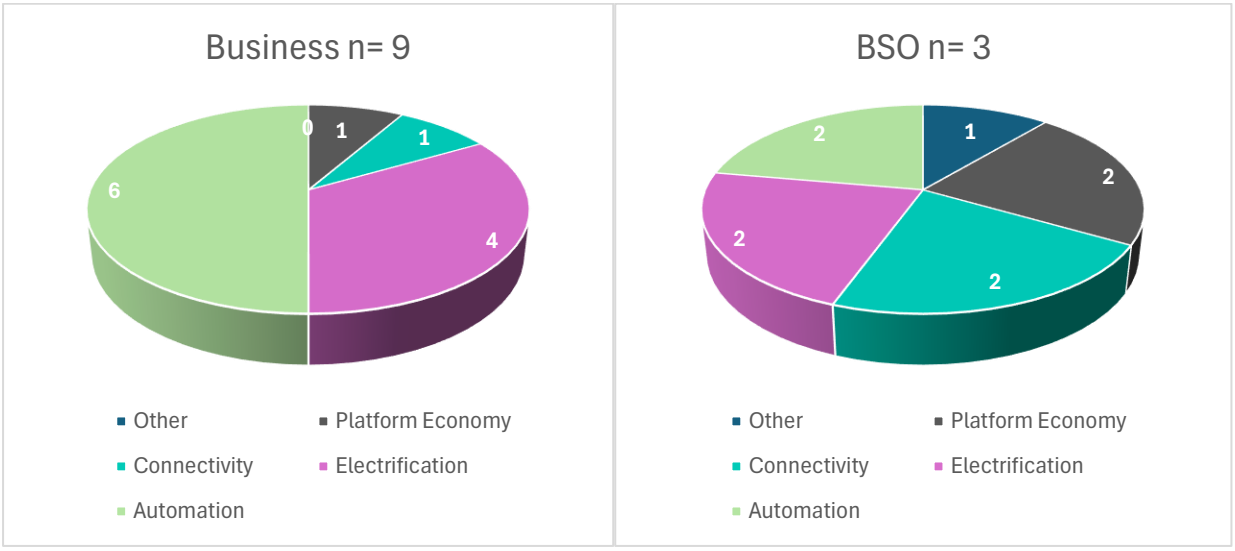
The further analysis focuses on the Bavarian region “Upper Palatinate” which surrounds the city of Regensburg.

Inventory of companies and business support organisations (BSO) (Q1-8)

Overall, **9 companies** and **3 BSO**s answered the questionnaire. The surveyed companies are relatively homogeneously selected, including both small and large enterprises. **All companies have a significant focus on the automotive sector, with at least 50% share of their company sales**. Their product and service portfolios vary from engineering services to component production for battery trays and chassis or coating services. Many of the surveyed companies are involved in **software development**.

Whereas the surveyed companies are primarily active in the fields of **Automation** and **Electrification**, which aligns with the general assessment for the region, the BSO addresses **all four thematic areas** to set incentives for the future development of the region.

Regarding the survey format in general, it is noted that there is a strong preference to maintain the approach of **direct conversations**. The survey is completed together with the company either in an on-site meeting or in an online meeting. This approach intensifies interaction with the company and ensures that questions are not misunderstood.



Transformation risks, pressure and readiness for business continuity in 2024-2030 (Q10-14)

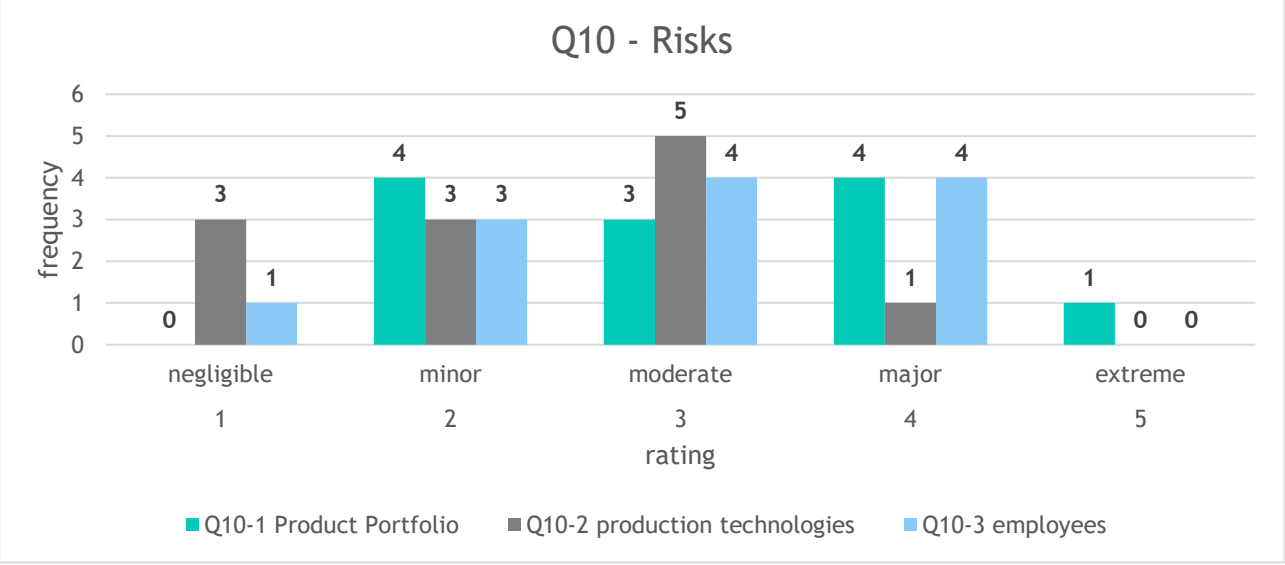
Risks endangering business continuity (Q10-11)

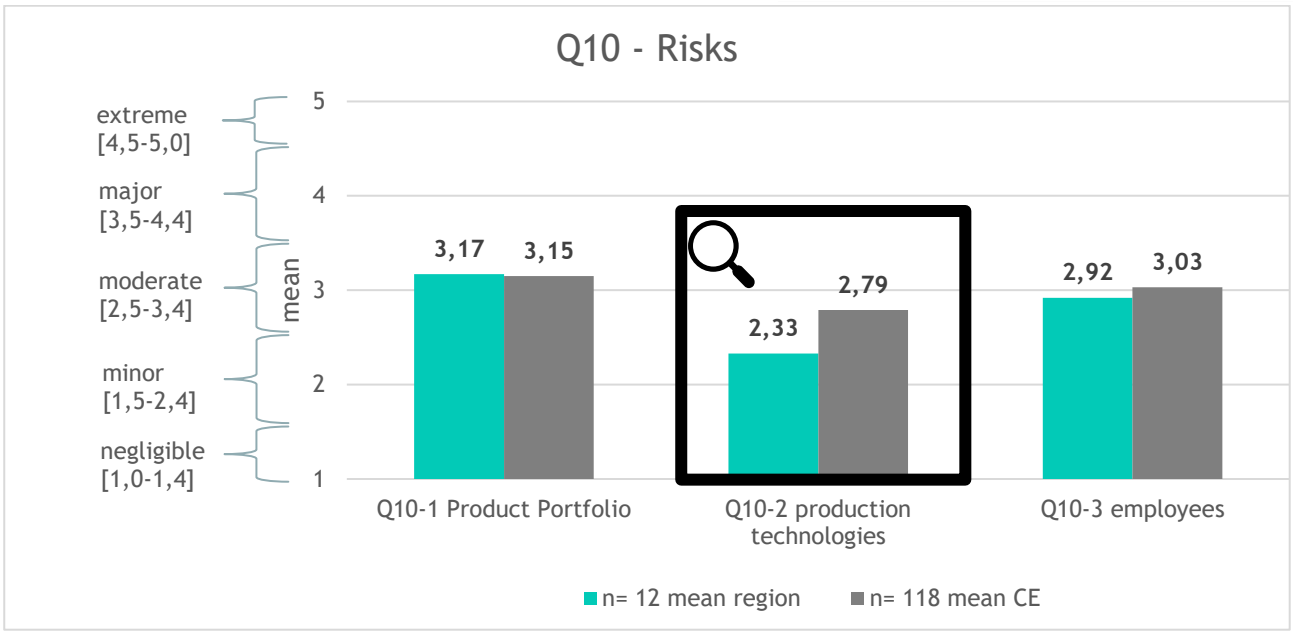
The risk for the **product portfolio** is assessed as **moderate**, aligning with the European average. Responses range from 2 (low risk) to 4 (major risk). In the BSO sector, the risk is rated between 2 and 5 (extreme).

The risk regarding the **production technologies** is assessed as **minor** (2). This differs from the European comparison, which assesses it as moderate. In the detailed company data, the risk ratings range from 1 to 3. The Bavarian region is relatively well-positioned in this area compared to the European average, showing a clear difference. 6 out of 12 companies estimate the risk to be very low.

The risks in the area of **employees** are assessed as **moderate** by the surveyed companies, which aligns with values from the European comparison. In the detailed data, the ratings mainly range from 2 to 4. No conclusions can be drawn regarding specific sectors or types of companies based on the data.

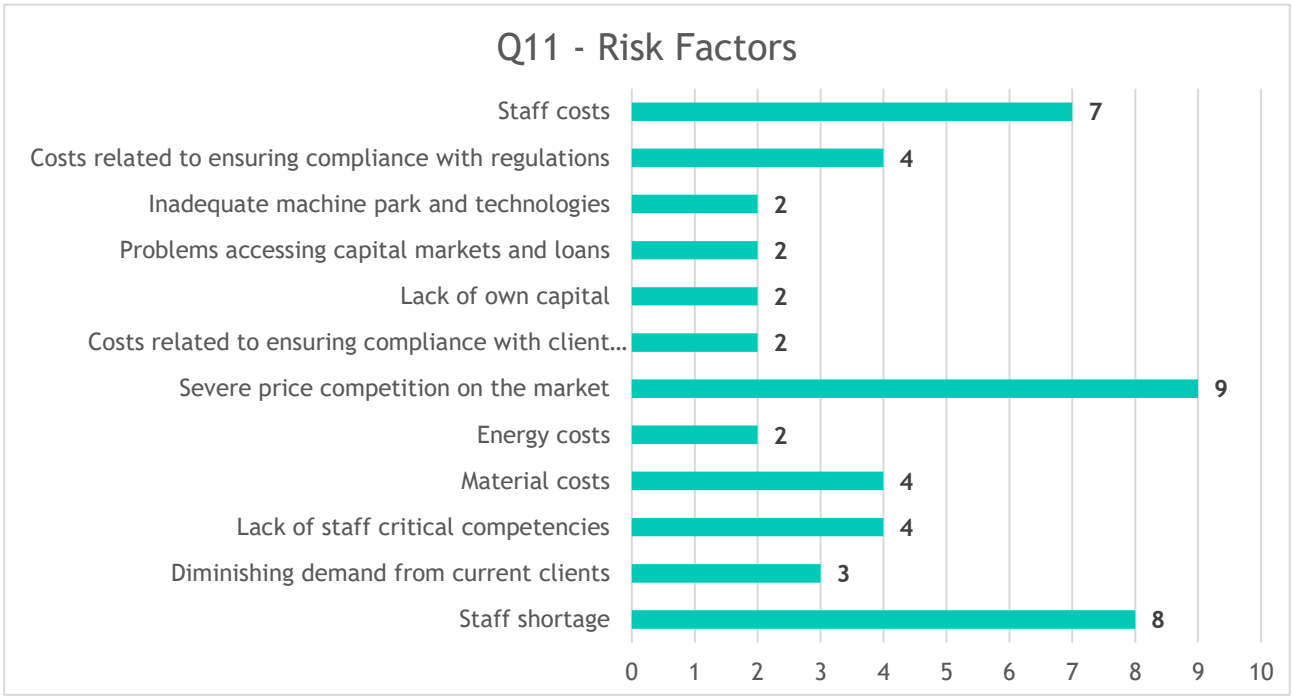
In summary, it can be said that the risks are still in the moderate range, but the trend could change quickly. In comparison, the production technology sector is currently assessed slightly more favorably.





Risk factors

Here it can be noted that the three greatest risks are staff shortages, **staff costs, and intense competition, especially with Asia (China).** These issues are developing very quickly. For example, the introduction of short-time work could impact the issue of staff shortages. Employee costs pose a major risk in both European and international comparisons, as does the intense competitive environment.



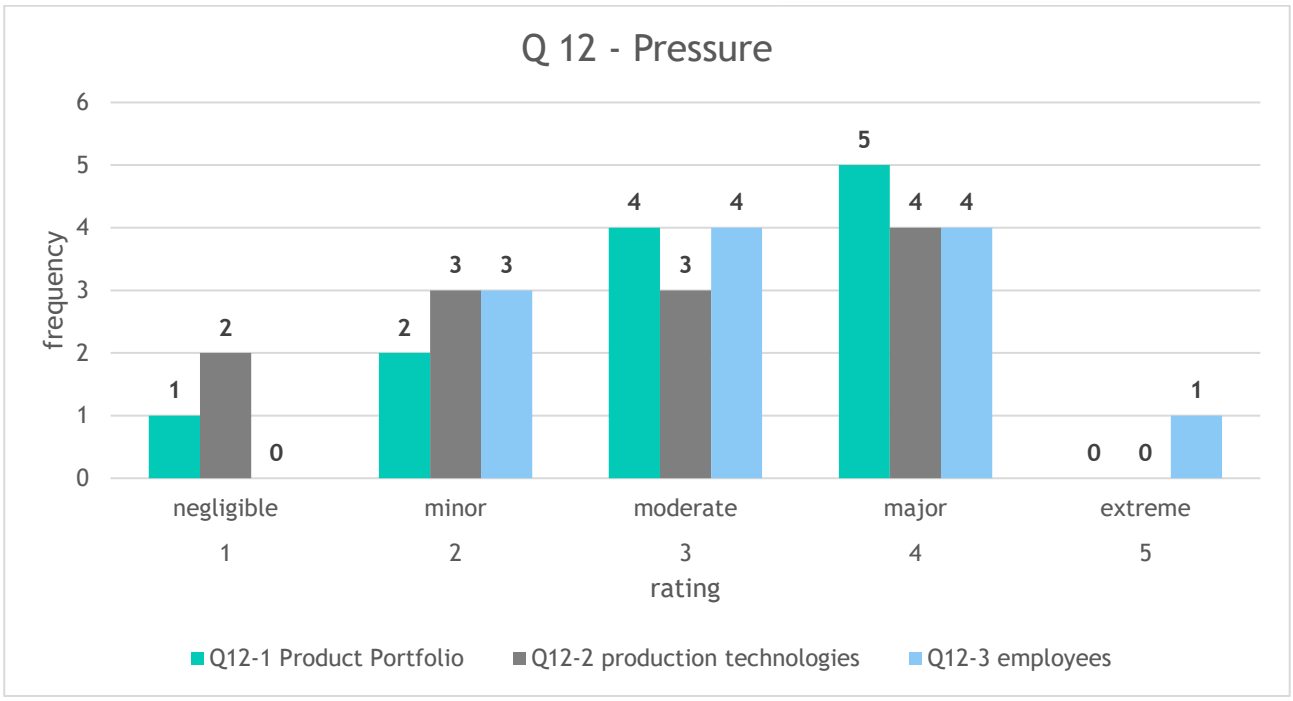
Pressure to change business for ensuring business continuity (Q12)

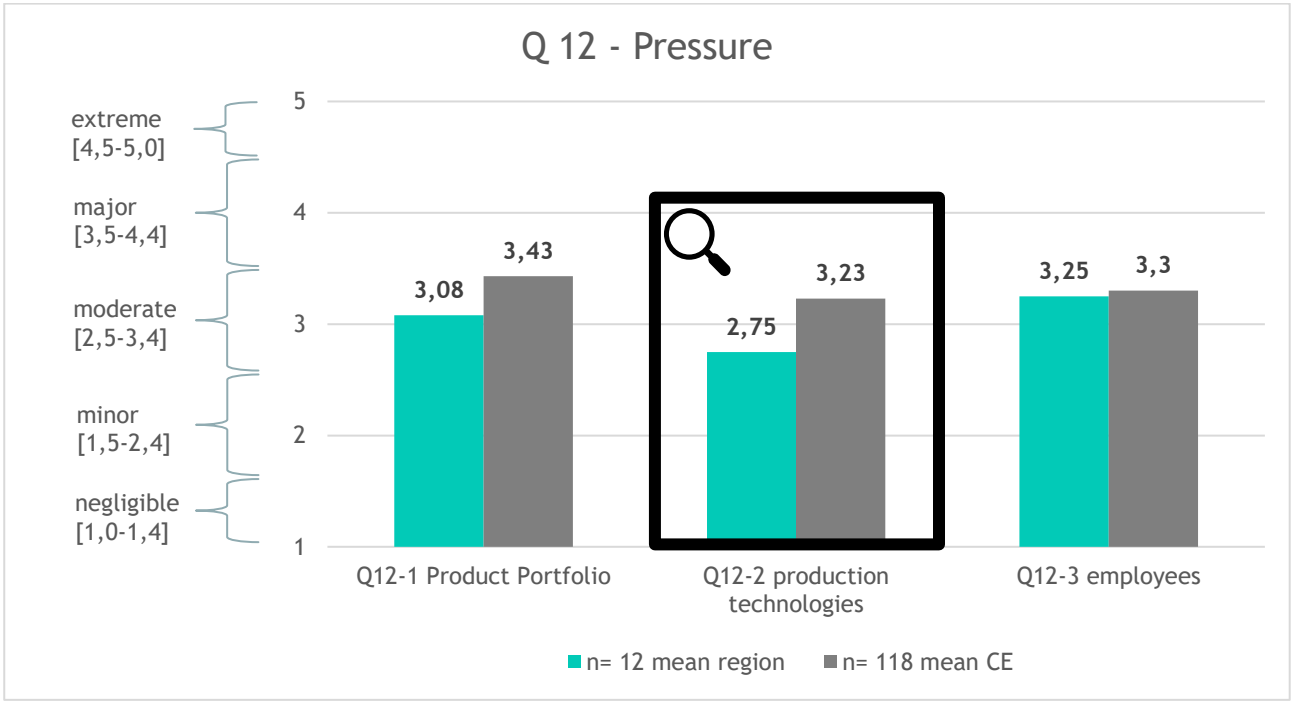
The assessment of **pressure to change in product portfolio** for ensuring business continuity for both Bavaria and Europe falls within the range of 3, indicating **moderate pressure**. Bavaria, however, tends to show a slightly lower level of pressure. Looking more closely at the surveyed companies, the range of responses mostly spans between moderate pressure and high pressure.

Similar to the risks, the **pressure to change related to production technologies** is also rated lower in the European comparison. However, the values remain in the **moderate mid-range** and are not assessed as good. Company responses mainly fall between 2 and 4. No company perceives the pressure as extreme, though 2 companies rate it as very low.

For **currently processed competencies among employees**, the values are very **similar to the European comparison**, with only marginal differences. Looking at the data in more detail, we see that some companies perceive the pressure as low, while one company already considers the pressure to be extreme.

In summary, it can be said that the pressure is seen as somewhat **more moderate compared to the European average. Specifically, in production technologies, the pressure is slightly lower**, similar to the risks. However, there is already a tendency toward higher values.





Readiness to change business for ensuring business continuity (Q13)

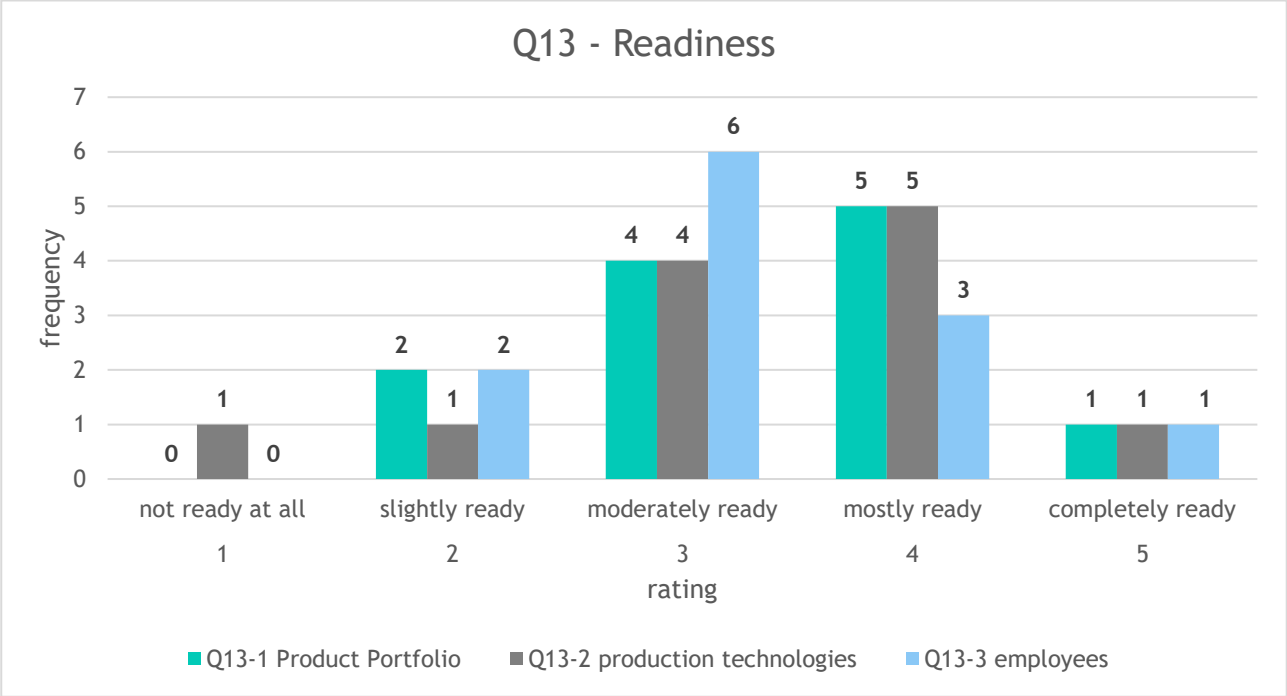
Comparing the results related to the perceived readiness to change business for ensuring business continuity in 2024-2030, the answers have been quite equally distributed when it comes to product portfolio, competencies among employees and production technologies.

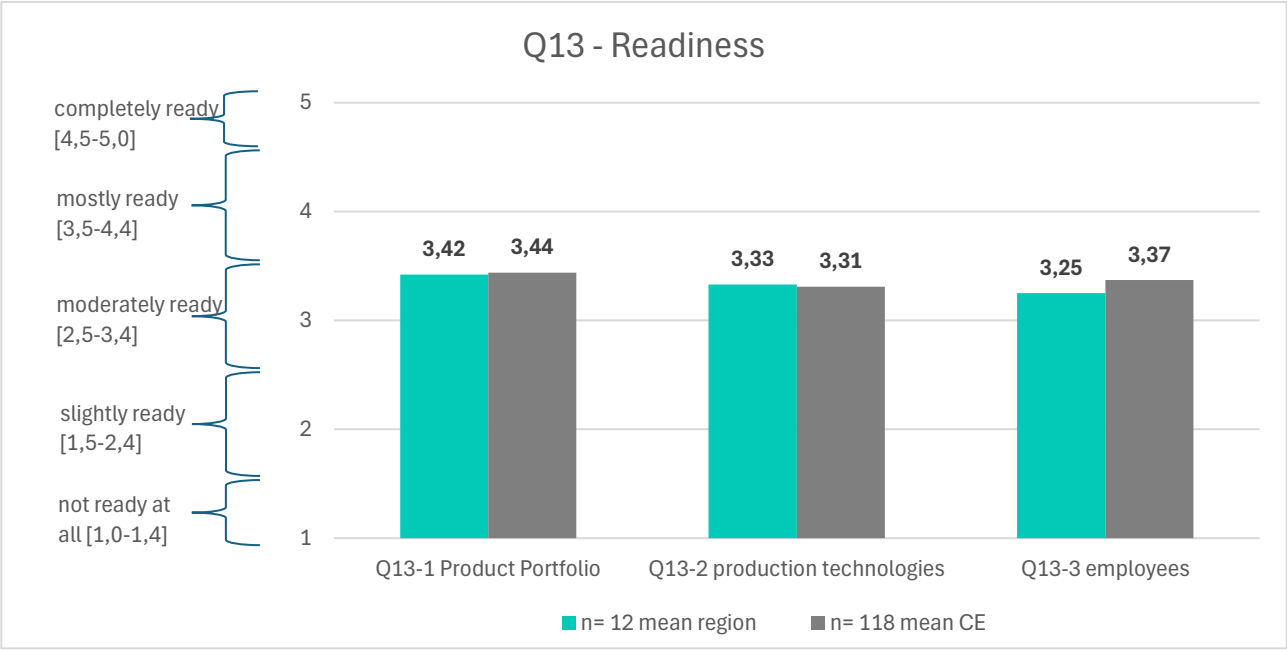
The results for **product portfolio readiness** are **nearly identical to the European average, falling in the moderate range but close to major**. Companies tend to consider their product portfolios as relatively future-proof. Most company responses are in the 3-4 range. **Interestingly, two of the BSOs rate the situation somewhat more critically, assigning it a 2.**

The values related to **production technologies** are also rated as **moderate**, with a tendency towards being well-prepared for the transformation. Most values primarily fall within the 3-4 range.

The same picture emerges for competencies among employees: **moderate to good readiness**.

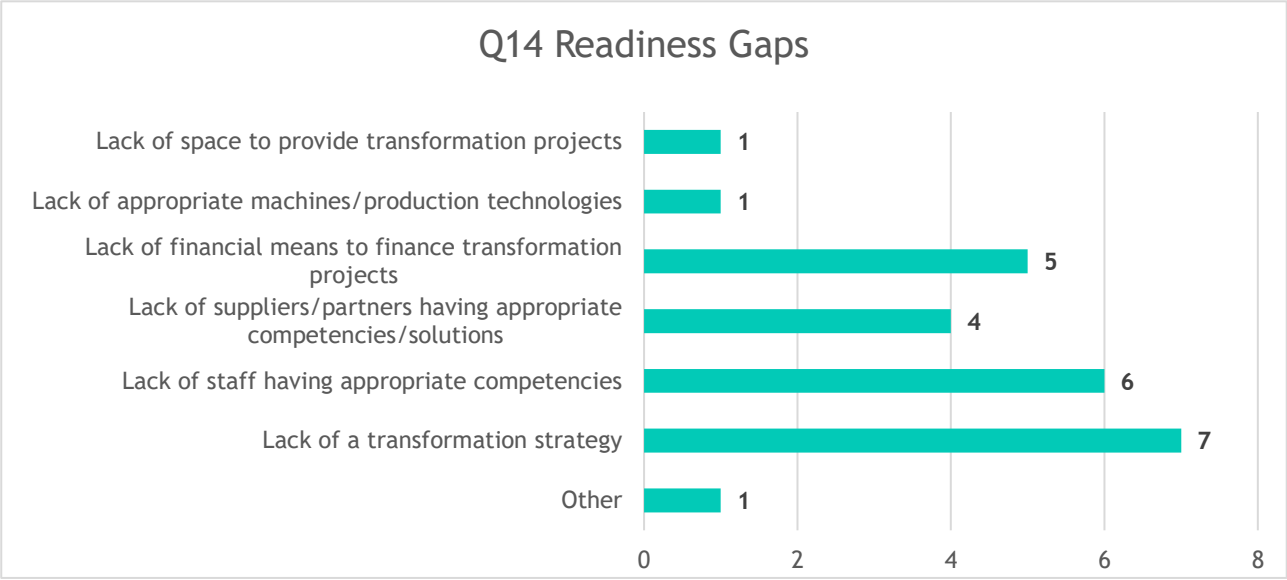
In summary, it can be said that readiness in **Bavaria is assessed similarly to the European average**. Companies see themselves as **moderately to well-prepared for changes** in the automotive industry.





Main readiness gaps hindering businesses from starting a transformation process (Q14)

In question 14, it also emerges that production technology is not seen as a relevant issue. Four main problem areas were identified with frequent mentions. **The most common problem is the lack of a clear strategy, cited seven times, followed by a lack of skills within the company or with partners, as well as a lack of financial resources.**



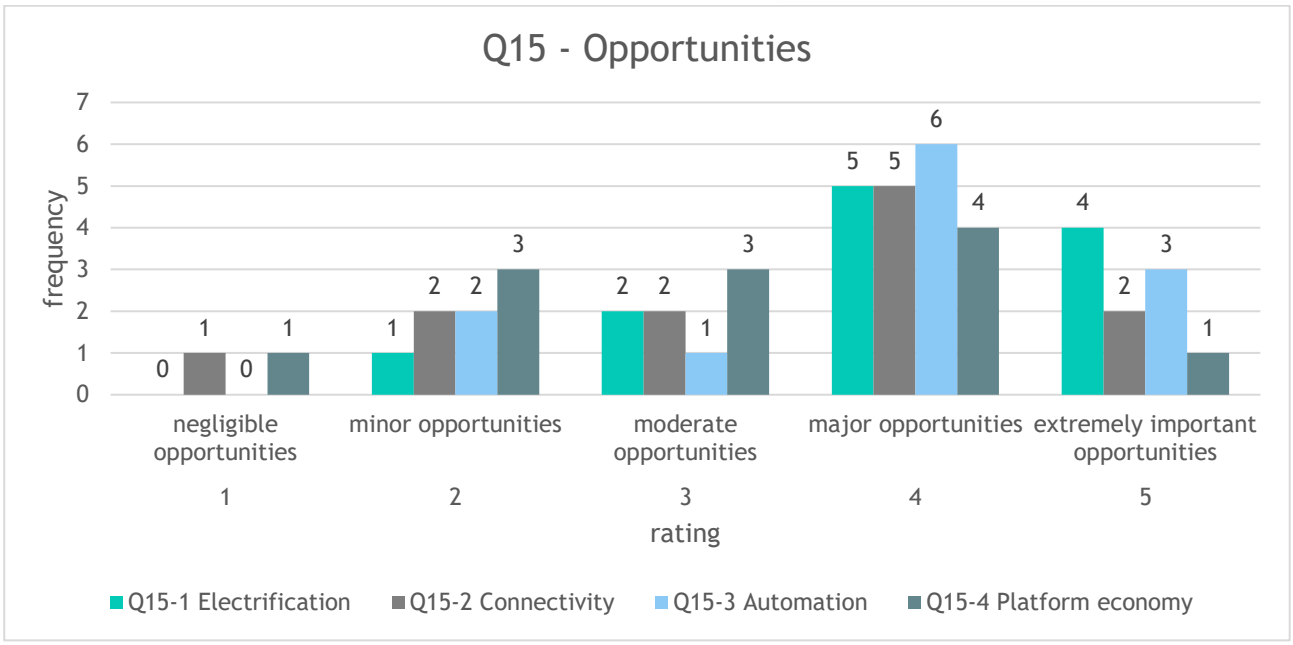
KEY LEARNINGS: Despite very strong competitive pressure, the situation is still considered **moderate** to change for business continuity in 2024-2030. However, there are upward trends in both pressure and risk. In comparison, the production technology sector in Bavaria performs well. BSOs view the situation somewhat more critically. The majority of companies feel well-prepared for the future. It will be important to support companies in developing future strategies and financially, as well as to significantly expand employee training.

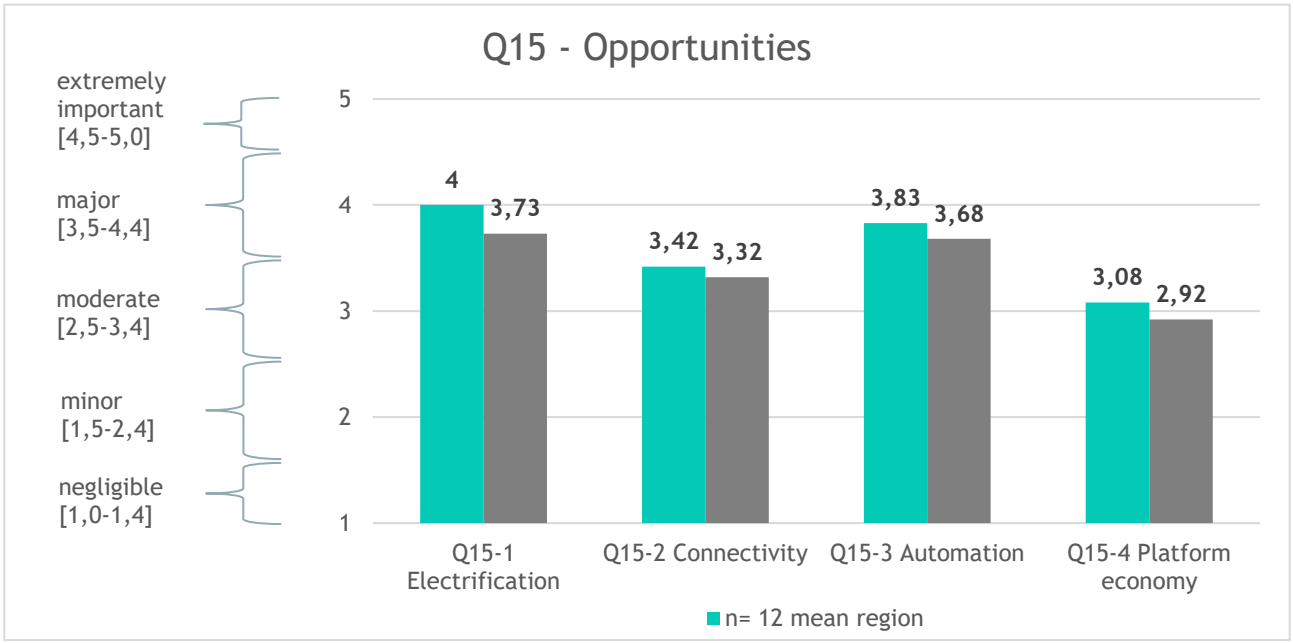
Transformation opportunities and strategic approaches to ensure business continuity in 2024-2030 (Q15-17)

Opportunities to ensure business continuity (Q15)

The assessment of opportunities is similar across all thematic areas compared to the European average. The greatest opportunities are expected in **Electrification**, **Automation and Connectivity**, with strong prospects. **Platform Economy** is rated as moderate. In all areas, Bavarian companies rate the opportunities slightly higher than the European average. The BSOs also assess the situation positively. Notably, they rate the opportunities in the area of Connectivity significantly higher (consistently at 4).

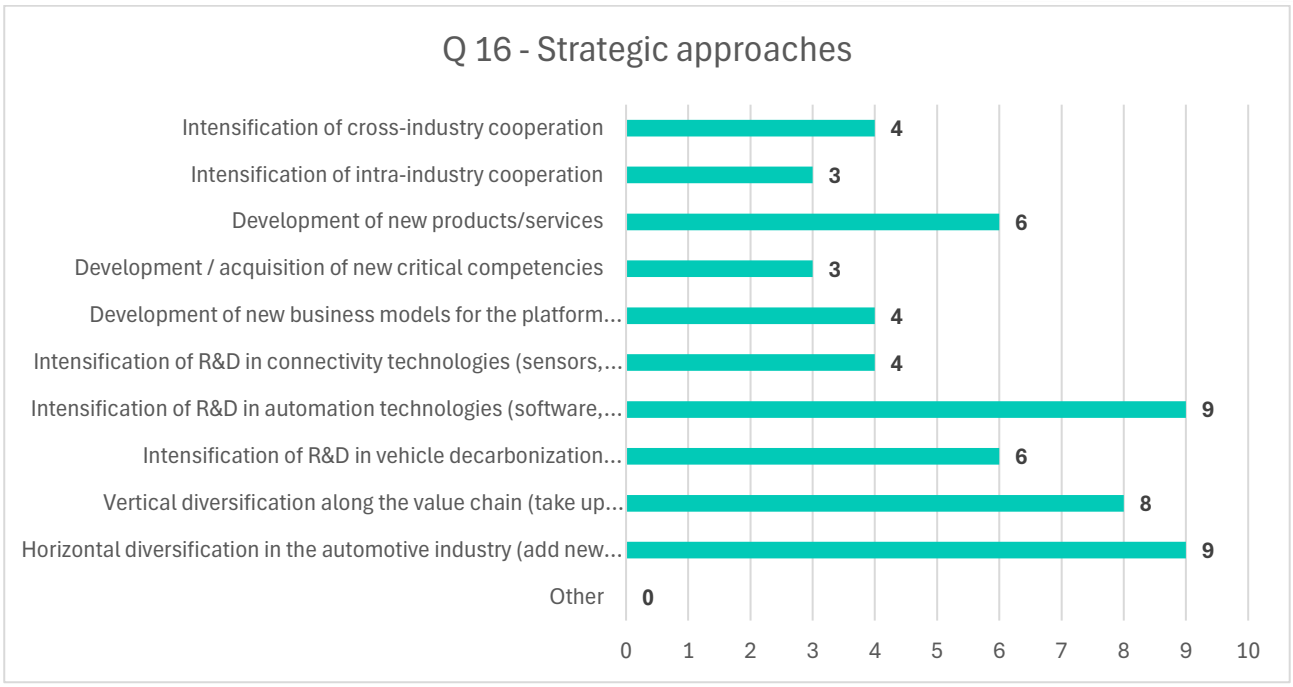
Specifically in **Electrification**, the opportunities are seen as high to very high, with four companies rating the potential as very high.





Strategic approaches to seize opportunities (Q16)

The key strategies identified include **horizontal diversification** (adding related products/services appealing to new segments, **9 mentions**) and **vertical diversification along the value chain** (taking up supplier/client activities, **8 mentions**). Companies also prioritize **R&D intensification** in **automation technologies** (software, sensors, decentralized systems, **8 mentions**) and **decarbonization technologies** (electric, hybrid, hydrogen vehicles, **5 mentions**). Developing new products/services (**7 mentions**) is another significant focus area.



Technology and skills gaps (Q17)

The following identified skill and technology gaps are single answers to the open questions in the questionnaire. It needs to be highlighted that those are only individual comments. Interpretation is therefore very difficult. Only few answers were given in these open questions. That is in line with the previous answers on readiness, risks and pressure, as most of them have been rated as moderate.

Skills gaps:	• **Cloud Services Expertise**: There is a need for knowledge in cloud services, highlighting a gap in digital infrastructure skills, essential for data management and digital transformation. • **Customer Access in E-Mobility**: Gaps in accessing clients in the electric mobility sector, especially concerning battery safety, indicate a need for better networking and market access. • **Mindset and Speed**: Companies need a more transformation-ready mindset and faster adaptation, suggesting cultural and operational gaps in agility and proactiveness.
Technology gaps:	• **Advanced Laser Cutting Technology**: High-speed, high-quality laser cutting capabilities for roll-to-roll materials or sheets are needed to achieve modern production efficiency and standards. • **Testing Facility**: [One example:] The lack of a hydrogen testing centre for component testing points to a gap in infrastructure to support hydrogen technology development, vital for sustainable transformation. *(**BUT: Two** H2 Cluster/Research Centres were set up in the last year.)*

KEY LEARNINGS: The positive takeaway is that the opportunities are substantial—both companies and BSOs agree on this in the areas of Automation and Electrification. In Connectivity, companies also see very significant opportunities, and there may be a need to communicate more clearly where exactly these opportunities lie (a focus area for workshops, training sessions, and events). It is also worth noting that the assessment is similarly positive in the European comparison.

Regional resources and business support ecosystem (Q18-22, 26-27)

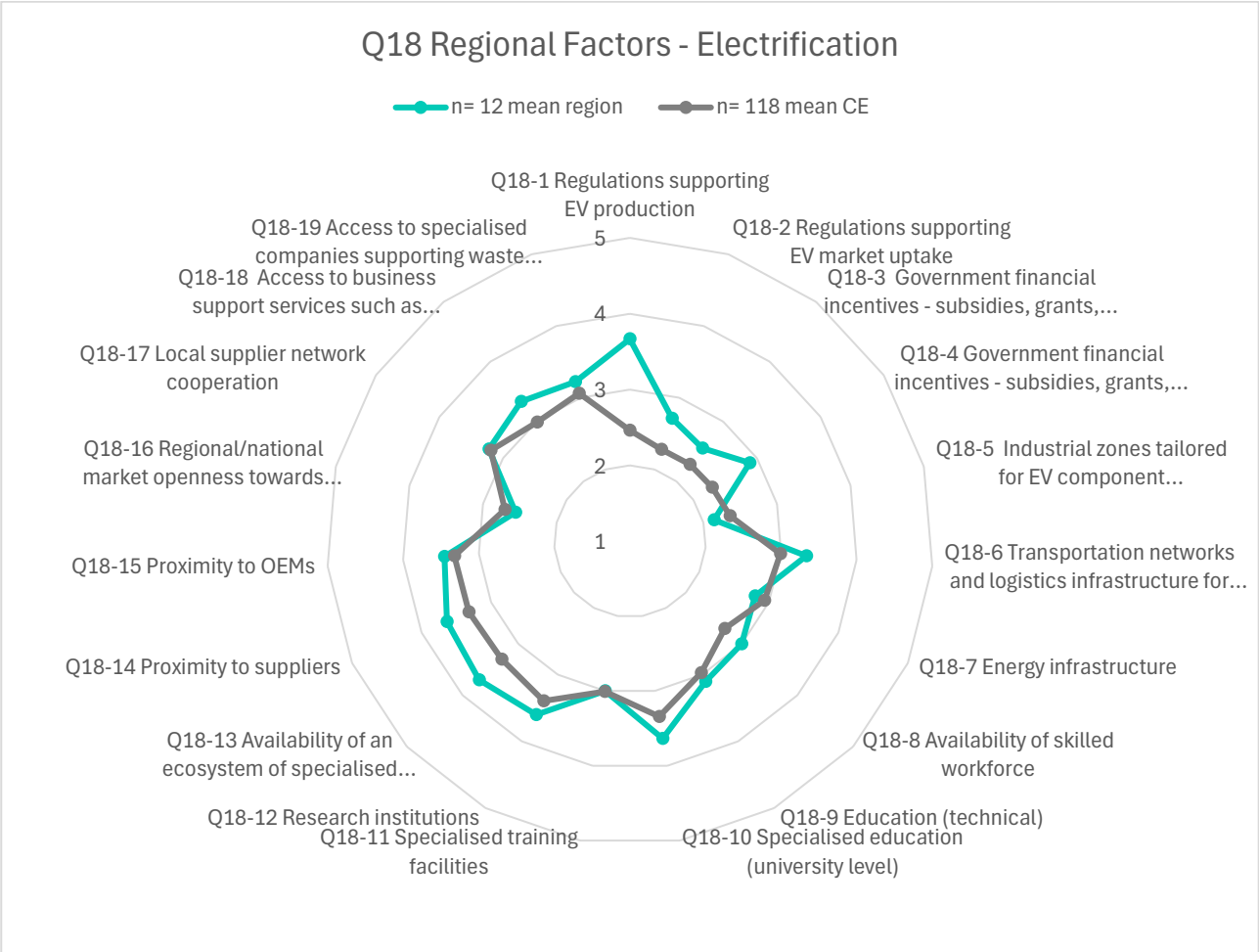
Factors to play a role in automotive in 2024-2030 (Q18-22)

Electrification (Q18)

In the area of Electrification, we are examining which questions are, **on average, rated low**, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Government policies – regulations supporting EV market uptake
- Government financial incentives - subsidies, grants, tax breaks for production companies
- Industrial zones tailored for EV component manufacturing
- Energy infrastructure
- Availability of skilled workforce
- Availability of specialised education at technical school level
- Regional/national market openness towards buying EV
- Local supplier network cooperation

Areas for improvement in electrification include reducing regulations and bureaucracy, increasing financial incentives for EV purchases, and expanding the energy infrastructure. Employee availability must also be improved—potentially through central contact points to simplify recruiting foreign workers (note from an interview). Market openness toward EVs needs further enhancement, as internal combustion engines remain the first choice for many, partly due to public debates and a lack of infrastructure. Local partnerships, especially those promoted through clusters, should also be expanded. It is essential to stay close to customer needs and understand what matters most to them.



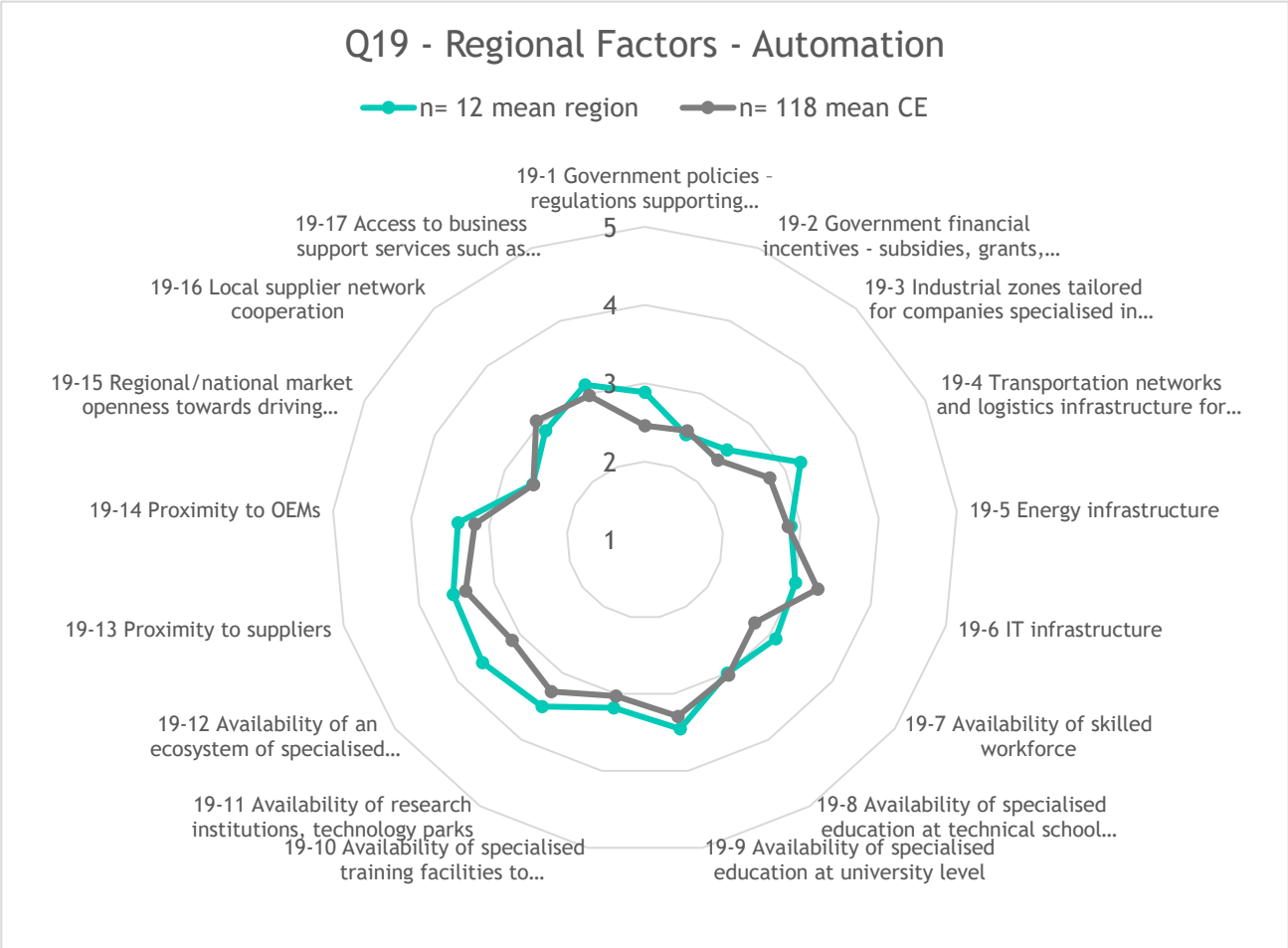
Automation (Q19)

In the area of Automation, we are examining which questions are, **on average, rated low**, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Government financial incentives - subsidies, grants, tax breaks for production companies
- Industrial zones tailored for companies specialised in vehicle automation solutions
- IT infrastructure
- Availability of skilled workforce
- Availability of specialised education at technical school level
- Regional/national market openness towards driving autonomous vehicles
- Local supplier network cooperation

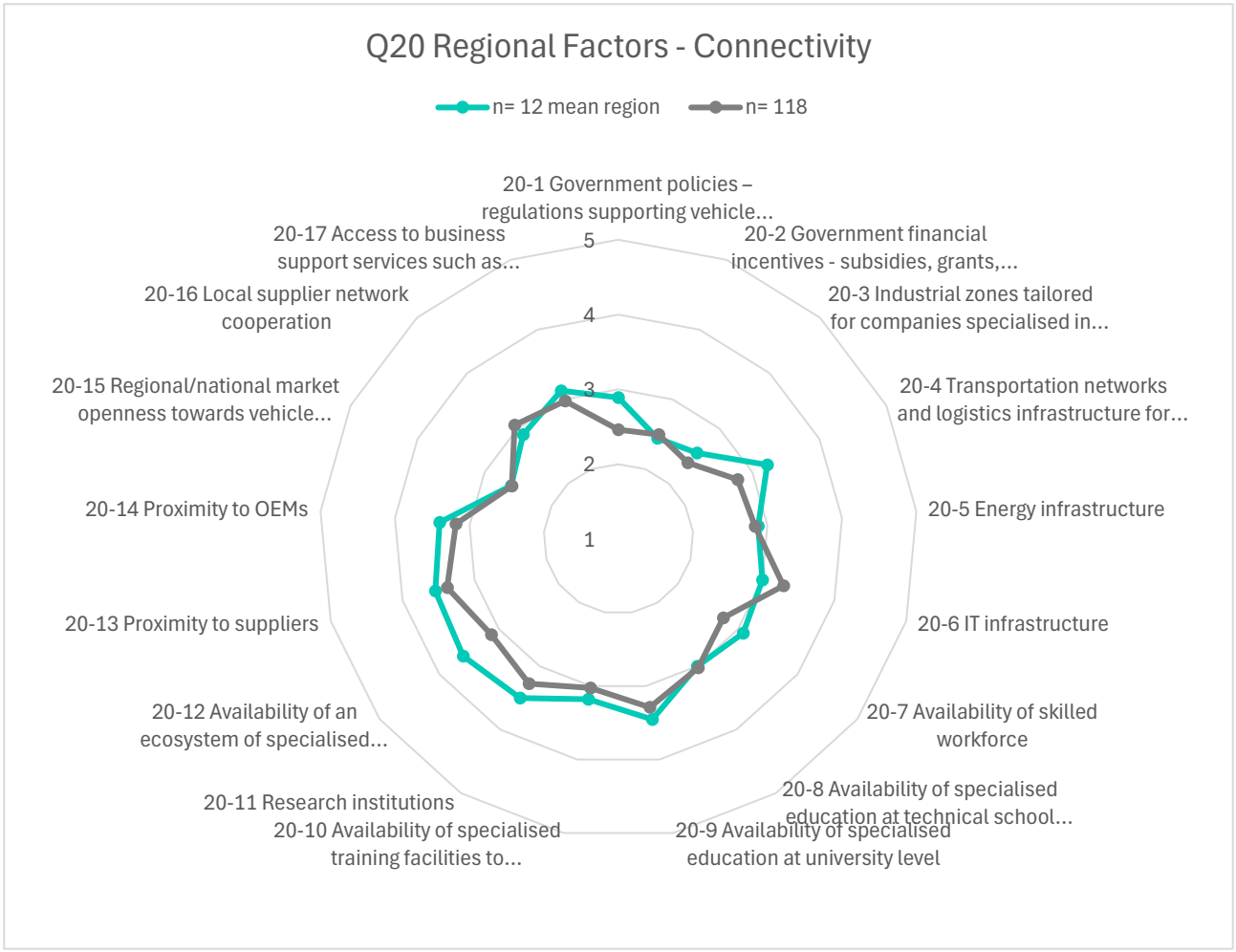
There are similar topics here as in Electrification, but also some differences. Similar issues include a lack of financial incentives, a shortage of employees with the necessary skills, and insufficient market openness to autonomous driving, for example. Networking around this topic should also be strengthened. **Interestingly, bureaucracy and regulations are (still) not seen as the biggest hurdles, and IT**

infrastructure is considered inadequate. Additionally, specialised zones like real-world labs should be created to support this area.



Connectivity (Q20)

In this area, it should be noted for Bavaria that the data base from the surveyed companies **is too limited,** many respondents have rated with “unable to answer”. More companies from the Connectivity sector should be surveyed, **and this area should also be further developed through cluster policy**. A key takeaway here is the lack of market openness, along with employee training and availability playing a major role. **The BSOs assess this area as one where real-world labs, reduced bureaucracy, and financial support from the government are essential factors.**

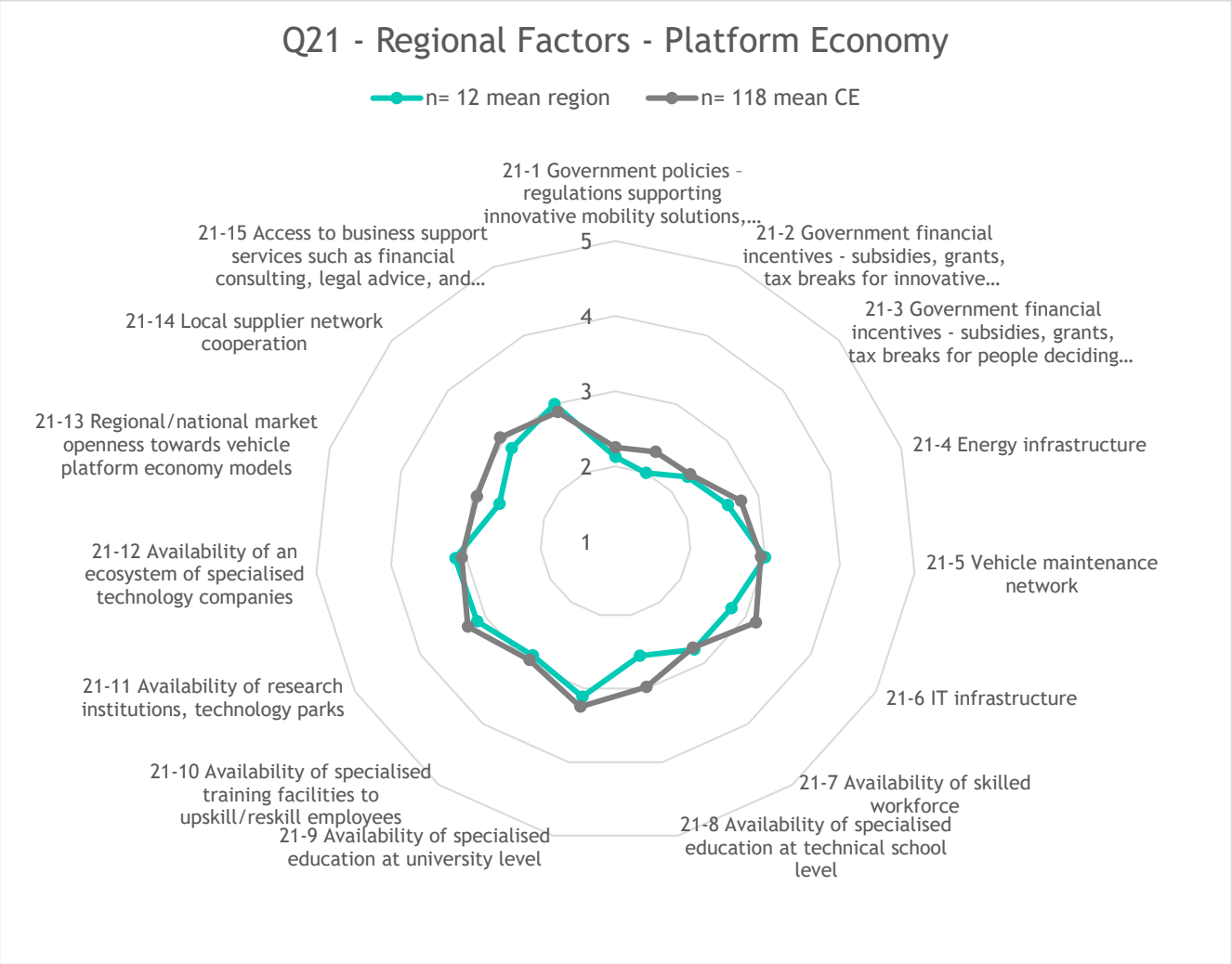


Platform Economy (Q21)

In the area of Platform Economy, we are examining which questions are, **on average, rated low**, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Government policies – regulations supporting innovative mobility solutions, vehicle platform economy models
- Government financial incentives - subsidies, grants, tax breaks for innovative mobility solutions, platform economy initiatives
- Government financial incentives - subsidies, grants, tax breaks for people deciding to participate in vehicle sharing
- Energy infrastructure
- IT infrastructure
- Availability of skilled workforce
- Availability of specialised education at technical school level
- Regional/national market openness towards vehicle platform economy models

In the area of Platform Economy, similar issues are viewed as insufficient, particularly the **lack of financial incentives, with regulations and bureaucracy seen as obstacles**. Financial incentives for car sharing are considered necessary, and large parts of the **energy and IT infrastructure are still missing**, along with specially **trained employees**. **Market openness** for car sharing is also still inadequate. Targeted programmes to promote these areas are essential.



THESES/KEY LEARNINGS: The most important priority is the **development of the necessary infrastructure**, especially for charging stations as well as the IT infrastructure. **Financial incentives** are also needed in all areas to advance these topics and **improve market openness**. In Connectivity, targeted measures should be taken, especially in Bavaria, to promote this topic within companies, and the data base should be expanded through additional surveys and exchanges with companies.

Additional factors influencing the regional competitiveness (Q22)

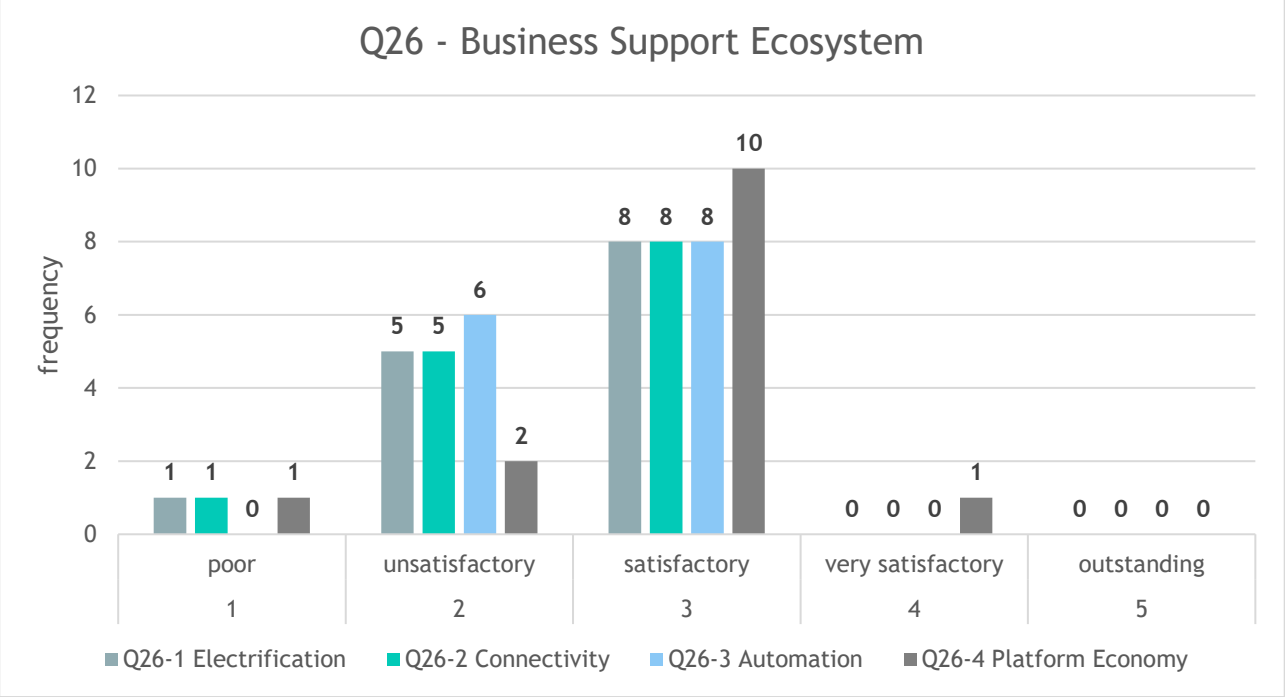
Influence from China: There is concern about China's influence on the regional automotive sector. Strategies to protect local industries from external pressures and dependencies are needed, potentially through government action to strengthen regional competitiveness and resilience.

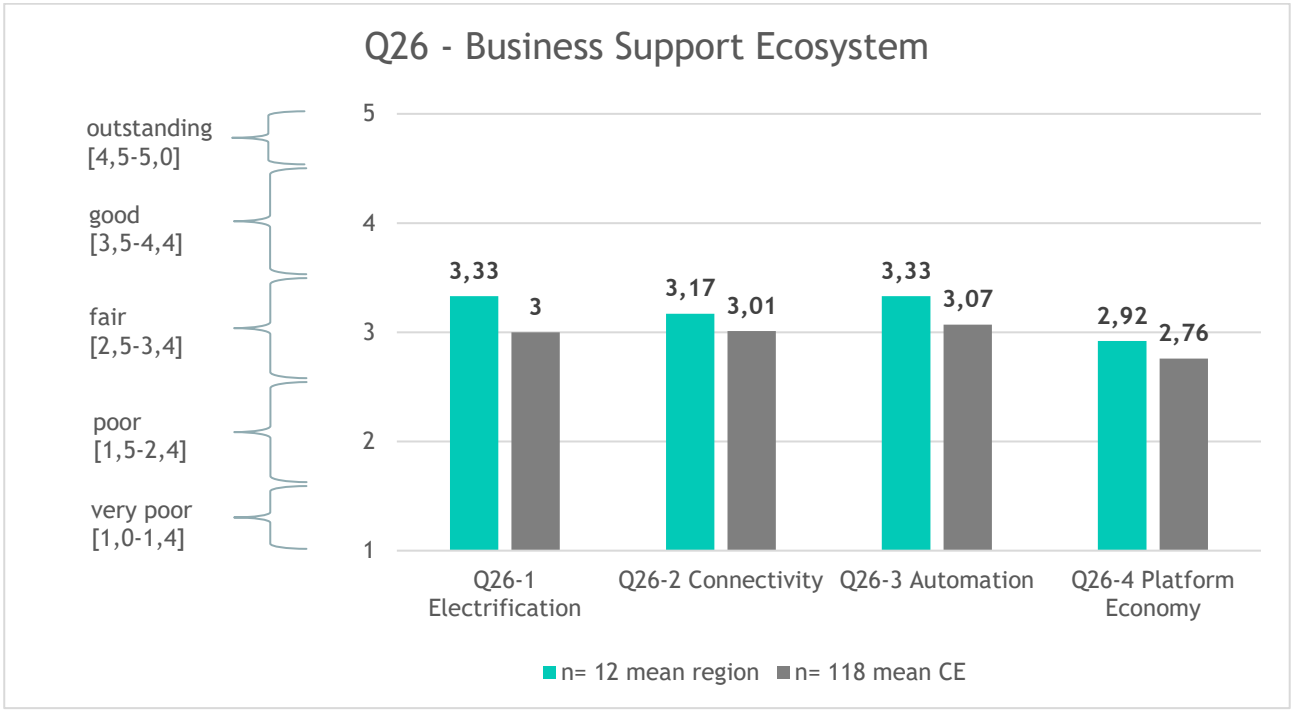
Business support services (Q26-27)

The **service provided by the support ecosystem** is rated as **satisfactory** across all four thematic areas, with slight variations. It scores lowest in Platform Economy and Connectivity, while in Electrification and Automation, it leans more toward very satisfactory. Interesting is that two of the three BSOs answered to provide services in all three thematic areas whereas most companies are only in one or two of the thematic areas specialised.

Respondents specially mentioned that a **clear commitment for local support is needed.** There is a call for dedicated local support services to aid companies in transformation efforts, indicating a gap in regional resources and initiatives focused on business continuity and transformation readiness for the automotive sector between 2024 and 2030.

THESES/KEY LEARNINGS: Even though support is already considered **satisfactory** in most areas, it is essential to significantly expand support services due to the immense challenges posed by the transformation of the automotive industry. Emerging fields, particularly within Connectivity and Platform Economy, should be further developed and emphasised.

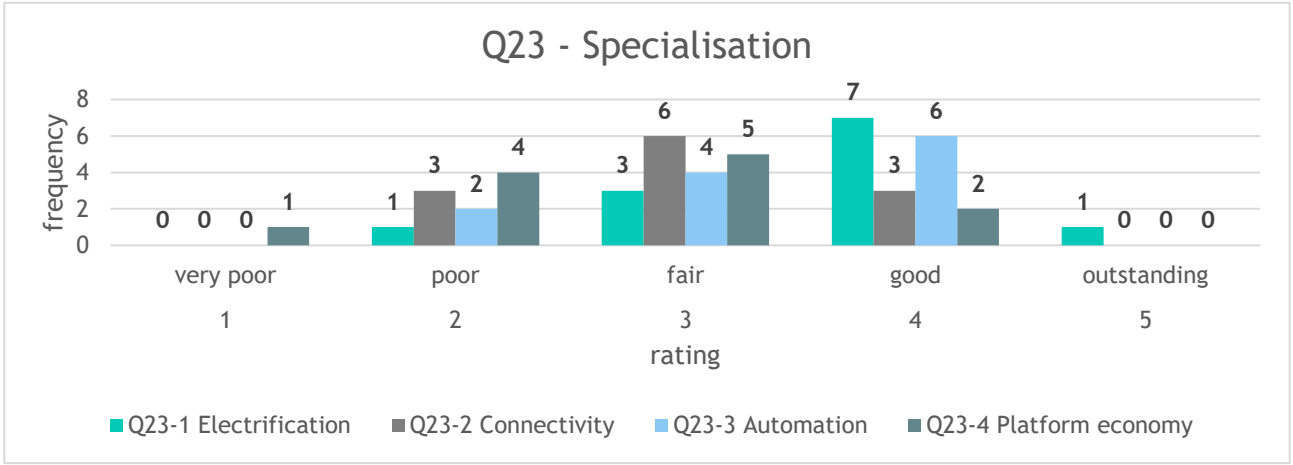


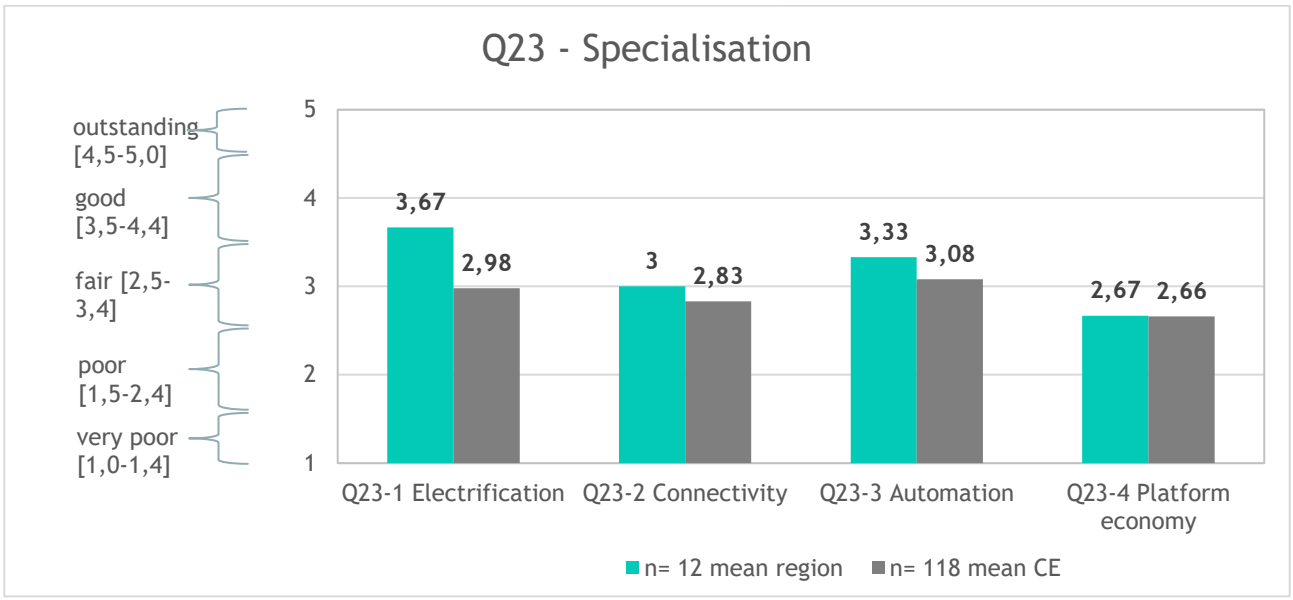


Specialisation level and development perspectives (Q23-25)

Specialisation

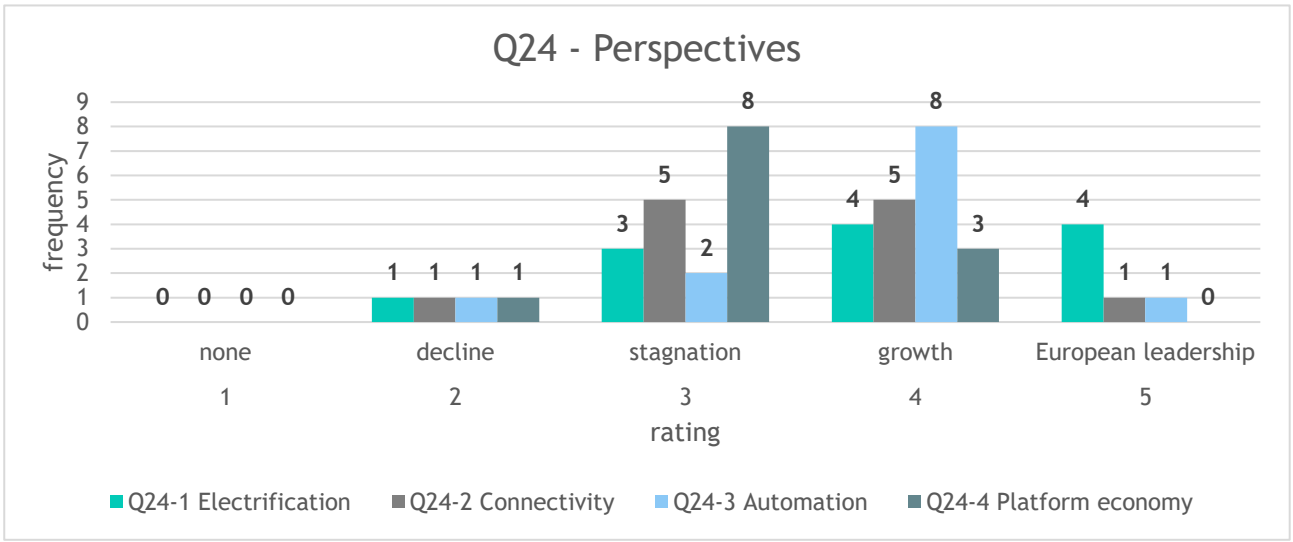
In Automation and Electrification, the region sees itself well-positioned as an automotive hub (rated as good = 4). Connectivity is rated between fair and good, while Platform Economy remains at fair. Overall, there is a tendency toward stagnation or diversification. Diversification is particularly increasing among smaller companies.

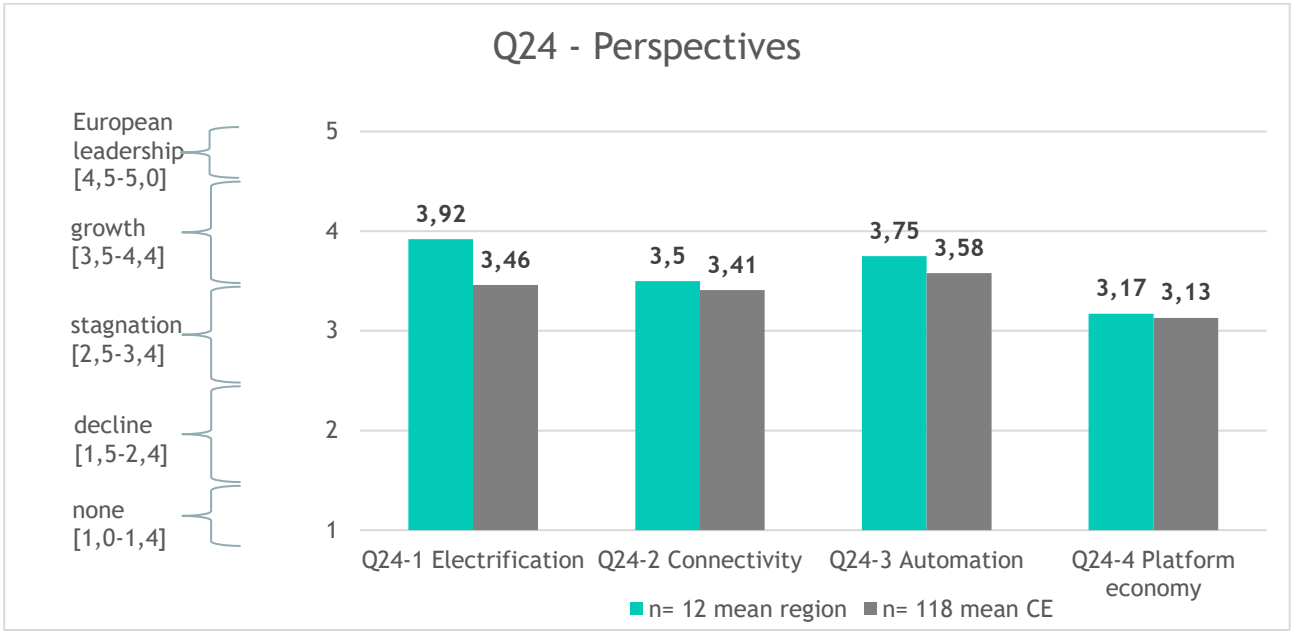




Perspectives

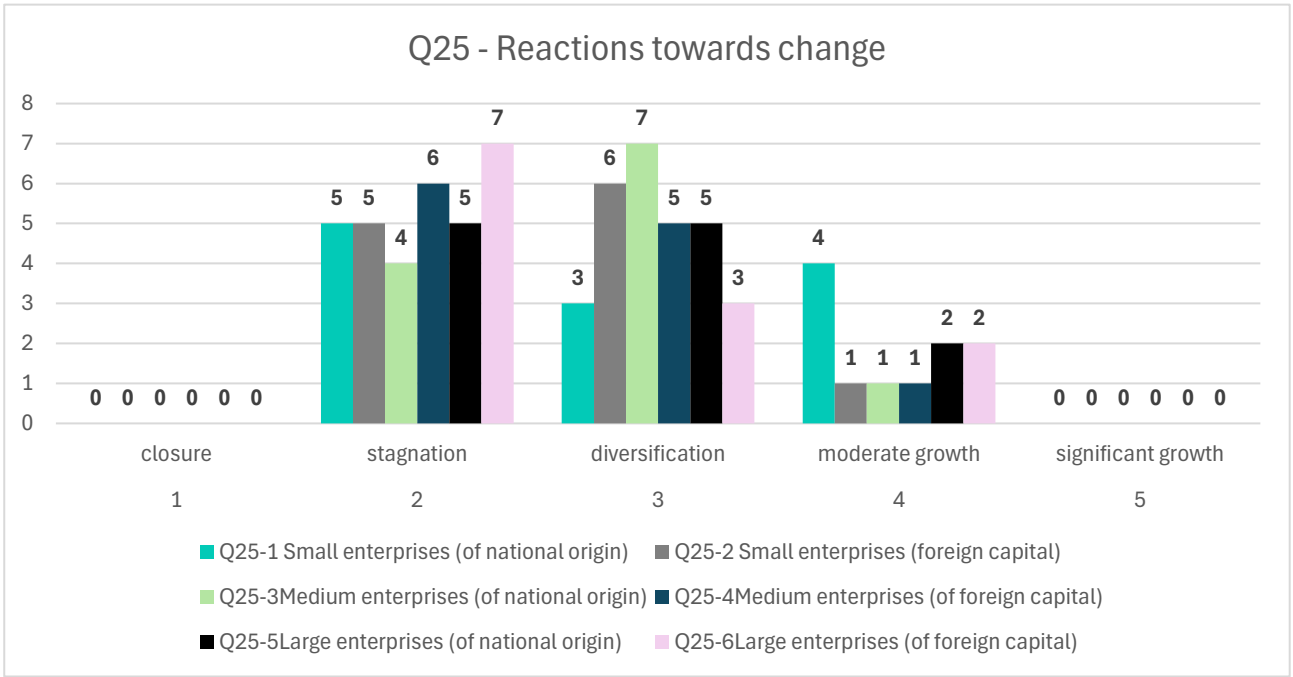
When asking for the observed overall reaction of automotive companies to the ongoing changes in European automotive sector in 2024-2030 the areas of Connectivity, Automation, and Platform Economy are considered stagnant (rated 3). This is a significant disappointment, especially given the growth in these sectors in other global markets. Only the area of Electrification is viewed as growing (rated 4) within the region. In comparison, European averages show slightly better results across these areas. But when comparing the respondents' view on how they observe overall reactions of automotive industry on ongoing changes, it is surprising that none have answered with "closure". But, when comparing those observations with the current news and profit expectations from big OEMs, it seems to be worse than stagnation. Also in Bavaria, Upper Palatinate companies may experience closure.

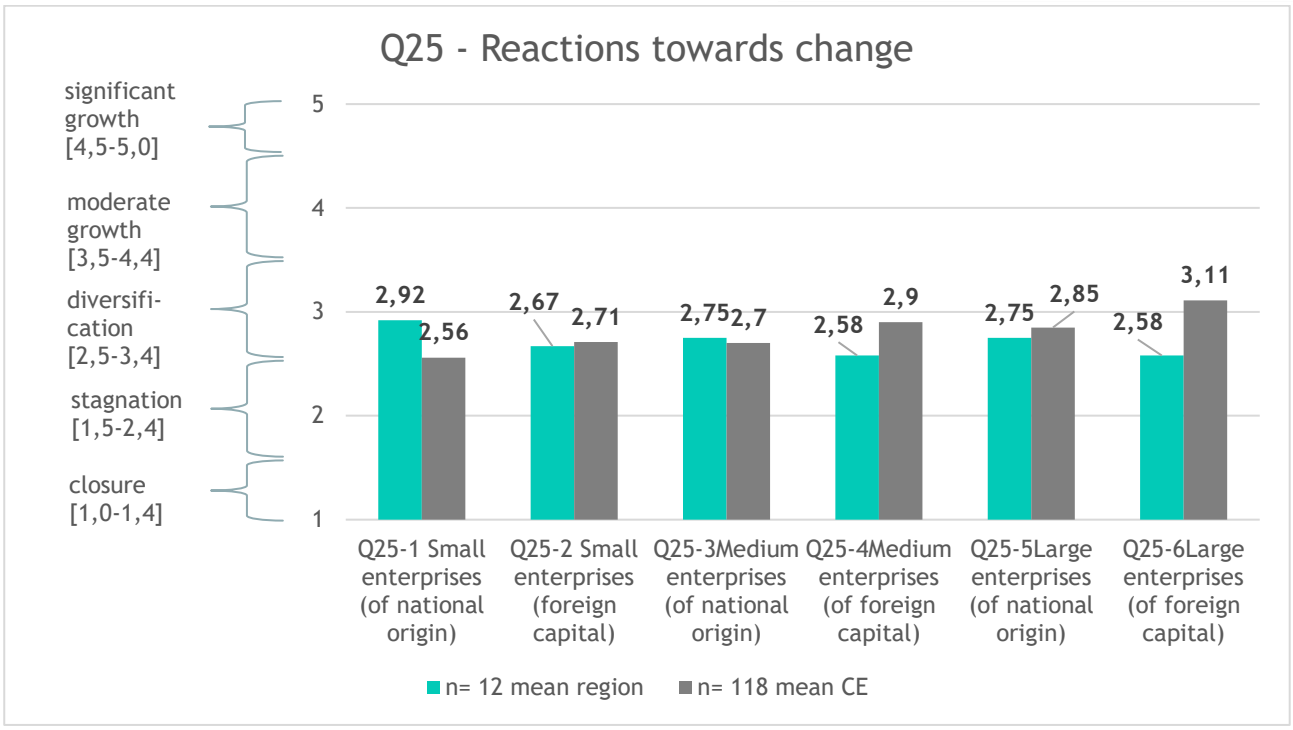




Reactions towards changes

The chart shows that large enterprises of foreign capital rate regional business support services most favorably, with a mean score of 3.11, indicating "satisfactory" performance. Small and medium enterprises (SMEs) of national origin perceive the services as slightly less satisfactory, with mean scores ranging from 2.92 to 2.75, but still above the "unsatisfactory" threshold. SMEs of foreign capital tend to have a more neutral or slightly positive perception, averaging around 2.71, reflecting moderate satisfaction with support services for transformation processes.





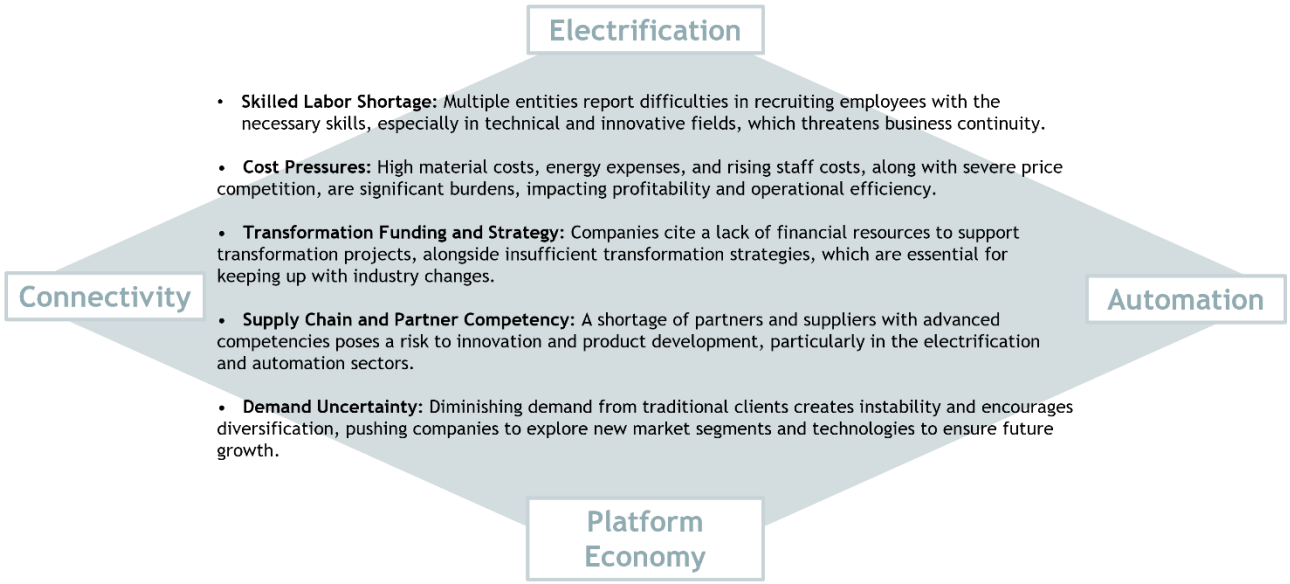
Conclusion - Key findings for regional transformation capacities in the automotive sector

Bavaria's automotive sector is robust but faces challenges due to skilled labor shortages, high material costs, high energy costs, high bureaucracy and a need for transformation.

Companies see growth potential in electrification and automation but require stronger local support, particularly in cloud services, e-mobility access, and technology testing infrastructure.

Addressing these gaps and mitigating external influences, such as from China, is crucial for sustaining competitiveness and innovation through 2030.

- Readiness: No difference between large and small companies
- Pressure and Risks: Large companies perform better
- Platform Economy: Large companies see opportunities
- BSO Values: Very close to the values of the companies
- More Data/Surveys needed.



Challenges in GER-BY

THESES/KEY LEARNINGS: Using the TRM Score tool based on the EU survey, we assess the Bavaria region as "**Moderate Ready**" for transformation. To reach the "Transformation Ready" status, measures and deficiencies must be addressed, especially by tackling similar issues at the European level, as the challenges are the same or very similar. Growth is primarily seen in Electrification and Automation, while much work remains in the areas of Connectivity and Platform Economy.

Transformation Readiness Index – Germany/Bavaria

According to the TRM, Bavaria is assessed as moderately ready for the transformation. The region achieves its highest score in Opportunities and Perspectives, while its lowest score is in the Regional Factor

Platform Economy.

Ranking:

>60 Transformation Ready

50-60 Moderate Ready

40-50 Limited Ready

30-40 Low Ready

<30 Not Ready

Austria | Upper Austria (Biz-Up)

Brief description of the region

The automotive industry in Upper Austria is a networked factor in the overall economic structure and Upper Austria is one of the leading regions in the automotive industry in Austria. It not only generates sales, added value and employment in its own companies, but it is also linked to numerous other domestic industries through intensive interdependencies, both on the supplier side and on the customer side. Because of the economic networking with other economic sectors, automotive companies provide impulses for the entire Austrian economy.

Future Mobility Region Upper Austria

Comprising 280 companies and research institutions with 11.5 billion euros in sales and 31,000 employees, the automotive (supplies) industry is a key industry for Upper Austria as a business location, an industry which is during a monumental transformation process. The challenge to be met here is the fundamental shift towards the zero-emission powertrain.

And the conditions required to achieve this change are in place locally. Within a radius of 50 kilometres, you will find almost all the expertise needed to develop and manufacture sustainable vehicle solutions for commercial and special-use vehicles.

The Future Mobility Region initiative seeks to make these capabilities palpable and usable with a view to supporting local companies in their transformation processes. At the same time, it is also a signal beyond the borders to spell out to anyone wanting to develop or implement sustainable vehicle solutions that they will find the know-how and infrastructure, and highly trained specialists in Upper Austria within the radius mentioned above.

Business Upper Austria and the Automotive-Cluster

Business Upper Austria is the Upper Austrian government's location agency. It is an innovation driver and the first contact partner for companies in Austria and abroad to whom it offers customised solutions for their investment and innovation projects. It helps steer economic and research policy.

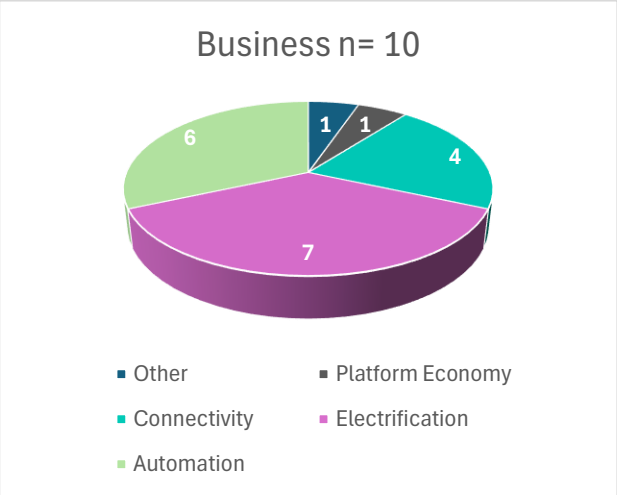
The Automotive-Cluster of the Business Upper Austria agency is a cross-industry network for the automotive sector. The purpose is to initiate, promote and coordinate successful cooperation between companies. As a hub connecting member companies, research institutes and decision-makers it is also committed to raising the international profile of Upper Austria as a centre of the automotive industry.

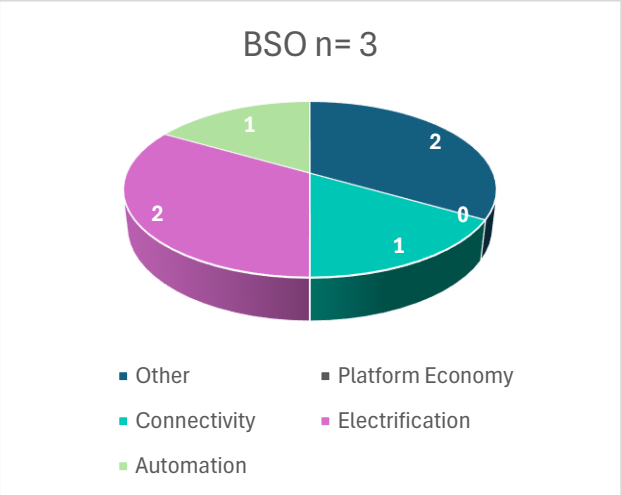
Inventory of companies and business support organisations (BSO) (Q1-8)

Overall, **10 businesses** and **3 BSOs** answered the questionnaire. The surveyed companies are relatively homogeneous, including both small and large enterprises. **Many of the companies have a significant focus on the automotive sector with a share of at least 50% of their company turnover.** For two companies the share of the automotive sector is less than 50%. Its product and service portfolio is very diverse, starting with machines and systems and ranging from information and communication technologies to various supplier parts, for example, for alternative propulsion systems, through to vehicle production.

The surveyed companies are very active in the fields of Electrification and Automation, which aligns with the general assessment for the region. The BSOs address several thematic areas, whereby Electrification and Automation are also key topics. Additional support measures are also offered, for example such as qualification and internationalisation.

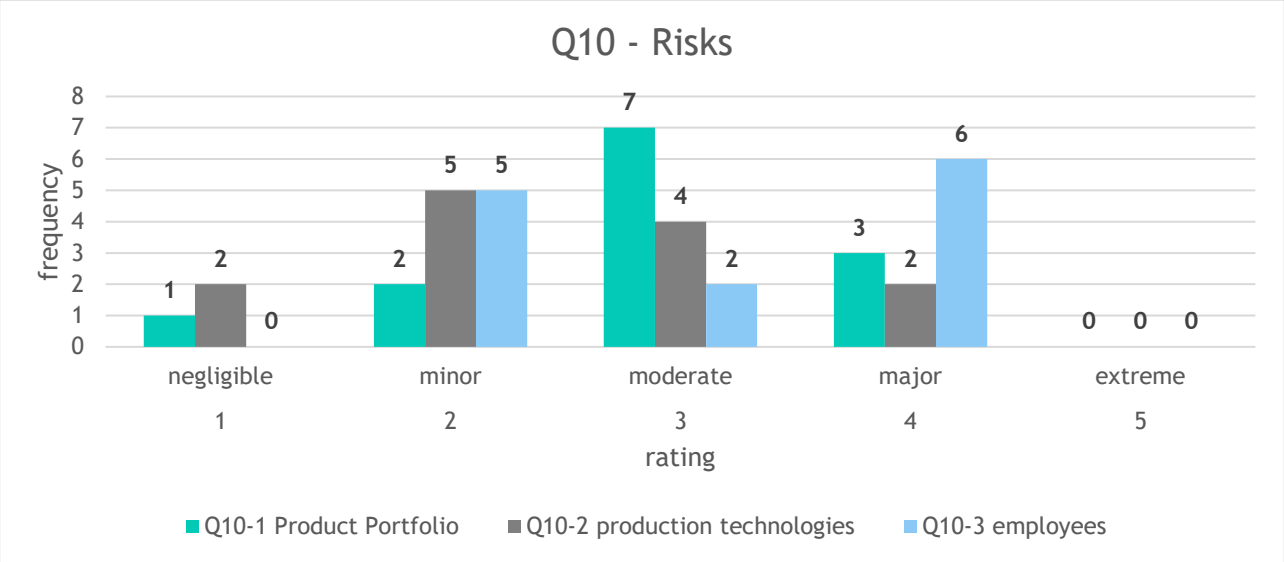
Regarding the survey format in general, it is noted that the companies complete the survey for themselves, but get in touch if they have any questions. Or the survey was explained in detail in advance.

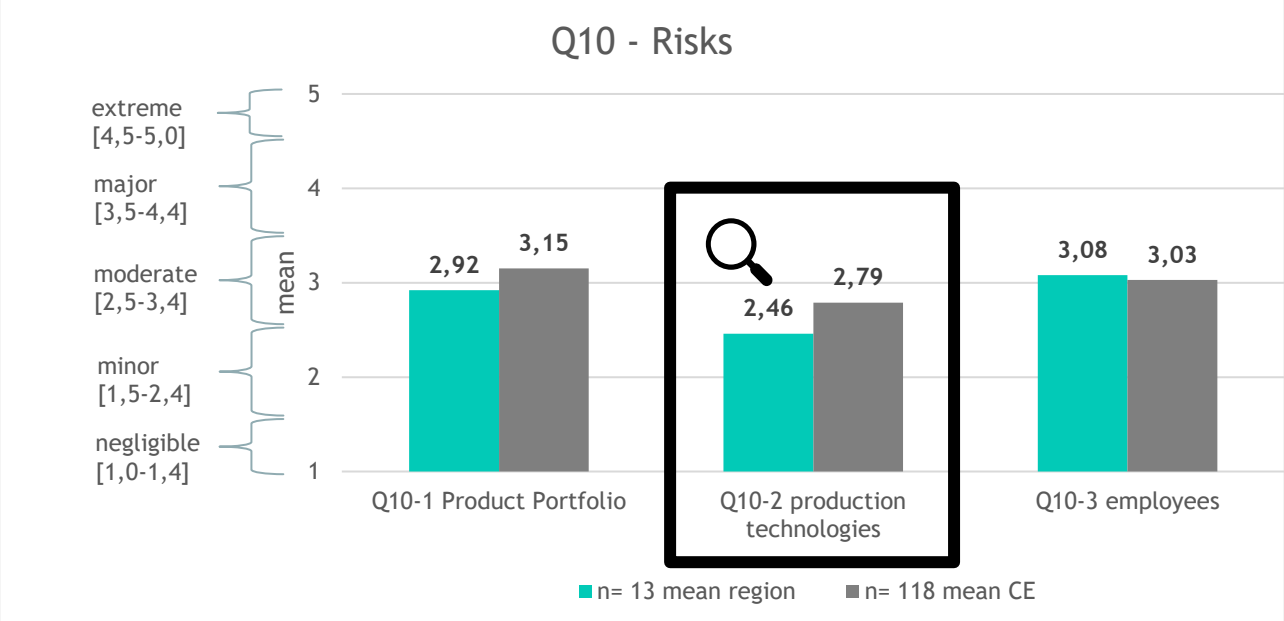




Transformation risks, pressure and readiness for business continuity in 2024-2030 (Q10-14)

Risks endangering business continuity (Q10-11)





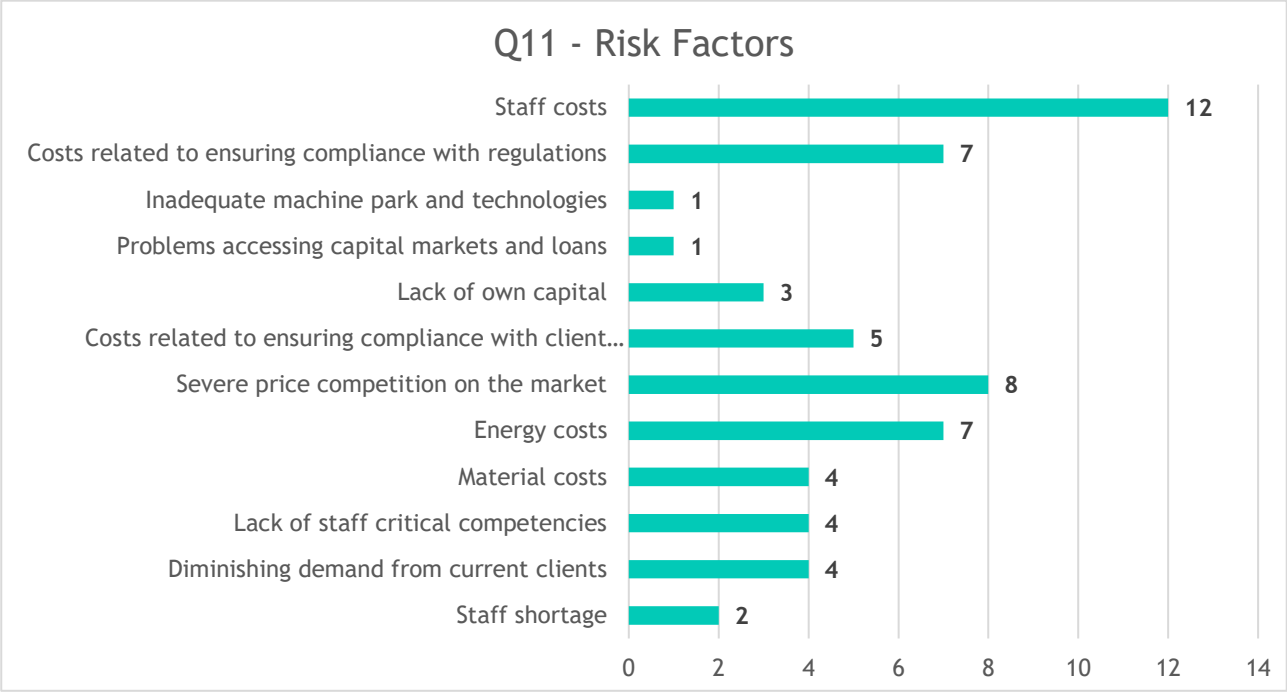
In Austria, the risk assessment for the automotive sector shows a similar level of concern in various areas compared to the Central European average (CE).

The risk for **product portfolio** is rated as moderate with a mean score of 2.92, slightly lower than the CE of 3.15. Responses range from 1 (negligible risk) to 4 (major risk). In the BSO sector the risk is rated between 2 (minor risk) and 4.

Regarding **production technologies**, the risk level in Austria is rated between minor and moderate with a mean score of 2.46 and so below the CE of 2.79, which is clearly moderate. In detail, the risk ratings are between 1 (negligible risk) and 4 (major risk). Austrian companies see less risk in this area and are well positioned within the CE region. 7 out of 13 companies estimate the risk at 1 (negligible risk) and 2 (minor risk).

The risk associated with **employees** is also assessed as moderate, with an average score of 3.08, slightly higher than the CE of 3.03. The ratings mainly range from 2 (minor risk) to 4 (major risk) - the segmentation is interesting, on the one hand 5 out of 13 companies estimate the risk at 2, on the other hand 6 out of 13 companies estimate the risk at 4.

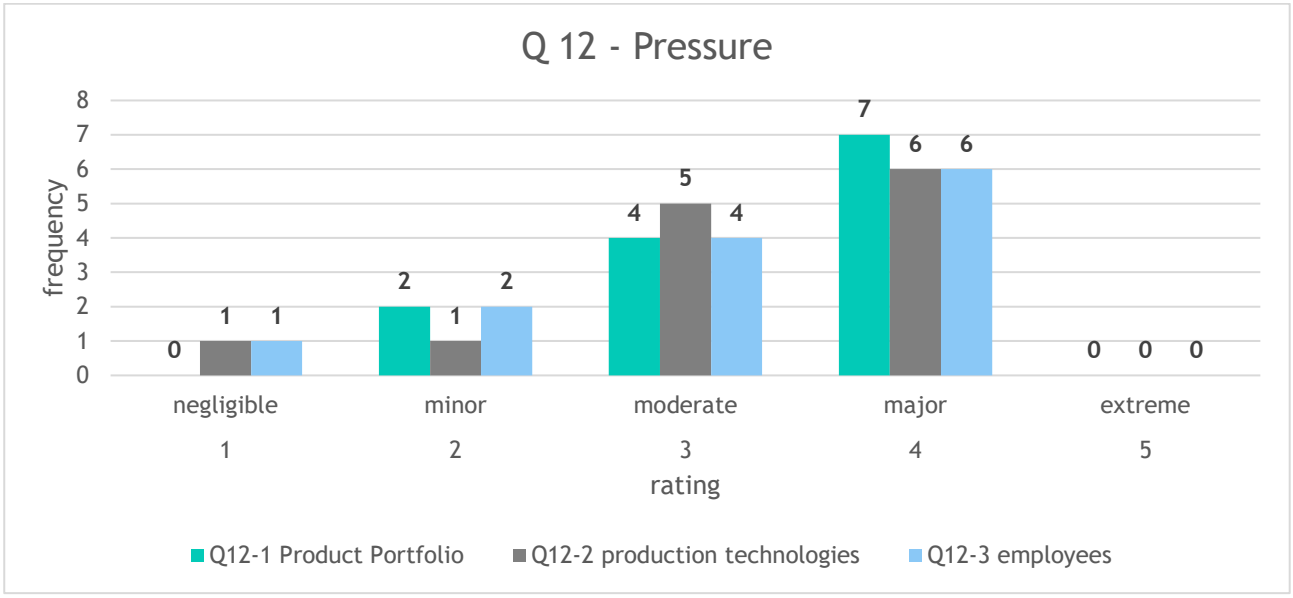
In summary, the risks for Austrian automotive companies are moderate and similar to the CE. In comparison, the production technologies are currently assessed slightly more favorably.

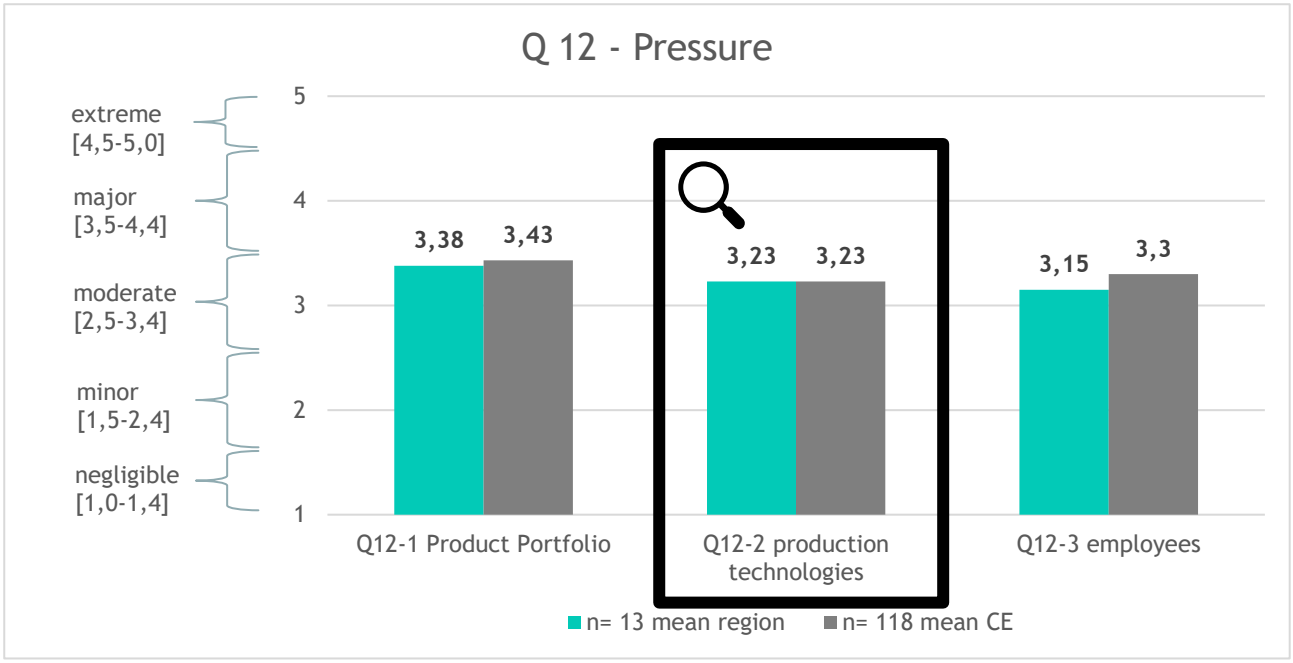


The three greatest risk factors, as shown in the chart, are **staff costs**, **severe price competition on the market** (especially with China) and **costs related to ensuring compliance with regulations / energy costs.** Costs are a very big issue for the companies, because they have a direct impact on profits and making it difficult to compete on an international level. For the companies it is difficult to pass on rising costs, which is why the number of orders is often good, but turnover is falling. Severe price competition, especially in automotive and manufacturing industries, pressures companies to lower prices.

Further risk factors worth mentioning are costs related to ensuring compliance with client requirements, material costs, lack of staff critical competencies and diminishing demand from current clients.

Pressure to change business for ensuring business continuity (Q12)





The Austrian values are very close to the European average and are in the moderate range everywhere.

