



National Skills Gaps and Needs Analysis: Czech Republic

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Abbreviations and glossary of terms

AI	Artificial Intelligence
AT	Austria
ASP	Associated Strategic Partners
BH	Bosnia and Herzegovina
BG	Bulgaria
CE	Circular Economy
CZ	Czech Republic
DE	Germany
DR	Danube Region
EU	European Union
HR	Croatia
HU	Hungary
i4.0	Industry 4.0
IoT	Internet of Things
LCA	Life Cycle Assessment
LP	Lead Partner
MD	Moldova
NGO	Non-Government Organization
PP	Project Partner
R&I	Research and Innovation
RO	Romania
RS	Serbia
S3	Smart Specialization
SK	Slovakia
SL	Slovenia
SME	Small and Medium Enterprises
SO	Specific Objective
STEM	Science, Technology, Engineering, and Mathematics

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Executive summary

Czechia, located in Central Europe, has a population density of 133.3 inhabitants per km² with a total population of 10,900,555, (women constituting 50.71%). Women have a higher life expectancy than men, which explains the higher proportion of females, especially in the older age groups.

The educational structure reveals a significant gender gap, especially in pre-primary, primary, and lower secondary education (ISCED 0 - 2), where the female population exceeds the male population by almost 25.6%. For upper secondary and post-secondary non-tertiary education (ISCED 3 - 4), the gender distribution equalizes at 47.4%. In tertiary education (ISCED 5 - 8), women again predominate with a 7.2% gender gap.

In the entrepreneurial landscape, women are less likely to be self-employed or to run businesses compared to men. In 2020, 11% of employed women were self-employed, just above the OECD average, but significantly lower than the 19% of employed men. The entrepreneurial ecosystem is characterized by SMEs and self-employment, with women driving change across various sectors.

The 'Trade' sector has the highest percentage of self-employed women at 21%, followed by 'Professional scientific and technical activities' at 15%, and 'Agriculture' at 13%. Sectors like 'Construction' and 'Transport/storage' have lower female representation.

WEs in Czechia, especially in construction and real estate, show a high level of familiarity with CE. However, those in consumer goods are less familiar, indicating a need for targeted education in this area. A significant number (61%) of WEs are applying CE practices such as repair, refurbish, reuse, and recycle. Yet, there is a notable gap in the adoption of digital platforms for sharing resources, suggesting a potential area for development. The primary challenge faced by WEs is a lack of clear options for implementing CE in WE's businesses. They express a need for training on financing the transition, Al in CE, and digital technologies for CE transition.

Mobile technology and cloud storage are widely adopted, while advanced technologies like 3D printing and blockchain are underutilized, pointing to a need for skill development in these areas. High investment costs and a lack of skills are the main barriers to adopting digital technologies. This highlights **the need for financial and** **non-financial support mechanisms** and educational programs to build digital competencies. **Cybersecurity and programming** are identified as critical skills for digital transition. WEs seek training in these areas to effectively overcome skill gaps and leverage digital technologies.

The main motivations for applying CE technologies include management's commitment to ecological transformation and using digital technologies for competitive advantage. Challenges faced include a lack of knowledge about suitable options and securing sufficient financial resources. Training needs are focused on financing the transition and the use of AI in CE. Support for women entrepreneurs in this transition includes information dissemination, educational platforms, and financial assistance.

These findings underscore the importance of providing comprehensive support to women entrepreneurs in the Czech Republic to enhance their skills in CE and digitalization, thereby enabling them to contribute more effectively to the country's transition to a digital and circular economy.

Based on the analysis conducted, **following recommendations for supporting women entrepreneurs in the Czech Republic**, particularly in relation to digital and circular transitions, were prepared:

- Encourage networking, coaching, and mentoring through incubators and associations to support women entrepreneurs.
- Increase the availability of childcare facilities to give women more time to focus on entrepreneurship.
- Develop banking products tailored to support women's businesses, ensuring better access to financial resources.
- Improve access to social security for self-employed women in precarious situations.
- Implement a comprehensive approach by mapping current policies related to gender issues, linking them, and harmonizing strategies.

These recommendations aim to create a more inclusive entrepreneurial ecosystem and address the specific challenges faced by women entrepreneurs in the Czech Republic.

Introduction

This National Report for Czech Republic is an integral component of the Transnational Skills Gaps and Needs Analysis, aimed at dissecting the unique barriers and opportunities that lie within Czech Republic's transition to a more circular, innovative, and digital economy. Through a meticulous examination of the current state, this report endeavours to illuminate the path forward, identifying specific needs and proposing strategic interventions to empower women entrepreneurs in the realm of CE, S3, and i4.0.