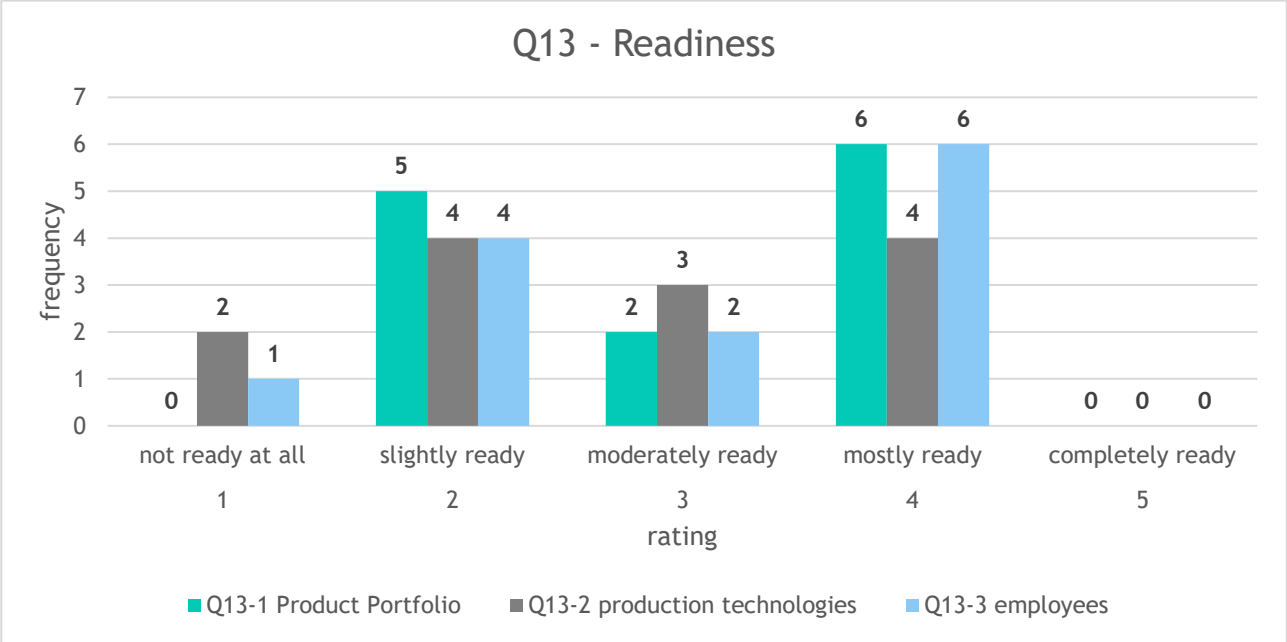
The assessment of pressure to change in **product portfolio** for ensuring business continuity in Austria shows that the companies experience a moderate pressure. The mean score is 3.38, slightly lower than the CE of 3.43. Responses range from 2 (minor pressure) to 4 (major pressure).

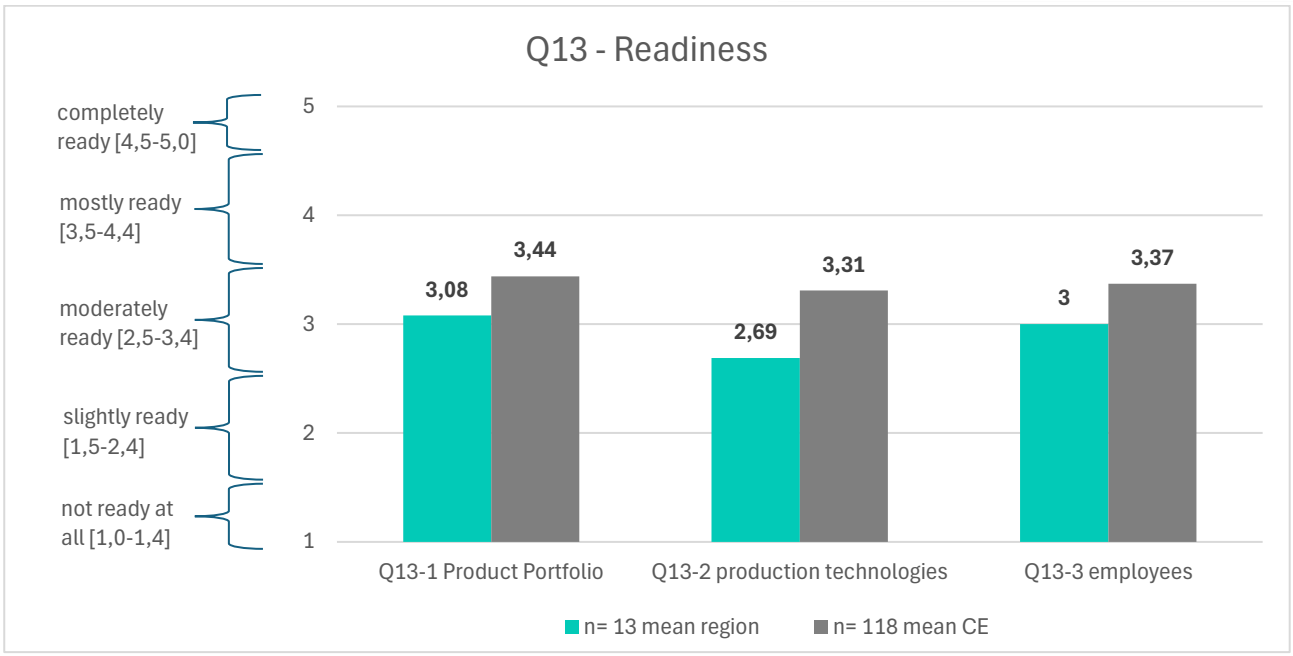
In the area of **production technologies,** the mean score of Austria is 3.23, which is the same value as the CE and a moderate level. The majority of the companies rate the pressure with 3 (moderate pressure) and 4 (major pressure). No company perceives the pressure as extreme, but one company rates it as 2 (minor pressure) and one company rates it as 1 (negligible pressure).

Regarding **employee competencies**, the pressure level of 3.15 is again slightly lower than the CE average, but still close to it. In detail, few companies rate the pressure as low, while several companies are experiencing major pressure.

In summary, the Austrian pressure is very close to the European average, which already indicates a higher level. To remain competitive some efforts are certainly necessary.

Readiness to change business for ensuring business continuity (Q13)





Comparing the results related to the perceived readiness to change business for ensuring business continuity in 2024 – 2030, there is a peak in responses for product portfolio, production technologies and employees at 2 (slightly ready) and 4 (mostly ready). The region shows a moderate level of readiness compared to the CE average.

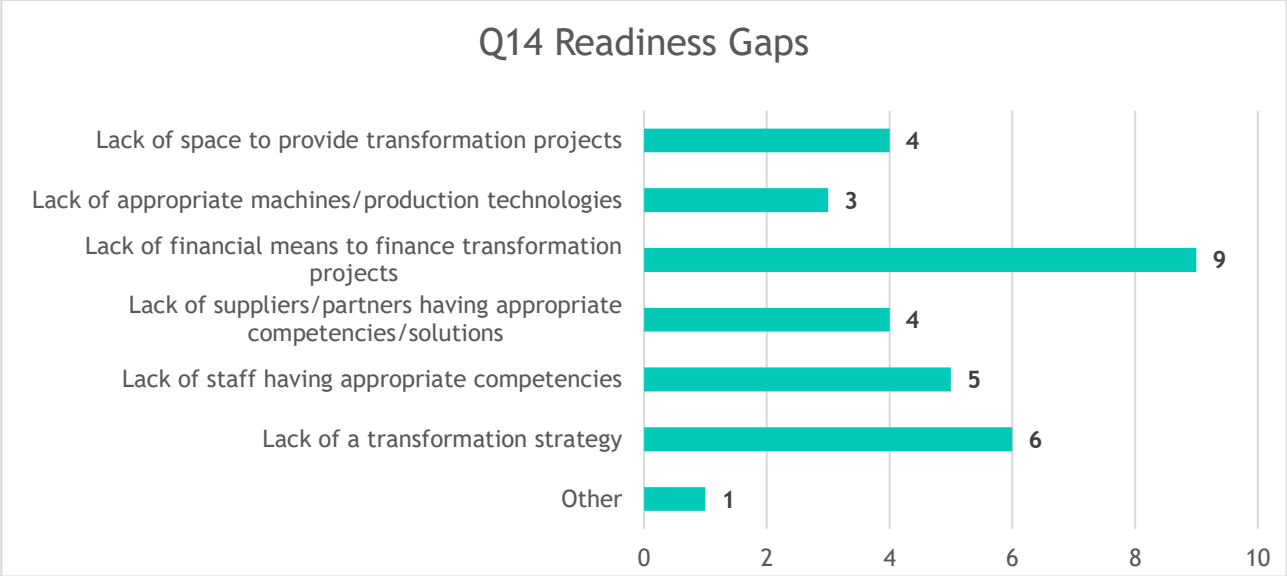
The readiness in **product portfolio** is rated with a mean score of 3.08, compared to the CE with 3.44. This indicates a lower perceived preparedness of the companies in adapting their product portfolio. Most company responses are in 2 (slightly ready) and 4 (mostly ready).

In **production technologies** the score is 2.69, also under the CE average with 3.31. This also indicates a lower perceived preparedness – two companies are in 1 (not ready at all).

The same picture emerges for **competencies among employees**. The readiness is rated with a mean score of 3, compared to the CE with 3.37. There is room for improvement too.

In summary, the companies see themselves as moderately prepared for changes in the automotive industry, but lag behind the European average in all areas.

Main readiness gaps hindering businesses from starting a transformation process (Q14)



There are several challenges for Austrian companies. At the moment, costs are playing a major role and the companies try to save money wherever it is possible.

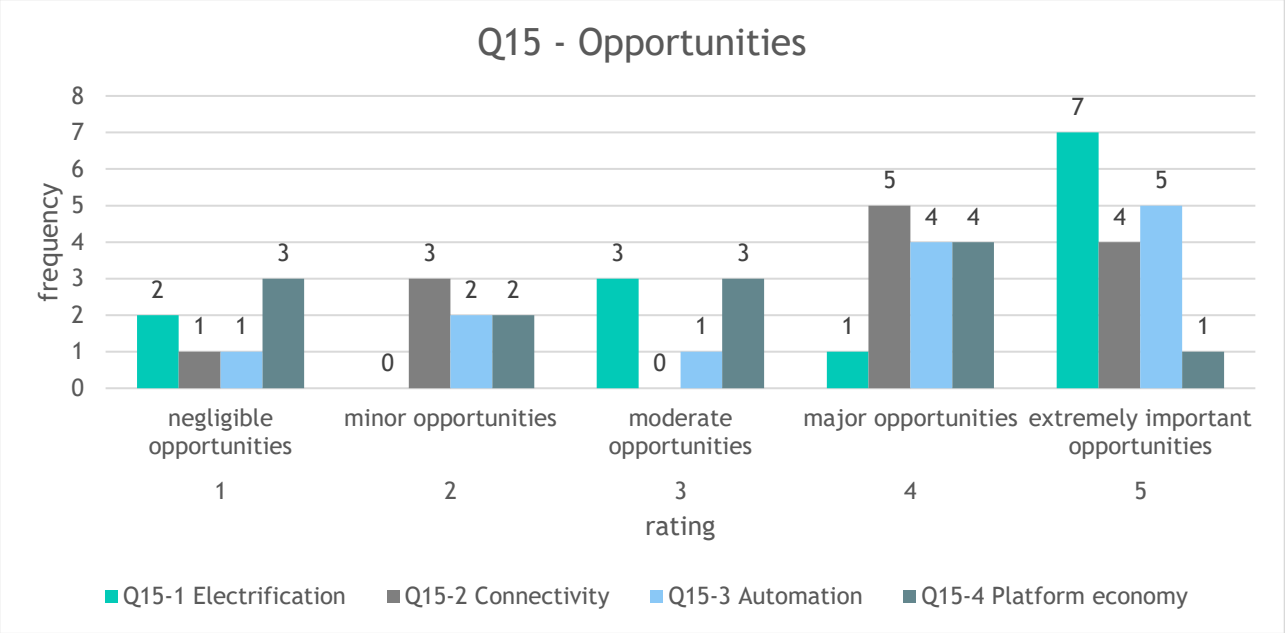
The most common problem is the lack of financial means to finance transformation projects, followed by the lack of a transformation strategy and the lack of staff having appropriate competencies. So not only the shortage of skilled labour is an issue, but also the fact that the current staff lack important skills.

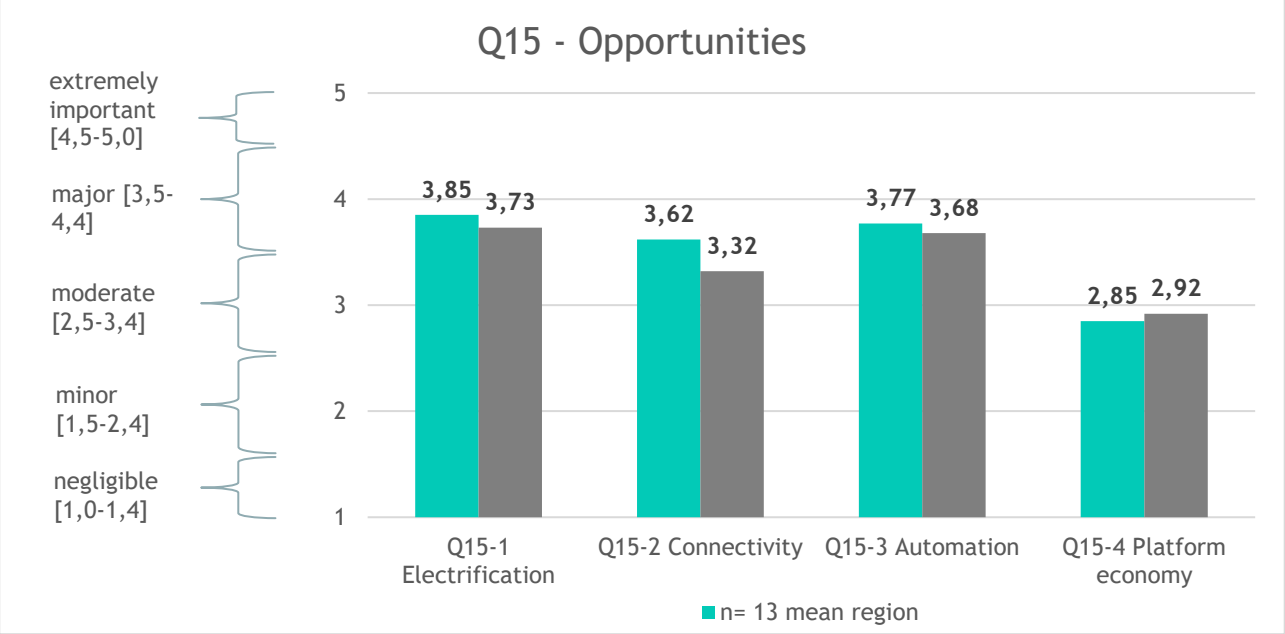
It also emerged that there is a lack of process efficiency competences.

KEY LEARNINGS: Although numerous risk factors influence Austrian companies, the companies see the risks as moderate, but at the same time, the pressure is increasing. The companies feel moderately prepared for the future, but the support of BSOs is particularly necessary for financing issues, the development of transformation strategies and the further training of employees.

Transformation opportunities and strategic approaches to ensure business continuity in 2024-2030 (Q15-17)

Opportunities to ensure business continuity (Q15)





The assessment of opportunities is similar across all thematic areas compared to the European average. The greatest opportunities are expected in Electrification, Automation and Connectivity. Platform economy is rated as moderate. In Electrification, Automation and Connectivity the Austrian companies rate the opportunities slightly higher than the European average. Platform economy is rated slightly lower than the European average.

The BSOs also assess the situation positively. Especially in the field of Electrification the opportunities are considered to be very high. Similar to the companies, the BSOs see the opportunities in the field of Platform economy as limited.

Strategic approaches to seize opportunities (Q16)

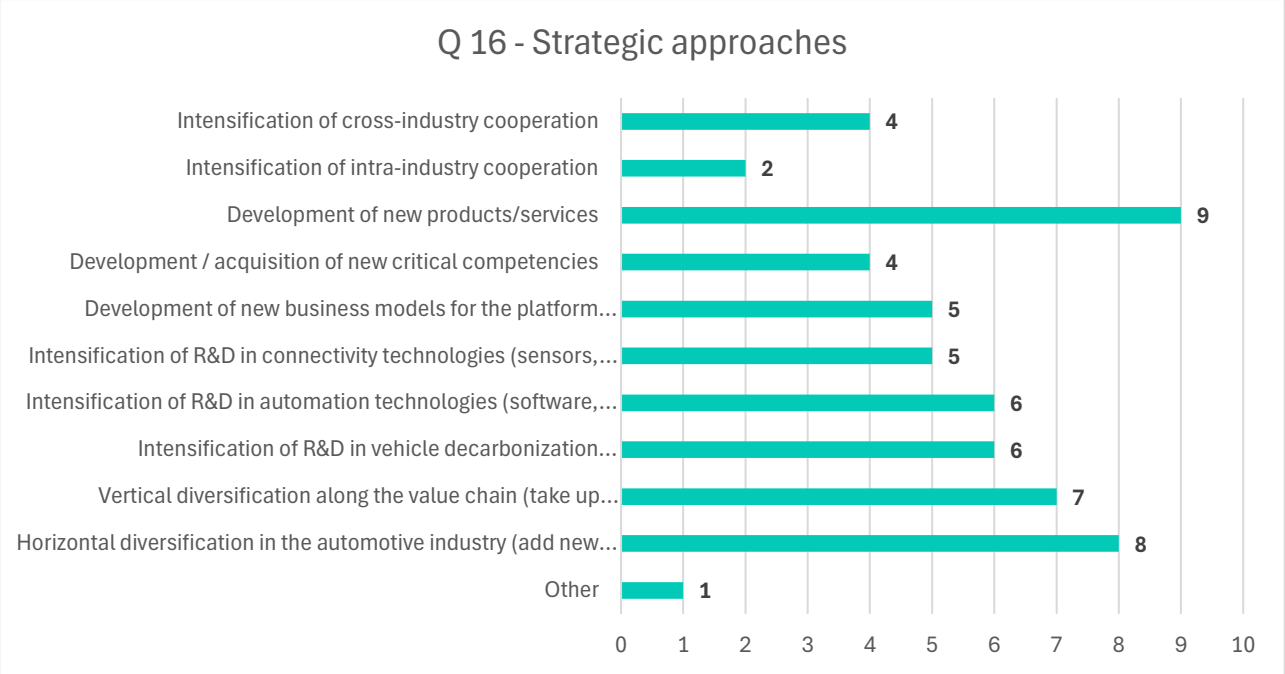
The analysis identifies key opportunities for business. The most prominent is the development of new products and services. It highlights the importance of innovation to meet market demands.

In second place is the horizontal diversification in the automotive industry. Companies add new products or services that are related to existing ones, but appeal to different clients or segments.

Third place is the vertical diversification along the value chain. It allows businesses to take over supplier or client activities, enhancing efficiency and control.

Followed by intensification of R&D in vehicle decarbonisation technologies and intensification of R&D in automation technologies.

In general, many approaches are chosen to focus on innovation, diversification and strategic growth in order to be successful in the future.



Technology and skills gaps (Q17)

The following identified technology and skills gaps are single answers to the open questions in the questionnaire. It needs to be highlighted that those are only individual comments. Interpretation is therefore very difficult. Only few answers were given in these open questions.

Skills gaps:	▪ **AI integration speed:** There is a need for knowledge in AI ▪ **Knowledge management:** Replacing the know-how of employees who retire - very product-, production- and company-specific
Technology gaps:	No specific comments

KEY LEARNINGS: The greatest opportunities are expected in Electrification, Automation and Connectivity. The companies use various strategic approaches to ensure their future success.

Regional resources and business support ecosystem (Q18-22, 26-27)

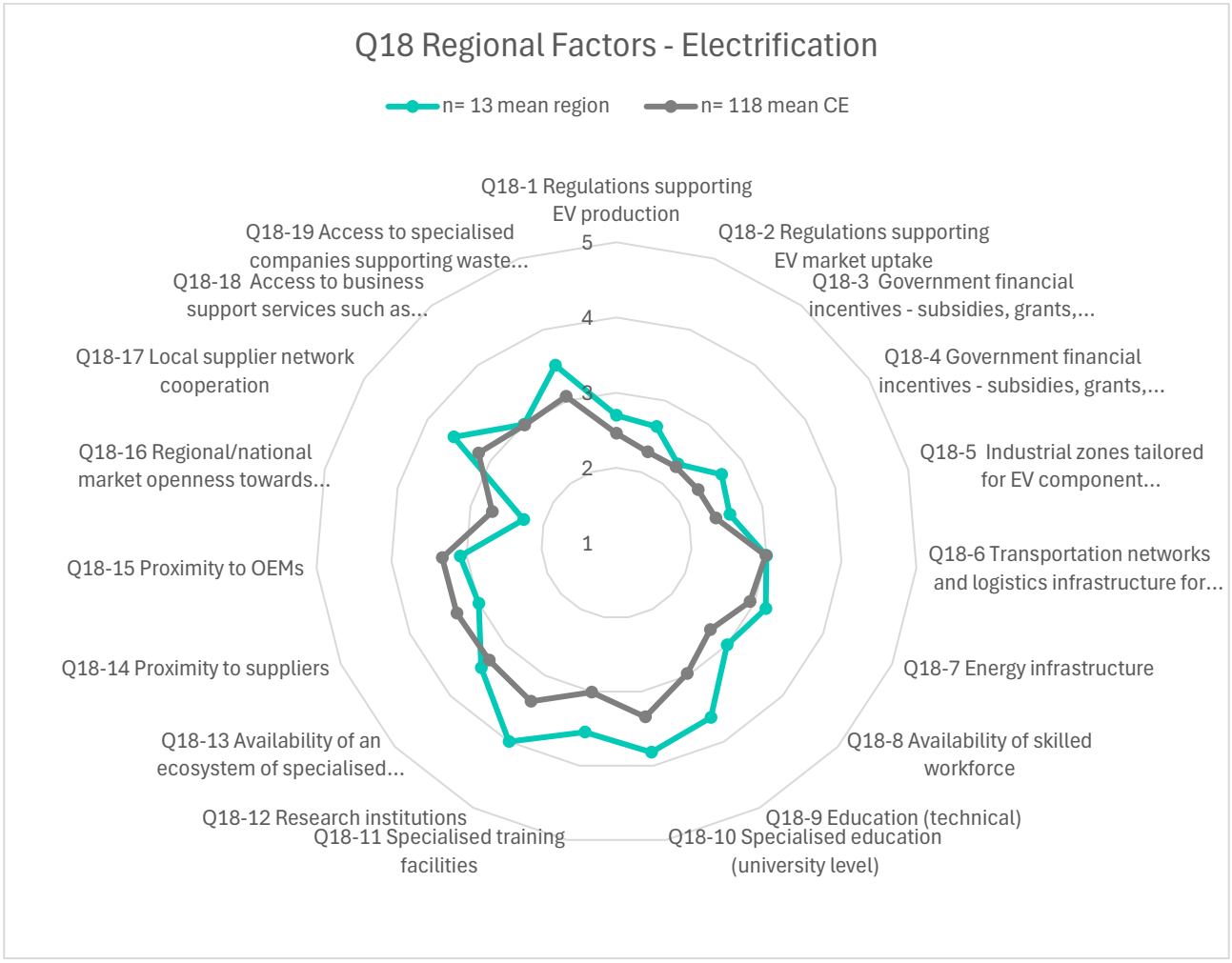
Factors to play a role in automotive in 2024-2030 (Q18-22)

Electrification (Q18)

In the area of Electrification, we are examining which questions are, on average, rated low, specifically in the 1 (poor) and 2 (unsatisfactory) range. Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Government policies – regulations supporting EV production
- Government policies – regulations supporting EV market uptake
- Government financial incentives - subsidies, grants, tax breaks for production companies
- Government financial incentives - subsidies, grants, tax breaks for EV market uptake
- Industrial zones tailored for EV component manufacturing
- Availability of skilled workforce
- Regional/national market openness towards buying EV

In the field of electrification, improvements are particularly necessary in the area of government policy, especially to reduce regulations and bureaucracy. However, financial incentives are also needed to enable companies to make the transition towards electrification. Financial incentives are also needed to encourage the purchase of electric vehicles. Another issue is the availability of skilled workforce, although education at schools and universities is rated positively. The companies are also satisfied with the training and further education of the workforce. The availability of skilled workforce is lower, especially in regions with many industrial companies outside of urban centres. Market openness toward EVs needs further enhancement, as internal combustion engines remain the first choice for many, partly due to a lack of infrastructure. It is pleasing that the local supplier network cooperation is rated positively.

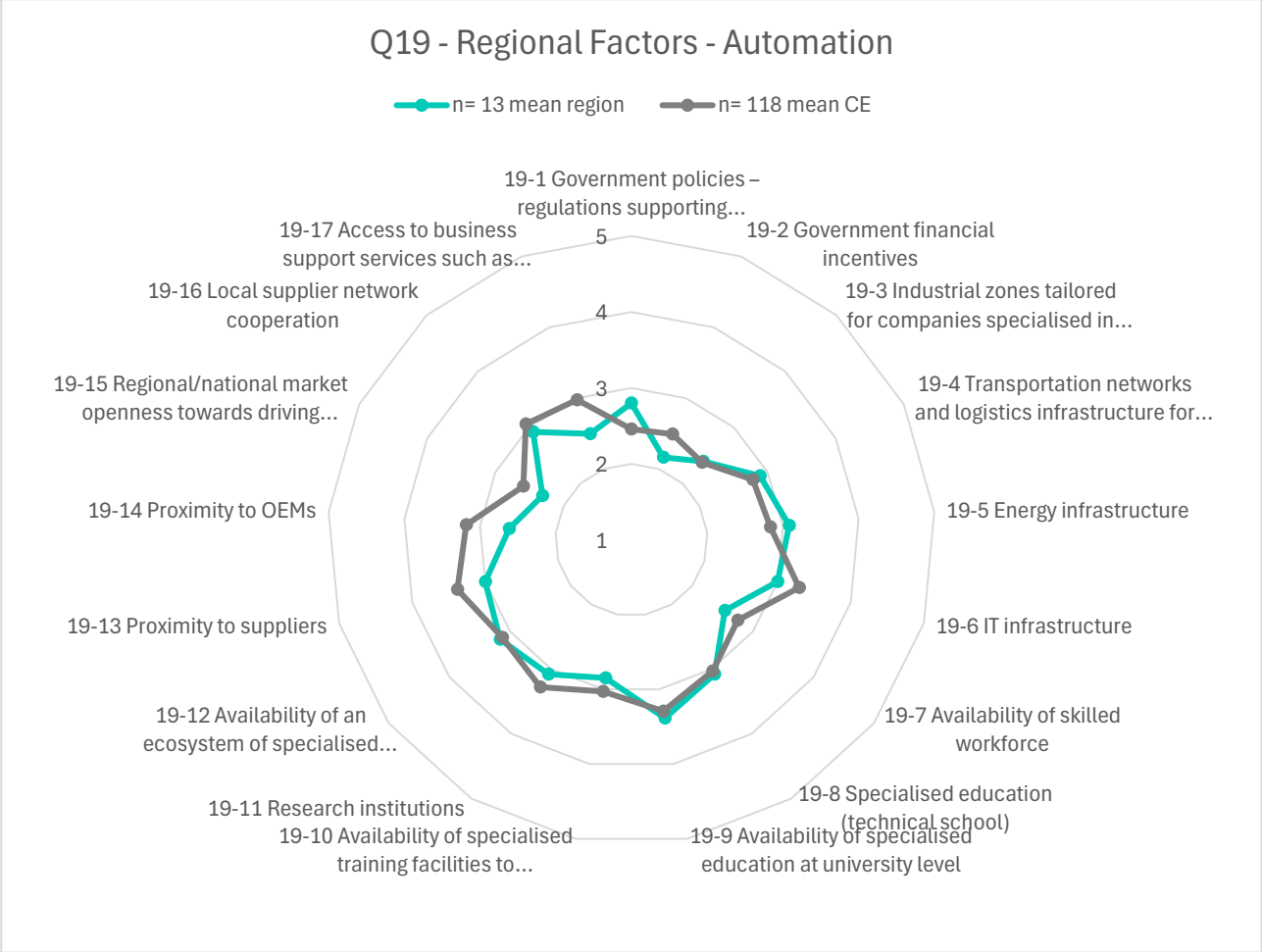


Automation (Q19)

In the area of Automation, we are examining which questions are, on average, rated low, specifically in the 1 (poor) and 2 (unsatisfactory) range. Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Government policies – regulations supporting automation technologies production
- Government financial incentives - subsidies, grants, tax breaks for production companies
- Industrial zones tailored for companies specialised in vehicle automation solutions
- Transportation networks and logistics infrastructure for materials and finished goods to facilitate timely and cost-effective delivery
- Availability of skilled workforce
- Availability of specialised training facilities to upskill/reskill employees
- Proximity to OEMs
- Regional/national market openness towards driving autonomous vehicles
- Access to business support services such as financial consulting, legal advice, and market intelligence tailored for companies specialised in vehicle automation solutions

Similar to Electrification, improvements are needed in the areas of regulations and bureaucracy, and there is also a lack of financial incentives. The availability of skilled workforce is also viewed critically, especially the availability of special trainings for employees. In general, industrial zones should be created for companies in this area in order to increase the opportunity for practical testing. Like Electrification, insufficient market openness is mentioned. The companies are also dissatisfied with the proximity to the OEMs, which represents an opportunity for the BSOs to facilitate cooperation. As there is a general need for business support services, the BSOs are particularly challenged in this area. The education at the universities is rated positively.



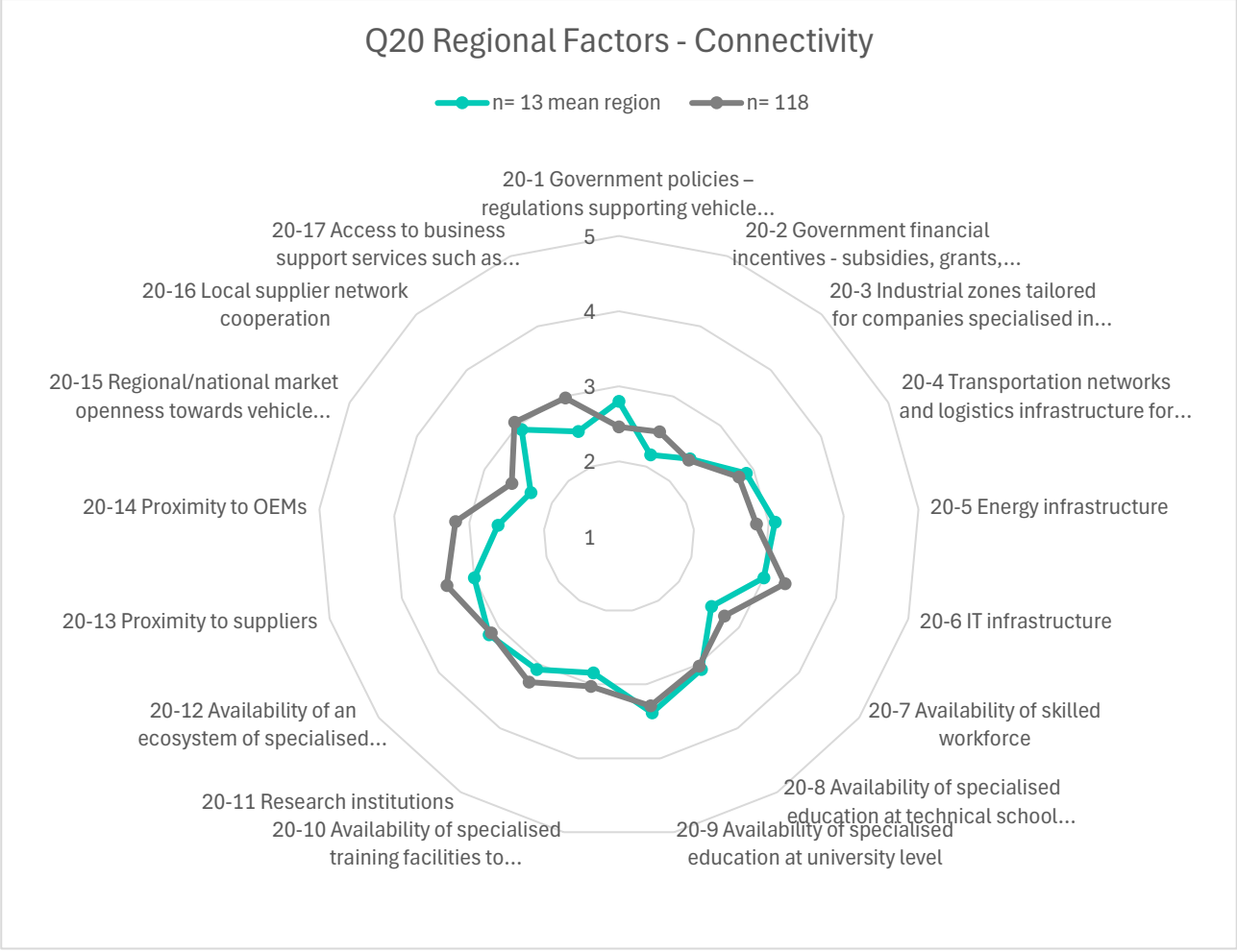
Connectivity (Q20)

In the area of Connectivity, we are examining which questions are, on average, rated low, specifically in the 1 (poor) and 2 (unsatisfactory) range. Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Government policies – regulations supporting vehicle connectivity, smart city, data exchange, cybersecurity
- Government financial incentives - subsidies, grants, tax breaks for production companies
- Industrial zones tailored for companies specialised in vehicle connectivity solutions

- Availability of skilled workforce
- Availability of specialised training facilities to upskill/reskill employees
- Proximity to OEMs
- Regional/national market openness towards vehicle connectivity, data-sharing
- Access to business support services such as financial consulting, legal advice, and market intelligence tailored for companies specialised in vehicle connectivity solutions

Compared to Automation, the issues are very similar. Again, regulations and bureaucracy, the lack of financial incentives, the lack of skilled workforce including the availability of specialised training, the establishment of industrial zones, the insufficient market openness and proximity to OEMs, as well as access to business support services play a major role. Networking around this topic should also be strengthened. Interestingly, the IT infrastructure has never been a major hurdle.



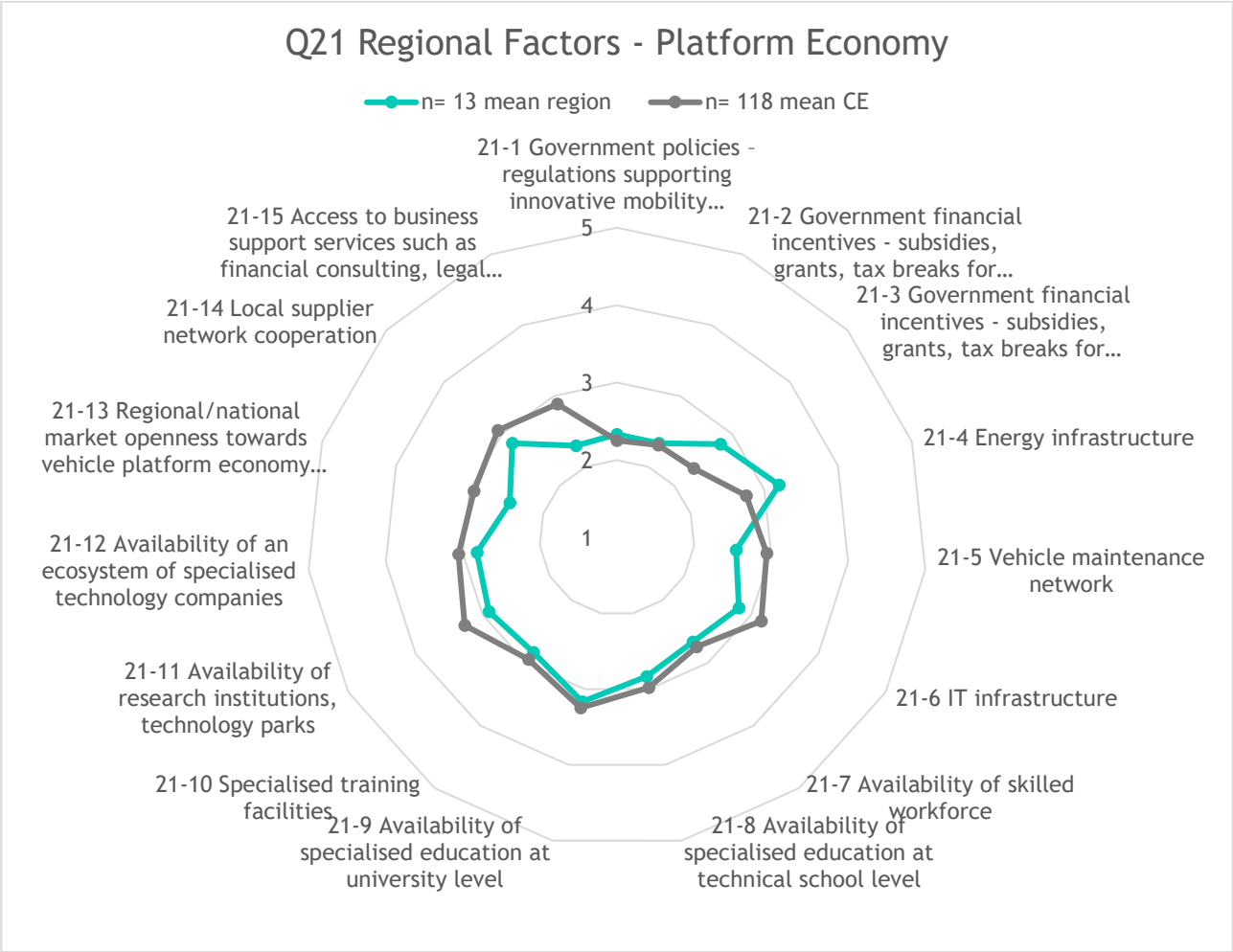
Platform Economy (Q21)

In this area the data base from the surveyed companies is very limited, many respondents have rated with “unable to answer”. As already mentioned at the beginning, Platform Economy is not a key topic for the companies in Austria. But to get a feeling, here is the analysis:

In the area of Platform Economy, we are examining which questions are, on average, rated low, specifically in the 1 (poor) and 2 (unsatisfactory) range. Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Government policies – regulations supporting innovative mobility solutions, vehicle platform economy models
- Government financial incentives - subsidies, grants, tax breaks for innovative mobility solutions, platform economy initiatives
- Government financial incentives - subsidies, grants, tax breaks for people deciding to participate in vehicle sharing
- Vehicle maintenance network
- IT infrastructure
- Availability of skilled workforce
- Availability of specialised education at technical school level
- Availability of specialised training facilities to upskill/reskill employees
- Availability of research institutions, technology parks
- Availability of an ecosystem of specialised technology companies
- Regional/national market openness towards vehicle platform economy models
- Local supplier network cooperation
- Access to business support services such as financial consulting, legal advice, and market intelligence tailored for companies specialised in vehicle platform economy models

Improvements are needed in almost all areas of the Platform Economy. The cluster policy should also focus more on this topic and develop it further. To obtain more significant data, more companies from this sector should be surveyed.



KEY LEARNINGS: To drive these issues forward and support companies in their transformation, there is a strong political challenge. On the one hand, regulations and bureaucracy must be reduced; on the other hand, financial incentives are needed to improve market openness. The necessary infrastructure must be expanded, and employees must be kept up to date with appropriate trainings. The BSOs are also challenged, on the one hand the topics must be driven forward, on the other hand the companies must be supported with appropriate business support services.

Additional factors influencing the regional competitiveness (Q22)

As already mentioned, some companies would like to see a reduction in regulations and bureaucracy; for example, the reduction of GDPR restrictions was mentioned. In Austria staff costs also play an enormous role, which is why a reduction is required.

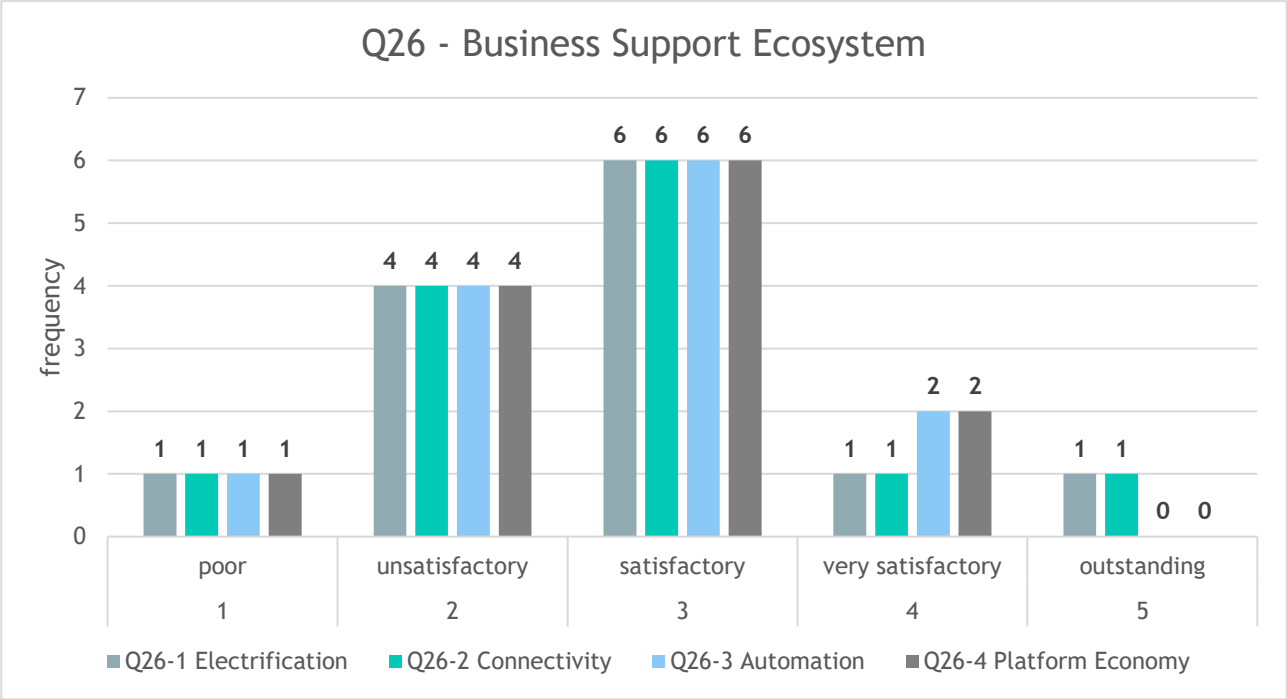
In general, political action is required to protect Austria as a business location. There are concerns about the influence of China and the USA on the regional automotive sector. Strategies to protect local industries

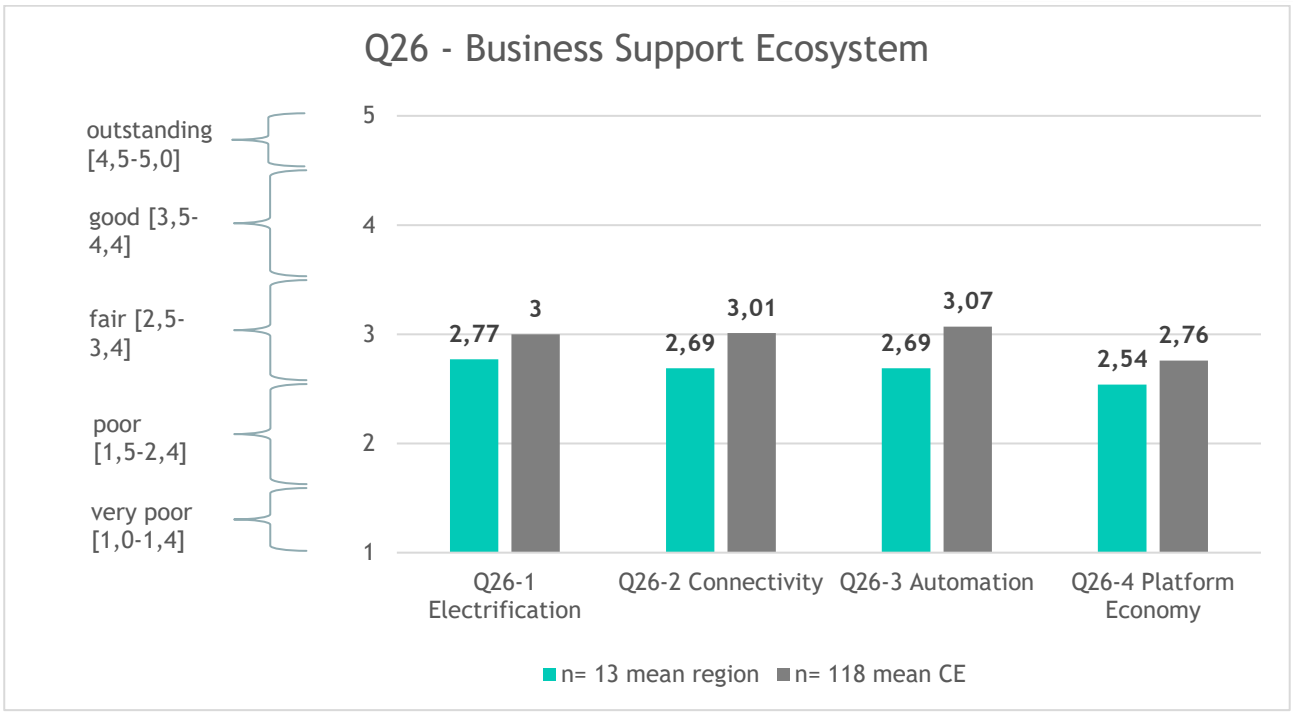
from external pressures and dependencies are needed, potentially through government action to strengthen regional competitiveness and resilience.

Business support services (Q26-27)

The support ecosystem's services are rated as satisfactory across all four thematic areas, with slight variations. Platform Economy achieved the lowest score (2.54), while Electrification was rated with the highest score (2,77). Connectivity and automation are in the middle with a value of 2.69. Only one BSO offers services across three thematic fields, while the others only cover one thematic area or serve other topics. Companies tend to specialize in only one or two, three at most.

Respondents specially mentioned that they are satisfied with the business support services. But they struggle with the high (mostly administrative) effort, to be able to survive in international competition (with all the standards and requirements).





KEY LEARNINGS: Even though support is already rated as satisfactory / fair in many areas, the massive transformation in the automotive industry means that services need to be significantly expanded. There is room for improvement in all areas, but the focus should be in particular on Platform Economy.

Specialisation level and development perspectives (Q23-25)

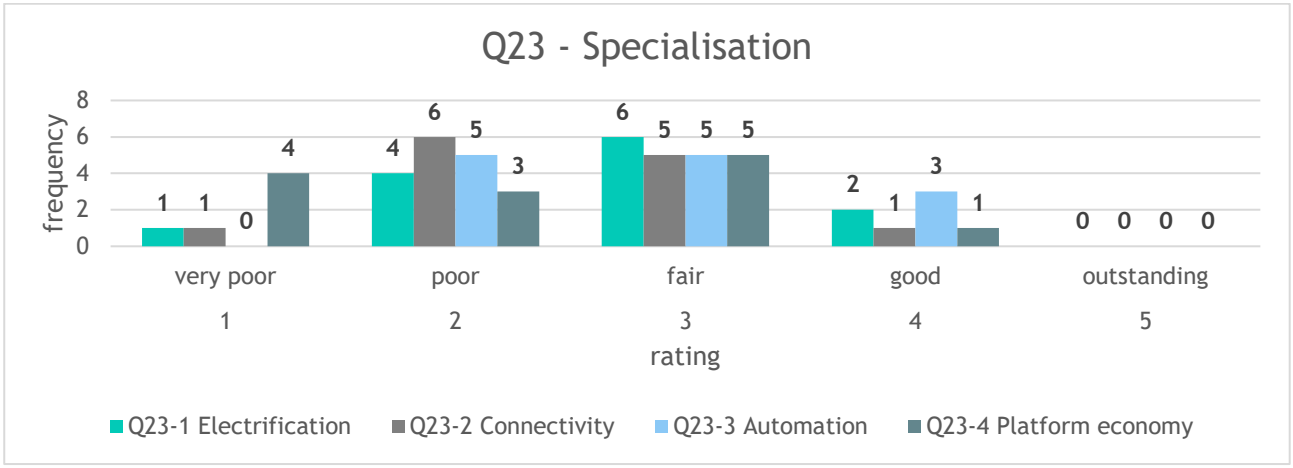
Specialisation

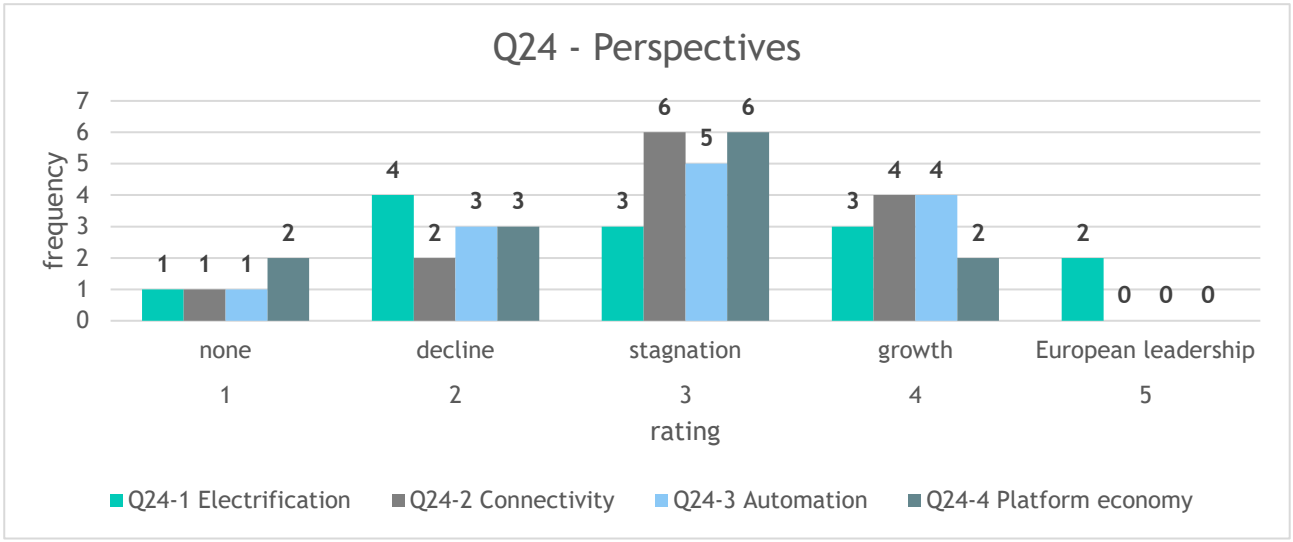
Automation and Electrification is rated as fair. Connectivity is rated between poor and fair, while Platform Economy is rated as poor. Overall, there is a tendency towards stagnation or diversification. Diversification is particularly increasing among smaller companies.

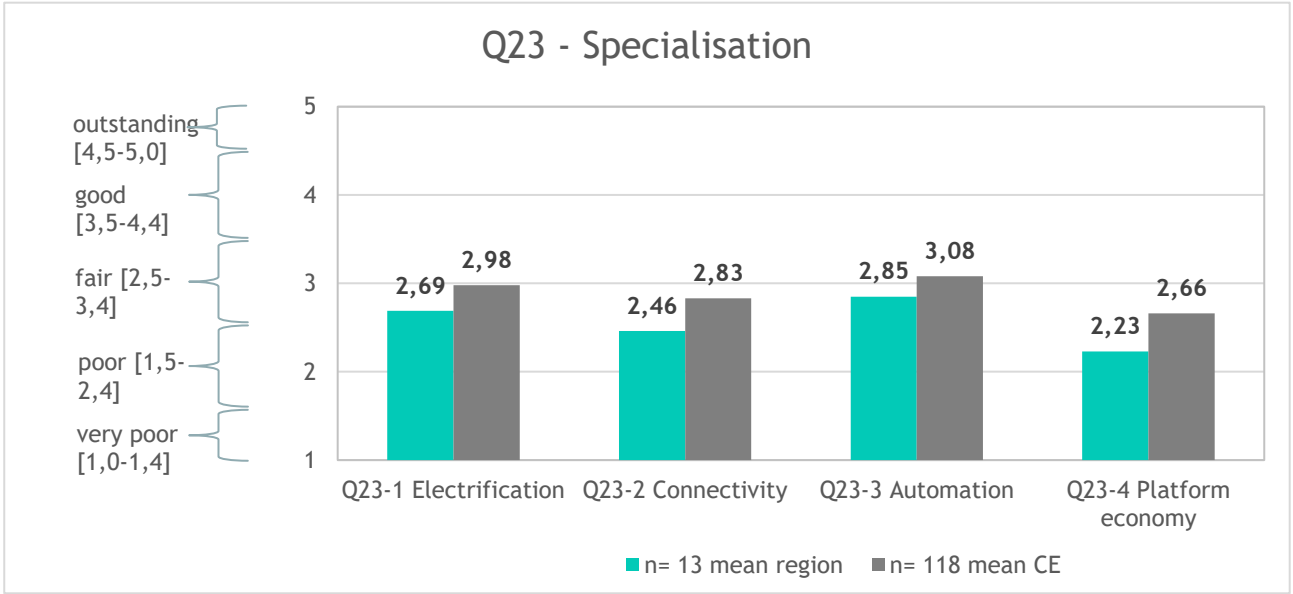
Perspectives

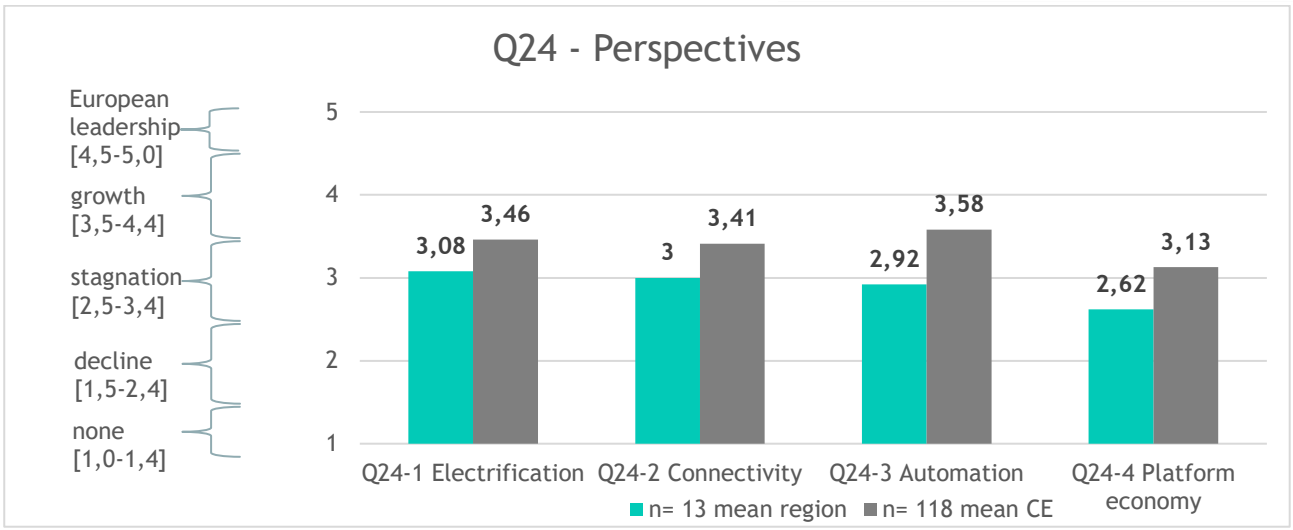
When asking for the observed overall reaction of automotive companies to the ongoing changes in European automotive sector in 2024 – 2030 all areas, Electrification, Connectivity, Automation and Platform economy, are considered stagnant. In comparison, the European averages show better results across all areas.

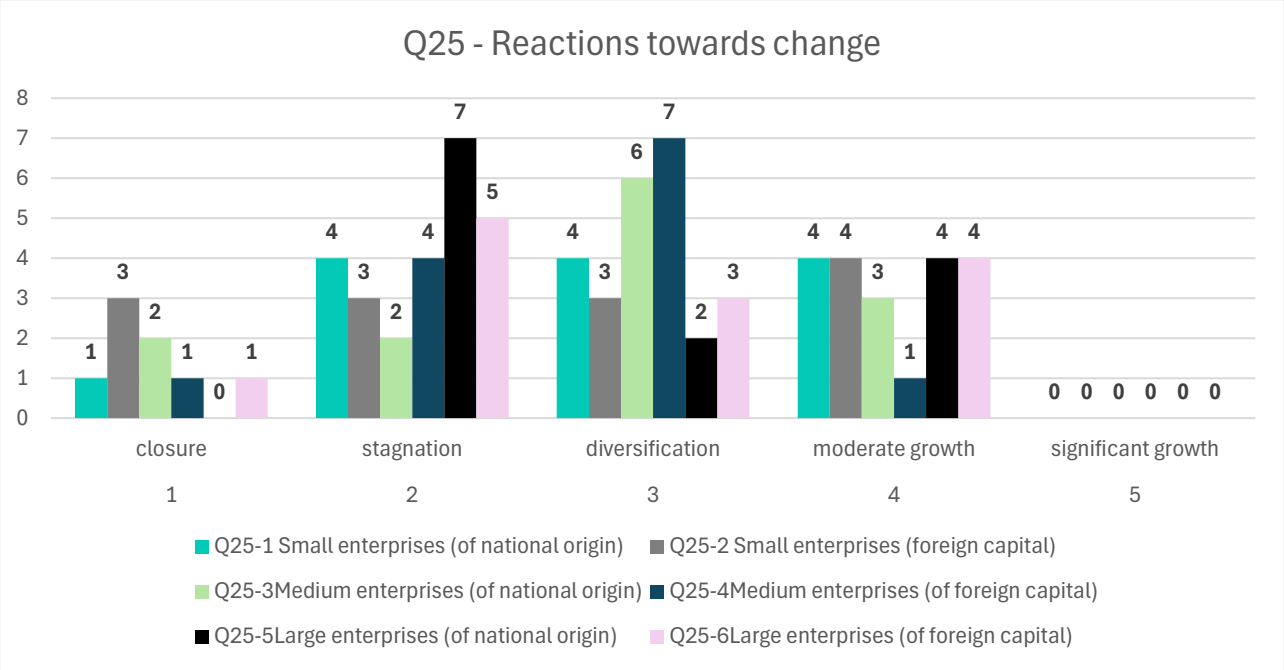
If you look at the latest news about OEMs from Germany, where Austrian companies are very strong suppliers, and also from the special and commercial vehicle sector, the outlook seems to be worse. Suppliers and OEMs are already cutting staff.

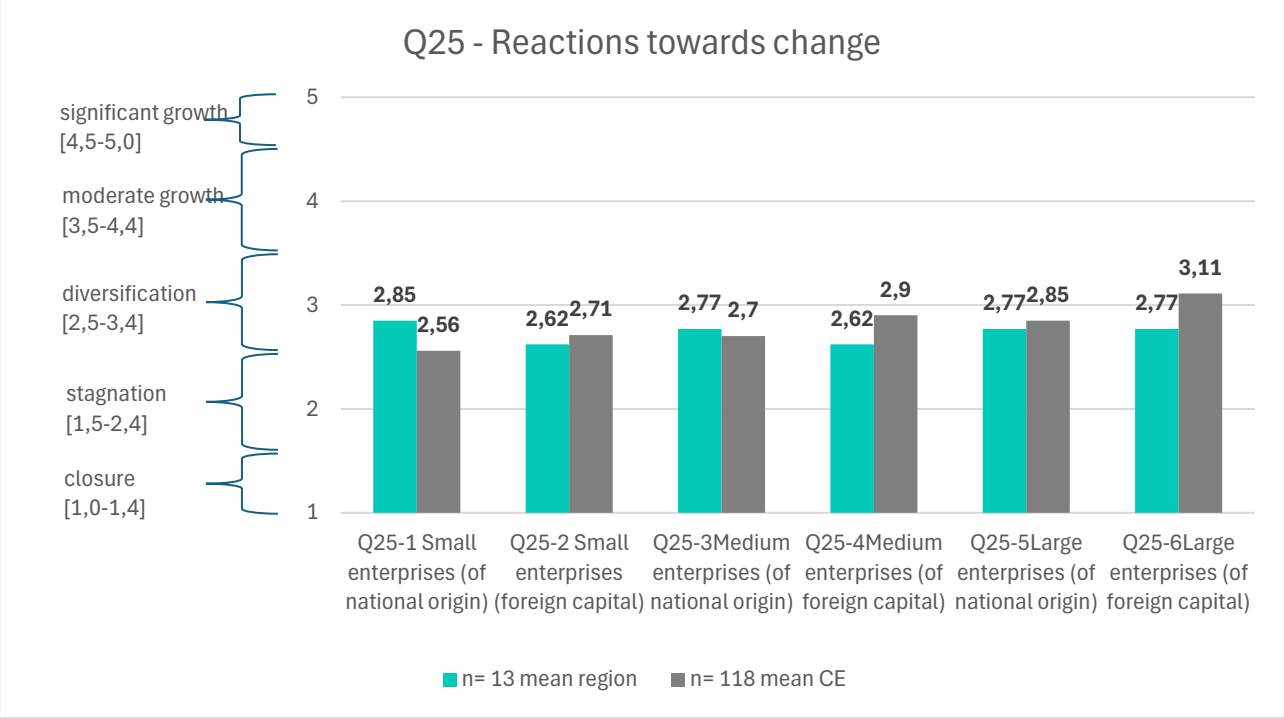

Q23 - Specialisation
frequency
very poor
poor
fair
good
outstanding
1
2
3
4
5
rating
Q23-1 Electrification
Q23-2 Connectivity
Q23-3 Automation
Q23-4 Platform economy


Q24 - Perspectives
frequency
none
decline
stagnation
growth
European leadership
1
2
3
4
5
rating
Q24-1 Electrification
Q24-2 Connectivity
Q24-3 Automation
Q24-4 Platform economy


Q23 - Specialisation
outstanding [4,5-5,0]
good [3,5-4,4]
fair [2,5-3,4]
poor [1,5-2,4]
very poor [1,0-1,4]
Q23-1 Electrification
Q23-2 Connectivity
Q23-3 Automation
Q23-4 Platform economy
n= 13 mean region
n= 118 mean CE


Q24 - Perspectives
European leadership [4,5-5,0]
growth [3,5-4,4]
stagnation [2,5-3,4]
decline [1,5-2,4]
none [1,0-1,4]
5
4
3
2
1
3,08
3,46
3
3,41
2,92
3,58
2,62
3,13
Q24-1 Electrification
Q24-2 Connectivity
Q24-3 Automation
Q24-4 Platform economy
n= 13 mean region
n= 118 mean CE


Q25 - Reactions towards change
8
7
6
5
4
3
2
1
0
1 3 2 1 0 1
4 3 2 4 7 5
4 3 6 7 2 3
4 4 3 1 4 4
0 0 0 0 0 0
closure
stagnation
diversification
moderate growth
significant growth
1
2
3
4
5
Q25-1 Small enterprises (of national origin)
Q25-2 Small enterprises (foreign capital)
Q25-3Medium enterprises (of national origin)
Q25-4Medium enterprises (of foreign capital)
Q25-5Large enterprises (of national origin)
Q25-6Large enterprises (of foreign capital)


Q25 - Reactions towards change
significant growth [4,5-5,0]
moderate growth [3,5-4,4]
diversification [2,5-3,4]
stagnation [1,5-2,4]
closure [1,0-1,4]
5
4
3
2
1
2,85 2,56
2,62 2,71
2,77 2,7
2,62 2,9
2,77 2,85
2,77 3,11
Q25-1 Small enterprises (of national origin)
Q25-2 Small enterprises (foreign capital)
Q25-3Medium enterprises (of national origin)
Q25-4Medium enterprises (of foreign capital)
Q25-5Large enterprises (of national origin)
Q25-6Large enterprises (of foreign capital)
n= 13 mean region
n= 118 mean CE

Conclusion - Key findings for regional transformation capacities in the automotive sector

The automotive industry has strong roots in Austria and Upper Austria but is currently facing many challenges. In particular, Electrification and Automation are seen as opportunities that are being pursued with various strategic approaches. However, strong local support is absolutely essential.

In summary, the challenges in Austria are very similar to the challenges in Central Europe, which is no surprise, as the automotive industry is very closely linked across countries.

The challenges are:

- Cost pressures:

  high staff costs, energy costs, material costs, strong price competition for example with China, price pressure from the OEMs, costs related to regulations, etc.

- Transformation Funding and Strategy:

  At the moment some companies don't have the financial resources to support or to realise transformation projects. In some cases transformation strategies are missing.

- Lack of staff critical competences:

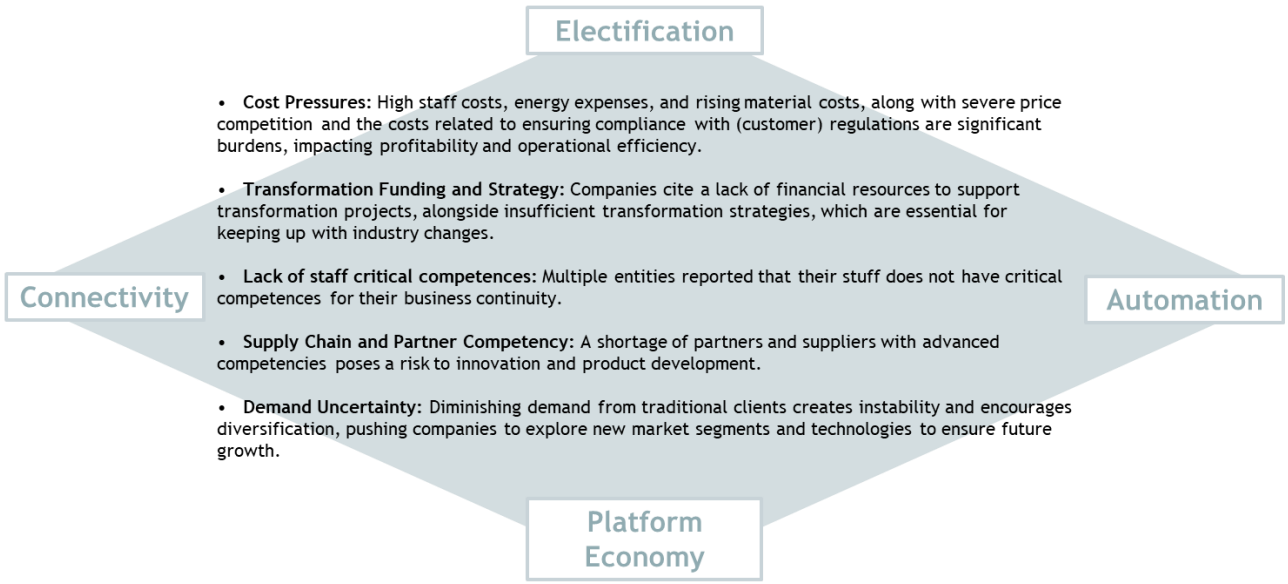
  In addition to the shortage of skilled labour, also the current staff lack important skills.

- Supply Chain and Partner Competency:

  In some cases, there is a lack of partners and suppliers with the relevant expertise.

- Demand Uncertainty:

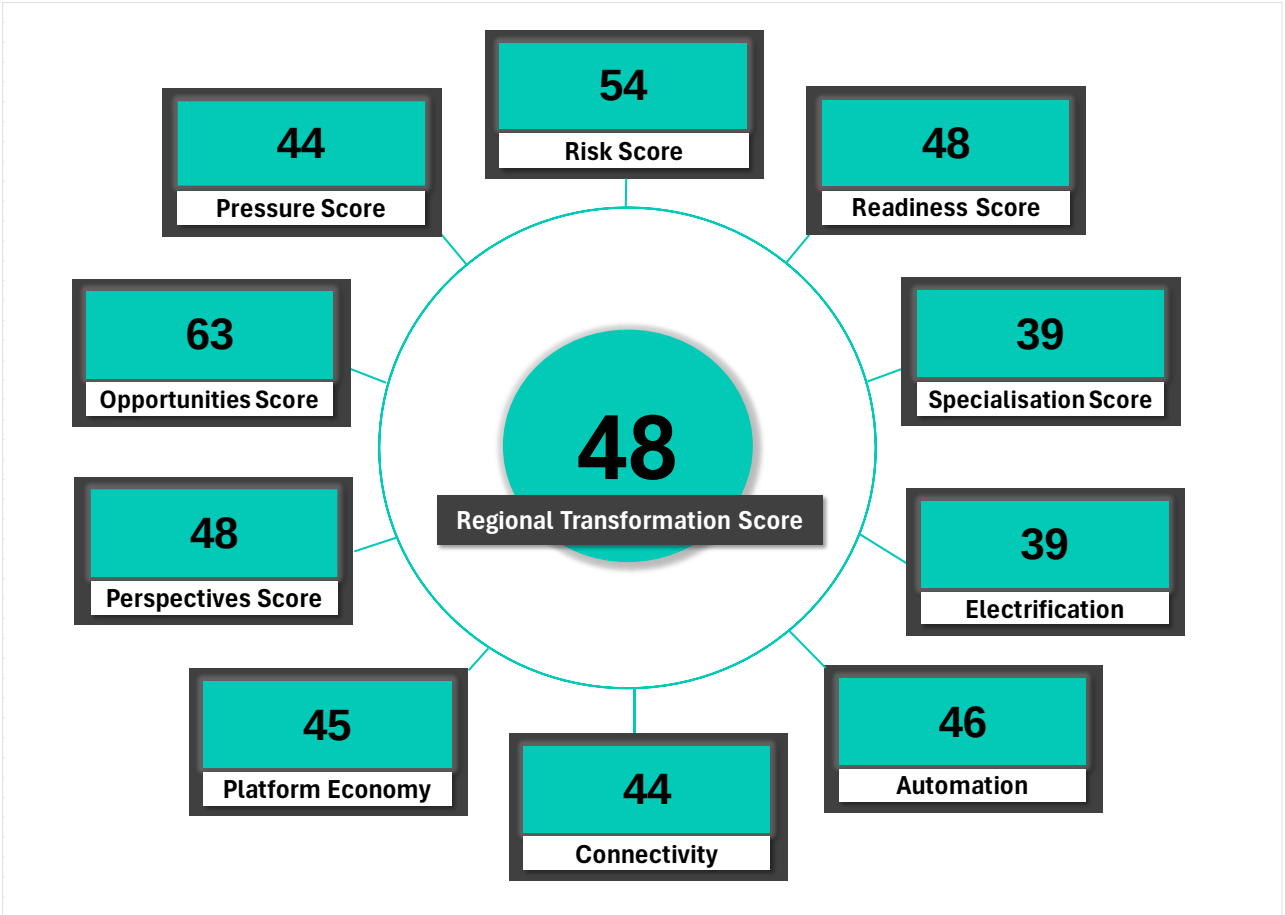
  There is less demand from traditional customers or the demand changes very quickly and so the forecast is very difficult. Many companies try to enter new sectors and diversification.



Challenges in Austria

Transformation Readiness Index - Austria/ Upper Austria

Using the TRM, Austria is rated as limited ready for the transformation. What stands out is its very good rating in Opportunities and the lower rating in Specialisation and the Regional Factor Electrification.



Ranking:

>60 Transformation Ready

50-60 Moderate Ready

40-50 Limited Ready

30-40 Low Ready

<30 Not Ready

Czech Republic | Pilsen Region (RDA Pilsen)

Brief description of the region

The Pilsen Region is driven by research, development, and innovation, making it one of the most advanced and productive regions in the Czech Republic. Pilsen, and the entire region, were made famous in the past by globally successful brands, such as Pilsner Urquell and Škoda. Today, these traditional areas are carried on effectively by both the business and research sectors in the Pilsen Region, while new fields are also developing, often through start-up projects. The Pilsen Region builds on long-standing industrial experience and supports research, development, and innovation at the same time, shaping the future and making the region not only a great place for business and studying, but also for living.

Role of the automotive industry

The automotive industry is a pillar of the Czech Republic. In the long term, it creates almost 10% of GDP. It employs approximately 200,000 workers directly and over 0.5 million workers in related fields. Automotive produces more than 31% of industrial investment in R&D and innovation.

There are 38 entities with more than 50 employees in the Pilsen region, whose products are used in the automotive industry, most of them also employ more than 100 people, which makes them important for the region also from the point of view of the labour market. This identification of companies in the automotive industry is based on NACE classification, it does not sufficiently identify supply chains. In reality, many more companies will operate in the automotive industry as subcontractors. Entities in the Pilsen Region range from small companies to large enterprises. The focus of the companies is as follows: no OEM manufacturer, Tier 1 to 3 suppliers and their interconnected supply chains. The region is represented by a mix of automotive businesses from R&D centres, IT, manufacturing to warehouses and supply chain companies. Key thematic focuses include automation, connectivity and electrification.

Business support ecosystem

There are more than 100 scientific, research, and development teams operating in the Pilsen Region, spread across various disciplines and topics. They can be found in companies, research centres, faculties, and science departments of the University of West Bohemia in Pilsen, as well as the Faculty of Medicine of Charles University in Pilsen. The connection with the private sector also earns the teams a lot of recognition internationally. We have excelled in the long term in the areas we concentrate in, which are five so-called specialisations — Biomedicine & Technology in Healthcare, Smart Mobility, Intelligent Manufacturing Systems, Modern Energy Industry, and New Materials &Technologies.

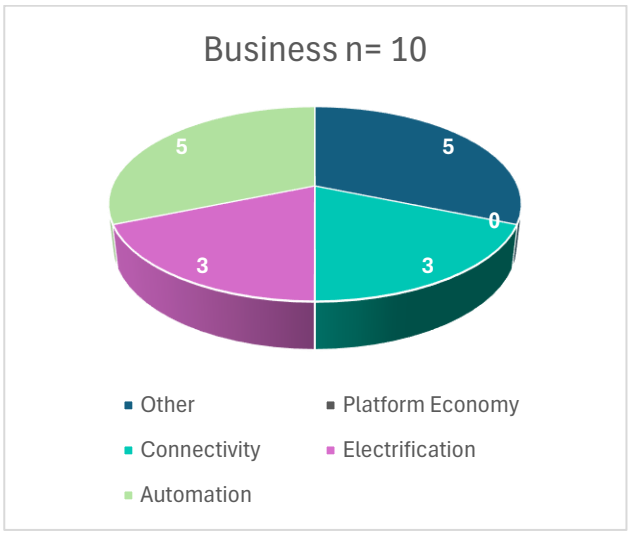
The following BSOs operate nationwide in the Czech Republic specifically for the automotive industry: Ministry of Industry and Trade/National innovation platform: Transport for the 21st century, Association of the Automotive Industry (AutoSAP), Electromobility Platform and Mobility Innovation Hub (project of Agency for business and investment support - CzechInvest). Specifically, the following BSOs operate in the Pilsen region: Regional Development Agency of the Pilsen Region, Business Innovation Centre Pilsen, University of West Bohemia with 5 research centres, Medical faculty Pilsen of Charles University in Prague - Biomedical Centre, 3 independent research organisations, 2 science and technology parks, Information Technology Administration of the City of Pilsen, Clusters Smart Pilsen Region and MECHATRONIKA, Polygon for autonomous mobility for tram traffic and of course the Regional Chamber of Commerce in the Pilsen Region.

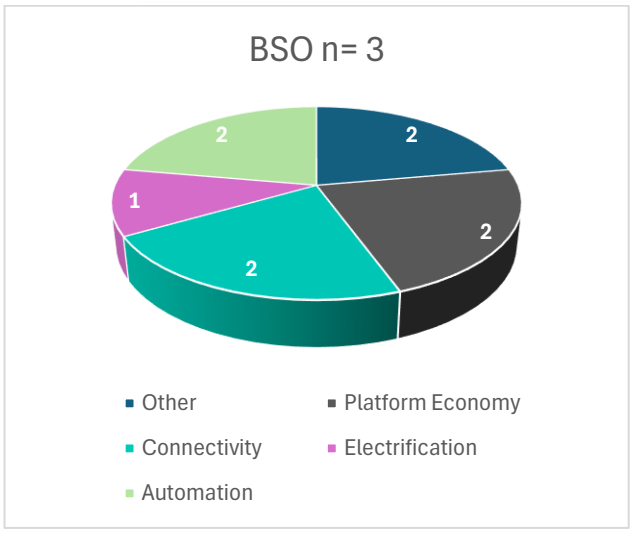
Inventory of companies and business support organisations (BSO) (Q1-8)

Overall, 10 companies and 3 BSOs answered the questionnaire. The companies surveyed are selected across the automotive sector, including both small and large enterprises. All companies focus on the automotive sector, ranging from a small to an exclusive share of their company's sales. Their product and service portfolios varied from engineering services to the production of components for combustion engine fuel systems. Several of the surveyed companies are involved in software development. Two companies primarily supply and implement software. In contrast, several companies have metal manufacturing as their core business.

Whereas the surveyed companies are primarily active in the fields of Automation and Electrification, which aligns with the general assessment of the region, the BSO addresses all four thematic areas to set incentives for the future development of the region.

Regarding the survey format in general, it is noted that there is a strong preference to maintain the approach of direct conversations. The survey is completed together with the company in an on-site meeting. This approach intensifies interaction with the company and ensures that questions are not misunderstood. Another type of intervention towards companies or BSOs with this survey (survey sent by email, online meeting) in the region did not lead to the completion of the survey.





Transformation risks, pressure and readiness for business continuity in 2024-2030 (Q10-14)

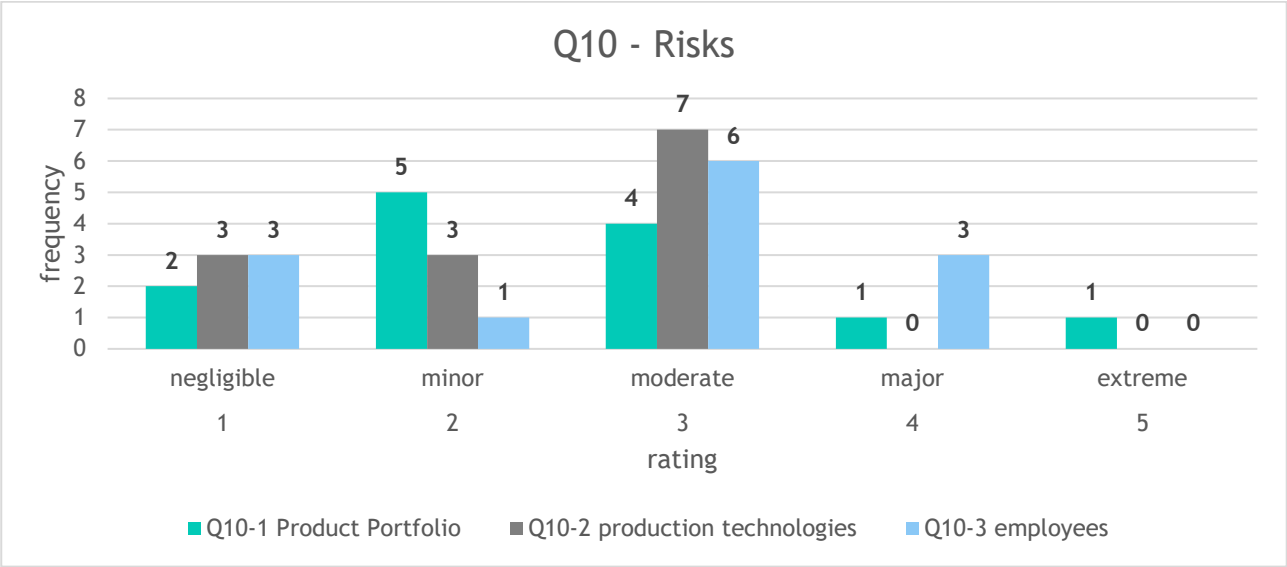
Risks endangering business continuity (Q10-11)

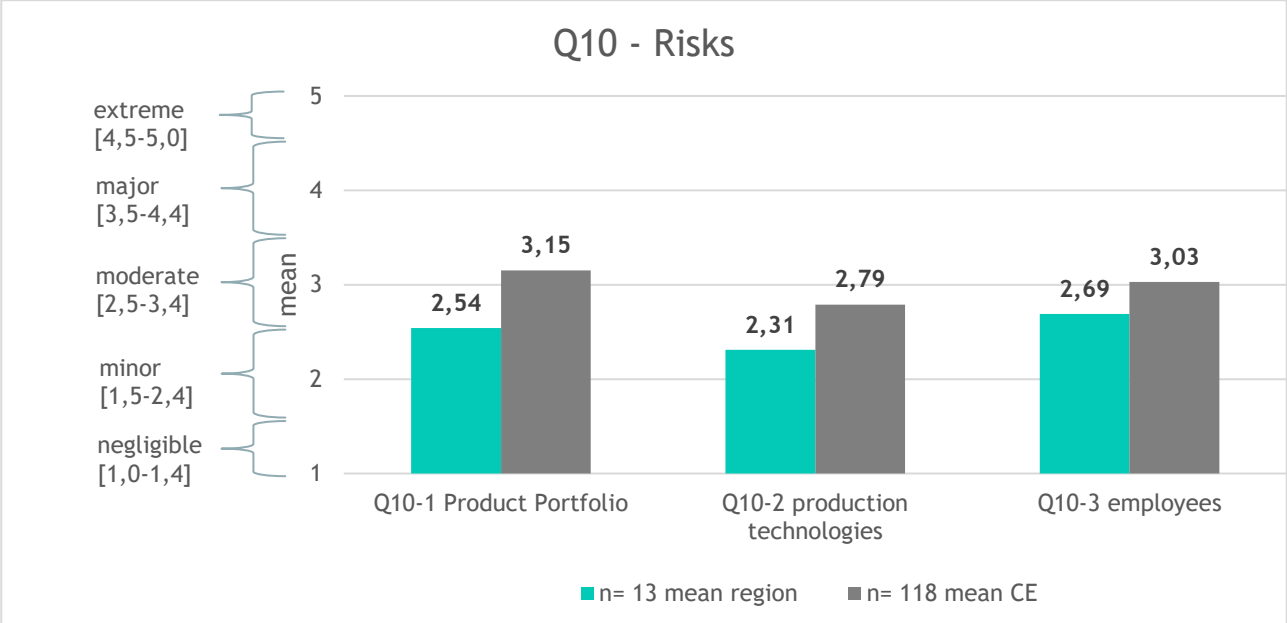
The risk for the **product portfolio** is assessed as **moderate**, aligning with the European average. Responses range from 1 (negligible) to 5 (extreme risk). In the BSO sector, the risk is rated between 1 and 2 (minor risk). Automotive companies in the region are mainly focused on interior parts and systems usually made of plastic, seats and components, body parts or engineering services. This core business of companies will not be canceled by electrification. On the other hand, one company manufactures parts for the fuel system of combustion engines. This company obviously assesses the situation as an extreme risk, but in this case is share of company sales in the automotive industry less than 20%.

The risk regarding the **production technologies** is assessed as **minor**, this differs from the European comparison, which assesses it as moderate.

The risks in the area of **employees** are assessed as **moderate** by the surveyed companies, which aligns with values from the European comparison.

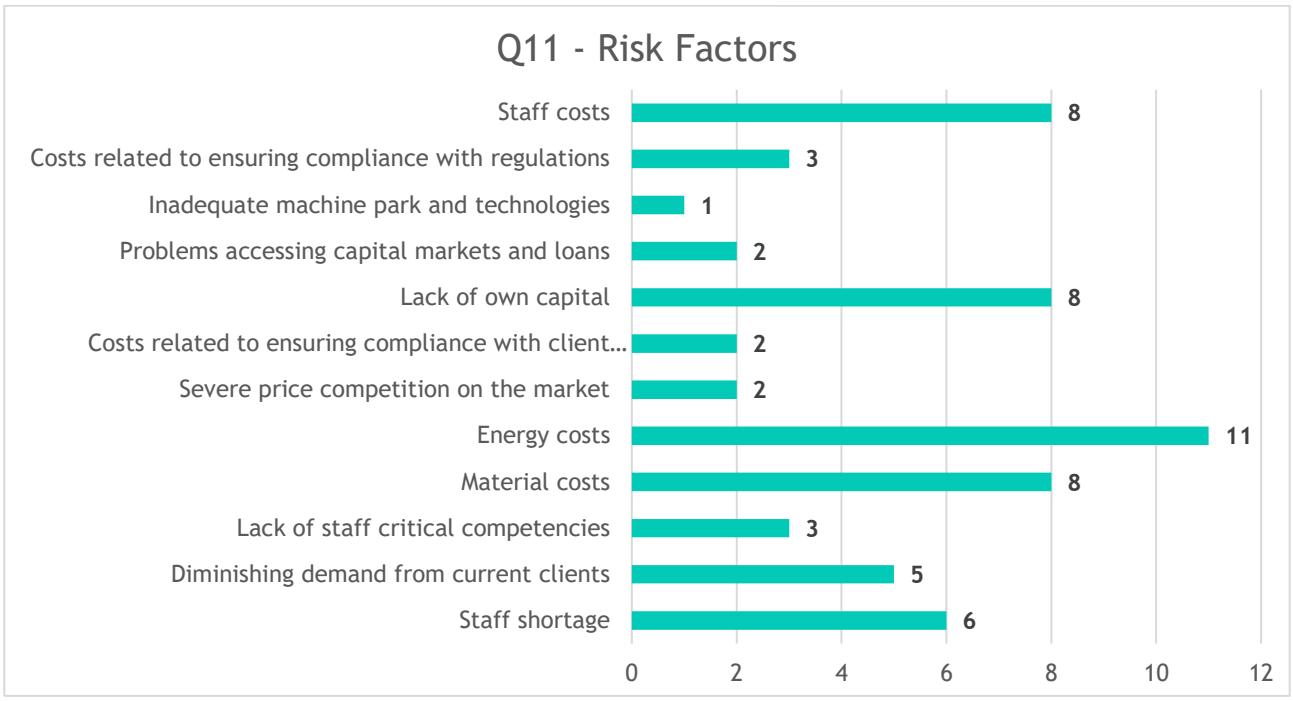
In summary, risks are still moderate, but the trend could change quickly as the current situation in the automotive industry is turbulent. The unclear outlook is causing stagnation and transformation problems in this sector. IT companies supplying exclusively to the automotive sector are already experiencing the same stagnation problem.





Risk factors

It is quite clear that the biggest risks are input costs, especially energy prices, material costs, lack of own capital and staff costs. Such a situation occurred during the Covid pandemic and subsequently escalated with the beginning of the war in Ukraine. In addition, other risks, such as intense competition, especially with China, are interfering with the current situation.



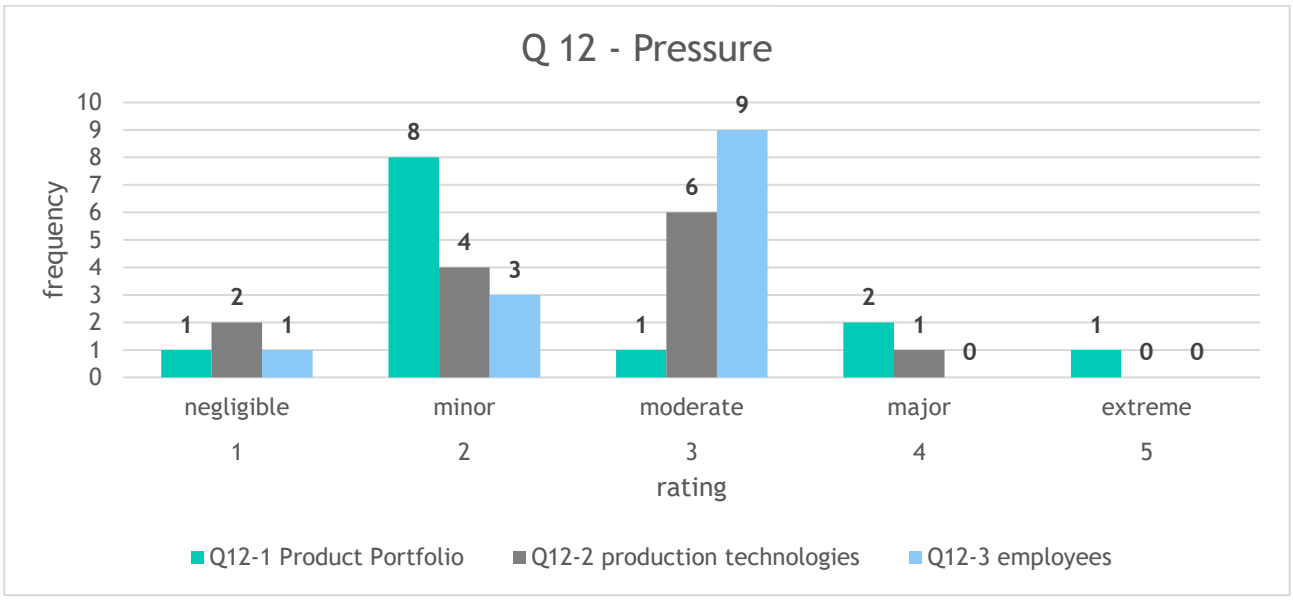
Pressure to change business for ensuring business continuity (Q12)

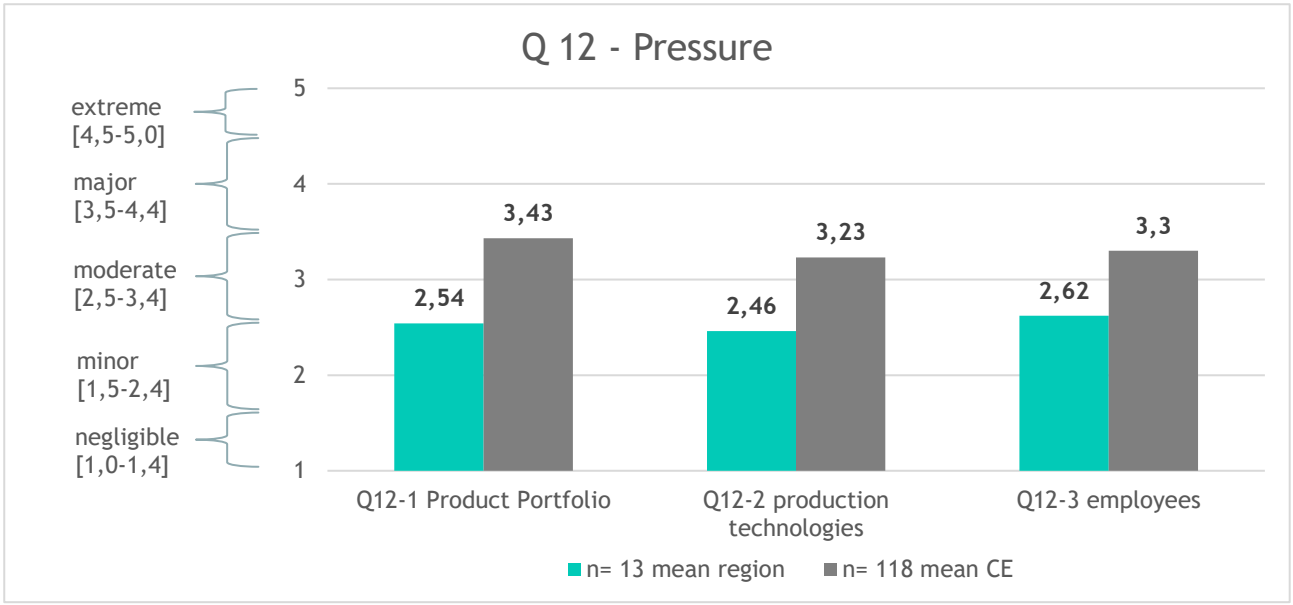
The assessment of the **pressure to change the product portfolio to ensure business continuity** for the Pilsen region is below the European values, which indicates moderate pressure. Looking more closely at the companies surveyed, the range of responses suggests that companies in the region are mostly focusing on car parts that will not be eliminated by electrification.

Similar to the risks, the **pressure to change related to production technologies** is also rated lower in the European comparison. This is more or less in line with the previous assessment of the pressure to change the product portfolio.

For the competencies currently being developed among **employees**, the values are very similar to the European comparison, with only minor differences. A closer look at the data shows that some companies assess this pressure as even lower.

In summary, it can be said that the pressure is seen as somewhat **more moderate compared to the European average**.





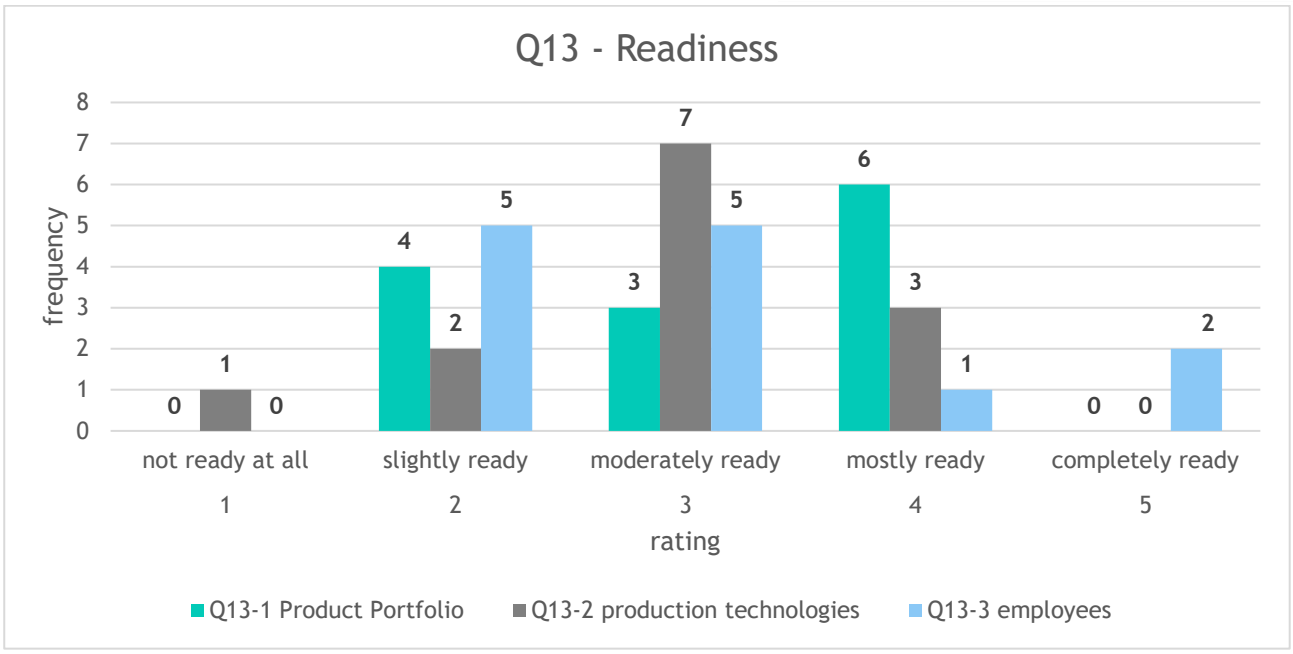
Readiness to change business for ensuring business continuity (Q13)

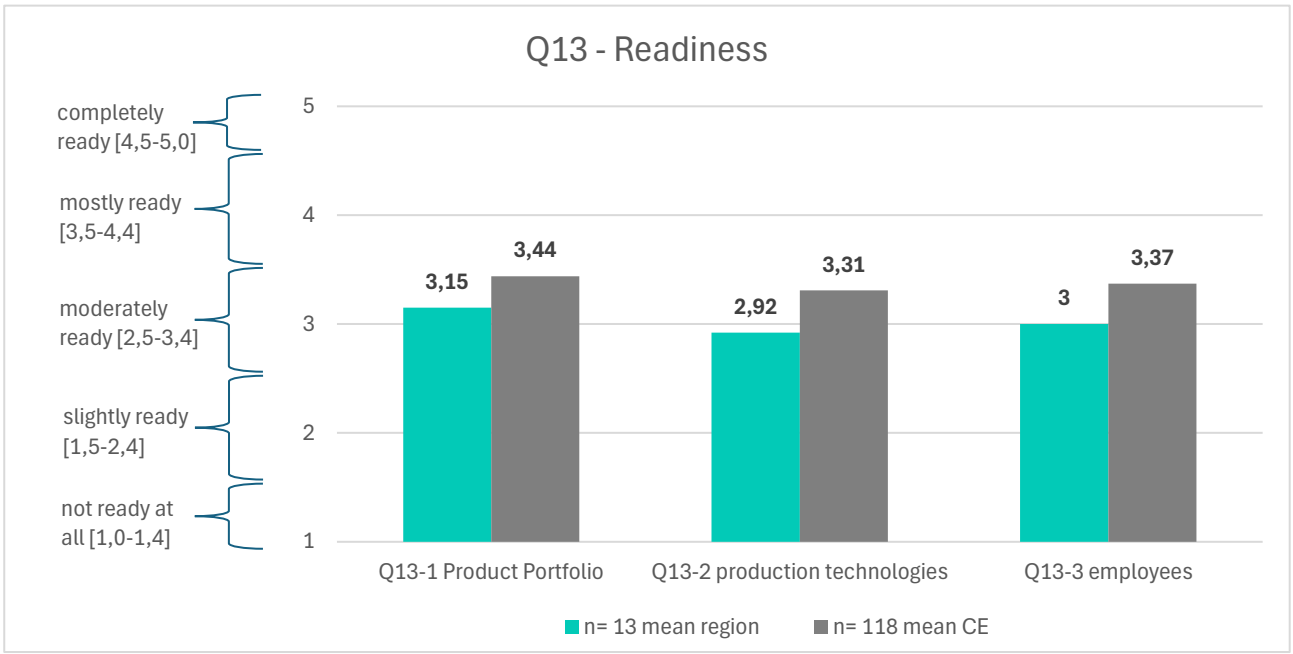
Comparing the results related to the perceived readiness to change business for ensuring business continuity in 2024-2030 the answers have been quite equally distributed when it comes to product portfolio, competencies among employees and production technologies.

The results for **product portfolio readiness** are **nearly identical to the European average**. Companies tend to consider their product portfolios as relatively ready for future.

The values related to **production technologies** are also rated as **moderate**.

The same situation is in the area of employees: **moderate readiness**.

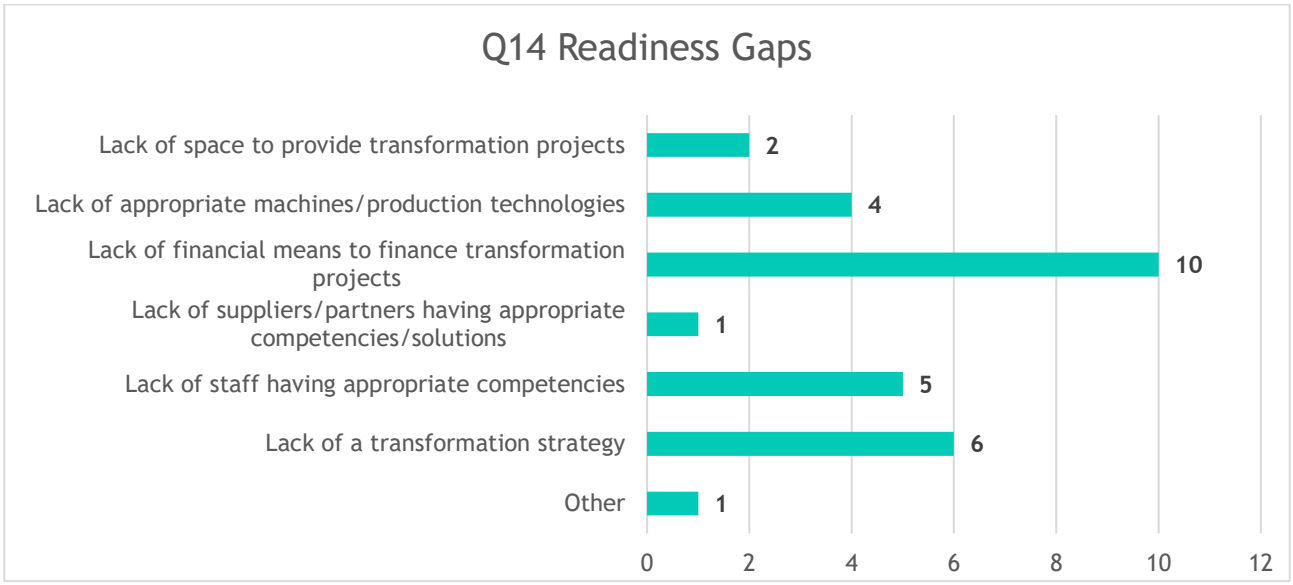




Main readiness gaps hindering businesses from starting a transformation process (Q14)

The most common problem is the lack of financial means to finance transformation projects - this corresponds to the result of question Q11 Risk factors - input costs, especially energy prices, material costs, lack of own capital and staff costs. Another significant problem is the lack of strategy and competencies.

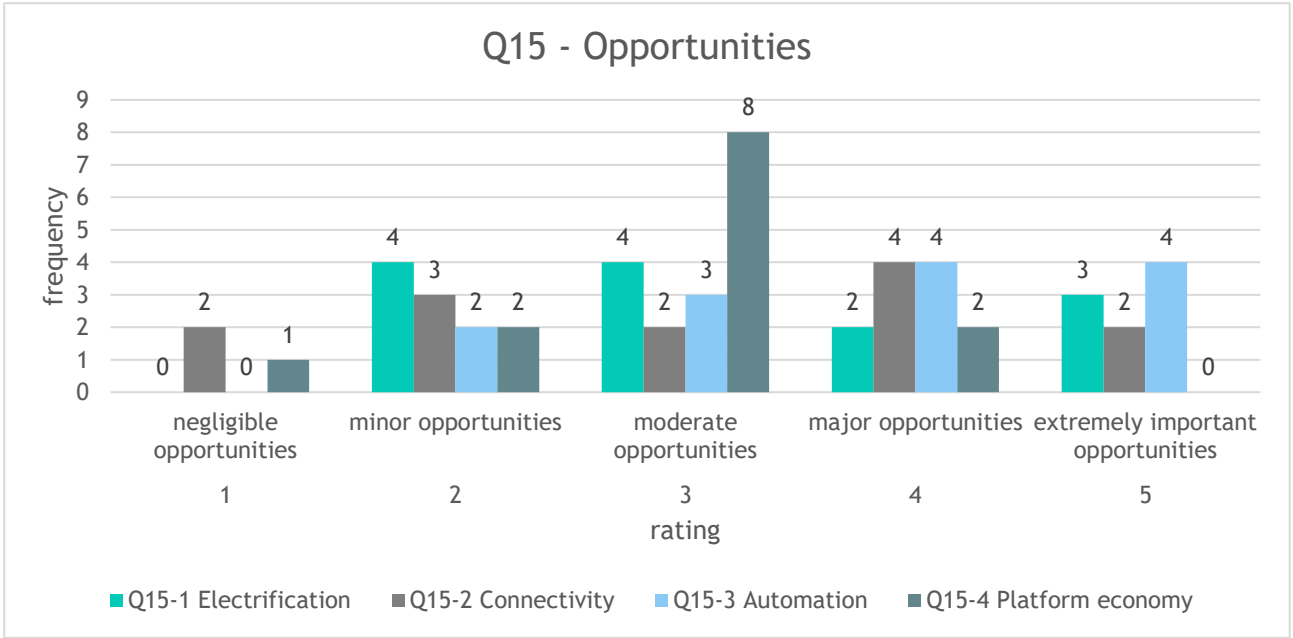
KEY LEARNINGS: This result is consistent with the previous evaluation of issues and risk factors. It essentially speaks to the overall state of the industry at the current time.

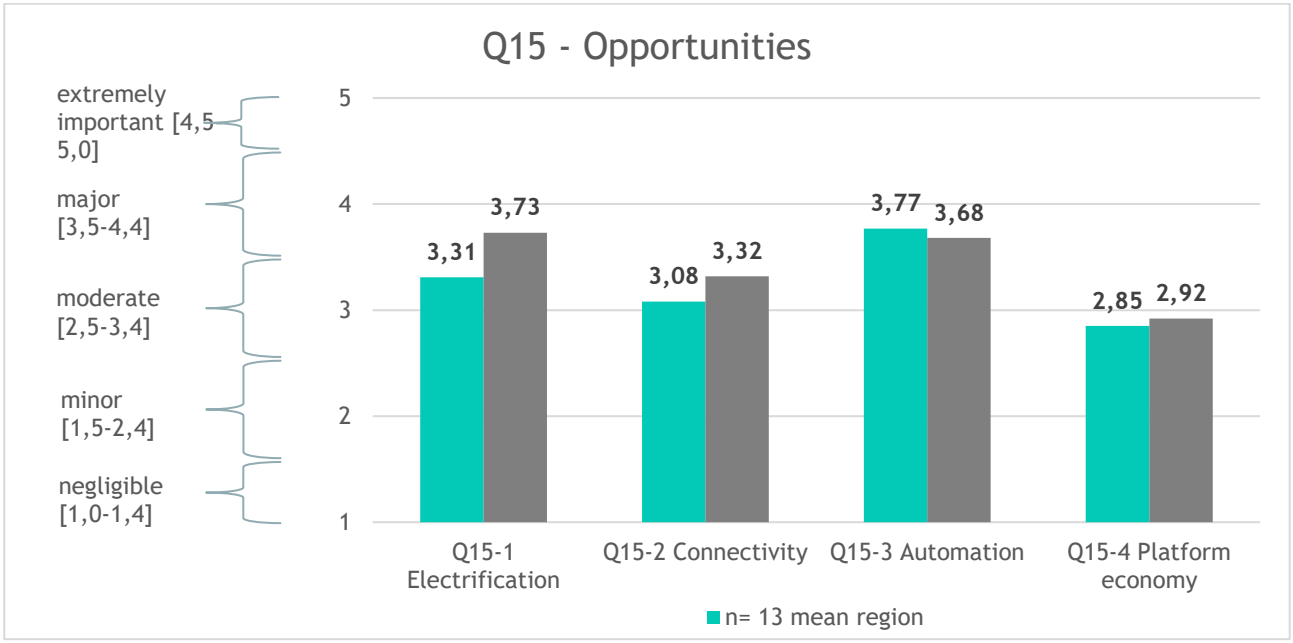


Transformation opportunities and strategic approaches to ensure business continuity in 2024-2030 (Q15-17)

Opportunities to ensure business continuity (Q15)

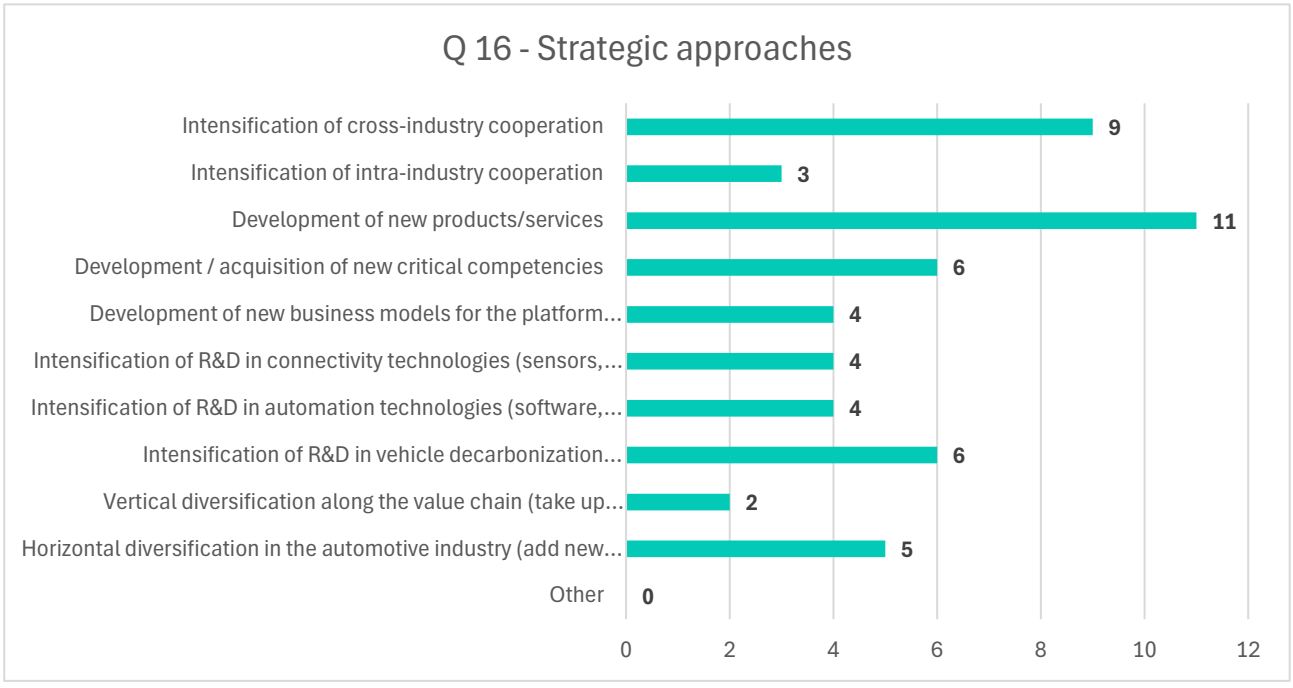
The assessment of opportunities is similar in all thematic areas compared to the European average. The largest opportunities are expected in automation, which corresponds to the focus of companies in the region. In automation, expectations are even higher than the European average.





Strategic approaches to seize opportunities (Q16)

Various measures are being taken to seize the opportunities. The most frequently mentioned are the development of new products and services, as well as cross-industry cooperation.



Technology and skills gaps (Q17)

These are individual responses to open-ended questions in the questionnaire. Only a few responses were provided to these open-ended questions. It should be emphasised that the responses range from general, such as subsidy projects to support business in the region, to deeply technically specific responses. A general interpretation is therefore very difficult.

Skills gaps:	▪ intensive cooperation with municipalities, support with marketing and PR, local subsidy projects to support business in the region ▪ skilled people (tool maker, senior sw developers) ▪ automation and platform economy related skills ▪ increase education of new generation in logistics, production and IT sector ▪ BSO - B2B contact ▪ lack of capabilities for programming robots, SW development for robotic applications ▪ open mind
Technology gaps:	▪ stable energy price technology ▪ know-how for new products for EV

The positive conclusion is that the opportunities are significant - companies and BSOs agree on this, especially in the area of automation, where they see a better opportunity than the European average.

Regional resources and business support ecosystem (Q18-22, 26-27)

Factors to play a role in automotive in 2024-2030 (Q18-22)

Electrification (Q18)

In the **Electrification** area, we primarily examine which questions are rated low on average, specifically in the range of 1 and 2 (poor and unsatisfactory).

Areas with more mentions in the poor and unsatisfactory categories include:

- Availability of skilled workforce
- Availability of specialised education at the technical school level

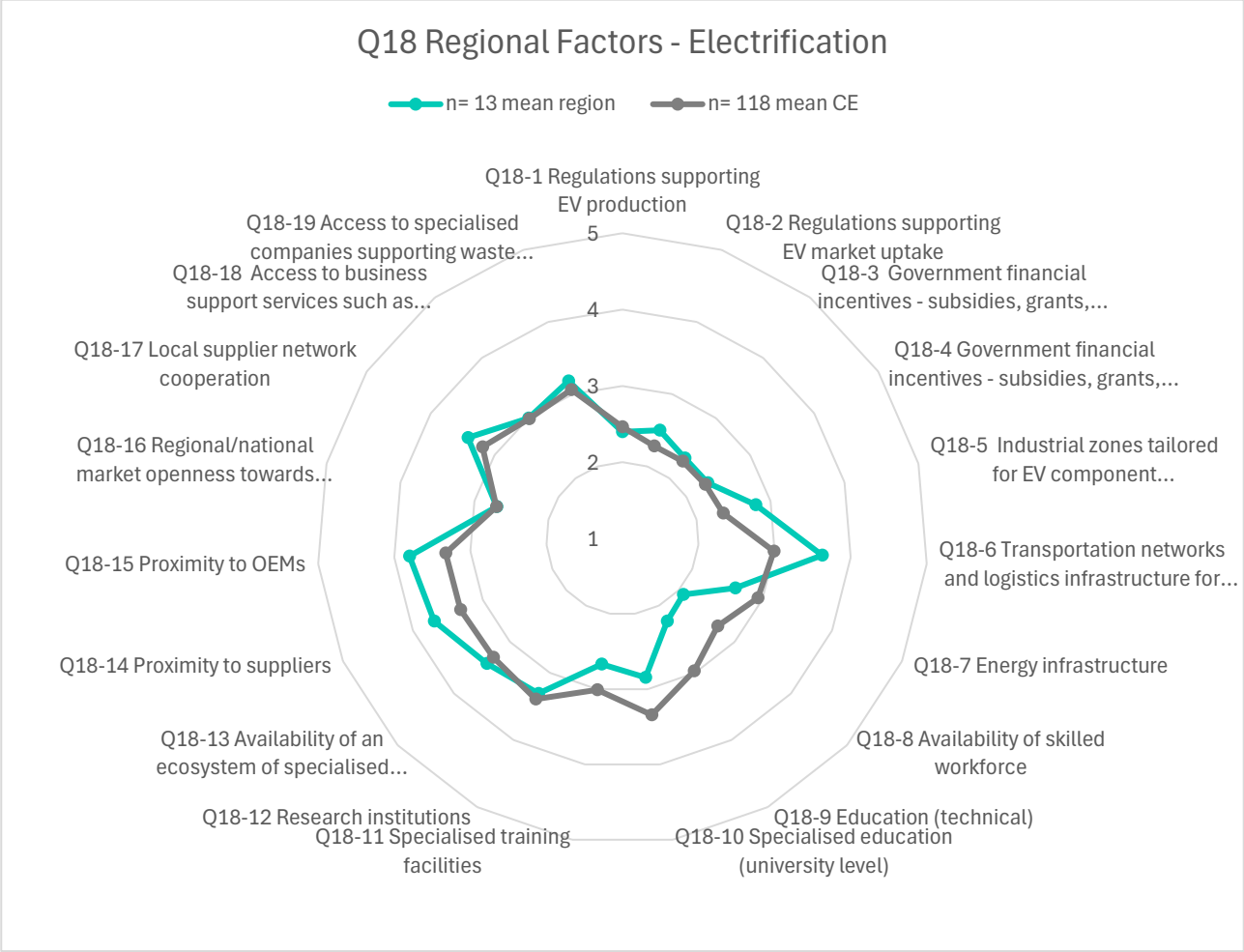
Areas rated more positively than the European average include:

- Transportation networks and logistics infrastructure for materials and finished goods to facilitate timely and cost-effective delivery
- Proximity to OEMs
- Proximity to suppliers

Positively rated areas correspond to each other, as do negative areas.

Other values do not differ from the European assessment of the situation in EV.

Furthermore, general conclusions were drawn, such as that the adoption of electric vehicles needs to be further strengthened, as internal combustion engines remain the preferred choice for many, partly due to ongoing public debates and insufficient infrastructure and uncertain future developments. Areas for improvement in electrification include reducing regulations and bureaucracy, increasing financial incentives for EV purchases, and expanding the energy infrastructure. Employee availability must also be improved.



Automation (Q19)

In the area of **Automation**, we are examining which questions are, on average, rated low, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Availability of skilled workforce
- Availability of specialised education at the technical school level

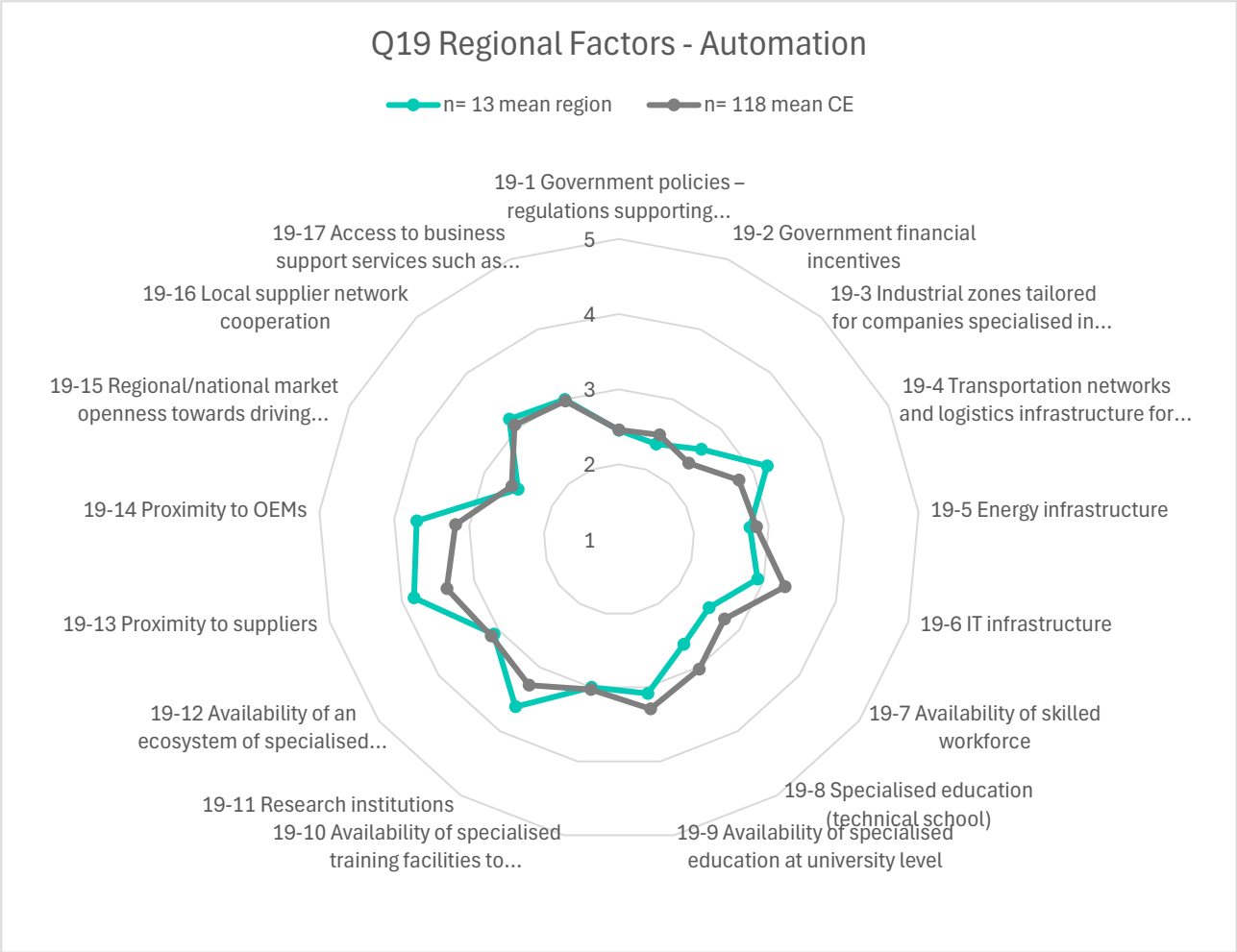
Areas rated more positively than the European average include:

- Transportation networks and logistics infrastructure for materials and finished goods to facilitate timely and cost-effective delivery
- Proximity to OEMs
- Proximity to suppliers
- Availability of research institutions, technology parks

Positively rated areas correspond to each other, as do negative areas.

Other values do not differ from the European assessment of the situation in Automation.

There are similar topics here as in Electrification, but also some differences. Similar issues include a lack of financial incentives, and a shortage of employees with the necessary skills.



Connectivity (Q20)

In the area of **Connectivity**, we are examining which questions are, on average, rated low, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Availability of skilled workforce
- Availability of specialised education at the technical school level
- IT infrastructure

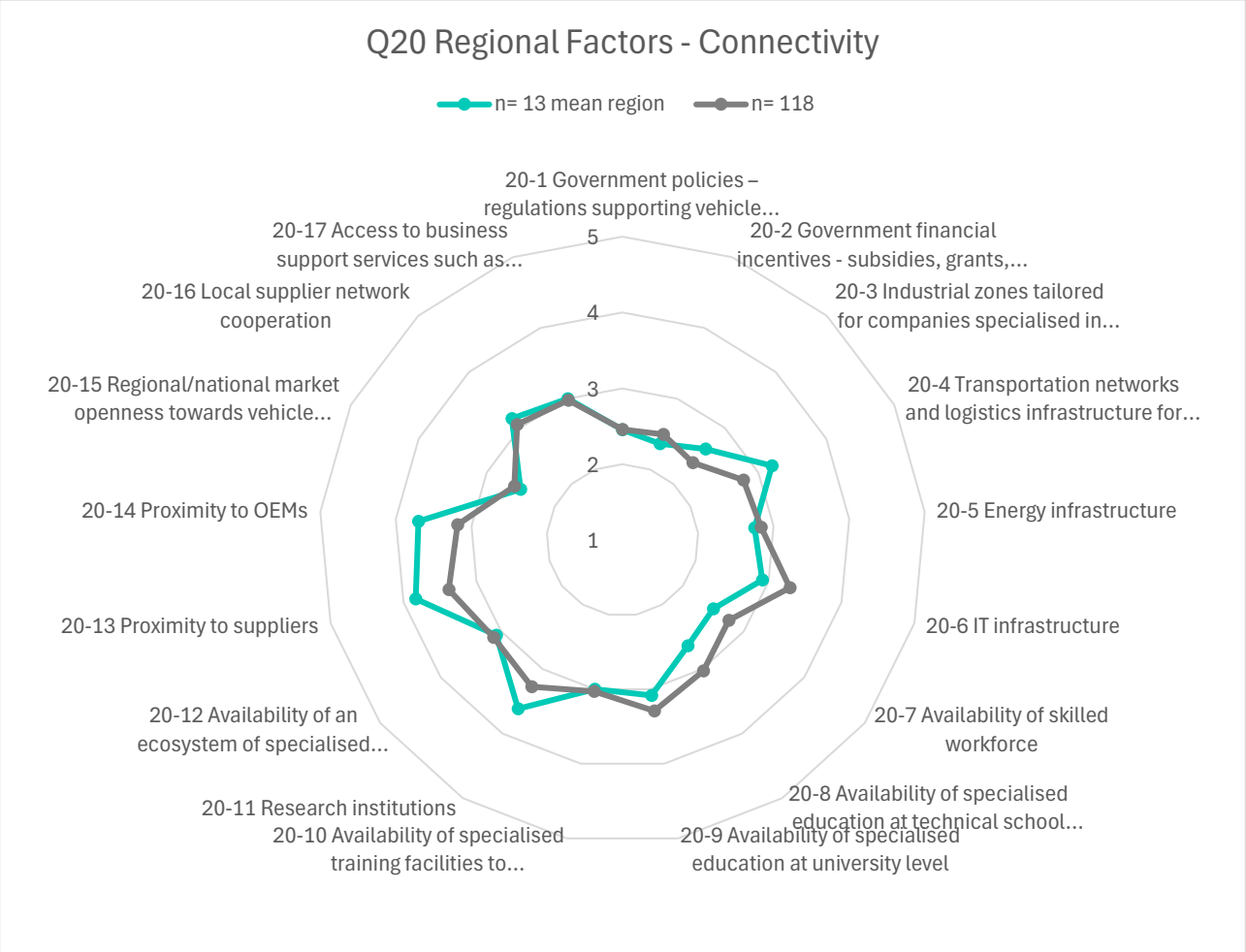
Areas rated more positively than the European average include:

- Transportation networks and logistics infrastructure for materials and finished goods to facilitate timely and cost-effective delivery
- Proximity to OEMs
- Proximity to suppliers

- Availability of research institutions, technology parks

Positively rated areas correspond to each other, as do negative areas.

Other values do not differ from the European assessment of the situation in Connectivity.



Platform Economy (Q21)

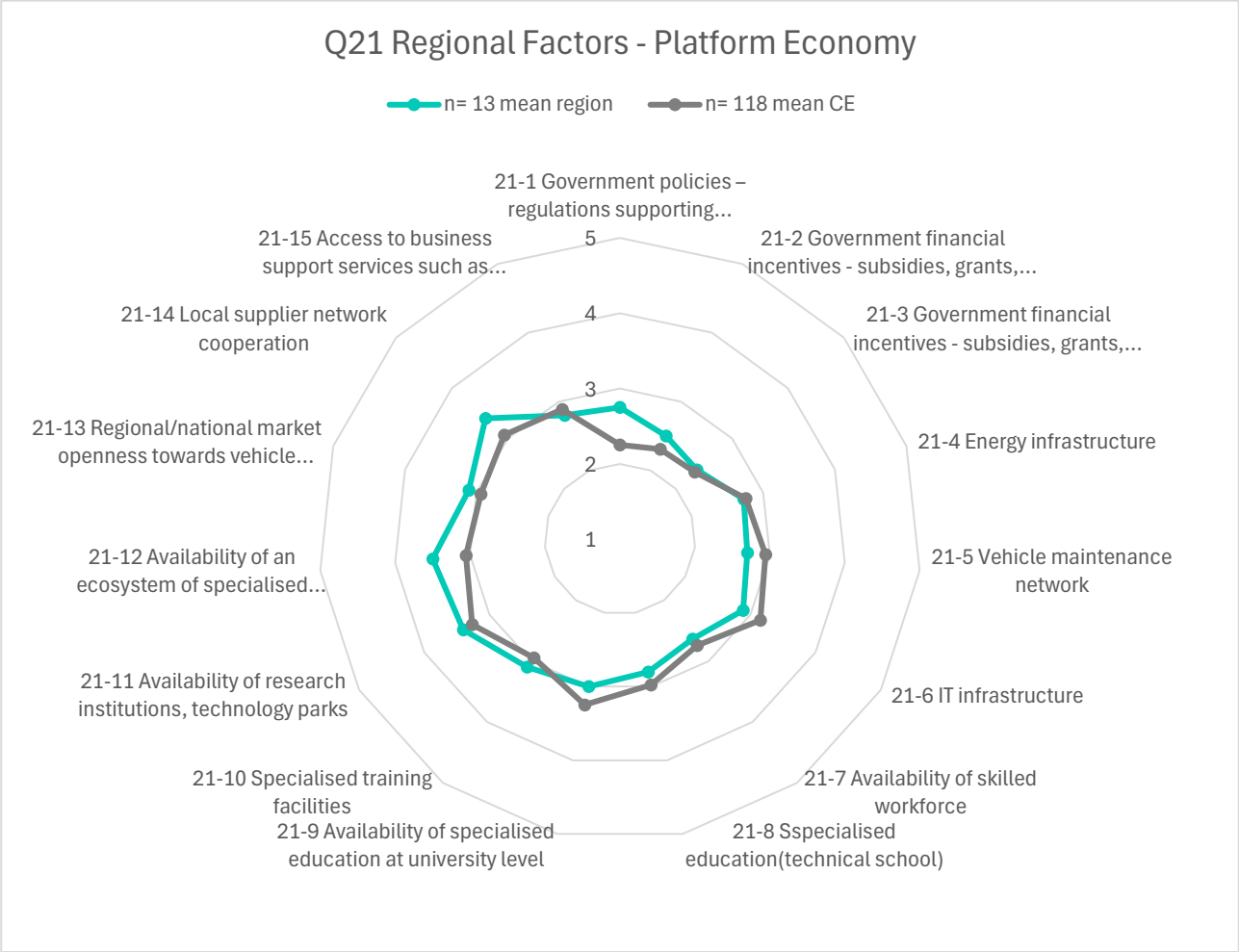
In the area of **Platform Economy**, we are examining which questions are, on average, rated low, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- IT infrastructure

Areas rated more positively than the European average include:

- Government policies – regulations supporting innovative mobility solutions, vehicle platform economy models
- Local supplier network cooperation
- Availability of an ecosystem of specialised technology companies

Other values do not differ from the European assessment of the situation in Platform Economy, but relatively many subjects used the answer "unable to answer" when evaluating the questions.



Additional factors influencing the regional competitiveness (Q22)

The companies involved in the survey have a rather pessimistic view of the development of electromobility in the region. The subjects answered an open-ended question regarding other general recommendations and/or comments that the region needs to consider for regional competitiveness in the automotive sector (e.g. actions from the government) as follows:

- more subsidy grants for transformation to EV,
- better cross border and interregional cooperation, education, policy consolidated from EU perspective,
- attract skilled workforce,
- stable and competitive energy prices,
- stabilization of the environment, stabilization of future steps and clear direction,
- not to financially support EV vehicles and let the market define itself,

- focus on sustainability but from the business perspective point of view, more subsidy projects with regional impact,
- space for financial schemes supporting this cooperation with less bureaucratic complexity,
- create a specialized supporting programs,
- excessively high energy prices in the Czech Republic reduce the competitiveness of companies.

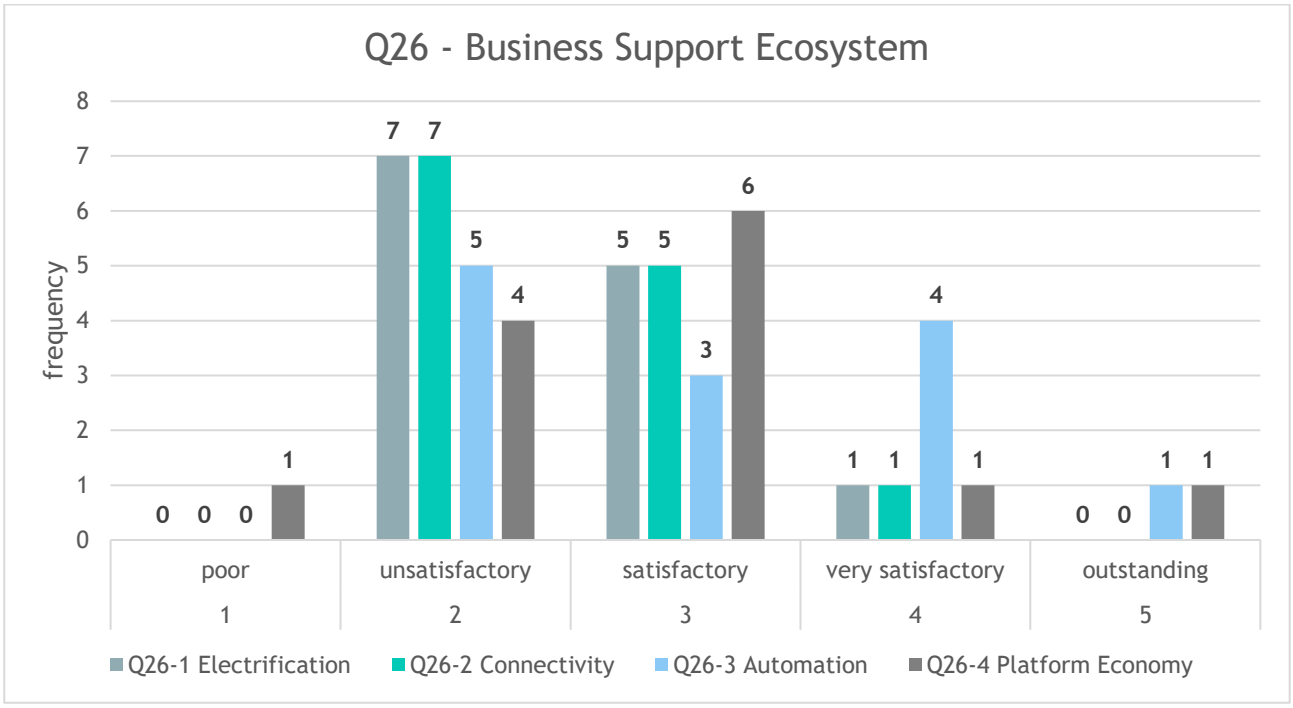
The answers correspond to the previous findings that subjects have a problem with an increase in input prices, e.g. energy, and an uncertain strategy for the future.

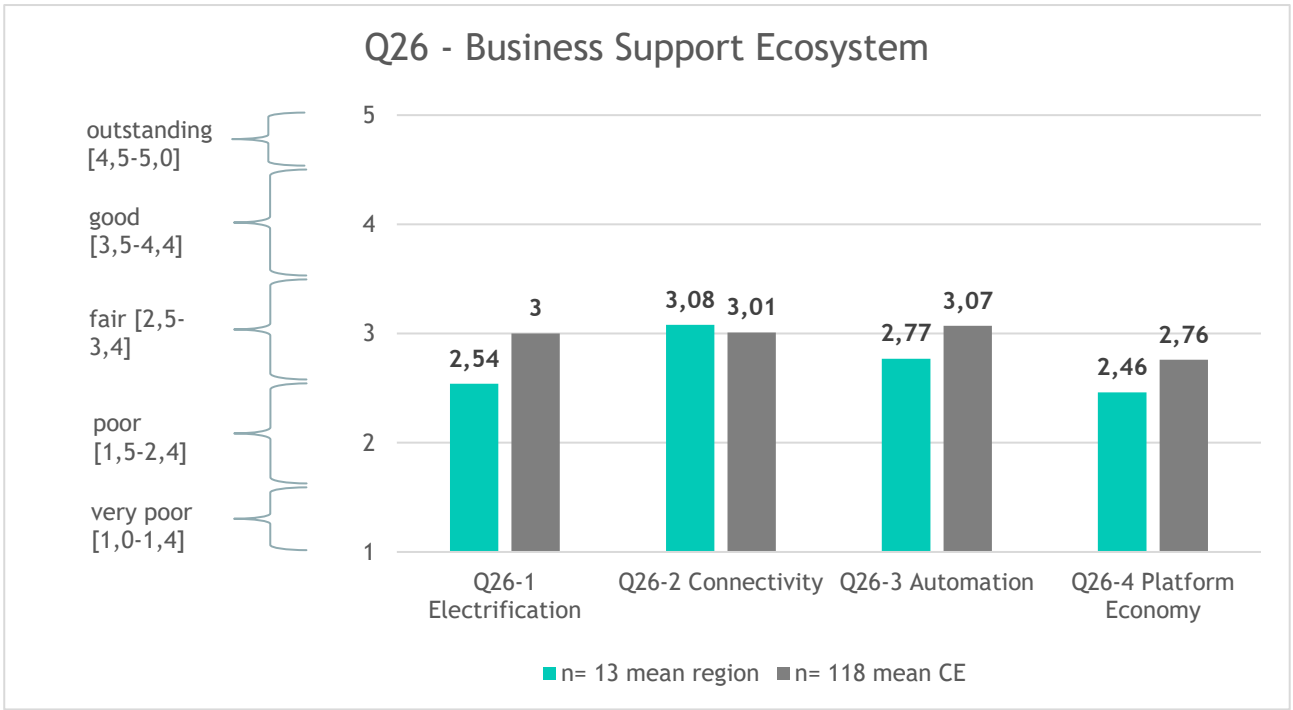
Business support services (Q26-27)

The feedback on the service portfolio of business support organizations in the four thematic areas is varied, with a significant number of companies rating the availability and quality of services as satisfactory, or unsatisfactory. Survey participants highlighted the absence of specific government support programs and financial instruments necessary to kickstart and sustain the transformation process in the automotive sector. This aligns with the primary readiness gap impeding transformation, as major the part of respondents cited a lack of financial resources to support the transformation process. It is important to consider that profit margins in the automotive sector are under pressure, leaving little room for financial risk-taking and research and development initiatives that are not driven by client demands.

The subjects answered an open-ended question regarding missing services for business support as follows:

better and ongoing information within the experience of companies in the region, networking, financial incentives, skilled people, finance, clear government policies and business support services, consulting for companies to optimize energy consumption and prices, business transformation support, international marketing, testing facilities e.g. polygon for testing autonomous vehicles etc., motivation and understanding of the positive meaning of transformation, government support policies and business support services, investment project support is currently focused in the region primarily on start-up companies only.


Q26 - Business Support Ecosystem
frequency
0 0 0 1
7 7 5 4
5 5 3 6
1 1 4 1
0 0 1 1
poor
1
unsatisfactory
2
satisfactory
3
very satisfactory
4
outstanding
5
Q26-1 Electrification
Q26-2 Connectivity
Q26-3 Automation
Q26-4 Platform Economy


Q26 - Business Support Ecosystem
outstanding [4,5-5,0]
good [3,5-4,4]
fair [2,5-3,4]
poor [1,5-2,4]
very poor [1,0-1,4]
2,54 3
3,08 3,01
2,77 3,07
2,46 2,76
Q26-1 Electrification
Q26-2 Connectivity
Q26-3 Automation
Q26-4 Platform Economy
n= 13 mean region
n= 118 mean CE

Specialisation level and development perspectives (Q23-25)

Specialisation

In Electrification, Connectivity and Platform Economy the region evaluates itself mainly poor as an automotive hub. the exception is Automation, which is rated as fair, which means an average rating. All respondents understand the term Automation primarily as the automation of processes, both production and non-production, or the overall digitalization of companies. There is no OEM in the region and companies here focus on other than autonomous driving vehicles with the exception of competence for autonomous driving of trams including a test polygon. However, trams are considered rail vehicles and do not belong to our assessment.

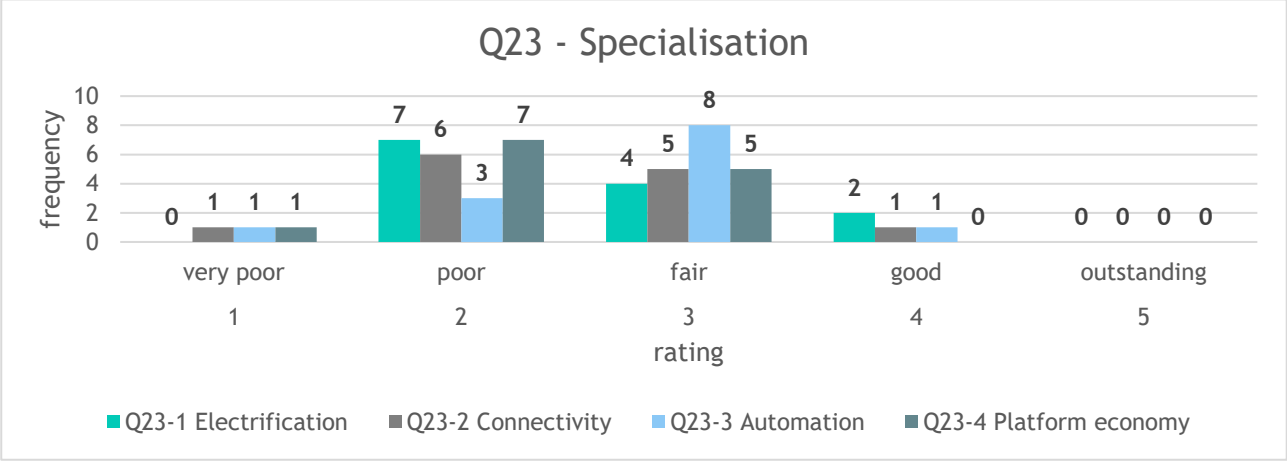
The assessment of companies and BSOs regarding individual specializations, compared to the average of other regions, is slightly below the European average in all 4 areas.

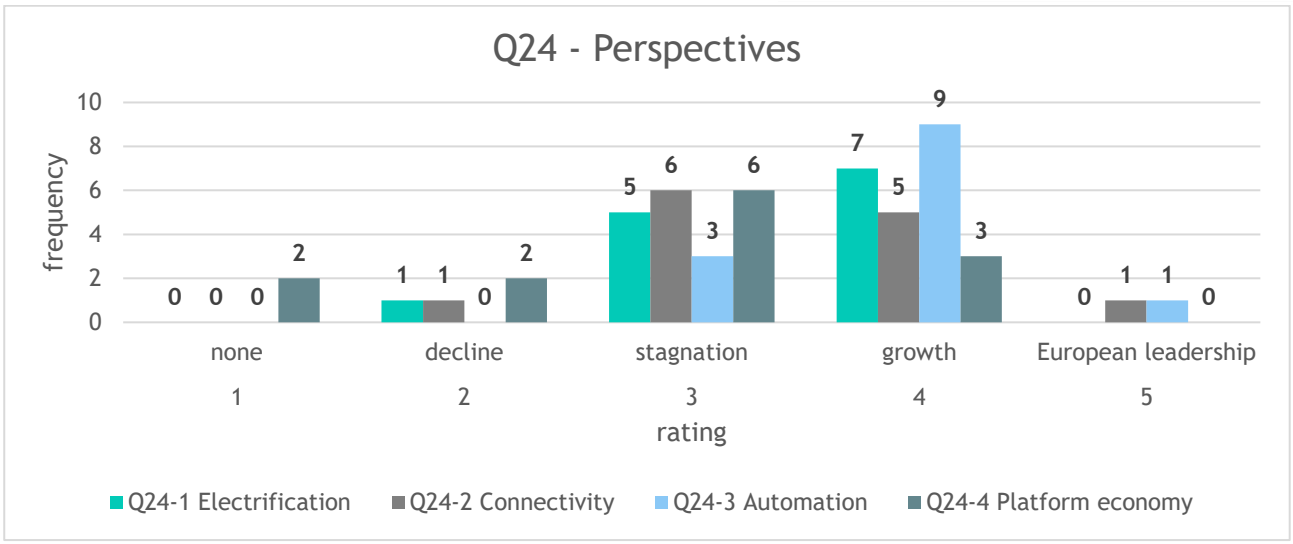
Perspectives

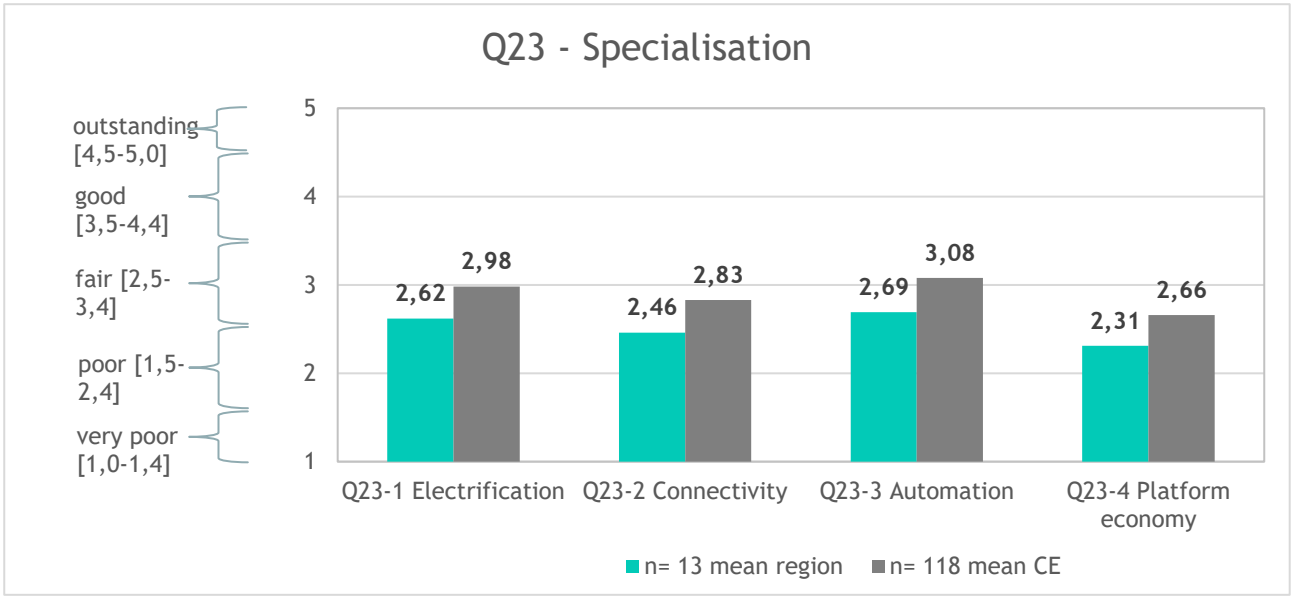
The perspectives for growth are seen by entities in the region in Electrification and primarily in Automation, Connectivity level is at the interface for stagnation and growth. Platform Economy is assessed as mostly stagnant.

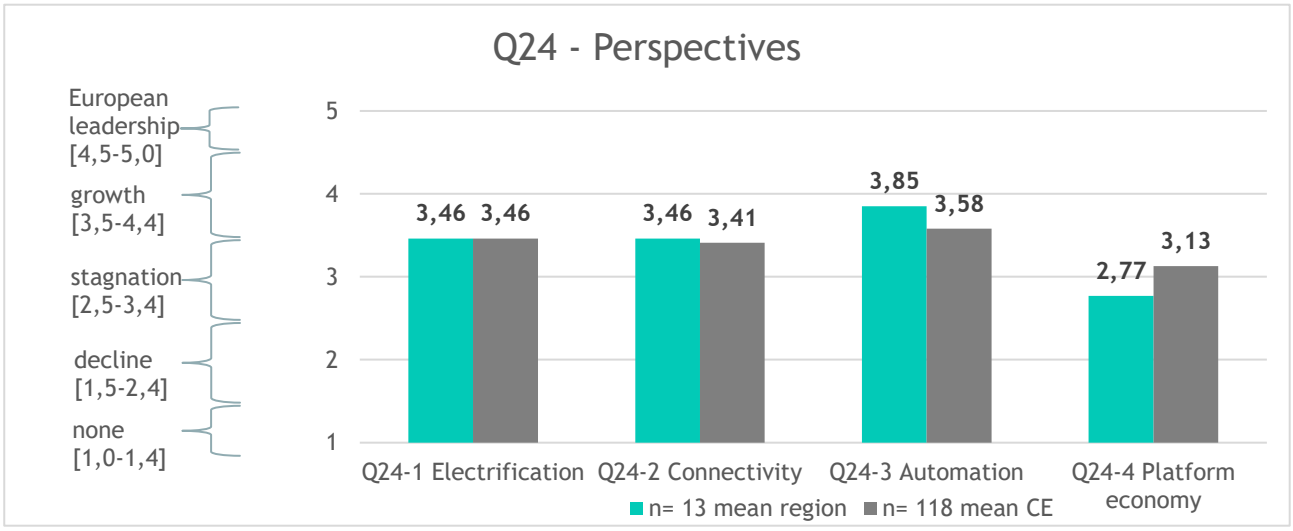
The evaluation of companies and BSOs regarding individual specializations is at the European average in Electrification and Connectivity, in the field of Automation it is slightly higher and in Platform Economy significantly lower.

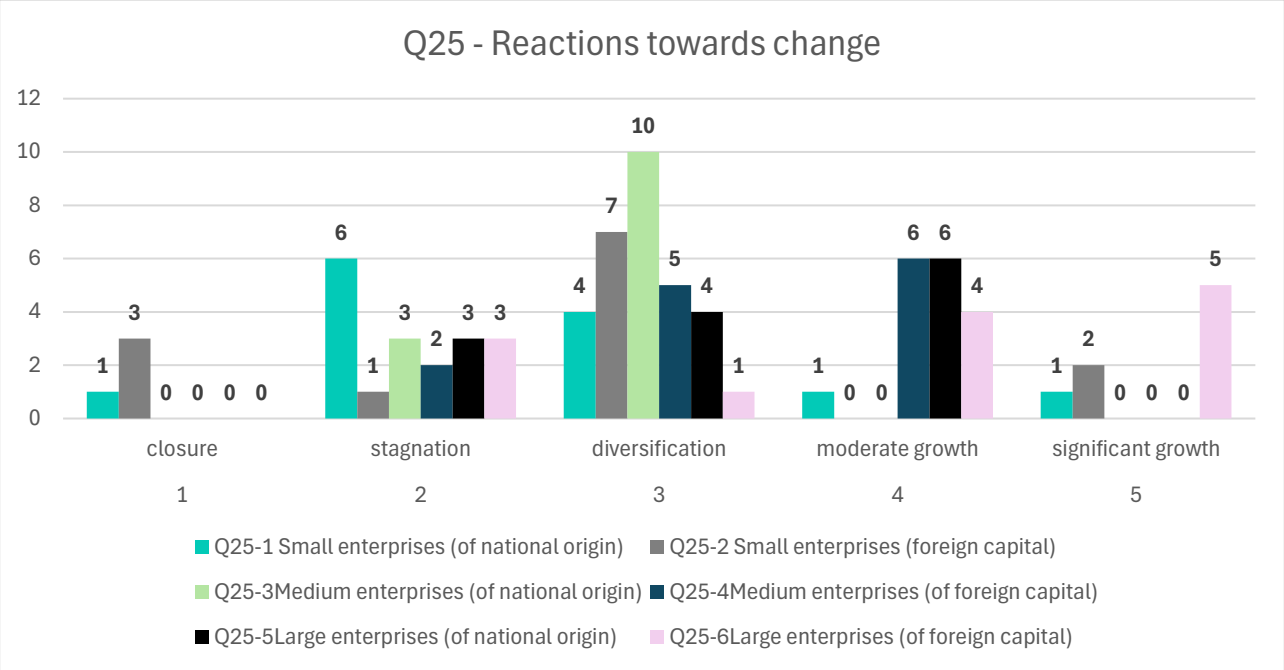
There is a generally high expectation in the region for automation at various stages and levels. This result is in line with previous findings. Other specializations need strong support at the present time and of course with a perspective for the future.

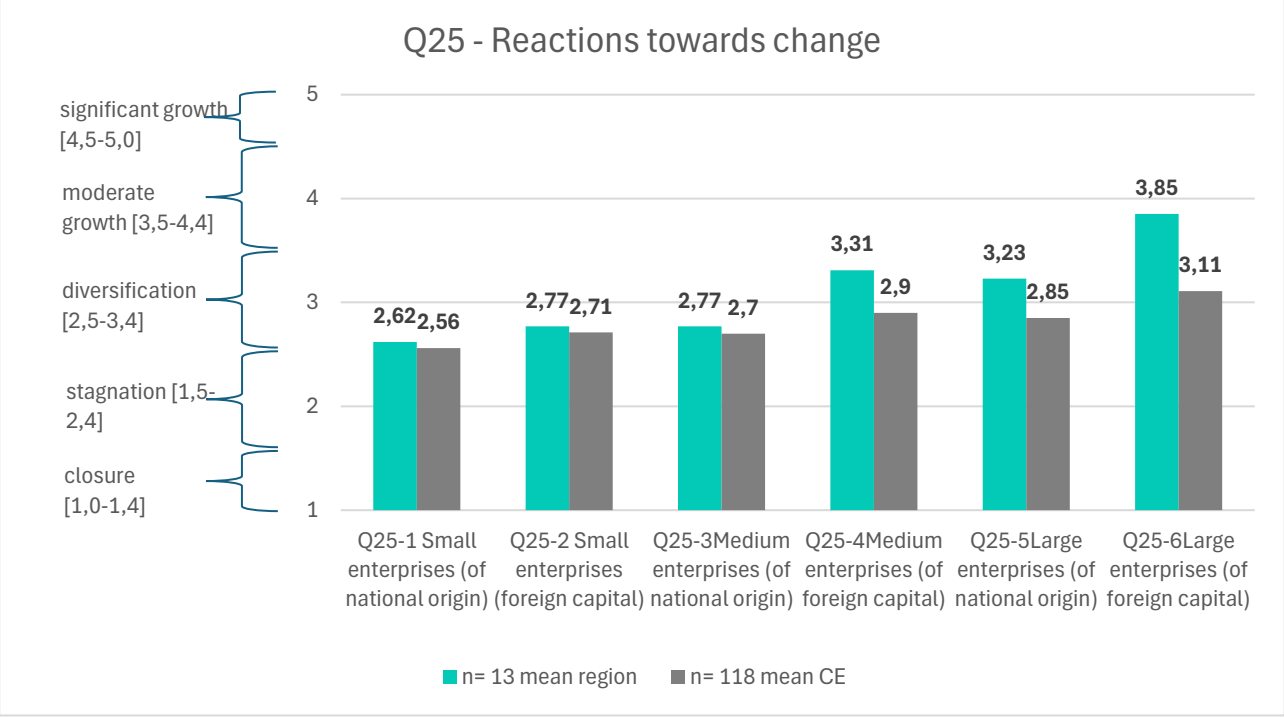



Q24 - Perspectives
frequency
10
8
6
4
2
0
0 0 0 2
1 1 0 2
5 6 3 6
7 5 9 3
0 1 1 0
none
decline
stagnation
growth
European leadership
1
2
3
4
5
rating
Q24-1 Electrification
Q24-2 Connectivity
Q24-3 Automation
Q24-4 Platform economy


Q23 - Specialisation
outstanding [4,5-5,0]
good [3,5-4,4]
fair [2,5-3,4]
poor [1,5-2,4]
very poor [1,0-1,4]
5
4
3
2
1
2,62 2,98
2,46 2,83
2,69 3,08
2,31 2,66
Q23-1 Electrification
Q23-2 Connectivity
Q23-3 Automation
Q23-4 Platform economy
n= 13 mean region
n= 118 mean CE


Q24 - Perspectives
European leadership [4,5-5,0]
growth [3,5-4,4]
stagnation [2,5-3,4]
decline [1,5-2,4]
none [1,0-1,4]
5
4
3
2
1
3,46 3,46
3,46 3,41
3,85 3,58
2,77 3,13
Q24-1 Electrification
Q24-2 Connectivity
Q24-3 Automation
Q24-4 Platform economy
n= 13 mean region
n= 118 mean CE

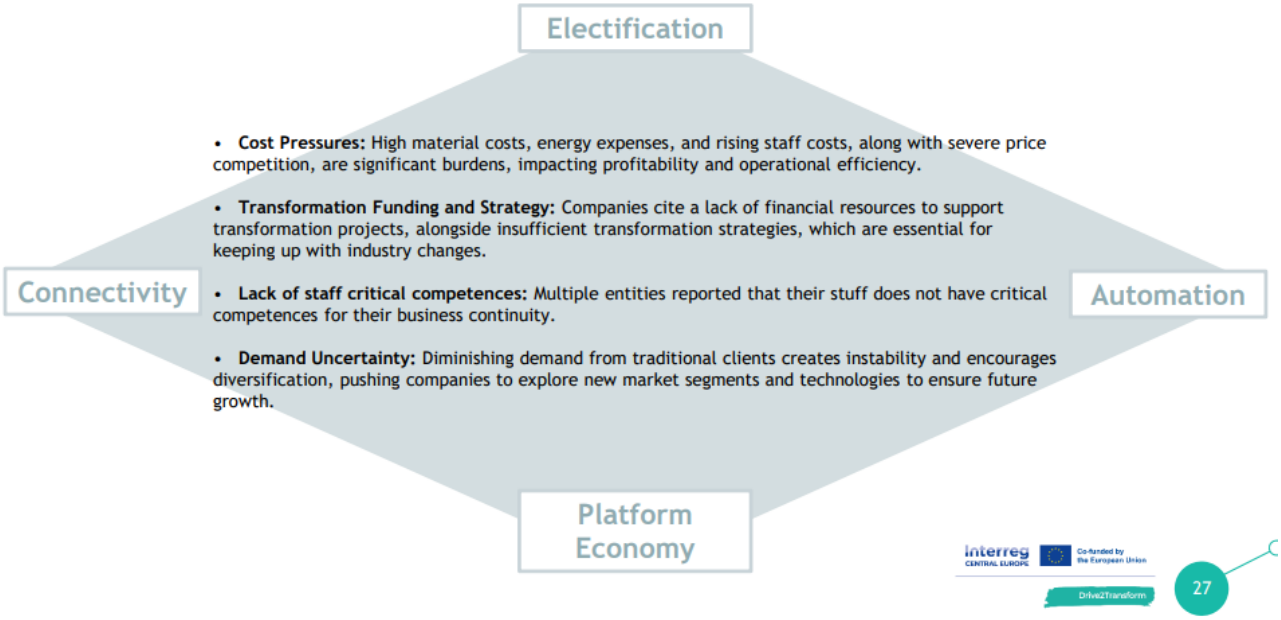




Conclusion - Key findings for regional transformation capacities in the automotive sector

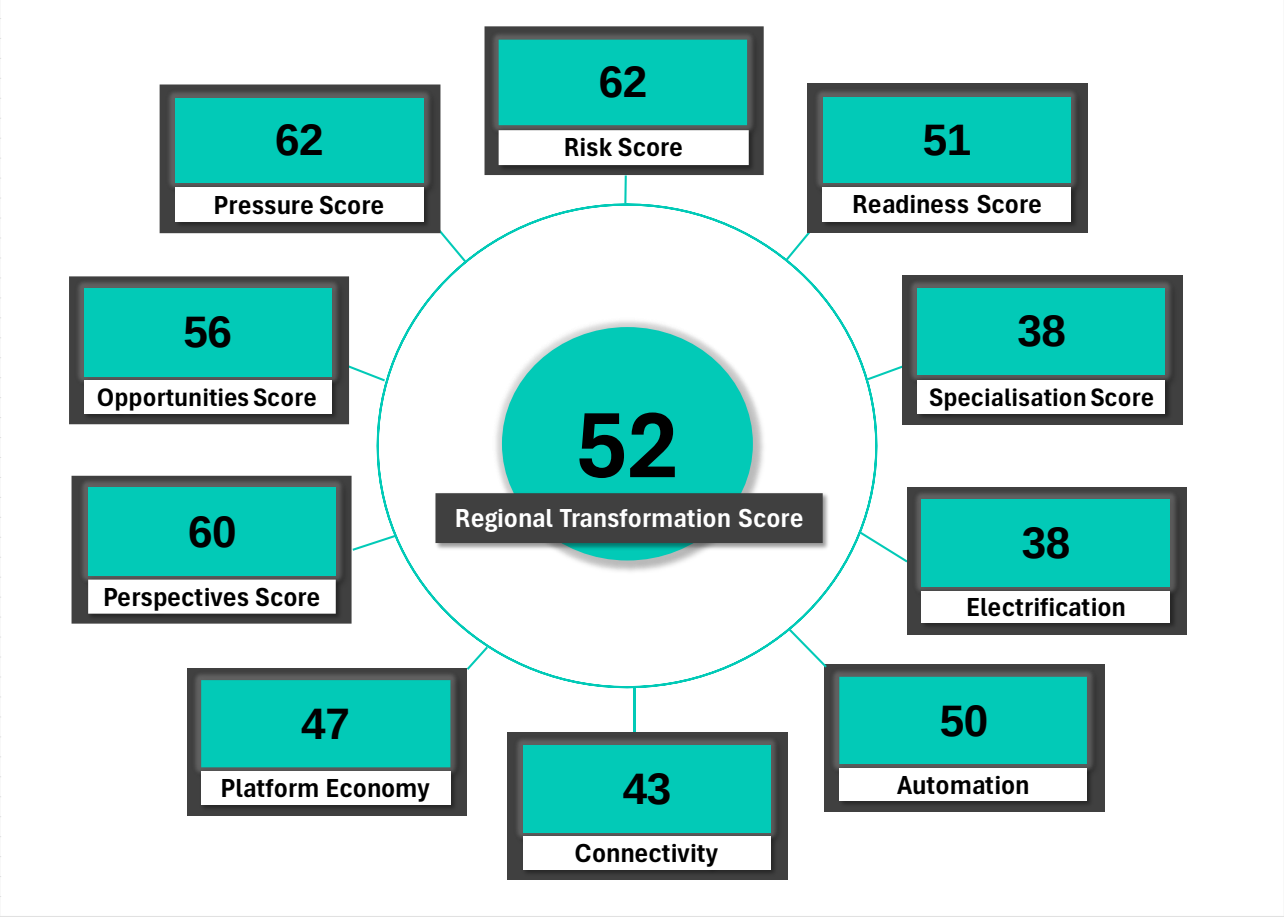
Entities in the Pilsen Region range from small companies to large enterprises. The focus of the companies is as follows: no OEM manufacturer, Tier 1 to 3 suppliers and their interconnected supply chains. The region is represented by a mix of automotive businesses from R&D centers, IT, manufacturing to warehouses and supply chain companies. Electrification will not eliminate the core business of most companies in the region. Nevertheless, there is stagnation, problems with transformation. IT companies supplying exclusively to the automotive sector already have the same problem with stagnation.

It is quite clear that the **biggest risks** are **input costs, especially energy prices, material costs, lack of own capital and staff costs**. In addition, other risks, such as **intense competition**, especially **with China**, are interfering with the current situation. Companies in the region are further negatively affected by the **lack of transformation strategies and specialized support programs**, as well as **doubts about the future** direction **of the automotive industry**. To refine this analysis, much **more data** would need to be processed – involving more companies and BSOs in the region in the survey.



Transformation Readiness Index – Czech Republic/ Pilsen

Using the TRM, Czech Republic is rated as moderate ready for the transformation. The respondents have given the highest scores for risk and pressure, meaning that the companies can cope well with risk and pressure, and the lowest scores in Specialisation and the Regional Factor Electrification.



Ranking:

>60 Transformation Ready

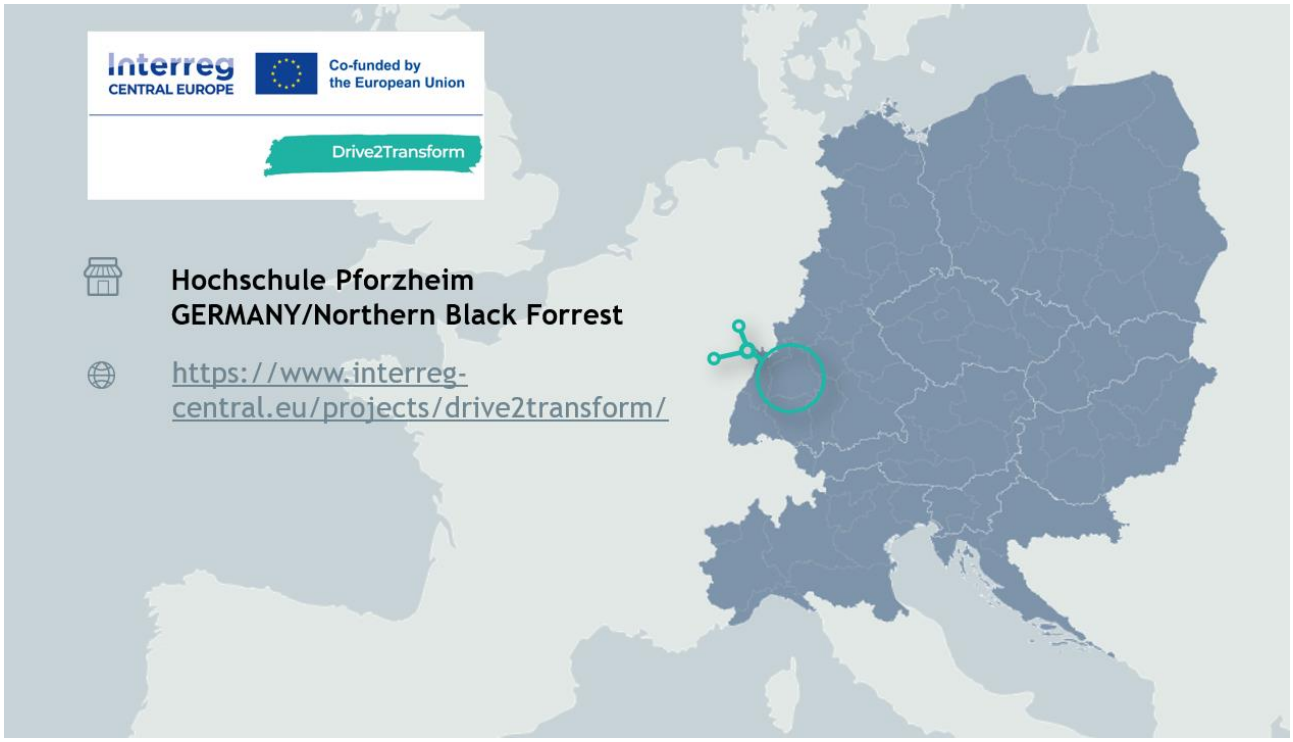
50-60 Moderate Ready

40-50 Limited Ready

30-40 Low Ready

<30 Not Ready

Germany-Baden-Württemberg | Northern Black Forest (PU)



Brief description of the region

Baden-Württemberg is one of Europe's leading regions in automotive innovation and advanced engineering, driven by globally recognised companies like Mercedes-Benz-Cars, Daimler-Trucks Porsche, Audi, Bosch, MAHLE, ZF Friedrichshafen and TRUMPF. These industry leaders play a vital role in shaping the state's economic strength and international reputation. The automotive sector alone employs over 235,000 people and generates an impressive annual turnover of €90 billion, according to the Ministry of Economic Affairs, Labour and Tourism of Baden-Württemberg. The state's dense network of manufacturers, suppliers, and research institutions fosters strong collaboration, creating a robust value chain that supports innovation, sustainability, and technological leadership on a global scale.

Economic Significance of Northern Black Forest

The Northern Black Forest, with over 600,000 residents across 2,340 km², is a vital economic hub in southwestern Germany. Centred around the districts of Enzkreis, Calw, Freudenstadt, and the city of Pforzheim, it hosts a diverse economy led by industries like precision engineering, medical technology, and woodworking. The automotive sector plays a key role, employing over 30,000 people, or 14% of insured workers, as of 2018. Global leaders such as Arburg, Boysen, and Witzenmann operate alongside numerous family-owned suppliers specializing in components and precision manufacturing. Strategically located near Stuttgart and Karlsruhe, with excellent infrastructure including connections to the A8 and A81 motorways, the Northern Black Forest combines industrial strength and accessibility to remain a key player in Germany's manufacturing landscape.

Role of Pforzheim University (PU)

The Pforzheim University plays a pivotal role in supporting the transformation of industries within the Northern Black Forest region, especially amidst the ongoing challenges in the automotive sector. With a

focus on applied sciences, the university fosters innovation in fields such as digitalisation, production, and mechanical engineering. It offers cutting-edge facilities and research opportunities that enable collaboration between academia, industry, and public institutions, particularly in addressing the pressing demands of sustainability and technological advancement. Pforzheim University actively engages in research and education to address the disruptions in the automotive supply chain caused by electrification and digitalisation. Its programmes emphasize areas such as lightweight construction, emission reduction, and connected mobility solutions. By developing expertise in software and electronics—the critical drivers of future automotive innovation—the university supports regional suppliers in navigating the shift toward e-mobility and autonomous driving.

Challenges and Potentials

The Northern Black Forest region is characterised by its strong base of small and medium-sized suppliers, making it a flexible player in Germany's automotive industry. While lacking OEMs, the region's craftsmanship and adaptability are vital strengths as the sector shifts toward electrification and digitalisation.

Challenges are significant, with areas like Calw and Pforzheim heavily reliant on traditional powertrain production. However, trends in lightweight construction, connected mobility, and alternative drives offer opportunities. The Region has the lowest Innovation Index in Baden-Württemberg, nevertheless the region has potential. New megatrends, such as vehicle electrification and digitalisation, emphasize the importance of transitioning to future-ready technologies. The Northern Black Forest must address these challenges proactively by fostering innovation, improving R&D intensity, and supporting its many small and medium-sized enterprises through targeted programmes and partnerships to maintain its competitive edge in the evolving automotive landscape.

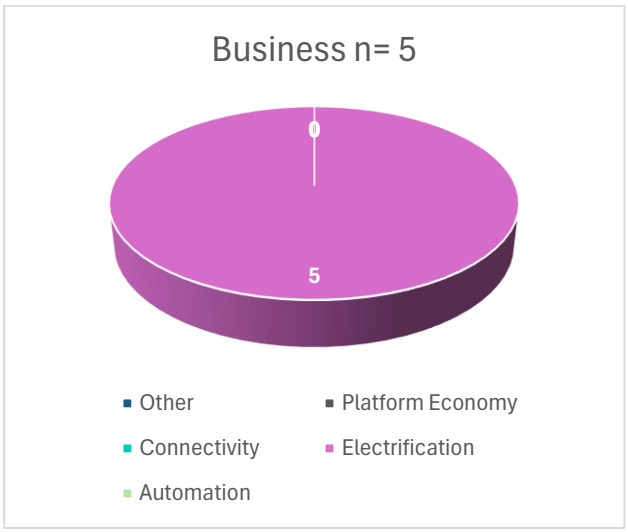
The further analysis focus on the Baden-Württemberg region "Northern Black Forest" which surrounds the city of Pforzheim.

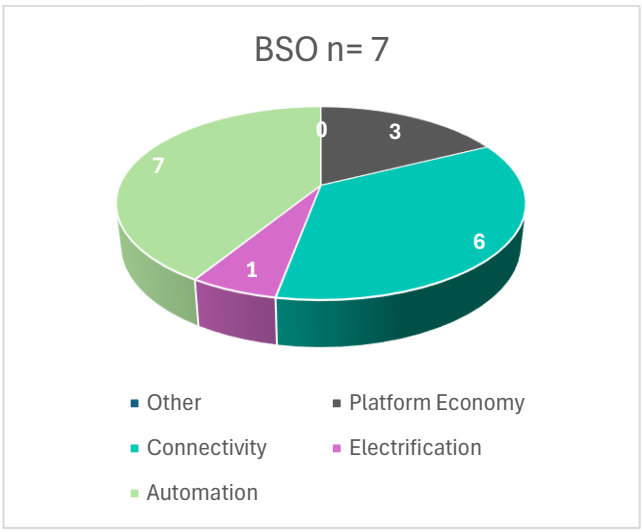
Inventory of companies and business support organisations (BSO) (Q1-8)

A total of 5 companies and 7 BSOs responded to the questionnaire. The surveyed companies were relatively homogeneously selected, including both SMEs and large enterprises, all with a strong focus on the automotive sector. Their product and service portfolios ranged from engineering services to the production of components such as pistons, tubes, and electric engines. Most of these companies are part of the precision and stamping technology cluster, which is traditionally rooted in the Northern Black Forest region.

The surveyed companies focus primarily on electrification, reflecting the region's industrial strengths. In contrast, the BSOs adopt a broader approach, addressing all four thematic areas critical to regional development. This wider focus aims to drive innovation, diversify industries, and ensure long-term economic growth and adaptability in the face of evolving challenges.

The survey format strongly favors maintaining the approach of direct conversations. Surveys are completed collaboratively with the company, either during an on-site meeting or through an online session. This method enhances interaction with the company and minimizes the risk of misunderstandings.





Transformation risks, pressure and readiness for business continuity in 2024-2030 (Q10-14)

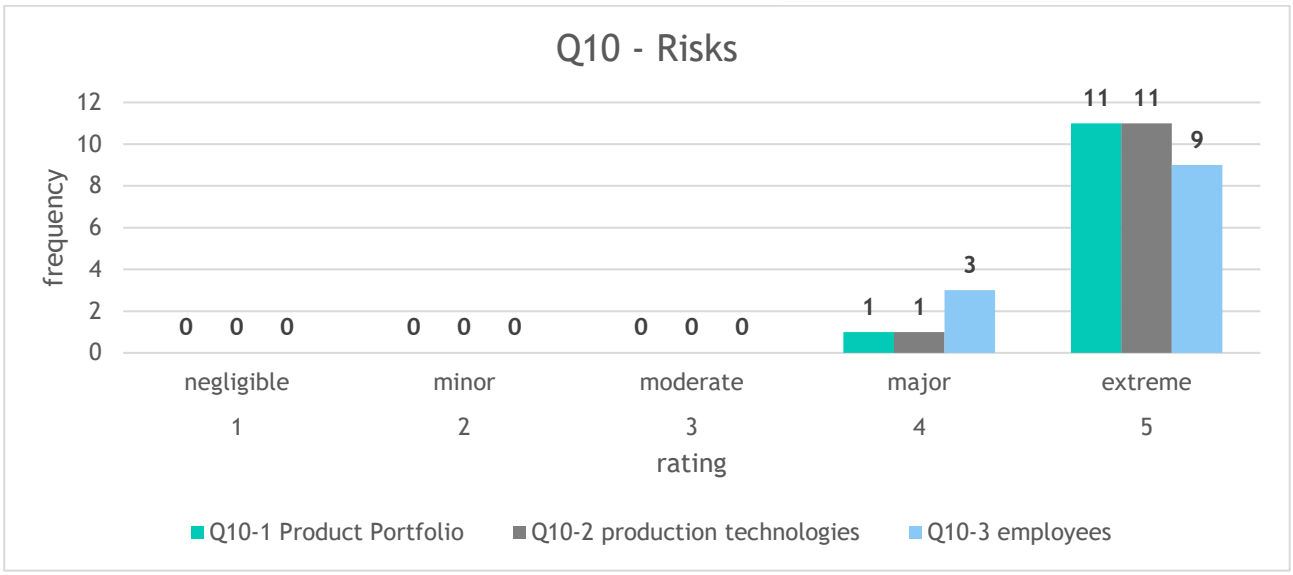
Risks endangering business continuity (Q10-11)

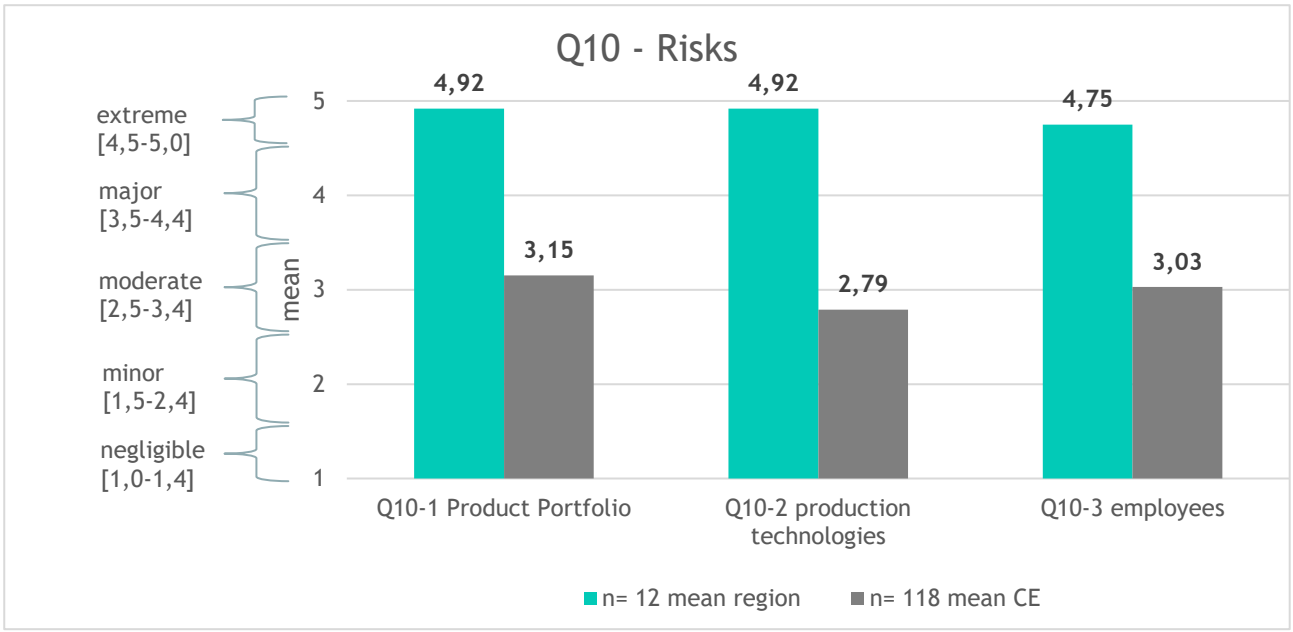
The risk assessment for product portfolios is categorised as extreme, significantly exceeding the European average. Responses range from 4 (major) to 5 (extreme), with the same trend observed in the BSO sector, where risk is also rated between 4 and 5. Notably, there is a marked deterioration of 1.77 points compared to previous values.

Similarly, risks associated with production technologies are rated as extreme, showing the widest gap compared to the EU average. This can be attributed to the surveyed organisations' heavy reliance on traditional production technologies that lack integration with ICT innovations.

Regarding employee-related risks, the surveyed companies provide a slightly better assessment, though still rating between major and extreme. These values align more closely with the European comparison but still show a 1.72-point deficit. Interestingly, this area performs best in the survey overall, with respondents perceiving it as the least critical risk factor. Detailed data shows most ratings falling between 4 and 5, indicating a belief among companies that employee-related risks are less pronounced in this context.

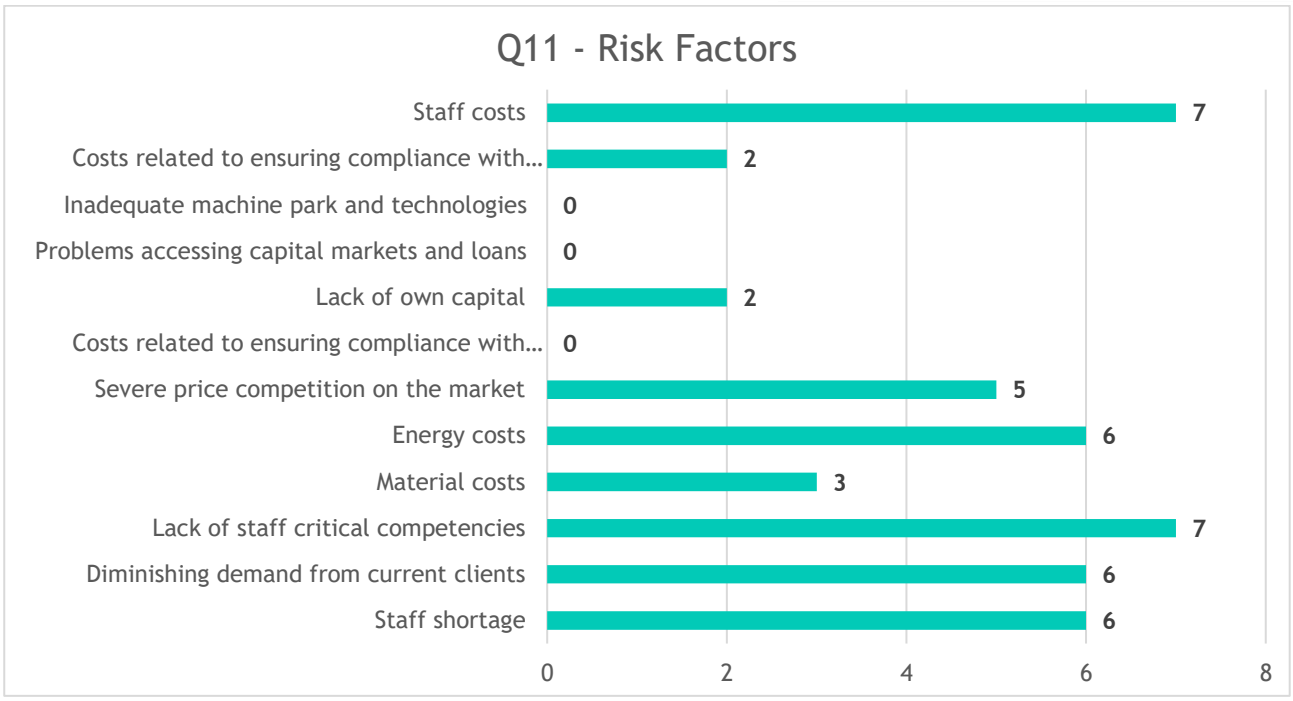
In summary, risks in all areas are predominantly assessed in the extreme range, reflecting the strong focus on electrification among the 12 interviewed businesses and BSOs, which introduces some bias. While employee-related risks are viewed slightly more favourably, they remain significantly worse than the EU average.





Risk factors

The analysis identifies five key risk factors impacting businesses. **Staff shortages** and **the lack of critical competencies** are the most pressing challenges, reflecting difficulties in attracting and retaining skilled personnel. **Diminishing demand from current clients** poses another significant threat, highlighting the need for strong client relationships and market diversification as there is extreme competition with other manufacturers. **Staff costs** and **energy costs** also rank high, adding financial strain to operations, particularly for SMEs. Additionally, **severe price competition**, especially from global markets like Asia, further pressures businesses to stay competitive while maintaining profitability. These factors collectively represent the greatest challenges for organisations in a dynamic and competitive market environment.



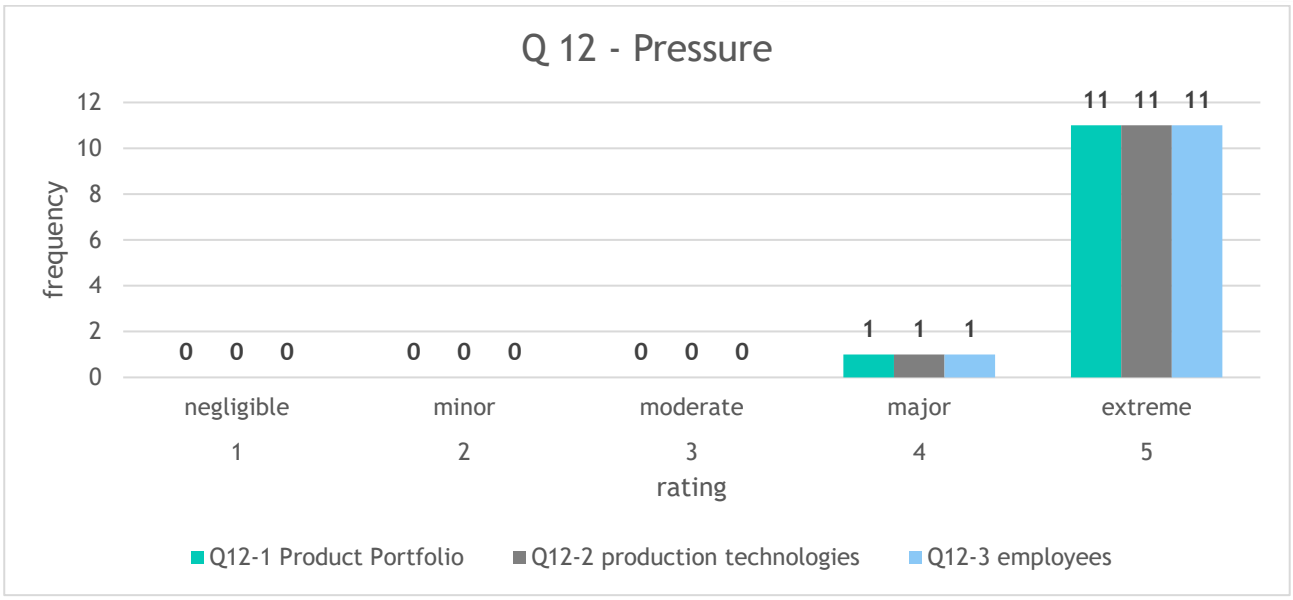
Pressure to change business for ensuring business continuity (Q12)

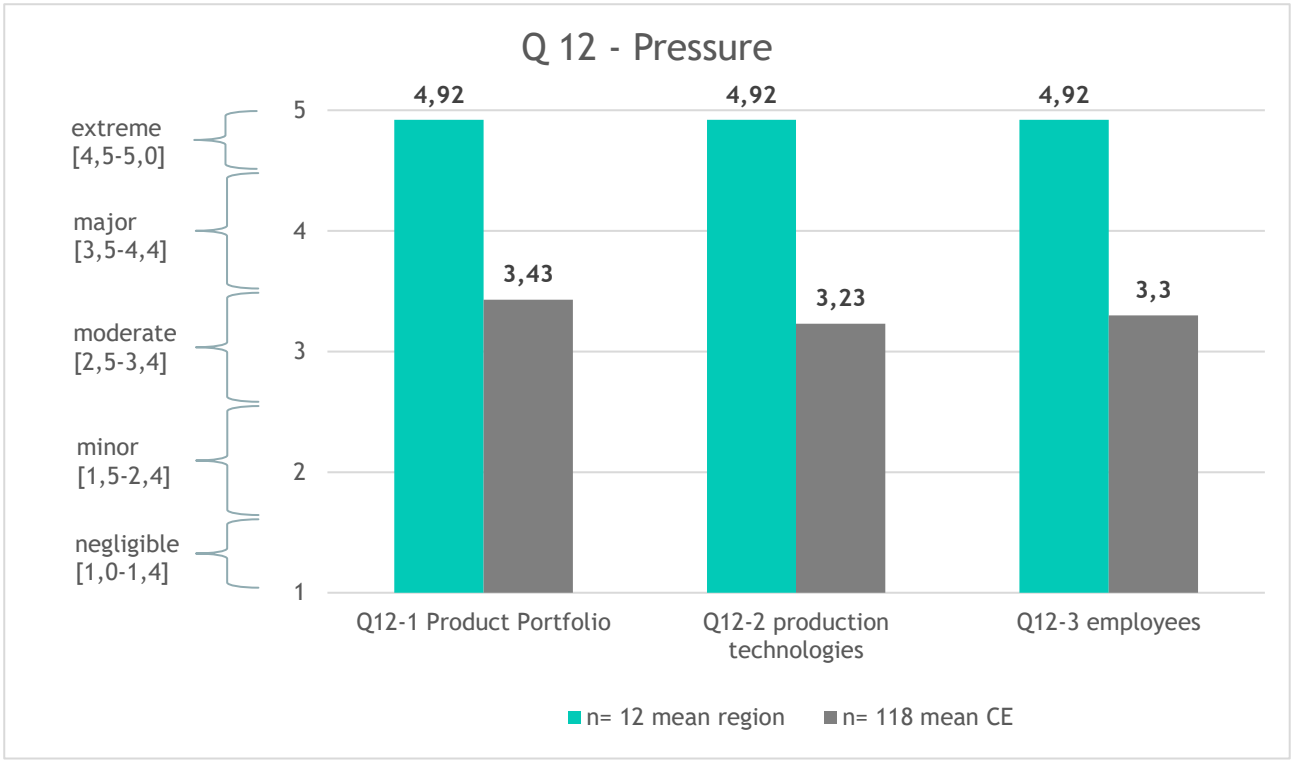
The assessment of pressure to change **product portfolio** to ensure business continuity in Baden-Württemberg, particularly the Northern Black Forest, reached an extreme level of 4.92 points in our survey, far exceeding the European average, which remains in the moderate range. Among the surveyed companies, responses predominantly ranged from major to extreme levels of pressure.

Similarly, the pressure to change in **production technologies** was also rated significantly higher than the European average. These values fall within the extreme range, with company responses consistently scoring between 4 and 5, indicating that every organisation perceives this pressure as critical. This highlights the urgent need to address outdated production methods, particularly in the context of new technological demands.

Regarding **employee** competencies, the pressure values are similarly elevated and remain well above the European average. While one organisation rated the pressure as major, all others considered it extreme. This underscores the widespread challenge of aligning workforce skills with the evolving demands of industry.

In summary, the pressure to change is perceived as extreme across all three areas—product portfolios, production technologies, and employee competencies**—with scores at least **1.5 points higher** than the European average. This trend can largely be attributed to the survey's focus on a select group of companies that produce components for internal combustion engines (ICE), which amplifies these extreme results due to their heightened vulnerability to industry transformation.





Readiness to change business for ensuring business continuity (Q13)

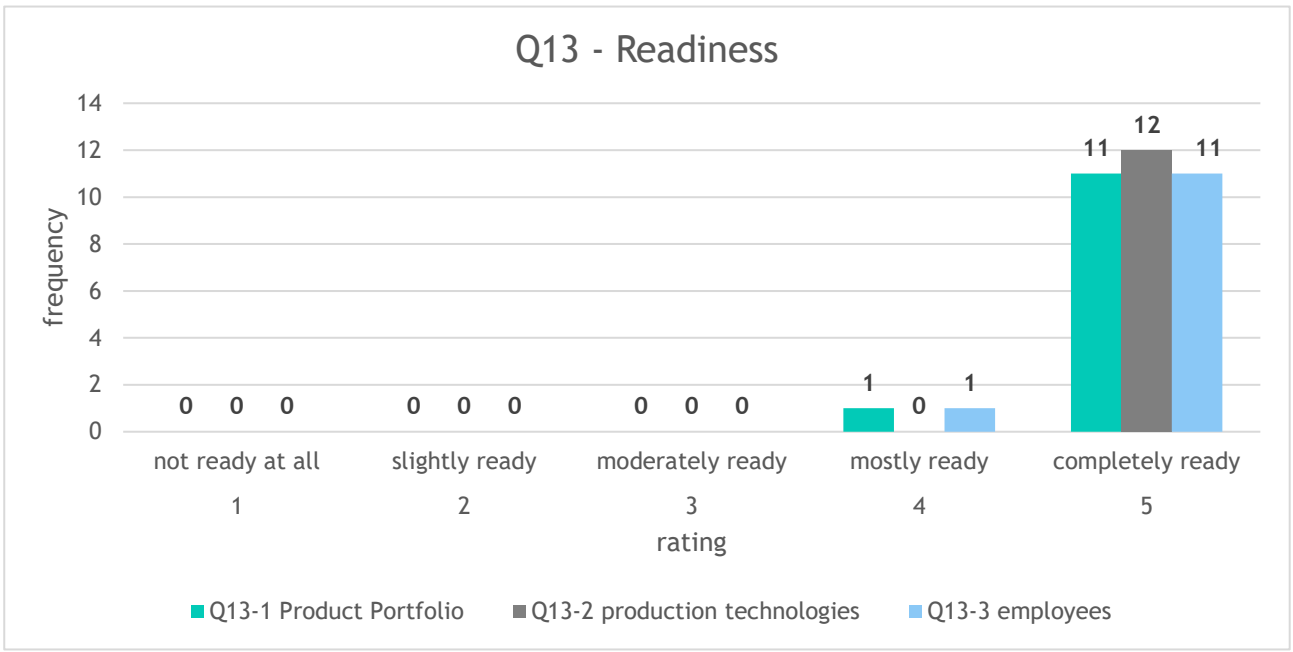
Comparing the results on the perceived readiness to adapt for business continuity in 2024-2030, the responses are distributed consistently across the three dimensions: **product portfolio**, **employee competencies,** and **production technologies**.

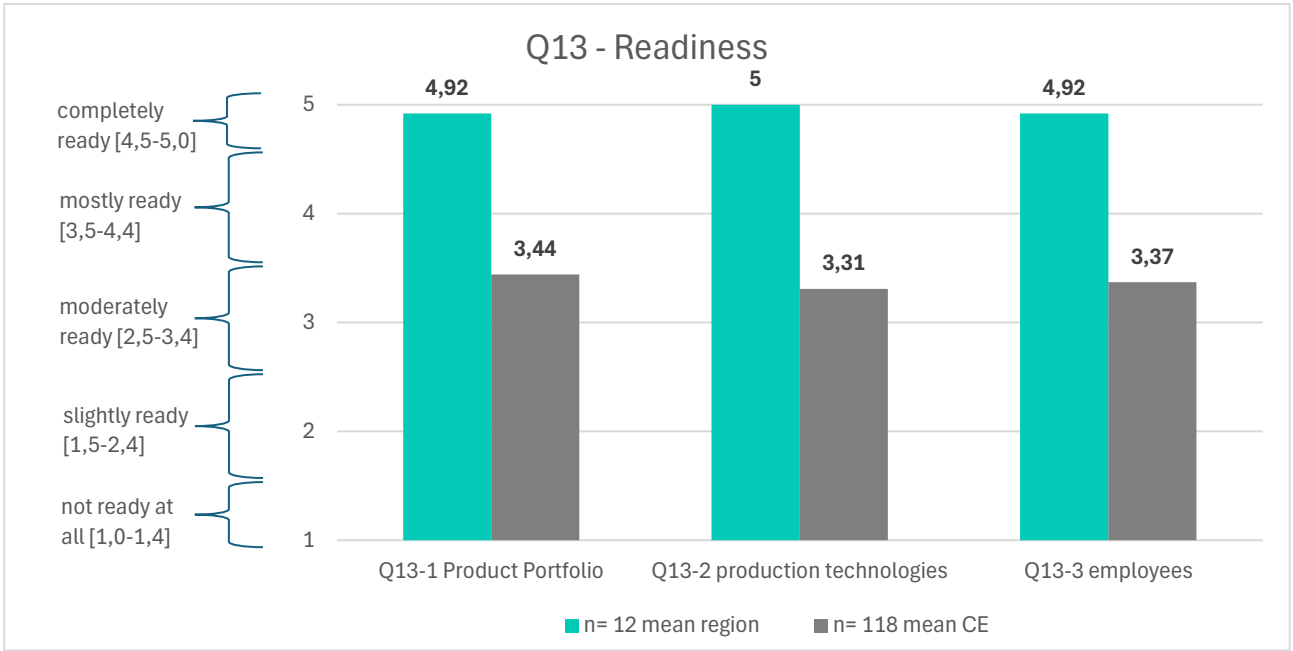
The readiness for **product portfolio** stands significantly above the European average, consistently falling within the extreme range and close to the maximum. Companies largely perceive their current portfolios as not future-proof, with most responses in the 5-range, signalling a strong willingness to adapt.

Similarly, **production technologies** are rated as extremely ready, with maximum values indicating that organisations are either prepared or already undergoing transformation. All responses also fall within the 5-range, demonstrating an advanced state of readiness.

For **employee competencies**, the results are equally extreme, reflecting a high level of readiness among organisations to address necessary skill transformations.

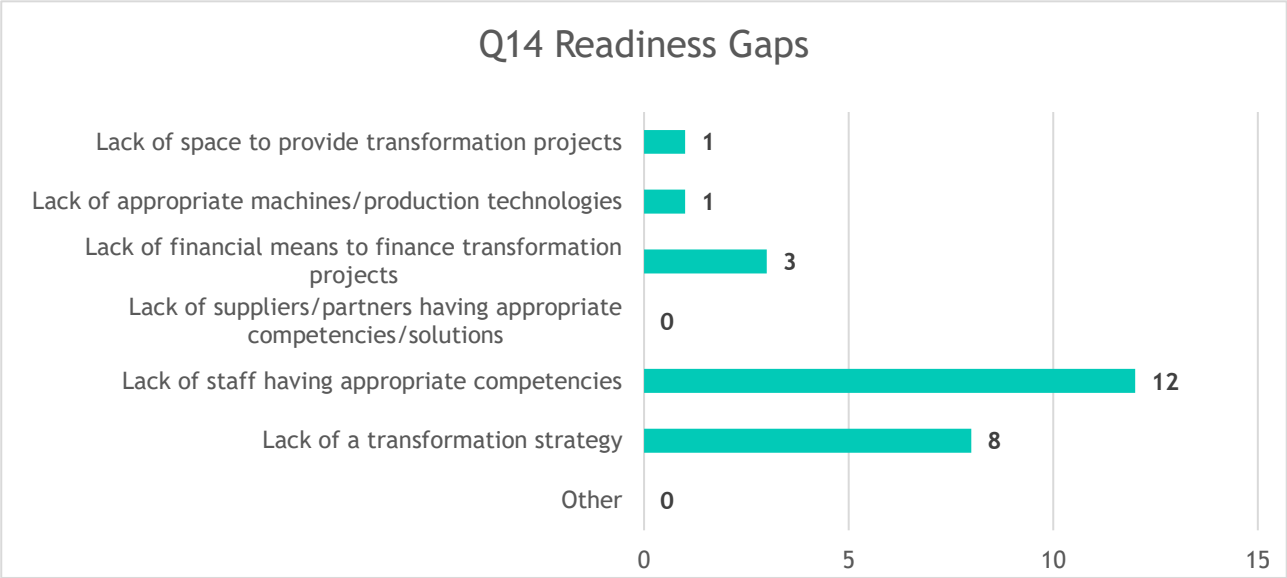
In summary, readiness in the Northern Black Forest region is assessed as significantly higher than the European average. Organisations consider themselves extremely prepared for the (involuntary) transformations in the automotive industry, particularly in light of ongoing sectoral changes.





Main readiness gaps hindering businesses from starting a transformation process (Q14)

The survey revealed that the lack of suppliers and production technology is not considered a significant issue. Instead, four primary problem areas emerged. The most frequently cited challenge is the **lack of staff with appropriate competencies**, mentioned 12 times. This is followed by the **absence of a clear strategy**, identified 8 times, and to a lesser extent, the **lack of financial resources** to fund transformation projects, which was mentioned 3 times.



KEY LEARNINGS: The surveyed organisations revealed a challenging overall picture. Both the risks and the pressures to change were rated as extreme, and the sense of urgency was palpable during the interviews. The high levels of pressure and strain are matched by a strong willingness to embrace transformation. Perspectives from companies and BSOs are largely aligned, with only minor differences. Key drivers of this challenging situation include a lack of strategic direction and personnel shortages, encompassing both a general shortage of skilled workers and gaps in necessary competencies. In some cases, limited financial resources for transformation projects were also noted as a barrier.

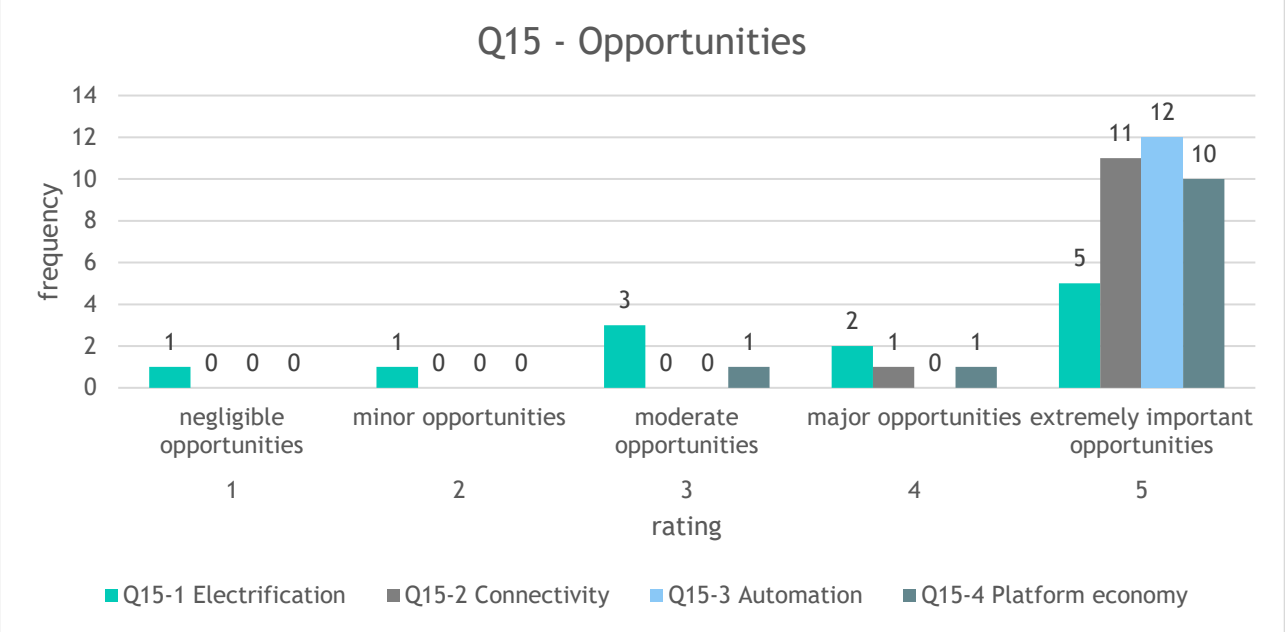
Disclaimer: The surveyed companies primarily focus on business related to ICE vehicles.

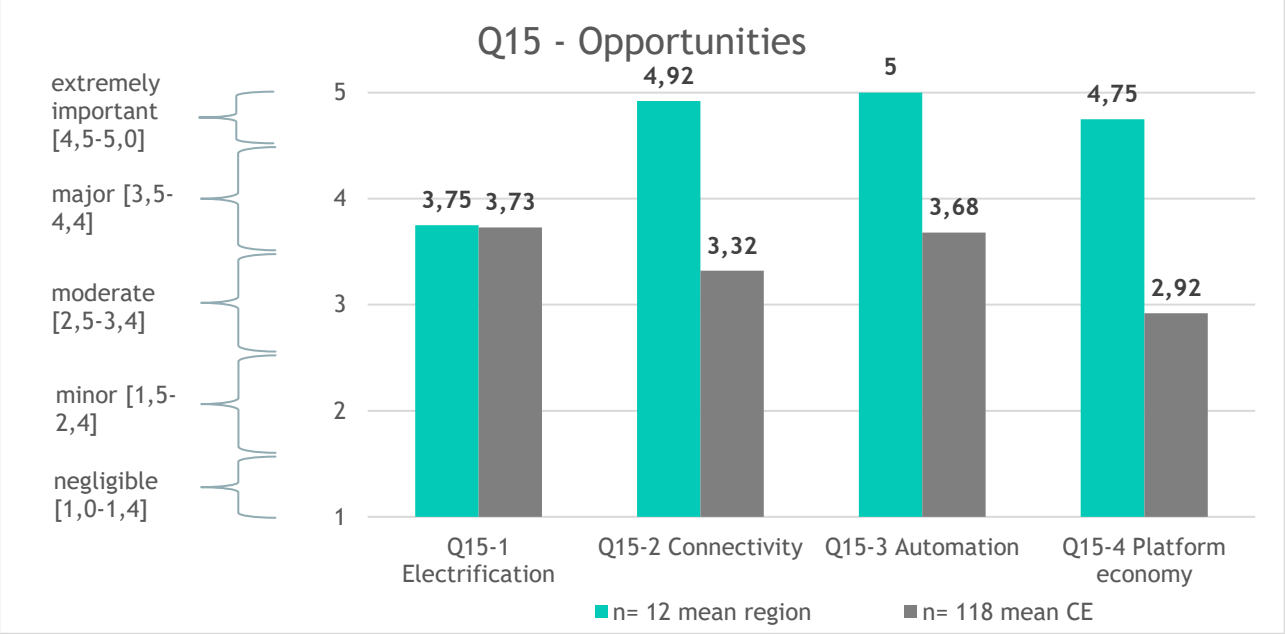
Transformation opportunities and strategic approaches to ensure business continuity in 2024-2030 (Q15-17)

Opportunities to ensure business continuity (Q15)

The assessment of opportunities in **Electrification** across all thematic areas is comparable to the European average. The greatest potential is seen in **Connectivity**, **Automation**, and the **Platform Economy**, with organisations in the Northern Black Forest identifying particularly strong prospects in these fields, exceeding the European average. BSOs also share this positive outlook.

While **Electrification** is considered a major opportunity, it is somewhat less emphasised. This is primarily because most businesses are already deeply engaged in this area and perceive limited additional opportunities beyond their current activities. Despite this, the overall sentiment reflects a recognition of significant opportunities across all assessed fields.





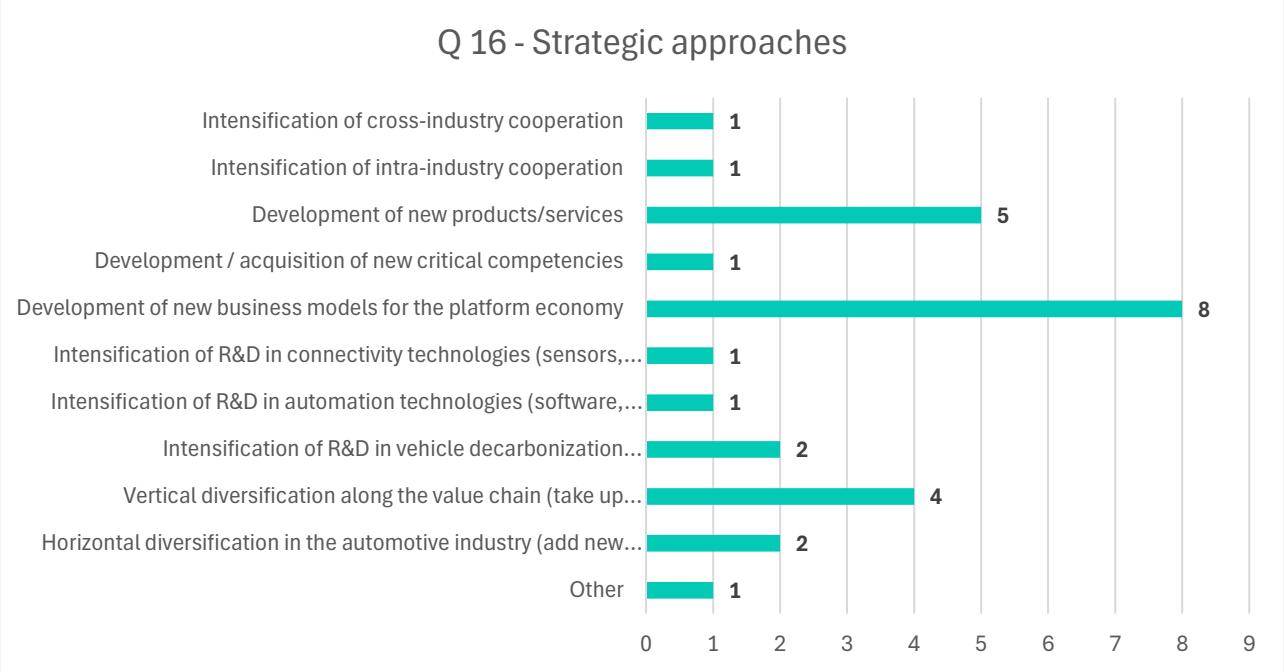
Strategic approaches to seize opportunities (Q16)

The analysis identifies key opportunities for businesses. The most prominent is the **development of new business models for the platform economy**, enabling companies to adapt to digitalisation and evolving industry trends.

Vertical diversification along the value chain offers another opportunity, allowing businesses to take over supplier or client activities, enhancing efficiency and control. Additionally, the **development of new**

products and services highlights the importance of innovation to meet market demands, while horizontal diversification allows companies to expand into related products for new client segments.

Finally, the **intensification of R&D** in vehicle decarbonisation, connectivity, and automation technologies is critical for competitiveness. Together, these opportunities focus on innovation, diversification, and strategic growth for future success.



Technology and skills gaps (Q17)

Those are single answers of the open questions in the questionnaire. It needs to be highlighted that those are only single mentioning's. Interpretation is therefore very difficult. Only few answers were given in these open questions. That is in line with the previous answers on readiness, risks and pressure as most of them have been rated major to extreme.

Skills gaps:	▪ Strategic Development: Lack of expertise in designing and implementing platform-based business models. ▪ R&D Skills: Gaps in knowledge for vehicle decarbonisation, connectivity, and automation technologies. ▪ Diversification Expertise: Insufficient skills for vertical and horizontal diversification within the value chain. ▪ Innovation Competencies: Limited abilities in developing new products and services aligned with emerging markets. ▪ Technical Skills: Need for critical technical expertise in electrification, software, and cross-disciplinary collaboration.

Technology gaps:	▪ Platform Technology: Missing infrastructure for digital platform ecosystems. ▪ Electrification Solutions: Limited access to scalable technologies for electric, hybrid, and hydrogen vehicles. ▪ Automation Tools: Gaps in advanced technologies for connectivity and automated systems. ▪ Value Chain Integration: Insufficient tools for managing vertical and horizontal diversification. ▪ R&D Support: Lack of collaborative research infrastructure for sustainable mobility and digital innovation.

Regional resources and business support ecosystem (Q18-22, 26-27)

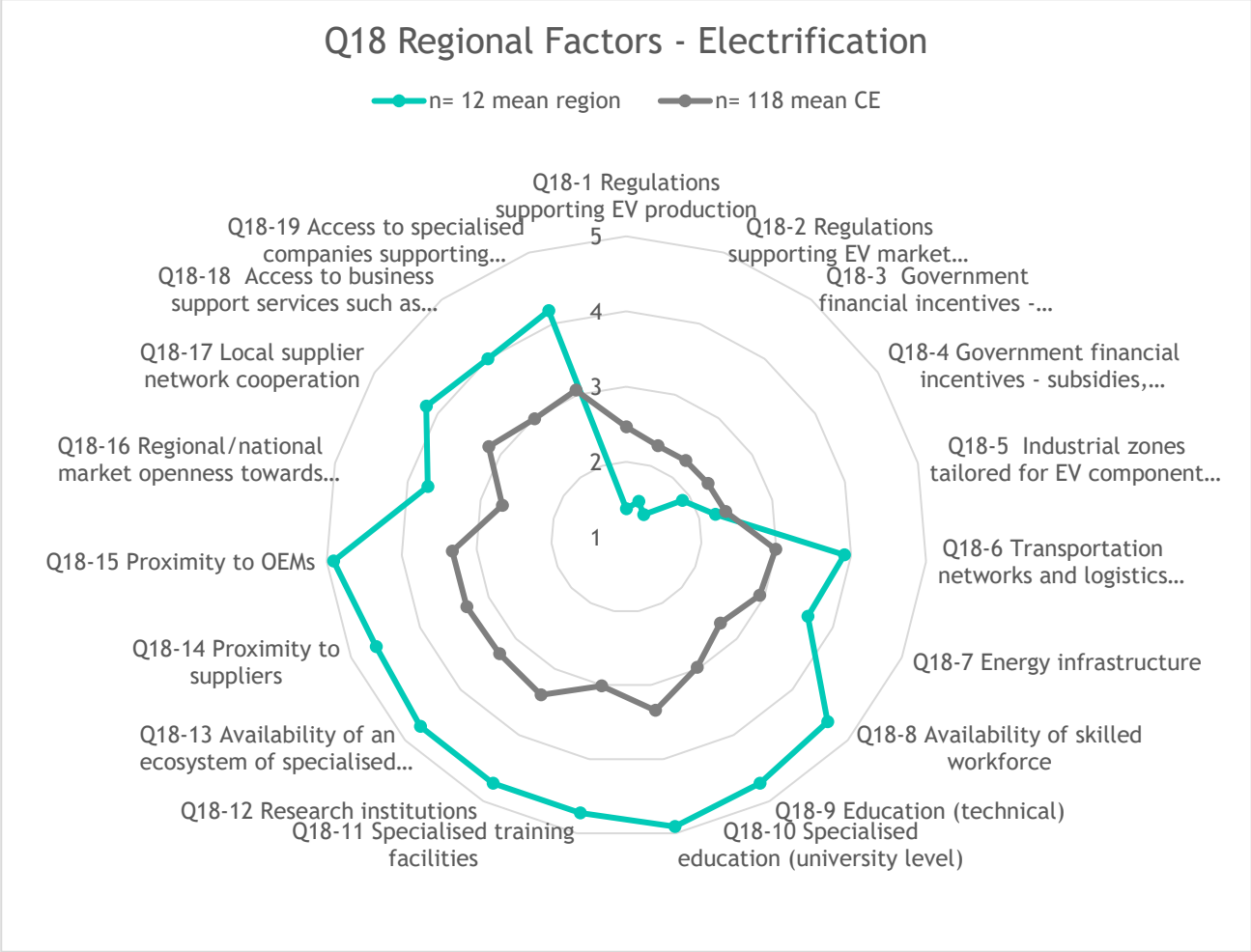
Factors to play a role in automotive in 2024-2030 (Q18-22)

Electrification (Q18)

In the area of Electrification, we are examining which questions are, **on average, rated low**, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Government policies – regulations supporting EV market uptake
- Government financial incentives - subsidies, grants, tax breaks for production companies
- Industrial zones tailored for EV component manufacturing

Areas for improvement in electrification include reducing regulations and bureaucracy, increasing financial incentives for EV purchases, and expanding the energy infrastructure.