Amidst the backdrop of a global pandemic and shifting geopolitical landscapes, the urgency for this analysis has never been greater. The resilience and agility of economies hinge on its ability to harness the potential of its female entrepreneurs, equipping them with the skills and knowledge to thrive in an increasingly competitive and sustainable marketplace.

This report synthesizes data collected from a comprehensive survey, stakeholder interviews, and case studies, offering a nuanced understanding of the skills landscape in Czech Republic. The objective is not only to chart the existing skills gaps but also to forge a roadmap for capacity building, policy intervention, and collaborative action that aligns with the nation's aspirations for economic revitalization and gender equity in entrepreneurship.

As we delve into the findings and recommendations herein, it is our hope that this report will serve as a catalyst for concerted efforts to bridge the skills divide, fostering an environment where women entrepreneurs can lead the charge towards a brighter, more sustainable future.

Methodology

Desk research, surveys, stakeholder interviews, case studies, and comparative analysis are used for to ensure a robust and inclusive analysis. By employing a multi-dimensional methodology, a detailed and nuanced understanding of the skills gaps and needs among women entrepreneurs in the Danube Region is aimed to be provided. This approach ensures that the analysis is both broad in its scope and specific

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in its findings, providing a solid foundation for the development of effective support strategies for the transition towards a more sustainable, digital, and circular economy.

Approached applied	Description of the performed task
Desk research	Review of analyses, research articles, national and translational reports, strategies and also data from OECD and CZSO is made in order to be established a baseline understanding of the current skills landscape for women entrepreneurs in the Czech Republic.
	The analysis incorporates results from survey conducted among women entrepreneurs form Czechia. It was organized in the period 23/04/2024 – 30/05/2024.
	Non-specified number of respondents were identified from different sectors and questionnaires were provided to them by SurveyMonkey platform.
Survey among women entrepreneurs	The survey provides both quantitative data and qualitative insights to analyse prevailing skills gaps and needs.
	43 of responses are collected which is equal to non-specified responding rate and could be accepted as quite sufficient for the main goal of the current Analysis.
	Outreach of respondents was conducted through NSHG's allied organisations and its own network. It is therefore not possible to say exactly how many respondents were contacted. Only units of women entrepreneurs were approached directly.
Stakeholders interview	In-depth interviews with industry experts, policymakers, academia, and support organizations for better understanding the broader ecosystem and support

Table 1: Methodology applied

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	structures for WEs are made. Representatives of the industry experts, policymakers, academia, and support organizations were contacted and 5 of interviews are done. Through them are explored perceptions and suggestions for facilitating a successful S3 and i4.0 transition under CE aspects of WEs in Czech Republic.
Successful case interviews	Successful case 1 of interviews with WE who have effectively implemented circular and digital transition are conducted aiming to be identified the motivational and successful factors which helped the WE through this process focusing on obtaining the necessary skills.

To effectively understand the dynamics of the skills gap and needs within Czech Republic, a carefully curated sample of women entrepreneurs and female-led start-ups has been selected for this study. This sampling approach is designed to ensure a comprehensive analysis that reflects the diverse sectors and regions within the country. By examining a representative cross-section of businesses, this investigation aims to identify prevalent challenges, opportunities for growth, and specific skills necessary for thriving in the realms of the Circular Economy, Smart Specialization, and Industry 4.0. This methodological step is crucial for deriving actionable insights and tailored recommendations that will empower women entrepreneurs to navigate and succeed in the evolving economic landscape of the Czech Republic.

In the following text, a detailed structure of the sample comprising women entrepreneurs who participated in the survey is presented, along with the demographics of the interviewees, and an illustrative case study.

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Czech Republic

1.1 General presentation of Czech Republic

The Czech Republic is located in the centre of Europe and covers an area of 78 871 km² with the population density of 133.3 inhabitants per km² (CZSO, 2023). Its capital and largest city, with 1.3 million inhabitants, is Prague. The population of the Czech Republic as of 31 December 2023 (latest data) was 10 900 555 and 50.71% of this population is female (CZSO, 2024c). Women in the Czech Republic have a higher life expectancy than men¹ (CZSO, 2023b). This fact can explain the higher proportion of women in the population and the shape of the graph showing the age structure (Figure 1) of the Czech population.



Figure 1: Age structure of population (31.12. 2022) Source: own elaboration on data from CZSO (2023a)

¹ A man born in 2022 can expect to live for 76.1 years, while a woman can expect to live for 82 years.