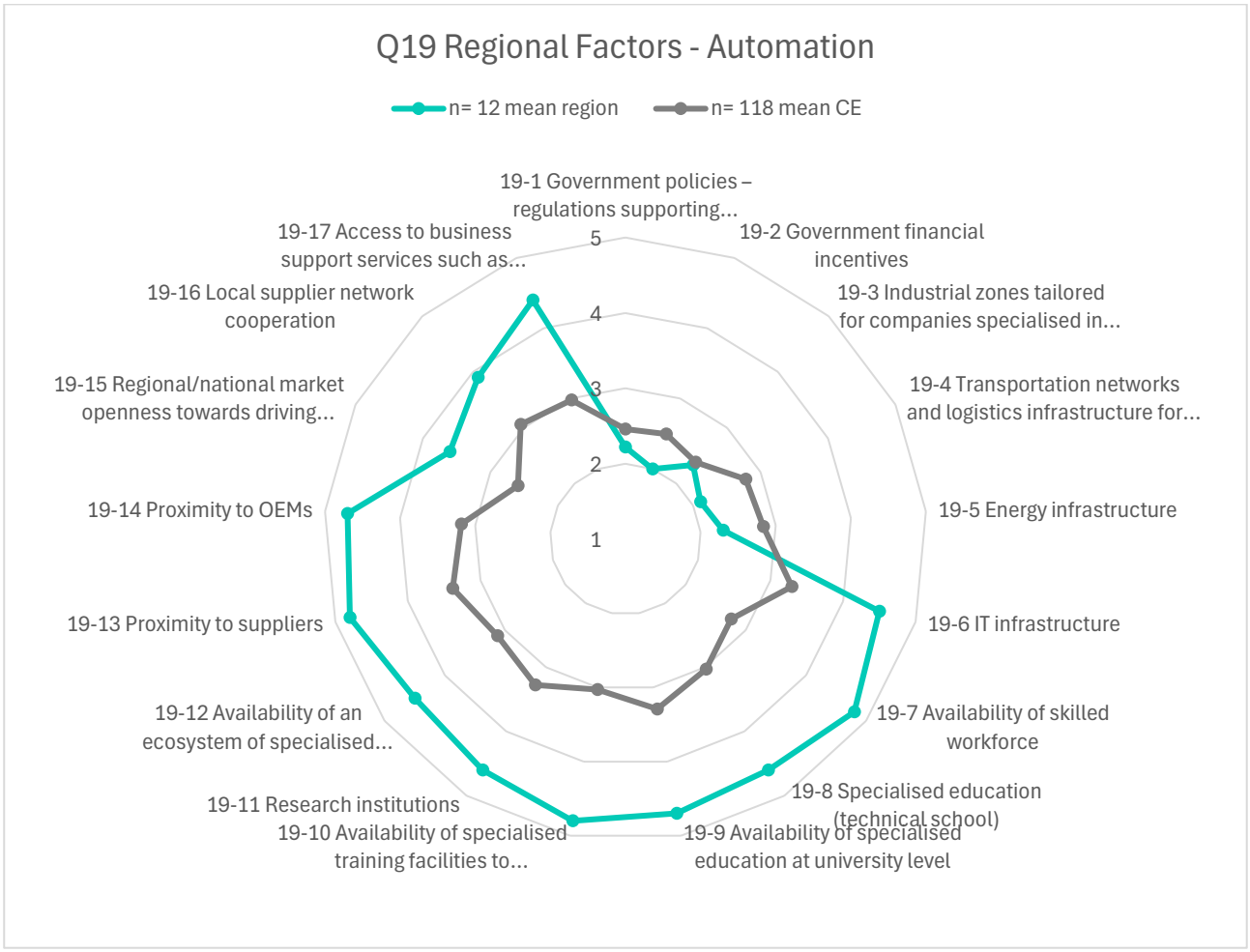


Automation (Q19)

In the area of Automation, we are examining which questions are, **on average, rated low**, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Government policies – regulations supporting EV market uptake
- Government financial incentives - subsidies, grants, tax breaks for production companies
- Industrial zones tailored for EV component manufacturing
- Transportation networks and logistics
- Energy infrastructure

The topics identified here overlap with those in electrification, but there are also notable differences. Common issues include the **lack of government policies and financial incentives** and the absence of **industrial zones specifically designed for EV component manufacturing**. Additionally, challenges related to **transportation networks and logistics** as well as **energy infrastructure** are highlighted.

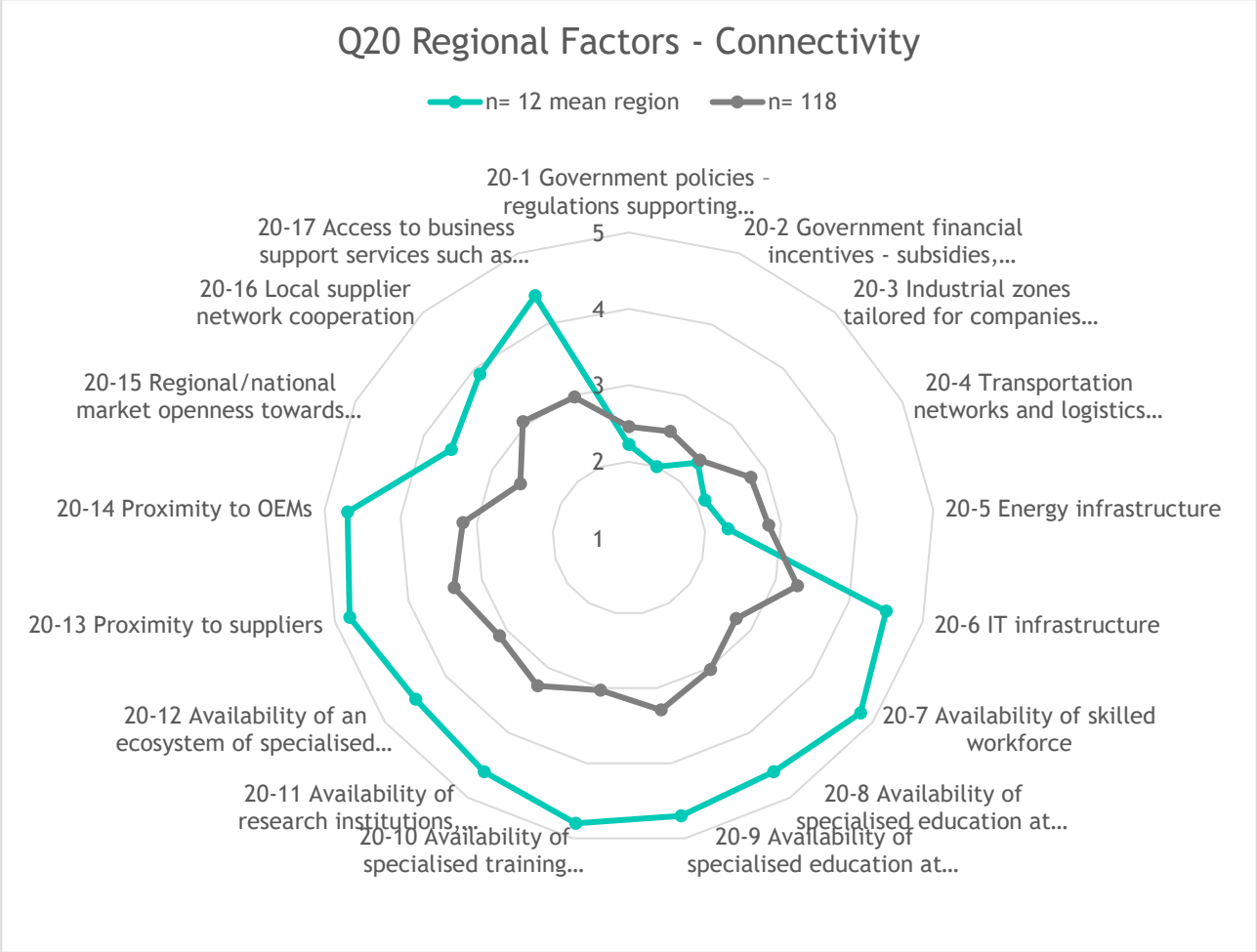


Connectivity (Q20)

In the area of Connectivity, we focus on identifying questions that receive consistently low ratings, specifically in the 1 and 2 range (poor and unsatisfactory). Key areas frequently rated as poor or unsatisfactory include:

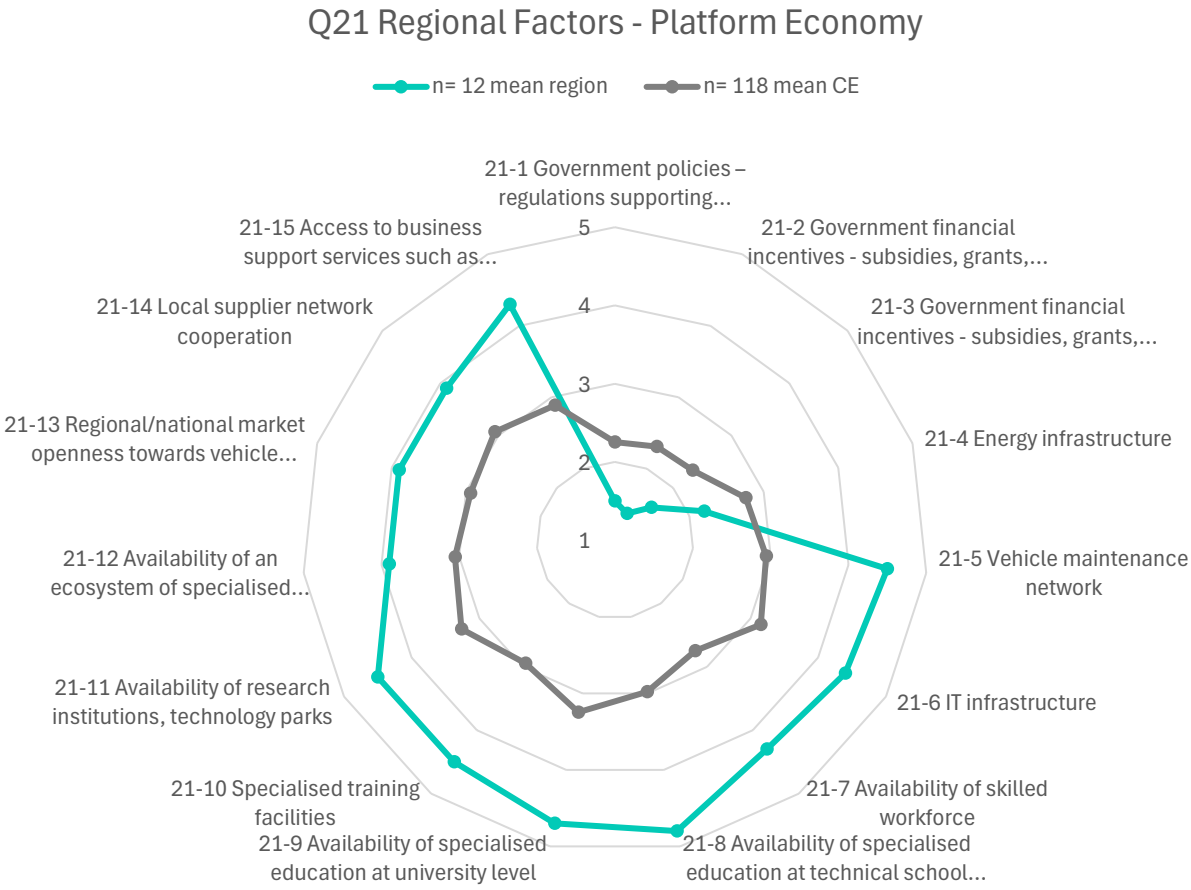
- **Government policies**: Lack of regulations supporting EV market adoption.
- **Government financial incentives**: Insufficient subsidies, grants, or tax breaks for production companies.
- **Industrial zones**: Absence of facilities tailored for EV component manufacturing.
- **Transportation networks and logistics**: Limited infrastructure to support efficient supply chains.
- **Energy infrastructure**: Inadequate systems to meet the demands of EV production and usage.

These issues overlap with those identified in Automation. Common challenges include the absence of government policies, financial incentives, and industrial zones for EV manufacturing, along with persistent gaps in transportation networks, logistics, and energy infrastructure.



Platform Economy (Q21)

In the Northern Black Forest, it is important to note that the data collected from surveyed organisations is too limited, with many respondents selecting "unable to answer." To gain more comprehensive insights, additional companies from the platform economy sector should be included in future surveys, and this area should be further developed through targeted cluster policies. A key finding is the lack of critical elements necessary to support the EV market, including **government policies** (regulations to drive market adoption), **financial incentives** (such as subsidies, grants, or tax breaks for production companies), **industrial zones** designed for EV component manufacturing, **transportation networks and logistics**, and adequate **energy infrastructure**.



KEY LEARNINGS: The transition to EV production and adoption is hindered by several critical gaps. A lack of **government policies** and **financial incentives** (e.g., subsidies, grants, or tax breaks) limits market uptake and industrial growth. Additionally, the absence of **industrial zones** tailored for EV component manufacturing, insufficient **transportation networks and logistics**, and inadequate **energy infrastructure** create significant barriers to scaling EV production and supporting supply chains. Addressing these challenges is essential to accelerate the EV industry's development.

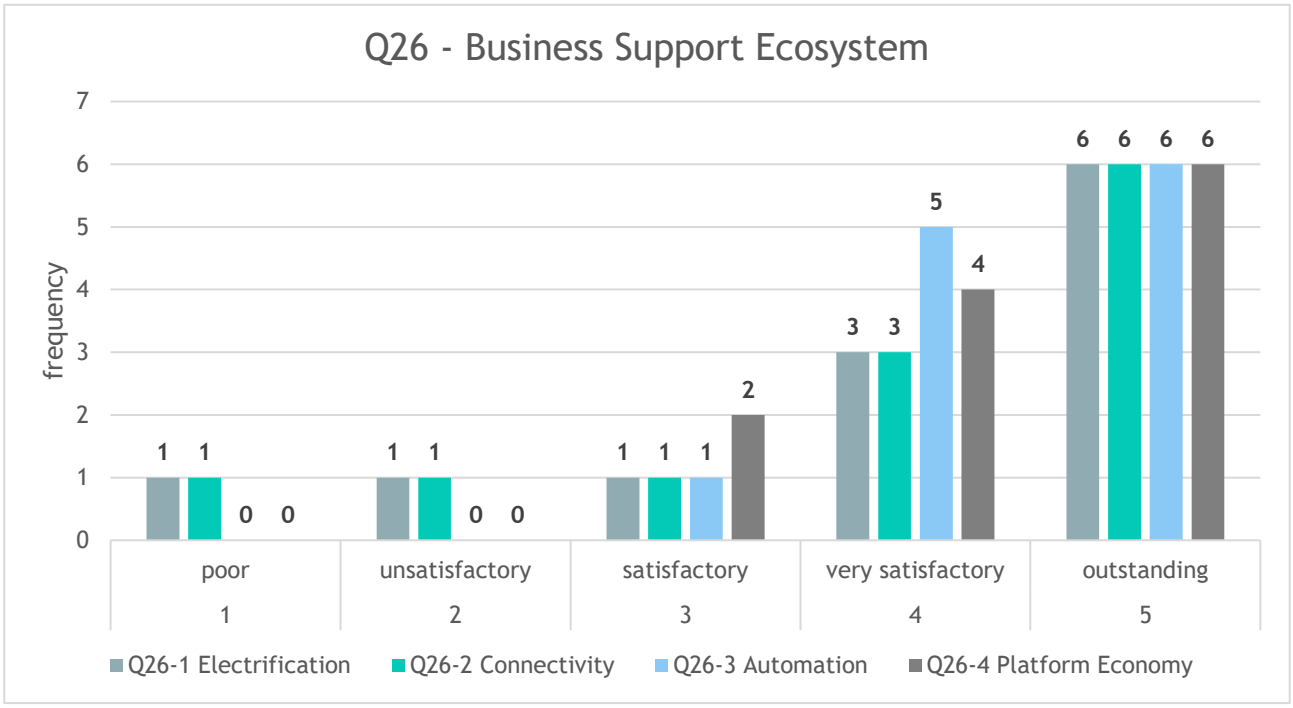
Additional factors influencing the regional competitiveness (Q22)

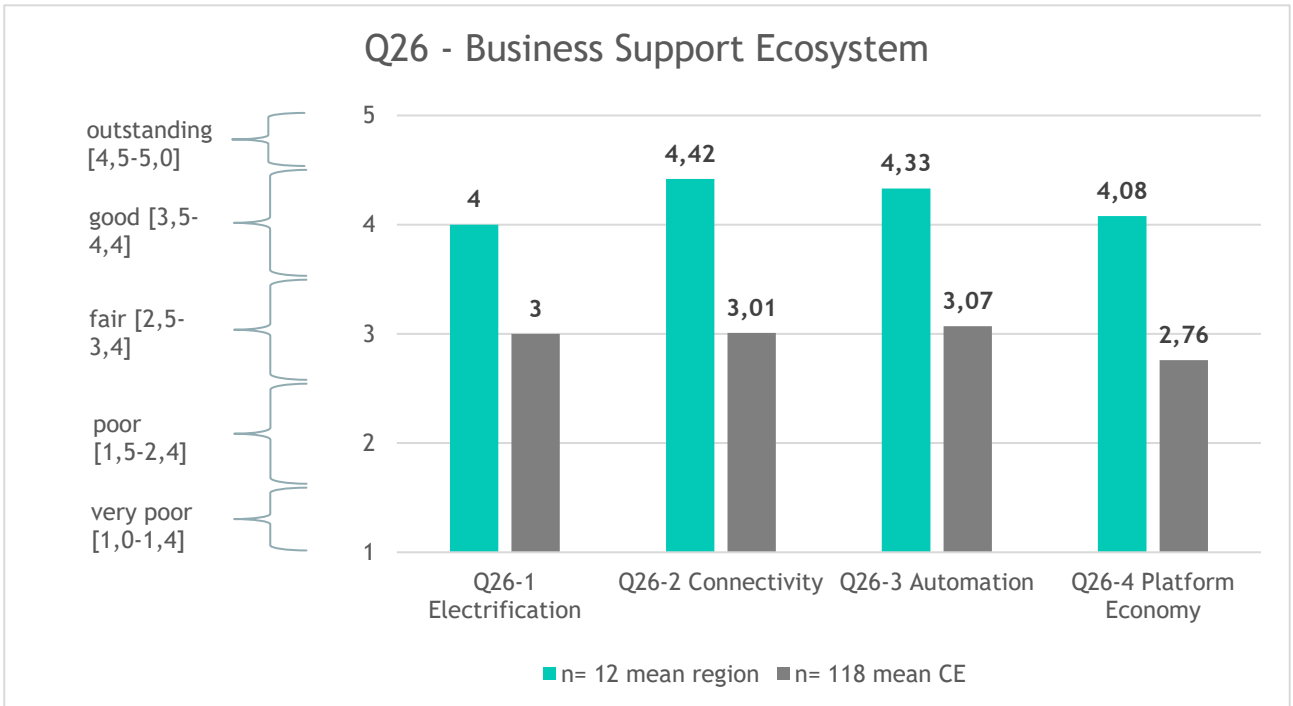
There are growing concerns about the impact of external influences on the regional automotive sector, particularly regarding pressures from global markets and dependencies on international supply chains. To address these challenges, comprehensive strategies are required to safeguard local industries. These strategies could include fostering innovation, enhancing supply chain independence, and strengthening regional competitiveness through targeted government policies, investment in infrastructure, and support for research and development. Building resilience and adaptability will be essential to ensure the long-term sustainability and success of the sector in an increasingly interconnected global market.

Business support services (Q26-27)

The support ecosystem's services are rated between **very satisfactory** and **outstanding** across all four thematic areas, with slight variations. The **Platform Economy** receives the lowest scores, while **Electrification**, **Automation**, and **Connectivity** are rated to **outstanding**. Most BSOs provide services across all three thematic areas, whereas companies tend to specialize in only one or two.

Respondents did not specifically highlight any regional-level services aimed at supporting companies.





KEY LEARNINGS: While support is generally rated highly in most areas, there is a pressing need to expand services significantly to address the immense challenges posed by the transformation of the automotive industry. Focus and development are particularly needed in emerging fields like the **Platform Economy**.

Specialisation level and development perspectives (Q23-25)

Specialisation
In the area of **Electrification**, the region views itself as a well-established automotive hub, with its position rated as **major**. For **Connectivity**, **Platform Economy**, and **Automation**, the ratings range between **major** and **extreme**, indicating significant opportunities and challenges in these fields.

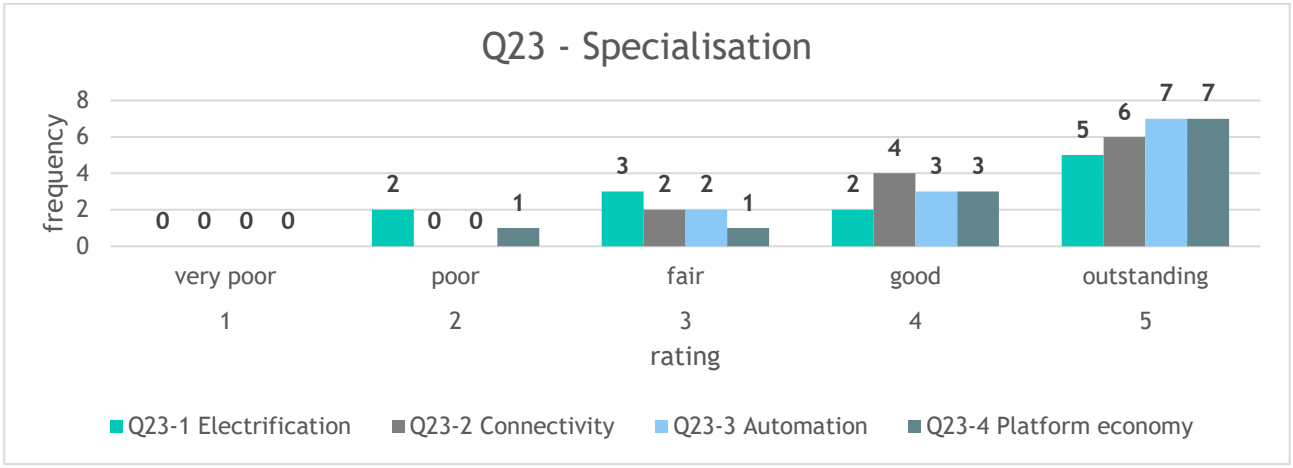
Overall, the region exhibits a mix of **stagnation** and **diversification** in its response to industry transformation. Notably, diversification is on the rise, particularly among **BSOs**, which are increasingly adapting their strategies to address emerging trends and support regional growth.

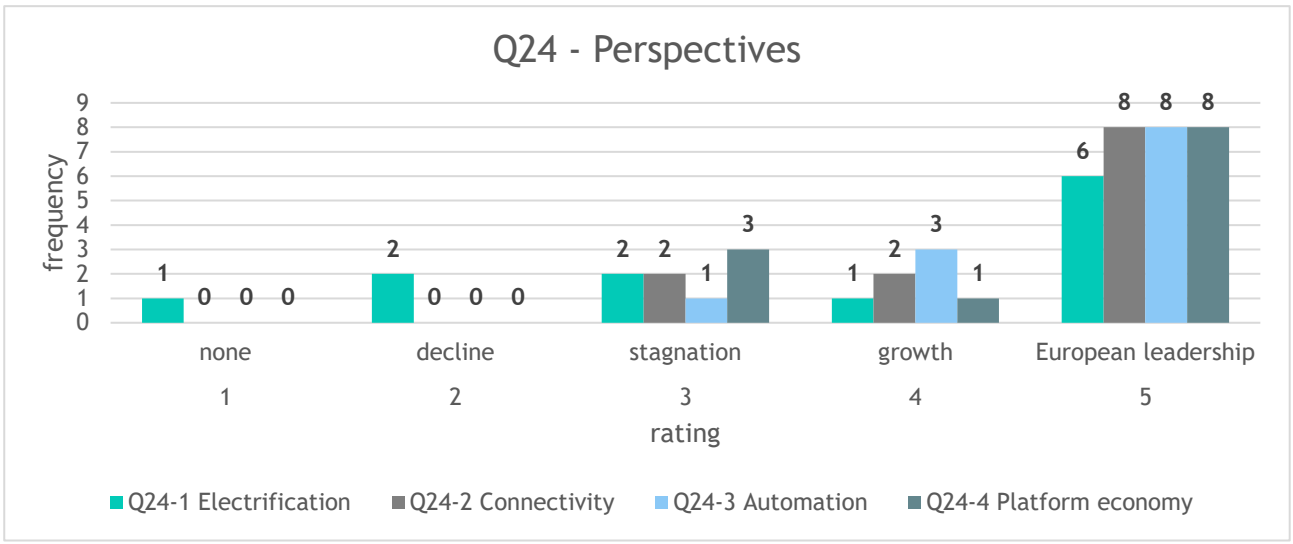
Perspectives
In the field of **Electrification**, the region positions itself as a strong automotive hub, rated as **major** in significance. For **Connectivity**, **Platform Economy**, and **Automation**, the assessments range from **major** to **extreme**, signalling considerable opportunities alongside challenges.

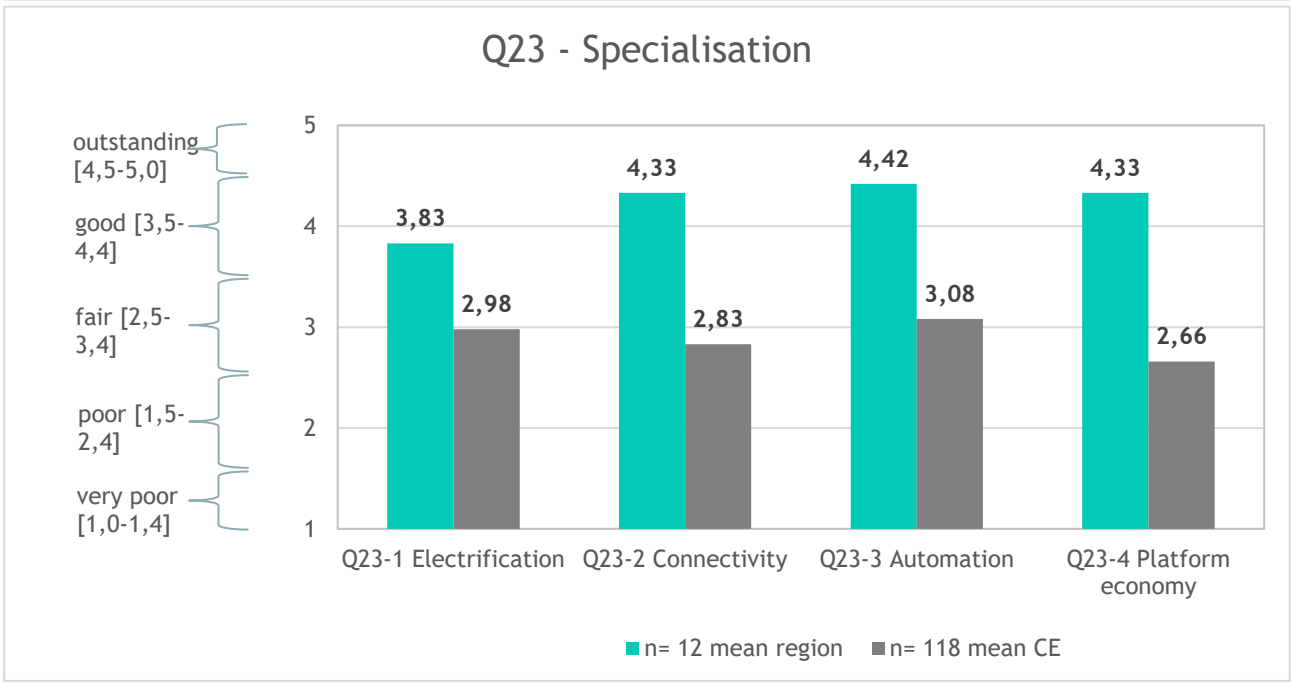
Overall, the region balances between **stagnation** and **diversification** in its approach to industry transformation. Diversification is increasingly prominent, especially among BSOs, which are actively evolving their strategies to address new trends and enhance regional development.

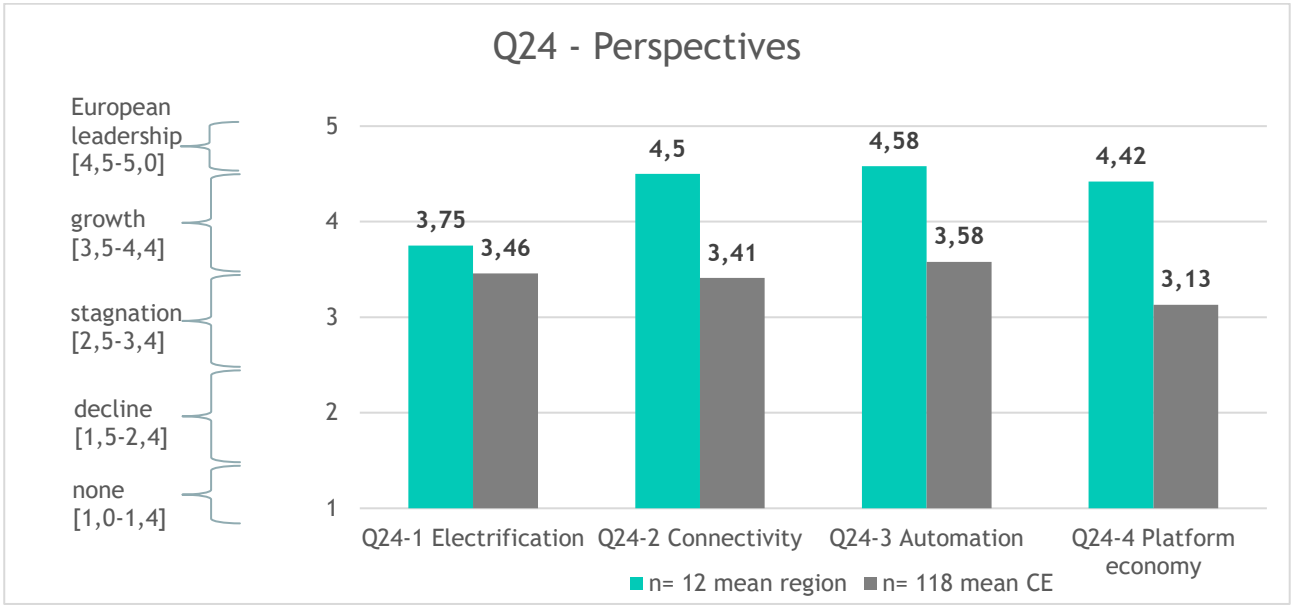
The results regarding specialisation and perspectives are largely found to be consistent in the analysis.

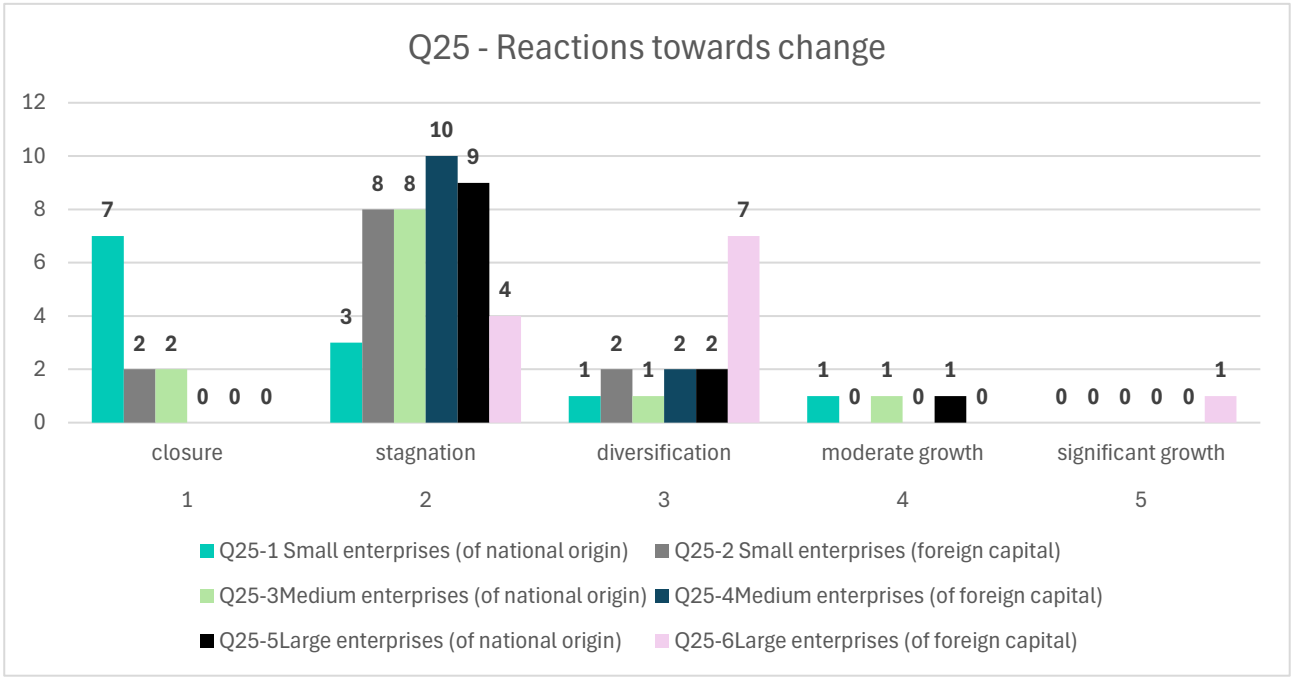
The overall reactions of automotive companies reveal a general tendency toward **stagnation** across most categories. **SMEs**, both with national and foreign capital, primarily show stagnation, with some national SMEs indicating a risk of closure. Similarly, **MEs**, regardless of capital origin, also report stagnation. In contrast, **LEs** with foreign capital stand out, demonstrating a focus on **diversification**, while LEs with national capital remain predominantly stagnant. This highlights varying levels of adaptability and strategic response based on company size and capital structure.

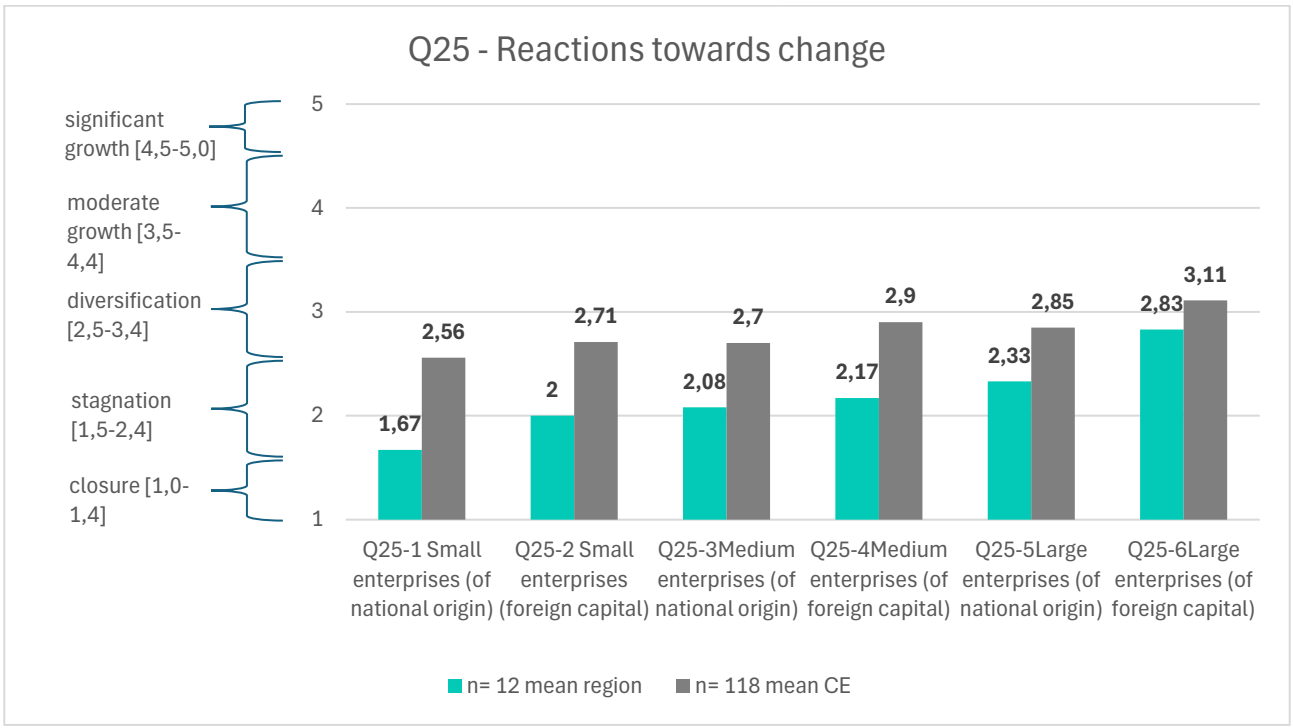

Q23 - Specialisation
frequency
0 2 4 6 8
0 0 0 0
2 0 0 1
3 2 2 1
2 4 3 3
5 6 7 7
very poor
poor
fair
good
outstanding
1
2
3
4
5
rating
Q23-1 Electrification
Q23-2 Connectivity
Q23-3 Automation
Q23-4 Platform economy


Q24 - Perspectives
frequency
0 1 2 3 4 5 6 7 8 9
1 0 0 0
2 0 0 0
2 2 1 3
1 2 3 1
6 8 8 8
none
decline
stagnation
growth
European leadership
1
2
3
4
5
rating
Q24-1 Electrification
Q24-2 Connectivity
Q24-3 Automation
Q24-4 Platform economy


Q23 - Specialisation
outstanding [4,5-5,0]
good [3,5-4,4]
fair [2,5-3,4]
poor [1,5-2,4]
very poor [1,0-1,4]
1 2 3 4 5
3,83
2,98
4,33
2,83
4,42
3,08
4,33
2,66
Q23-1 Electrification
Q23-2 Connectivity
Q23-3 Automation
Q23-4 Platform economy
n= 12 mean region
n= 118 mean CE


Q24 - Perspectives
European leadership [4,5-5,0]
growth [3,5-4,4]
stagnation [2,5-3,4]
decline [1,5-2,4]
none [1,0-1,4]
5
4
3
2
1
3,75
3,46
4,5
3,41
4,58
3,58
4,42
3,13
Q24-1 Electrification
Q24-2 Connectivity
Q24-3 Automation
Q24-4 Platform economy
n= 12 mean region
n= 118 mean CE


Q25 - Reactions towards change
12
10
8
6
4
2
0
7
2 2
0 0 0
3
8 8
10
9
4
1
2
1
2 2
7
1
0
1
0
1
0
0 0 0 0 0
1
closure
stagnation
diversification
moderate growth
significant growth
1
2
3
4
5
Q25-1 Small enterprises (of national origin)
Q25-2 Small enterprises (foreign capital)
Q25-3Medium enterprises (of national origin)
Q25-4Medium enterprises (of foreign capital)
Q25-5Large enterprises (of national origin)
Q25-6Large enterprises (of foreign capital)



Conclusion - Key findings for regional transformation capacities in the automotive sector

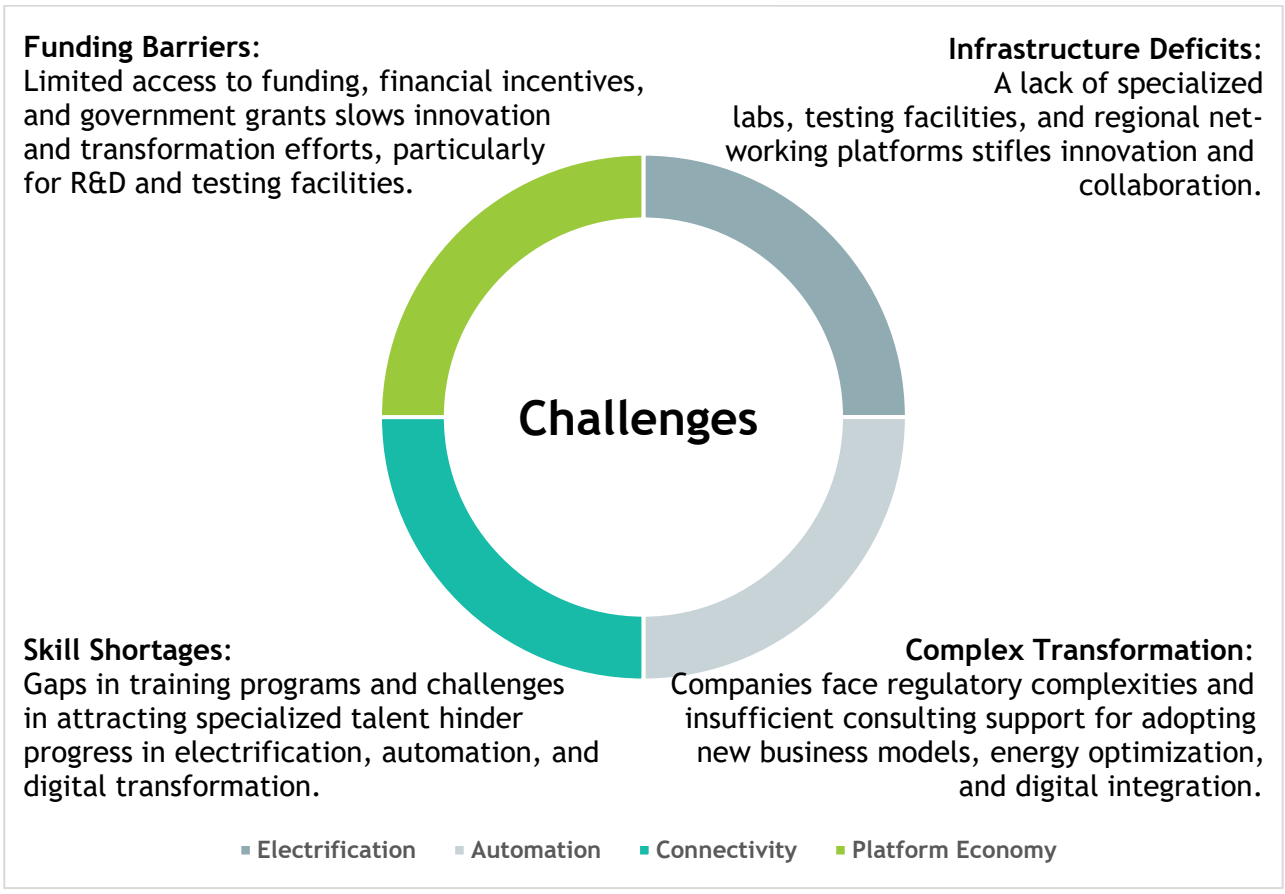
Key Findings

The automotive sector in the Northern Black Forest faces significant pressure, grappling with challenges such as **skilled labour shortages**, **high material and energy costs**, **extensive bureaucracy**, and the urgent need for transformation. These obstacles highlight the need for targeted strategies to support businesses in navigating this critical period.

Despite these challenges, companies recognize **growth potential in automation, connectivity, and the platform economy**, identifying these areas as key drivers for future success. However, stronger local support is needed to capitalize on these opportunities, particularly in the development of **IT skills and services**, **e-mobility infrastructure**, and **technology testing facilities**.

Addressing these gaps and reducing external pressures, such as **global competition**, is essential to sustaining regional competitiveness and fostering innovation through 2030. Surveyed organisations show a **high readiness for transformation**, but their ability to execute depends on collaborative efforts and robust support systems.

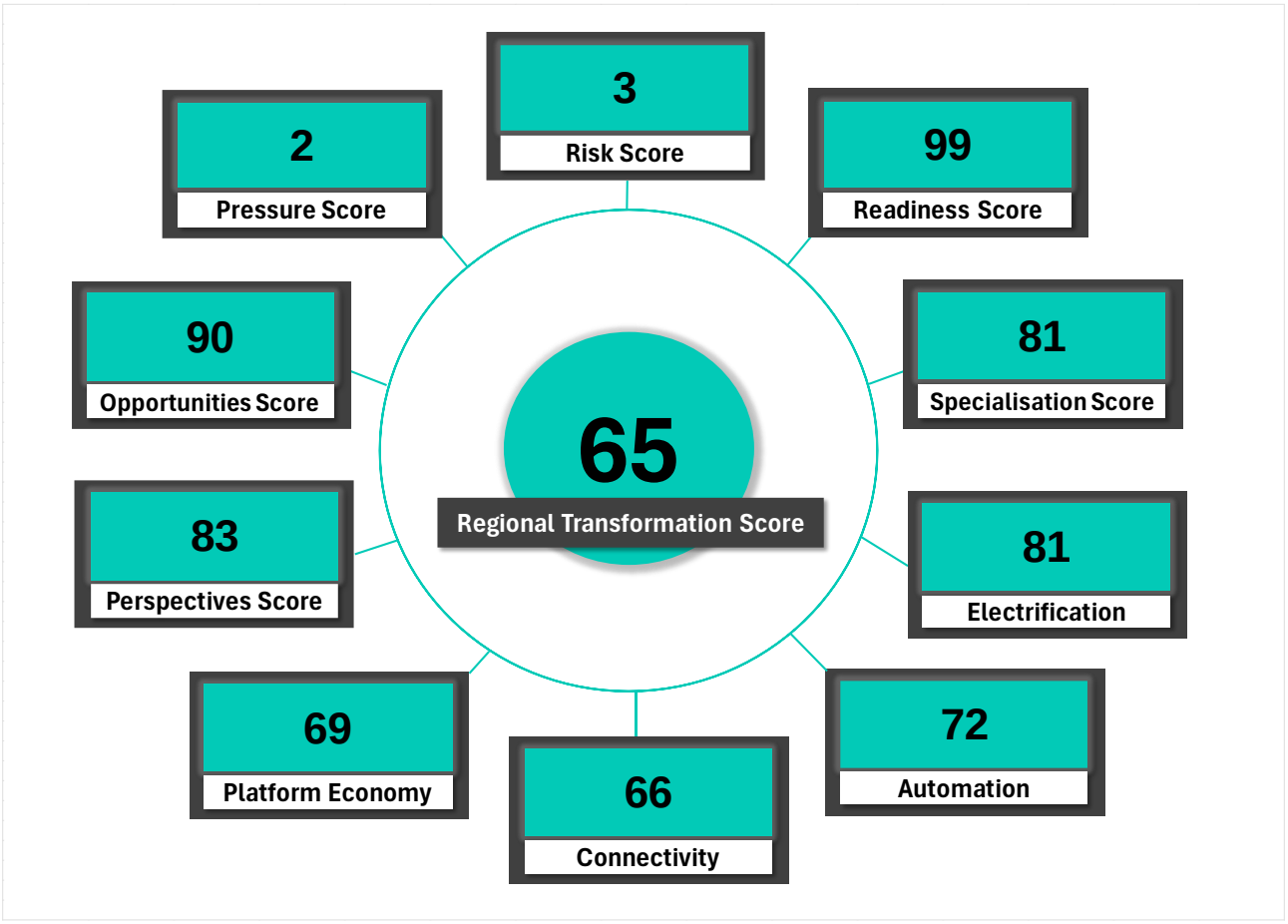
Additionally, both businesses and BSOs report similar levels of stress and pressure, emphasizing the shared urgency to address risks and seize opportunities. To better inform strategies, **more** comprehensive **data and surveys** are needed to refine regional policies and initiatives effectively.



Challenges in Germany – Baden-Württemberg

Transformation Readiness Index - Germany/ Baden-Württemberg

Baden-Württemberg is the only region that is rated as transformation ready. It received very high ratings in all areas, with readiness in particular receiving a top rating. The only exceptions are risk and pressure, which scored very low, indicating that the region is exposed to high risk and pressure.



Ranking:

>60 Transformation Ready

50-60 Moderate Ready

40-50 Limited Ready

30-40 Low Ready

<30 Not Ready

Hungary (PBN)

Brief description of the region

Hungary stands as a vital player in the European automotive industry, a position that reflects both strategic location and commitment to industrial advancement. Positioned in Central Europe with favorable trade routes and connections to key Western markets, Hungary has attracted major global automotive manufacturers and suppliers. Renowned brands like Audi, Mercedes-Benz, and Opel have not only set up production facilities but also invested in extensive research and development hubs. This influx of high-profile companies has propelled the automotive industry to represent about 21% of Hungary's exports, making it an anchor of the national economy and a significant source of employment.

One of the most compelling aspects of Hungary's automotive industry is its proactive embrace of the electric vehicle (EV) transition. Investments from companies like Mercedes-Benz, which is reconfiguring its Kecskemét plant to focus on EVs, demonstrate a shift towards future-oriented production. Furthermore, Hungary is rapidly becoming a hub for battery production, with significant investments from global giants like SK Innovation and CATL. This positioning is not only pivotal for the local automotive industry but also aligns with broader European sustainability and green energy objectives. Hungary’s approach to electrification extends beyond vehicle assembly to include a robust supply chain, reinforcing its role in the green mobility ecosystem.

However, this rapid evolution brings its own set of challenges. Hungary’s automotive industry faces a pressing need to develop the skilled workforce necessary to support advanced technologies like automation, artificial intelligence (AI), and green energy solutions. While Hungary has a skilled labour force, there is a growing gap between current skills and the demands of an increasingly digital and electrified automotive sector. Investment in education and vocational training is becoming critical to ensure that Hungary can meet the sector's evolving demands and sustain its competitive edge. Furthermore, the industry is

constrained by infrastructure that must modernize in tandem with technological advancements, particularly in IT and energy systems, to fully support the high-tech needs of the automotive sector.

Innovation and digital transformation are pillars of Hungary's approach, with a focus on optimizing production processes through advanced automation and data-driven insights. These initiatives are not just about meeting current demand but are aimed at embedding resilience and agility within the industry to navigate future disruptions. The presence of specialised testing facilities, such as the ZalaZONE automotive proving ground for autonomous driving, further illustrates Hungary's commitment to staying at the forefront of automotive technology.

Ultimately, Hungary's position in the automotive industry is marked by an intricate balance of traditional manufacturing excellence and forward-looking innovation. By investing in electrification, digitalisation, and workforce development, Hungary is not only securing its current standing in the European automotive landscape but is also shaping a future as a leader in sustainable and smart vehicle production.

Inventory of companies and business support organisations (BSO) (Q1-8)

Overall, this analysation gathered responses from 10 companies and 3 business support organisations (BSOs), focusing on businesses across various sizes and functions within the automotive sector. All companies surveyed rely significantly on automotive-related revenue, with most reporting that over 50% of their revenue comes from this industry. Their offerings span engineering services, manufacturing components for automotive systems, and logistics.

Companies:

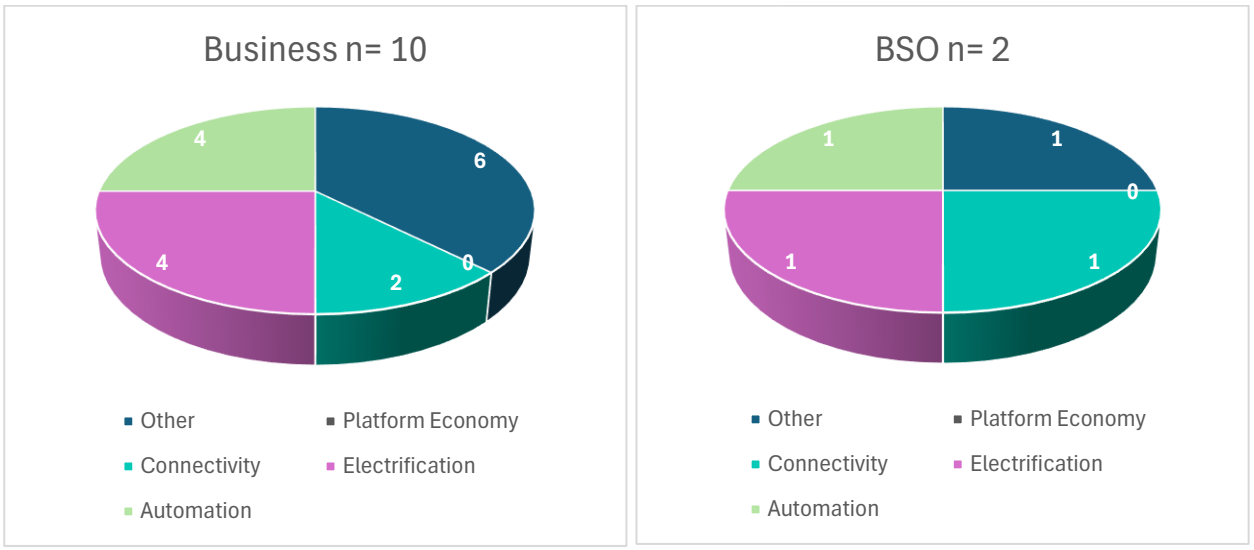
The companies surveyed represent diverse segments, such as manufacturing, logistics, and engineering, and include entities like ZF Hungária Kft., Knorr-Bremse Fékrednszerek Kft., and Opel Szentgotthárd Kft. These organisations span multiple regions in Hungary, including Eger, Kecskemét, and Szentgotthárd, with sizes ranging from small enterprises to large corporations. Notably, organisations like DENSO Manufacturing Hungary Ltd. and thyssenkrupp Materials Hungary Zrt. have substantial employee numbers and turnovers exceeding €100 million, emphasizing their considerable footprint within the automotive sector.

The focus areas across these companies vary, with primary attention given to Automation and Electrification to meet evolving automotive demands. A few companies, such as ElringKlinger Hungary Kft., also support Connectivity, whereas others, like Feintool System Parts Tokod Kft., target a blend of Automation and Platform Economy. A unique aspect of the analysation is the methodology: interviews were conducted through direct conversations, either on-site or online, which improved engagement and ensured clarity, as participants could address questions directly and share nuanced insights.

Business Support Organisations (BSOs)

The 3 BSOs interviewed serve critical roles within Hungary's regional automotive ecosystem, operating in areas like consulting, media, and advocacy. These include STAUFEN (specializing in corporate consulting with a focus on Electrification and Automation), MAGE (Hungarian Association of the Automotive Industry, which supports multiple thematic areas), and Trivero Ltd., which provides automotive media and services.

BSOs in this analysation support diverse thematic areas, covering all four target areas—Automation, Electrification, Connectivity, and Platform Economy. This broad focus underscores their role in fostering an adaptable regional ecosystem capable of responding to shifts in the automotive industry. These organisations set incentives for future industry growth, providing essential support for companies of various scales within the regional ecosystem.



Transformation risks, pressure and readiness for business continuity in 2024-2030 (Q10-14)

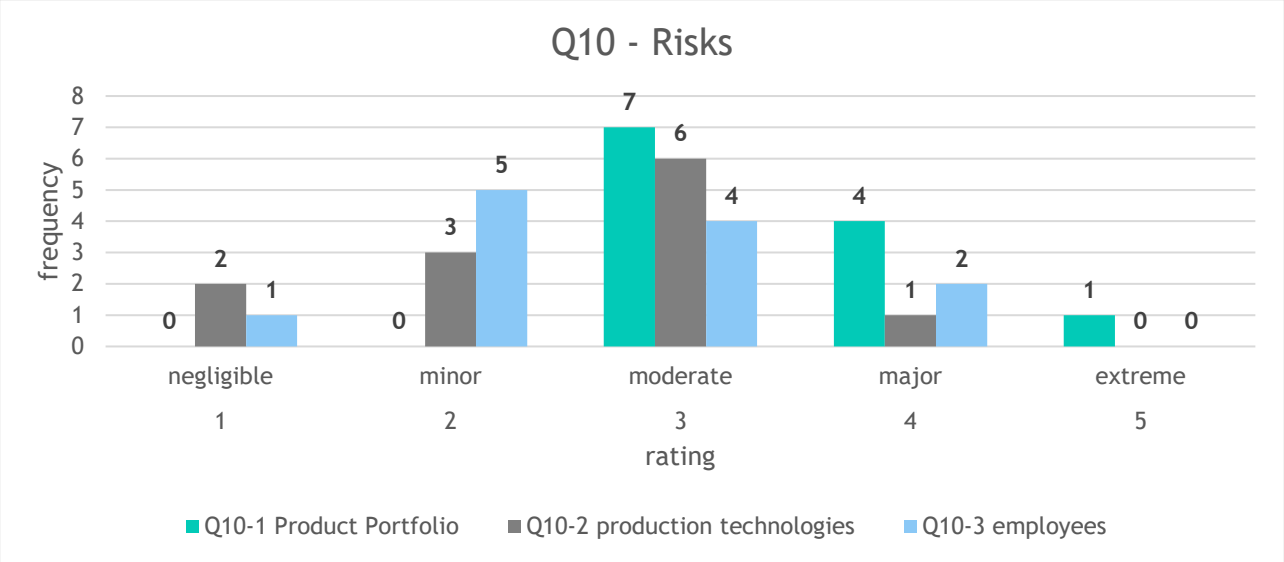
Risks endangering business continuity (Q10-11)

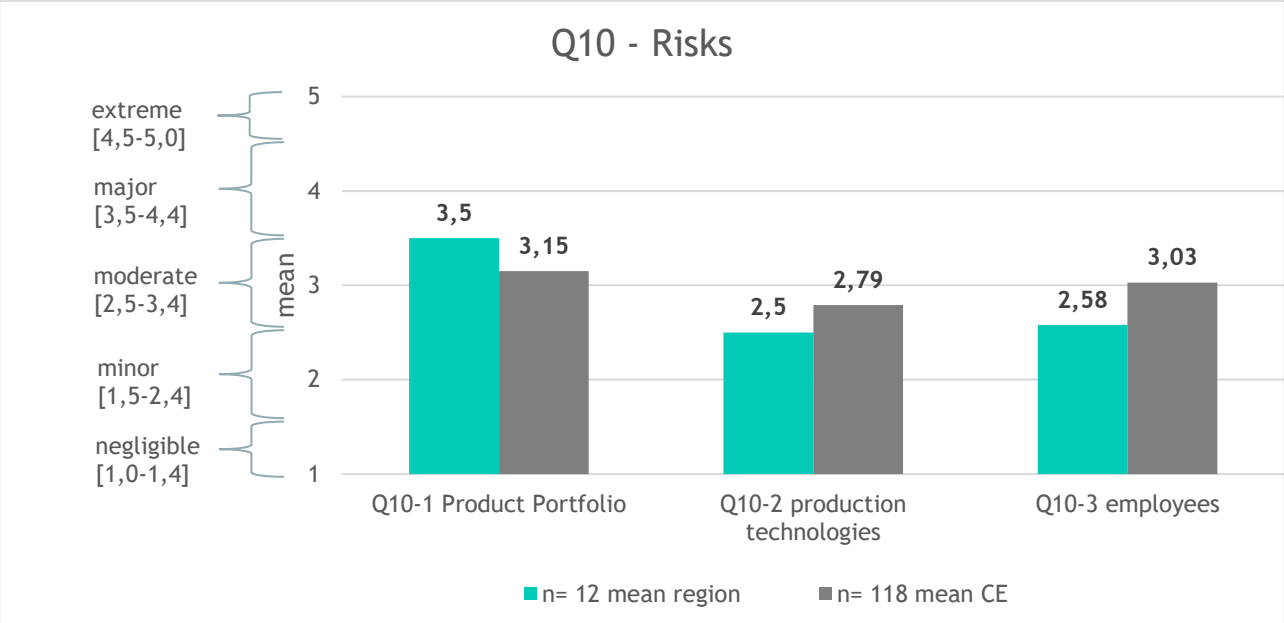
In Hungary, the risk assessment for the automotive sector shows varying levels of concern across different areas when compared to the Central European (CE) average. The risk associated with product portfolios is rated as moderate, with a mean score of 3.5, slightly higher than the CE average of 3.15. Hungarian automotive companies see this area as moderately impactful, with ratings ranging from 2 (minor risk) to 4 (major risk). This elevated concern may stem from the competitive pressures and variability in the Hungarian market, which lead firms to feel more exposed to shifts in product demand and requirements. Interviews with company representatives indicate that market competitiveness and the rapid pace of transformation contribute to this sense of vulnerability.

Regarding production technologies, the risk level in Hungary is rated as minor, with a mean score of 2.5, slightly below the CE average of 2.79. Hungarian firms appear to feel well-equipped in this area, with most ratings falling between 1 (negligible) and 3 (moderate). Discussions reveal that Hungary's established manufacturing capabilities and recent investments in advanced technology contribute to the lower perceived risk in production technologies. This positions Hungary advantageously within the CE region, as firms feel relatively secure in their technological infrastructure and innovation capacities.

The risk associated with employees in Hungary is also assessed as moderate, with an average score of 2.58, lower than the CE average of 3.03. Hungarian companies generally rate this risk as moderate, reflecting a consistent level of concern regarding talent availability and retention. However, this concern is not as pronounced as in other Central European regions, where the risks related to employees are seen as higher. Interviews suggest that although workforce challenges exist, Hungarian companies benefit from a stable, albeit limited, talent pool that possesses industry-specific skills in the automotive sector.

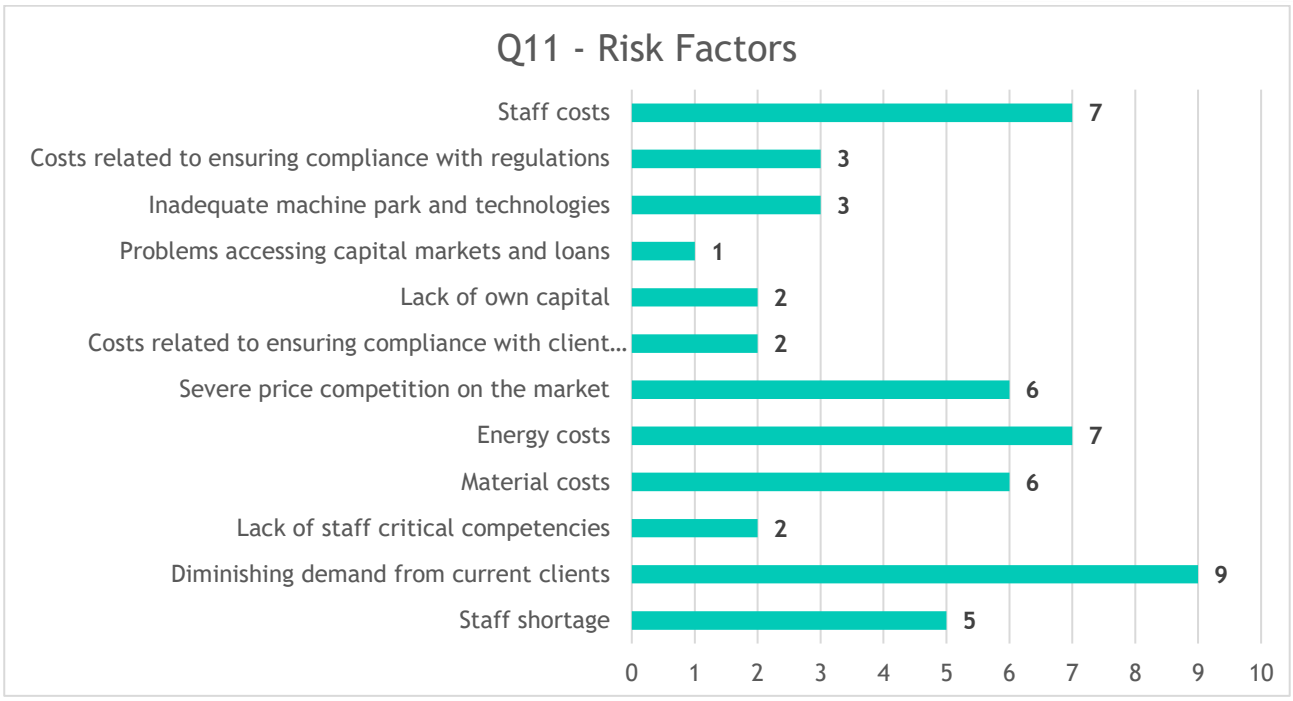
In summary, the overall risks for Hungarian automotive companies are moderate, though they show distinct characteristics compared to the CE average. The slightly higher perceived risk in product portfolios reflects concerns about market adaptability and competitive pressures, while the lower risk assessment for production technologies highlights Hungary's strength and stability in this area. Employee-related risks, while moderate, indicate a relatively stable situation, although challenges could grow as industry demands continue to evolve.





The three most significant risk factors in Hungary, as shown in the chart, are diminishing demand from current clients, staff costs, and severe price competition in the market. These issues pose substantial challenges. Diminishing client demand could destabilize revenues, especially as existing clients seek cost reductions or alternative suppliers. High staff costs impact company profitability, making it difficult for Hungarian firms to compete on an international level. Severe price competition, especially in automotive and manufacturing industries, pressures companies to lower prices, which may affect quality and innovation capacity.

In addition to these top three risks, other notable factors include energy costs, material costs, and staff shortages. Rising energy and material costs strain operating budgets, especially in energy-intensive industries. Staff shortages and lack of critical competencies further complicate operational stability, making it challenging for companies to meet production targets and maintain quality standards. Addressing these risks is essential for maintaining competitiveness in Hungary's automotive sector and beyond.



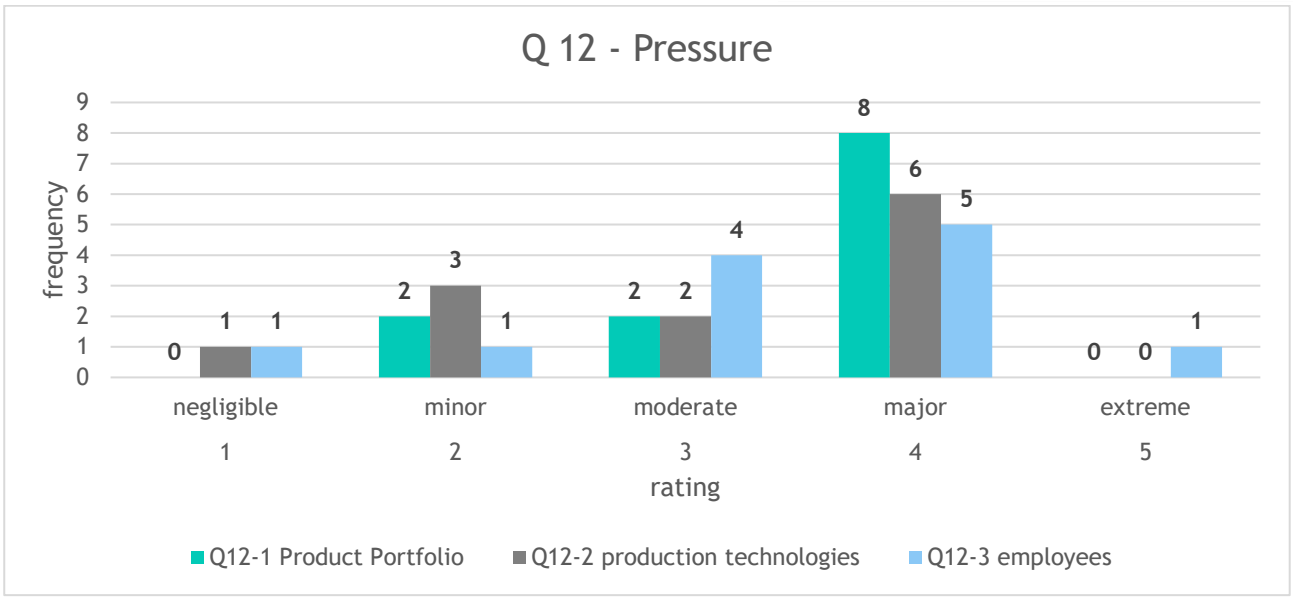
Pressure to change business for ensuring business continuity (Q12)

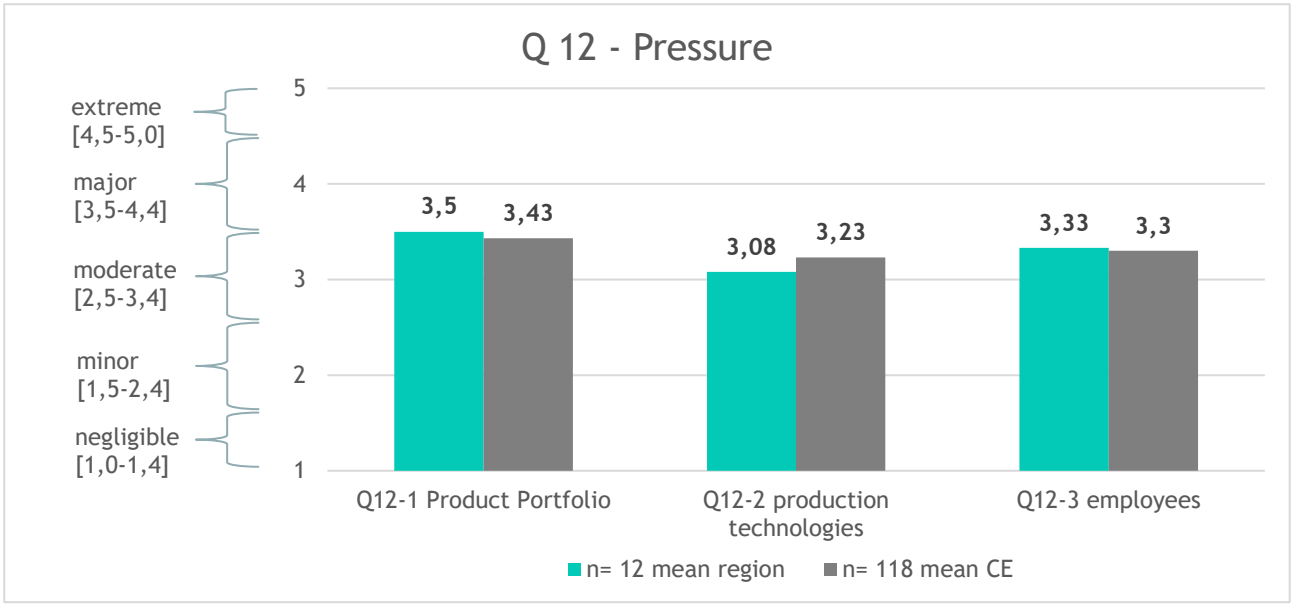
The assessment of pressure to change in Hungary shows that companies experience a moderate need to adjust in areas critical for business continuity, with slight variations when compared to the Central European (CE) average. In product portfolio, Hungarian companies report a pressure level of 3.5, which is slightly higher than the CE average of 3.43. This suggests a moderate but somewhat elevated pressure within Hungary to adapt product offerings, likely in response to regional market demands and competitive shifts.

In the area of production technologies, the perceived pressure in Hungary stands at 3.08, a bit lower than the CE average of 3.23. This indicates a relatively moderate urgency for technological updates in Hungary, with companies generally rating this aspect as important but not critical. No company perceives this pressure as extreme, though the range does extend from moderate to high in specific cases.

Regarding employee competencies, Hungary's pressure level of 3.33 closely aligns with the CE average of 3.3, reflecting a shared understanding across regions of the importance of workforce upskilling. In Hungary, responses vary more significantly, with some companies viewing the pressure as low, while others already experience it as extreme, highlighting a divide in how urgently companies feel the need to develop employee skills.

Overall, Hungarian companies tend to feel a moderate level of pressure across these areas, comparable to or slightly higher than the CE averages. There is, however, an emerging trend toward heightened pressure, especially in product adaptation and employee competency, as companies work to stay competitive amid industry changes.





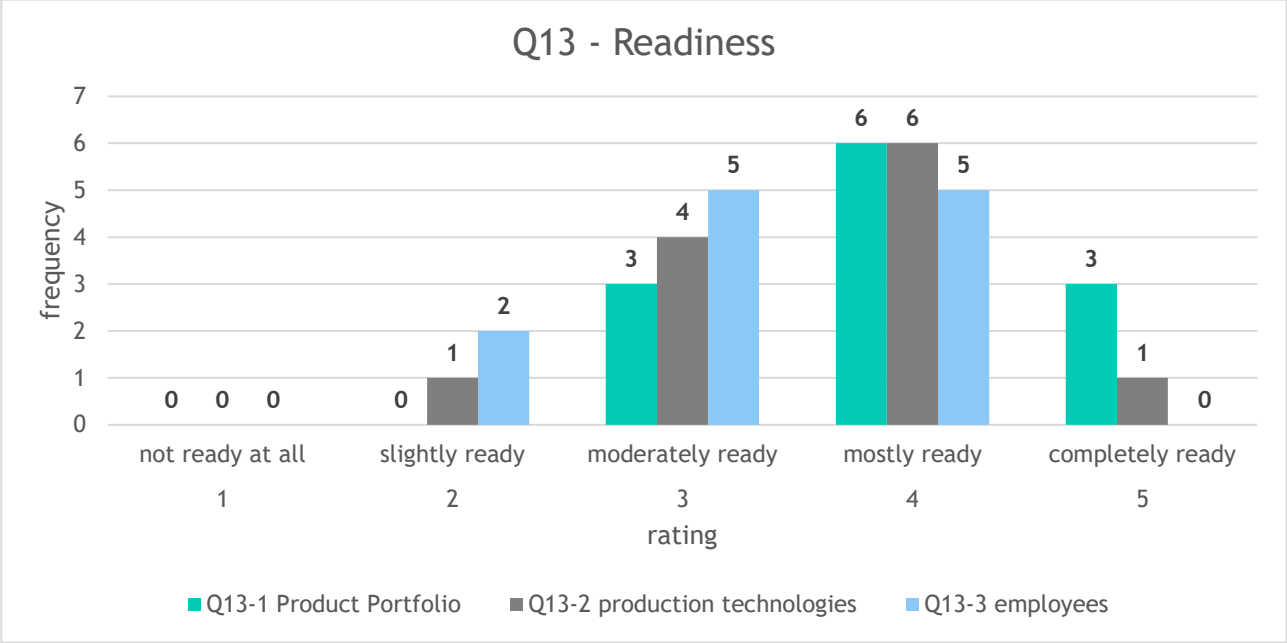
Readiness to change business for ensuring business continuity (Q13)

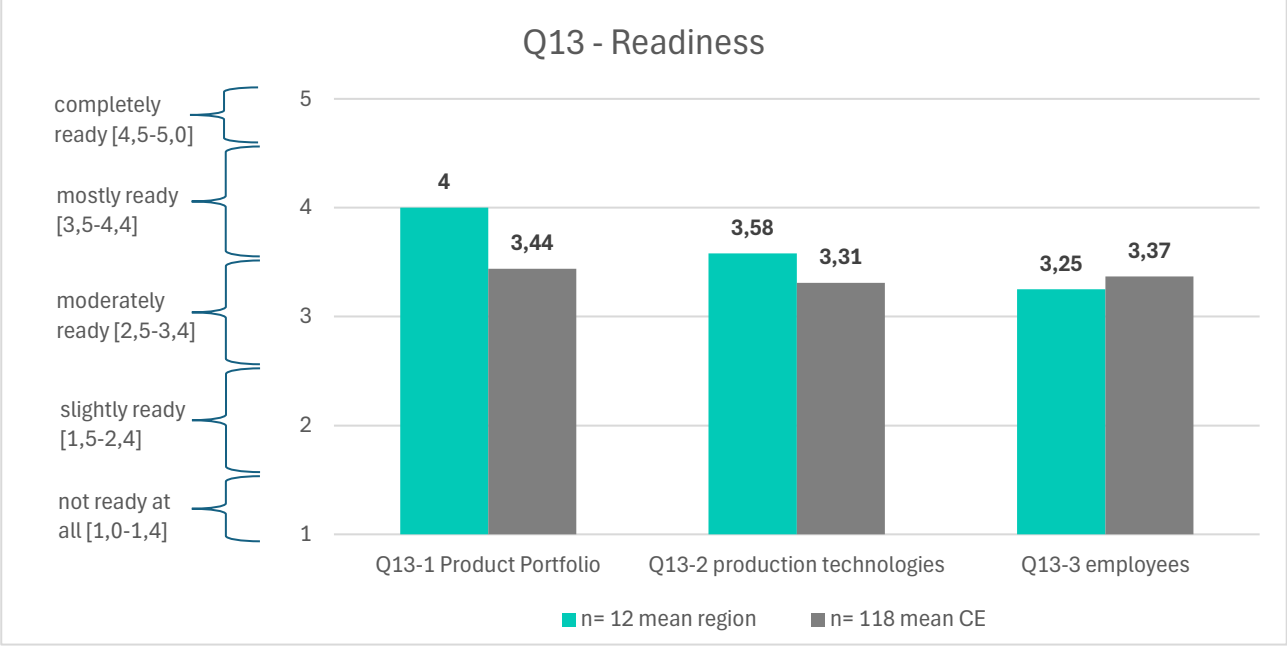
Based on the Q13 readiness assessment for Hungary, the region shows a moderate to high level of readiness compared to the European Central region (CE) in the areas of product portfolio, production technologies, and employee skills.

- **Product Portfolio:** Hungary's readiness is rated with a mean score of 4, compared to the CE average of 3.44. This indicates a higher perceived preparedness of Hungarian companies in adapting their product portfolios to automotive industry changes, especially in electrification and automation.
- **Production Technologies:** The Hungarian region scores 3.58, slightly above the CE average of 3.31. This reflects relative competitiveness in updating manufacturing processes, which is essential for adapting to new automotive technologies. Hungarian companies seem to have some edge in deploying production technology that aligns with industry transformation trends.

- **Employees:** For workforce readiness, Hungary's average score is 3.25, which is slightly lower than the CE average of 3.37. This suggests that although the workforce is fairly prepared, there may be room for improvement in employee training and skills development to fully meet the demands of the evolving automotive landscape.

Overall, Hungary displays solid readiness in product portfolio and production technologies but lags somewhat in workforce readiness. This aligns with the Drive2Transform project's broader aim of enhancing readiness across these thematic areas. The assessment indicates that while Hungary is mostly on par or slightly ahead in technical readiness, there might be a need for targeted interventions in workforce development to strengthen overall transformation capabilities.



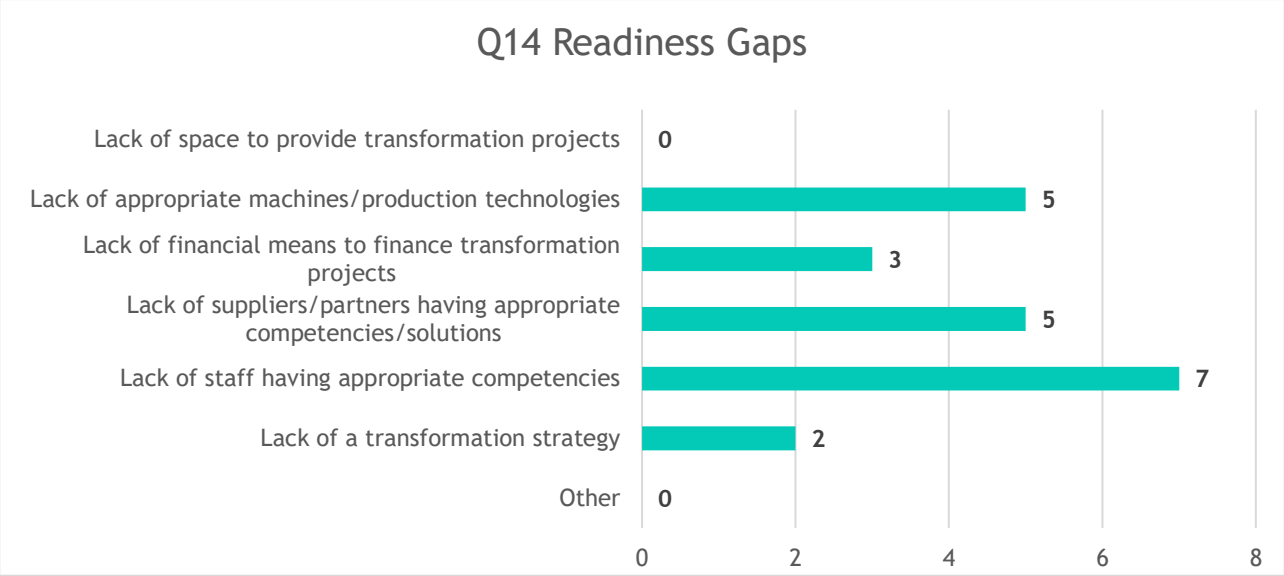


Main readiness gaps hindering businesses from starting a transformation process (Q14)

Hungarian companies face significant challenges in their readiness for transformation projects. The primary issue is a shortage of staff with the necessary skills, which is essential for driving innovation and adapting to new technologies. Additionally, companies are struggling to find suppliers or partners who can offer the specialised competencies or solutions needed to support transformation efforts, making collaboration and technological advancements more difficult.

Many companies are also hindered by outdated machinery and production technologies, which limits their ability to keep pace with industry standards in areas like automation and electrification. Financial constraints add another layer of difficulty, as some organisations lack the funds needed to invest in essential transformation projects. Furthermore, a few companies lack a clear transformation strategy, which can leave them without a defined path to navigate industry changes effectively.

Together, these readiness gaps highlight the need for a comprehensive approach, including workforce development, financial support, technology upgrades, and strategic planning, to enable Hungarian companies to adapt to the evolving demands of the automotive sector.



KEY LEARNINGS: The perspectives on risks, pressure, and readiness are largely in alignment. Product portfolios experience moderate-to-high risk and pressure, with readiness levels showing relative strength. Production technology exhibits low risk and moderate pressure, with high readiness levels. Employee-related factors exhibit moderate risk, pressure, and readiness, indicating that while Hungarian companies feel generally prepared, there is a recognised need for continued workforce development. This alignment underlines a balanced yet cautious approach toward transformation in Hungary's automotive industry.

Transformation opportunities and strategic approaches to ensure business continuity in 2024-2030 (Q15-17)

Opportunities to ensure business continuity (Q15)

The Q15 assessment of thematic opportunities in Hungary reveals a nuanced view across the areas of Electrification, Connectivity, Automation, and Platform Economy. When comparing the Hungarian companies' perspectives to the Central European (CE) average, several interesting insights emerge.

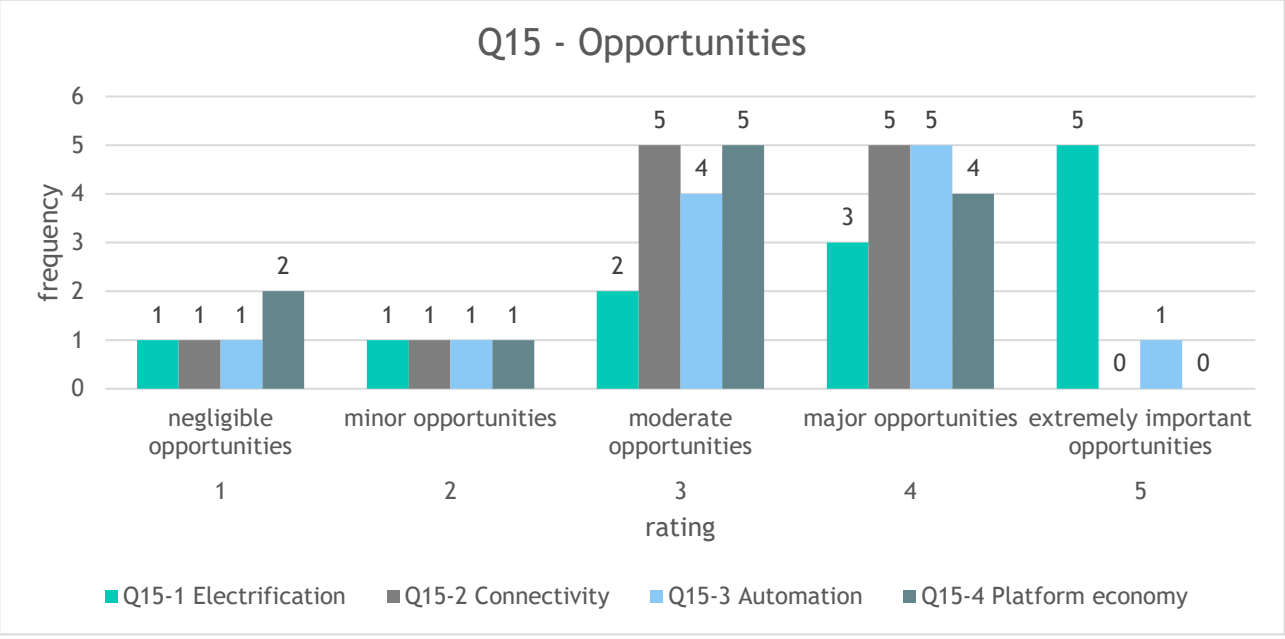
In the area of **Electrification**, Hungarian companies perceive high opportunity, assigning it an average score of 3.83, which is slightly higher than the CE average of 3.73. This reflects a strong optimism about the electrification trend, likely driven by growing demand for electric vehicles and supportive policies within the region. Electrification is seen as one of the most promising areas, with a substantial number of Hungarian companies rating it as either a major or extremely important opportunity. This enthusiasm suggests that Hungary may be well-positioned to capitalize on the shift toward electric mobility.

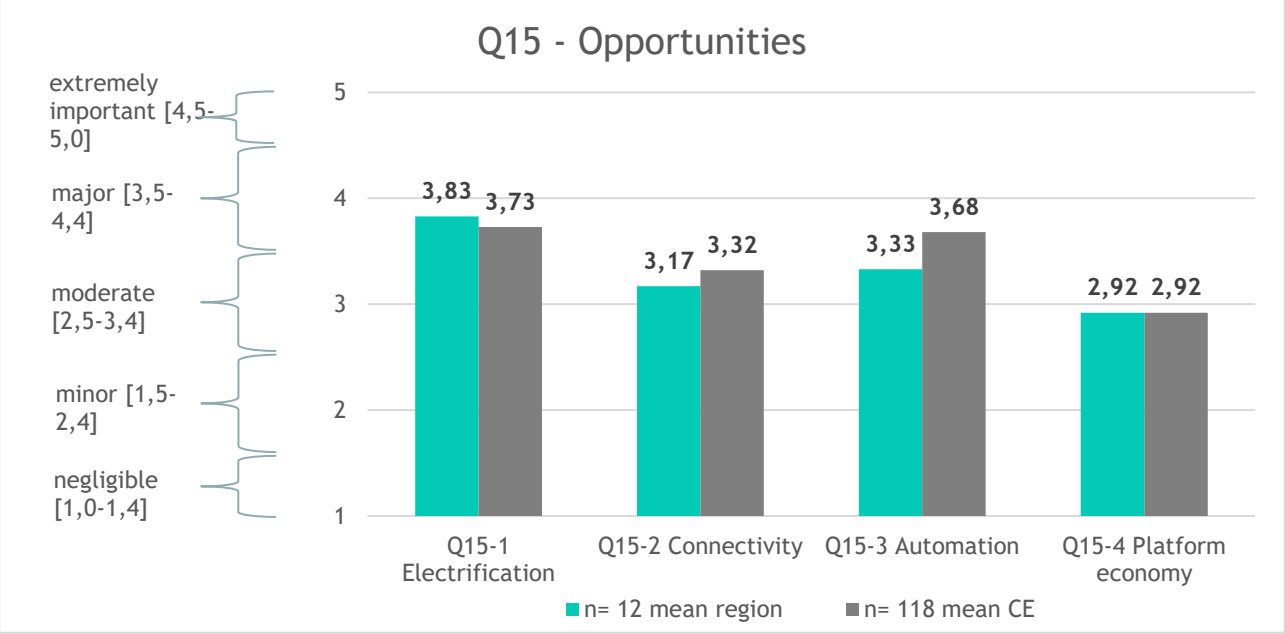
In contrast, **Connectivity** is rated lower in Hungary, with an average score of 3.17, compared to the CE average of 3.32. This indicates that Hungarian companies see slightly less potential in connectivity than their CE counterparts. This could be due to limited existing infrastructure or a lesser allocation of resources towards connectivity-focused advancements in Hungary. While connectivity is viewed as a moderate opportunity, it does not receive the same priority as other areas, suggesting room for growth with further investment and support.

Automation is another area where Hungarian companies show slightly less enthusiasm, with a score of 3.33 compared to the CE average of 3.68. Although automation remains a recognised opportunity, Hungarian companies appear less optimistic about its potential than those in other regions. This lower rating may reflect challenges in adopting automation technologies, possibly due to resource constraints or the slower pace of updating manufacturing systems. Enhancing automation readiness could therefore represent an area for targeted initiatives to bring Hungary closer to the regional average.

Finally, **Platform Economy** receives a score of 2.92, which is identical to the CE average. This suggests that both Hungarian companies and their CE counterparts view platform economy opportunities as relatively low in the current landscape. This likely reflects the nascent state of digital platform development within the automotive industry across Central Europe, where the platform economy is seen as a longer-term opportunity that will require further ecosystem development before reaching its full potential.

In summary, Hungarian companies view Electrification as the most promising thematic area, seeing slightly greater opportunity than the CE average, while Connectivity and Automation are perceived as moderate opportunities with slightly less enthusiasm than in other CE regions. Platform Economy, meanwhile, is uniformly seen as the least promising area for immediate opportunities. These insights suggest that while Hungary is well-positioned for electrification, there is room to boost readiness in connectivity and automation, potentially guiding focus areas for future regional development efforts.





Strategic approaches to seize opportunities (Q16)

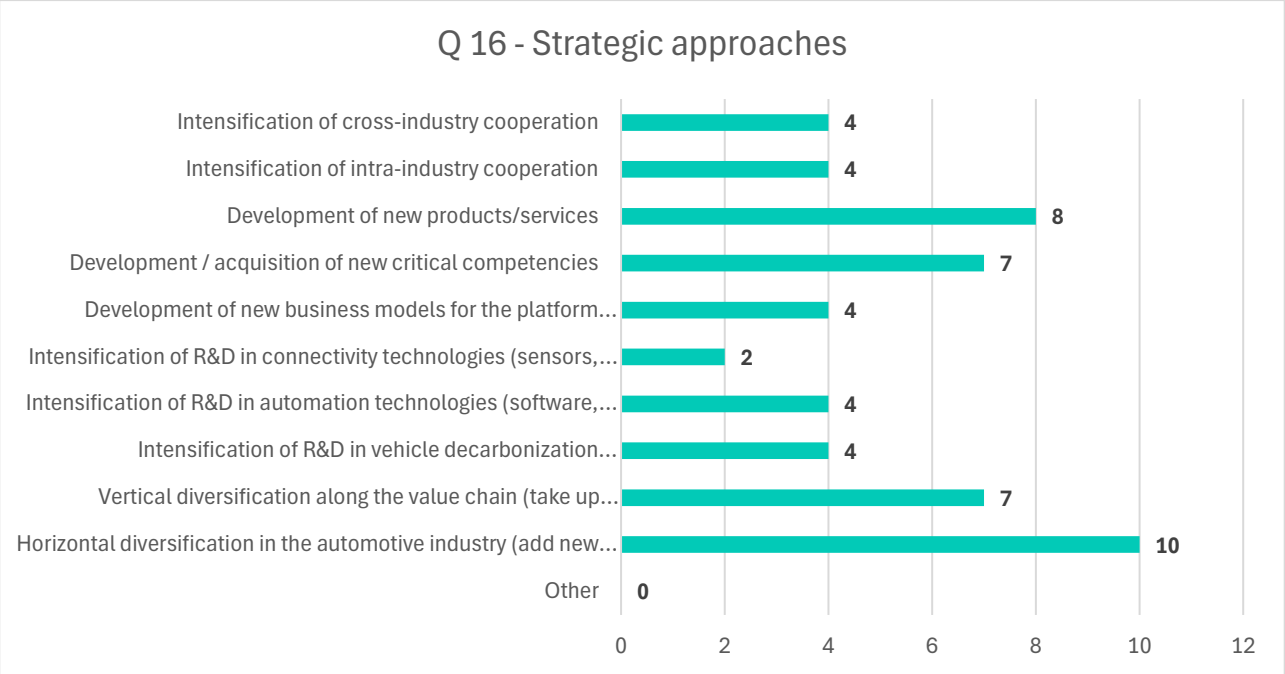
In Hungary, automotive companies' strategic approaches focus on diversification and intensifying R&D, with distinct differences between SMEs and larger firms.

Larger companies prioritize vertical and horizontal diversification, expanding their control over production processes and adding new products to serve evolving client needs. They lead in R&D investments, especially in electrification (like electric and hydrogen vehicle components), connectivity (sensors and software), and automation technologies. Their greater resources allow them to drive more extensive R&D and internal skill-building programmes.

SMEs, on the other hand, face resource constraints and focus more on partnerships and incremental innovations. They engage in cross-industry cooperation to access new technologies in connectivity and automation without heavy R&D investments. They rely on partnerships and external training to build necessary skills, as they often lack the capacity for extensive in-house programmes.

For the platform economy, both SMEs and large firms see this as a long-term opportunity, though it currently receives less focus than electrification or automation. SMEs approach it cautiously due to limited digital infrastructure, while larger companies explore digital platforms more actively.

In summary, Hungarian SMEs and larger firms both pursue R&D and diversification but differ in scale and methods. Larger companies drive innovation directly, while SMEs leverage partnerships to adapt to industry changes.



Technology and skills gaps (Q17)

This is an open-ended question, allowing companies to elaborate on specific needs or barriers they face, and to highlight areas where external assistance would be beneficial. The survey has collected responses from various participants, reflecting a range of industry perspectives.

Skills gaps:	• **Lack of critical technical competencies** related to new technologies, especially in electrification, automation, and connectivity fields. This gap affects the industry's ability to keep up with modern production and innovation demands. • **Staff shortages** overall, as companies struggle to find enough qualified personnel to support expansion into new technological areas. • **Limited specialised education** and training programmes in fields essential for the automotive transformation, such as software development, AI, and cybersecurity.
Technology gaps:	• **Outdated machinery and production technology**, limiting companies' ability to implement advanced manufacturing processes. • **Inadequate access to advanced production technologies** needed for automation and electrification initiatives. • **Insufficient digital infrastructure**, including IT systems and cybersecurity, which are essential for developing a connected and automated vehicle ecosystem.

KEY LEARNINGS: These gaps highlight the need for targeted upskilling, partnerships with educational institutions, and investment in new technologies to support Hungary's automotive industry transformation.

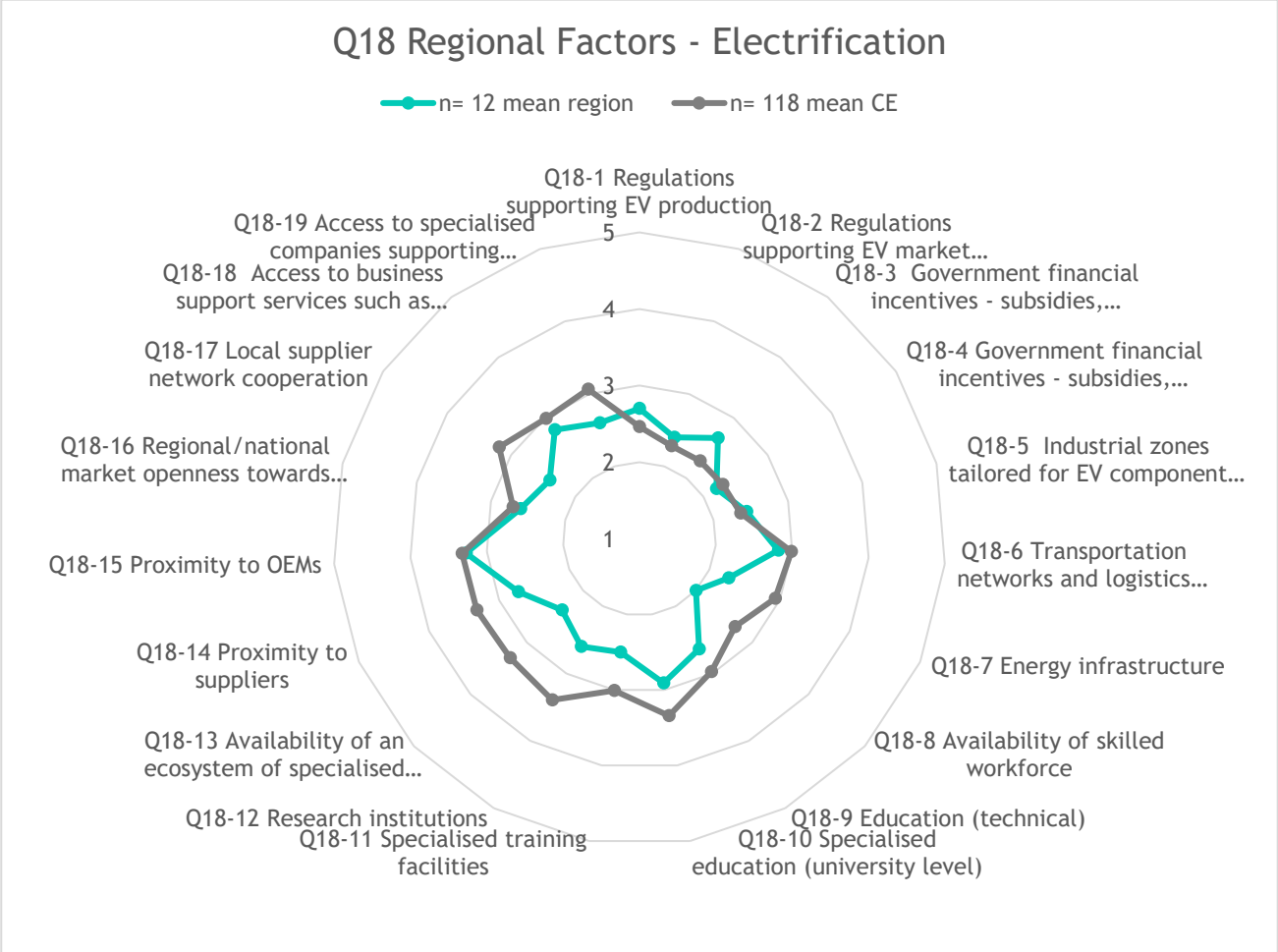
Regional resources and business support ecosystem (Q18-22, 26-27)

Factors to play a role in automotive in 2024-2030 (Q18-22)

Electrification (Q18)

Hungary demonstrates strong potential in electrification, especially through companies like Feintool System Parts Tokod and DENSO, which specialize in manufacturing electronic components for electric vehicles. Positive factors include government support for green technology and a growing interest in electric vehicle (EV) production within the Hungarian automotive sector. These aspects position Hungary relatively favorably within CE, as many companies actively engage in R&D and production for EV components.

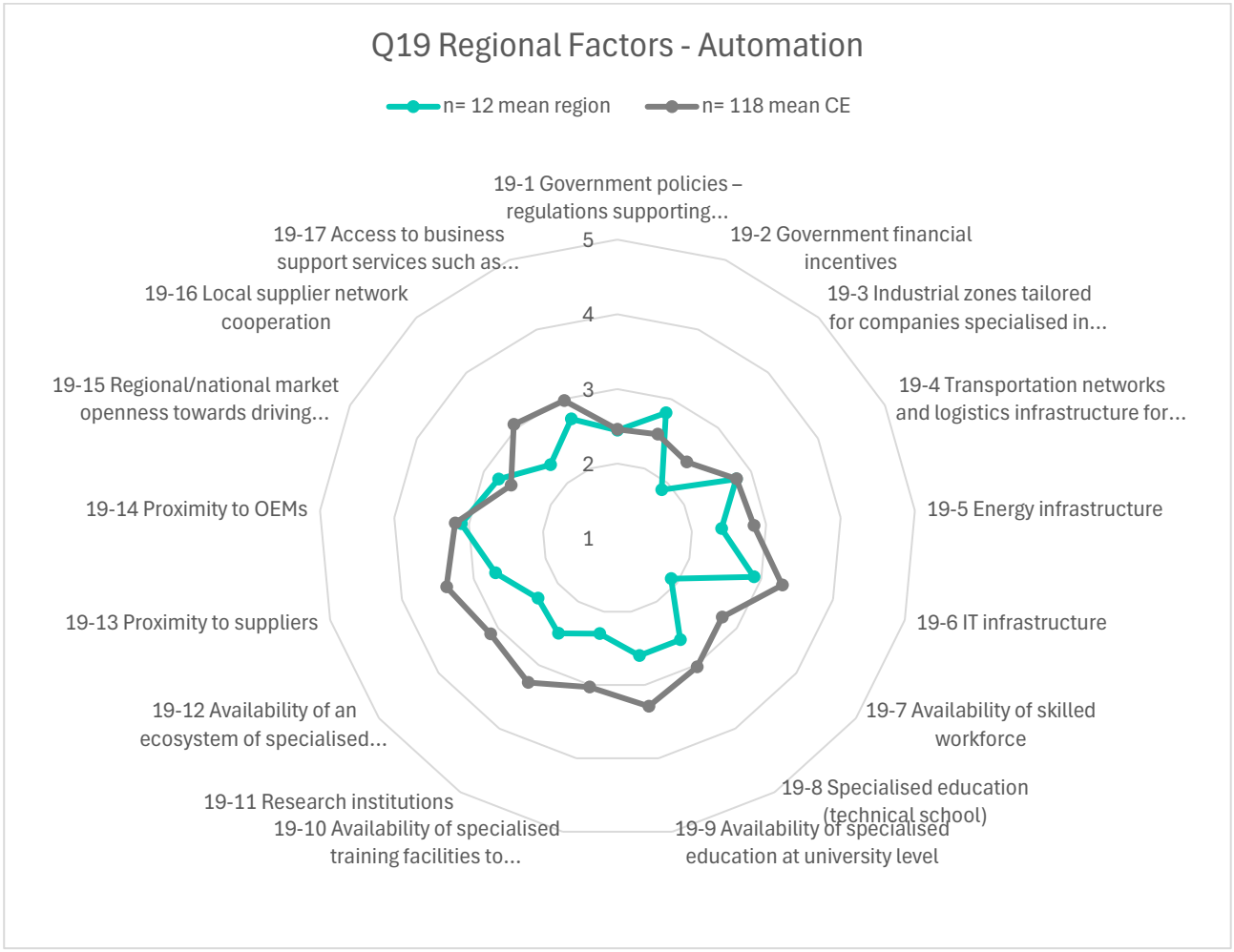
However, Hungary's challenge lies in scaling production to match the demands of larger markets, with limited domestic battery production capacity and reliance on imports compared to CE leaders. Furthermore, the need for substantial investment in infrastructure and skilled labour has led to slower expansion than expected in the electrification segment.



Automation (Q19)

In Hungary, automation in the automotive sector is significant, with several companies such as DENSO Manufacturing, Knorr-Bremse, and ZF Hungária Kft. leading in automated production systems for manufacturing automotive components like braking systems and electronic parts. Factors that positively impact automation include a high level of industry demand and a supportive local supplier ecosystem, which contribute to Hungary's competitive advantage in Central Europe (CE).

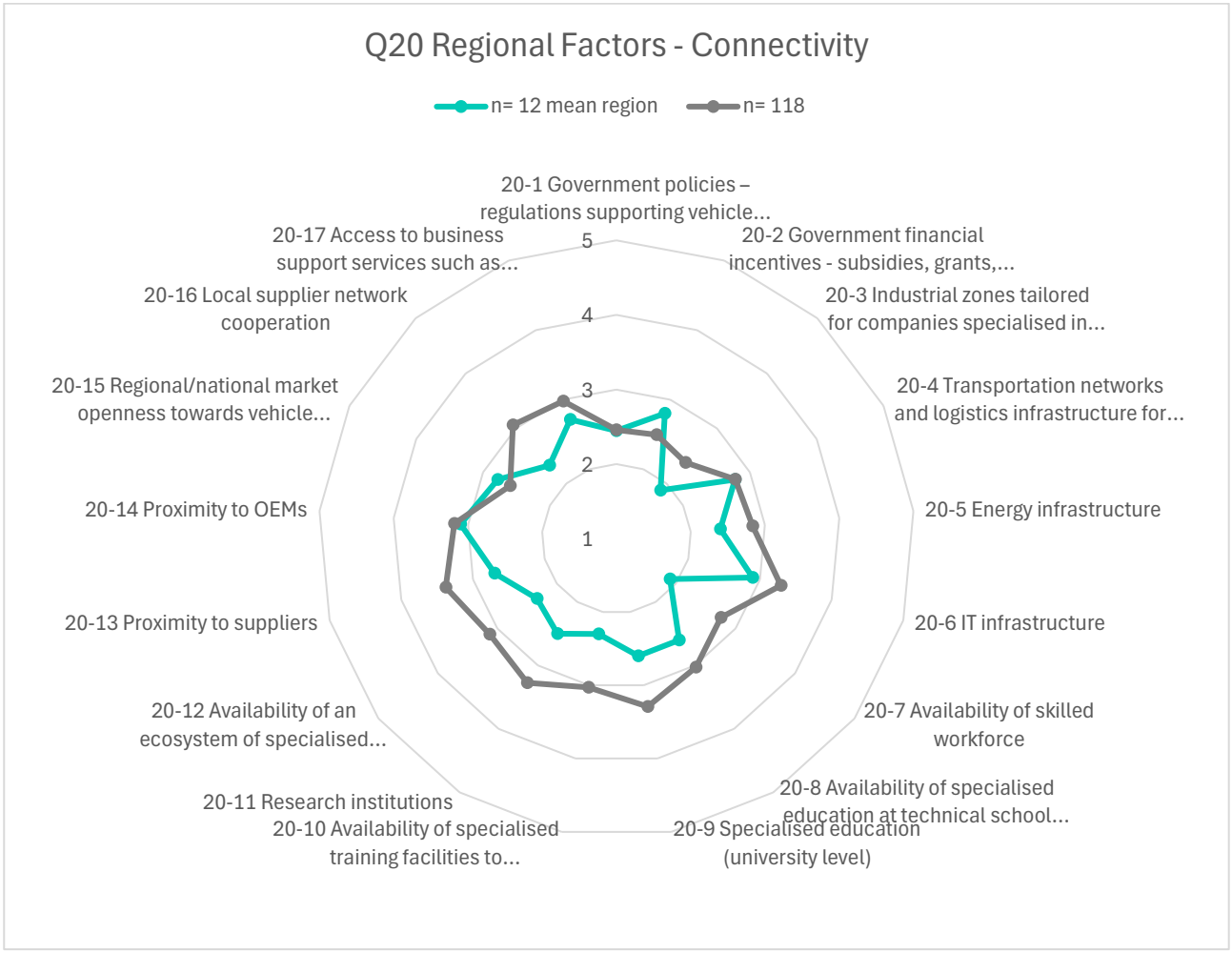
However, the region still faces challenges such as labour shortages and varying levels of automation expertise across SMEs, impacting Hungary's competitiveness compared to other CE countries. This results in a mixed assessment: while larger companies perform well in automation, smaller enterprises experience difficulty keeping up due to limited resources and expertise.



Connectivity (Q20)

Connectivity in Hungary's automotive industry has progressed with companies like Opel Szentgotthárd and ElringKlinger focusing on connectivity technologies for vehicle components. Factors such as robust internet infrastructure and government incentives for digital transformation support the integration of connected systems in vehicles, giving Hungary a competitive edge within the CE region.

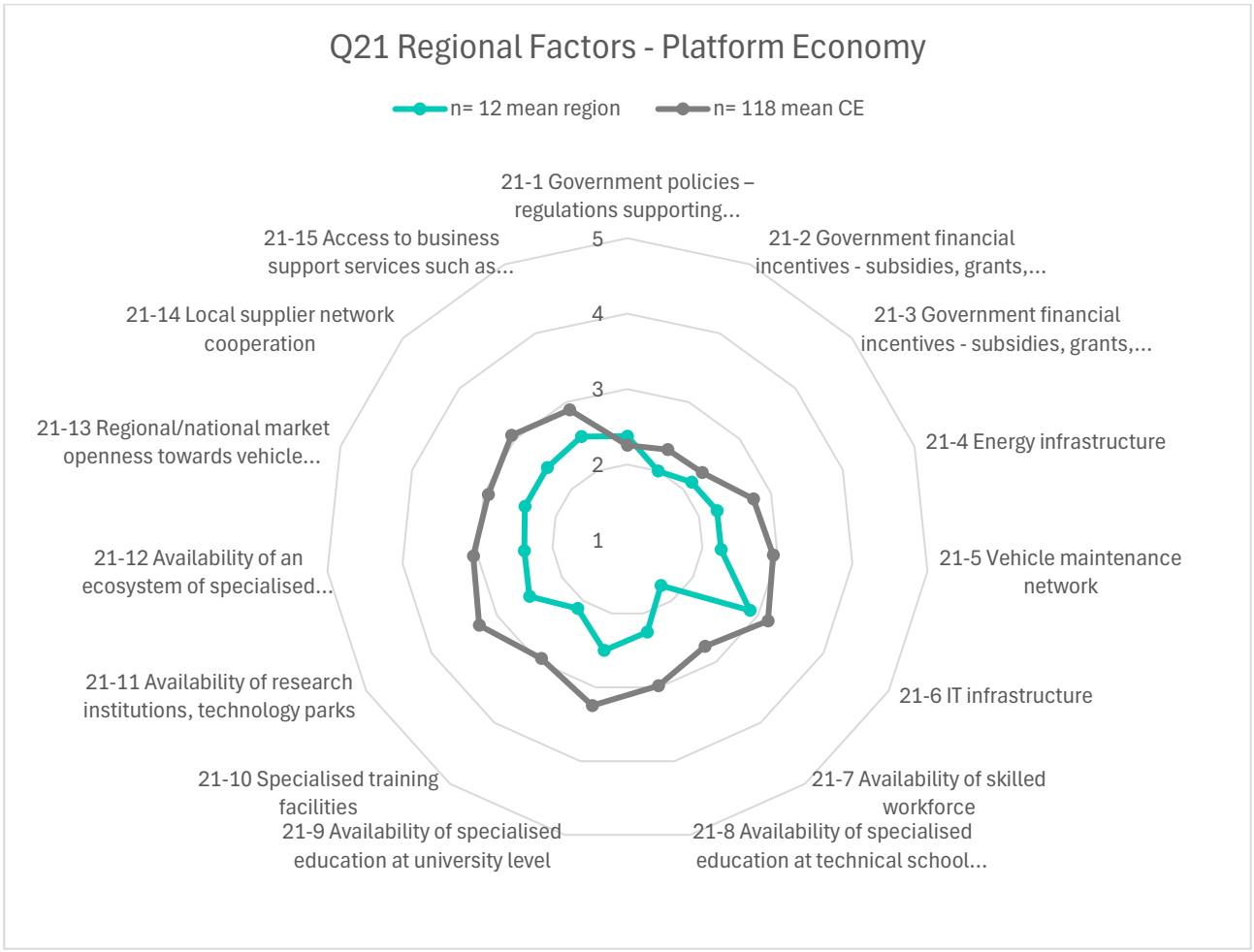
Despite these strengths, the region faces limitations, including varying levels of readiness among suppliers and occasional interoperability issues in technology adoption across entities. This discrepancy creates a gap, particularly for smaller companies that struggle to meet the demands for high-tech, connected automotive components compared to the CE average.



Platform Economy (Q21)

Hungary is still in the early stages of platform economy integration within the automotive sector, with limited but growing involvement from local companies in areas such as logistics and supply chain digitisation. Entities like Duvenbeck IMMO Logisztikai Kft. offer logistics solutions through digital platforms, showcasing some readiness for platform-based business models.

Positive aspects include an increasing number of logistics and supply chain companies adopting platform solutions and some governmental interest in supporting platform economy initiatives. However, this thematic area remains less mature compared to automation or electrification. Hungarian SMEs, in particular, face resource constraints in adopting and scaling platform-based business models, creating a notable gap compared to the CE average.



Additional factors influencing the regional competitiveness (Q22)

- **Government Financial Incentives:** There's a need for accessible subsidies, grants, and tax incentives aimed at fostering investment in automotive advancements, especially in electrification, connectivity, automation, and platform economy sectors.
- **Workforce Development:** The industry requires a technically skilled workforce, supported by robust educational frameworks from both technical and university institutions. Upskilling and reskilling initiatives were highlighted as vital for adapting to new automotive technologies and sustaining regional competitiveness.
- **Infrastructure Enhancements:** Upgrading IT, energy, transportation, and logistics infrastructure is critical. Improved infrastructure will support efficient production and the movement of goods, which are essential for growth in the automotive industry, particularly as it transitions to more digitalised and electrified platforms.
- **Global Competition:** The regional automotive sector must address increased competition from markets like China, where lower-cost products and technological advancements present challenges. To stay competitive, local industries may need to focus on unique value propositions or enhance technological capabilities.

- **Resource Access and Partnerships:** Strengthening local supplier networks, enhancing collaboration with research institutions, and ensuring access to support services like financial consulting are key factors that would facilitate a smoother transition and transformation within the sector.

Business support services (Q26-27)

In Hungary, the rating of business support services in the automotive sector reveals a well-established foundation for large enterprises but highlights some clear gaps in supporting SMEs and driving innovation, especially in alignment with the industry's rapid transformation. Overall, the ecosystem is populated with both private sector services and BSOs that focus on crucial areas such as electrification, connectivity, automation, and the platform economy. Organisations like the Hungarian Association of the Automotive Industry (MAGE) play a significant role in advocacy and supplier development, organizing exhibitions and networking events to foster industry connections. Larger consulting firms like STAUFEN provide valuable corporate consulting in automation and electrification, while entities such as Duvenbeck IMMO Logisztikai and Knorr-Bremse offer logistics and Tier 1 support, underscoring the system's alignment with the needs of established automotive operations.

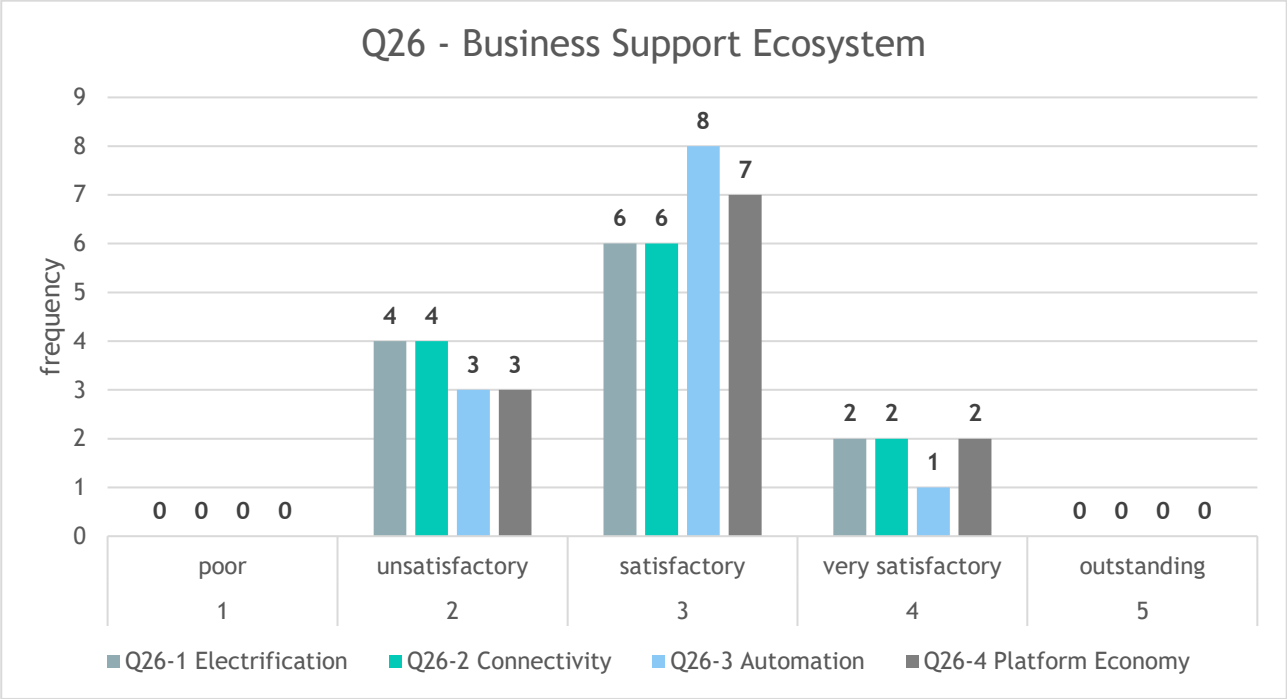
However, the range of support services reflects a stronger fit with the requirements of larger enterprises rather than the agile, tech-driven support SMEs often need. Larger companies like DENSO Manufacturing Hungary and ZF Hungária Kft. have access to robust supply chain and logistical support that aligns well with their established portfolios. Meanwhile, SMEs face more difficulty accessing specialised services, such as R&D, rapid prototyping, and digital transformation support, which are increasingly critical for adapting to new automotive technologies. Regional disparities also affect service availability, with resources and specialised support concentrated in urban centres like Budapest and Székesfehérvár, while companies in smaller areas such as Tokod and Kalocsa face limited access to advanced support.

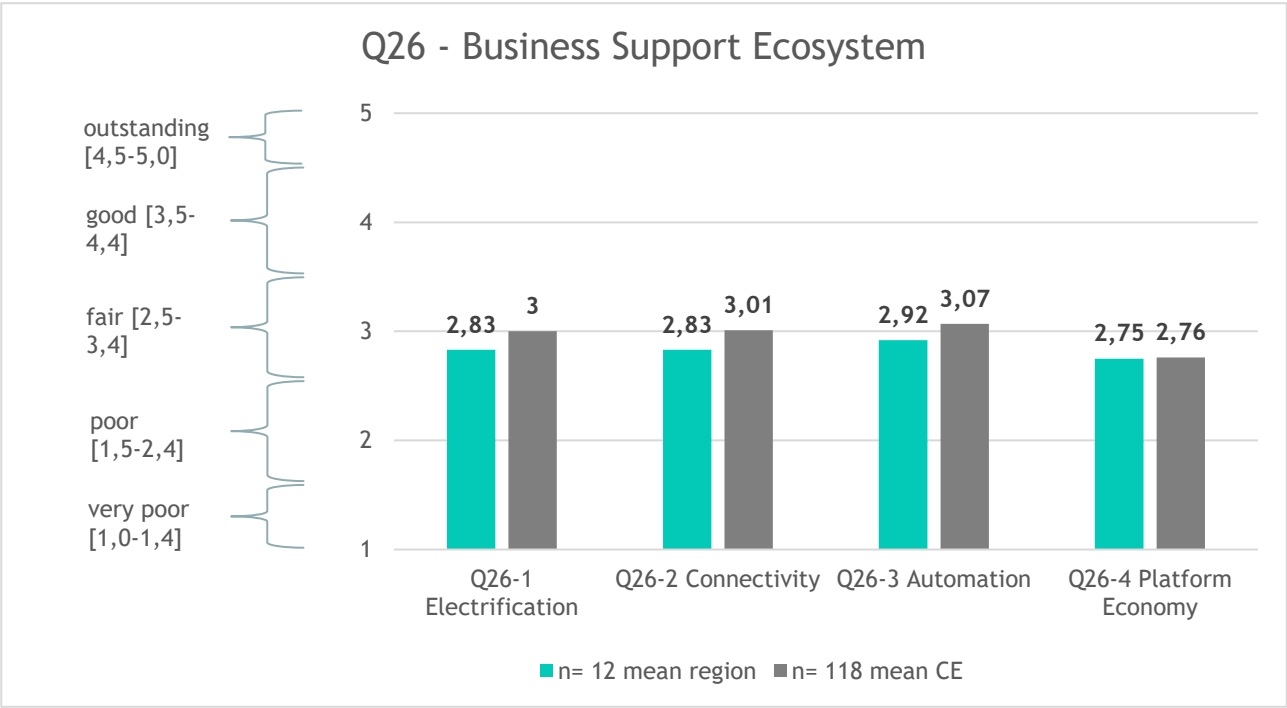
The Hungarian business support ecosystem has promising potential for development to align better with the demands of a transforming automotive sector. One significant area for enhancement lies in expanding R&D and prototyping capabilities, which would enable companies—particularly SMEs—to innovate and adapt more freely to technological shifts without heavy in-house investment. Developing specialised technology transfer hubs focused on electrification, autonomous systems, and connectivity would accelerate the sector's modernisation, bringing in advanced knowledge and resources that companies can leverage. These hubs could serve as collaborative points, combining the expertise of both BSOs and technical institutes to provide tailored support for rapid technological advancement.

Another priority is workforce development that meets the demands of automation and data-driven manufacturing. Collaborating with educational institutions to create targeted training programmes could address current skill gaps and ensure a steady supply of technically proficient workers, enhancing the sector's long-term competitiveness. To support SMEs specifically, which often struggle to independently fund digital and automation transitions, subsidised digital services or shared resources would greatly improve readiness across the ecosystem. These measures would empower smaller companies to incorporate digital and automated processes, which are essential in an increasingly tech-centric automotive industry.

In terms of alignment with company needs and the services that BSOs have self-assessed, the current portfolio meets traditional requirements effectively, providing operational and logistical support that benefits larger players. However, the gap in specialised, future-oriented support underlines a disconnect between the rated services and the transformation needs expressed by companies, particularly around advanced digital capabilities and tech adoption. By prioritizing R&D infrastructure, technology transfer, workforce development, and SME-focused digital support, Hungary's business support ecosystem could be

positioned to better meet the evolving needs of its automotive sector and help it thrive in a competitive global landscape.





Specialisation level and development perspectives (Q23-25)

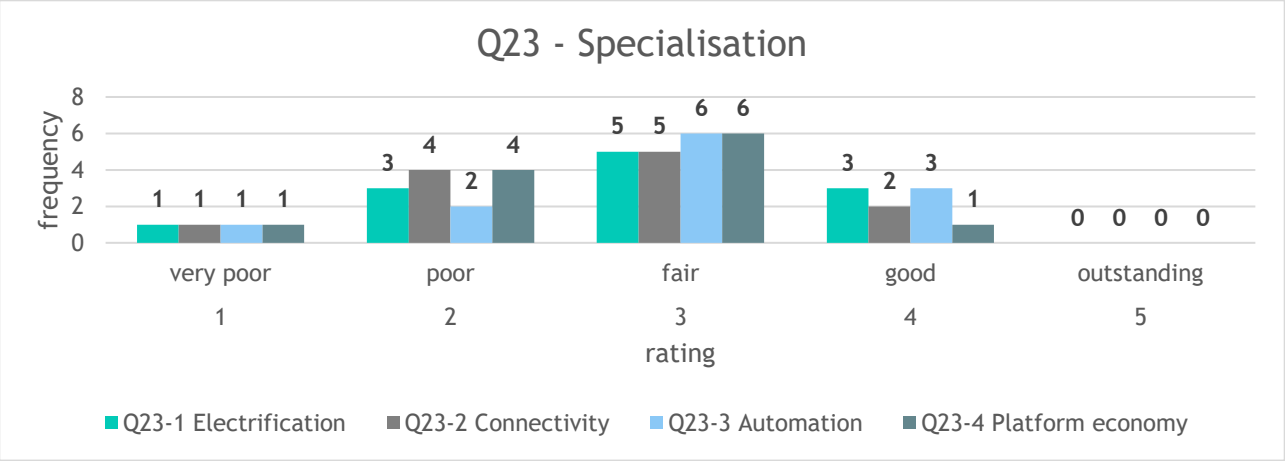
Specialisation: The assessment of specialisation in Hungary's automotive industry reveals a mixed but insightful picture when compared to the Central European (CE) average. Hungarian companies and Business Support Organisations (BSOs) demonstrate a specialisation level that is generally in line with, though slightly

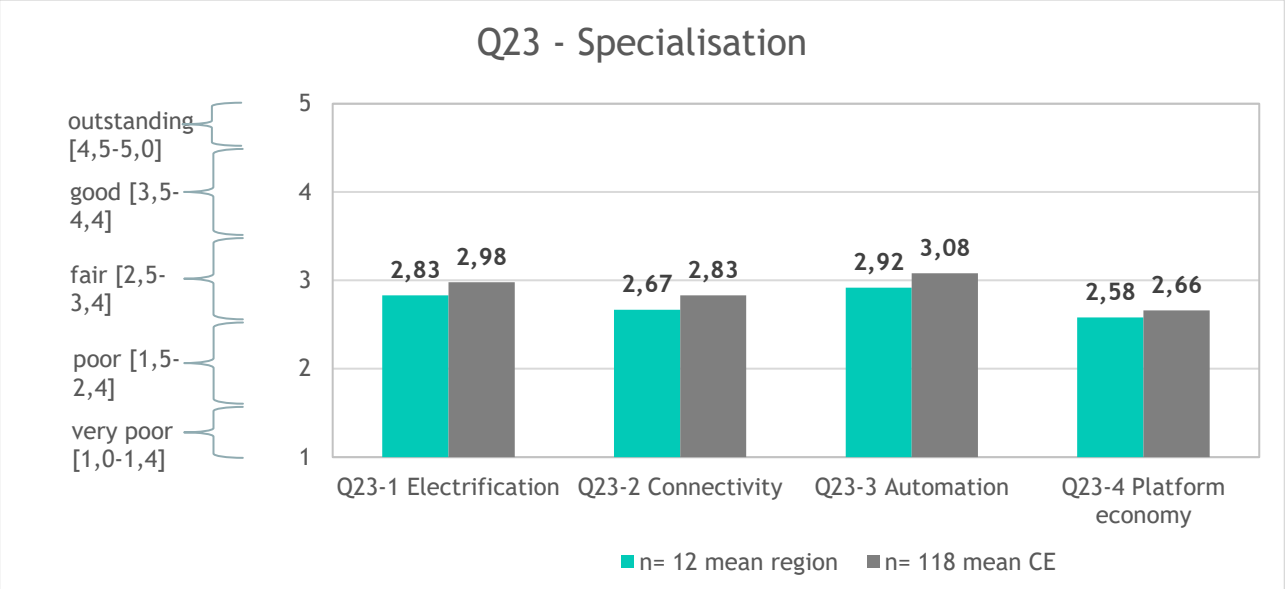
below, the CE average across key thematic areas such as electrification, connectivity, automation, and the platform economy.

In the area of electrification, Hungarian automotive entities show a focus comparable to the CE average, albeit slightly lower. This suggests that while there is an interest and emerging capability in electrification, it may not be as advanced or prioritised as in some other Central European regions. Connectivity, however, shows a more noticeable gap, with Hungarian organisations lagging behind the CE average. This may indicate challenges or a lower strategic emphasis on developing connectivity technologies within Hungary's automotive sector, a factor that could influence the industry's adaptation to increasingly connected automotive systems.

Automation appears to be a relatively stronger area of focus in Hungary, closely aligning with CE trends that emphasize automation as a priority for the automotive industry's transformation. Hungarian companies' ratings for automation suggest that they are developing significant capabilities in this area, even if slightly trailing the CE average. The platform economy, on the other hand, receives the lowest specialisation ratings both in Hungary and across Central Europe, reflecting a common trend where the platform economy is less emphasised compared to other areas. Hungarian entities show only a moderate engagement with platform-based business models, similar to but again slightly below the regional average.

The frequency distribution of ratings further illustrates that most Hungarian companies and BSOs rate their specialisation levels as "fair" or "poor," with very few reaching "good" or "outstanding" ratings. This distribution suggests that while the foundational capabilities exist, there is considerable room for growth, particularly in connectivity and platform economy, to match or exceed Central European standards. Overall, while Hungary's automotive sector is making strides in areas like automation and electrification, it faces challenges in connectivity and platform-based models, which may impact its future readiness within the rapidly evolving automotive landscape.





Perspectives: The assessment of development perspectives in Hungary, as seen through the ratings of companies and Business Support Organisations (BSOs), shows a cautiously optimistic outlook with some differences compared to the Central European (CE) average.

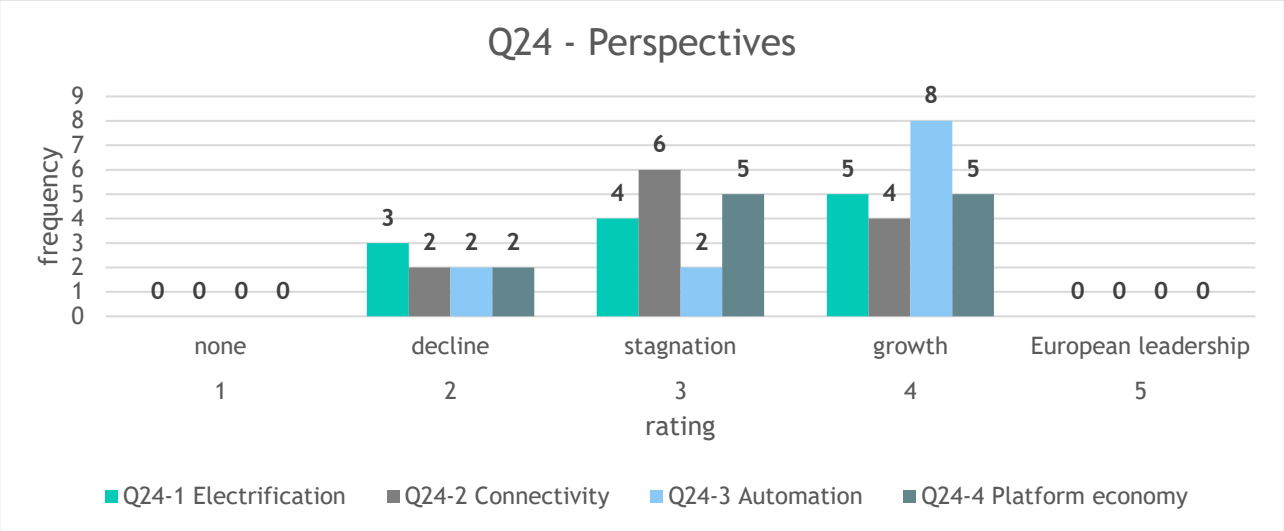
In terms of future potential, Hungarian entities generally view growth in areas like electrification, connectivity, and automation but with more modest expectations than the broader CE region. Specifically, Hungarian companies rate the perspectives for electrification and connectivity at 3.17, slightly below the CE average of 3.46 and 3.41, respectively. This indicates that while there is a belief in moderate growth for these areas in Hungary, it is slightly tempered compared to the expectations in other CE regions.

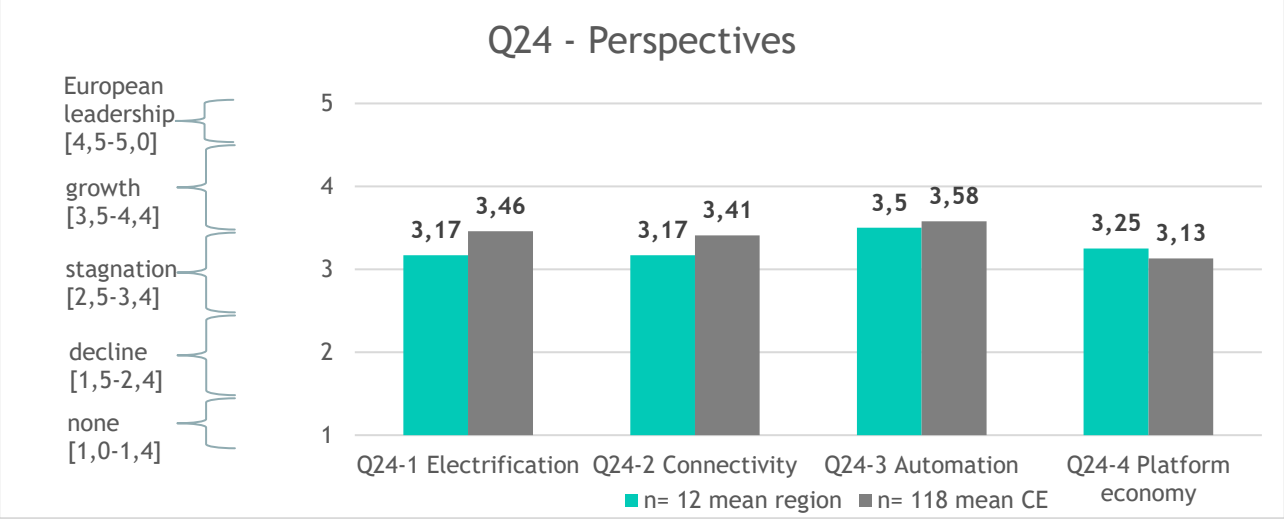
For automation, which has the highest growth perspective both in Hungary and across CE, Hungarian organisations rate it at 3.5, closely aligning with the CE average of 3.58. This suggests that automation is viewed as a robust area for future development, and Hungarian entities see similar growth potential as their CE counterparts, possibly reflecting confidence in ongoing investments and innovation in automation within the automotive industry.

Platform economy receives mixed assessments, with Hungarian entities assigning a 3.25 rating, which is slightly above the CE average of 3.13. This difference suggests that Hungarian companies may perceive relatively stronger potential in platform-based models than the CE average, perhaps due to emerging initiatives or business models that are gaining traction locally.

The frequency distribution chart illustrates that the majority of Hungarian companies and BSOs anticipate "stagnation" or "growth" across these thematic areas, with few expecting "decline." Notably, no organisations rated their perspectives as reaching "European leadership," indicating that while growth is expected, there may be a lack of confidence in Hungary's ability to lead on a European scale in these sectors.

Overall, while Hungarian entities are optimistic about growth, particularly in automation, they tend to have a slightly more conservative outlook than the CE average. This suggests steady but moderate development perspectives, with automation standing out as the most promising area for advancement.





Reactions towards change: The overall reactions of automotive companies in Hungary toward change, as compared to the Central European (CE) average, indicate a varied but generally responsive stance, especially among larger and foreign-owned companies.

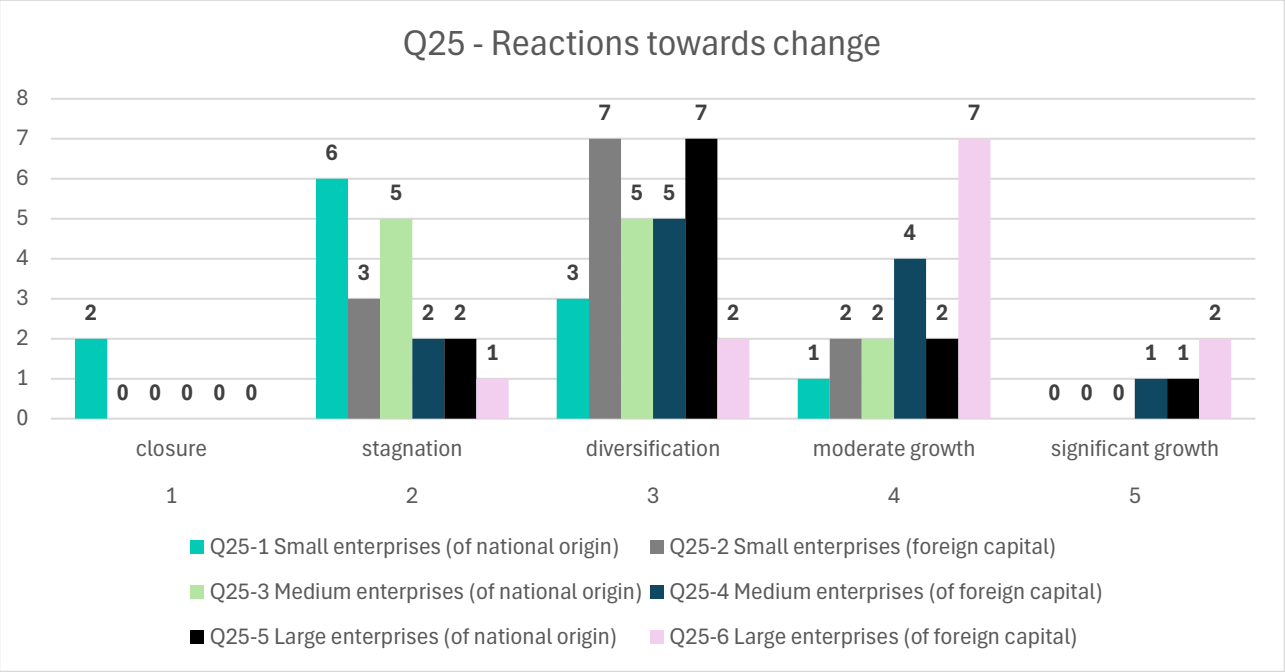
In Hungary, small enterprises of national origin exhibit the lowest reaction scores at 2.25, noticeably below the CE average of 2.56. This suggests that smaller Hungarian companies with domestic ownership may be slower to adapt or less prepared to respond to industry changes. In contrast, small enterprises of foreign capital have a stronger reaction score of 2.92, slightly above the CE average of 2.71, indicating a higher adaptability or responsiveness to change within this segment, likely due to access to broader international resources or support from parent companies.

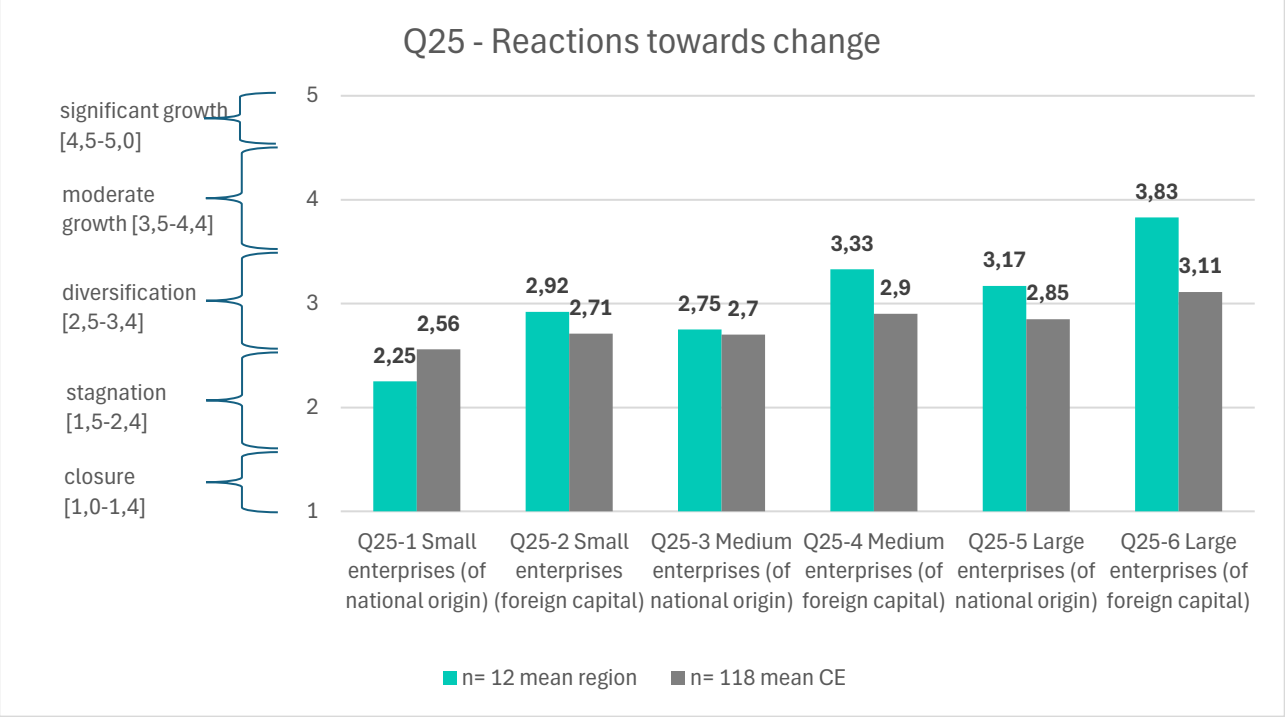
Medium enterprises of national origin in Hungary show a reaction score of 2.75, close to the CE average of 2.7, suggesting that they are somewhat aligned with the broader regional response. However, medium enterprises of foreign capital in Hungary demonstrate a significantly higher reaction at 3.33 compared to the CE average of 2.9, reflecting a stronger readiness to address industry changes, likely due to similar reasons as their smaller foreign-owned counterparts.

For large enterprises of national origin, Hungary's score of 3.17 is above the CE average of 2.85, indicating that large Hungarian-owned companies are more proactive or responsive to change than their regional peers.

The most responsive segment overall is large enterprises of foreign capital, which have the highest score in Hungary at 3.83, well above the CE average of 3.11. This suggests that large foreign-owned automotive companies in Hungary are highly equipped to adapt to changes, possibly due to strong global integration and substantial resources.

In summary, foreign-owned companies in Hungary, both medium and large, display a high level of adaptability and readiness for change, surpassing regional averages. In contrast, Hungarian-owned small and medium enterprises show more moderate responsiveness, with domestic small enterprises particularly lagging. This distribution reflects a reliance on foreign capital for dynamic change adaptation in Hungary's automotive sector, especially among larger entities.





Conclusion - Key findings for regional transformation capacities in the automotive sector

Key findings:

a) **Electrification and Sustainability:** Hungary is emerging as a key player in Europe's electric vehicle (EV) transition, with major investments from manufacturers like Mercedes-Benz and BMW. Mercedes is transforming its Kecskemét plant to produce EVs and building a new battery plant. Hungary is also becoming a leading battery production hub with significant investments from SK Innovation and CATL.

b) **Industry Resilience and Challenges:**The automotive sector, contributing 21% of Hungary's exports, faces challenges due to shifts away from internal combustion engines (ICEs). Plants like Opel's Szentgotthárd, focused on ICE production, are adapting with investments in R&D and hybrid/EV production.

c) **Digital Transformation:** The industry is focusing on digital innovations like automation and AI to optimize production, responding to evolving market demands.

Challenges:

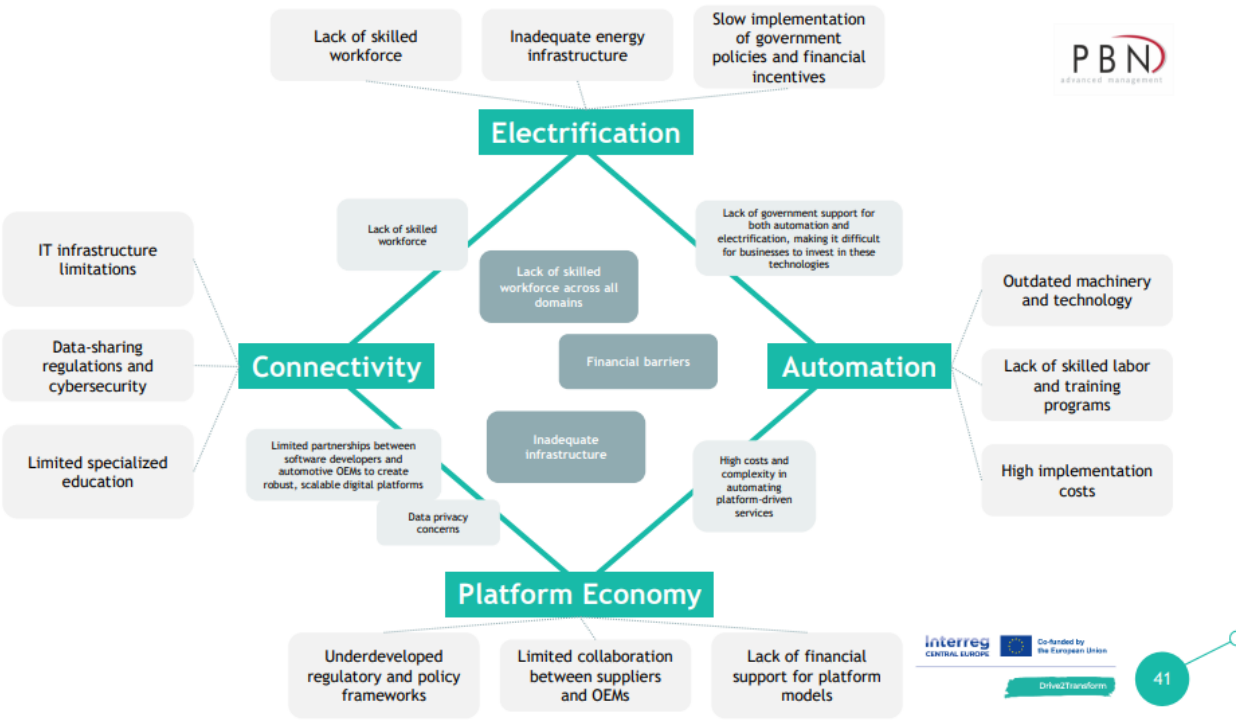
Hungary's automotive sector faces substantial challenges as it transitions toward electrification, automation, connectivity, and a platform economy. A critical barrier across all areas is the shortage of a skilled workforce, worsened by limited specialised education and training programmes, leaving the workforce unprepared for advanced automotive technologies.

Financial and governmental support is also lacking. High costs for automation and platform development deter investment, while slow policy implementation and inadequate incentives, particularly in electrification, add further uncertainty. An outdated energy infrastructure compounds the issue, making electrification especially challenging.

Connectivity efforts are hampered by outdated IT systems, restrictive data-sharing regulations, and cybersecurity concerns. Limited collaboration between software developers and OEMs restricts the development of robust digital platforms, while data privacy issues add additional complexity.

The push toward a platform economy is slowed by underdeveloped regulatory frameworks, limited collaboration, and insufficient financial support, all of which prevent the establishment of a fully integrated digital ecosystem.

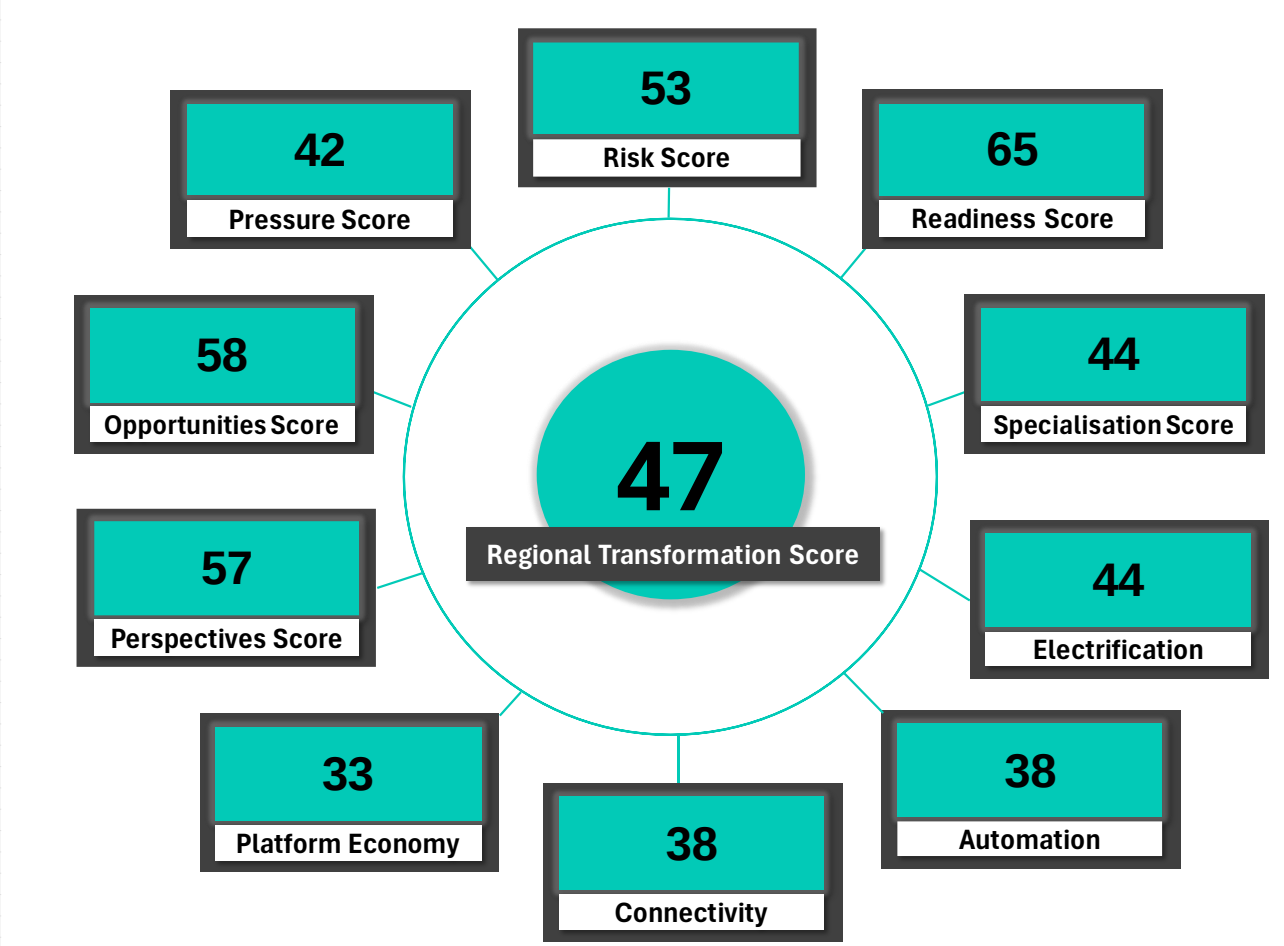
In summary, Hungary's automotive industry faces a complex mix of workforce shortages, financial barriers, regulatory gaps, and infrastructure limitations. Overcoming these obstacles will require coordinated support from government, industry, and education to enable effective transformation.



Challenges in Hungary

Transformation Readiness Index - Hungary

Hungary is rated as limited ready for transformation. It scored high in readiness, but has lower ratings in the Regional Factor Scores, especially regarding Platform Economy.



Ranking:

>60 Transformation Ready

50-60 Moderate Ready

40-50 Limited Ready

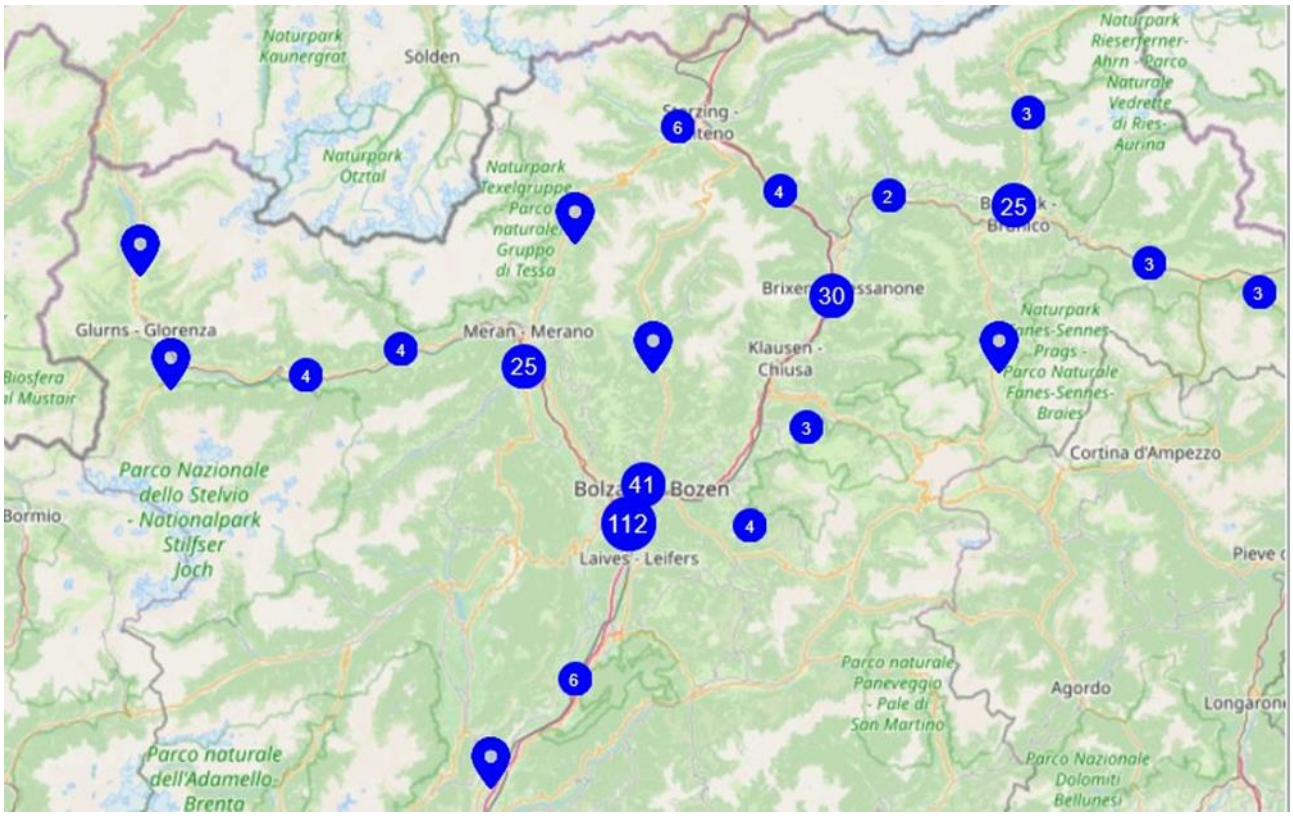
30-40 Low Ready

<30 Not Ready

Italy | South Tyrol-Alto (NOI)

Brief description of the region

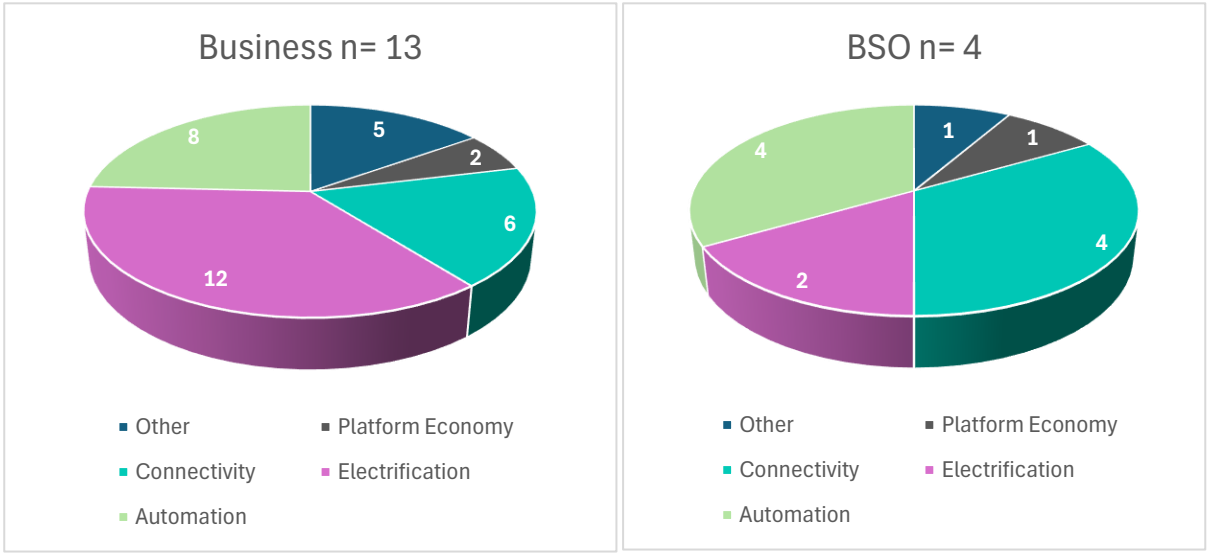
South Tyrol is a mountain region with 500T inhabitants in north Italy, with a boarder to Austria, Switzerland. Due to its geographical position between the two strongest industrial regions in Europe – Southern Germany and Northern Italy - some automotive suppliers established an ecosystem, which contributes ~5% to the regional GDP (160% of EU av.). The 200+ companies assume 5k employees and generate 2+G€ turnover. They have in common lack of cheap economic production areas and cheap labour.



The focus of the automotive ecosystem (https://automotive.noi.bz.it/) is on vehicles and mobility solutions in off-road and mountain areas, the prototyping and manufacturing of small series and special vehicles. Market leaders in ropeway construction, snow groomers, fast electric charging stations, agricultural vehicles for mountains and military vehicles.

Inventory of companies and business support organisations (BSO) (Q1-8)

In total 12 businesses (5 large, 4 medium and 3 small enterprises) and 5 supporting organisations were interviewed. The mentioned thematic focus areas of the current product portfolio were: 14 electrification, 12 automation, 9 connectivity, 5 other, 3 platform economy.



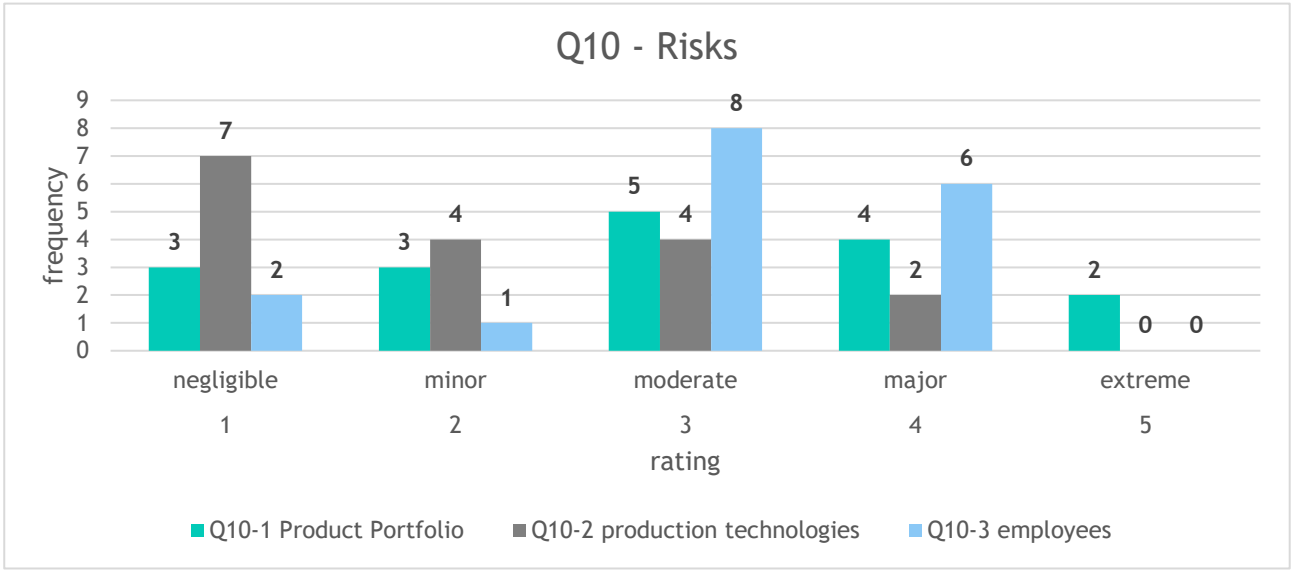
Transformation risks, pressure and readiness for business continuity in 2024-2030 (Q10-14)

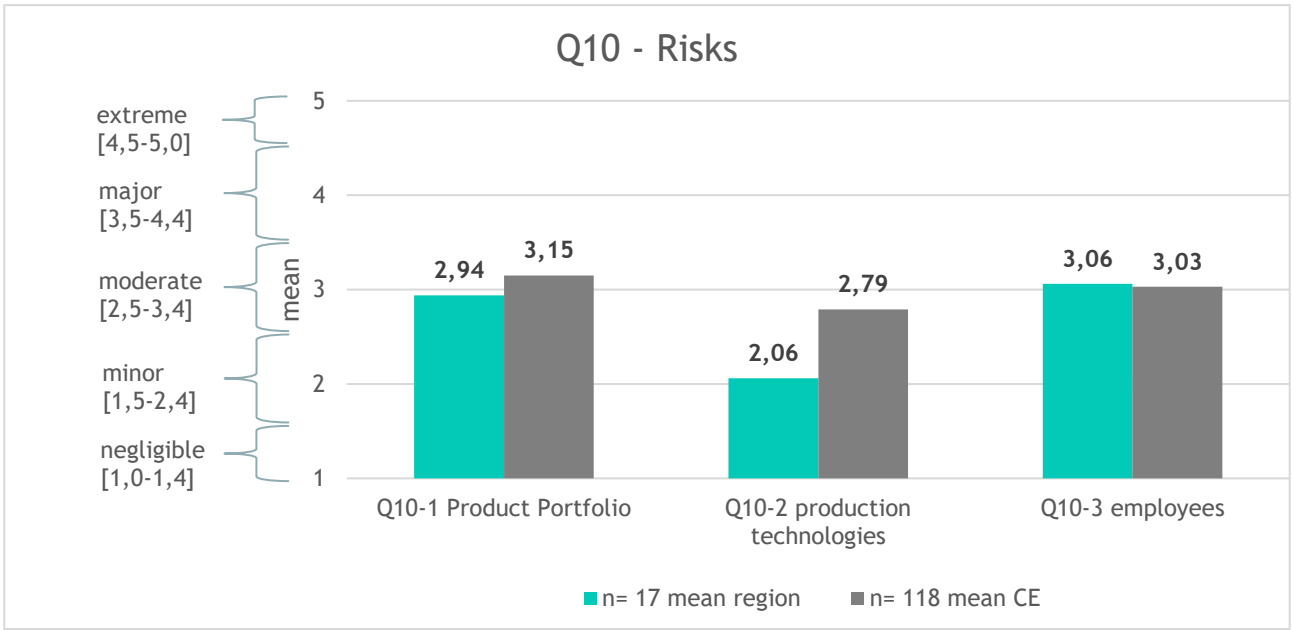
Risks endangering business continuity (Q10-11)

The risk for the **product portfolio** is assessed as **moderate**, aligning with the European average. Responses range from 2 (low risk) to 4 (major risk).

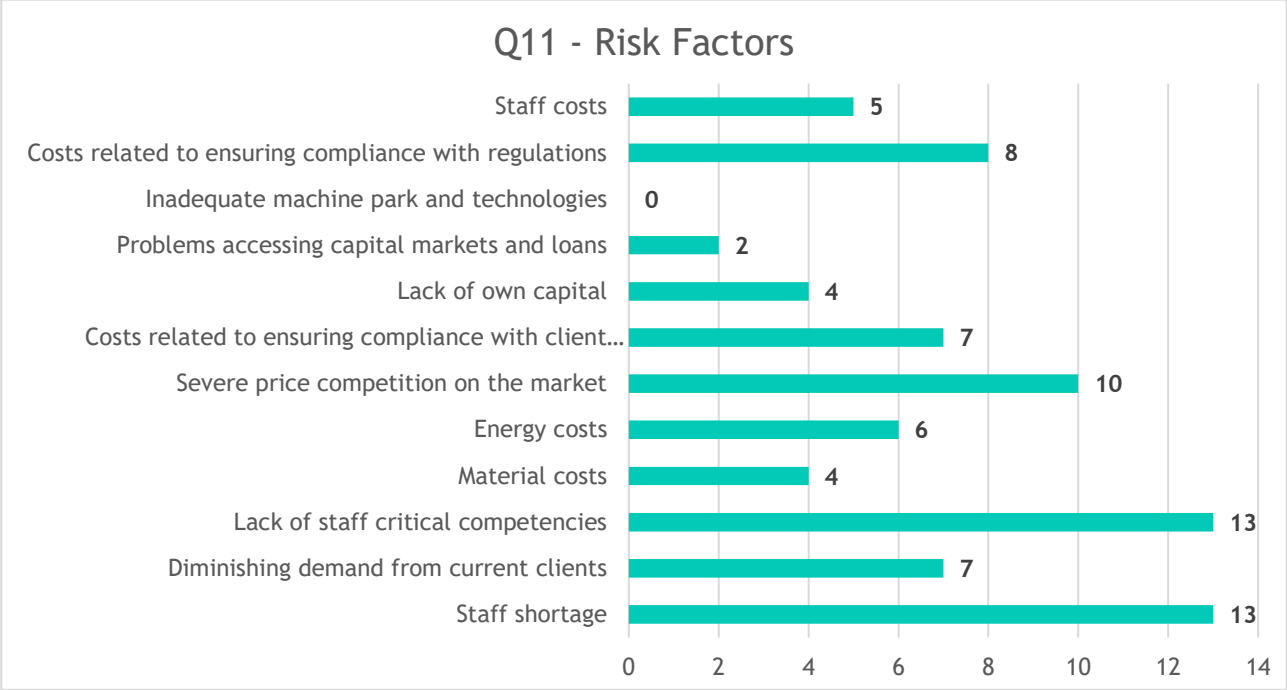
Rather than seeing the risk on production technology, it is the product portfolio for the Automotive Supplier the main weak point evaluated as moderate risk for the companies. The reason probably is related to engine component supplier, which need to be replaced with electric component used on BEV. There is also a moderate risk not to have adequate competences and employees.

Generally, it can be said that the risk in the region is comparable within the CE, but the trend has been changed during the last month, due to lack of order and diminishing demand from OEM's.



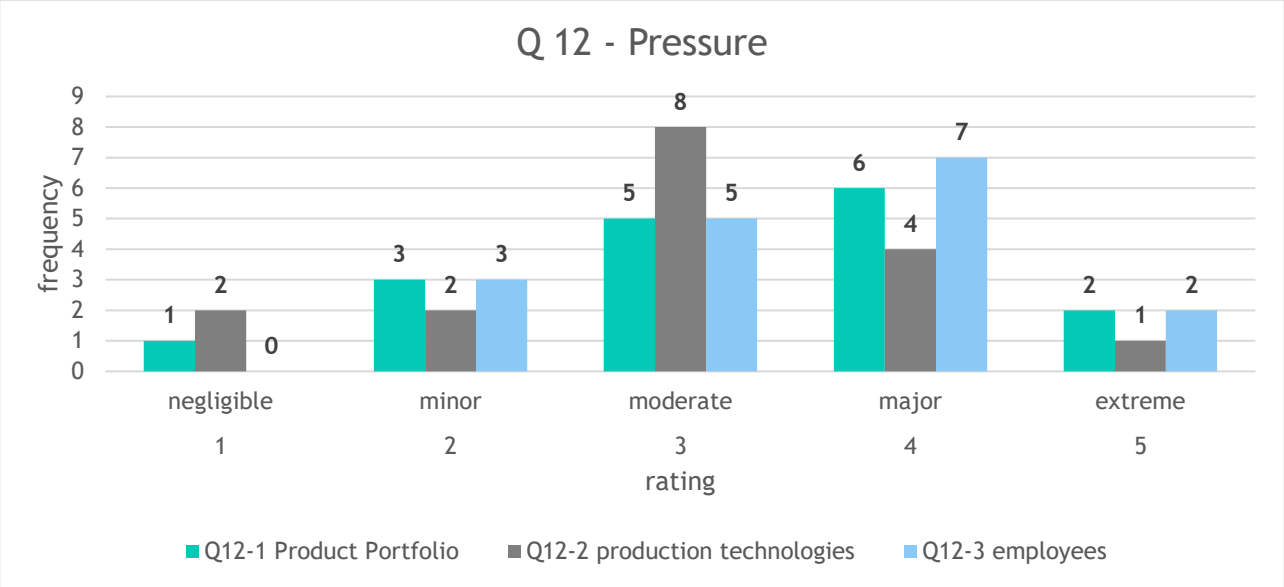


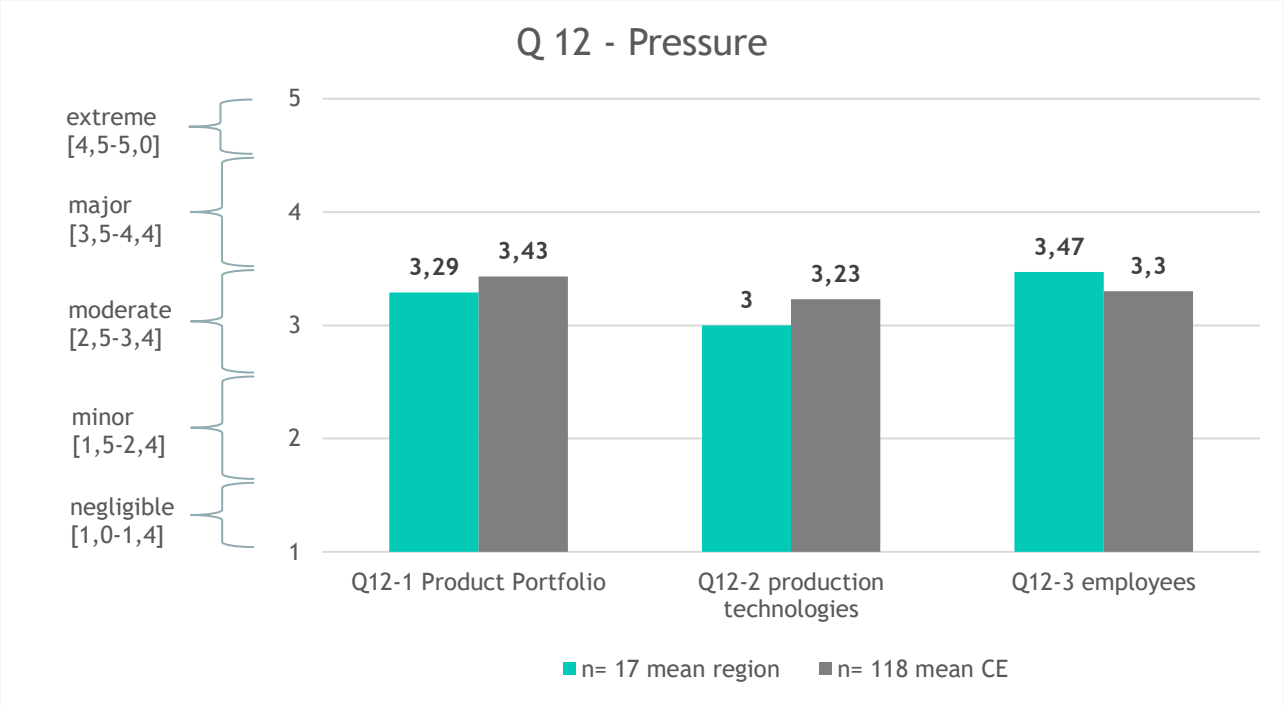
Here it can be noted that the three greatest risk factors are **staff shortages**, **staff critical competences, and intense price competition,** especially with East Europe**.** According with the Draghi report, shortages of high-skilled workers are likely to become more acute over time. Projections to 2035 indicate that labour shortages will be most pronounced in high-skilled, and 77% of EU companies report that even newly recruited employees do not have the required skills. In addition the introduction of short-time work could impact the issue of staff shortages, and these issues are developing very quickly. Employee costs pose a major risk in both European and international comparisons, as does the intense competitive environment.



Pressure to change business for ensuring business continuity (Q12)

The assessment of **pressure to change in product portfolio** for ensuring business continuity for both region and Europe falls within the range of 3, indicating **moderate pressure**. South Tyrol, however, tends to show a slightly higher level of pressure on employees. Looking more closely at the surveyed companies, the range of responses mostly spans between moderate pressure and high pressure





Readiness to change business for ensuring business continuity (Q13)

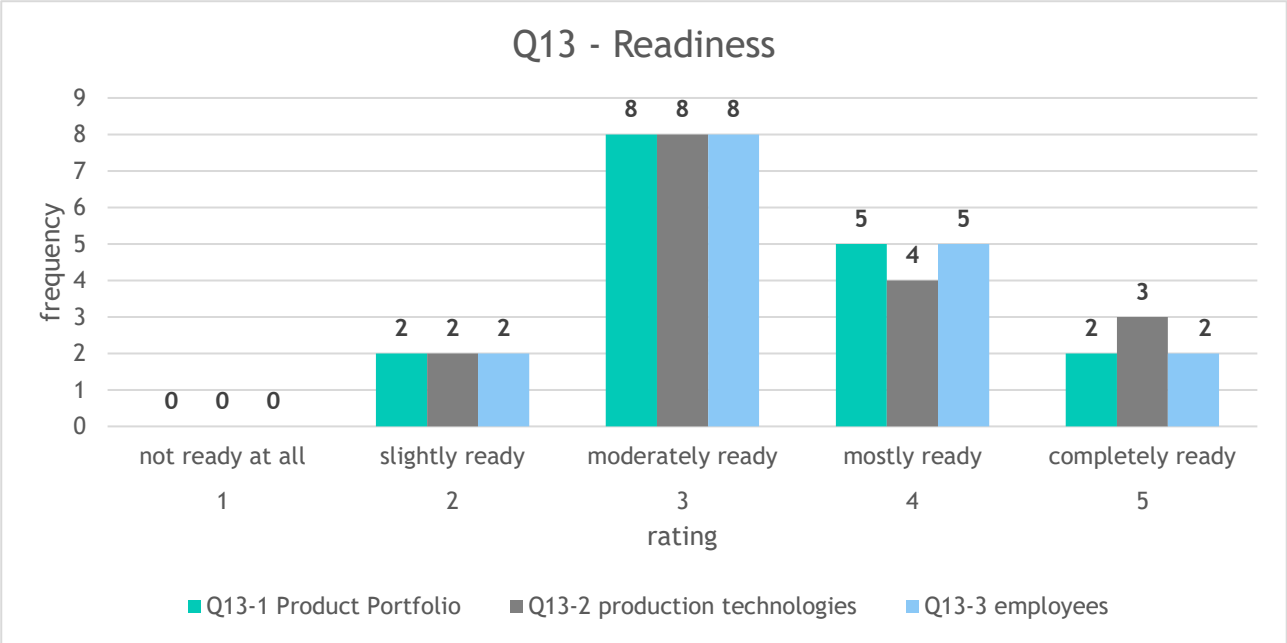
Comparing the results related to the perceived readiness to change business for ensuring business continuity in 2024-2030 the answers have been quite equally distributed when it comes to product portfolio, competencies among employees and production technologies.

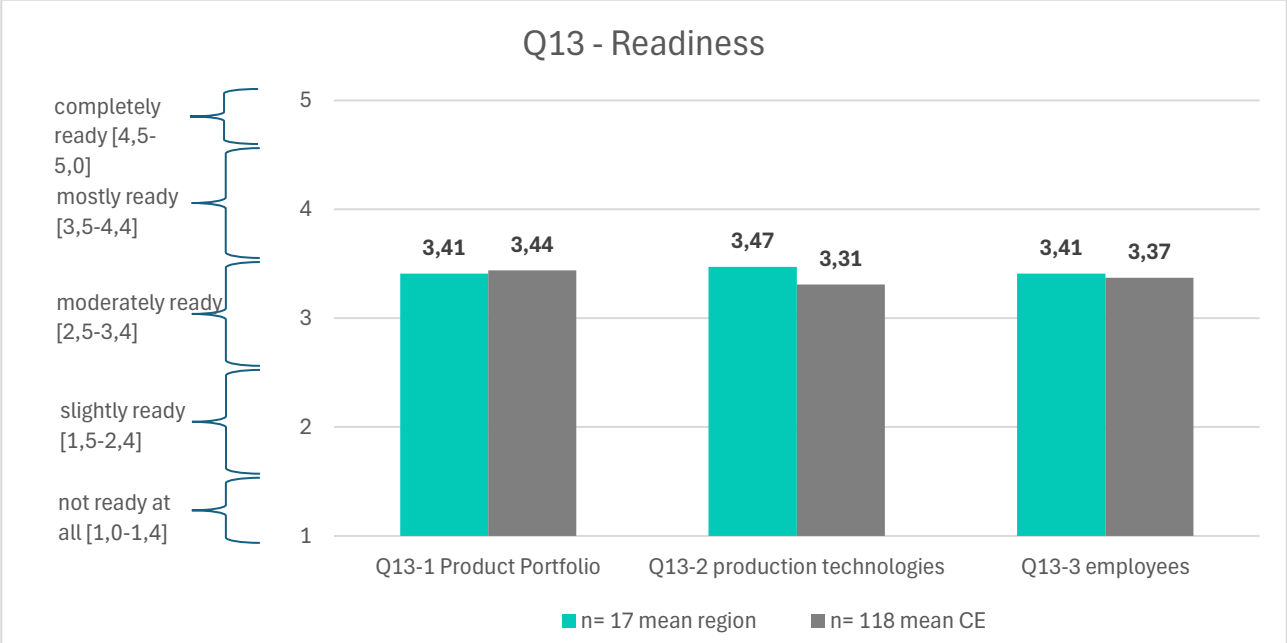
The results for **product portfolio readiness** are **nearly identical to the European average, falling in the moderate range but close to major**. Companies tend to consider their product portfolios as relatively future proof. Most company responses are in the 3-4 range.

The values related to **production technologies** are also rated as **moderate**, with a tendency towards being well-prepared for the transformation. Most values primarily fall within the 3-4 range.

The same picture emerges for competencies among employees: **moderate to good readiness**.

In summary, it can be said that readiness in **region is assessed similarly to the European average**. Companies see themselves as **moderately to well-prepared for changes** in the automotive industry.

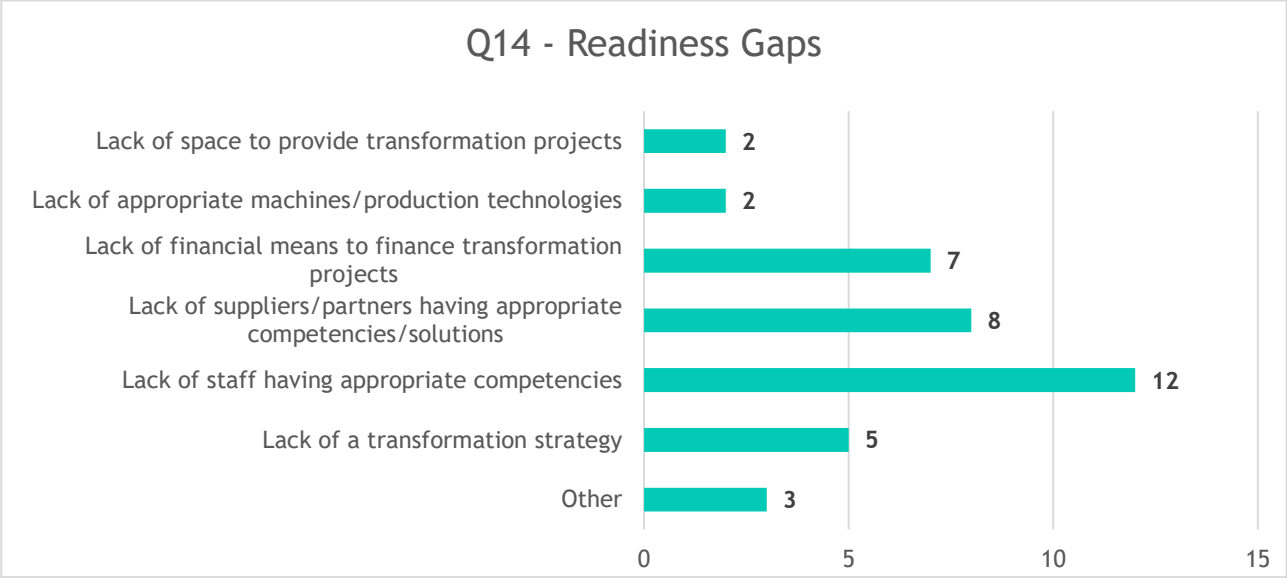




Main readiness gaps hindering businesses from starting a transformation process (Q14)

The primary issue, especially for the medium-low company, is a shortage of staff with the necessary skills, which is essential for driving innovation and adapting to new technologies. Additionally, companies are struggling to find suppliers or partners who can offer the specialised competencies or solutions needed to support transformation efforts, making collaboration and technological

advancements more difficult. Significant is the gap, that companies in the region noticed with the lack of financial means to finance the transformation, highlighting the need for increased investment and funding opportunities for companies to adopt new technologies and a collaborative approach on having a common strategy with research institutes and technology parks.



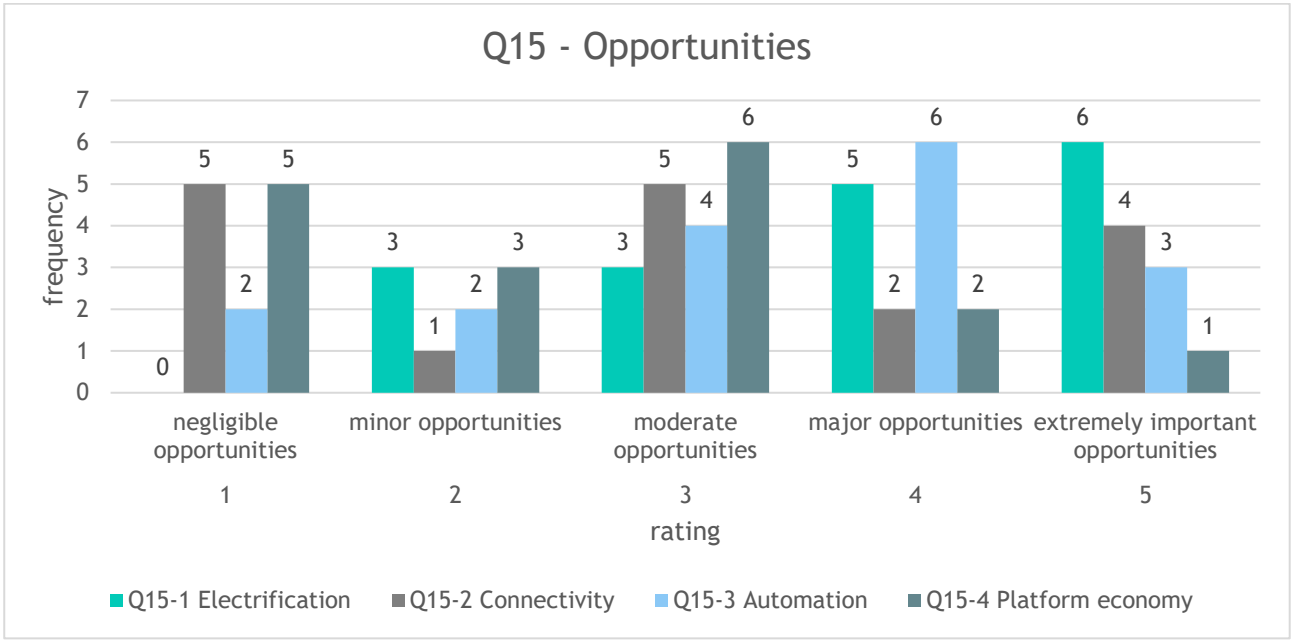
KEY TAKEAWAY: According with the results the automotive sector in Nord Italy is moderately ready for the upcoming changes in all three indicators: current product portfolio, current production technologies, and currently possessed competencies among employees. Companies feel confident and ready for a transformation in their product portfolios but face challenges with workforce development. While there is a willingness to transform, companies need support to overcome financial constraints and develop comprehensive strategies for navigating the changing automotive sector. Despite the majority of companies feel well-prepared for the future, the diminishing order from OEM's linked to market troubles of BEV, influences negatively in the last month, the financial perspective and economic result of 2024.

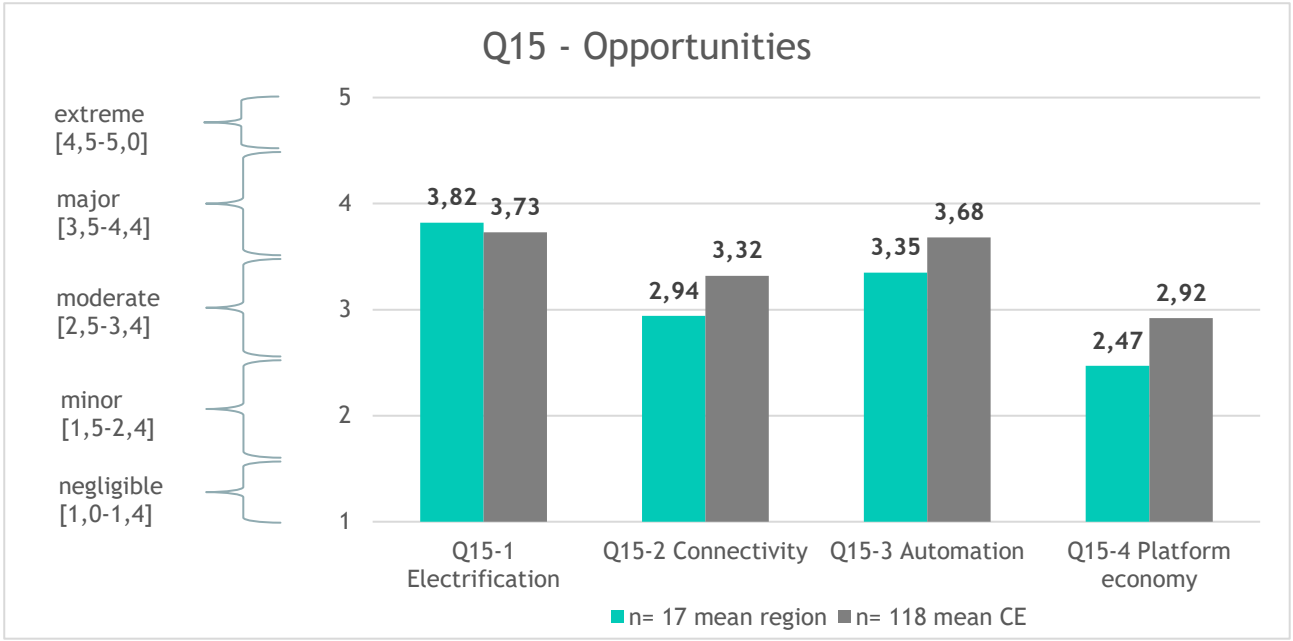
Transformation opportunities and strategic approaches to ensure business continuity in 2024-2030 (Q15-17)

Opportunities to ensure business continuity (Q15)

The assessment of opportunities is similar across all thematic areas compared to the European average. The greatest opportunities are expected in **Electrification**, **Automation and the Connectivity**, with strong prospects. Electrification is seen as one of the most promising areas, with a substantial number of nord Italian companies rating it as a major important opportunity.

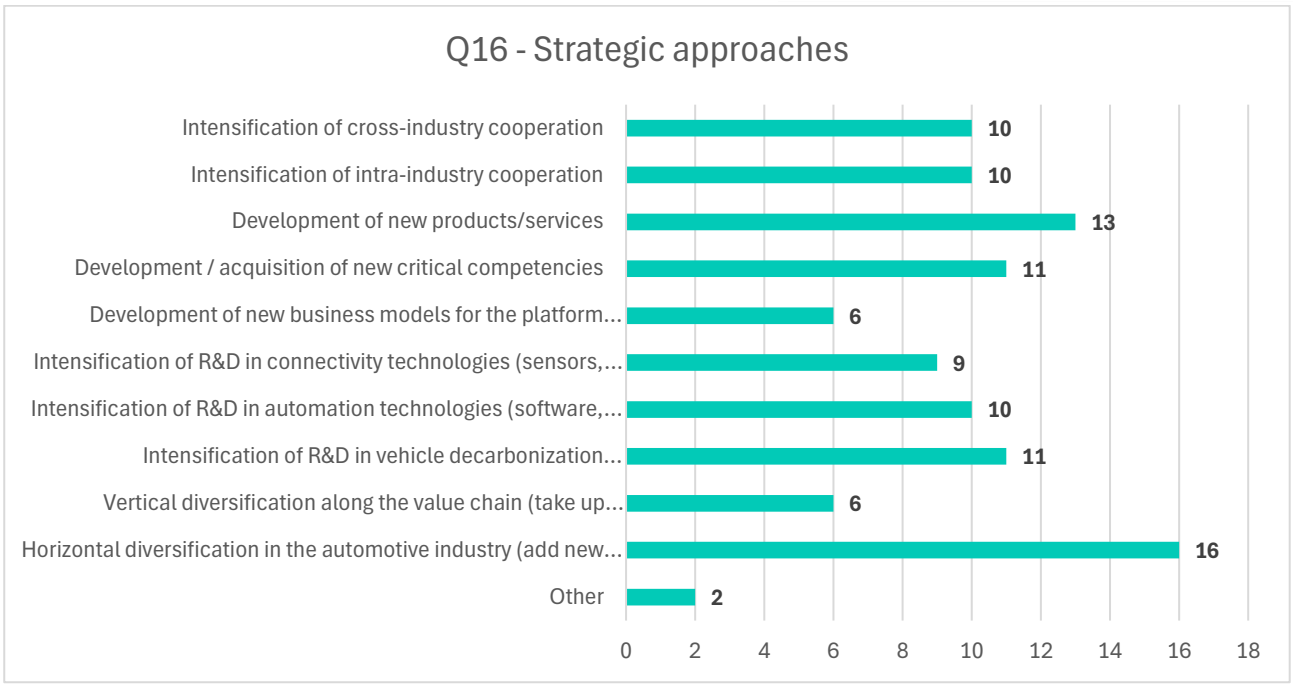
Platform Economy is rated as lower at minor level, where Nord Italian companies rate the opportunities slightly lower than the European average. **Automation** is rated as moderate level, where Nord Italian companies rate the opportunities slightly lower than the European average (major). Electrification is seen as one of the most promising areas, with a substantial number of north Italian companies rating it as either a major or extremely important opportunity.





Strategic approaches to seize opportunities (Q16)

Horizontal diversification strategy within the north Italian automotive industries remains a common thread in order to seize the opportunities. Therefore, companies are also looking to intensify R&D efforts in key areas like vehicle decarbonisation (components for BEVs production), connectivity, and automation. This aligns with their perceived opportunities in electrification and the need to adapt to technological advancements. Some companies emphasize developing new business models for the platform economy, indicating an awareness of the transformative potential of digital platforms. Several companies highlight the importance of collaboration, both within the industry and across sectors, to access new knowledge and resources.



Technology and skills gaps (Q17)

Skills gaps:	Digital IT and AI: lack of skill in big data utilisation for data-informed decision making and increasing productivity of processes. Electronics, Optics Programming robotics
Technology gaps:	Batteries technology Computer vision

Regional resources and business support ecosystem (Q18-22, 26-27)

Factors to play a role in automotive in 2024-2030 (Q18-22)

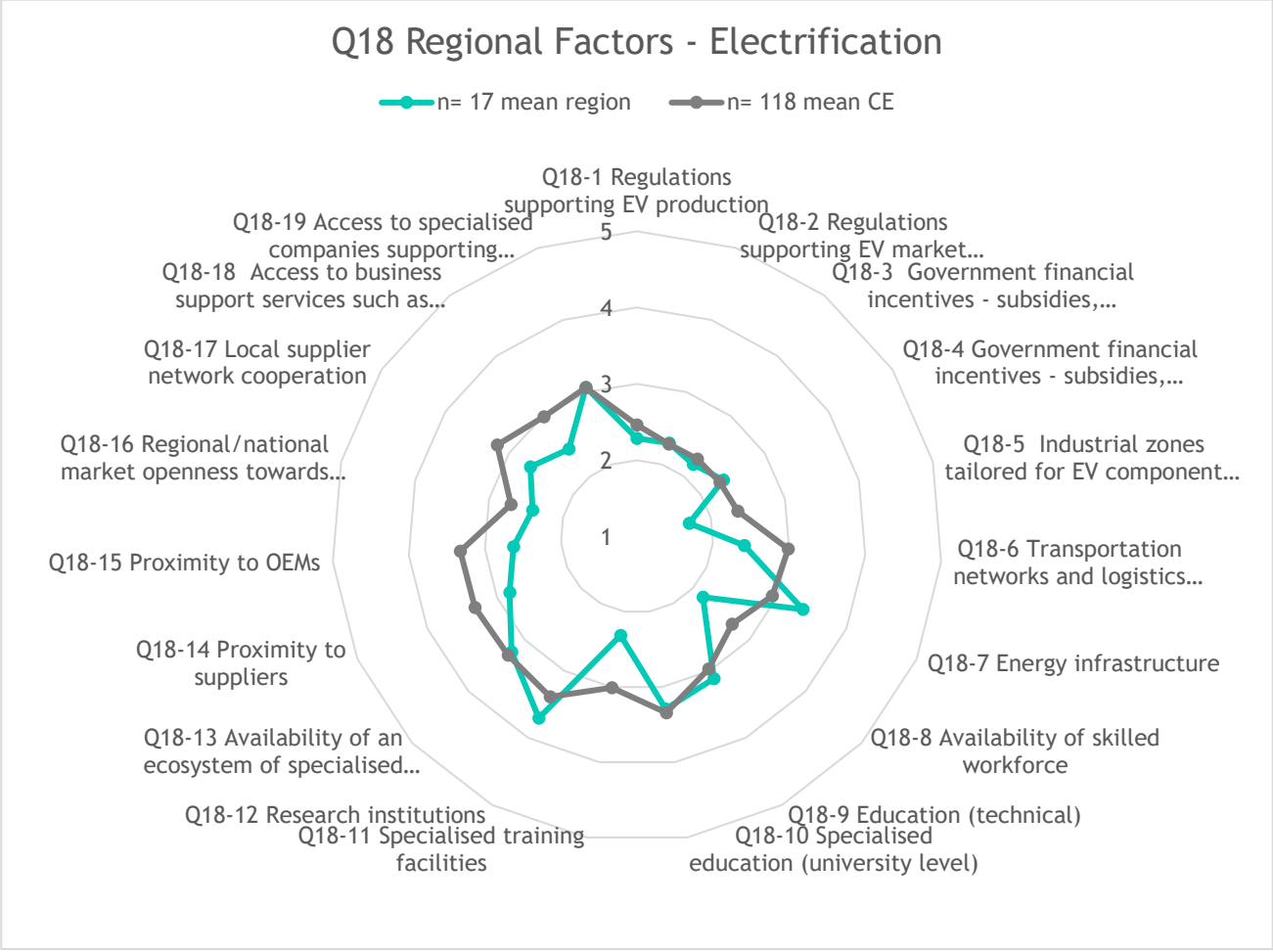
Electrification (Q18)

In the area of Electrification, areas with multiple mentions in the poor and unsatisfactory categories include:

- Government policies – regulations supporting EV market uptake
- Government financial incentives - subsidies, grants, tax breaks for production companies
- Industrial zones tailored for EV component manufacturing
- Availability of skilled workforce
- Availability of specialised education at technical school level
- Availability of specialised training
- Regional/national market openness towards buying EV

- Access to business support services
- Transportation network and logistics infrastructure

In this area, it should be noted for region that the data base from the surveyed companies is relatively good represented, according with the company's inventory and presentation table, where all the companies are well focused on electrification of the product portfolio. Evident gaps compare EU on the electrification is the lack of zone tailored to BEV components, proximity to OEM, availability to specialised training, and skilled workforce.

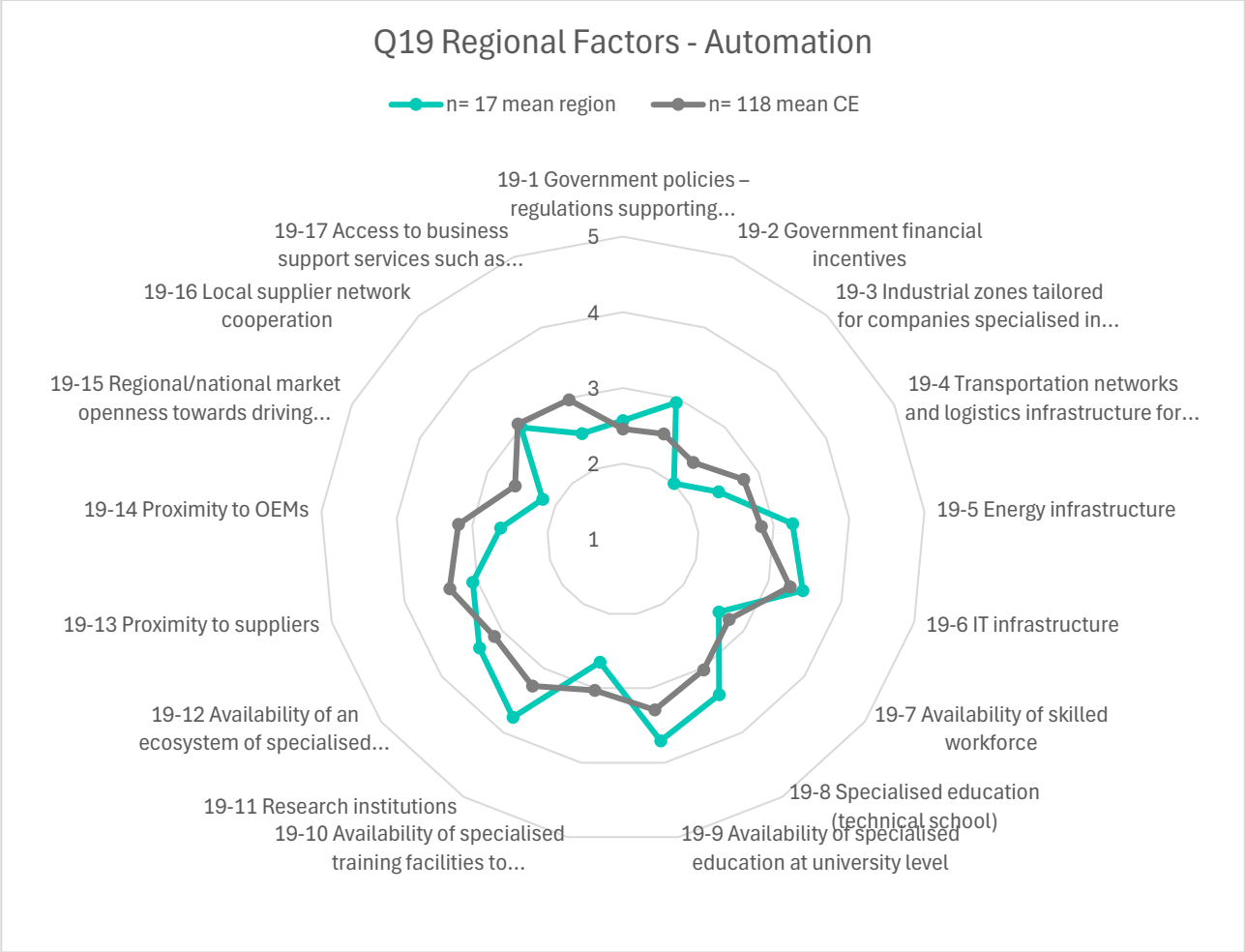


Automation (Q19)

In the area of Automation, areas with multiple mentions in the poor and unsatisfactory categories include:

- Regional/national market openness towards driving autonomous vehicles
- Industrial zones tailored for companies specialised in vehicle automation solutions
- Access to business support services
- Transportation networks and logistic infrastructure

Compared to electrification, the automation gap compare mean EU is less evident. Is the lack of zone tailored for companies specialised in vehicle automation, proximity to OEM, transportation network and logistics. Strength points in comparison to Eu average are Availability of specialised education at university level, Availability of research institutions and technology parks, Energy infrastructure.

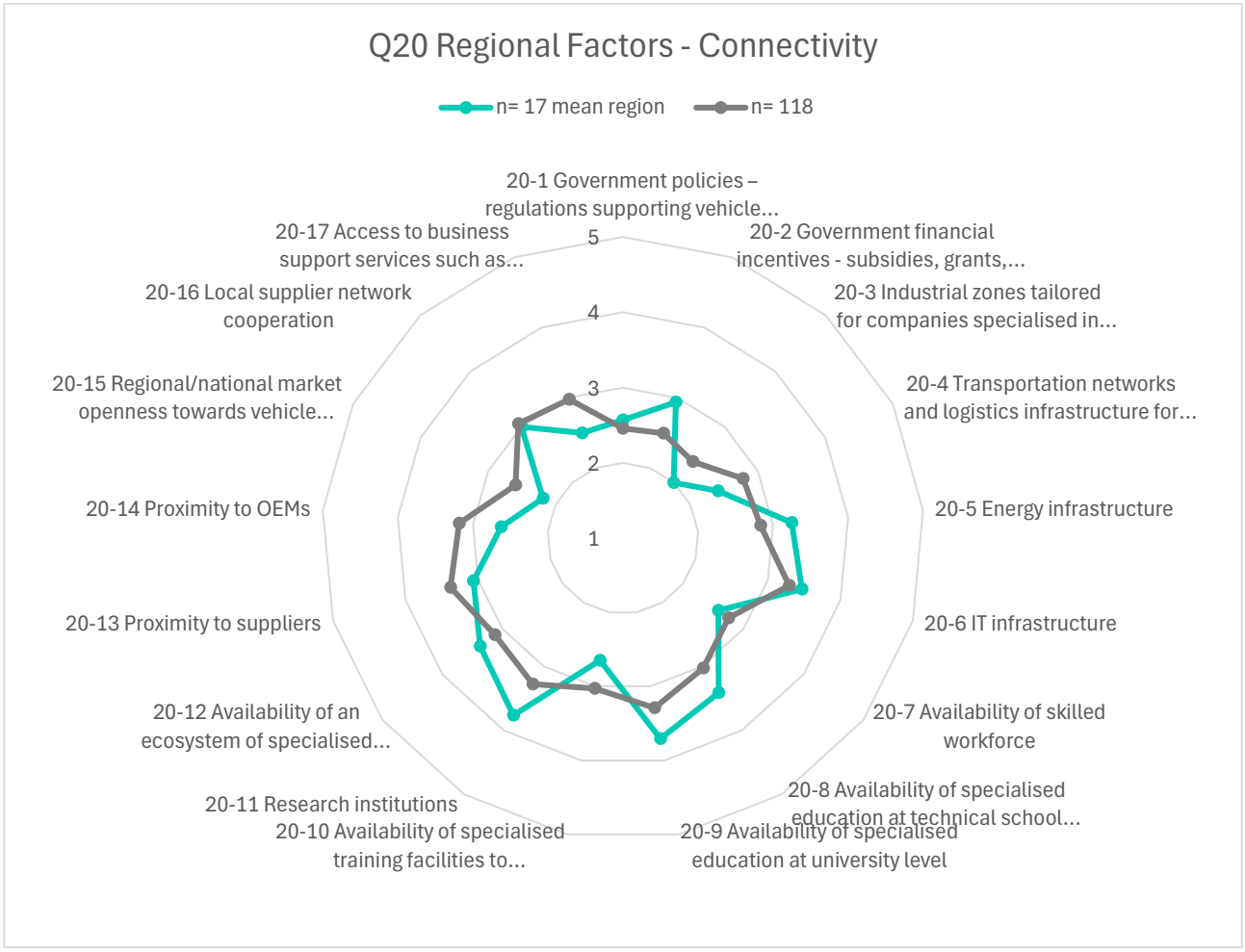


Connectivity (Q20)

In the area of connectivity, areas with multiple mentions in the poor and unsatisfactory categories include:

- Regional/national market openness towards vehicle connectivity, data-sharing
- Industrial zones tailored for companies specialised in vehicle connectivity solutions
- Access to business support services
- Transportation network and infrastructure

Those points are lower respect the EU mean, despite the availability of research institutions and government incentives, availability of specialised education at university level, and energy infrastructure is relatively higher.



Platform Economy (Q21)

In this area, it should be noted for region that the data base from the surveyed companies is too limited, according with the company's inventory and presentation table, only few are focused on that. There are many respondents have rated with "unable to answer". More companies from the Platform economy sector should be surveyed, and this area should also be further developed through cluster policy

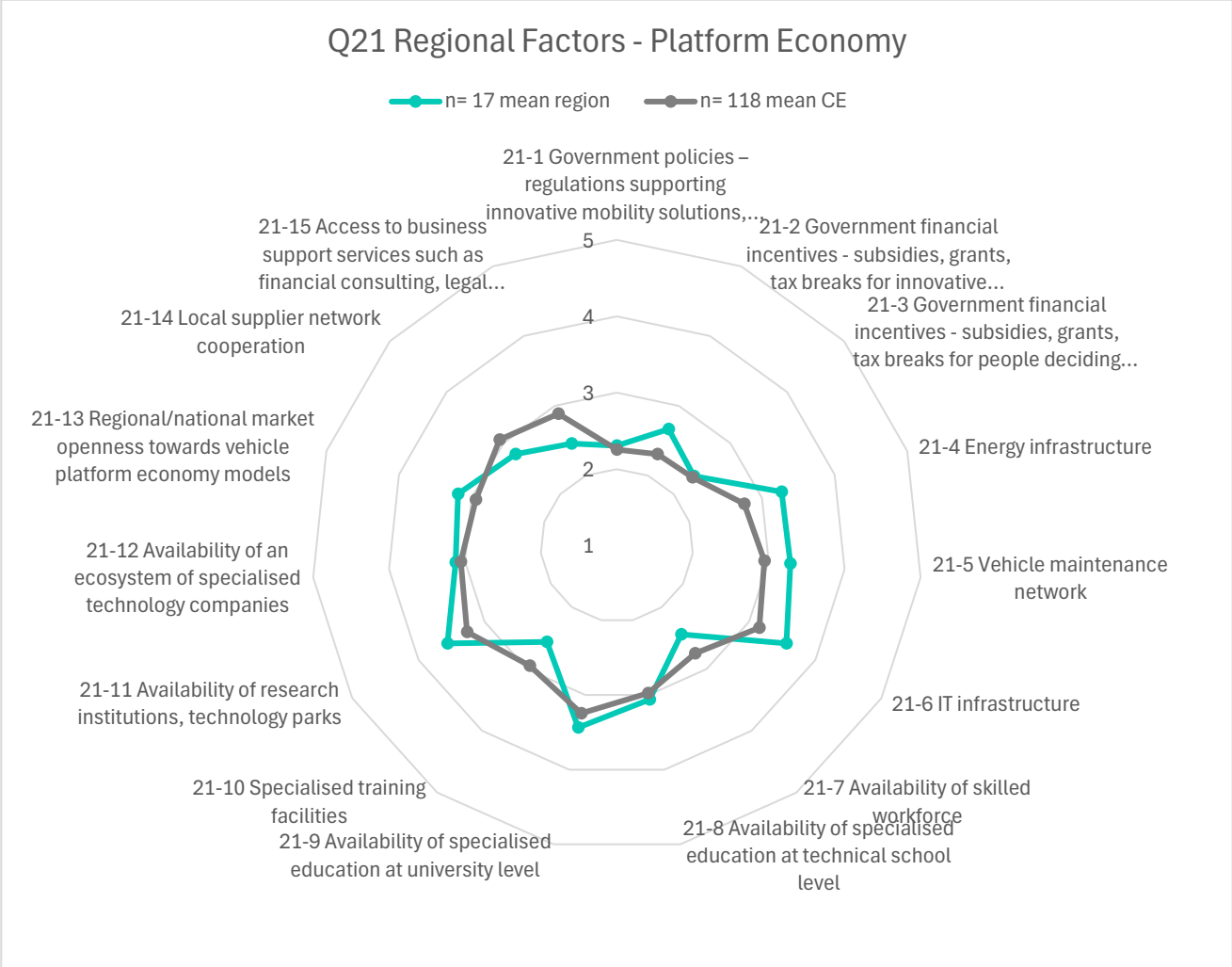
In the area, with multiple mentions in the poor and unsatisfactory categories include:

- Availability of skilled workforce
- Government financial incentives - subsidies, grants, tax breaks for people deciding to participate in vehicle sharing
- Government policies – regulations supporting innovative mobility solutions, vehicle platform economy models
- Access to business support services

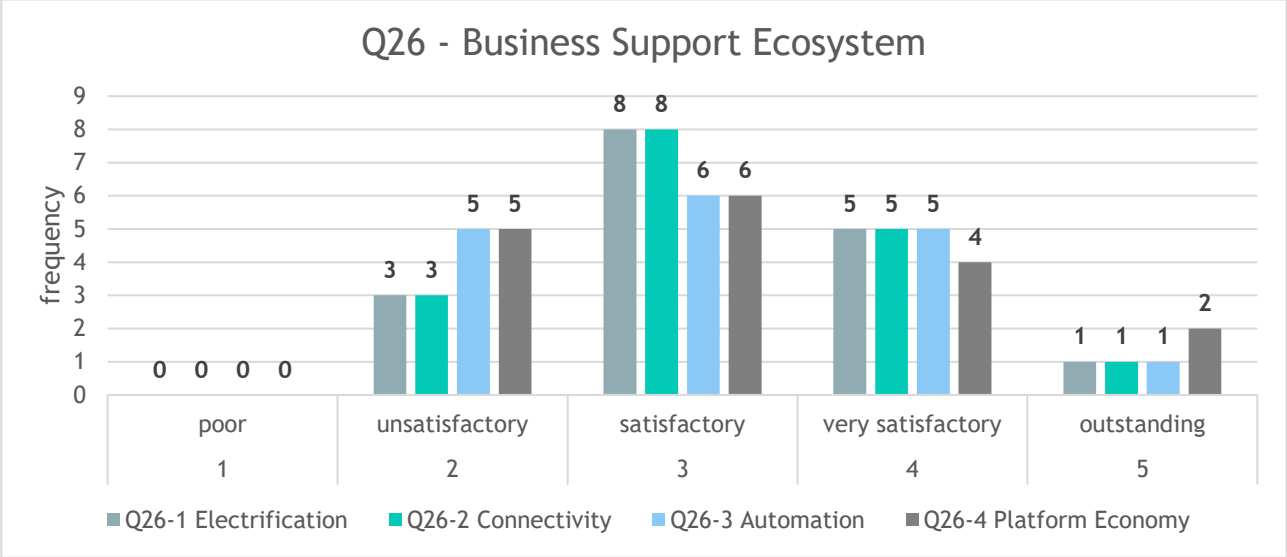
Additional factors influencing the regional competitiveness (Q22)

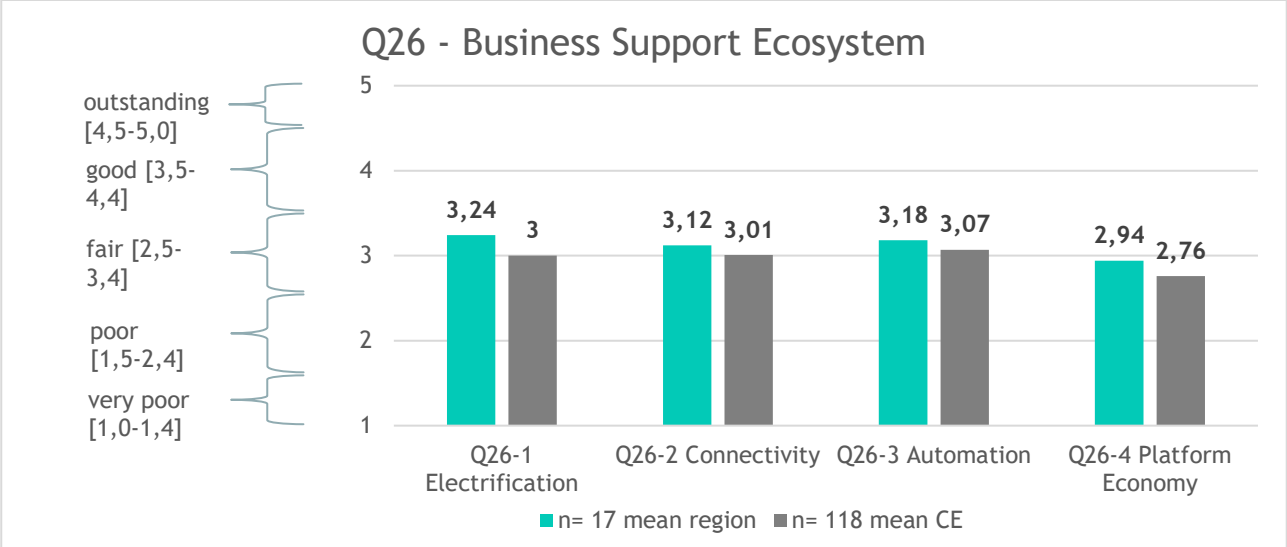
- Dedicated political strategy along value chain - focused on production volume
- Skilled workforce and education - technical and university-level education

- Enhance cooperation projects - create interconnected, national high-tech clusters driven by private innovative companies
- Increased competition from China - lower-cost transportation, technological advancements



Business support services (Q26-27)

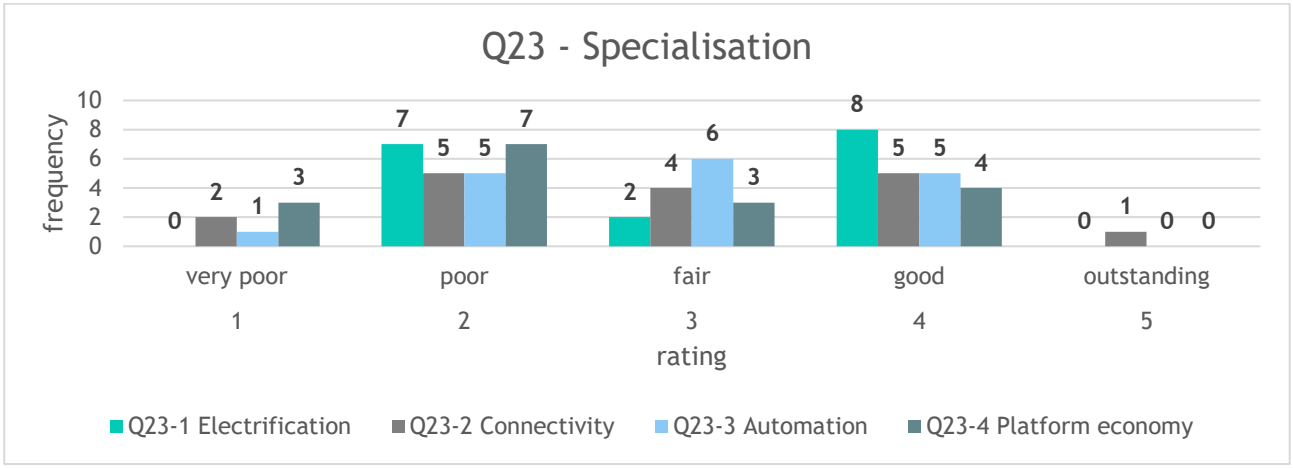


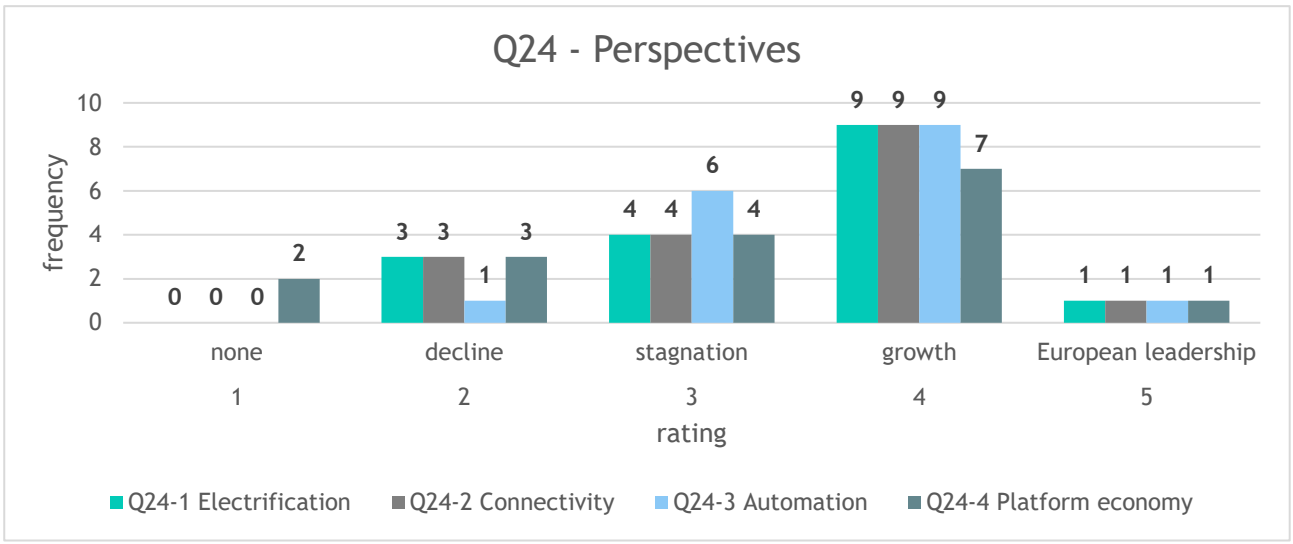


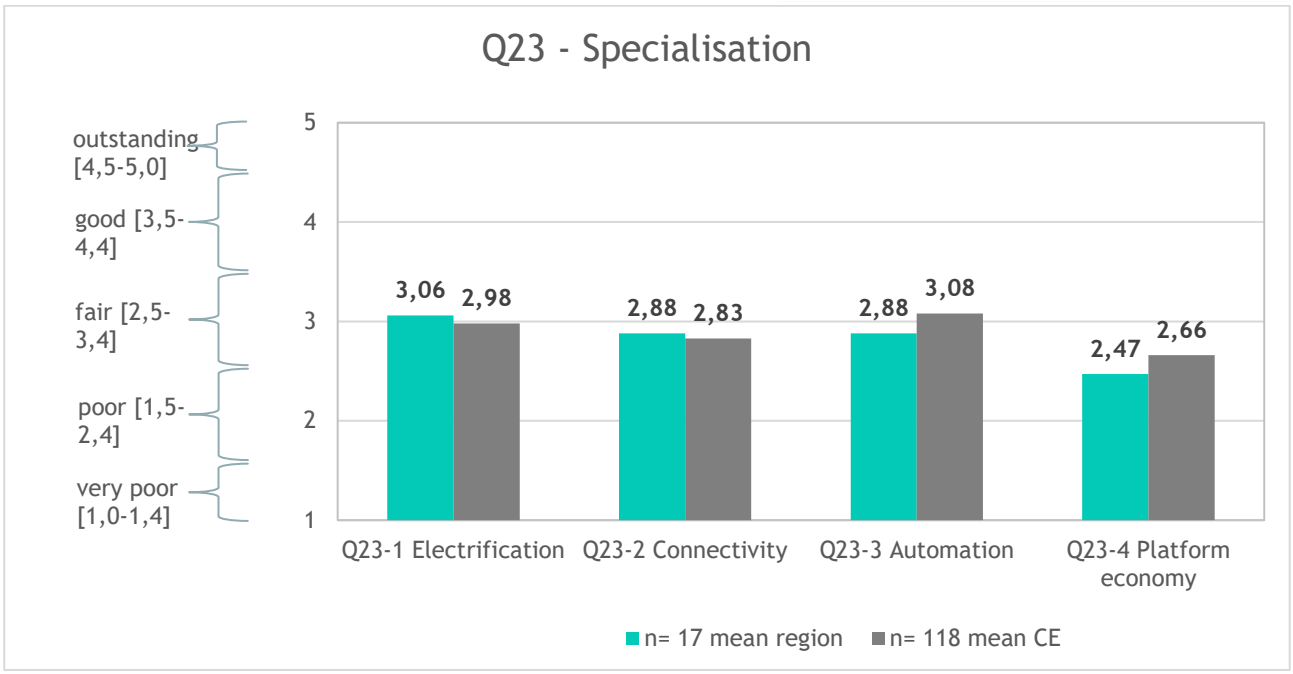
Specialisation level and development perspectives (Q23-25)

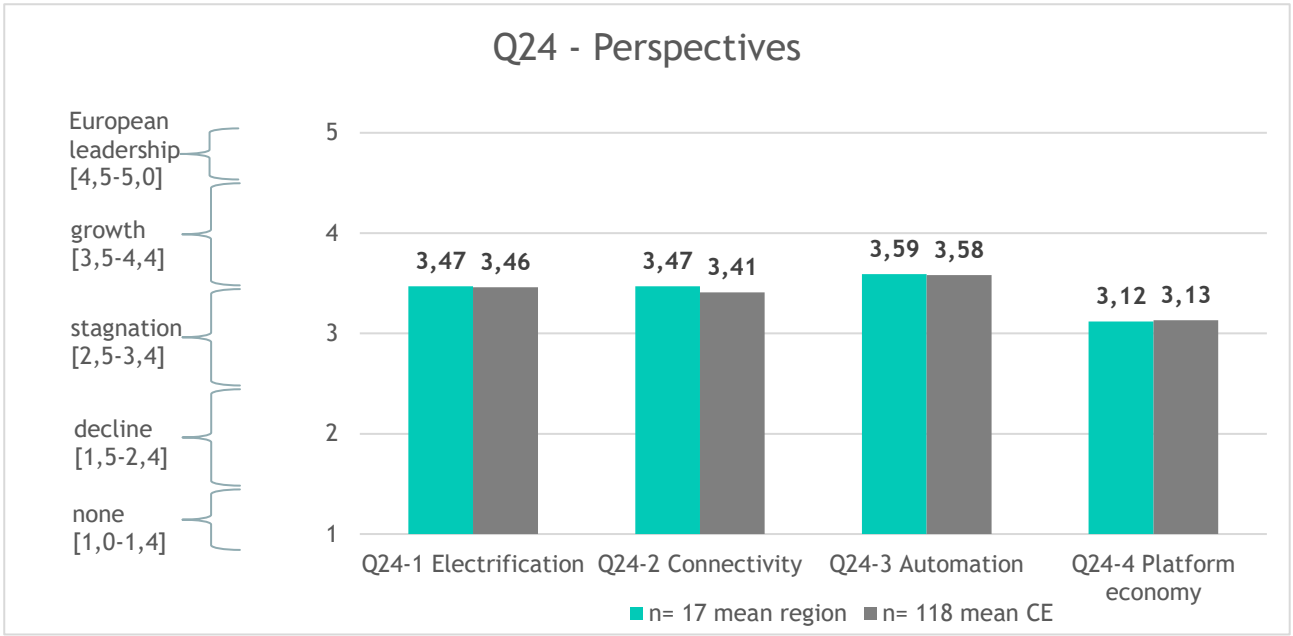
In Electrification, the region sees itself well-positioned as an automotive hub (on average rated as fair = 3). Automation and Connectivity is rated a bit lower but still as fair, while Platform Economy remains between fair and poor, with small gap in comparison with Eu average. Overall, there is a tendency toward stagnation or growth. Diversification is particularly increasing among smaller companies.

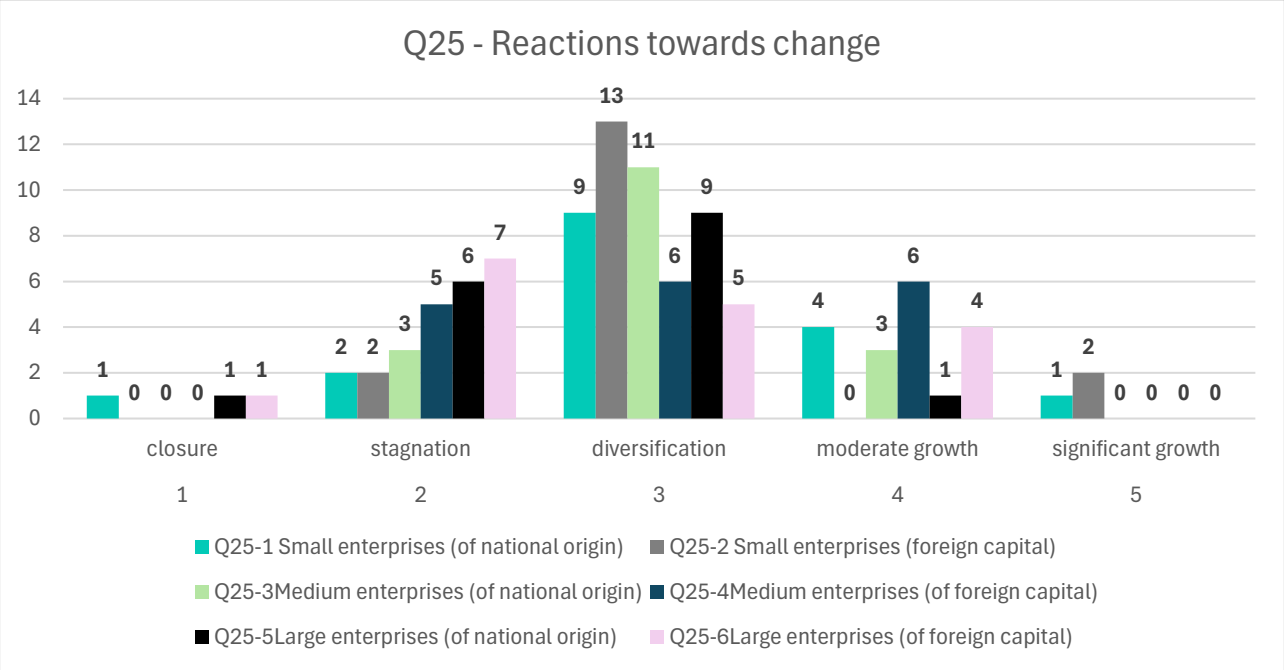
Despite the overall results for the development perspective are between fair and good, ongoing market weaknesses in European automotive sector, and the latest bad news related to closure of production plants, tend to offer a different scenario. It seems to be worse than stagnation, also in north Italian companies. At least cost reduction and working time reduction are the now focus. On average, smaller Slovenian enterprises (both national and foreign owned) express slightly dynamic reactions towards changes compare to medium – large of their counterparts and exceeding the CE average.

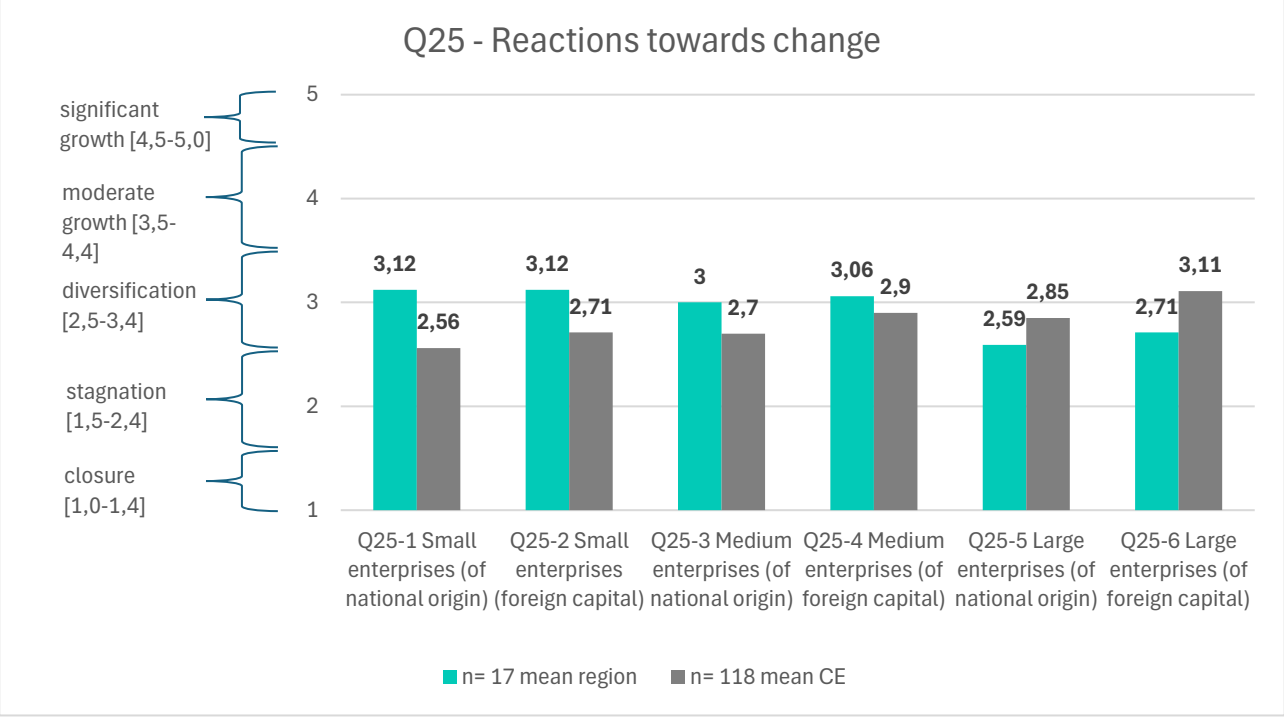

Q23 - Specialisation
frequency
10
8
6
4
2
0
0 2 1 3
7 5 5 7
2 4 6 3
8 5 5 4
0 1 0 0
very poor
poor
fair
good
outstanding
1
2
3
4
5
rating
Q23-1 Electrification
Q23-2 Connectivity
Q23-3 Automation
Q23-4 Platform economy


Q24 - Perspectives
frequency
10
8
6
4
2
0
0 0 0 2
3 3 1 3
4 4 6 4
9 9 9 7
1 1 1 1
none
decline
stagnation
growth
European leadership
1
2
3
4
5
rating
Q24-1 Electrification
Q24-2 Connectivity
Q24-3 Automation
Q24-4 Platform economy

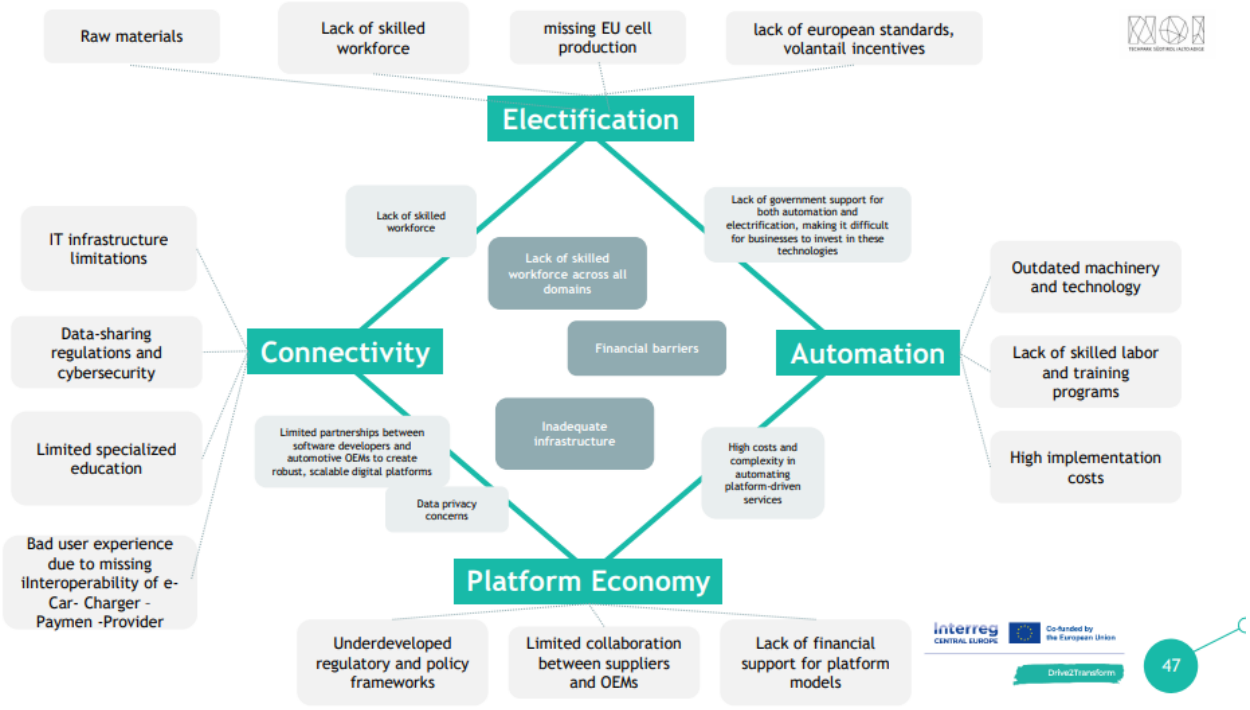

Q23 - Specialisation
outstanding [4,5-5,0]
good [3,5-4,4]
fair [2,5-3,4]
poor [1,5-2,4]
very poor [1,0-1,4]
5
4
3
2
1
3,06
2,98
2,88
2,83
2,88
3,08
2,47
2,66
Q23-1 Electrification
Q23-2 Connectivity
Q23-3 Automation
Q23-4 Platform economy
n= 17 mean region
n= 118 mean CE


Q24 - Perspectives
European leadership [4,5-5,0]
growth [3,5-4,4]
stagnation [2,5-3,4]
decline [1,5-2,4]
none [1,0-1,4]
5
4
3
2
1
3,47
3,46
3,47
3,41
3,59
3,58
3,12
3,13
Q24-1 Electrification
Q24-2 Connectivity
Q24-3 Automation
Q24-4 Platform economy
n= 17 mean region
n= 118 mean CE


Q25 - Reactions towards change
14
12
10
8
6
4
2
0
1 0 0 0 1 1
2 2 3 5 6 7
9 13 11 6 9 5
4 0 3 6 1 4
1 2 0 0 0 0
closure
stagnation
diversification
moderate growth
significant growth
1
2
3
4
5
Q25-1 Small enterprises (of national origin)
Q25-2 Small enterprises (foreign capital)
Q25-3Medium enterprises (of national origin)
Q25-4Medium enterprises (of foreign capital)
Q25-5Large enterprises (of national origin)
Q25-6Large enterprises (of foreign capital)


Q25 - Reactions towards change
significant growth [4,5-5,0]
moderate growth [3,5-4,4]
diversification [2,5-3,4]
stagnation [1,5-2,4]
closure [1,0-1,4]
5
4
3
2
1
3,12 2,56
3,12 2,71
3 2,7
3,06 2,9
2,59 2,85
2,71 3,11
Q25-1 Small enterprises (of national origin)
Q25-2 Small enterprises (foreign capital)
Q25-3 Medium enterprises (of national origin)
Q25-4 Medium enterprises (of foreign capital)
Q25-5 Large enterprises (of national origin)
Q25-6 Large enterprises (of foreign capital)
n= 17 mean region
n= 118 mean CE

Conclusion - Key findings for regional transformation capacities in the automotive sector



Challenges in Italy

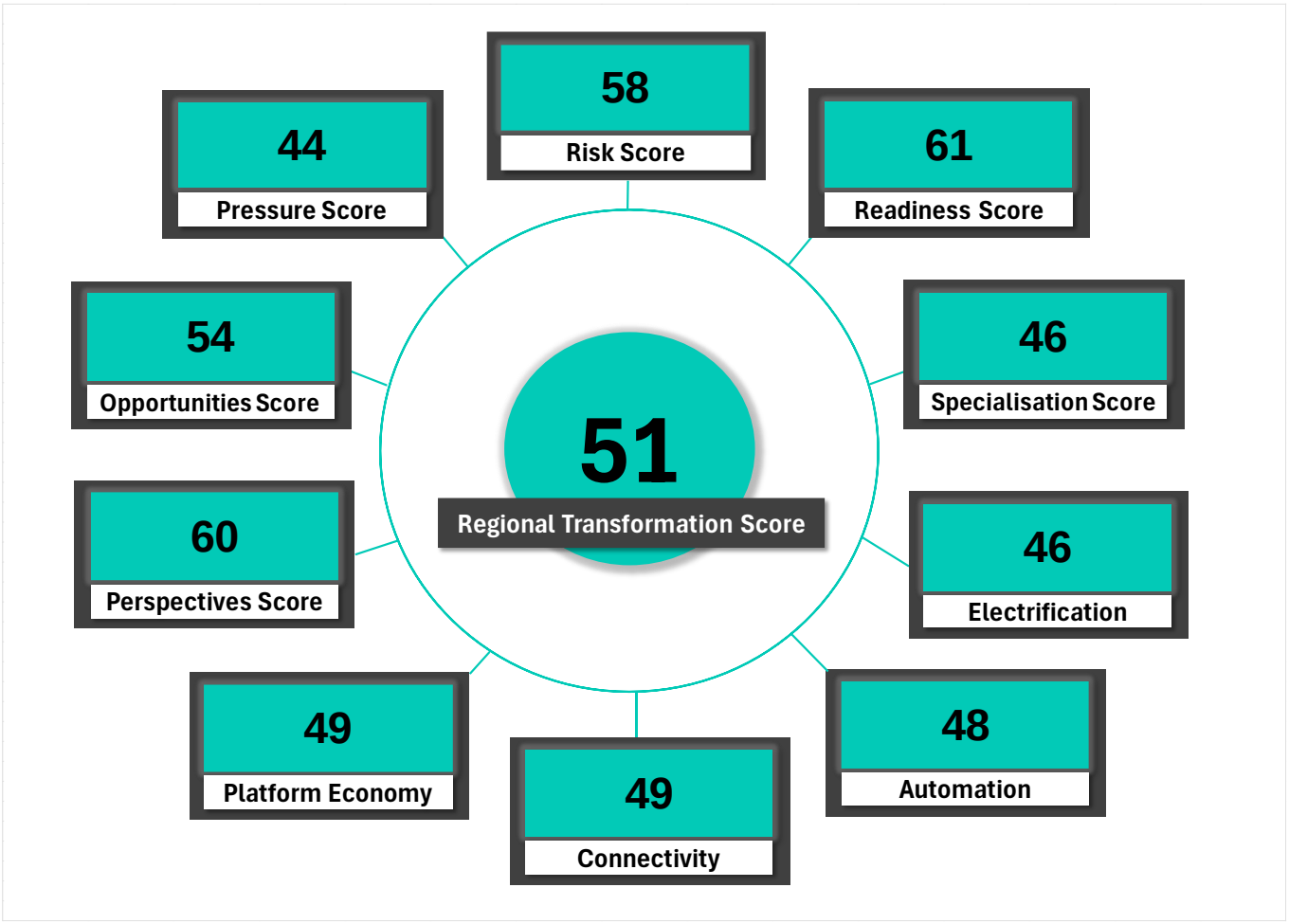
- **Electrification and Sustainability**
  South Tyrol is a prototyping, testing and showcase region for offroad and mountain mobility with international market leaders (like Leitner, Doppelmayr, IDV,) and electrification technology providers (Alpitronic, Intercable, GKN Automotive).

- **Industry Resilience and Challenges**
  The automotive sector (5% of rGDP) shifted towards **electromobility and is suffering in the moment a retroshift** towards ICE. Challenges are the talents with of specific competences, the high costs of living, lack of space, too low R&D investments.

- **Digital Transformation**
  The industry is focused on electrification and automation, in near future connectivity and IT/AI competences will become crucial to improve the manufacturing process to **reduce cost**, the product development to reduce **time to market** and to get **phygital products/services innovation** in place.

Transformation Readiness Index - Italy/ South Tyrol

Italy is rated as moderate ready for transformation. Its top ratings are Readiness and Perspectives, while they score lower in all four Regional Factor Scores, Pressure and Specialisation.



Ranking:

>60 Transformation Ready

50-60 Moderate Ready

40-50 Limited Ready

30-40 Low Ready

<30 Not Ready

Poland-Silesia | Katowice Special Economic Zone (KSSE/SA&AM)

Brief description of the region

The Silesia region (Śląskie Voivodeship) is one of the country's most industrialised regions with a strong presence of the automotive industry.

The Silesia region encompasses an area of 12.3 thousand km2 and is home to 4.3 m inhabitants (11,5% of the Polish population). The region is characterised by a high share in the creation of Polish Gross Domestic Product (GDP), second only to the Masovian Voivodeship in this respect.

In Poland about 207,000 people are employed in 2782 companies registered under NACE29 (manufacture of road vehicles), of which about 55,000 people in 432 companies in Silesia. Many companies registered under NACE22 (manufacture of rubber and plastic products), NACE24 (manufacture of basic metals) and NACE25 (manufacture of fabricated metal products) are Tier-2 and Tier-3 suppliers in automotive supply chains. As such the total employment related to the automotive sector in the region is estimated around 80,000 to 100,000 jobs.

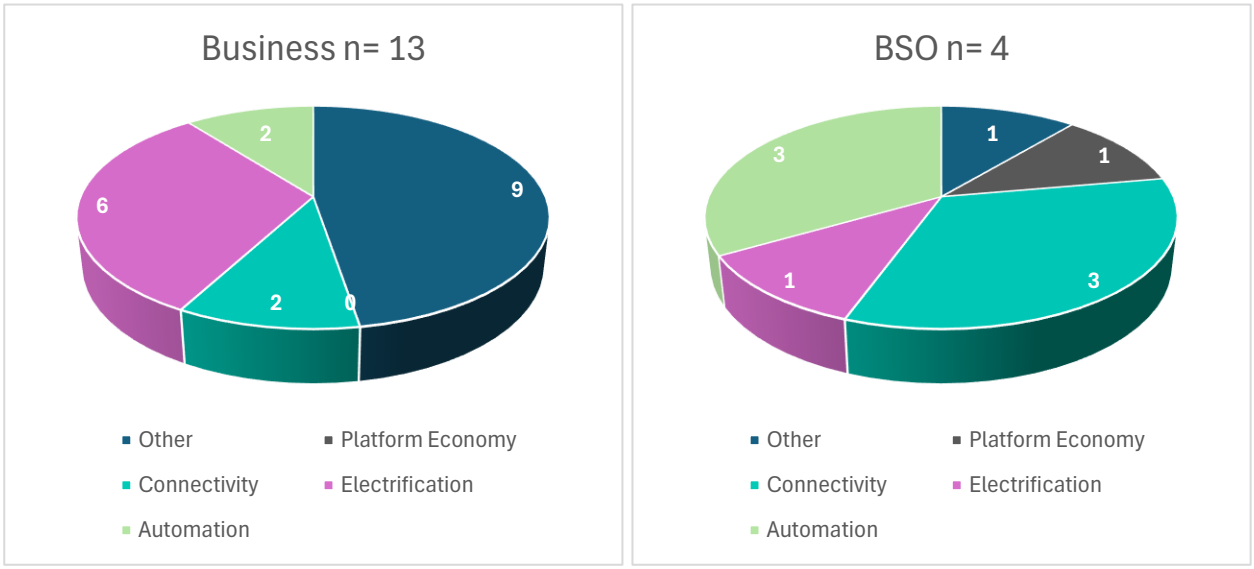
The Katowice Special Economic Zone (Katowicka Specjalna Strefa Ekonomiczna S.A. – KSSE) is the coordinator of Silesia Automotive & Advanced Manufacturing, a cluster established in 2011 counting currently over 220 members. Among these members there are several business and technology parks that developed their own partnerships, for example to provide projects supporting companies' competitiveness through technology development and innovation. There are several service companies (for instance: Dekra Polska, SQD Alliance, QSence, Quality Austria Polska) in the cluster delivering training and certification to ensure compliance with norms and standards. At the end of 2023, SA&AM counted 23 universities and research institutions among its members. Research teams specialised in engineering, machine and machine tool engineering, new materials, IT engineering and other research disciplines are being involved in problem-solving workshops and Science2Business matchmaking events. On regional level, there are several business

support organisations that were set up by local and regional self-governments about 30 years ago to manage economic transformation processes. There are also several loan and guarantee funds supporting companies. Companies in the automotive sector cooperate with consultancy firms and business support organisations in identifying public and private financing instruments and in preparing business plans and project applications.

Inventory of companies and business support organisations (BSO) (Q1-8)

The surveyed companies seem to be a fairly good representation of the regional automotive SME-suppliers ecosystem. Out of 12 respondents, over 40% are metal parts producers, 40% are plastic components producers, 2 companies provide automotive-related services such as vacuum testing and heat treatment and thermal processing and 1 company also deals with carbon composites. Among the surveyed companies roughly 1/3 has less than 20% involvement in automotive (diversification as a result of previous crises in the automotive sector), 1/3 declared automotive industry sales revenues in the range of 20-49% of total revenues and 1/3 over 50% of their revenues.

The group of BSOs that took part in the survey included: 2 service companies delivering training and certification to ensure compliance with norms and standards, the regional self-government, the Katowice Special Economic Zone. This gives a fairly good representation of organisations providing indirectly support measures through development programmes (among others the programme European Funds for Silesia including dedicated measures for SMEs in the field of research and development, digital transformation, energy efficiency, competencies development) and services for companies in the automotive sector. The Katowice Special Economic Zone (Katowicka Specjalna Strefa Ekonomiczna S.A. – KSSE) was established under the Regulation of the Council of Ministers of 18 June 1996 in order to support and advance restructuring processes, as well as to generate employment in the Silesia Voivodeship. Currently KSSE is involved in delivering administrative decisions on tax relief for new investments under the programme Polish Investment Zone. Companies that would like to make use of this tax relief instrument have to demonstrate their investments follow sustainable economic and social development principles. KSSE is the coordinator of Silesia Automotive & Advanced Manufacturing, a cluster established in 2011 counting currently over 220 members. KSSE is also coordinating the European Digital Innovation Hub Silesia Smart Systems, a consortium of business support organisations, research and development organisations and universities supporting digital transformation in SMEs. Sustainable transformation is being promoted through workshops, training and matchmaking between demand and supply of advanced technologies and specialised services.

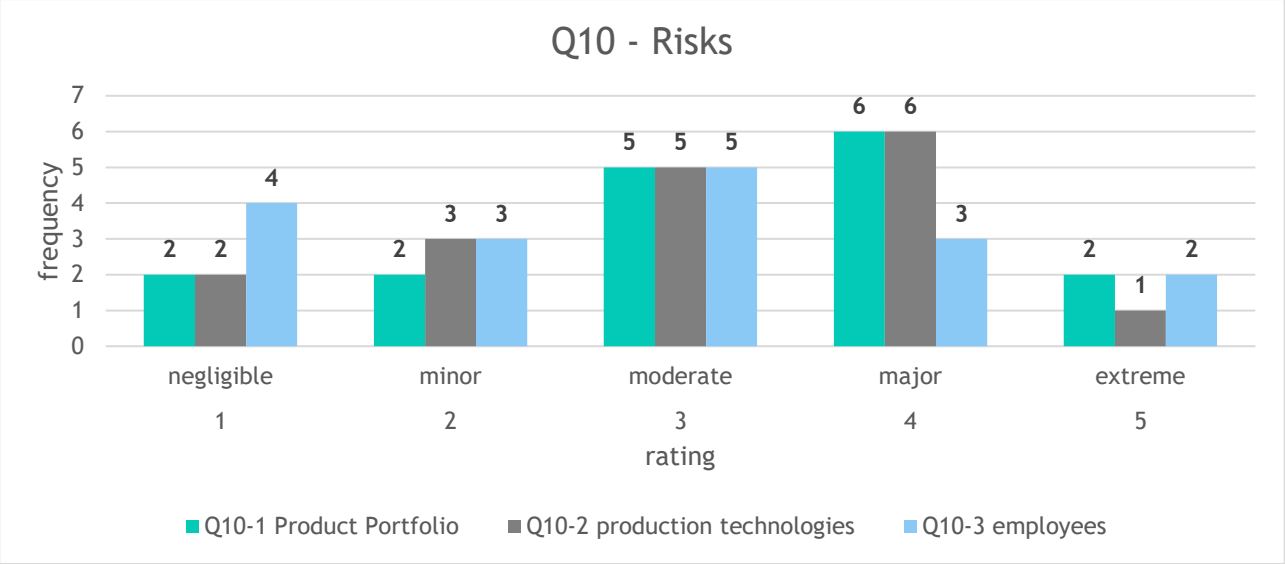


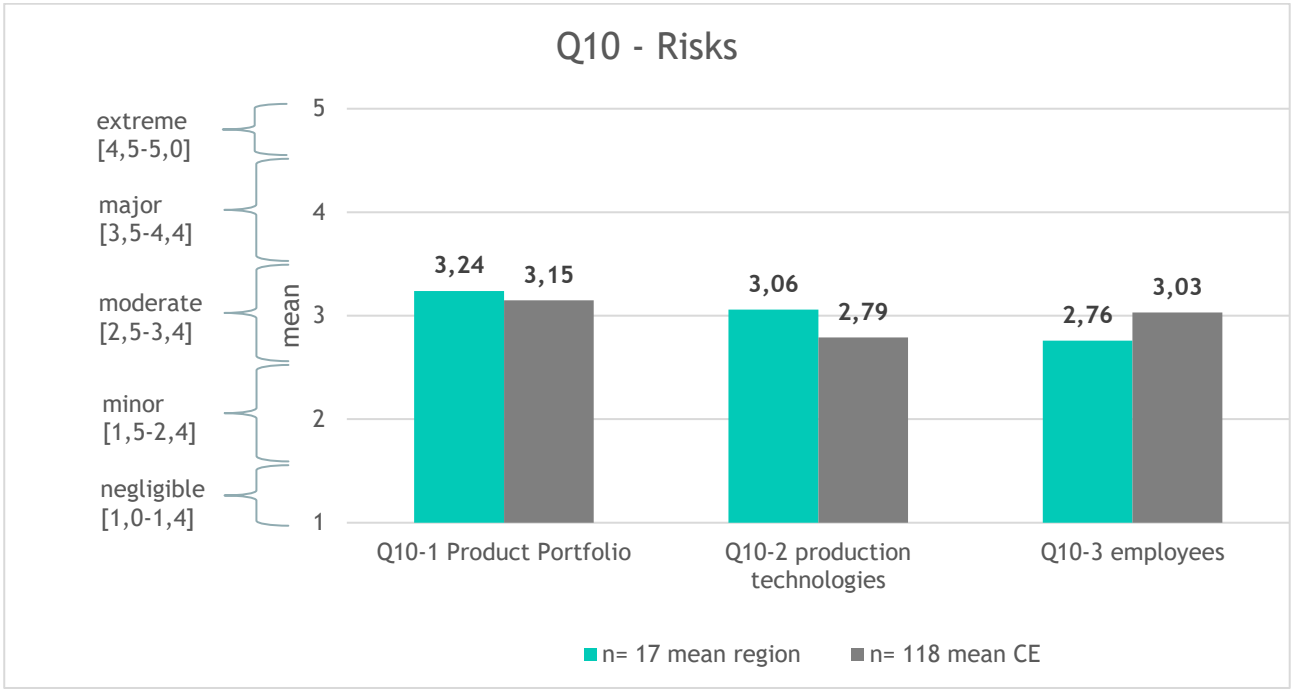
Transformation risks, pressure and readiness for business continuity in 2024-2030 (Q10-14)

Risks endangering business continuity (Q10-11)

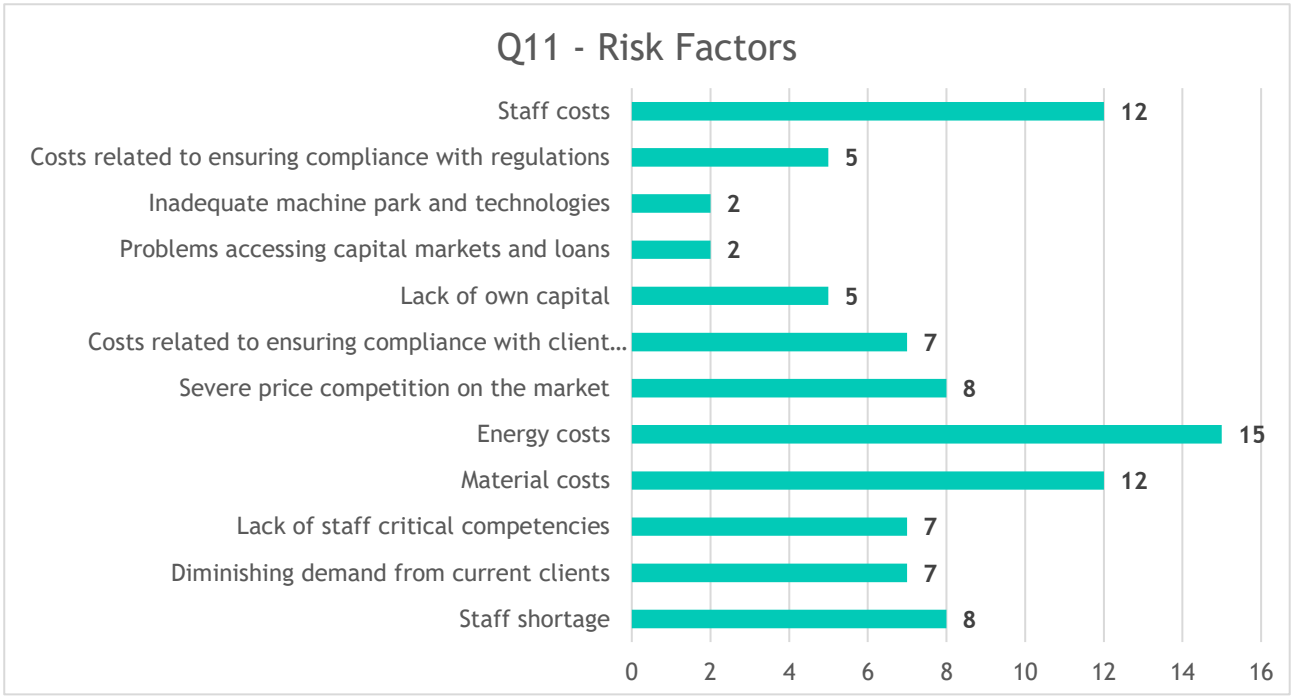
The risk for the product portfolio, production technologies and employees has been assessed on average as moderate which in general aligns with the European average. There is a slight difference noted in the frequency of answers assessing the risk related to employees which is currently assessed slightly more favourably compared to the European average.

The companies involved in the survey have a rather pessimistic view about the future of the region as a European automotive hub. These companies are mostly active on tier-3 and tier-4 level in the supply chains. Medium-sized enterprises are expected to provide diversification strategies however they still could be confronted with moderate growth. Depending on the product portfolio certain large companies are deemed to experience significant growth (module and system suppliers), while others, mainly those producing standardised metal and plastic parts, will be confronted with stagnation of their business activities.





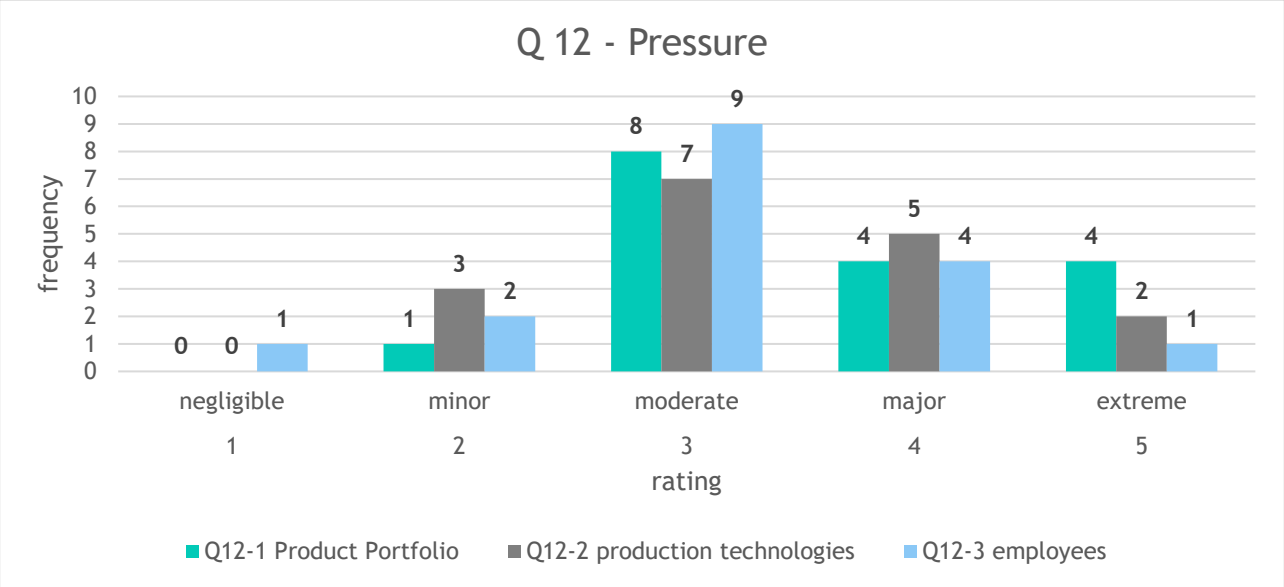
The three greatest risk factors indicated by respondents are: energy costs, staff costs, and material costs. An explanation for this is the respondents' production profile: production of metal and plastic parts and service profile: product heat treatment processes. These are energy intensive processes. The push for green energy and the war in Ukraine have impacted negatively on energy prices. Also, the Polish labour market has seen a considerable raise in the minimum wage and a raise in wages of specialists lacking currently on the labour market. Therefore, companies, in order to retain skilful workforce need to provide attractive renumeration. Finally, material costs remain a significant risk, due to the rising costs of raw materials. Since automotive companies operate on tight margins, fluctuations in material costs impacts their profitability.

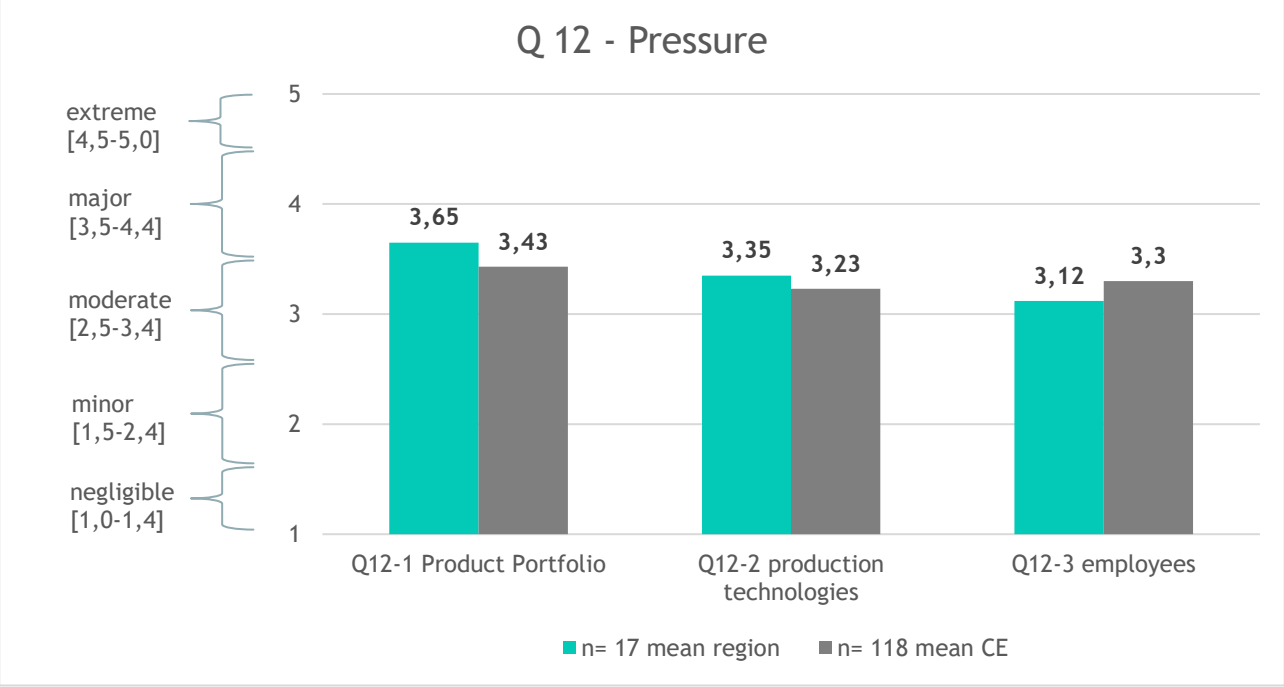


Pressure to change business for ensuring business continuity (Q12)

In general, the assessment of pressure to provide change in Silesia falls within the range of 3, indicating moderate pressure. Slightly higher pressure is noted locally than on EU average when it comes to pressure to provide change in the product portfolio and in the field of production technologies. This might be interpreted as the growing awareness of companies to stay alert and actively respond to challenges in the automotive industry. Several companies have been diversifying their business activities towards other market segments during previous crises in the automotive sector.

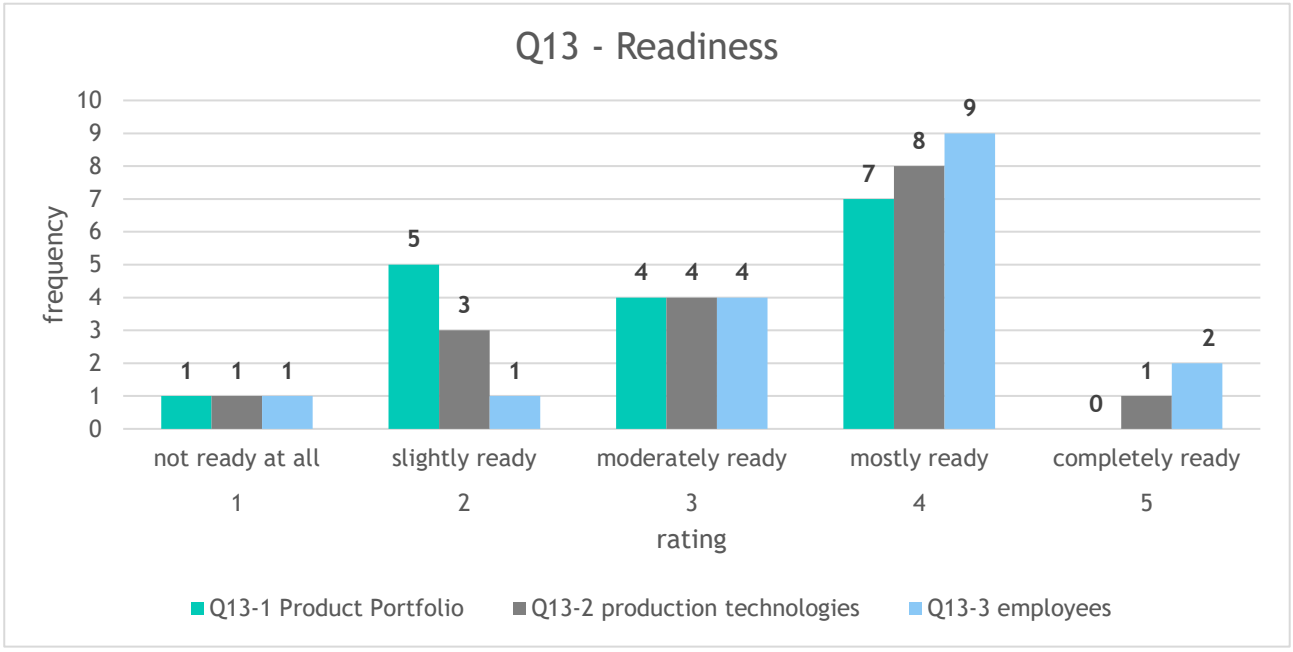
On the other hand, the pressure to provide change linked to employees is lower in Silesia compared with the EU average. An explanation for this trend could be rooted in good availability of skilled workforce in companies as well as specialised training facilities to upskill/reskill employees in the region.

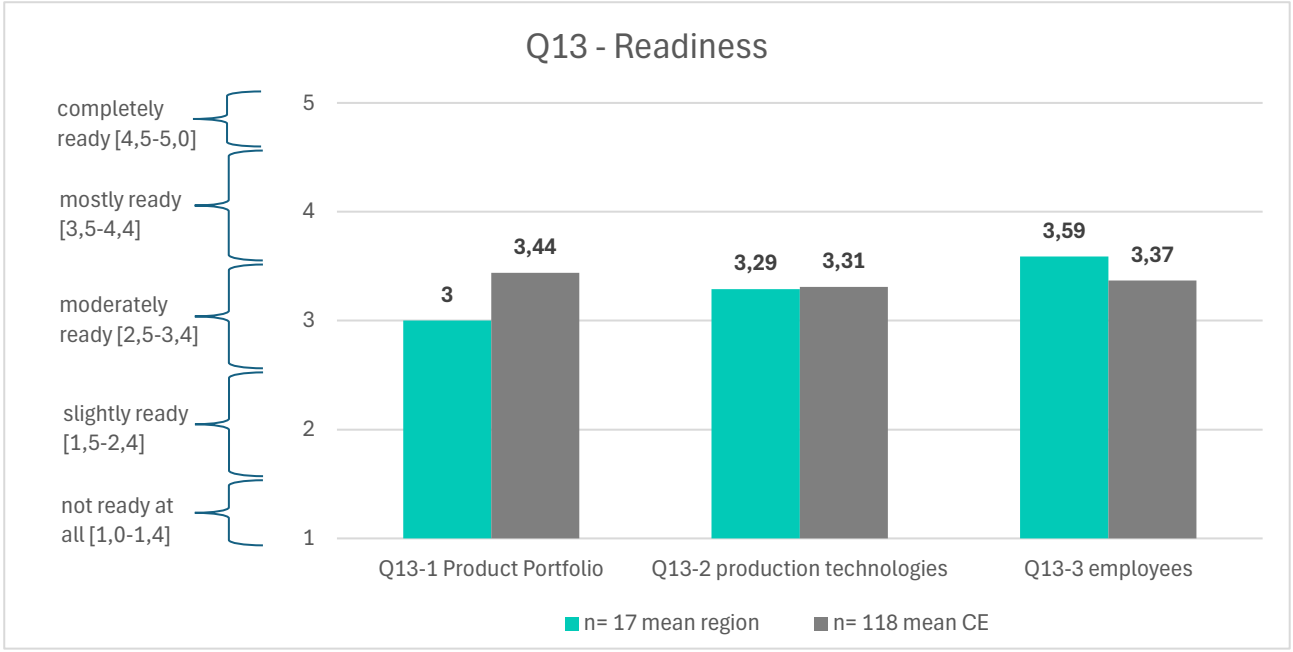




Readiness to change business for ensuring business continuity (Q13)

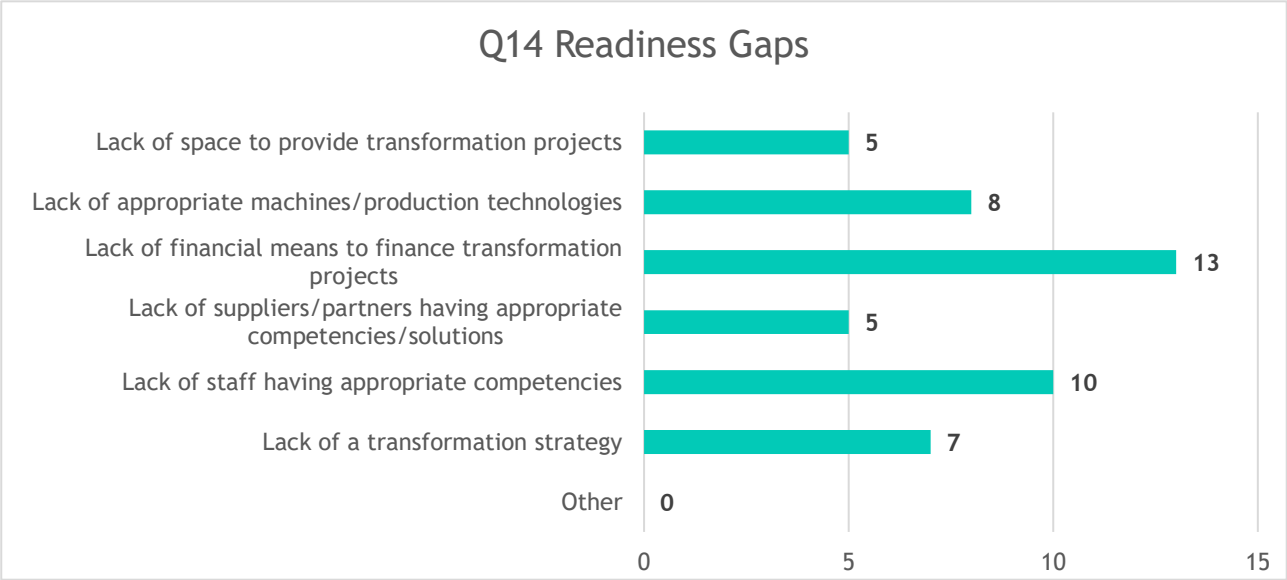
Comparing the results related to the perceived readiness to change business for ensuring business continuity in 2024-2030, companies in Silesia assessed they are moderately ready, which is like the average result on European level. The results for product portfolio readiness fall in the moderate readiness range but are lower than the EU average. One has to keep in mind that SME suppliers on Tier-2 and Tier-3 level are much dependent on the decisions of their clients in terms of preparing and delivering new products. On the other hand, companies are convinced to be ready for changes in employees' competencies. In general employees in Poland have good technical skills and are open for training and education. Companies organise internal training and motivate employees to participate in external training. On the cluster level companies are involved in workshops and training sessions during which employees get insight in new solutions that could be applied in their companies.





Main readiness gaps hindering businesses from starting a transformation process (Q14)

Entities that took part in the survey listed lack of financial means to finance transformation projects and lack of staff having appropriate competencies as the most common problems hindering their transformation process. However, most companies were not able to define which competencies should be further developed. The overall picture shows a need for a deeper company analysis, identification of its transformation pathway, on the basis of which a competencies portfolio could be defined.



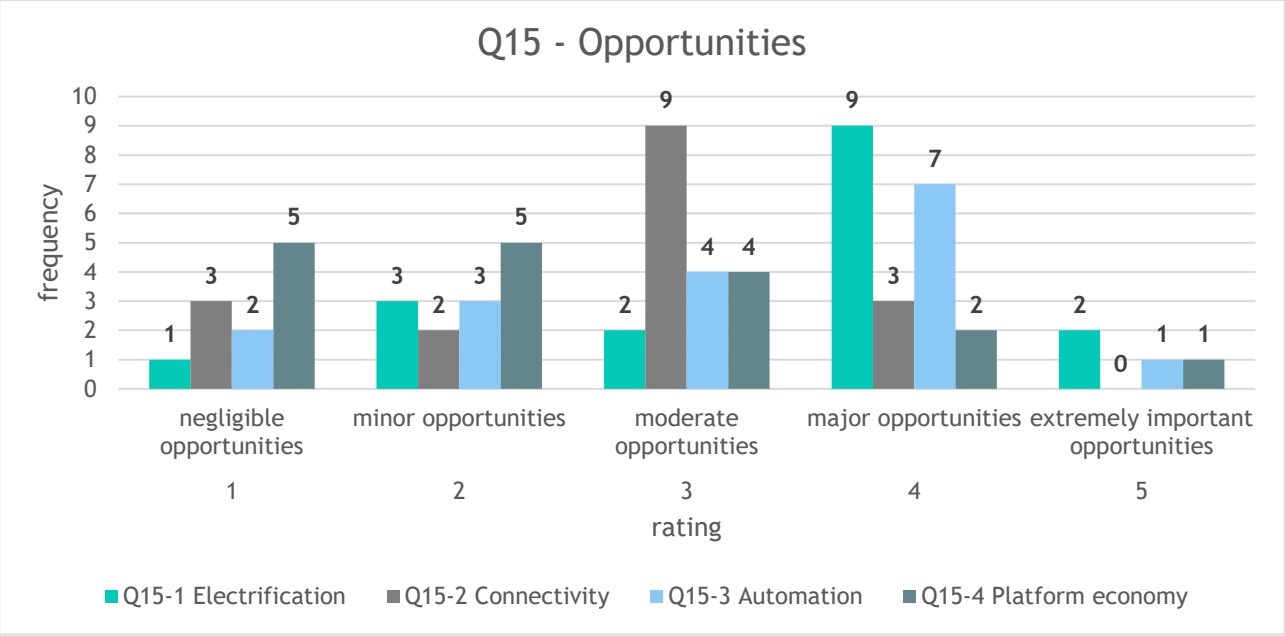
KEY LEARNINGS: Despite the rapidly evolving automotive landscape and increasing uncertainties, the situation is still considered as moderate when it comes to sustaining business continuity in 2024-2030. There is an upward trend visible in risk linked with business continuity, which shows high awareness of regional companies on the current challenging situation in the sector. Silesia is among the Just Transition regions providing a transformation process of its coal mining sector and energy intensive sectors. Nevertheless, there has been little attention for the challenges in the automotive sector, since this sector has been seen as the major driver for industrial change in the past two decades. Especially product portfolio and secondly production technologies are the areas for development. The outcomes of the survey show a need for a wider discussion on transformation trajectories for SME's in terms of adaptation to changes in the sector and of diversification of business activities.

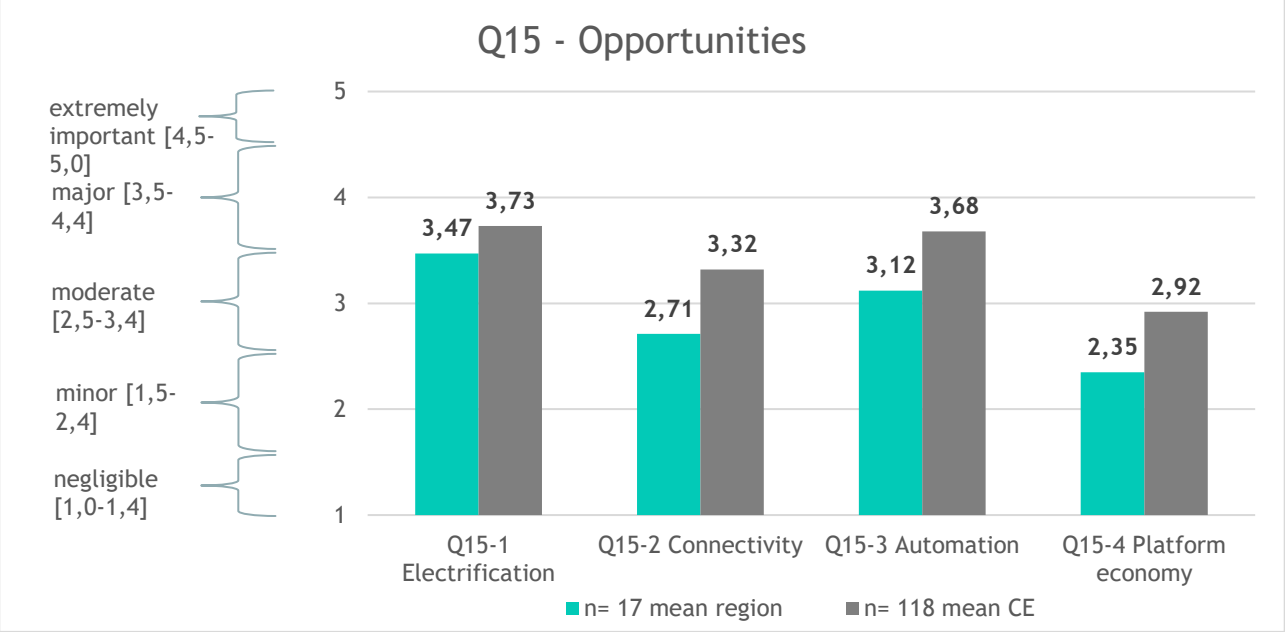
Transformation opportunities and strategic approaches to ensure business continuity in 2024-2030 (Q15-17)

Opportunities to ensure business continuity (Q15)

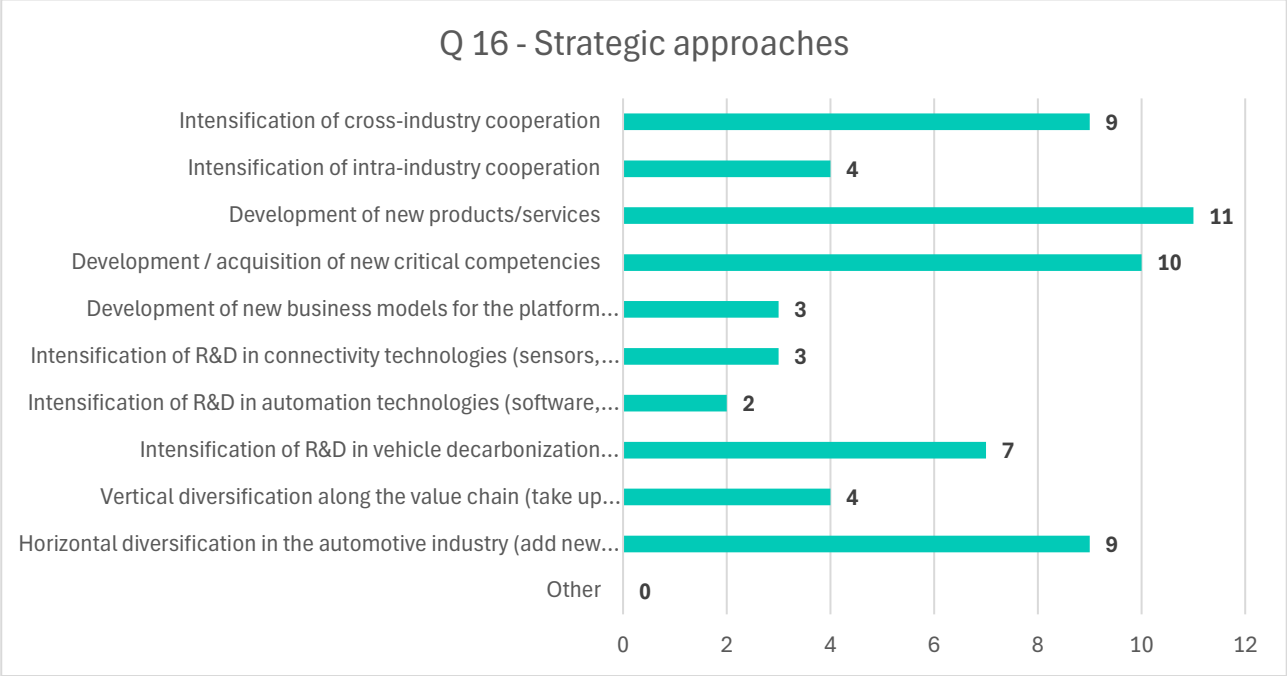
The assessment of opportunities across all thematic areas compared to the European average shows in general a more pessimistic view towards opportunities in the region. Local companies rated opportunities linked to Electrification as close to 'major', while opportunities linked with Automation and Connectivity as 'moderate' and Platform Economy as 'minor'. There has been little ambiguity seen in the frequency of respondents, with 9 replies indicating connectivity as a moderate opportunity, and 9 votes indicating electrification as a major opportunity. An explanation for such a positive view on electrification could lie in

the fact that more and more suppliers are cooperating with Stellantis and VW to deliver parts for electric vehicles. Silesia is home to two production plants (Gliwice, Tychy) where electric vehicles are being produced. The rather negative view on opportunities related to platform economy could be linked to the regional and national markets demonstrating a relatively low openness towards vehicle platform economy models (lack of public-private cooperation).





Strategic approaches to seize opportunities (Q16)



Technology and skills gaps (Q17)

Skills gaps:	Companies pointed out the lack of appropriate competencies among employees as one of the main challenges hindering their transformation process. However, most companies were not able to define which competencies should be further developed. Examples of identified gaps include: skills in automation of production processes, machine programming and skills in collaboration with foreign clients. The overall picture shows a need for a deeper company analysis, identification of its transformation pathway, on the basis of which a competencies portfolio could be defined.
Technology gaps:	Companies did not define specific technology gaps. However, they mentioned that the lack of appropriate machines/production technologies is hindering the transformation process. It shows that companies do not have a clear transformation strategy yet, as a result of which they could not define precise technology gaps.

Regional resources and business support ecosystem (Q18-22, 26-27)

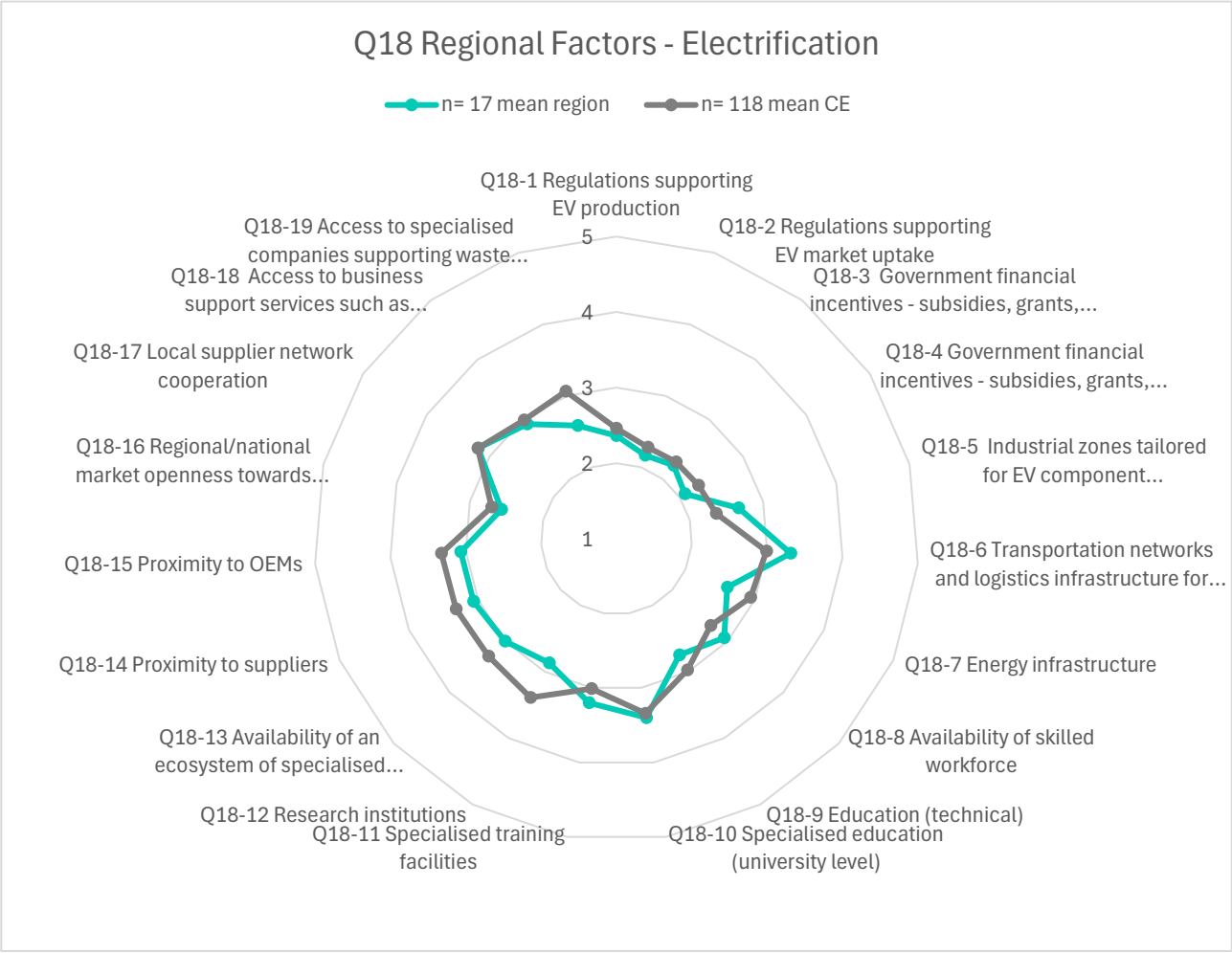
Factors to play a role in automotive in 2024-2030 (Q18-22)

Electrification (Q18)

Respondents rated the availability of factors allowing Silesia to play a role in the thematic area of electrification in automotive in 2024-2030 as being **satisfactory.** However, the areas which have received a regional score towards 'unsatisfactory' include: government policies (regulations supporting EV market uptake) and government financial incentives (subsidies, grants, tax breaks for EV market uptake). The pace of new investments in EV loading infrastructure is rather slow. Current subsidies for EV buyers are not convincing the mainstream since prices for EV are still too high. R&D related to electrification takes place in R&D centres of multinationals abroad. Even when Tier-1 suppliers have their R&D centre.

s in Silesia and Lesser Poland, these centres deliver services internally within their group with little or any connections with companies in the regional ecosystem. Some public and private R&D institutions of Polish origin and universities are dealing with materials and production technologies for electric vehicles. Their impact however on the overall changes in the electric vehicle sector is limited.

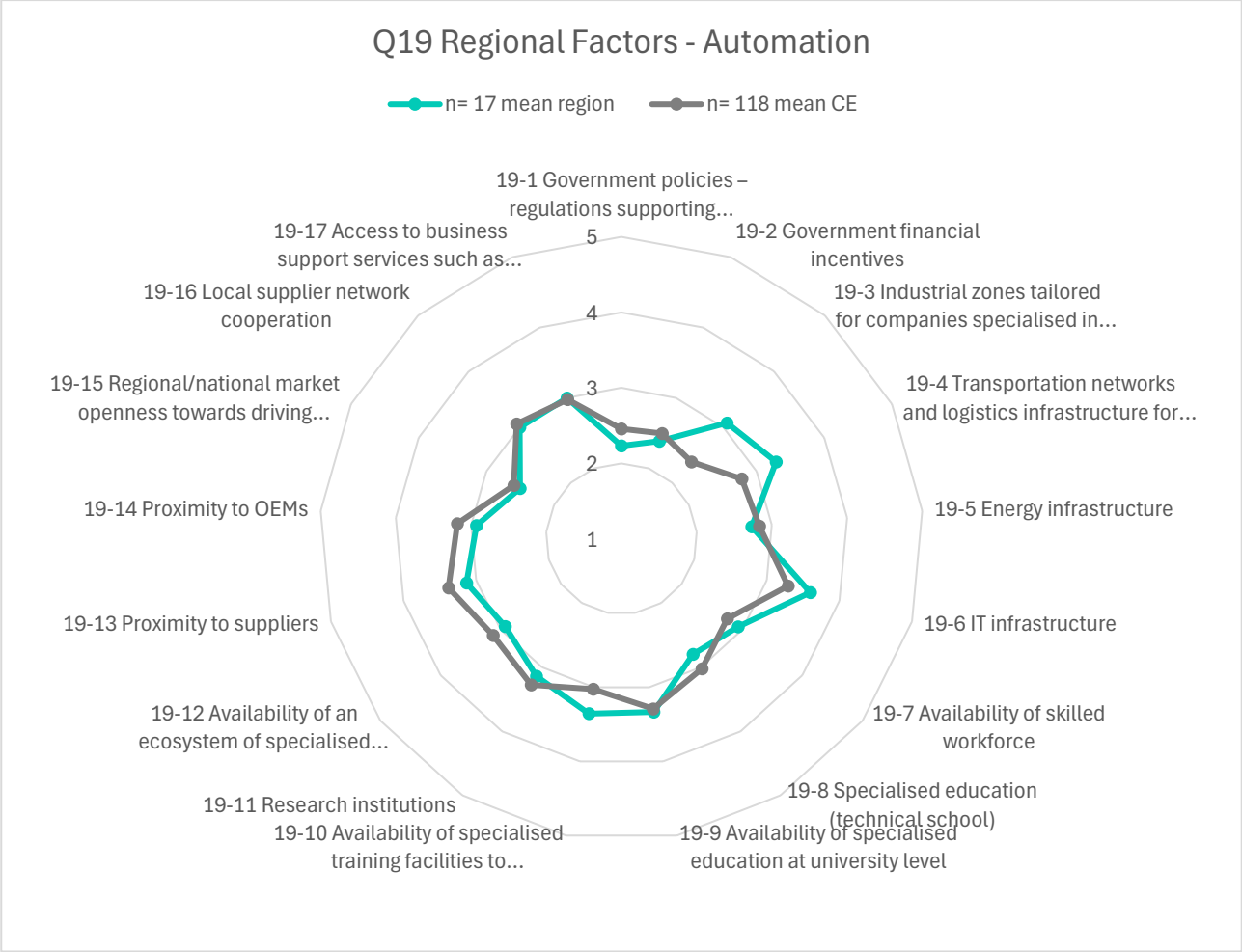
The areas which were rated as 'very satisfactory' include: transportation networks and logistics infrastructure and availability of specialised education at university level and specialised training facilities to upskill/reskill employees. One has to take into account that, although the transportation network is well-developed, European policies in the field of climate neutrality of business activities can lead to a situation where long transport streams are replaced by shorter regional supply chains. A such suppliers in Silesia cooperating with clients in Italy, France and Germany are potentially in a difficult situation.-



Automation (Q19)

When automation is considered, regional respondents rated the availability of factors that allow Silesia to play a role in automotive in 2024-2030 in this thematic area as **satisfactory**. This regional rating is similar to the EU average. Although there are no direct government policies or financial incentives, the national support measure SMART foresees support for research and development projects and innovative investment projects in line with national smart specialisation priorities, among which "environmentally friendly transport" includes a focus on automation technologies related to: "innovative transportation modes". On the regional level there are industrial zones and technology parks where companies specialised in vehicle

automation solutions and vehicle connectivity solutions are active. Nevertheless, there is little cooperation in the region between IT companies involved in these matters in the framework of international B2B relations and R&D Centres of Tier-1 suppliers bounded by NDA's. Due to investment in new business activities in this area (for instance by Stellantis), there is a growing need for IT specialists. The technical universities in Silesia and in Lesser Poland are cooperating with companies in refining educational programmes, organising apprenticeships and other initiatives to ensure the inflow of young IT personnel in the companies.

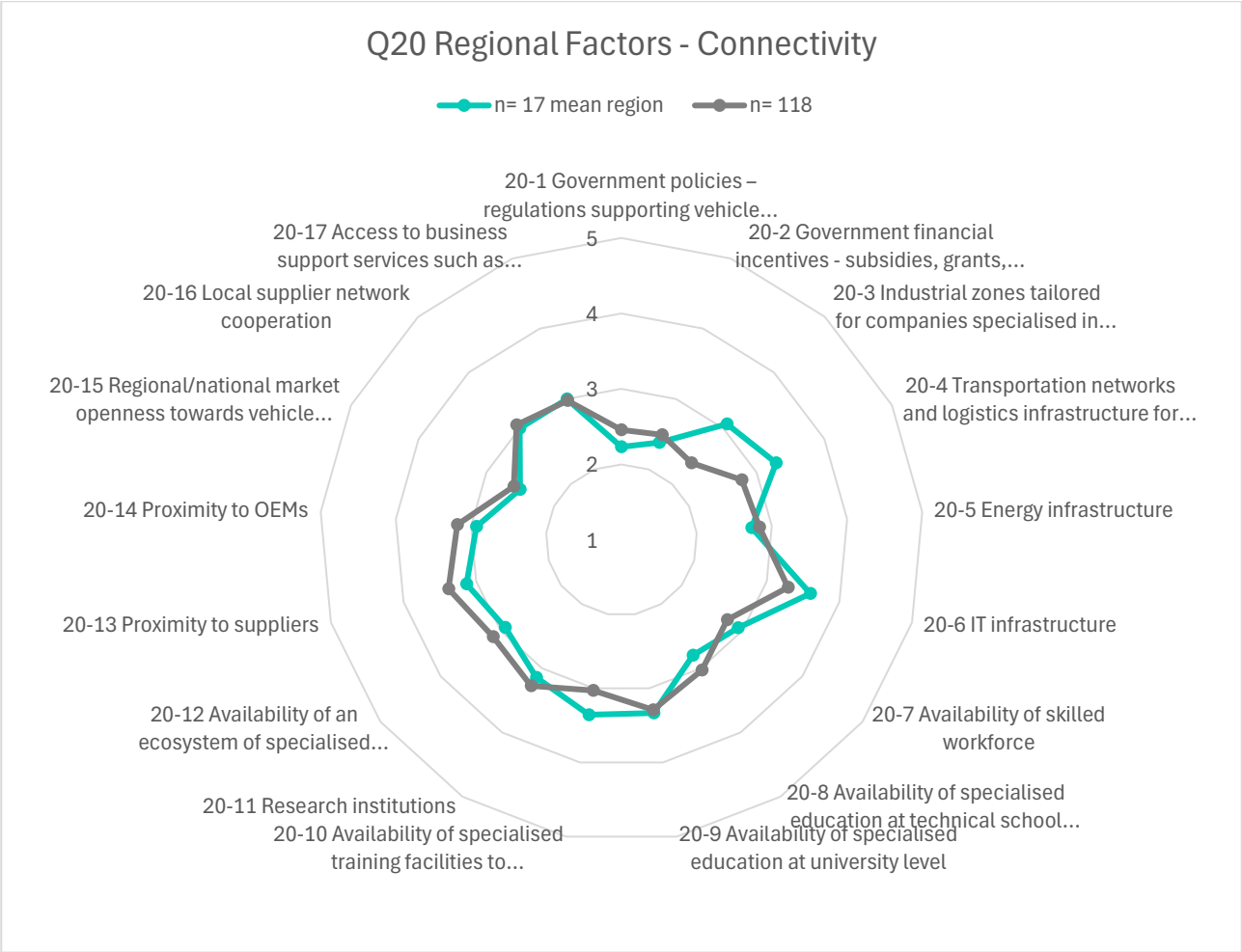


Connectivity (Q20)

The availability of factors that allow Silesia to play a role in automotive in 2024-2030 in the area of Connectivity has been assessed as **satisfactory**. This regional rating is similar to the EU average. Although there are no direct government policies or financial incentives, the national support measure SMART foresees support for research and development projects and innovative investment projects in line with national smart specialisation priorities, among which "environmentally friendly transport" includes a focus on technologies related to: "transport management systems".

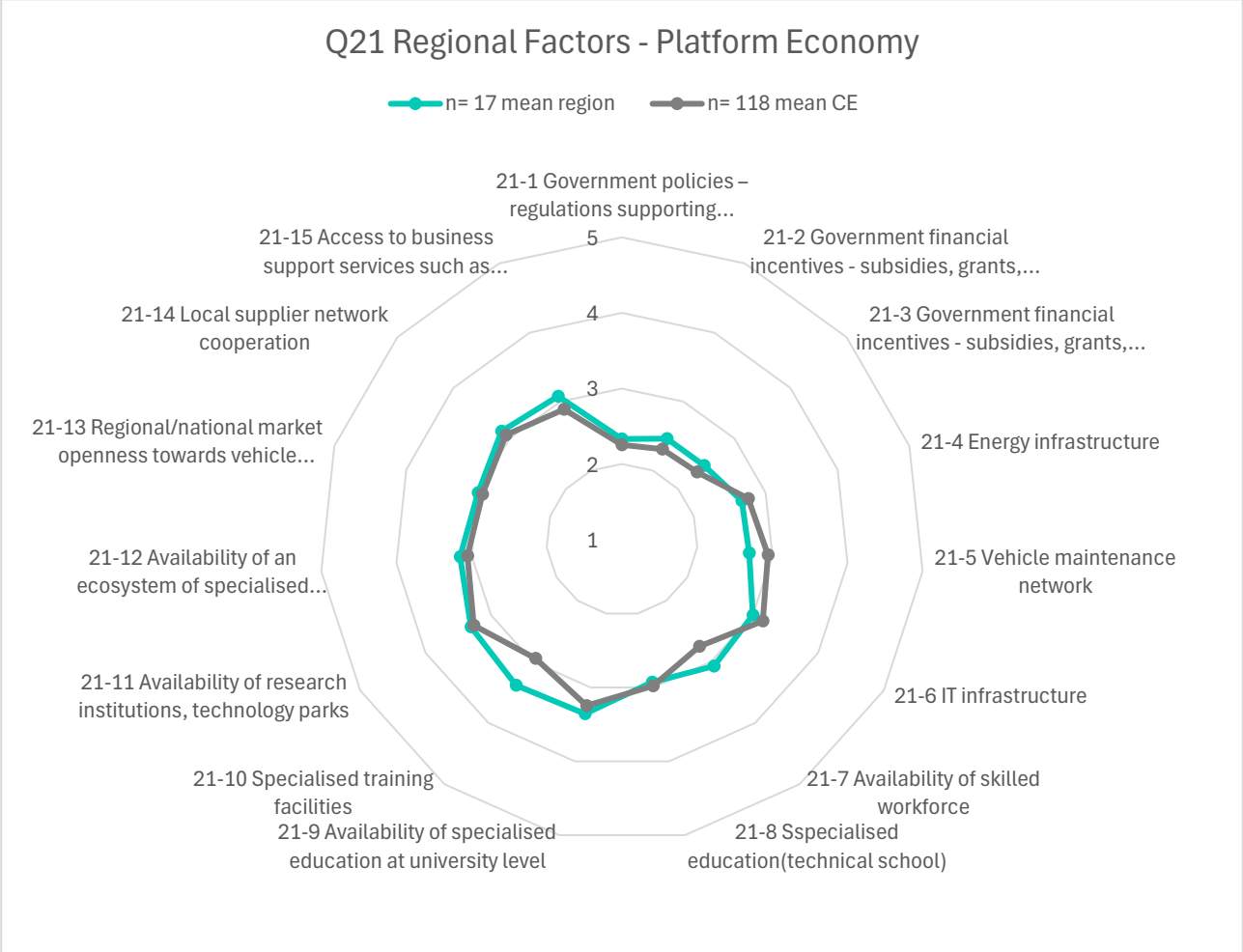
The area which has been ranked more positively and closer to 'very satisfactory' by the regional respondents concerns availability of specialised education at university level. The technical universities in Silesia and in Lesser Poland are cooperating with companies in refining educational programmes, organising apprenticeships and other initiatives to ensure the inflow of young IT personnel in the companies. Gliwice

and Bielsko-Biała in Silesia as well as Cracow in Lesser Poland are hubs for IT companies dealing among others with smart city and other connectivity solutions for automotive. Taking into account safety issues and non-disclosure policies, little space is left for regional cooperation.



Platform Economy (Q21)

The availability of factors that allow Silesia to play a role in automotive in 2024-2030 in the area of Platform Economy also falls in the **'satisfactory' level**. This regional rating is similar to the EU average. Poland has been debating for a long time over the legal framework for smart city solutions, smart mobility and platform economy solutions in a public-private setting. However, it still seems that public sector actors would like to play a more active role in developing the platform economy than they can do in practice (due to lack of competencies and financial means). For private initiatives to succeed in this area, not only a transparent legal framework is required, but also favourable cooperation with local governments. As long as local governments are taking the position of competitor and not that of a partner, there is little space for rational economic sustainable development in the field of platform economy. One is aware that the development of a platform economy opens up new service opportunities that will require new skills. Silesia and Lesser Poland have specialised training facilities to upskill/reskill employees and specialised education at university level offering training and education in IT that can be applied to platform economy solutions.



Additional factors influencing the regional competitiveness (Q22)

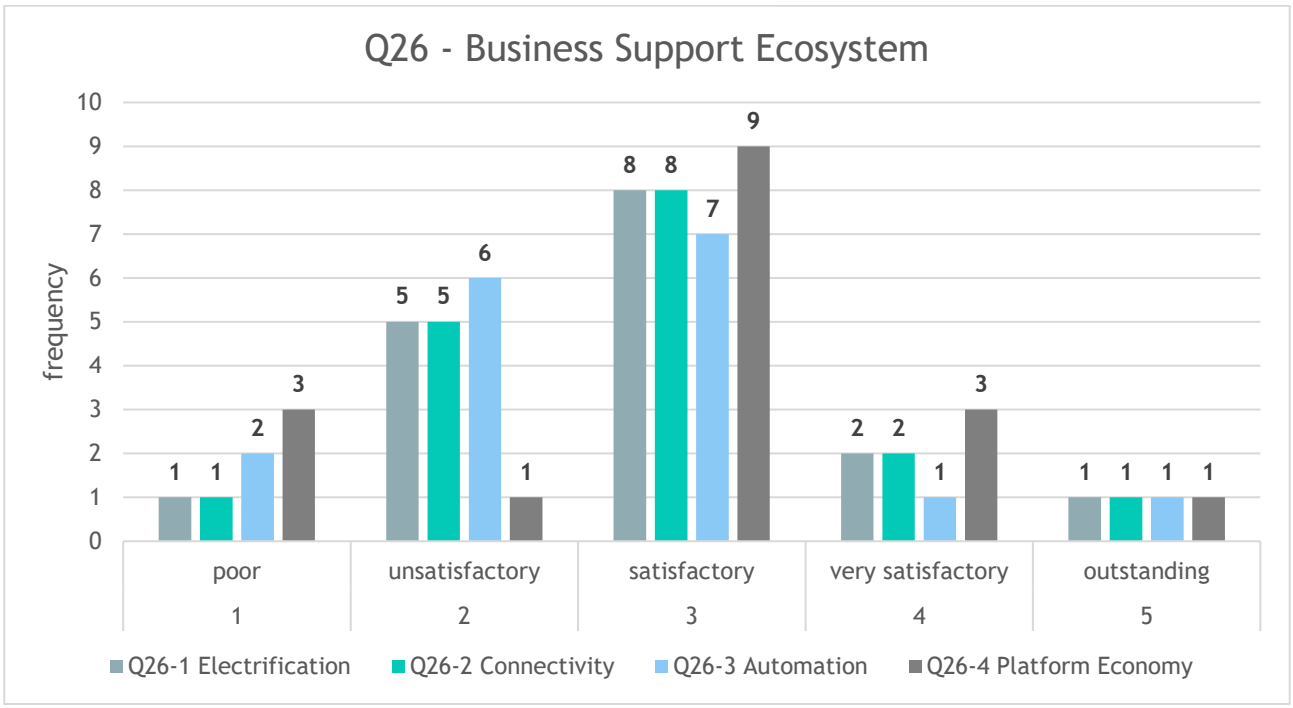
The companies involved in the survey have a rather pessimistic view about the future of the region as a European automotive hub. They foresee that as a result of changes in the automotive sector especially small companies will disappear from the market or be forced to restructure their business activities. These companies are mostly active on tier-3 and tier-4 level in the supply chains. Medium-sized enterprises are expected to provide diversification strategies however they still could be confronted with moderate growth. Depending on the product portfolio certain large companies are deemed to experience significant growth (module and system suppliers), while others, mainly those producing standardised metal and plastic parts, will be confronted with stagnation of their business activities. Business support organisations highlighted among the main challenges for business continuity in the automotive sector: staff shortage and as such raising staff costs, lack of staff critical competencies, material costs, high energy costs, high costs related to ensuring compliance with regulations and with clients' requirements. According to business support organisations especially the lack of transformation strategy, lack of staff and suppliers/partners having appropriate competencies are among the factors hindering the transformation process. However, the Business Support Organisations observe among companies in the automotive sector: horizontal diversification in the automotive industry as well as vertical integration, intensification of R&D in vehicle decarbonisation technologies, R&D in connectivity technologies and R&D in automation technologies. In the framework of these processes one can observe development of new critical competencies and intensification of cross-industry cooperation.

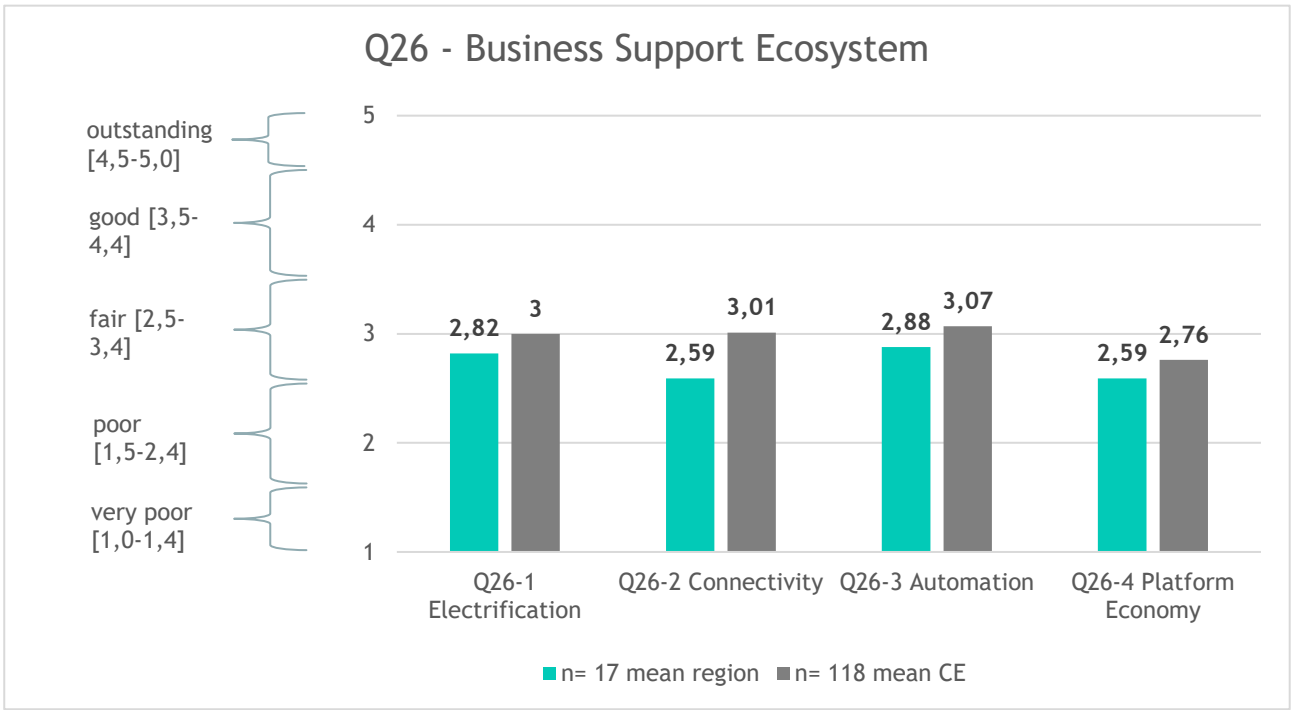
The companies that took part in the survey urge for a complete redefinition of the regional economic policy that would encompass transformation issues specifically related to the automotive sector and the new mobility revolution. Silesia is among the Just Transition regions providing a transformation process of its coal mining sector and energy intensive sectors. There has been little attention for the challenges in the automotive sector since this sector has been seen as the major driver for industrial change in the past two decades. After many years of large investments and employment growth, there is little awareness among policy makers and BSO's of the transformation challenges ahead. Another important issue is the adaptation of educational programmes on technical school and university level in line with new requirements related to electrification, connectivity and autonomous vehicles.

Business support services (Q26-27)

The opinions concerning the business support organisations' service portfolio related to the 4 thematic areas are mixed, with relatively more companies ranking the availability and quality of services as unsatisfactory or satisfactory.

Participants in the survey pointed out the lack of specific government support programmes and financial instruments to initiate and support the transformation process in the automotive sector. This seems to be in line with the main readiness gap hindering transformation - over 80% of the respondents mentioned the lack of financial means to provide the transformation process. One has to take into account that the margins in the automotive sector are under pressure. There is little financial space risk-taking and research and development initiatives that are not supported by clients' requirements. For what concerns BSOs involved in training and certification in line with norms and standards, these organisations cooperate on a regular basis with automotive suppliers. Also training organisations (for example in Silesia, one training organisations trains over 10 000 technicians and engineers yearly) are ensuring that employees have appropriate skills. Within the cluster about 30-50 workshops are organised every year based on issues raised by companies. During these workshops trends are being analysed, good practices presented, knowledge exchanged, and new relations being built. Branches of automotive companies cooperate with consulting companies and other service suppliers, often selected by their central offices abroad. Companies with Polish capital work with consulting companies in preparing applications for public funding. Regular non-profit BSOs are not often considered as a partner for tackling specific automotive related issues.



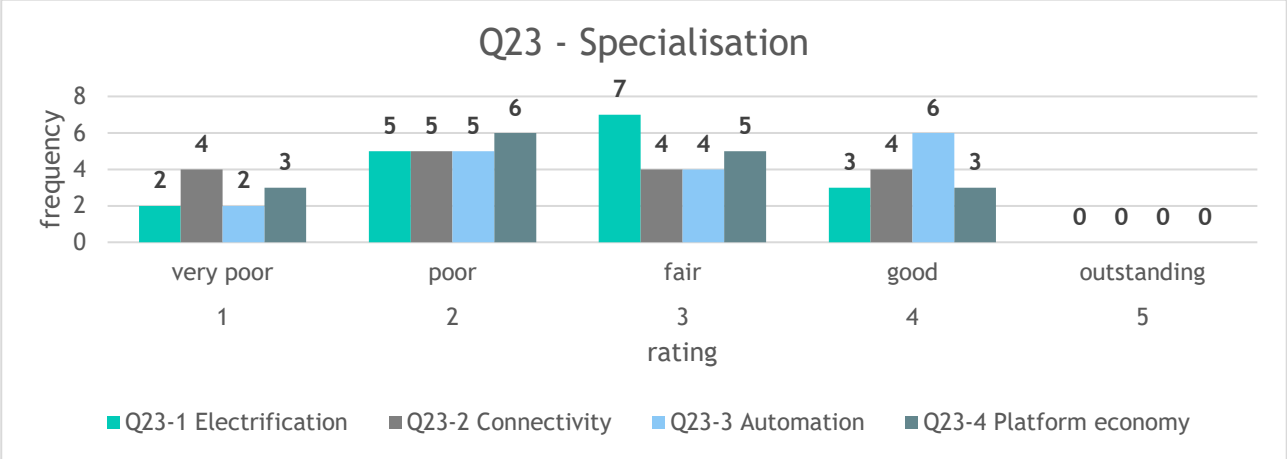


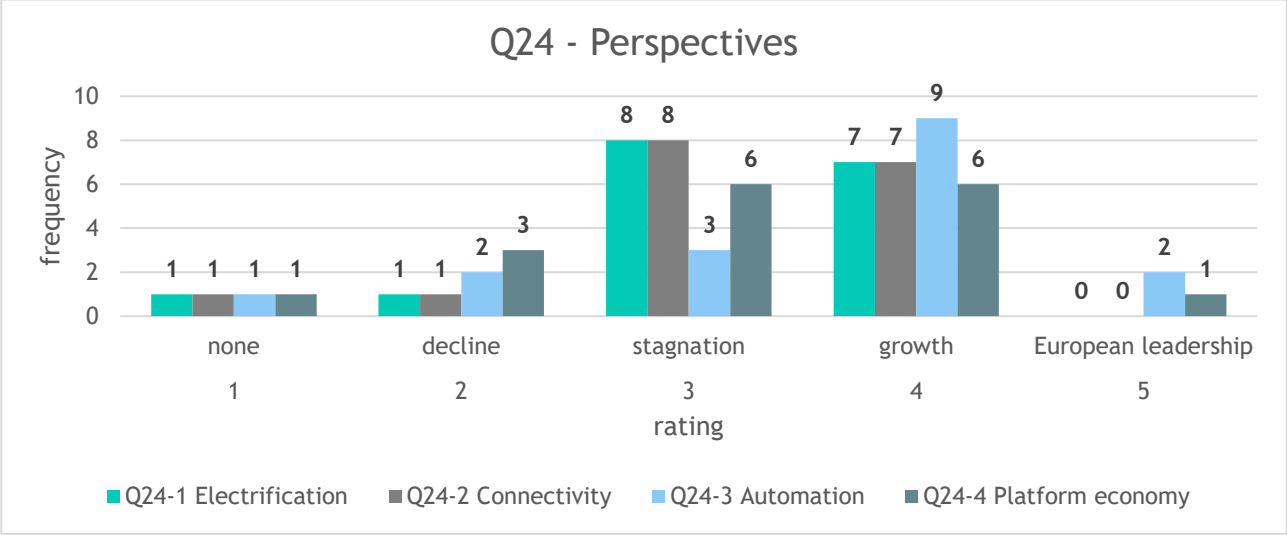
Specialisation level and development perspectives (Q23-25)

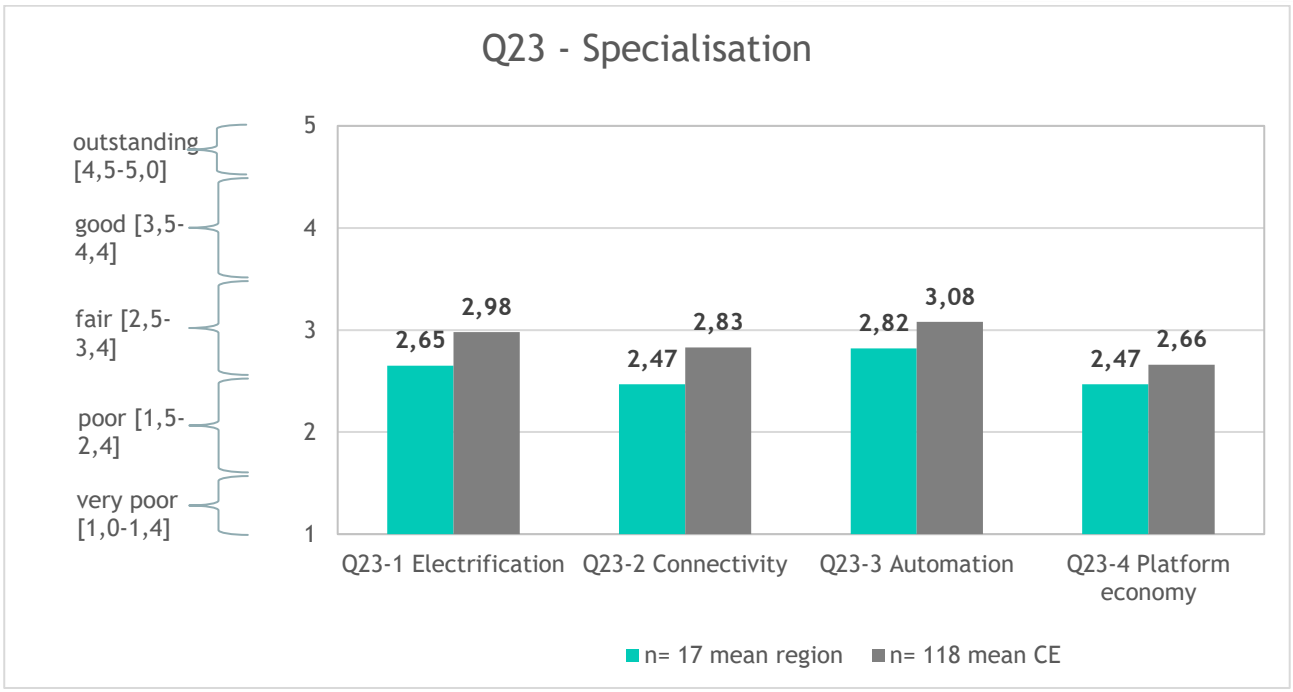
In the opinion of the respondents, the current specialisation level of Silesia in all of the four thematic areas is rather low. In the area of electrification, the current specialisation is to find on OEM level (two plants of Stellantis producing electric vehicles), and Tier-1 level (for instance: Nexteer Automotive, ZF, Hirschvogel Components Poland, Plastic Omnium) but is weak on the level of Polish SME suppliers and loading infrastructure.

The highest regional score has been given to Automation which could have been understood by respondents in context of using technology and machines to perform manufacturing processes (Industry 4.0) in efficient and accurate manner, rather than technologies enabling autonomous operations during driving.

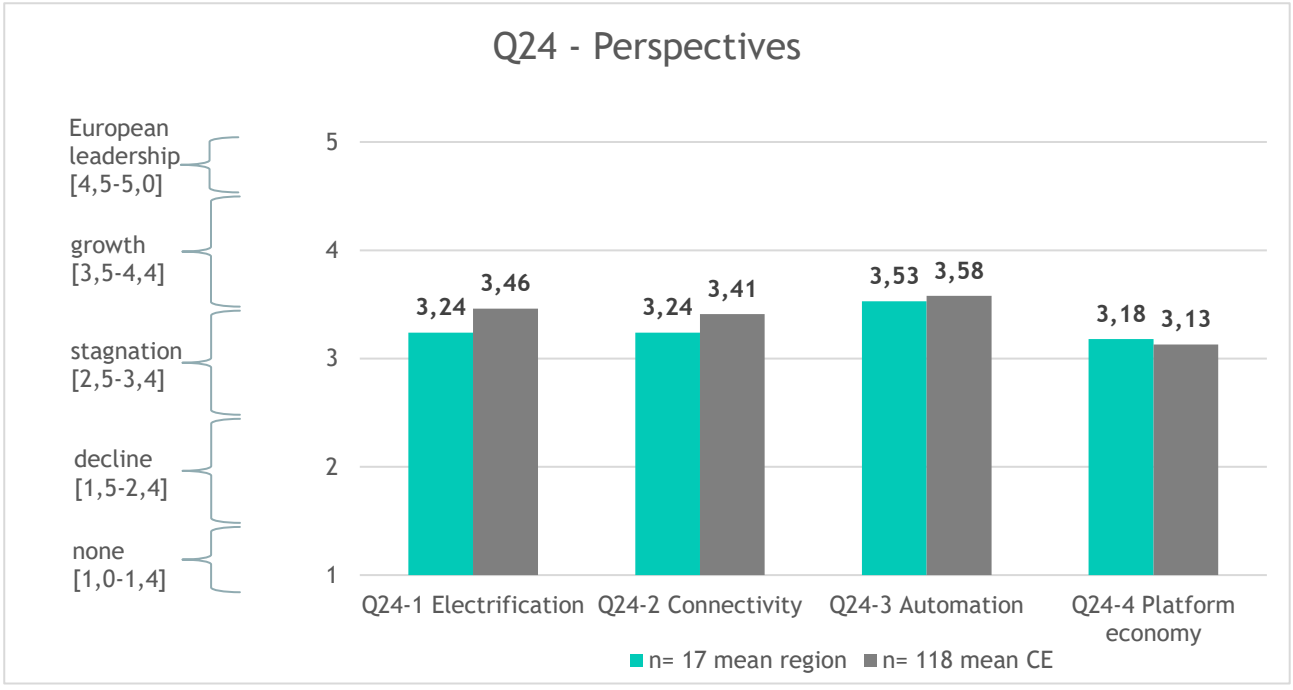
On the other hand, the lowest regional score has been assigned to Platform Economy. Platform Economy solutions have not yet been deployed on a wider scale in the region. IT companies involved in such solutions rather cooperate with clients abroad to deliver services and products for the West-European market. Because of NDA-reasons not much is known about these software houses, and as such the respondents in the survey rated this specialisation level as being very moderate.







For what concerns future perspectives in the areas of electrification, automation and connectivity, the respondents in Silesia are less optimistic than the respondents overall on European level. Nevertheless, they see opportunities for further development in the Platform Economy. Silesia is home to two assembly factories producing electric vehicles. Two Tier-1 companies have an R&D centre in Silesia with specific focus on automation and connectivity technologies. Additionally, one OEM (Stellantis) is developing its centre for IT solutions in the region. Some companies are involved in loading infrastructure for electric vehicles. They are awaiting government incentives and transparent conditions to engage with other partners in improving the EV loading infrastructure in Poland. Silesia and Lesser Poland have a good educational and training offer to support skill development in the four areas.

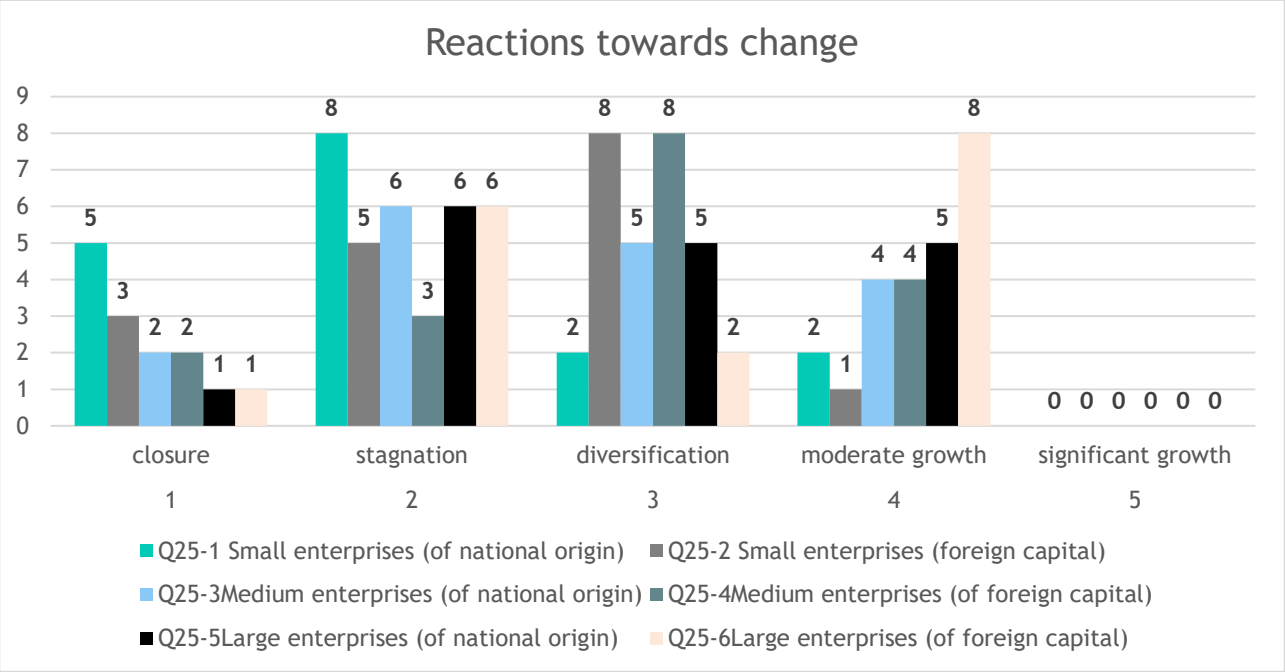


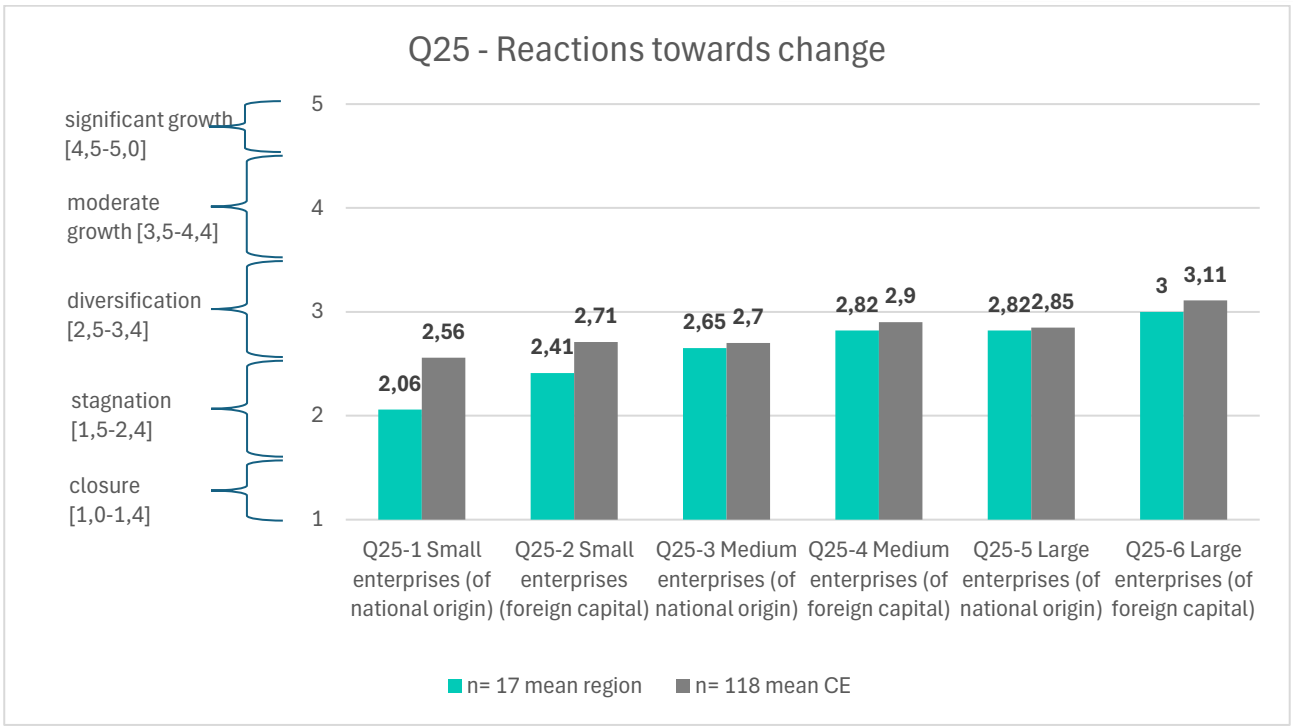
There is an overall awareness among companies that the automotive industry is characterised by international supply chains with decision making centres outside Poland. The companies active in Poland

have little impact on the main development trajectory of the automotive sector in Europe and are mostly in the position of observer and adaptor. With the growing pressure from Chinese suppliers and OEM's, the impact of European regulation concerning carbon footprint, emissions and recycled content in automotive components, and increased lobbying by national governments in European legislation development processes, the players in the Automotive industry in Silesia are constantly monitoring the changing rules of play and their impact on the companies' competitiveness.

Looking at the reactions towards change, the respondents expect that small enterprises (both of national origin and foreign capital) are the most prone to experience stagnation rather than diversification. In the region, there are many small companies, mainly producing metal and plastic components. These companies are mostly active on tier-2, tier-3 and tier-4 level in supply chains. They foresee that, as a result of changes in the automotive sector, especially those small companies will either disappear from the market or be forced to restructure their business activities.

On the other hand, it is expected that large companies, both branches of multinationals (foreign origin) and of national origin, will diversify their business activities. These companies cooperate with regional suppliers who meet their requirements and expect that these suppliers quickly adjust to changes in the market. Therefore, these companies expect either diversification or moderate growth as a reaction to change.





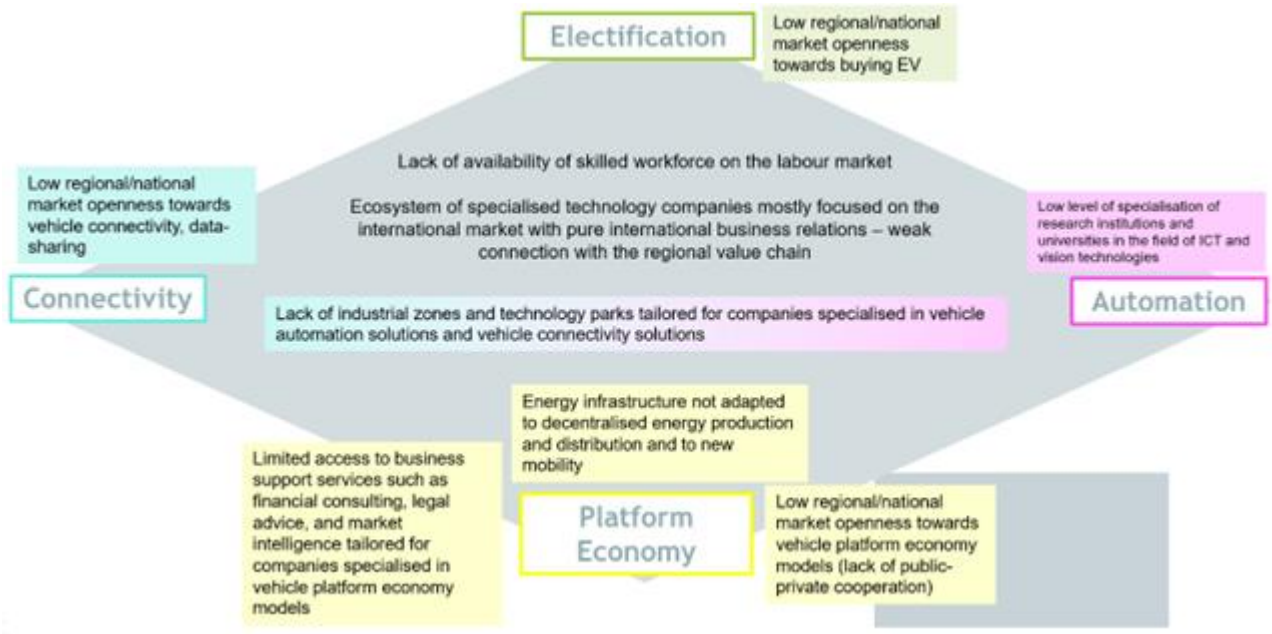
Conclusion - Key findings for regional transformation capacities in the automotive sector

The companies that took part in the survey urge for a complete redefinition of the regional economic policy that would encompass transformation issues specifically related to the automotive sector and the new mobility revolution.

There has been little attention for the challenges in the automotive sector since this sector has been seen as the major driver for industrial change in the past two decades. After many years of large investments and employment growth, there is little awareness among policy makers and BSO's of the transformation challenges ahead.

Another important issue is the adaptation of educational programmes on technical school and university level in line with new requirements related to electrification, connectivity and autonomous vehicles.

Finally, the survey findings emphasize the importance of expanding discussions about how SMEs can navigate sectorial changes and explore opportunities for business diversification.



Challenges in Poland

Theses/Key Learnings:

The automotive sector in the Silesia region is characterised by a large proportion of suppliers delivering parts, modules and systems to their clients in countries like: Germany, Italy, France, Czech Republic and Slovakia.

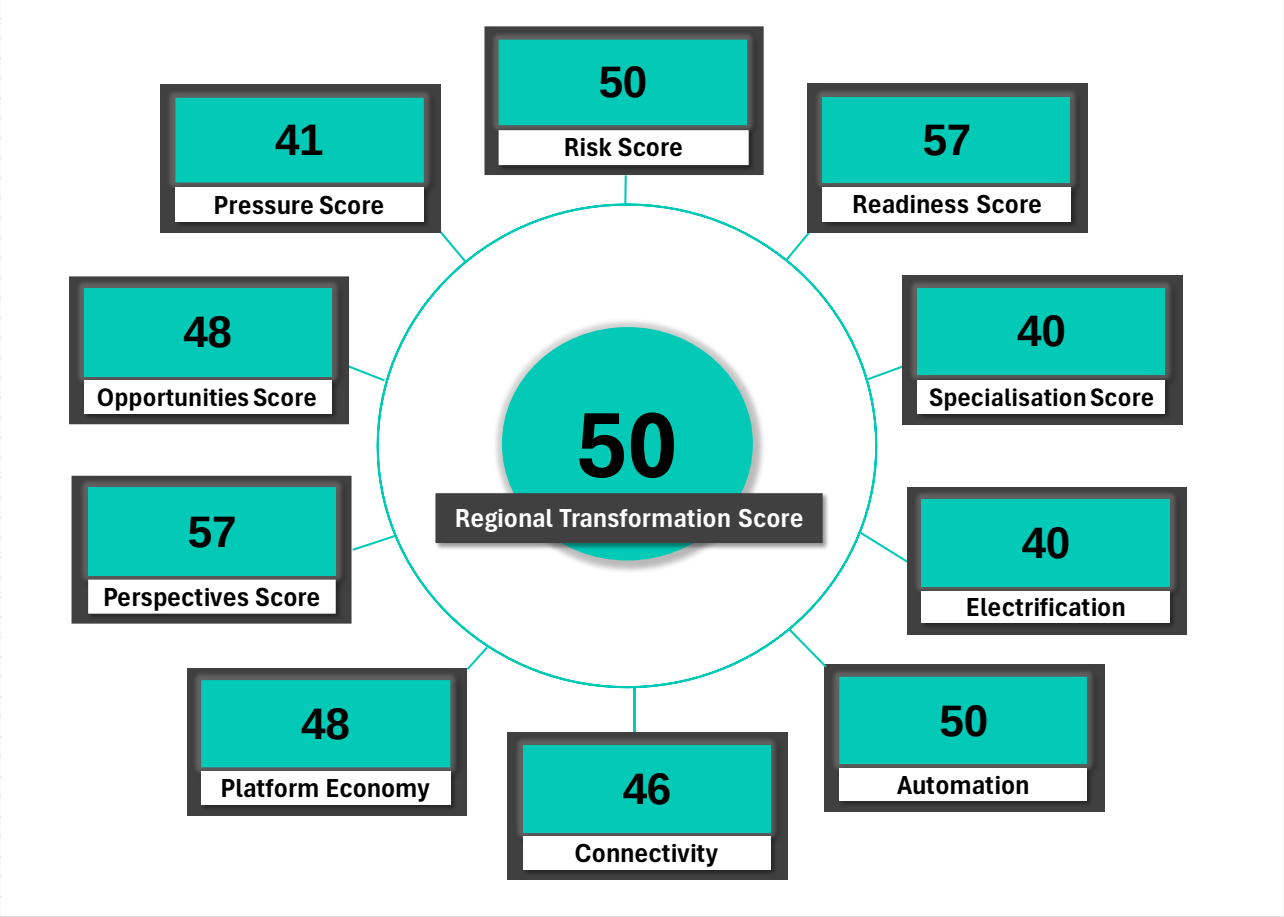
Among them a large group of branches of multinationals that have little impact on policy level – their role is to deliver quality in time according best-cost standards. As such they cooperate with regional suppliers who meet their requirements and expect that these suppliers quickly adjust to changes in the market.

Several of these factories already produce for electric vehicles and are involved in providing solutions related to autonomous and/or connected vehicles.

SMEs in the automotive sector in the region are mainly producing metal and plastic components. Some of them are inv0olved in car design and in delivering specialised solutions for niche segments.

Transformation Readiness Index – Poland/ Silesia

Poland is in between limited and moderate ready for transformation. It scores highest in Readiness and Perspectives, but overall its ratings are very close to each other.



Ranking:

>60 Transformation Ready

50-60 Moderate Ready

40-50 Limited Ready

30-40 Low Ready

<30 Not Ready

Slovenia (CCIS)

Brief description of the region

Slovenia's Automotive Industry: A Driving Force in the Economy

The automotive industry plays a crucial role in the Slovenian economy, contributing significantly to both GDP and exports. Generating approximately 10 % of Slovenia's GDP and accounting for over 20 % of its exports, the sector demonstrates its strength on a national and international level. Notably, major Slovenian automotive companies export over 90 % of their production to global markets, highlighting their integration into international value chains.

Structure and Economic Significance

Comprising a robust network of approximately 100 Tier 1 and Tier 2 suppliers, along with an estimated 600 lower-tier suppliers, the Slovenian automotive industry forms a dynamic ecosystem. This network provides approximately 40,000 jobs and employs around 7 % of the total workforce in Slovenia's manufacturing industry (representing 15,738 direct jobs). (IRT3000, 10. 5. 2023)

Challenges and Opportunities

While the Slovenian automotive industry demonstrates resilience, it faces challenges common to the European automotive landscape. A primary concern is the increasing competitiveness of China, particularly in the electric vehicle (EV) market. This competition, coupled with high energy costs, reduced productivity, and a heavy tax burden on wages, poses hurdles for Slovenian companies, particularly those involved in EV production. Furthermore, diminishing demand in the European automotive market presents an additional challenge.

Strategic Initiatives and Future Directions

To navigate these challenges and capitalize on emerging opportunities, Slovenia has implemented strategic initiatives to support its automotive industry. The Automotive Cluster of Slovenia (ACS) fosters collaboration between research institutions, businesses, and support organisations, driving innovation and development within the sector.

Moreover, the Slovenian government actively promotes the industry's transformation through the GREMO Mission. This initiative focuses on strengthening global competitiveness, fostering breakthrough innovation, and promoting sustainable practices. By connecting key players in the Slovenian automotive industry, GREMO aims to position them as valued suppliers of solutions in vehicle electrification, green production, and digitalisation.

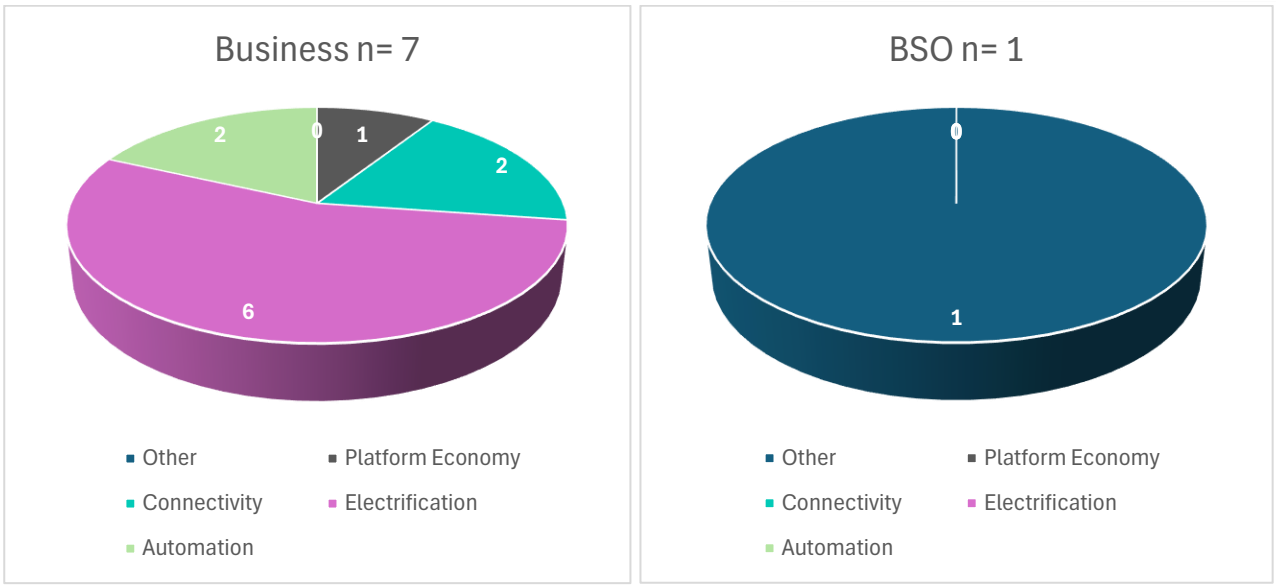
Key Priorities for the Future

To ensure the continued success of Slovenia's automotive industry, several key priorities have been identified:

- **Advanced Manufacturing:** Enhancing production processes through the integration of Industry 4.0 technologies, such as digitalisation, automation, robotics, and data analytics.
- **Innovation and R&D:** Supporting research and development to create breakthrough technologies and products with higher added value.
- **Market Expansion:** Developing new markets and deepening the integration of Slovenian stakeholders into global value chains.
- **Workforce Development:** Investing in employee training and skills development to foster a culture of innovation and equip the workforce for the demands of a rapidly evolving industry.
- **Infrastructure for sustainable mobility:** Building e-charging stations, hydrogen filling stations and other supporting infrastructure for faster uptake of EVs and hybrid cars.

Inventory of companies and business support organisations (BSO) (Q1-8)

The surveyed entities are located in Slovenia and range from medium firms to large enterprises with up to 2,999 employees, generating revenues less than €2 million and over €100 million. A few companies have a significant focus on the automotive sector, often deriving between 50–80 % of their revenue from it, while there are also many companies which receive about 20 % or less revenue from the automotive industry. Key thematic focuses are on **electrification**, with a smaller number of companies working on automation and connectivity, and platform economy. Geographically, the companies encompass the whole Slovenian region.

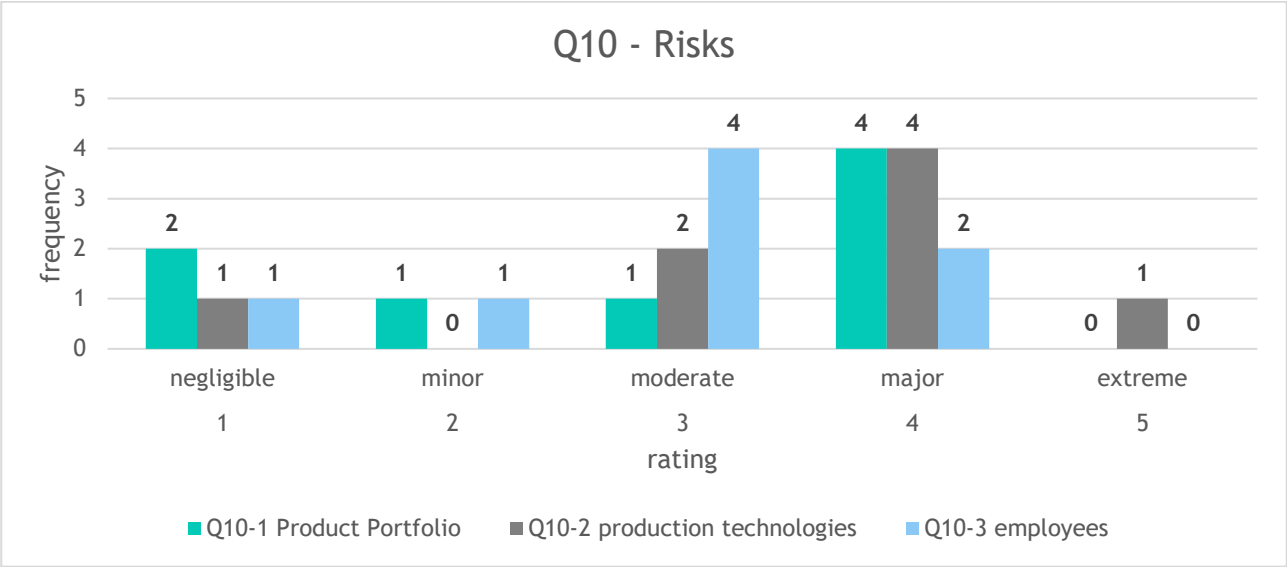


The BSO interviewed is the only public business support organisation for the automotive industry working in the region. It is classified as a small organisation but is influential in the sector in all focus areas.

Transformation risks, pressure and readiness for business continuity in 2024-2030 (Q10-14)

Risks endangering business continuity (Q10-11)

Companies overwhelmingly see risks related to **production technologies** as the most significant, with a strong emphasis on "major" risk levels. This suggests potential concerns about factors like automation, supply chain disruptions, technological obsolescence, or cybersecurity threats within their production processes. While still present, concerns about **employees** and the product portfolio are less severe and more depending on individual company perception "Major" risks are nevertheless identified, potentially related to skills shortages or talent retention. Risks associated with the **product portfolio** could indicate that companies feel somewhat confident in their current product offerings and market positioning. However, it might also signal a need for greater awareness of potential future market shifts or disruptive technologies. Across all three categories, negligible and minor risks are relatively low. This implies a generally robust risk management framework in place, with a virtually absent level of extreme risks.

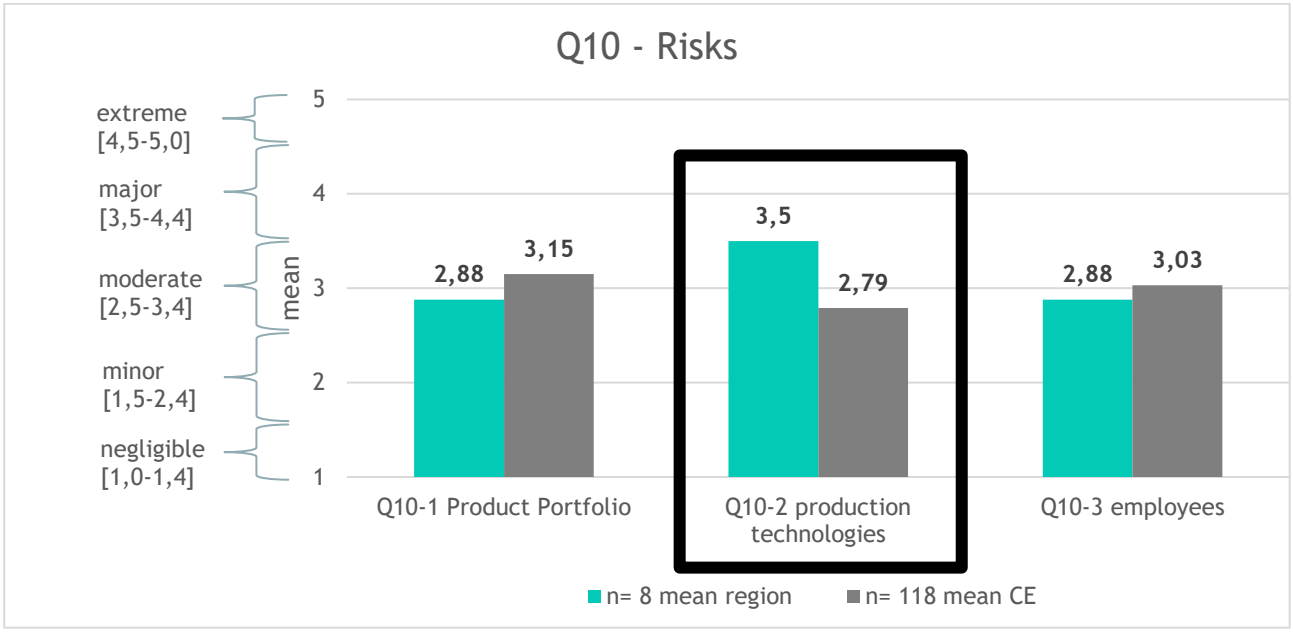


This comparison highlights that Slovenian automotive companies share some common challenges with their CE peers, particularly regarding workforce development and technological advancement. However, they also exhibit unique strengths, such as potential niche specialisation and agility.

Even compared to the European average, Slovenian automotive sector is more concerned with the capacity of their production technologies. This reinforces the notion that adapting to Industry 4.0, managing supply chains, and ensuring cybersecurity are critical across various sectors in Slovenia. Slovenia has a higher concentration of automotive manufacturing and component suppliers compared to the CE average. This likely increases their sensitivity to disruptions in production technologies, supply chains, and the adoption of Industry 4.0. The EU's push for electric vehicles is forcing rapid technological change and Slovenian companies must adapt their production to new components and processes. The emphasis on production technology risks highlights the need for continuous investment in modernisation, upskilling, and cybersecurity to maintain competitiveness.

Across Europe, there's a shortage of skilled workers in advanced manufacturing and IT, crucial for Industry 4.0. This likely contributes to the perceived employee-related risks, which are at a similar level to the European average. Additionally, workforce challenges like talent shortages, skills gaps, and wage pressures are widespread across the Slovenian economy.

On the other hand, Slovenian companies report a notably lower risk level associated with their product portfolios compared to the CE average. This could indicate a greater degree of confidence in their current offerings, market positioning, or diversification strategies. Smaller Slovenian companies might be more agile in adapting to market changes and customer demands, potentially reducing their perceived product portfolio risk.

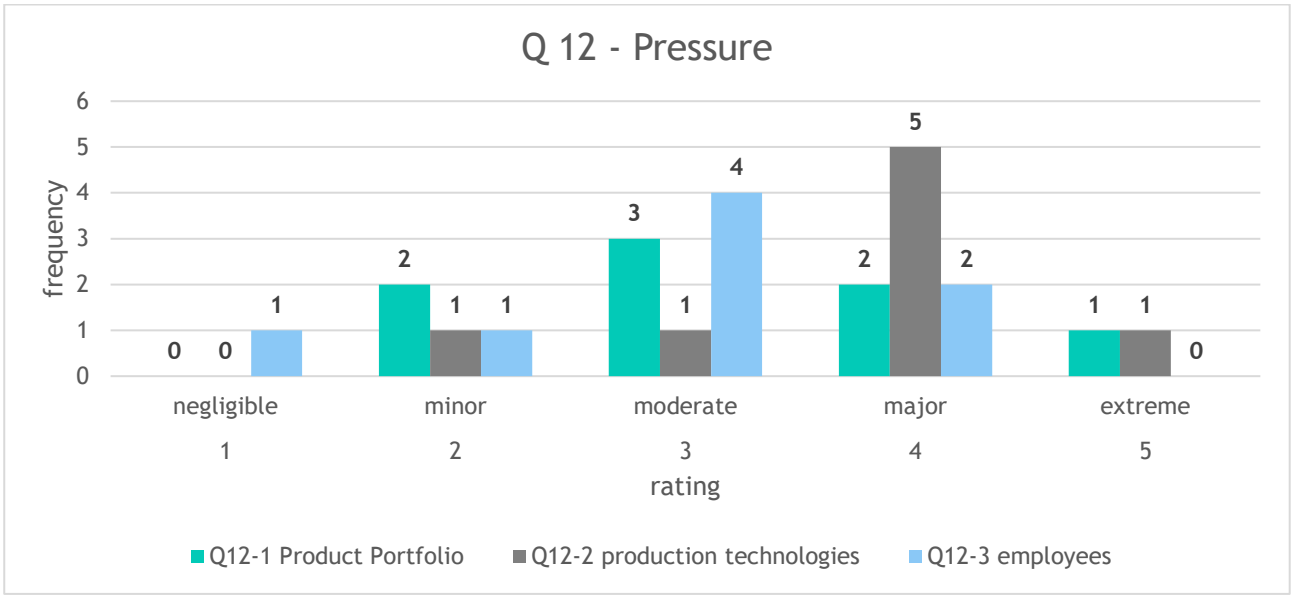


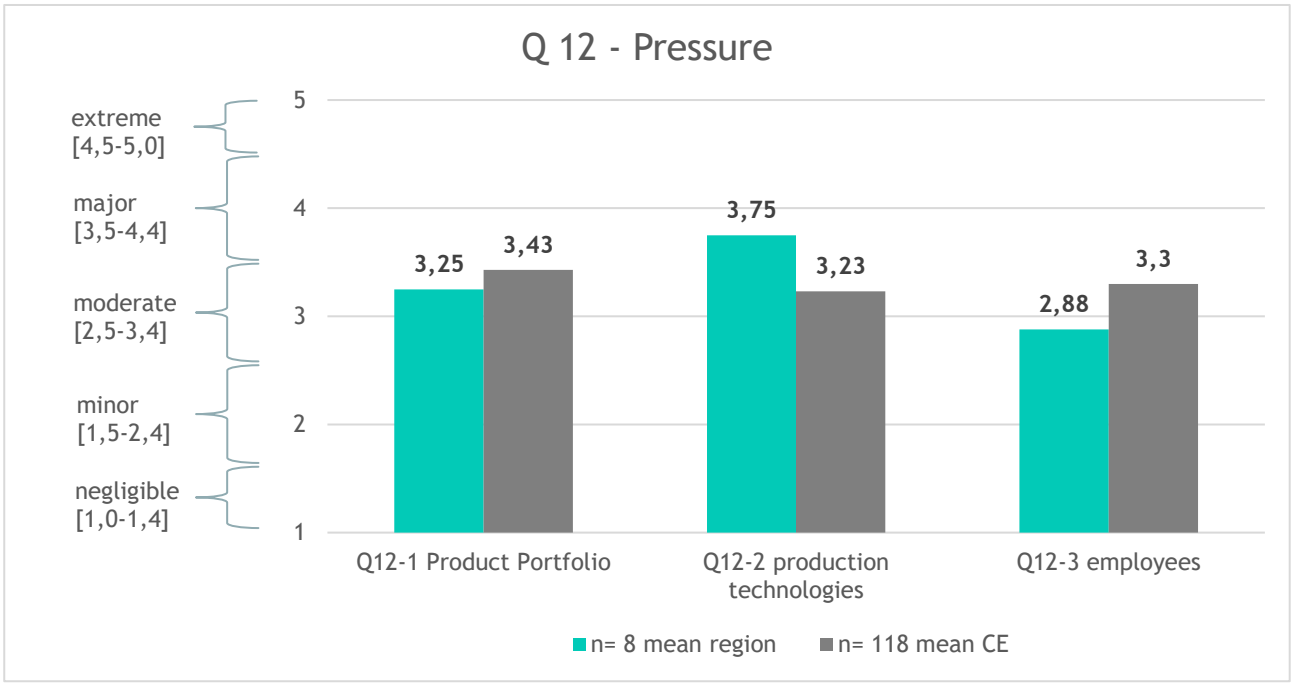
One of the main concerns of Slovenian companies is the severe price competition, likely driven by global competition with players like China increasing their market share. This puts pressure on Slovenian companies to lower prices to remain competitive. This is exacerbated by rising material and energy costs (also reflected in the graph) which further squeeze margins and making price competition even more challenging. The European automotive market might also be approaching saturation, leading to intense competition for customers and risks related to costs of compliance to customer requirements. Additionally, the highly rated risk factor of material costs is based on ongoing disruptions, geopolitical instability, and increased transportation costs which contribute to higher material prices. Certain raw materials crucial for automotive production (e.g., lithium for batteries) are becoming scarcer and more expensive and there is additional price pressure from inflation that is prevalent across the Eurozone.

Slovenian automotive companies face moderate concerns regarding a shrinking workforce. Ensuring compliance with environmental and labour regulations adds to their financial burden, while a shortage of skilled workers and a lack of critical competencies hinder their ability to adapt to technological advancements. These challenges are interconnected, as a lack of skilled labour can increase costs and hinder innovation, ultimately impacting competitiveness in a rapidly evolving industry. The automotive sector also follows the overarching issues of energy costs in the region, as the ongoing energy crisis in Europe, fueled by the war in Ukraine, has dramatically increased energy prices for businesses. Automotive manufacturing is energy-intensive, making companies highly vulnerable to energy price fluctuations. While Slovenia is transitioning to greener energy sources, the process is showing to be costly in the short term, adding to energy cost concerns. Most of these risks are felt in the companies as pressure to drive and deliver change.

Pressure to change business for ensuring business continuity (Q12)

These graphs illustrate the pressures faced by Slovenian automotive companies, providing valuable context to the previously analysed risk factors. The prevalent pressure lies in production technologies, mirroring the high-risk perception in this area. This stems from the rapid technological advancements and the need to adapt to Industry 4.0, while facing challenges like supply chain disruptions and potential skills gaps. Employee-related pressures remain significant, reflecting concerns about talent shortages and rising labour costs, further emphasizing the need for workforce development in the whole CE region. Pressures related to the product portfolio are also perceived as moderate, but slightly less than the CE average. While Slovenian companies feel similar levels of pressure regarding product portfolio they perceive significantly higher pressure in production technologies. This suggests that Slovenian companies are facing greater challenges in adopting Industry, managing supply chains, and competing with more technologically advanced players in the region.



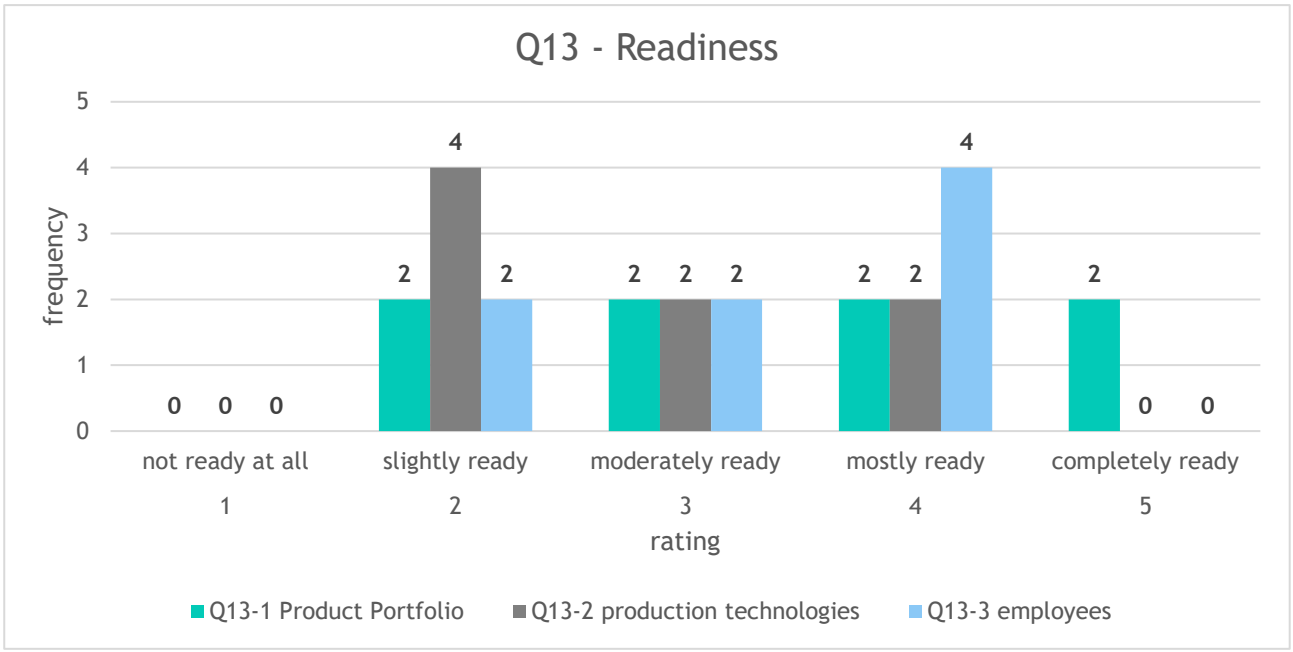


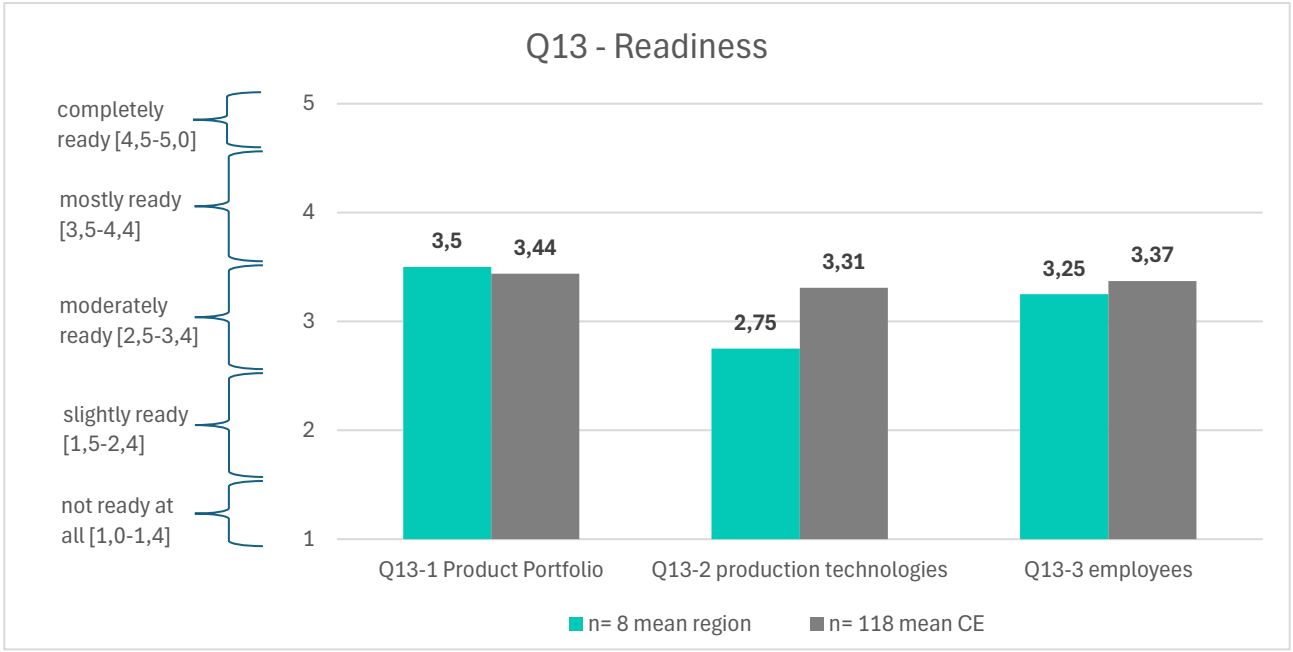
Readiness to change business for ensuring business continuity (Q13)

The perceived readiness of Slovenian automotive companies to transform reveals a mixed picture. While there's a notable absence of companies feeling "not ready at all," indicating a general willingness to adapt, the distribution across other categories highlights the challenges ahead. A significant portion finds themselves only "slightly ready" or "moderately ready," particularly in crucial areas like production technologies. They also lag slightly behind the CE average in their readiness regarding production technologies. This aligns with the previously discussed pressures and risks, suggesting that while companies acknowledge the need for transformation, they might face hurdles in implementation.

This is due to factors like limited access to capital, lack of own capital, skills gaps, and the complexities of integrating new technologies. The slightly higher readiness in "product portfolio" might again reflect

confidence in existing offerings, but also underscores the need to transform this readiness into innovation and market adaptation to address future challenges. Interestingly, Slovenian companies demonstrate a slightly higher readiness to transform in terms of their product portfolio compared to the average in Central European region, which can drive innovation. The lack of companies feeling "completely ready" emphasizes the ongoing nature of transformation and the need for continuous improvement and investment in key areas. Overall, this highlights the importance of strategic initiatives and support mechanisms to enhance the readiness of Slovenian automotive companies and enable them to thrive in a dynamic global environment.

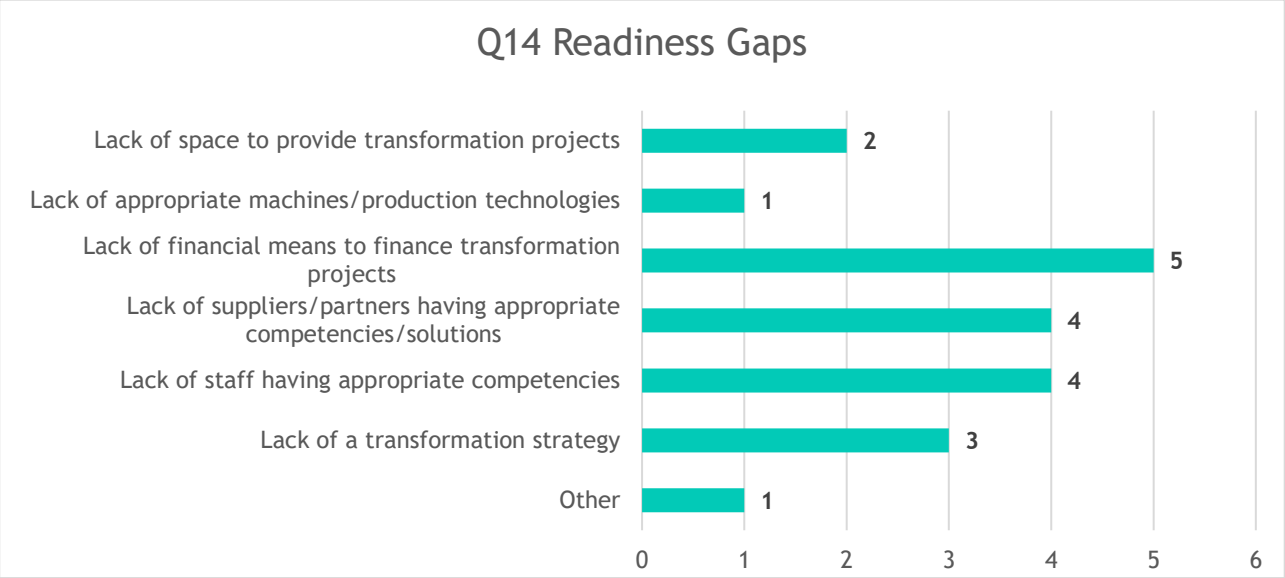




Main readiness gaps hindering businesses from starting a transformation process (Q14)

The most significant gap that companies in the region notice are the lack of financial means to finance the transformation, highlighting the need for increased investment and funding opportunities for companies to adopt new technologies, upskill their workforce, and adapt to changing market demands. This financial constraint likely connects to previous concerns about high costs related to energy, materials, and compliance. One company identified a readiness gap due to specifically legal and market uncertainty.

Furthermore, the lack of suppliers/partners having appropriate competencies and lack of staff having appropriate competencies underscore the importance of collaboration and skills development within the industry ecosystem. Addressing the skills gap through training programmes and knowledge transfer initiatives is crucial for successful transformation. The lack of a transformation strategy indicates that some companies might need guidance and support in developing comprehensive strategies to navigate the complexities of the changing automotive landscape.



KEY TAKEAWAY: The perspectives on risks, pressures, and readiness in the Slovenian automotive sector are generally aligned. Companies feel confident and ready for a transformation in their product portfolios but face challenges with production technologies and workforce development. This suggests a need to address technology adoption, skills gaps, and rising costs to enhance readiness and competitiveness. While there is a willingness to transform, companies need support to overcome financial constraints and develop comprehensive strategies for navigating the changing automotive landscape.

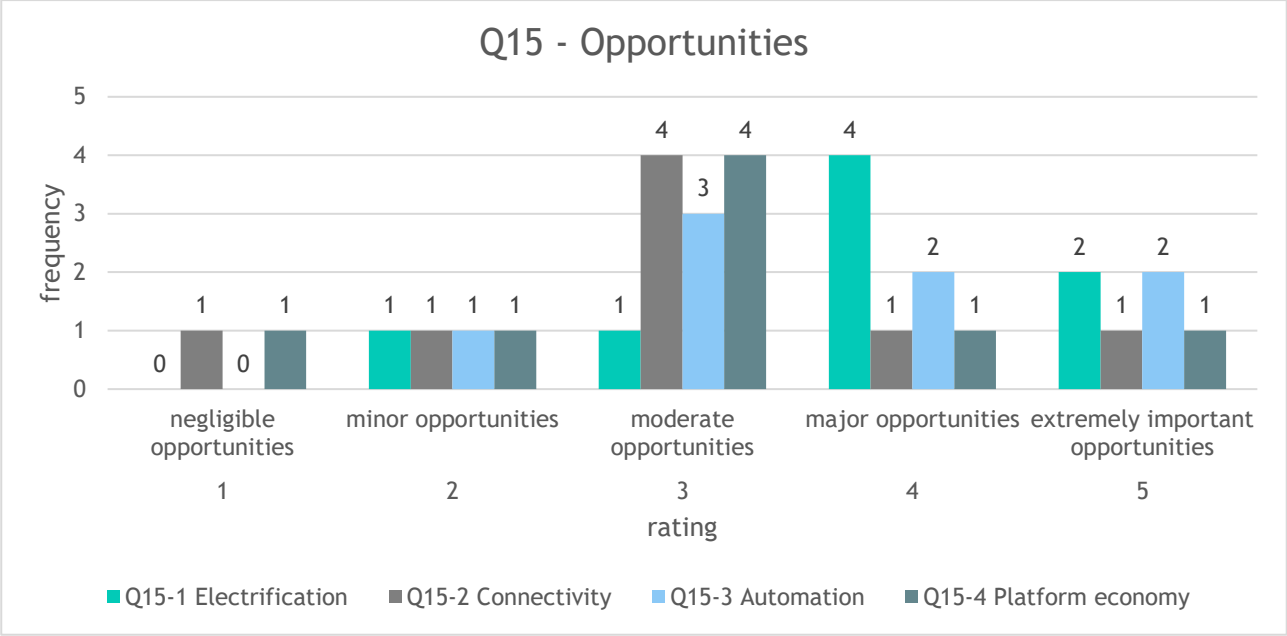
Transformation opportunities and strategic approaches to ensure business continuity in 2024-2030 (Q15-17)

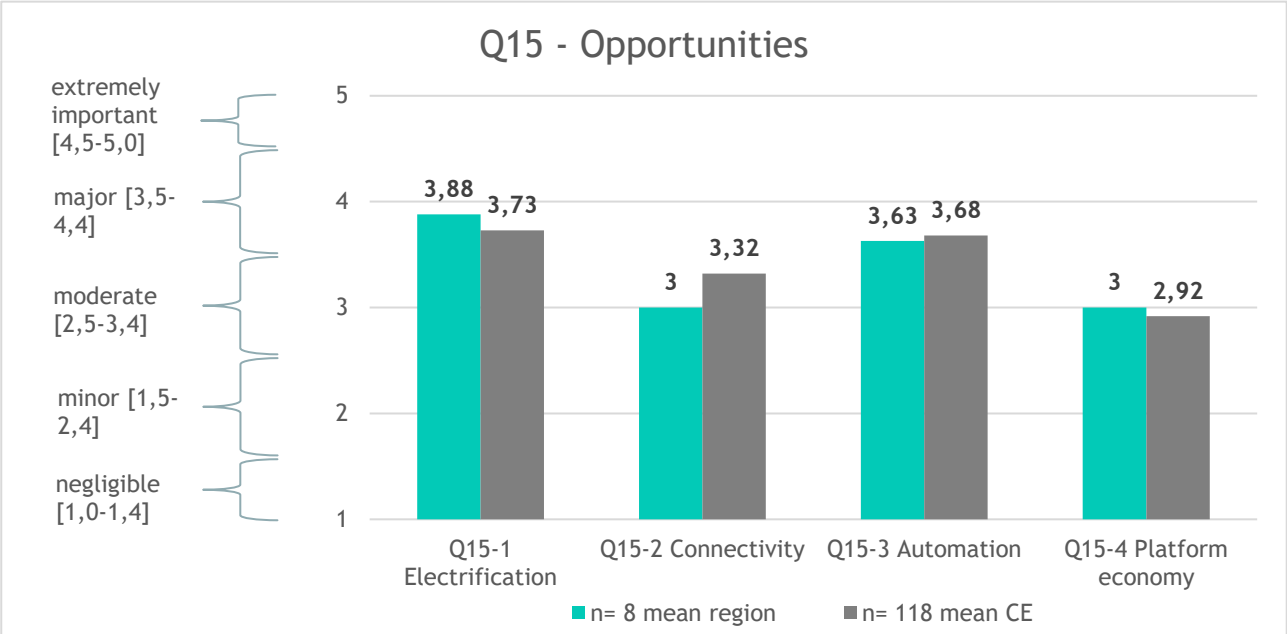
Opportunities to ensure business continuity (Q15)

Slovenian companies see substantial opportunities in electrification, aligning with the global shift towards electric vehicles and Slovenia's own strategic initiatives. Compared to the Central European average,

Slovenian companies see greater opportunities in electrification, aligning with national priorities. However, the more moderate perceived opportunities in automation connect to challenges in adopting advanced manufacturing technologies.

Connectivity and the platform economy present lower opportunities, suggesting that companies might be exploring these areas but haven't fully grasped their potential for innovation and growth. This cautious approach could be linked to previous concerns about skills gaps and the need for further investment in digital infrastructure.

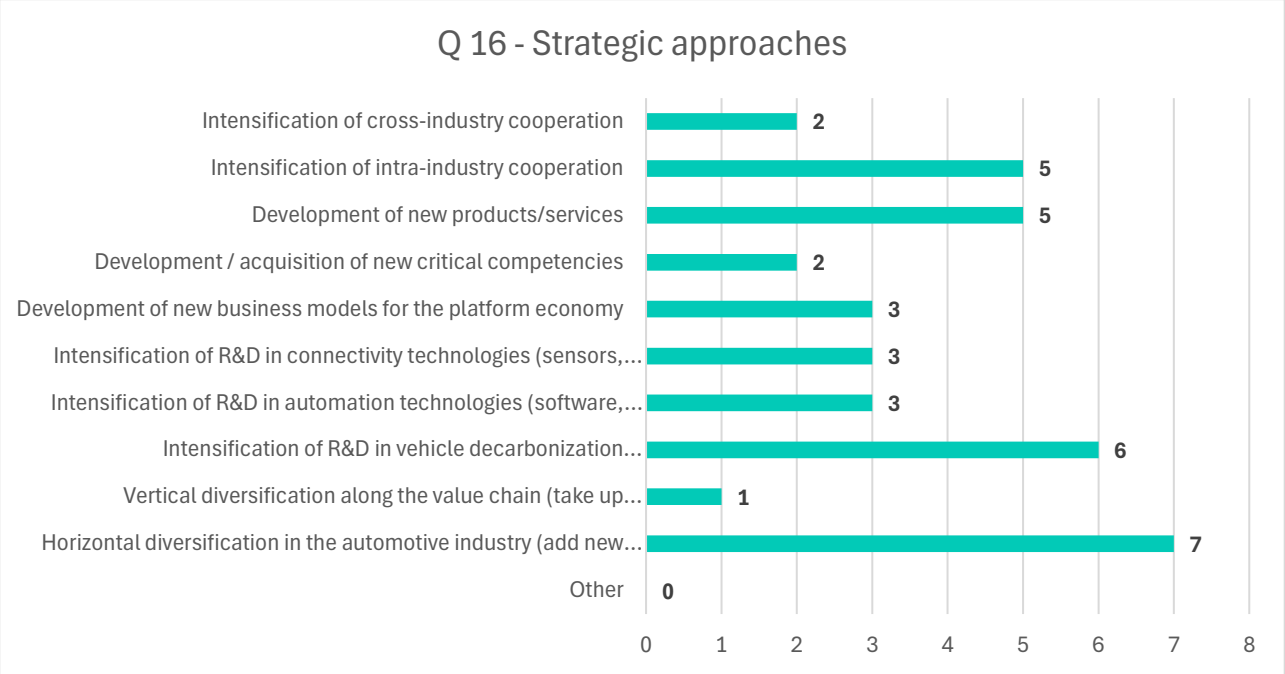




Strategic approaches to seize opportunities (Q16)

While horizontal diversification strategy within the Slovenian automotive industry remains a common thread in order to seize the opportunities, companies are also looking to intensify R&D efforts in key areas like vehicle decarbonisation (battery production), connectivity, and automation. This aligns with their perceived opportunities in electrification and the need to adapt to technological advancements. Some companies

emphasize developing new business models for the platform economy, indicating an awareness of the transformative potential of digital platforms. Several companies highlight the importance of collaboration, both within the industry and across sectors, to access new knowledge and resources.



Technology and skills gaps (Q17)

The responses below are answers to open questions and subsequent discussions with the BSO in the region for clearer interpretation. It is therefore not advised to take them as representative of the whole region, but they do offer important insight to identify some key technology and skills gaps that need to be addressed to successfully navigate the industry transformation.

Skills gaps:	Decarbonisation of technology and processes (using technology/machines which have low/zero carbon emissions, developing more sustainable products (recycled materials, repairable products, …) Mindset and speed: Companies and the public ecosystem need a more transformation-ready mindset and better adaptability, suggesting cultural and operational gaps in agility and proactiveness. ICT and data utilisation: Slovenia lacks skill in big data utilisation for data-informed decision making and increasing productivity of processes.
Technology gaps:	Decarbonisation of technology and processes (using technology/machines which has low/zero carbon emissions, developing more sustainable products (recycled materials, repairable products, …)

KEY TAKEAWAY: There are significant opportunities still seen in the area of Electrification and Automation, which is in line with national strategies. Companies are also open to further explore areas of Connectivity and Platform economy, similar to the generally positive outlook for all areas in the CE region.

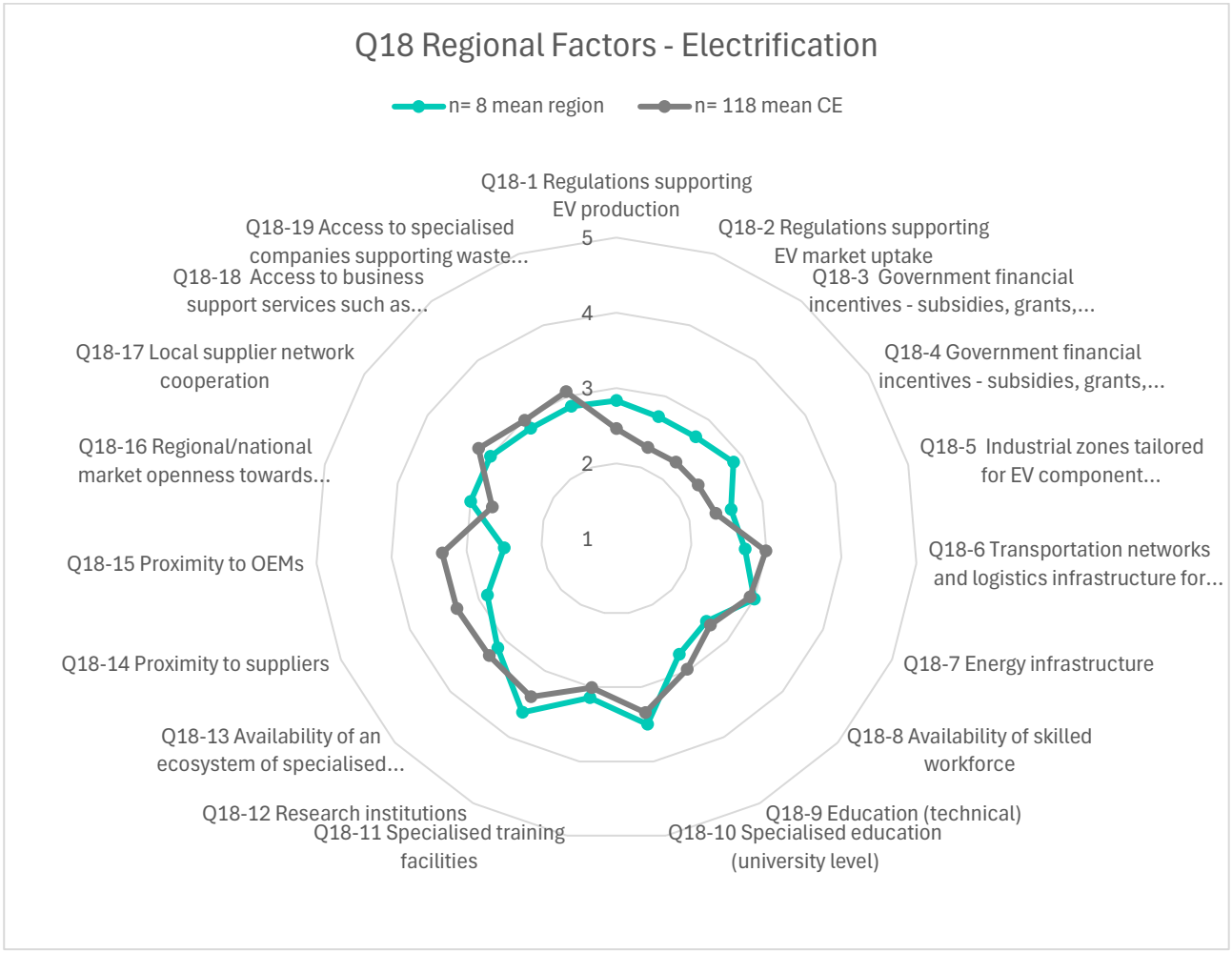
Regional resources and business support ecosystem (Q18-22, 26-27)

Factors to play a role in automotive in 2024-2030 (Q18-22)

This analysis of regional factors supporting the Slovenian automotive industry's transformation reveals a mixed picture across four key areas: electrification, automation, connectivity, and the platform economy. While Slovenia demonstrates strengths in skilled workforce development and market openness, exceeding the Central European average in several instances, significant challenges remain. Common weaknesses include limited access to specialised technology companies, insufficient financial incentives, and underdeveloped infrastructure, particularly specialised industrial zones. These shortcomings hinder Slovenia's ability to fully leverage the potential of these transformative areas and emphasize the need for strategic investments and policy interventions to enhance competitiveness in the evolving automotive landscape. With a maximum score of 5, all the scores in graphs below appear less positive. It suggests that while there's awareness of these issues and some level of support and readiness, there's still significant room for improvement across all areas. The prevalence of scores in the 3-4 range highlights a sense of urgency for Slovenian automotive companies and policymakers. These challenges must be actively addressed to remain competitive in the rapidly transforming automotive landscape.

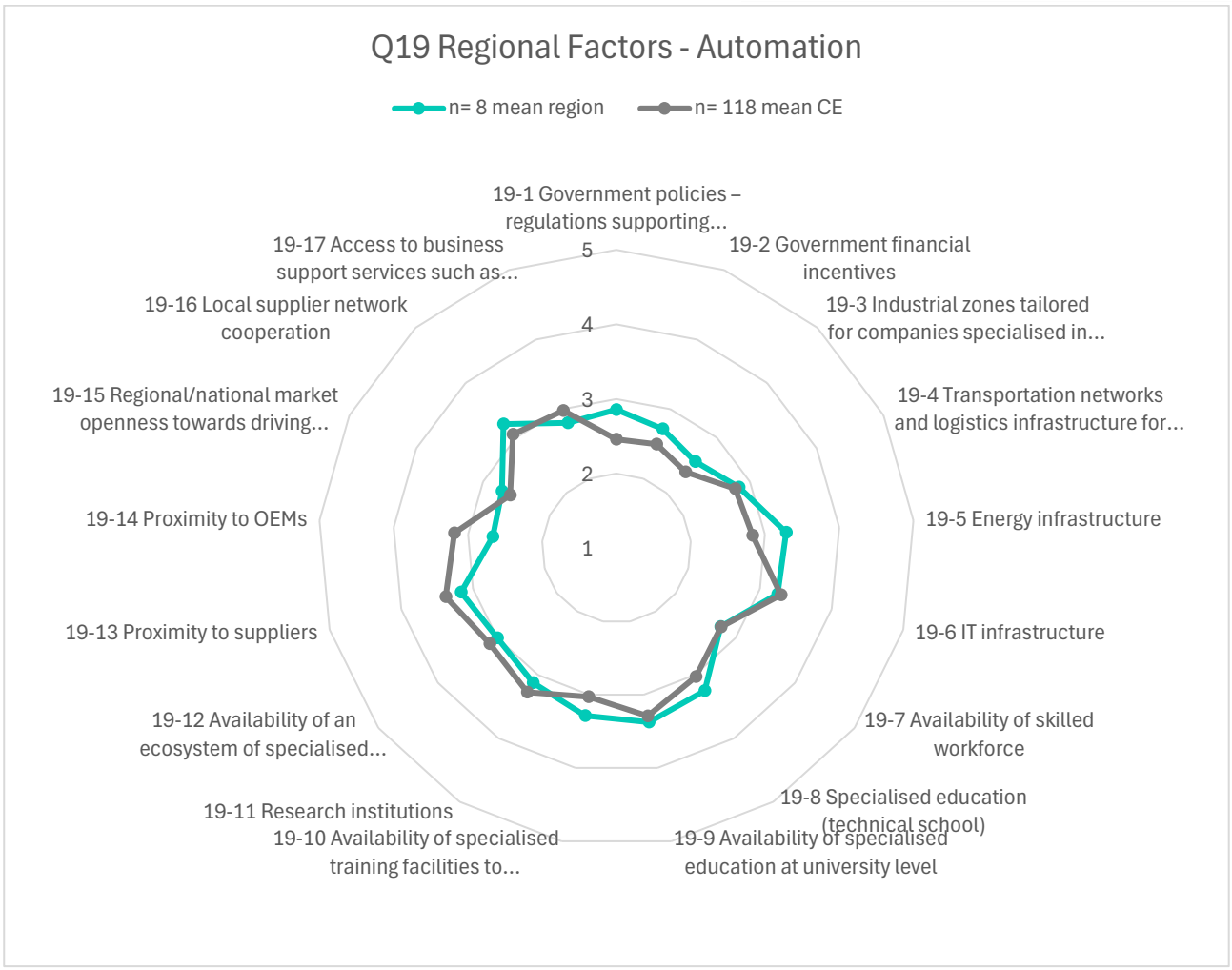
Electrification (Q18)

Slovenian automotive companies perceive their regional ecosystem as moderately supportive of their electrification efforts. While they benefit from a good foundation in skilled workforce development and energy infrastructure, along with supportive government policies and incentives, they face challenges in accessing specialised companies, business support services, and fostering collaboration within the local supplier network. Factors like proximity to OEMs and suppliers are also perceived as less available, while market openness is slightly higher than CE average, indicating both opportunities and challenges. Overall, while Slovenia possesses key strengths for electrification, there is a clear need for improvement in several areas to accelerate the transition towards electric vehicles and enhance the competitiveness of the Slovenian automotive sector. Particularly low is also the availability of specialised industrial zones. Slovenia appears to have a stronger foundation for skilled workforce development than the regional average, with higher scores in the availability of training facilities and university-level education. This could be a significant competitive advantage for Slovenia in the transition to electrification, along with a more receptive and open market for EVs.



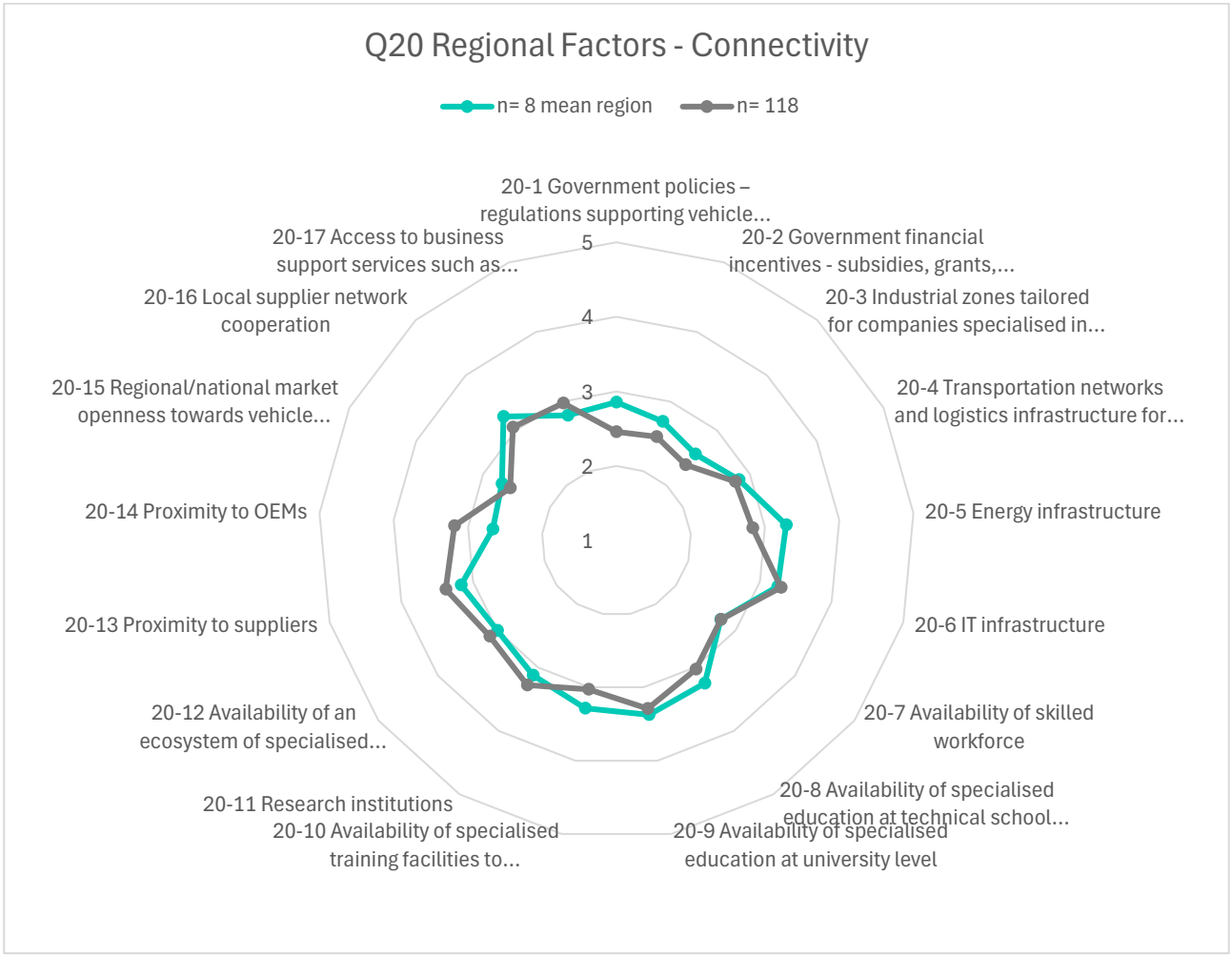
Automation (Q19)

Analysis reveals a mixed picture for Slovenia in terms of automation readiness. While skilled workforce development and energy and IT infrastructure are perceived as satisfactory, the proximity of suppliers and OEMs require attention to enhance Slovenia's competitiveness in this transformative area. By addressing these challenges and leveraging its strengths where the region is rating factors above the CE average, Slovenia can create a more conducive environment for the adoption and development of automation technologies within its automotive industry. Among the highest rated are the availability of specialised training facilities to upskill/reskill employees and access to specialised education at both technical school and university levels. This suggests that Slovenia is well-equipped to develop the skilled workforce necessary for implementing and managing automation technologies in the automotive sector.



Connectivity (Q20)

Slovenian automotive companies view their region as moderately conducive to developing vehicle connectivity, with strengths in workforce training and government support, but also notable weaknesses, like the availability of skilled workforce. The moderately high availability of government policies and regulations supporting smart vehicle connectivity, data exchange, and related technologies compared to the CE average could be linked to Slovenia's focus on digital transformation and its efforts to foster a connected and innovative automotive sector. While policies promote connectivity and the market shows openness to these technologies, exceeding the Central European average, companies face challenges. Accessing specialised technology companies and OEMs lags behind central European standards, much the same as in the area of automation. There is a clear desire for increased financial incentives to drive investments in connectivity solutions, suggesting that Slovenia could further enhance its financial support mechanisms to accelerate adoption. The possible enhancement could also be made on the lack of specialised industrial zones in all 4 areas.

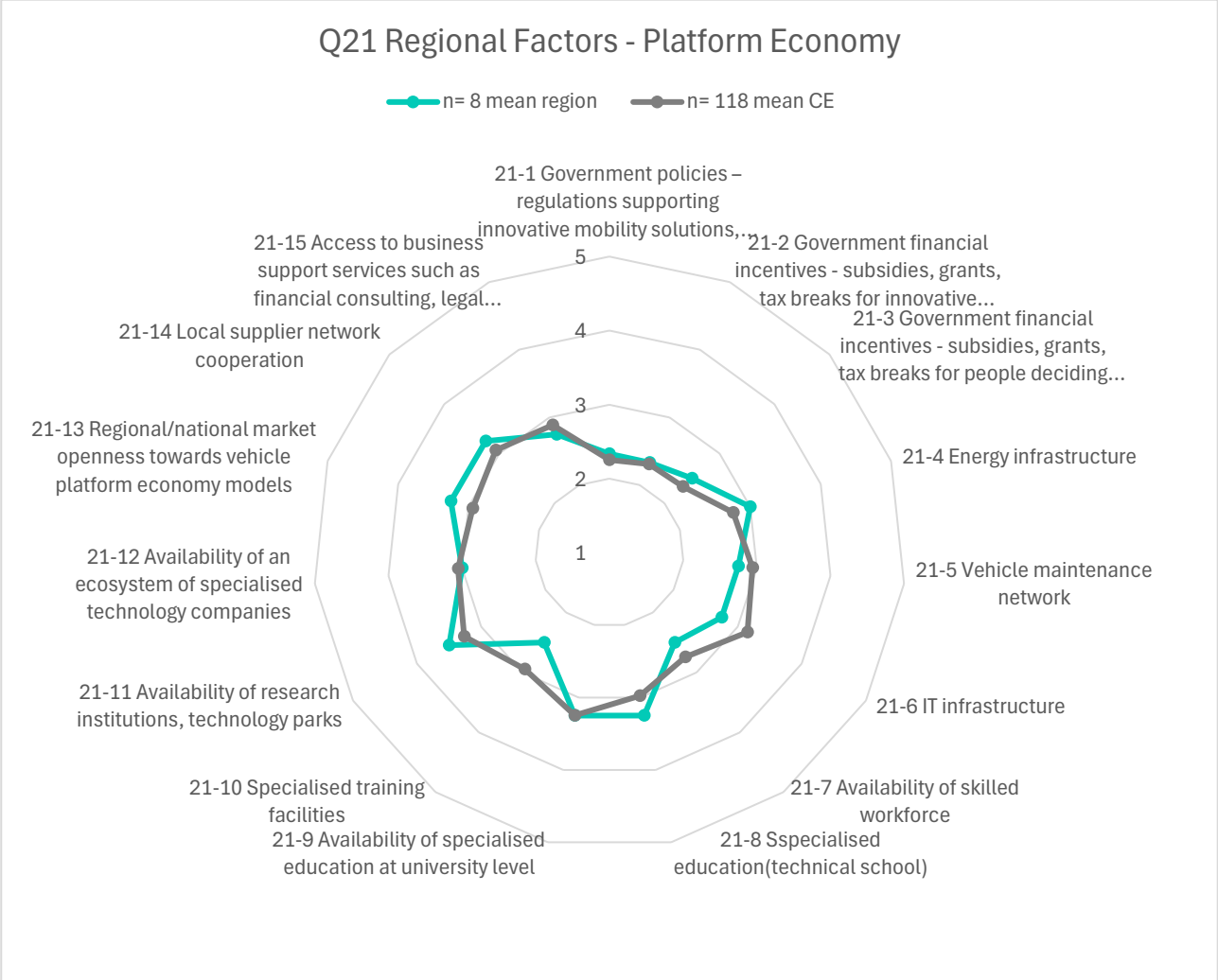


Platform Economy (Q21)

The situation in the region reveals a challenging landscape for Slovenian automotive companies seeking to embrace the platform economy. Despite a relatively receptive market for platform-based solutions, exceeding the Central European average, companies face significant hurdles in terms of support and resources.

A key problem lies in the availability of a skilled workforce and training facilities, with scores below the CE average. This is additionally undermined by a perceived lack of government support, particularly regarding financial incentives for innovative mobility solutions and platform economy initiatives. Additionally, the availability of essential infrastructure, such as IT infrastructure and vehicle maintenance networks, also falls short, potentially hindering the seamless operation and scaling of platform economy models.

Nevertheless, access to specialised schools and research institutions surpasses the CE average. This suggests a solid foundation for developing the talent needed to navigate the complexities of the platform economy.



KEY TAKEAWAY: Automation appears to be the most supported area overall. This is evidenced by relatively higher scores in skilled workforce availability, availability of research institutions, technology parks as well as energy and IT infrastructure. On the other hand, the lack of a supportive ecosystem, skilled workforce, and necessary infrastructure hinders progress in the area of platform economy the most, compared to others.

Additional factors influencing the regional competitiveness (Q22)

The companies did not give further insight.

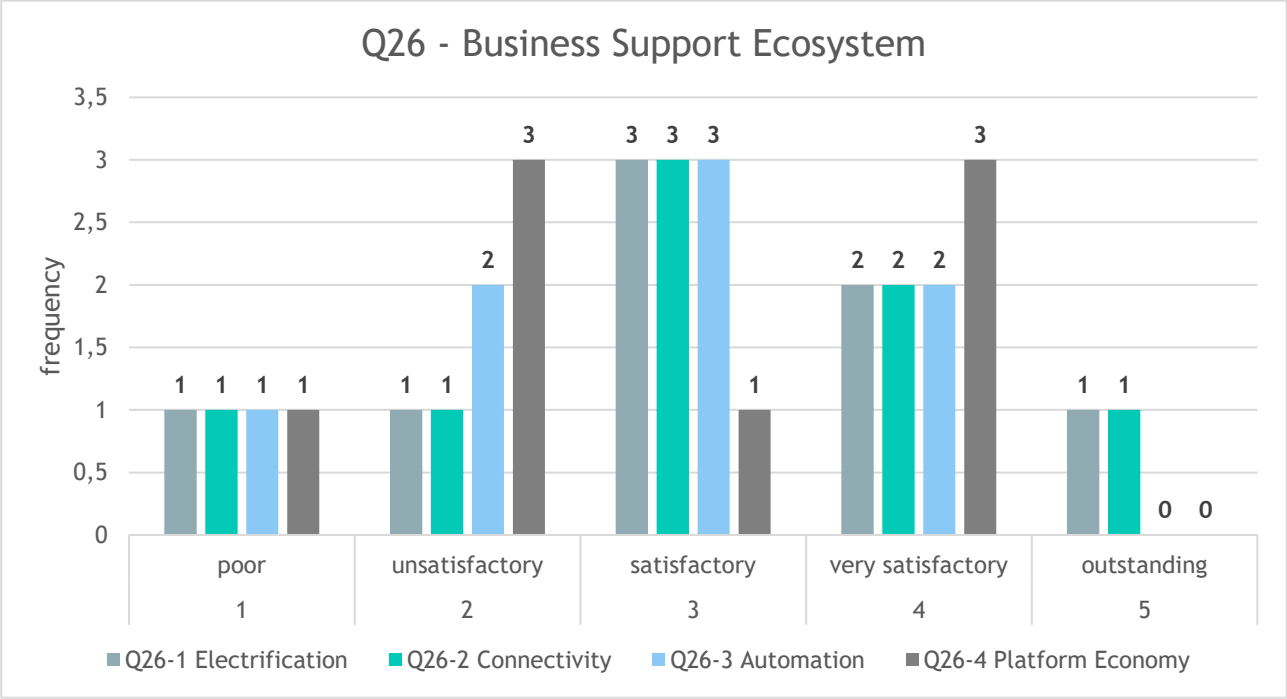
Business support services (Q26-27)

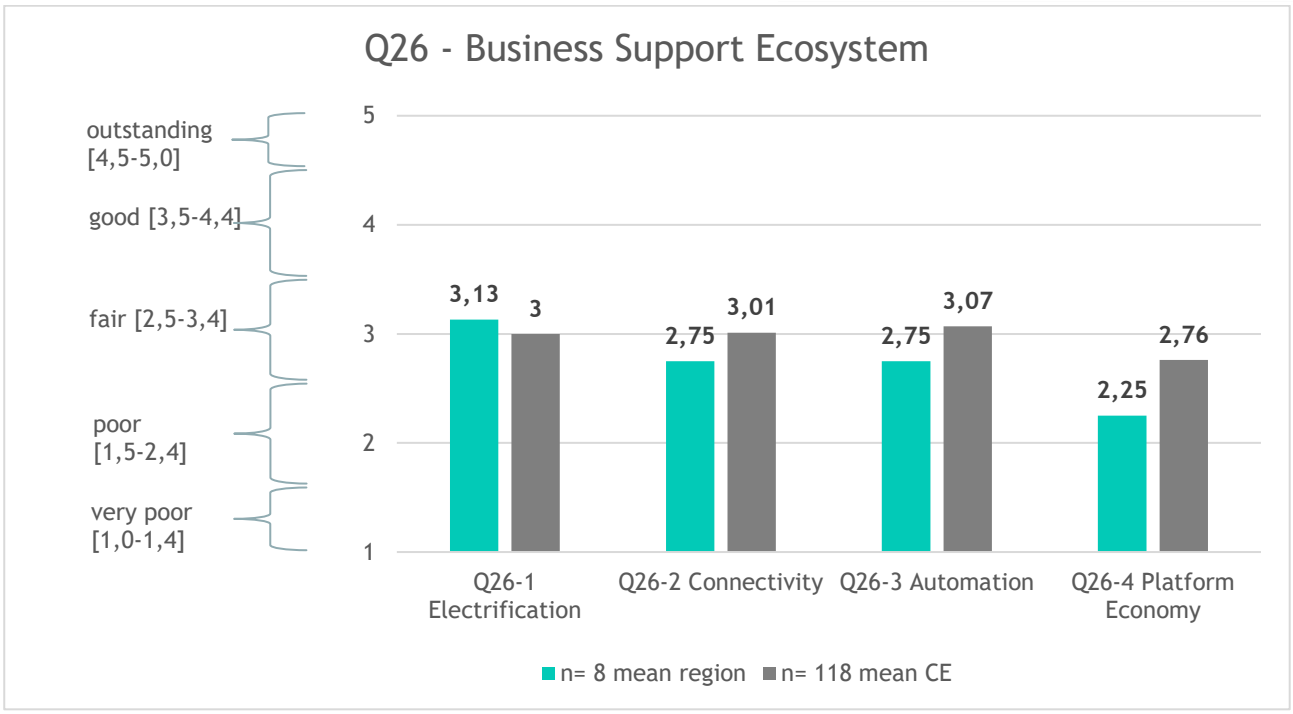
The ratings of companies paint a somewhat concerning picture of the regional business support ecosystem for the Slovenian automotive sector. With a maximum score of 5 ("outstanding"), the average ratings across all four transformative areas fall below "satisfactory". **Electrification** received the highest rating, suggesting some level of satisfaction with the support services, but it still falls short. Connectivity and automation both receive an average rating of 2.75, indicating "unsatisfactory" support services and highlighting significant room for improvement. Most concerning is the platform economy, with the lowest rating of 2.25, deemed

"poor," indicating a significant lack of adequate support. The discrepancy in ratings across the four areas highlights an uneven landscape of support, suggesting a need for more targeted and specialised services. A troubling finding is that most of the companies view the supporting ecosystem as unsatisfactory even in the area of their specialisation. As per the open answers, companies cite the need for governmental tax incentives, subsidies or more localised support, which is also visible in the assessments of regional factor availability in the chapter above.

While the self-assessment of BSO indicated some supportive activity in all areas of future mobility, there is considerable potential for development, particularly in the following areas:

- Financial Incentives: Providing better guidance and support for accessing financial incentives, grants, and subsidies for innovation projects in these areas could significantly benefit companies.
- Specialised Expertise: Increasing the availability of specialised consultancy firms, legal experts, and industrial parks focused on the specific needs of the automotive industry in each transformative area (electrification, automation, connectivity, and platform economy) is crucial.
- Collaboration and Networking: Facilitating stronger collaboration and knowledge sharing between research institutions, education and training organisations, and businesses could foster a more dynamic and supportive ecosystem.

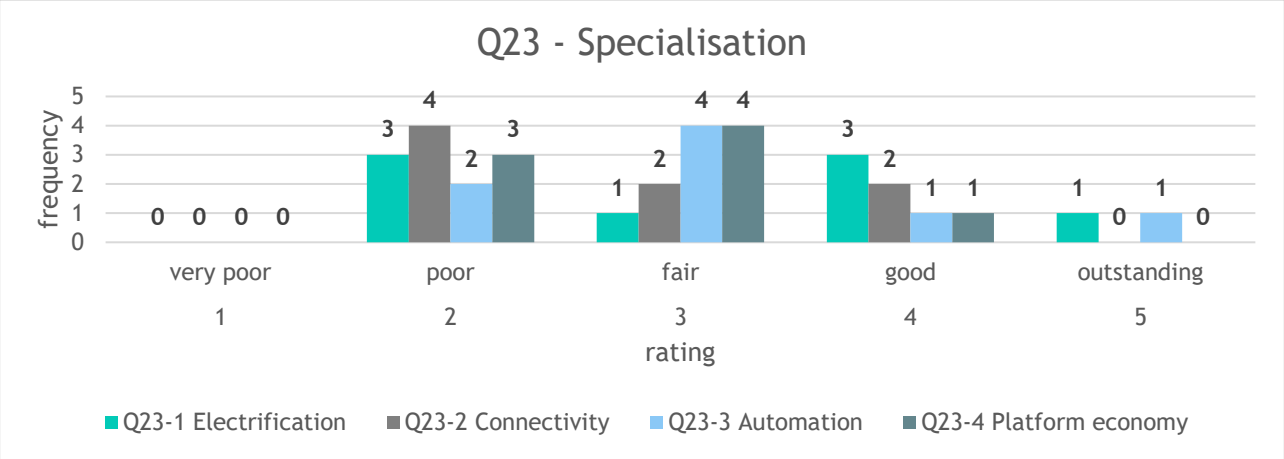




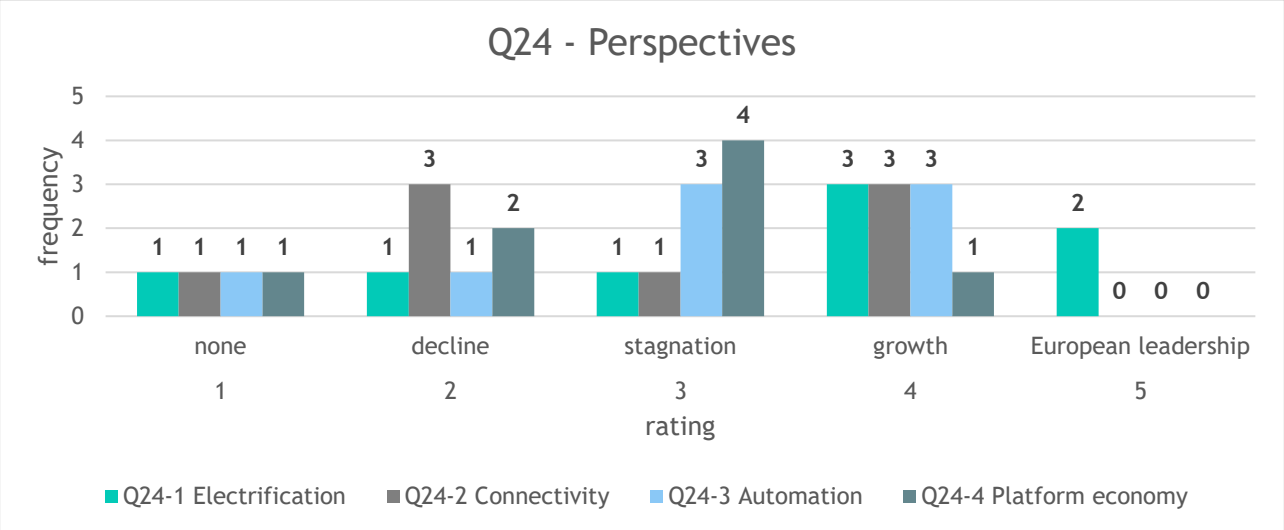
Specialisation level and development perspectives (Q23-25)

This graph illustrates Slovenian automotive companies' perspectives on the specialisation level of their region across the four key areas. The distribution of responses reveals a concerning lack of specialised support. Notably, the majority of responses cluster around "poor" to "fair" specialisation. This suggests a significant gap in the availability of tailored support services for companies navigating these transformative areas.

Electrification fares slightly better, with some companies rating the specialisation level as "good," indicating a potential emerging ecosystem for this area. Here, Slovenia shows a slightly higher level of specialisation compared to the CE average. However, connectivity, automation, and the platform economy predominantly receive "poor" to "fair" ratings, highlighting a critical need for development. This lack of specialisation hinders innovation and the adoption of new technologies within the Slovenian automotive sector. In comparison to CE average, the areas also do not show significant lags or surpassing and are generally still scored quite low, with the slight outlier being electrification.

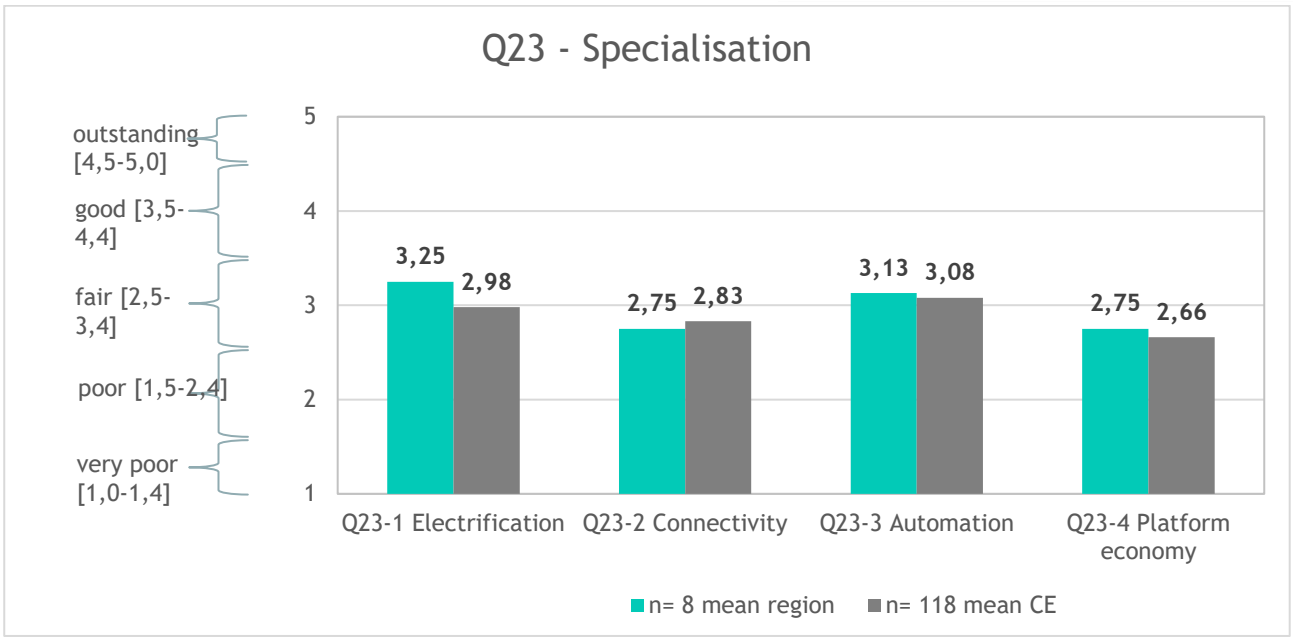


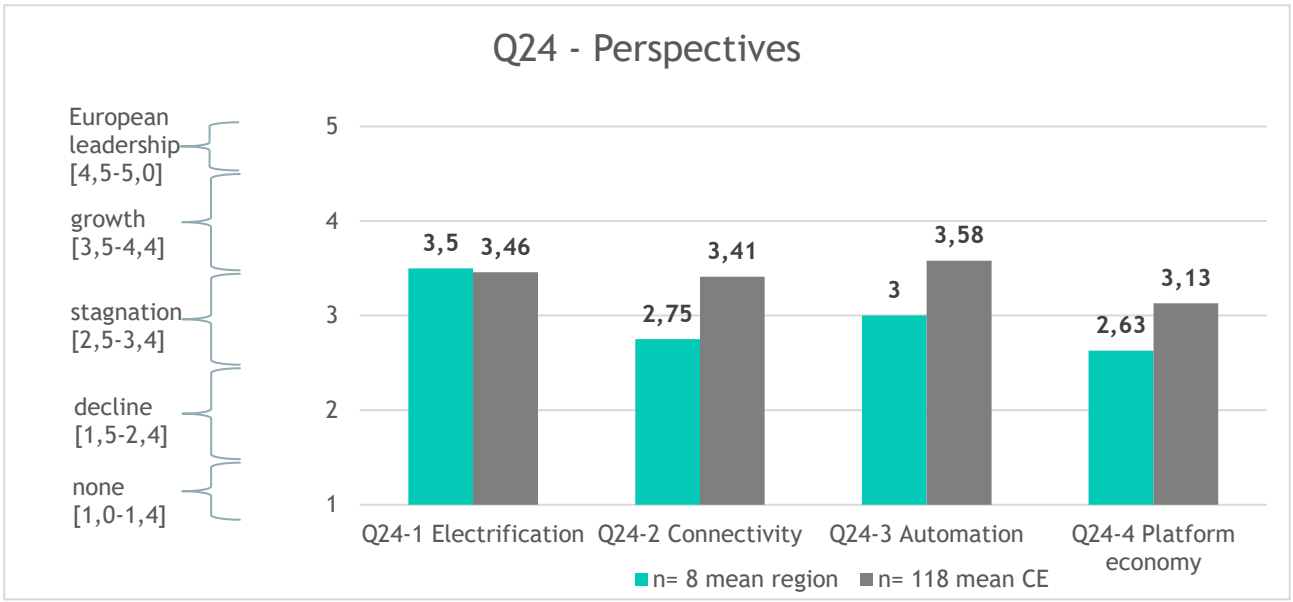
A majority of companies anticipate some growth in all four areas, indicating optimism about the future development of the region, particularly in Electrification. This outlook aligns with the general sentiment in Central Europe, as reflected in the average score. However, the presence of some stagnation and even decline concerns in Connectivity and Platform economy suggest a degree of uncertainty and potential challenges ahead in Slovenia.



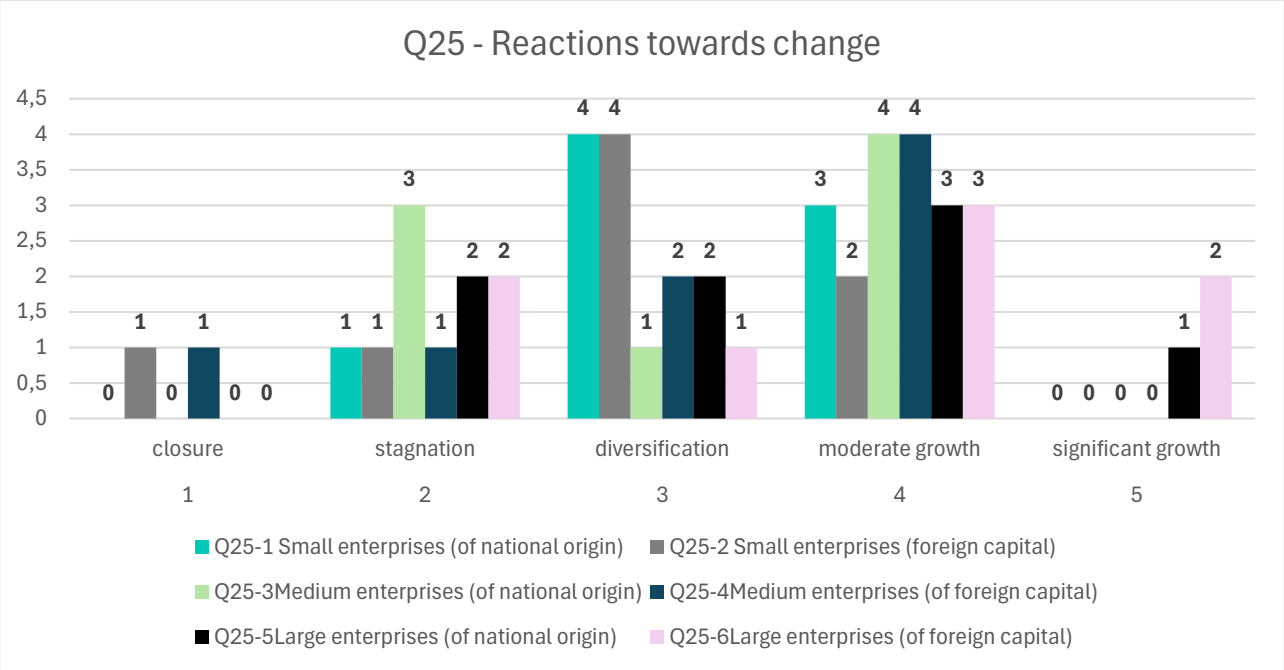
Electrification appears to have the most positive outlook, with a significant portion of companies expecting growth. This optimism is mirrored in the CE average, but Slovenian companies show slightly higher expectations for growth. Connectivity and automation show a more mixed picture, with a balance between growth and stagnation predictions. Notably, Slovenian companies are less optimistic than the CE average in both areas, indicating a potential need for stronger initiatives to foster development in these fields.

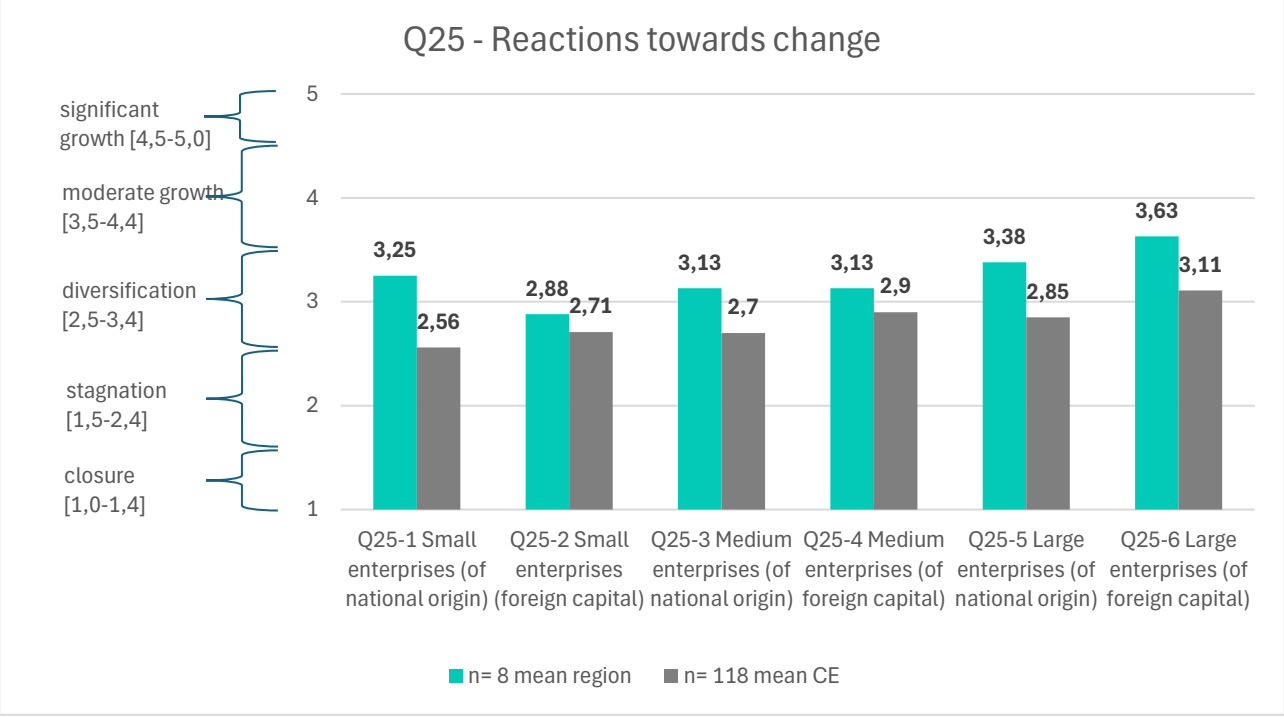
The platform economy presents the most concerning outlook, with a notable number of companies predicting stagnation or even decline. This pessimism is even more pronounced compared to the CE average and highlights a potential weakness in Slovenia's support for the platform economy and underscores the need for focused efforts to improve the ecosystem in this area.





Across all company sizes, Slovenian companies express more optimism than their CE counterparts in their view of reactions to ongoing changes in the sector. They generally anticipate "diversification" and "moderate growth" as primary responses to the ongoing transformation, with the higher scores compared to the CE average suggesting a proactive and dynamic approach to adaptation. On average, smaller Slovenian enterprises (both national and foreign owned) express slightly less optimistic views than their larger counterparts, though still exceeding the CE average. This could indicate that larger players might have more resources and established networks to navigate the changes, and future support ecosystem should be focused on helping SMEs.





KEY TAKEAWAY: The region needs to develop more specialised expertise, resources, and programmes tailored to the unique needs of each transformative area (electrification, automation, connectivity, and platform economy), although results show that the focus toward electrification, and at a lower level to automation, showcases that Slovenia is focusing its efforts into areas which are generally evaluated as those with growth potential.

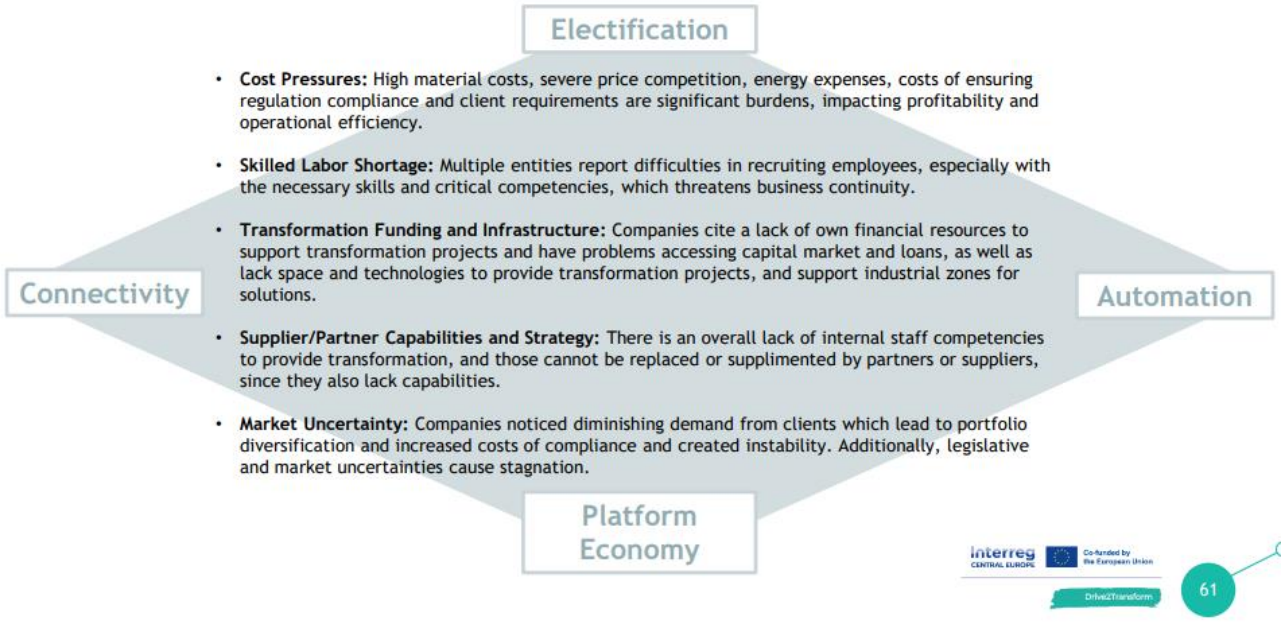
Conclusion - Key findings for regional transformation capacities in the automotive sector

Slovenia's automotive industry faces a mixed outlook in its transformation journey. While the sector benefits from a relatively skilled workforce, a comparatively receptive market for new technologies and good research institutions, it also faces significant challenges in accessing specialised production technologies, securing financial incentives, and developing essential infrastructure.

The business support ecosystem, while showing potential for growth, currently lacks specialisation and adequate resources to effectively support companies in all areas of transformation. Particularly concerning are the low ratings for support services related to connectivity, automation, and the platform economy.

Addressing these challenges will require a concerted effort from policymakers, industry stakeholders, and the business support ecosystem. Investing in specialised expertise, enhancing financial support mechanisms, and fostering collaboration will be crucial to accelerate the adoption of new technologies and ensure the long-term competitiveness of Slovenia's automotive sector.

Despite these challenges, Slovenian automotive companies demonstrate a proactive and dynamic approach to adapting to industry changes. Their optimism and willingness to embrace transformation, coupled with targeted support and strategic investments, can pave the way for a successful future in the evolving global automotive landscape.

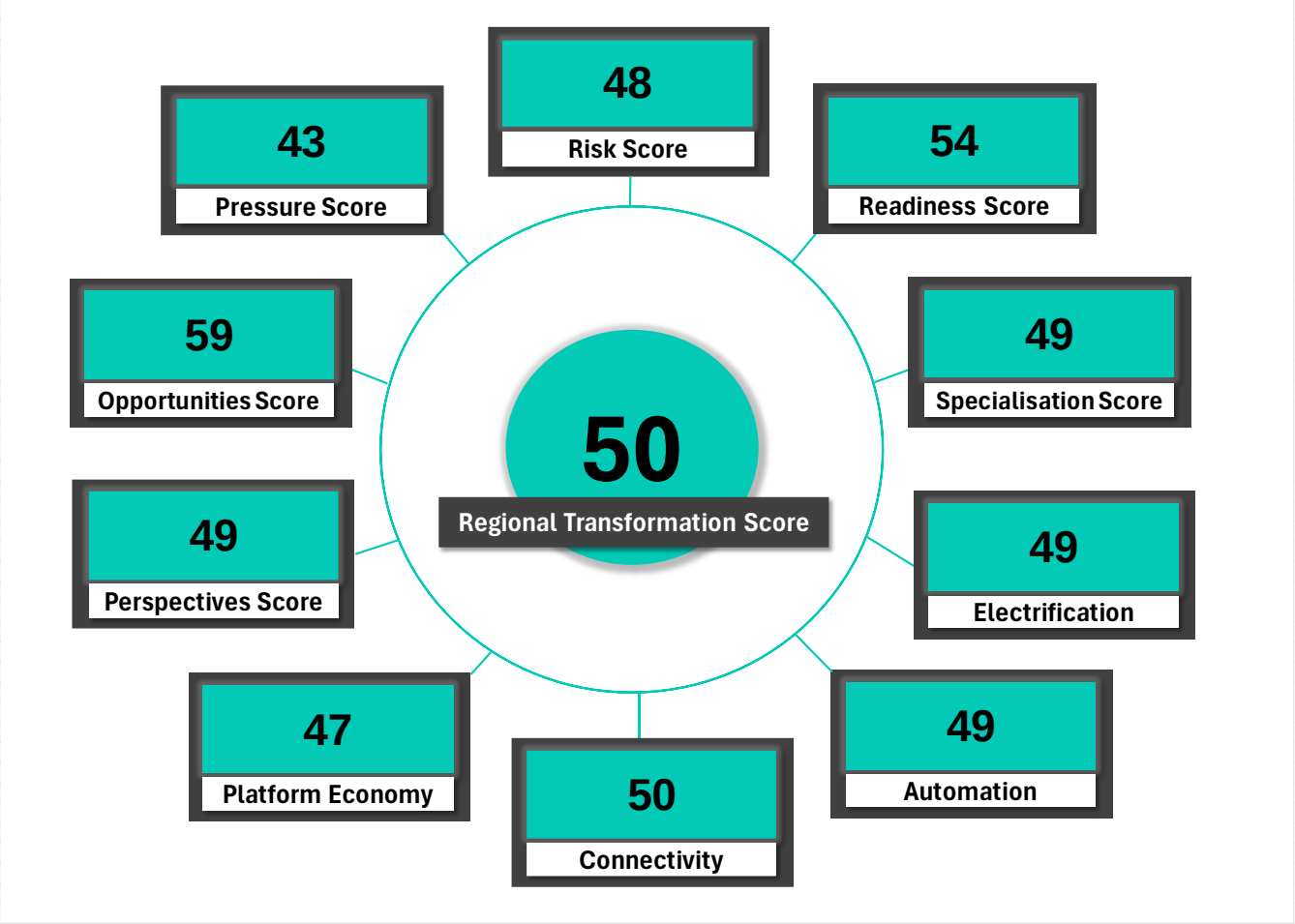


Challenges in Slovenia

KEY TAKEAWAY: Using the TRM Score tool based on the EU Survey, we assess the Slovenian region as 50 – Moderately ready for transformation. Slovenia must, along with other CE regions, address the common challenges in all areas of transformation to achieve better transformation readiness. Additionally, it should offer a more specialised array of support to region-specific challenges, such as more accessible financial incentives and progress in technologies.

Transformation Readiness Index - Slovenia

Slovenia is in between limited and moderate ready for transformation. Its Opportunities Score stands out as slightly higher than the others, but all scores lie quite close to its overall transformation score of 50.



Ranking:

>60 Transformation Ready

50-60 Moderate Ready

40-50 Limited Ready

30-40 Low Ready

<30 Not Ready

Slovakia (SEVA)

Brief description of the region

Slovakia is the largest global per capita passenger car producer, owing to four OEMs: Volkswagen Slovakia in Bratislava (since 1991), PSA Peugeot Citroën Slovakia in Trnava (since 2003), Kia Motors Slovakia in Žilina (since 2004), and Jaguar Land Rover in Nitra (since 2015). The fifth production facility by Volvo Cars Košice, dedicated solely to BEV (Battery Electric Vehicle) production, will be launched in 2026. There are more than 350 automotive suppliers in Slovakia, accounting for the vast majority (89 %) of direct jobs across the automotive industry. Car manufacturing is the largest industry in the country, constituting between 12 % and 13 % of GDP, almost 50 % of industrial production, over 33 % of industrial exports, and 10 % of the employed population (approximately 275,000 jobs between Tier 1 (177,000) and Tier 2 and services (98,000)).

The large Tier 1 foreign affiliates account for most of the value added in the sector compared to Tier 2 suppliers, which are typically Slovak small and medium-sized enterprises (SMEs).

The country's strong reliance on car manufacturing makes it particularly vulnerable to e-mobility adoption trends. Over 70% of Slovakia's key export markets have already announced bans on ICE vehicle sales by 2035. Domestic producers need to adapt to the changing market situation, regardless of the local rate of EV uptake, if they are to remain competitive.

The transition of Slovakia's automotive industry towards electric vehicles, especially BEVs, has accelerated since 2020-2021. Of the total annual production of almost 1.1 million vehicles in 2023, approximately 126 thousand were electric vehicles (BEV and PHEV). The share of EVs in the production of individual facilities reached from around 9 % (Kia) up to 28 % (VW). A good trend is at least six new fully electric models from Kia, Stellantis, and VW that are being launched between 2025 and 2026. The

production of only EVs launched at the new Volvo production site from 2026 will build on this production.

Another transformation is ongoing at the suppliers' level, where several large 1st-tier suppliers (Schoeffler, ZF, Hyundai Mobis, ON Semiconductors, Delta Electronics, and others) announced the launch of various parts for EVs. The key new components thus cover the electric powertrain, control units, semiconductors, charging stations, etc. Especially important are the ongoing or announced investments into the battery value chain, such as battery cell manufacturing (Gotion-Inobat), battery pack assembly (Porsche Werkzeugbau, Webasto), battery cooling systems (Mubea Tailored Products, Unitech), battery management, and others.

SEVA is a certified cluster in the electromobility sector.

SEVA was founded in 2012 and nowadays represents its 70 members from technology companies, charging infrastructure operators, car importers, companies from the energy, logistics, finance and other sectors. We work for a healthy and fair business environment. We submit legislative proposals to ministries and state authorities. We educate the professional and general public. We support domestic innovation and engage in development **projects.**

SEVA transformed into a cluster **organisation in 2021 and has also passed the comprehensive ESCA (European Secretariat for Cluster Analysis) certification.**

In June 2024, SEVA was awarded the "Developed Cluster" in the National Evaluation of the Cluster Performance.

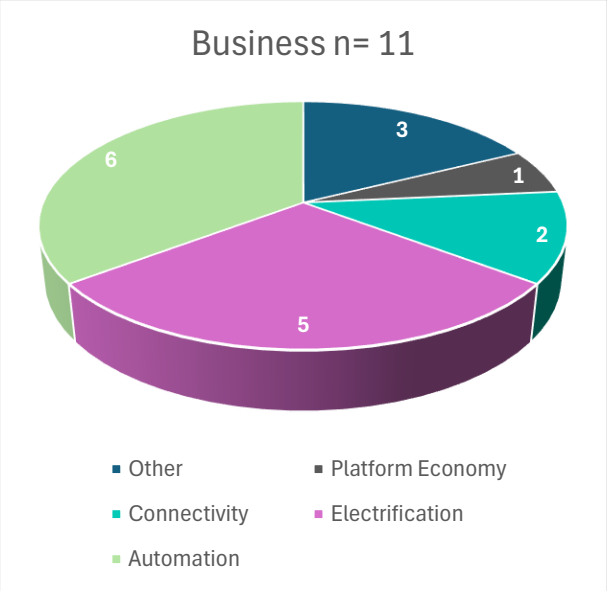
Inventory of companies and business support organisations (BSO) (Q1-8)

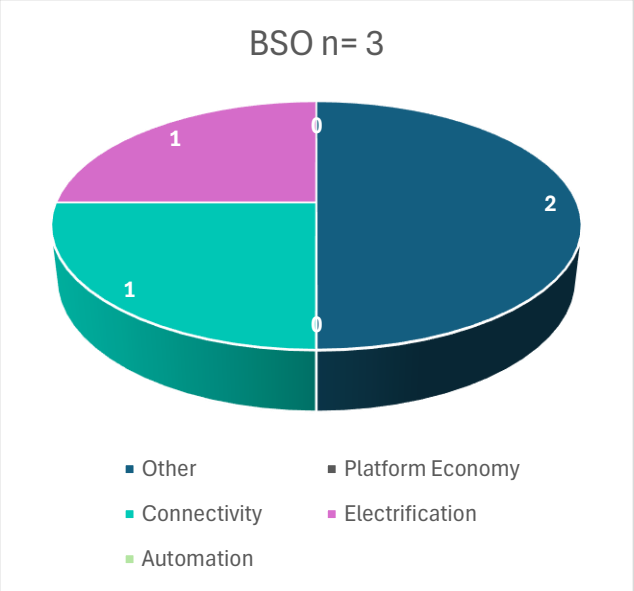
The companies and BSOs involved in the questionnaire are distributed mainly around automotive factories in the western and northern parts of Slovakia.

More than 70 % of the 11 companies surveyed are small and medium enterprises with 10 to 249 employees, and less than 30 % are large enterprises with up to 2,999 employees. Only one company employs more than 3,000 people. They generate revenues ranging from €2 million to over €100 million. Half of the companies have a significant focus on the automotive sector, with more than 80 % of their revenue coming from it.

The companies surveyed are primarily active in the fields of Automation (6 pcs) and Electrification (5 pcs). Only 2 companies are active in the field of Connectivity, and just one is in the Platform Economy.

The companies surveyed provide a wide range of services and products, from the production of components to
the automotive industry, through software and IT services to the manufacture of batteries and cells.





BSOs (3 pcs) involved in the survey are active mainly in consulting, legal advisory, and lobbying, which puts them in the field of Other (2 pcs). Only one is active in Electrification and Connectivity. However, all three are important and relevant players in the automotive industry—one is an association operating primarily in the field of automotive production, the second is the Slovak-German Chamber of Commerce and Industry, which represents multiple German economic organisations in Slovakia, and the last one associates with and represents 16 unions with more than 2,500 companies across the Slovak economy. Their feedback on transformation and changes in the automotive industry is very appropriate and necessary.

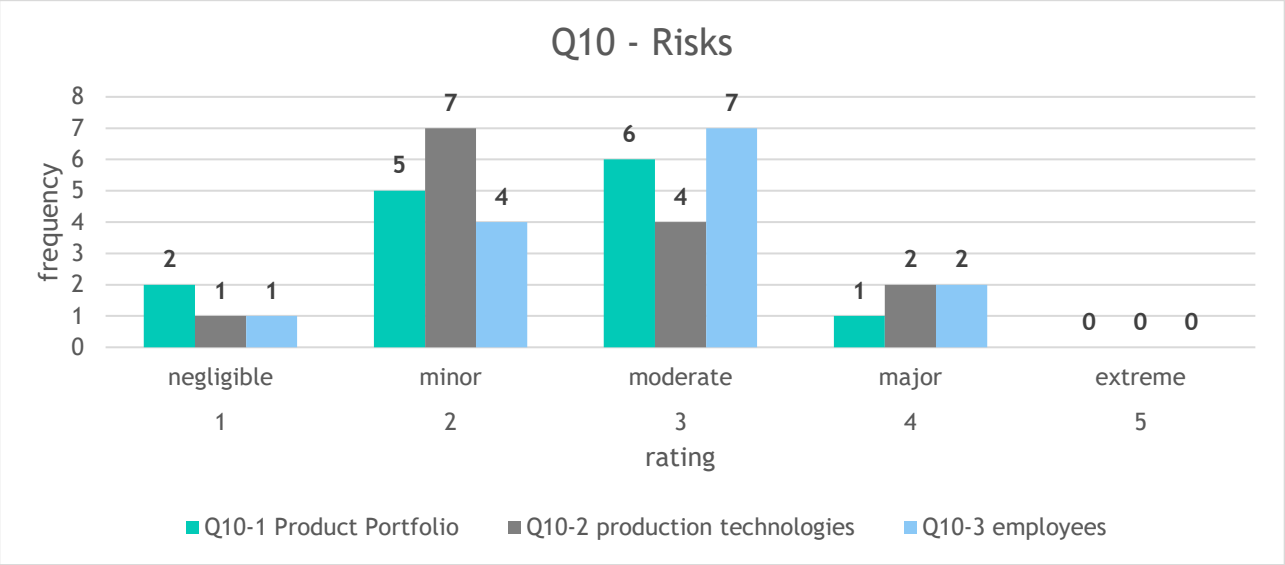
Transformation risks, pressure and readiness for business continuity in 2024-2030 (Q10-14)

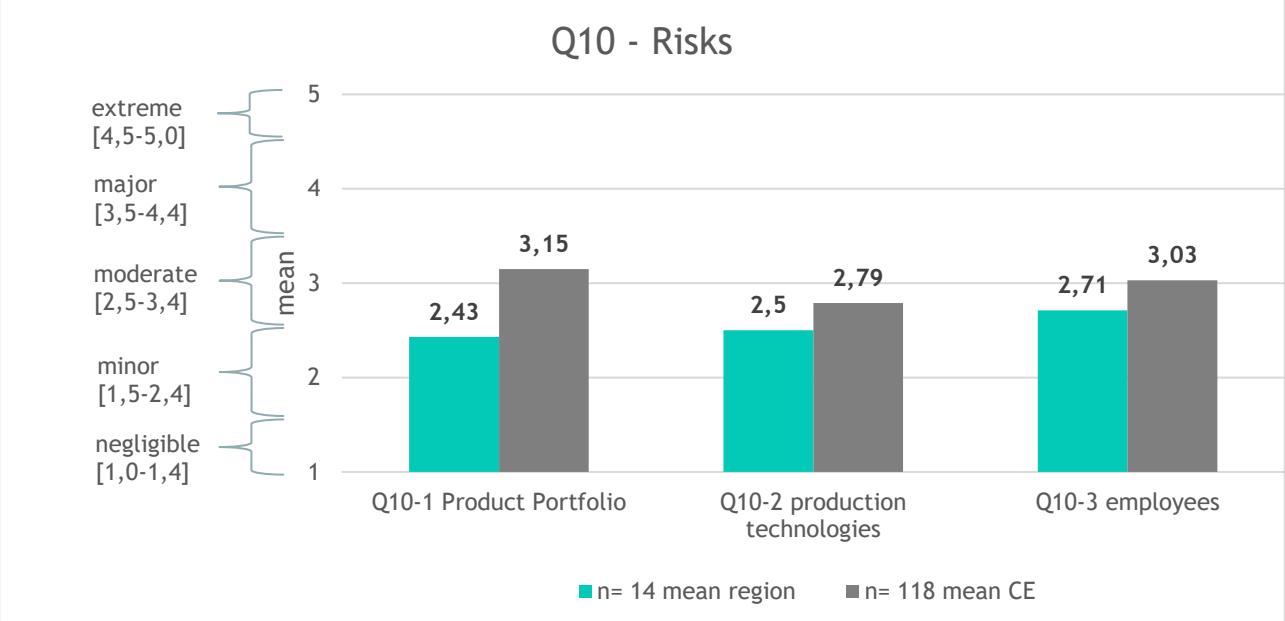
Risks endangering business continuity (Q10-11)

The risk for the product portfolio in the current business model is assessed as minor to moderate, a little lower than the European average. Responses from companies range from 1 (negligible risk) to 4 (major risk), with the majority at the minor (4 pcs) and moderate (4 pcs) levels. In the BSO sector, the risk is also assessed as moderate, rated between 1 and 3 (negligible to moderate).

The risk for production technologies in the current business model is assessed as minor to moderate according to companies that are in line with the European average. The BSO sector views it even less risky (minor risk - 2).

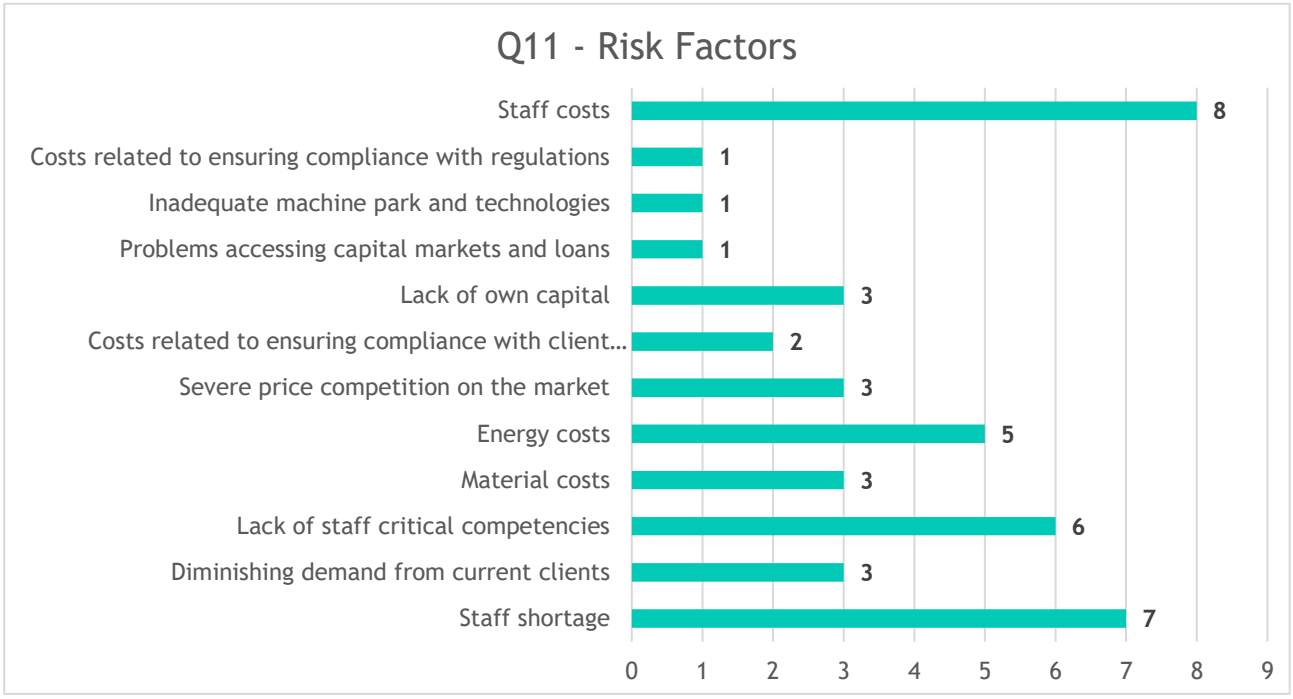
The risk related to the competencies currently possessed by employees is also assessed as minor to moderate, ranking from 1 to 4 in both target groups, companies, and BSOs.





As the main risk factors impacting companies' business continuity in the automotive sector in 2024-2030 were identified, Staff Costs (8 pcs), Staff Shortage (7 pcs), and Lack of Critical Competencies (6 pcs).

Companies and BSOs are aware that changes in the automotive industry towards electrification and automation will have a significant impact on the current workforce and their critical competencies. With EVs constituting 70 % fewer parts than ICE vehicles, robotisation, and Industry 4.0, the transformation of the automotive industry will affect the current workforce, creating distributional employment effects throughout regions and communities depending on car components and the company's willingness and ability to adapt.

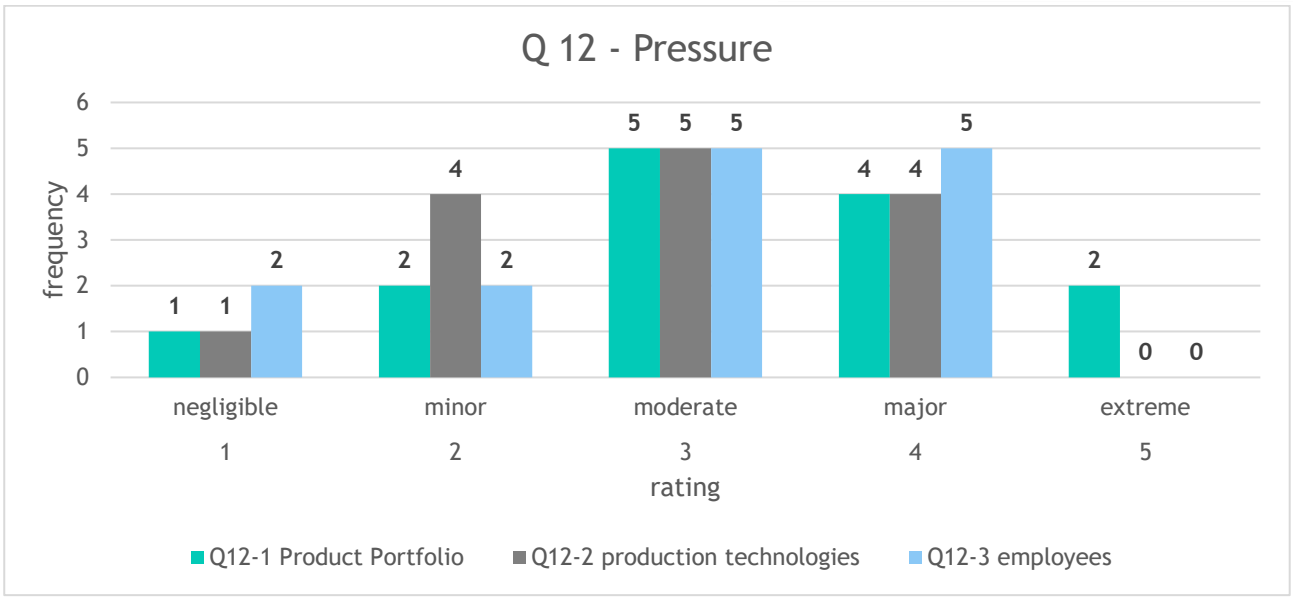


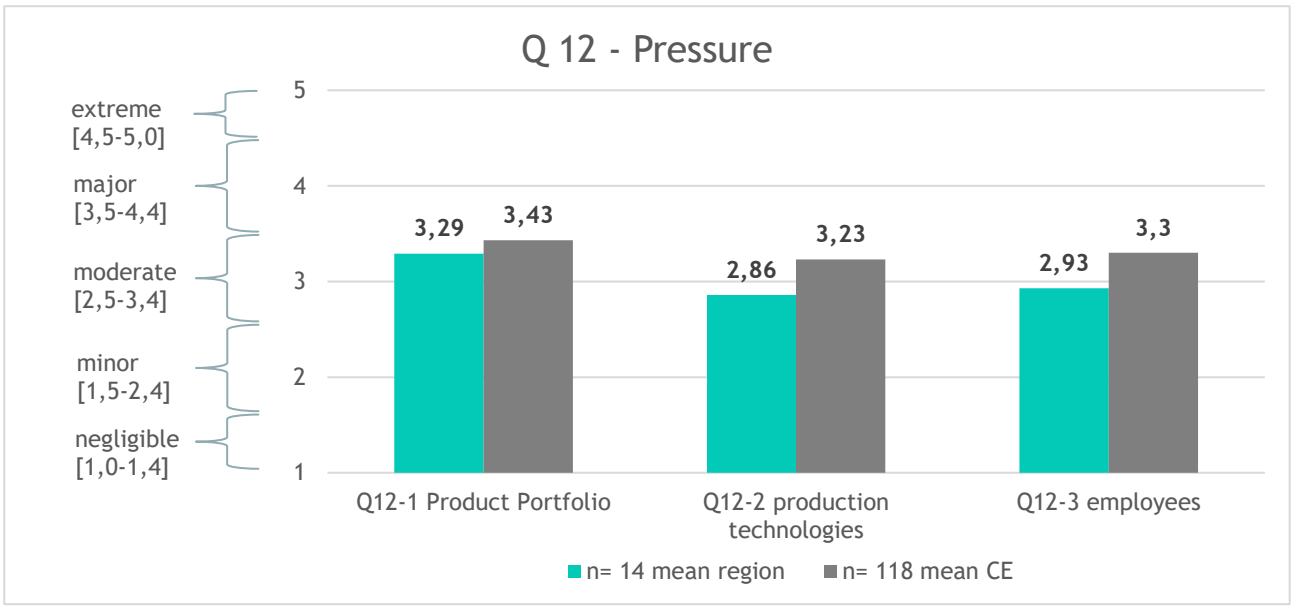
Pressure to change business for ensuring business continuity (Q12)

The pressure to provide change in the current product portfolio to ensure the entities ' business continuity is assessed as moderate in total (3.29); it is slightly lower than the European average. According to their observations, the BSOs feel this pressure more seriously, ranking it as a major level (4). Responses from companies range from 1 (negligible) to 5 (extreme), with the majority at the moderate (4 pcs) and major (3 pcs) levels.

The pressure to provide change in the current production technologies is assessed as rather moderate (2.86), which is lower than the European average.

The pressure to provide change in the currently possessed competencies among employees is also assessed as rather moderate (2.93), with most responses at the moderate (5 pcs) and major (5 pcs) levels.

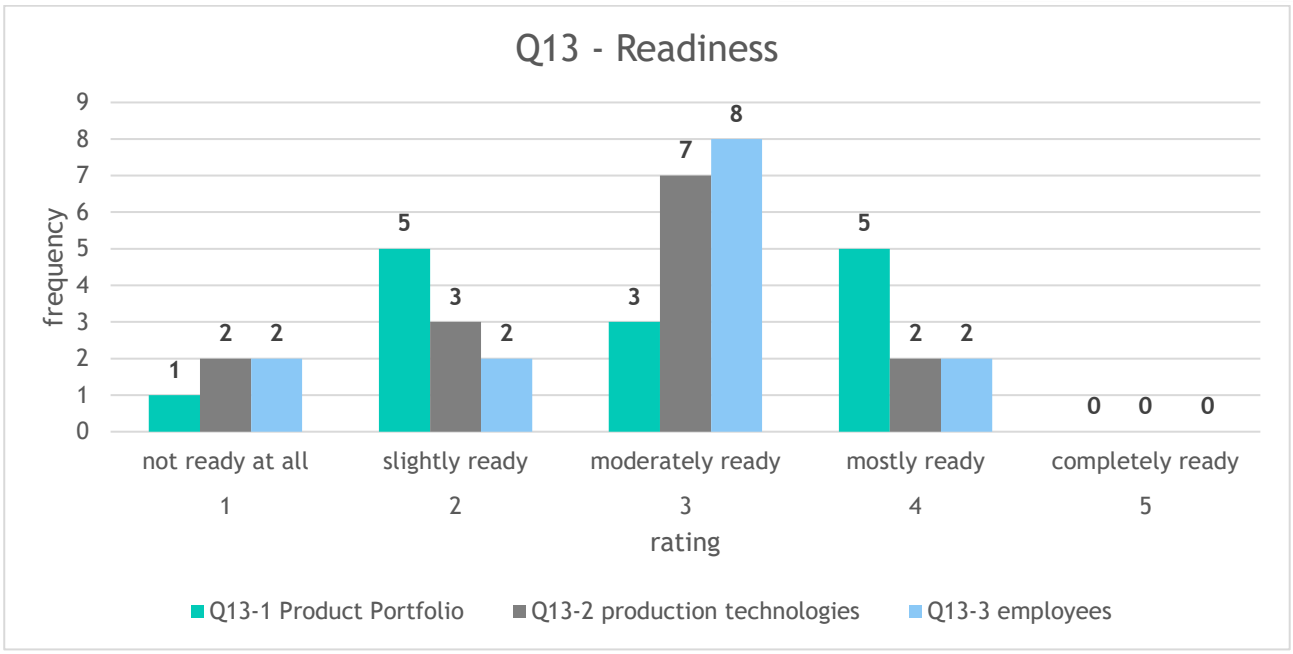


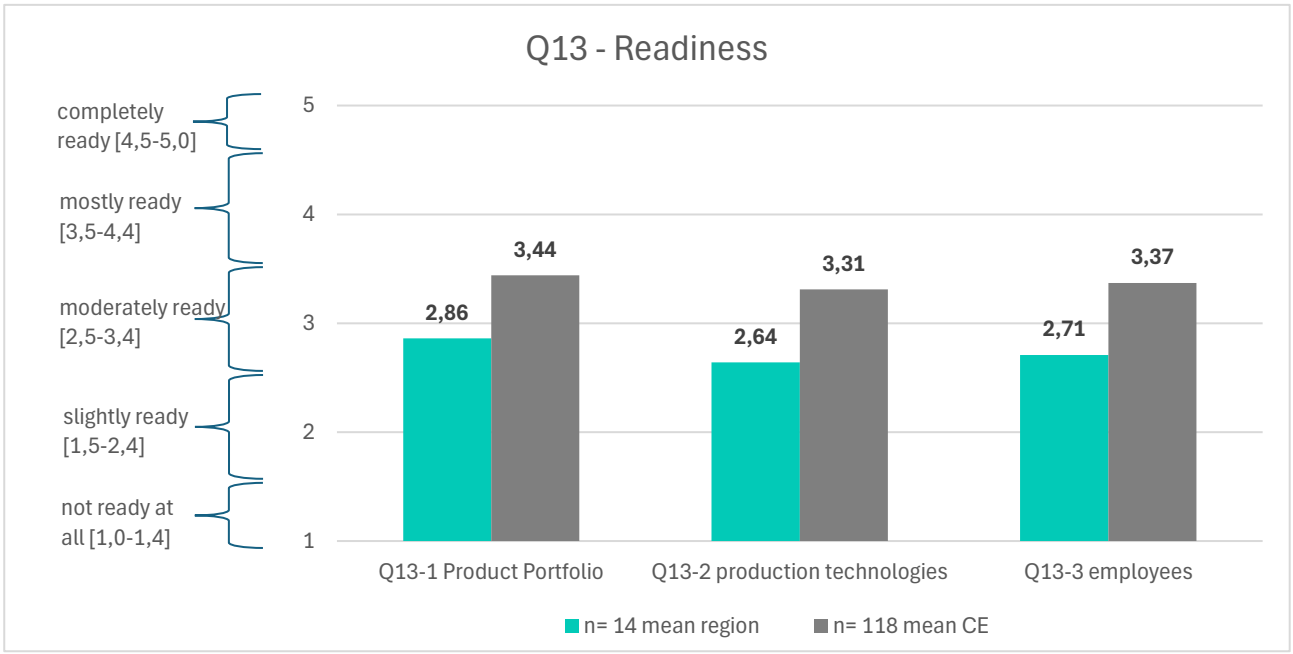


Readiness to change business for ensuring business continuity (Q13)

The overall readiness of the Slovak automotive sector to provide change in the short term, according to the responses of the companies and BSOs involved in the questionnaire, is below the European average.

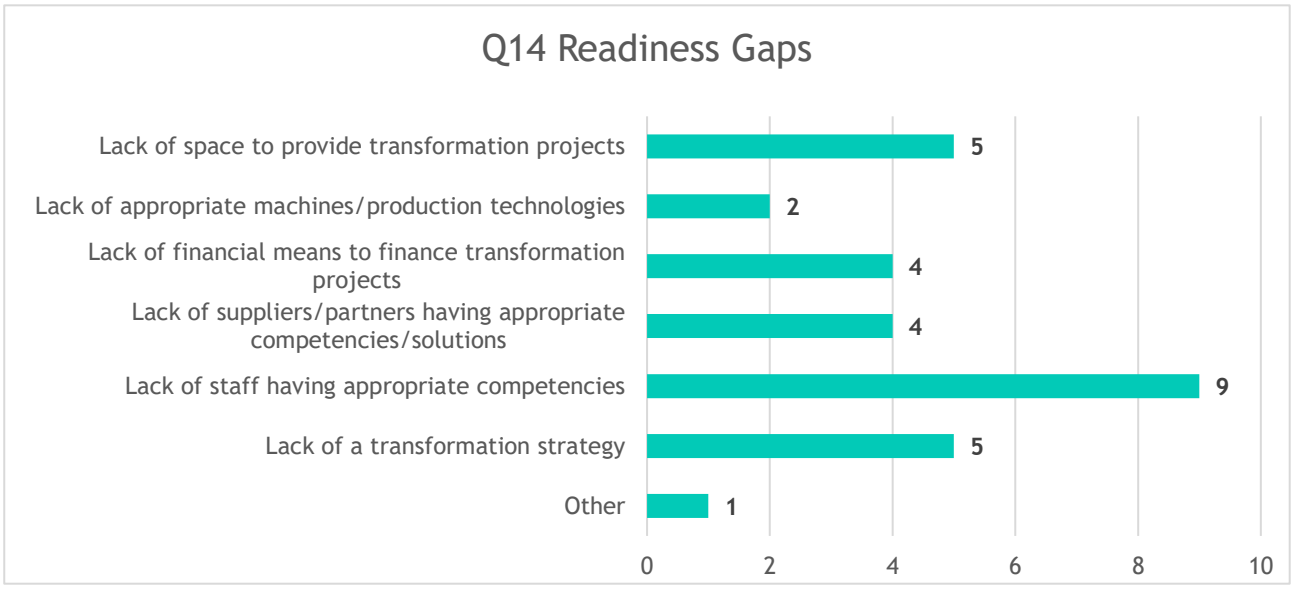
It implies that the Slovak automotive sector is rather moderately ready for the upcoming changes in all three indicators: current product portfolio, current production technologies, and currently possessed competencies among employees. Although some of the companies are mostly ready (5 pcs) for the change in their current product portfolio, and some are moderately ready (8 pcs) for the change in the competencies possessed among employees.





Main readiness gaps hindering businesses from starting a transformation process (Q14)

As the main readiness gaps hindering the entities from starting a transformation process were assessed, a lack of staff with appropriate competencies (9 pcs), a lack of a transformation strategy (5 pcs), and a lack of space to provide transformation (5 pcs) were identified.



According to the answers, the Slovak automotive sector is moderately ready for the upcoming changes in all three indicators: current product portfolio, current production technologies, and currently possessed competencies among employees.

However, the Slovak companies and BSOs involved in the questionnaire consider the risk to the product portfolio in the current business model as minor to moderate, the risk to production technologies in the current business model as moderate, and the risk related to the currently possessed competencies among employees as only moderate. All three indicators are below the European average.

Also, the pressure to provide changes in the current product portfolio to ensure the entities' business continuity is assessed as moderate, even though the BSOs feel it more serious. The pressure to provide changes in the current production technologies is assessed as rather moderate, as is the pressure to provide changes in the currently possessed competencies among employees. Again, all three indicators are below the European average.

The results for the risk and pressure assessment seem not to be in line with the results for the overall readiness of the sector. One would expect that if the companies and BSOs feel that they are just moderately ready for the transformation, they would feel at least a major level of risk and pressure for the change in their current product portfolio, production technologies, and current competencies of the staff.

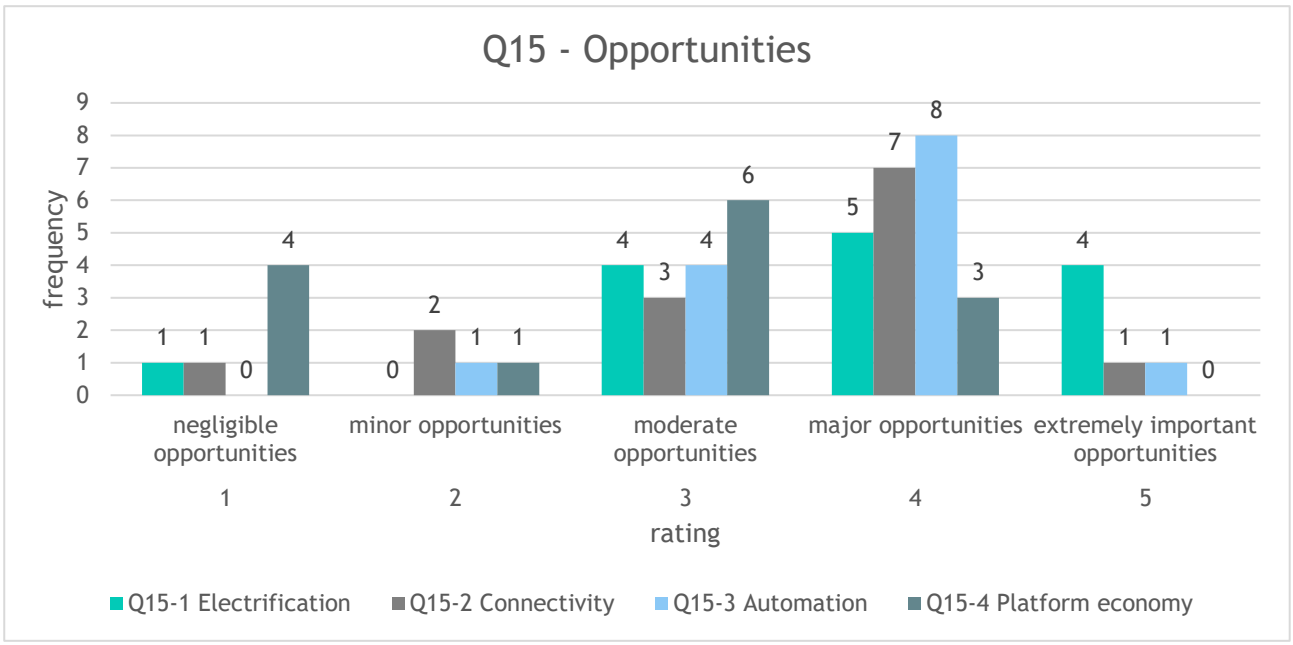
Transformation opportunities and strategic approaches to ensure business continuity in 2024-2030 (Q15-17)

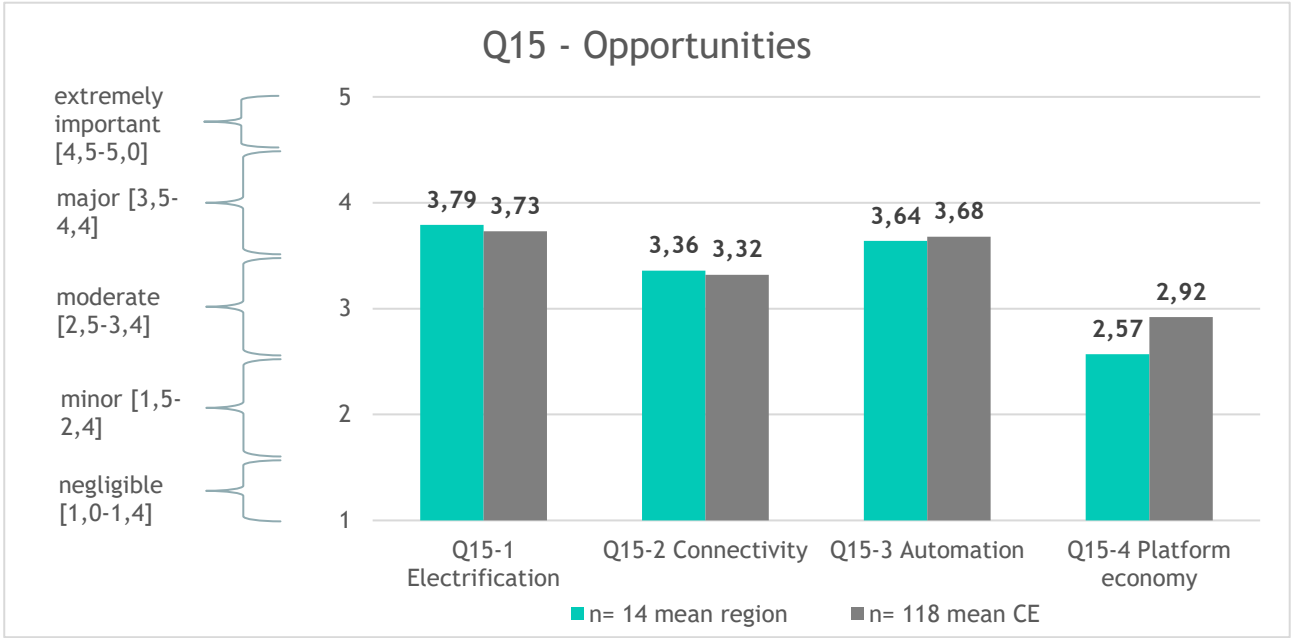
Opportunities to ensure business continuity (Q15)

Both, companies and BSOs involved in the survey see the biggest potential and opportunities of the Slovak automotive sector in the field of Electromobility and Connectivity, in both cases slightly above the European average.

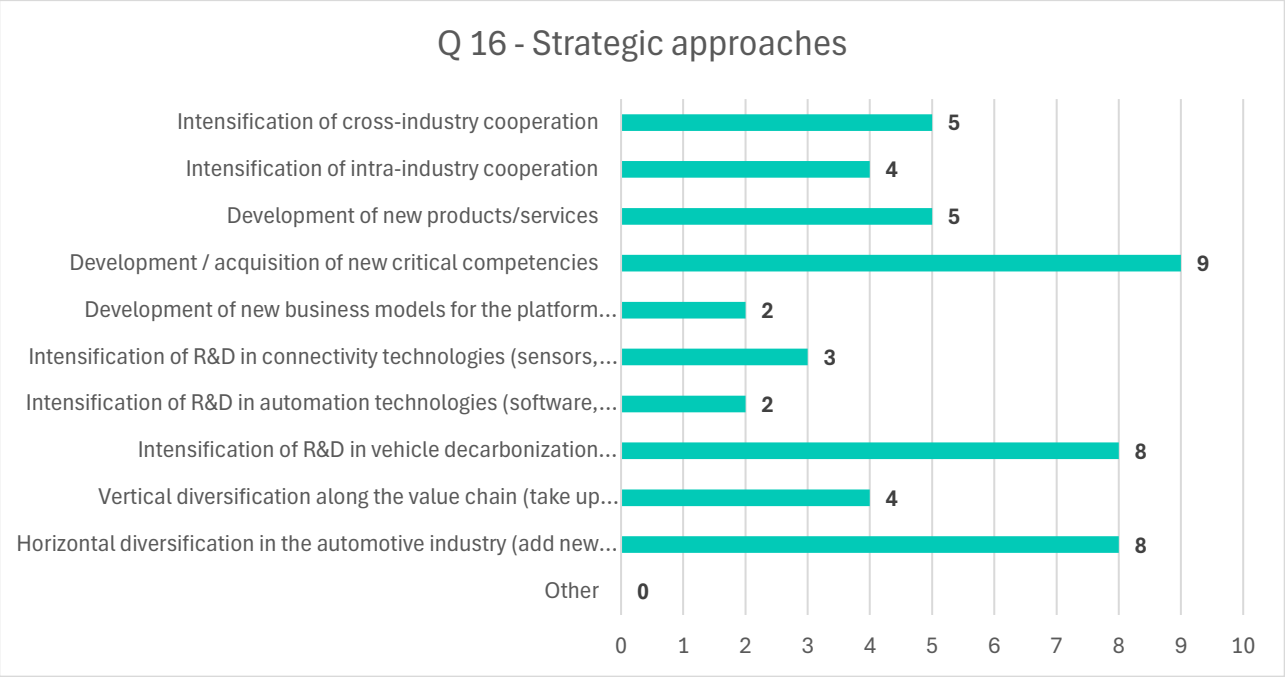
Automation as an opportunity for the Slovak automotive industry is in line with the European average.

As for the Platform Economy, it is slightly below the European average; however, BSOs (3.3) believe in the Platform Economy opportunity more than companies (2.4).


Q15 - Opportunities
frequency
9
8
7
6
5
4
3
2
1
0
1 1 0 4
0 2 1 1
4 3 4 6
5 7 8 3
4 1 1 0
negligible opportunities
minor opportunities
moderate opportunities
major opportunities
extremely important opportunities
1
2
3
4
5
rating
Q15-1 Electrification
Q15-2 Connectivity
Q15-3 Automation
Q15-4 Platform economy


Q15 - Opportunities
extremely important [4,5-5,0]
major [3,5-4,4]
moderate [2,5-3,4]
minor [1,5-2,4]
negligible [1,0-1,4]
5
4
3
2
1
3,79 3,73
3,36 3,32
3,64 3,68
2,57 2,92
Q15-1 Electrification
Q15-2 Connectivity
Q15-3 Automation
Q15-4 Platform economy
n= 14 mean region
n= 118 mean CE

Strategic approaches to seize opportunities (Q16)



Both, companies and BSOs agreed that the most important strategic approach to ensure the entities´ business continuity in the automotive sector in 2024-2030 is "Development / acquisition of new critical competences" which is also in line with the biggest Readiness Gap (Q14) "Lack of staff having appropriate competences".

The 2nd one is "Horizontal diversification" meaning adding new products or services related to existing ones but appealing the different clients or segments. It seems to be in line with the Q12 and Q13 – risks and pressure, where the companies do not feel so much pressure to change the current product portfolio, just to complement it with the news ones.

And the 3rd most important is "Intensification of R&D in vehicle decarbonisation technologies" which is in line with one of the biggest opportunities they see – Electrification.

Technology and skills gaps (Q17)

Skills gaps:	▪ Lack of experience in project work from school environment among graduates. ▪ Lack of Big Picture insight among graduates. ▪ Lack of industry-academia linkage
Technology gaps:	▪ New technology implementation for product using in electric vehicles and other vehicles in automotive.

As the skills gaps identified by the companies and BSOs involved in the survey mainly lack competencies among the staff and result from the failure of the school system in preparation, as well as the missing linkage between industry and academia/schools.

As for the technology gaps, they would need to implement new technologies towards electrification in the automotive industry. Companies see growth potential in electrification and connectivity but require stronger support in education and industry-academia linkage.

Regional resources and business support ecosystem (Q18-22, 26-27)

Factors to play a role in automotive in 2024-2030 (Q18-22)

Electrification (Q18)

In the area of electrification, we are examining which questions are, on average, rated low, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

- Government policies – regulations supporting EV market uptake
- Transportation networks and logistics infrastructure for materials and finished goods to facilitate timely and cost-effective delivery.
- Availability of a skilled workforce.
- Availability of specialised education at both technical school and university levels.
- Availability of specialised training facilities to upskill/reskill employees.
- Availability of research institutions and technology parks.
- Availability of an ecosystem of specialised technology companies.
- Access to specialised companies supporting waste reduction, energy efficiency, and carbon footprint reduction.

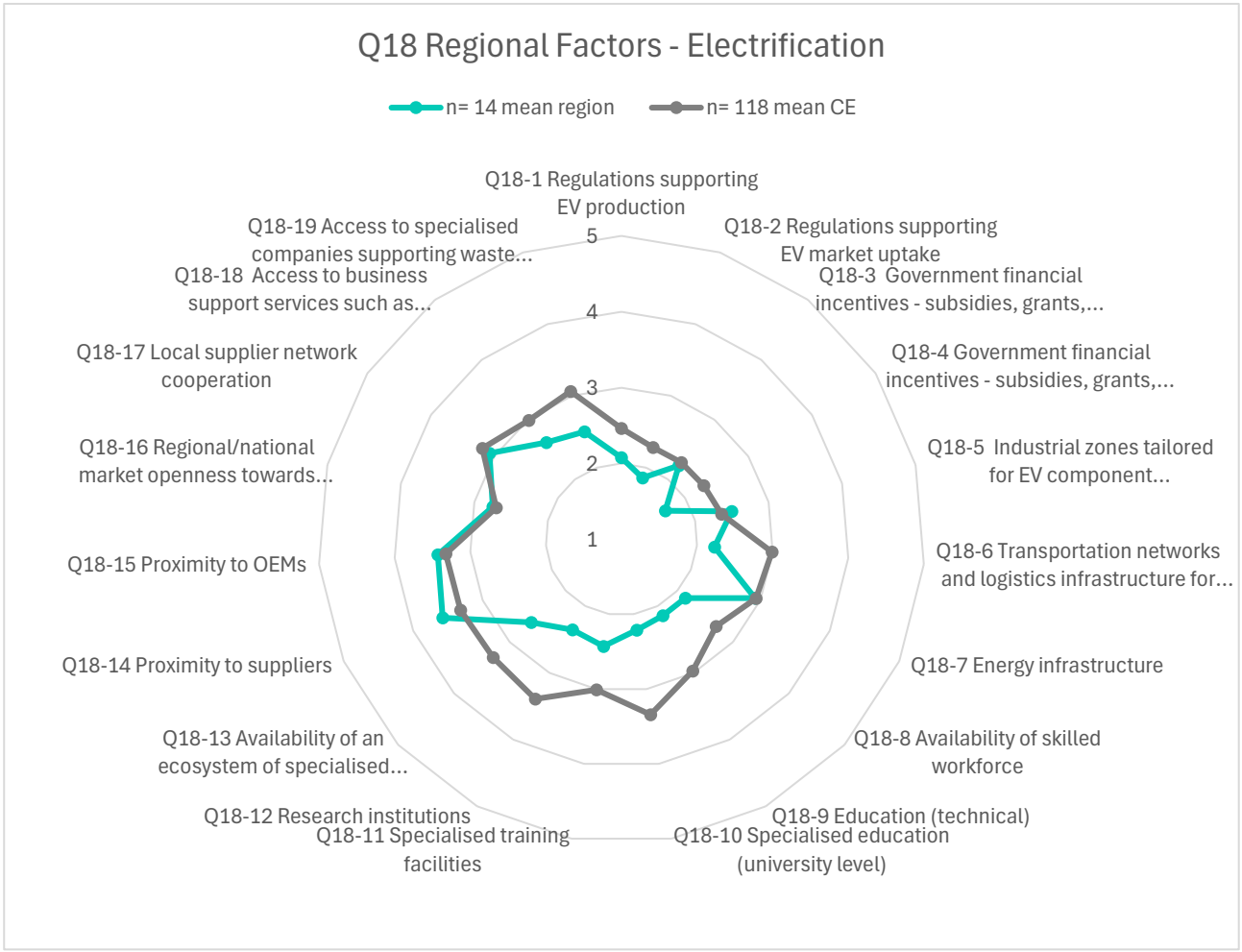
Areas for improvement in electrification mainly include government policies and financial incentives supporting EV market uptake, along with reducing regulations and bureaucracy.

Education, the school system, employee upskilling and reskilling, and availability are essential for Slovakia to improve its role in the automotive sector from 2024 to 2030 in the thematic area of electrification. Additionally, transportation networks and logistics infrastructure for materials and finished goods are necessary to facilitate timely and cost-effective delivery to support EV production.

Regional/national market openness toward EVs needs further enhancement, as internal combustion engines remain the first choice for many, partly due to public and political debates.

Access to business support services such as financial consulting, legal advice, and market intelligence tailored for EV component suppliers, local supplier network cooperation, and energy infrastructure are rated as satisfactory and seem to be in good condition in Slovakia, in line with the European average.

On the other hand, industrial zones tailored for EV component manufacturing and proximity to suppliers and OEMs are the factors evaluated the highest, even better compared to the European average. The reason should be that Slovakia is a small country, and the suppliers are located mainly around production plants.



Automation (Q19)

In the area of automation, we are examining which questions are, on average, rated low, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

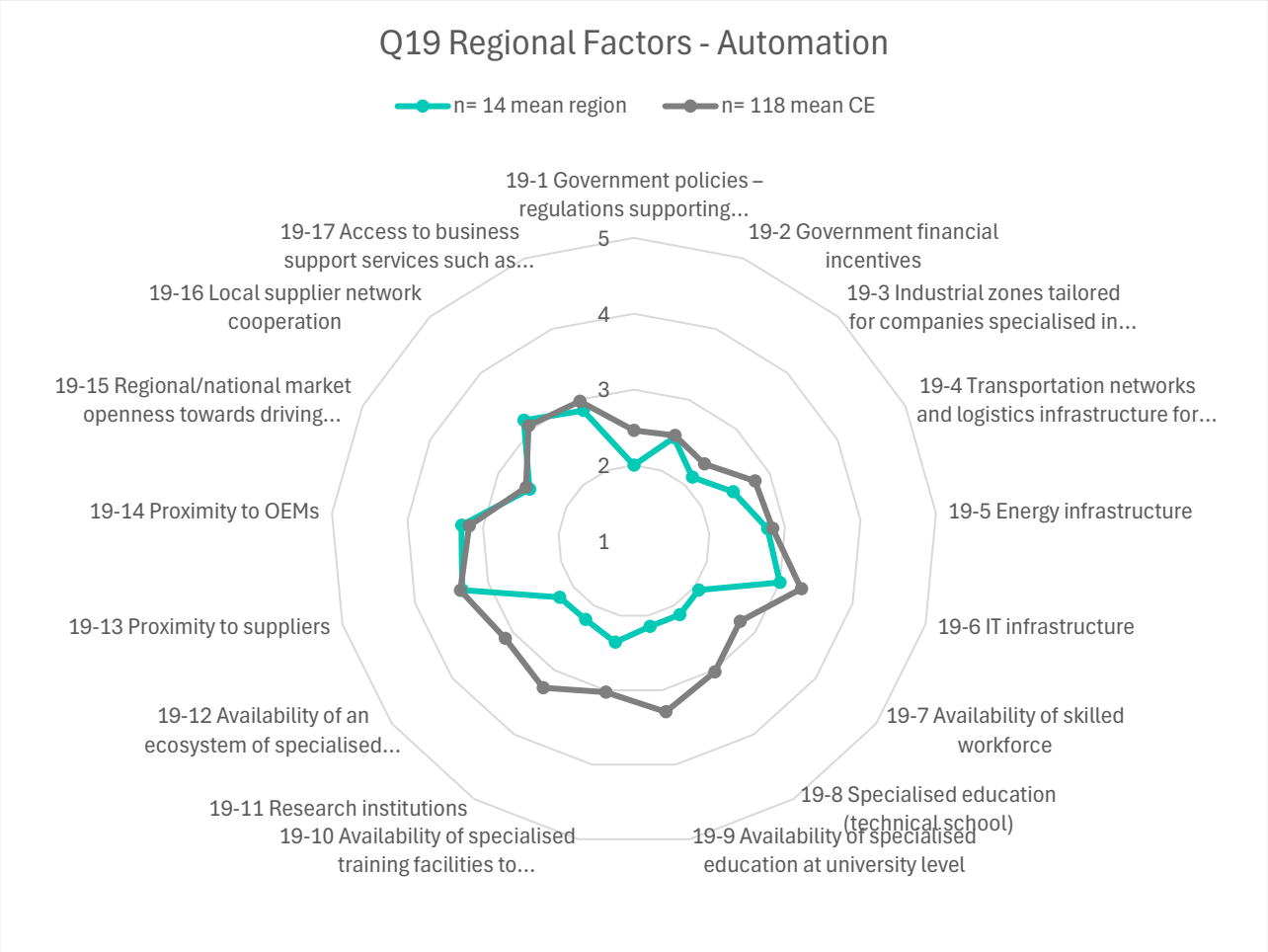
- Government policies – regulations supporting the production of automation technologies
- Government financial incentives - subsidies, grants, and tax breaks for production companies
- Industrial zones tailored for companies specializing in vehicle automation solutions
- Availability of a skilled workforce
- Availability of specialised education at technical schools and university level
- Availability of specialised training facilities to upskill/reskill employees
- Availability of research institutions and technology parks
- Availability of an ecosystem of specialised technology companies

Like the electrification, areas for improvement in automation include mainly government policies supporting automation technologies production and government financial incentives—subsidies, grants, and tax breaks for production companies.

Maybe the most important area to improve is education, the school system, employee upskilling and reskilling, and the availability of staff. It is a must for Slovakia to play a role in the automotive sector in 2024-2030 in the thematic area of automation as well.

Transportation networks and logistics infrastructure for materials and finished goods facilitate timely and cost-effective delivery. Energy and IT infrastructure seem to be satisfactory in terms of automation.

On the other hand, regional/national market openness toward driving autonomous vehicles, local supplier network cooperation, proximity to suppliers and OEMs, and access to business support services such as financial consulting, legal advice, and market intelligence tailored for companies specialised in vehicle automation solutions are rated the highest among the companies and BSOs as well.



Connectivity (Q20)

In the area of connectivity, we are examining which questions are, on average, rated low, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

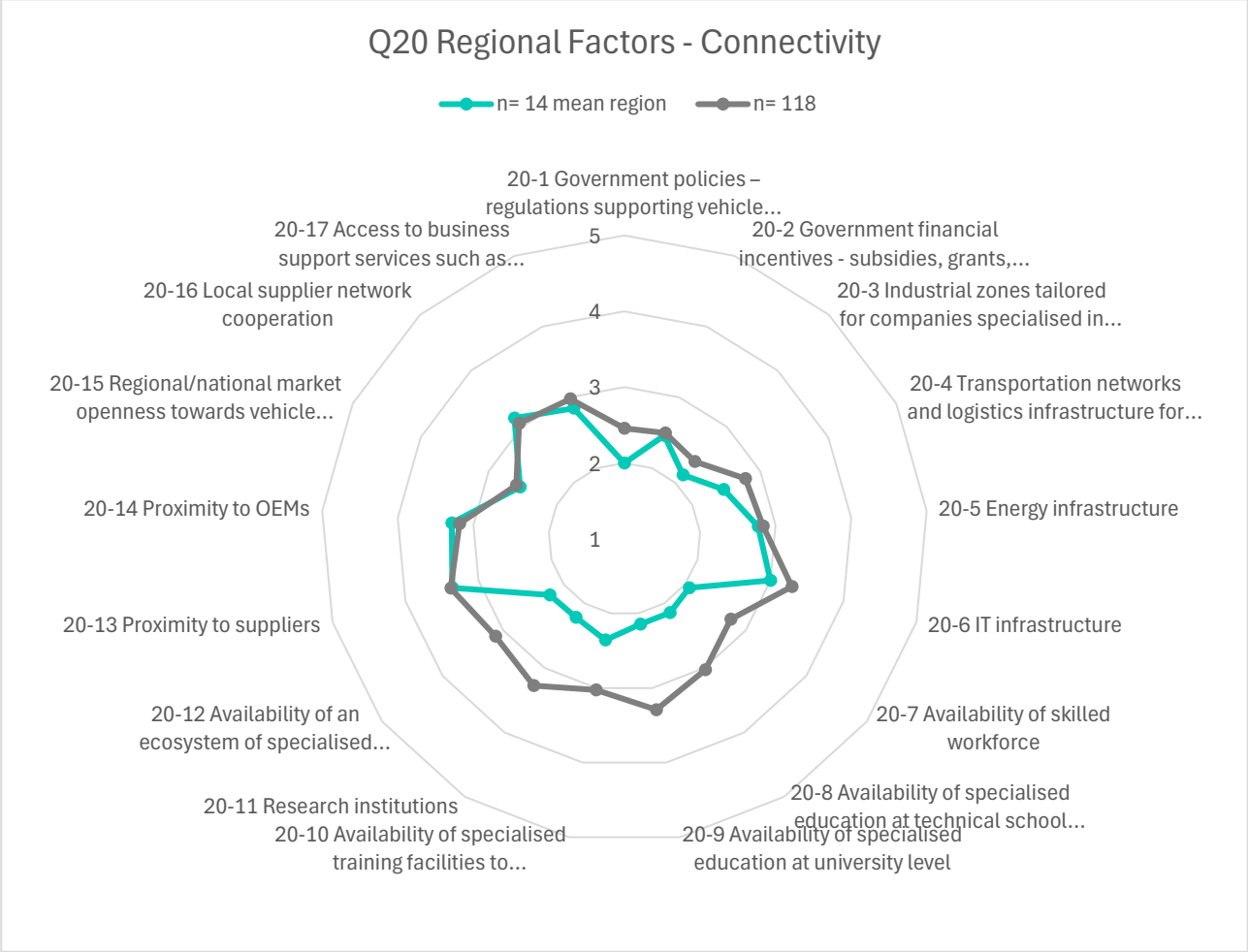
1. Government policies – regulations supporting vehicle connectivity, smart cities, data exchange, and cybersecurity
2. Government financial incentives - subsidies, grants, and tax breaks for production companies
3. Availability of a skilled workforce
4. Availability of specialised education at technical schools and university levels
5. Availability of specialised training facilities to upskill/reskill employees
6. Availability of an ecosystem of specialised technology companies

Similar to Electrification and Automation, enhancing Connectivity primarily involves improving Government policies. This includes establishing regulations that promote vehicle connectivity, smart cities, data exchange, and cybersecurity, along with providing financial incentives such as subsidies, grants, and tax breaks for manufacturing companies.

The other most important areas to improve are education, the school system, employee upskilling and reskilling, and staff availability. Slovakia must also play a role in automotive in 2024-2030 in the thematic area of Connectivity.

Industrial zones tailored for companies specialised in vehicle connectivity solutions, Transportation networks and logistics infrastructure for materials and finished goods to facilitate timely and cost-effective delivery, the Availability of research institutions and technology parks, Regional/national market openness towards vehicle connectivity, data-sharing, Local supplier network cooperation, and Access to business support services such as financial consulting, legal advice, and market intelligence tailored for companies specialised in vehicle connectivity solutions seem to be satisfactory in terms of Connectivity.

On the other hand, Energy and IT infrastructure and Proximity to suppliers and OEMs are rated the highest among companies and BSOs.



Platform Economy (Q21)

In the area of the Platform Economy, we are examining which questions are, on average, rated low, specifically in the 1 and 2 range (poor and unsatisfactory). Notable areas with multiple mentions in the poor and unsatisfactory categories include:

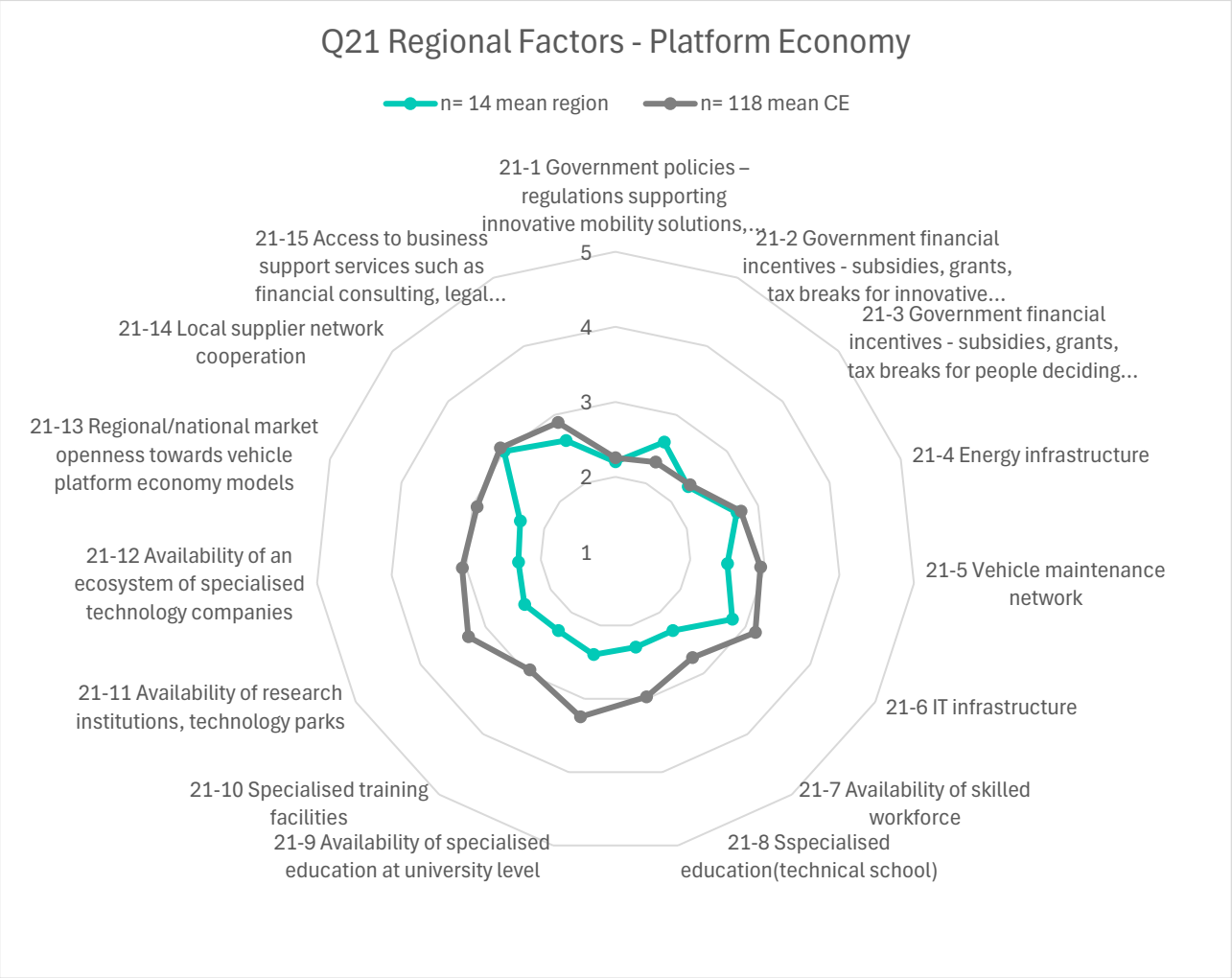
- Government policies – regulations supporting innovative mobility solutions and vehicle platform economy models
- Government financial incentives - subsidies, grants, and tax breaks for innovative mobility solutions and platform economy initiatives
- Government financial incentives - subsidies, grants, and tax breaks for people choosing to participate in vehicle sharing
- Availability of a skilled workforce
- Availability of specialised education at technical school and university levels
- Availability of specialised training facilities to upskill/reskill employees
- Availability of an ecosystem of specialised technology companies

Like all three above-mentioned fields, areas for improvement in the Platform Economy include mainly Government policies—regulations supporting innovative mobility solutions, vehicle platform economy models, and Government financial incentives—subsidies, grants, and tax breaks for innovative mobility solutions, platform economy initiatives, and subsidies, grants, and tax breaks for people deciding to participate in vehicle sharing.

But still, maybe the most important area to improve is education, the school system, employee upskilling and reskilling, and staff availability. Slovakia must also play a role in automotive in 2024-2030 in the thematic area of Platform Economy.

The availability of research institutions and technology parks, Regional/national market openness towards vehicle platform economy models, and Access to business support services such as financial consulting, legal advice, and market intelligence tailored for companies specialised in vehicle platform economy models seem to be satisfactory in terms of Platform Economy.

On the other hand, Local supplier network cooperation, Vehicle maintenance networks, and Energy and IT infrastructure are rated the highest among companies and BSOs.



Additional factors influencing the regional competitiveness (Q22)

Support the new technology and new types of equipment related to electric OEMs

To enhance Slovakia's competitiveness in the automotive sector, it is crucial to update educational programme

s and vocational training to focus on digital technologies, data analytics, and platform economy models. Strengthening collaboration between OEMs, suppliers, and tech companies will help create an integrated and innovative ecosystem. Additionally, increasing public awareness and acceptance of vehicle sharing and other platform-based services through targeted campaigns and incentives is essential. The government should increase policy support and funding for research and development in areas such as automation, connectivity, and electrification to support these initiatives. Furthermore, we recommend connecting to internationally reaching initiatives such as the Industry 4.0 platform in Germany. Finally, creating a comprehensive long-term strategy for the automotive sector, with clear goals and actions, will ensure that Slovakia maintains its competitiveness through 2030 and beyond.

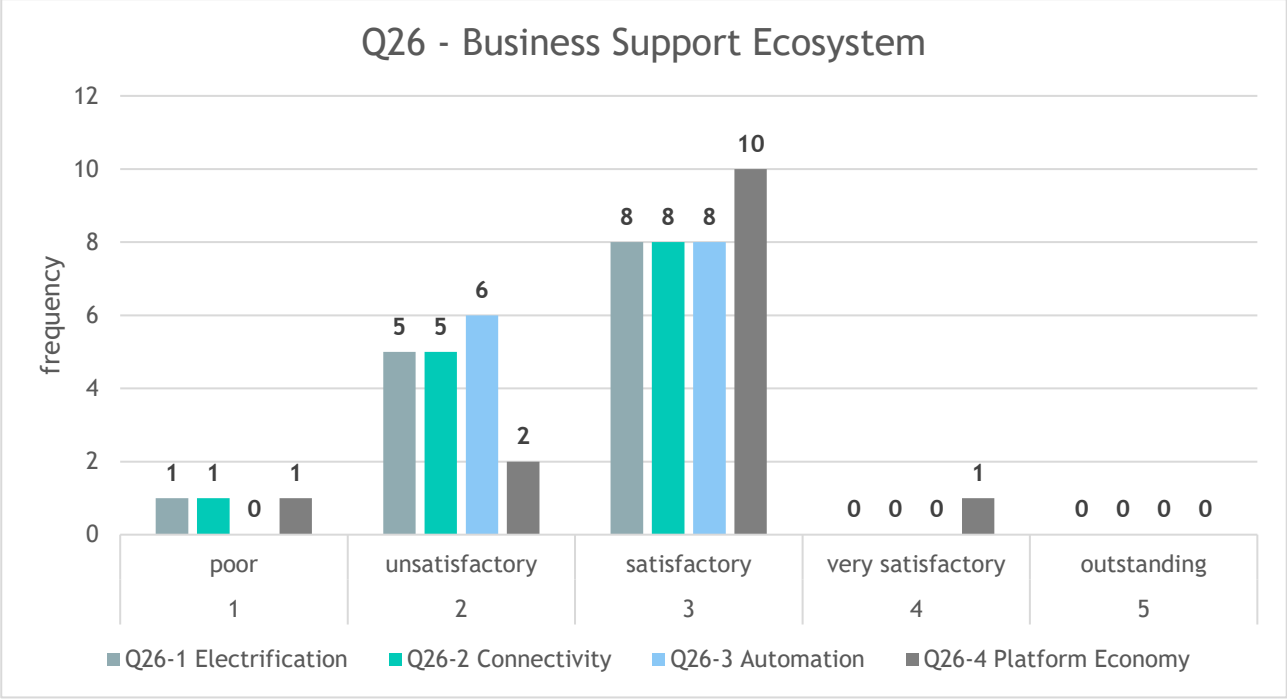
R&D support and advisory across the full cycle - from business start-up through grants and available challenges to transformation.

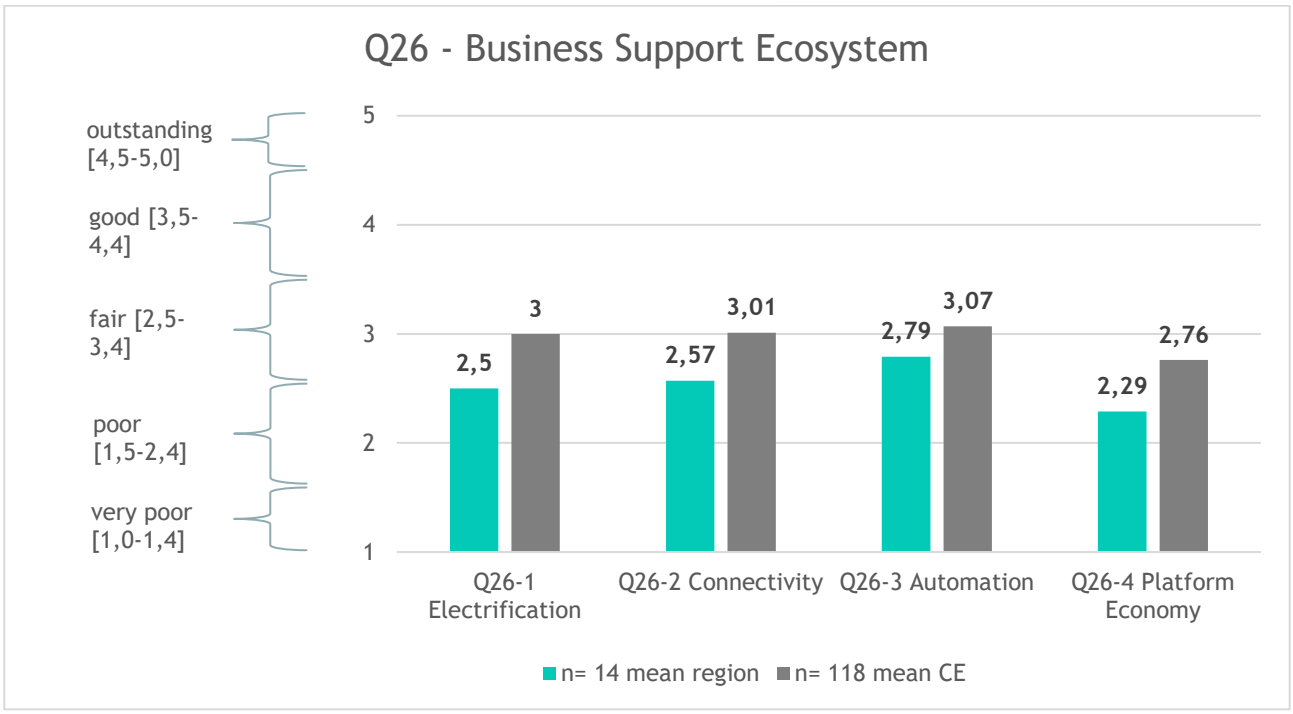
Enhance the motorway network in Slovakia to the North and East.

Business support services (Q26-27)

The support ecosystem's service is rated as satisfactory across all four thematic areas, with slight variations. It scores lowest in the Platform Economy. The companies surveyed are primarily active in Automation (6 pcs) and Electrification (5 pcs). Only two companies are active in Connectivity, and just one in Platform Economy.

A call for dedicated local support services to aid companies in transformation efforts indicates a gap in regional resources and initiatives focused on business continuity and transformation readiness for the automotive sector between 2024 and 2030.





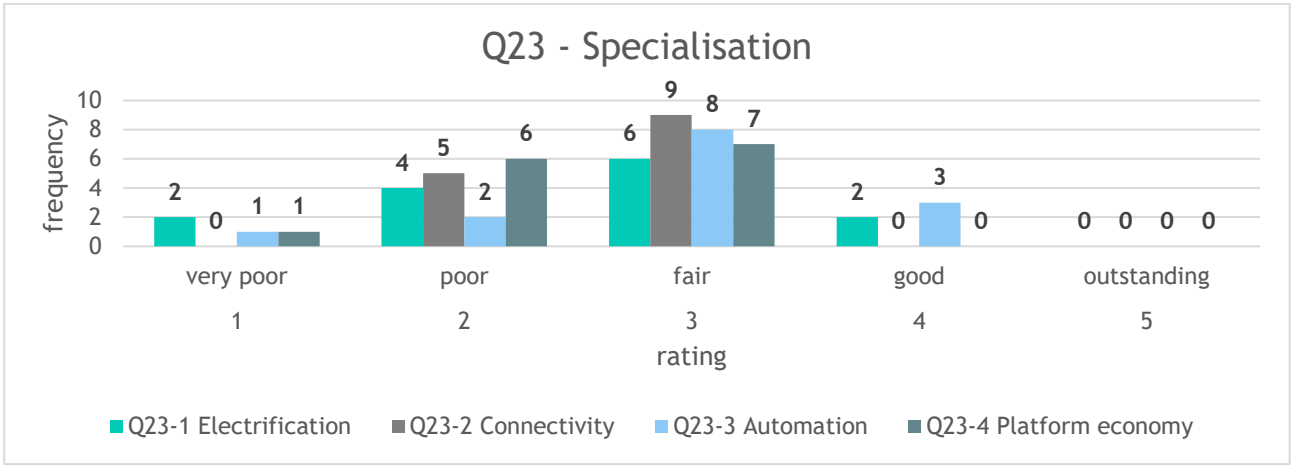
Specialisation level and development perspectives (Q23-25)

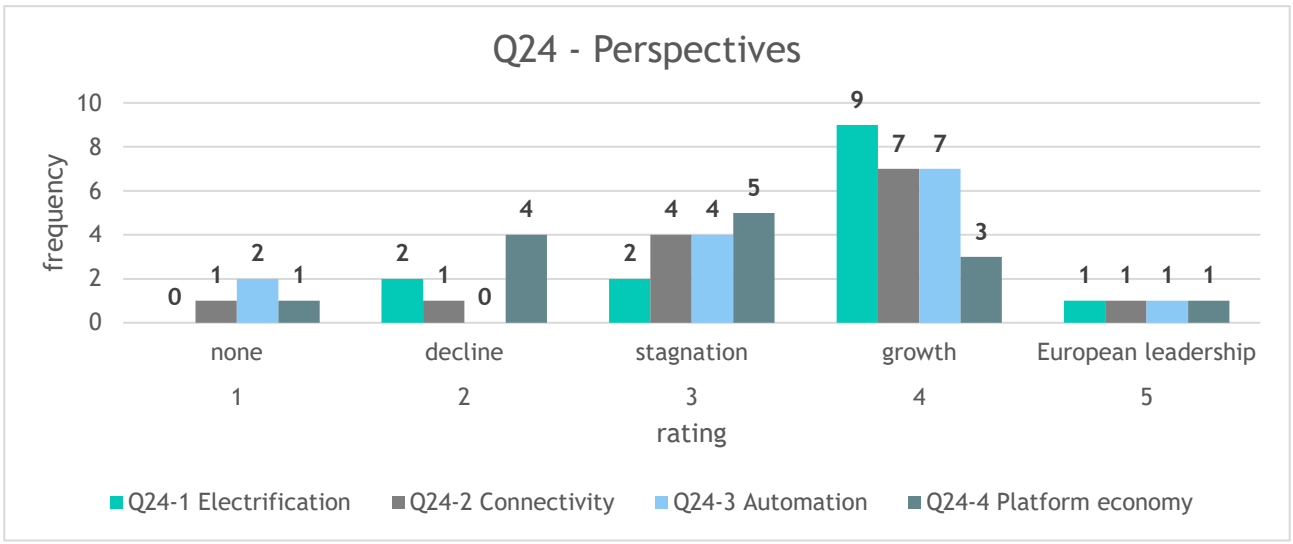
Specialisation
Companies and BSOs involved in the survey tend to see the current specialisation of Slovakia in Automation, Connectivity and Electrification as fair while in Platform Economy they tend to poor rather than fair.

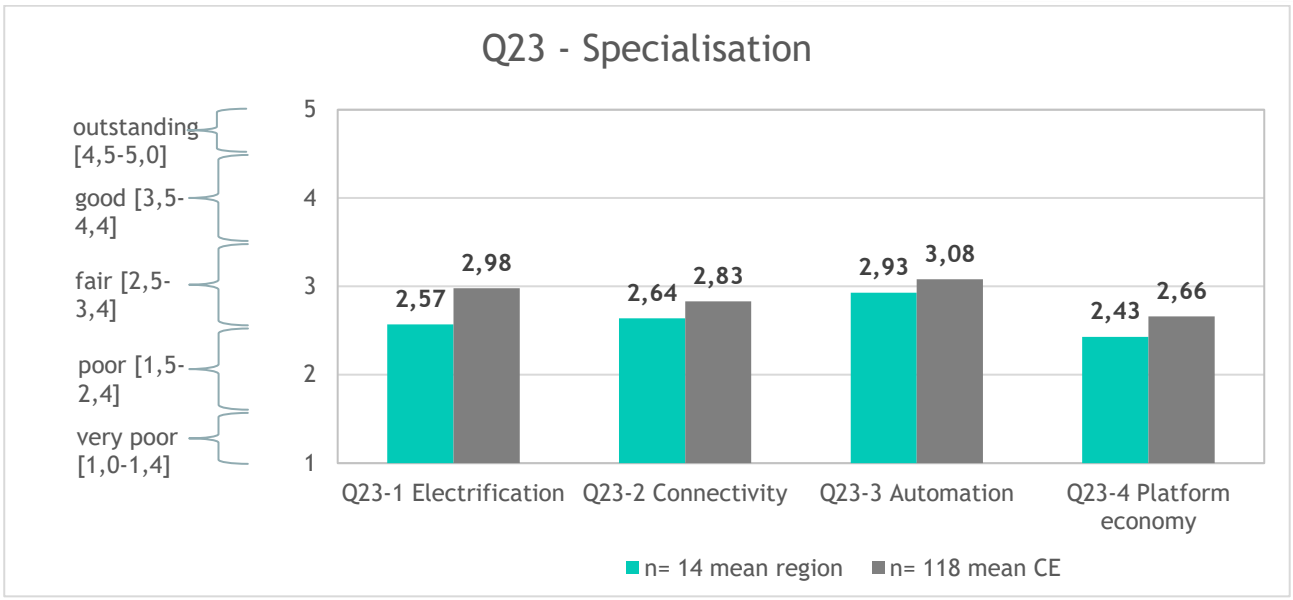
Perspectives
When asking for the observed overall reaction of automotive companies to the ongoing changes in the European automotive sector from 2024 to 2030, all the monitored areas of Electrification, Connectivity, Automation, and Platform Economy in Slovakia are expected to grow.

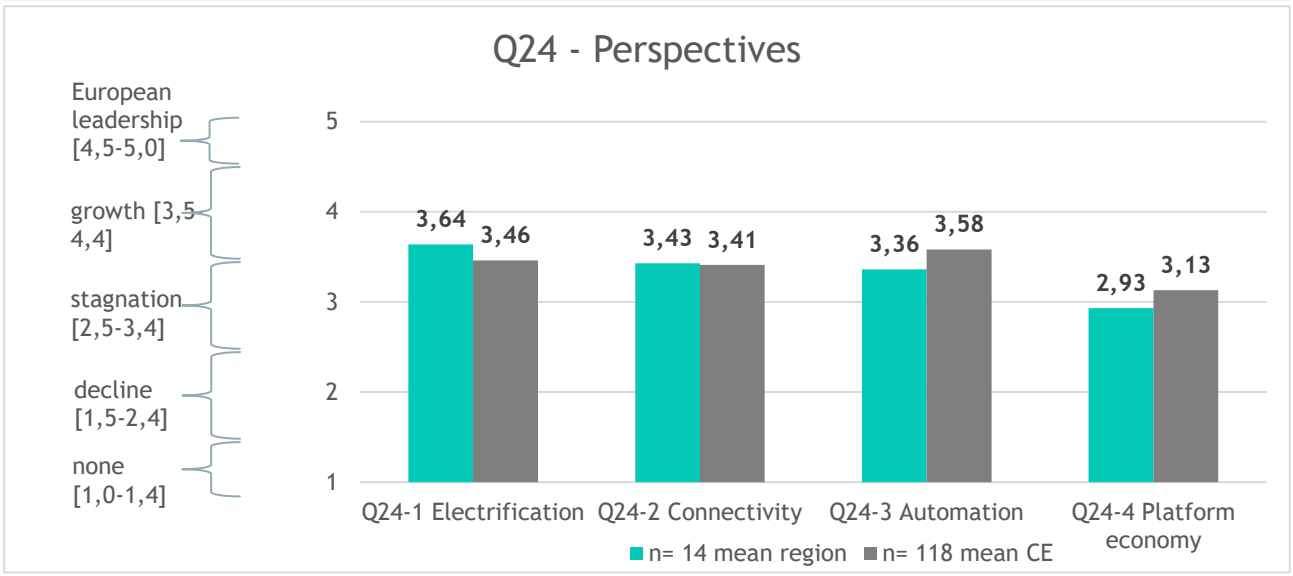
Growth is expected to exceed the European average in the fields of electrification and connectivity, while the Automation and Platform Economy fields tend to be slightly below the European average.

The companies and BSOs involved in the survey see Electrification as the clear driving force behind the changes in the automotive industry in Slovakia.

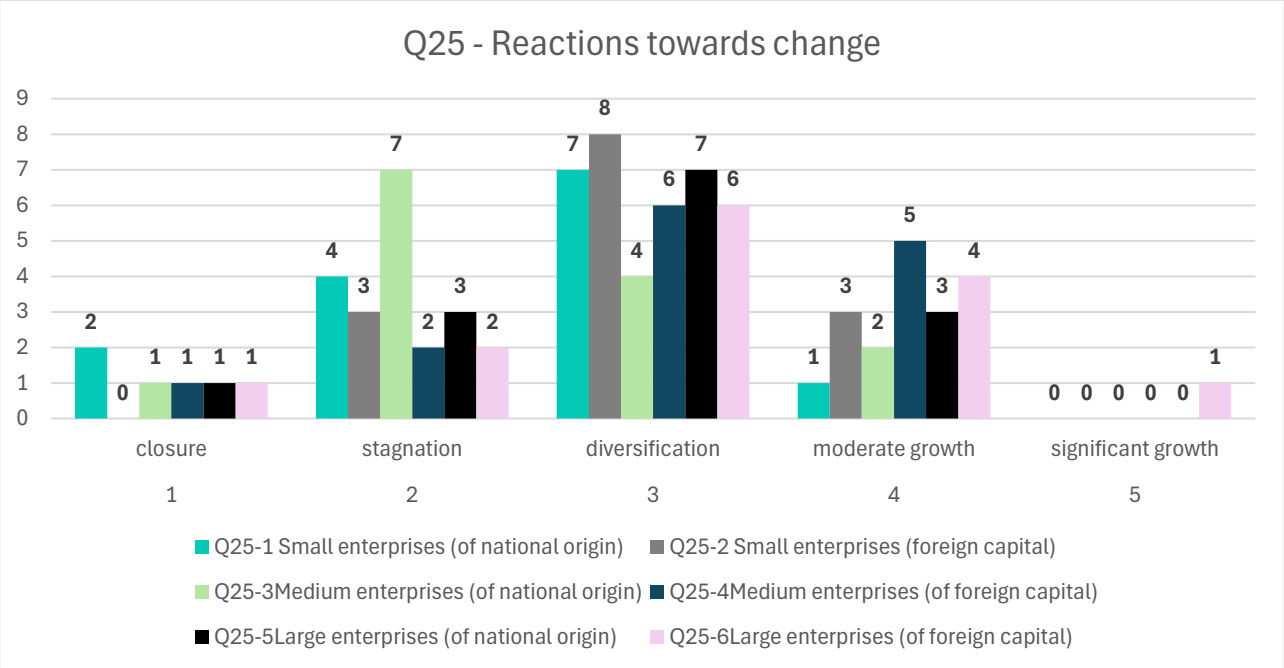

Q23 - Specialisation
frequency
10
8
6
4
2
0
2 0 1 1
4 5 2 6
6 9 8 7
2 0 3 0
0 0 0 0
very poor
poor
fair
good
outstanding
1
2
3
4
5
rating
Q23-1 Electrification
Q23-2 Connectivity
Q23-3 Automation
Q23-4 Platform economy

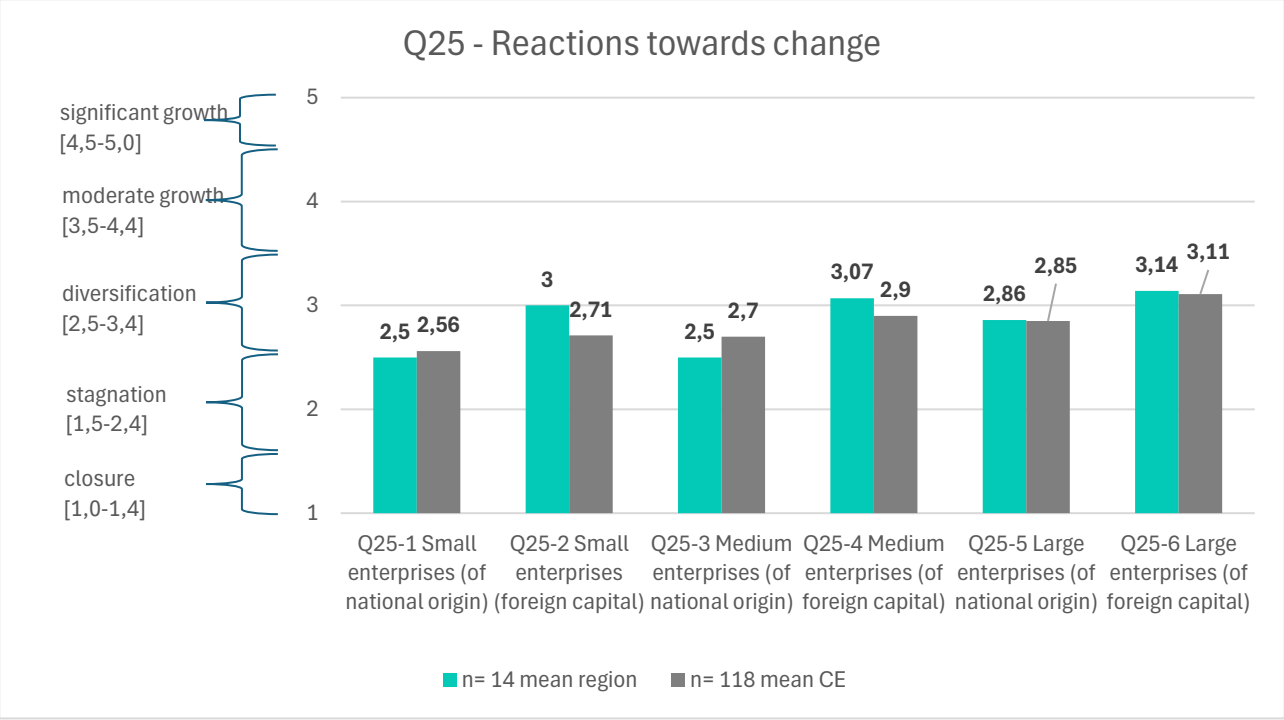

Q24 - Perspectives
frequency
10
8
6
4
2
0
0 1 2 1
2 1 0 4
2 4 4 5
9 7 7 3
1 1 1 1
none
decline
stagnation
growth
European leadership
1
2
3
4
5
rating
Q24-1 Electrification
Q24-2 Connectivity
Q24-3 Automation
Q24-4 Platform economy





Based on observations, most companies and BSOs involved in the survey think that companies will choose diversification as their reaction to the ongoing changes in the European automotive sector from 2024 to 2030. Only medium enterprises of national origin tend more toward stagnation.

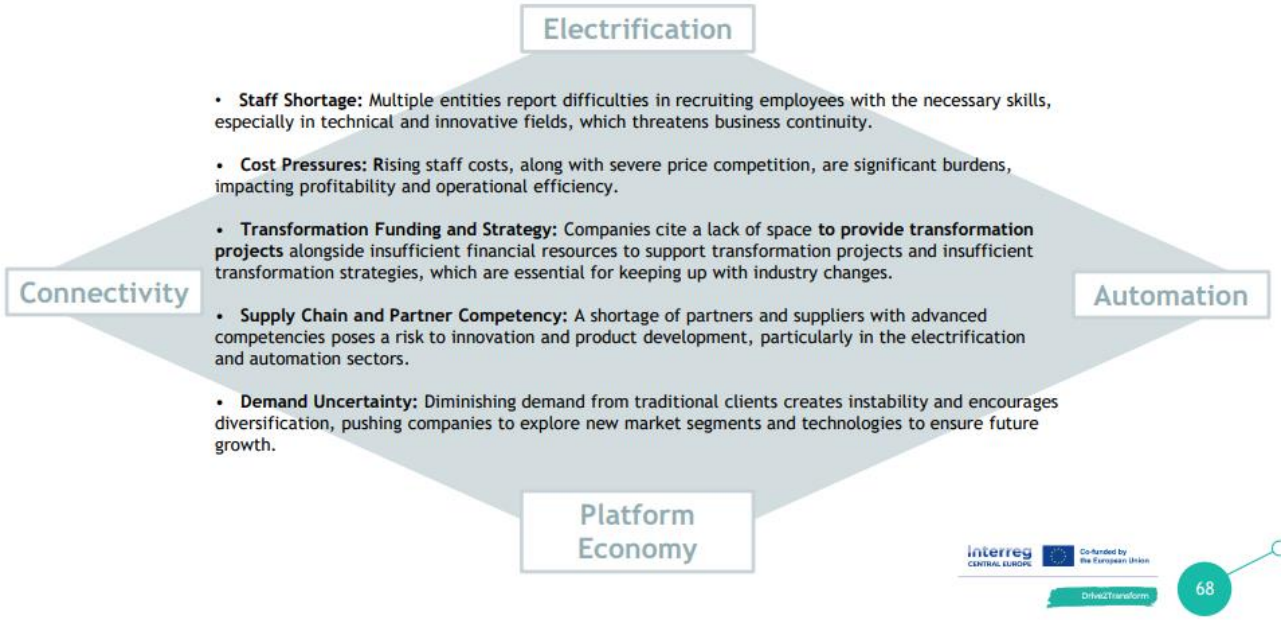




Conclusion - Key findings for regional transformation capacities in the automotive sector

Slovakia's automotive industry is strong yet confronts challenges primarily stemming from a shortage of skilled labour, rising costs, and insufficient critical competencies. Companies recognize the growth opportunities in electrification and automation but need enhanced support from the education system and stronger ties between industry and academia. There is also a demand for government policies and financial incentives to boost electric vehicle production and market adoption. A thorough long-term strategy for the

automotive sector, complete with specific goals and actionable steps, is essential for ensuring Slovakia's competitiveness through 2030 and beyond.



Challenges in Slovakia

Using the survey results there is a common understanding of challenges and risks that appear all over Central Europe:

- Lack of Skilled workers with right competences: more info is needed on skills gaps. Deeper analysis on company and regional level.
- Lack of Transformation strategies
- Lack of Financial ressources (material, staff, energy)
- High-cost pressure (Chinese influence)
- High speed of changing: decision level and productivity level (data useage becomes more important)

In some regions there is a need for more cross-industry cooperation. The question arised, how to find the right partners with matching competencies.

From the Pilsen workshop partners also decided that the following questions need to be stressed during Drive2Transform with high relevance:

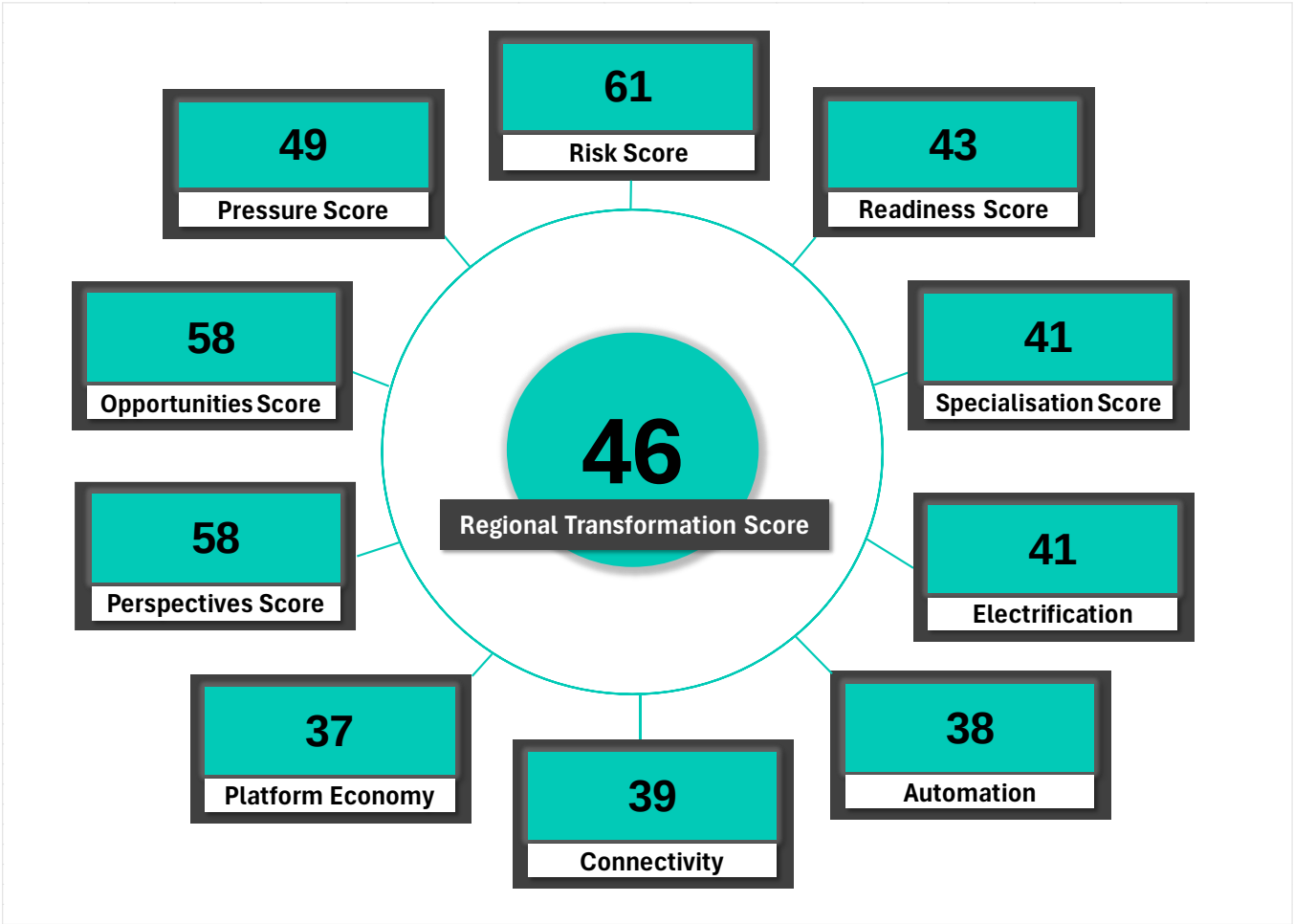
- How do regions need to support (a) SMEs and (b) industry in VUCA world?
- How can regions be adaptive in fast changing industry? How to prepare for changing external factors?
- How is market demand changing? How to get to know clients better? What is really needed/demanded?

In summary, the regional analysis shows that there is a pessimistic viewpoint in the industry whereas the current news of automotive industry seems to be even more alarming than the results from the survey. Drive2Transform partners provide next to the regional analysis also a transnational report

D1.1.3. Based on these A1.1 status-quo analysis of transformation readiness consortium will do its best to develop suitable measures to support companies and BSOs in these rough times.

Transformation Readiness Index – Slovakia

Slovakia is rated as limited ready for transformation. It scores highest in Risk, Opportunities and Perspectives, but still has deficits in the Regional Factor Scores Automation, Electrification, Connectivity and Platform Economy.



Ranking:

>60 Transformation Ready

50-60 Moderate Ready

40-50 Limited Ready

30-40 Low Ready

<30 Not Ready

Conclusion

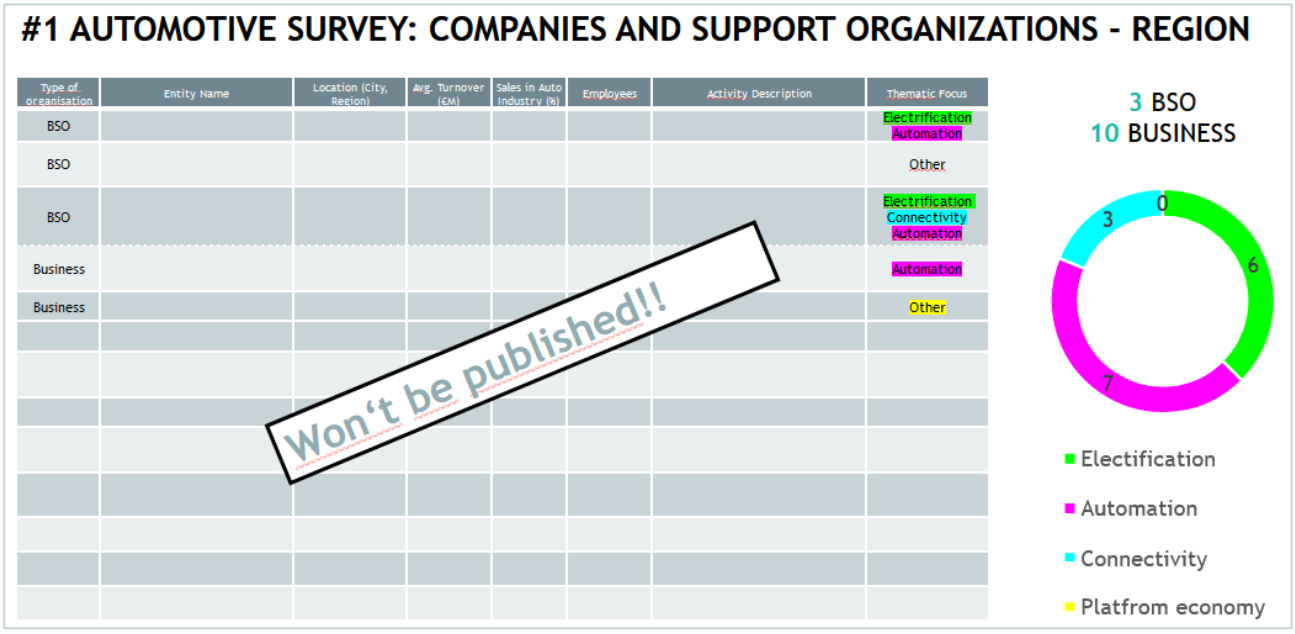
Zsmfassung mit gerankten Regionen, main challenges, skill gaps etc

Appendix

Appendix 1: Slide deck for the Pilsen workshop

The slide deck was used to prepare the morning session of the workshop. Each partner was asked to present its result in about 15 min.

- #1 Short description of the organisations participating in the survey – ca. 5 min
- #2 Regional factsheet – ca. 5 min
- #3 Key takeaways (Have there been any surprises?) – ca. 2,5 min
- #4 Diamond: What challenges, risks, and other hindering factors appear across the 4 focus topics in your region? What opportunities? – ca. 2,5 min



#2 REGIONAL FACTSHEET - REGION

Description of the region	*Texttexttext*

Capacities for transformation: synthesis of questions and answers

Description of the business support ecosystem	*texttexttext*
Q11. Risk factors impacting business continuity	*Texttexttext OR table/figure*
Q14. Readiness gaps hindering entities from starting a transformation process	*Texttexttext OR table/figure*
Q17. Skills gaps	*texttexttext*
Q17. Technology gaps	*texttexttext*
Q27. Missing services for business support:	*texttexttext*
Q22. Other comments regions need to consider for regional competitiveness	*texttexttext*
Further links & studies regarding the region	*texttexttext*

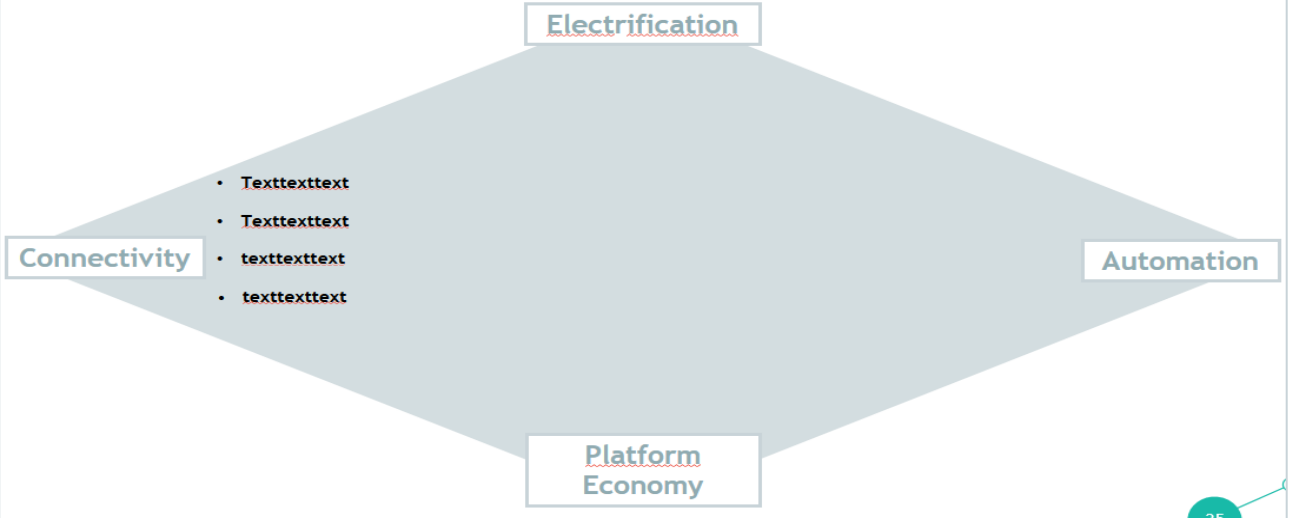
#3 KEY TAKEAWAYS - REGION

1. Titel
Texttexttext

2. Titel
texttexttext

3. Titel
texttexttext

#4 CHALLENGES - REGION



25

Appendix 2: Question categories

categories	questions	score weighting		
10 RISKS	3	10%		Company related
12 PRESSURE	3	10%		
13 READINESS	3	10%		
15 OPPORTUNITIES	4	10%		
18 ELECTRIFICATION REGIONAL	19	10%	REGIONAL FACTORS	Regional related
19 AUTOMATION REGIONAL	17	10%		
20 CONNECTIVITY REGIONAL	17	10%		
21 PLATFORM REGIONAL	15	10%		
23 SPECIALISATION	4	10%		
24 PERSPECTIVES	4	10%		

The whole questionnaire is added in D1.1.1. Please consult if needed.