Co-funded by banube Region Co-funded by the European Union The chart (Figure 1) reveals that for most age groups, there are more women than men, with this difference becoming more pronounced as age increases. The largest populations for both genders are within the middle-age brackets. Interestingly, there's an exception at younger ages where there are slightly more men than women.

The population was segmented into three main age groups. The largest segment was the middle-aged group (15 - 64 years), comprising 63.4% of the total population of 10.83 million. This group was almost evenly split between genders, with women making up 49.3%. The elderly population (65+ years) accounted for 20.4% of the total population. Interestingly, this group had a higher proportion of women, at 57.9%. The youngest age group, those under 15 years, made up 16.2% of the population. The gender distribution in this group was almost equal, with females representing 48.8%.

Overall, women made up a slight majority of the total population at 51%. These demographic trends provide a comprehensive overview of the population structure in Czechia, which is crucial for future planning in various sectors such as healthcare, education, and social services.

The educational structure of the Czech population shows the highest gender gap in pre-primary, primary and lower secondary education (ISCED 0 - 2) of all Europe in 2022. This means that a larger share of the Czech population has this low level of education than the male population by almost 25.6%. For the population with Upper secondary and post-secondary non-tertiary education (ISCED 3 - 4), the share of the population equalizes and the share of females in this educated population is 47.4%. In the most educated population (first and second stage of tertiary education, ISCED 5 - 8), the share of women is again predominant, with a gender gap of 7.2%.



Figure 2: Population per educational level and gender, Czech Republic, 2022 Source: own elaboration on data from CSZO (2024a)

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1.2 Female entrepreneurial ecosystem in the Czech Republic

In the Czech Republic, the landscape of entrepreneurship is evolving with a notable increase in female participation. However, a gender gap persists. Women are less likely to be self-employed or to run either a new or established business. In 2020, 11% of employed women were self-employed, slightly above the OECD average. However, this figure pales in comparison to the 19% of employed men who were self-employed. Furthermore, fewer self-employed women in the Czech Republic employ other workers, indicating a potential barrier to business growth (OECD, 2023b). Despite these challenges, women entrepreneurs drive change and contribute significantly to the nation's competitive edge in the global market. Their ventures span across various sectors, illustrating a broad spectrum of interests and expertise. The continued growth and success of female entrepreneurs in the Czech Republic will undoubtedly contribute to the country's economic development and progress towards gender equality. The entrepreneurial ecosystem in the Czech Republic is becoming more inclusive, paving the way for a more balanced and diverse business landscape.

Several national strategies and initiatives have been implemented to support inclusive entrepreneurship. These initiatives focus on supporting women entrepreneurs, particularly those over 50 years old, to reduce the risk of poverty in retirement age.

The following section of the report captures the state of the Czech women's entrepreneurship ecosystem, its composition in terms of economic sectors, with a focus on sectors with potential for digital or circular transitions, and finally, the main actors involved in this ecosystem and their activities.

Key characteristics of the ecosystem

Overall, entrepreneurial activity in the Czech Republic is characterized by small and medium-sized enterprises (SMEs) and mainly by self-employment, e.g., a trade license with no employees (CZSO, 2024b). This is also in line with the findings of Dvoulety (2019), who examined the period of entrepreneurship in the Czech Republic between 2005 and 2017 and verified, that SMEs correspond to 99.8% of all active businesses in the country, whereas the self-employment rate is about 90% CZSO (2024b).

Figure 3 shows that the number of male entrepreneurs is significantly higher than that of female entrepreneurs. Similarly, men hold more trade licenses than women, although the difference is less pronounced compared to entrepreneurship. Female entrepreneurs account for 36% of entrepreneurs in the Czech Republic and 33% of those with a trade licence (Department of Trades and Consumer Legislation of the Ministry of Industry and Trade, 2024).



Figure 3: Number of natural persons doing business and trade licenses by gender, absolute numbers, Q1 2024 Source: own elaboration on data from Department of Trades and Consumer Legislation of the Ministry of Industry and Trade (2024)

Global Entrepreneurship Monitor (2024) conducts studies comparing entrepreneurial ecosystems worldwide². The study shows that the perception of opportunities, the ability to become an entrepreneur, and entrepreneurial intentions are under average in Czechia compared to the global. On the other hand, the fear of failure is somewhat higher. Moreover, a low level of entrepreneurial activity in Czechia has been found. Compared to global and regional averages, this low level applies to both early-stage entrepreneurial activity and established business ownership.



² The results for 2013 and 2011 are extensive, and for the purposes of the report it is useful to mention data on the self-perception of Czech entrepreneurs and also their actual activity.

The 2018 Metro International Own Business Study, on the other hand, shows the proportion of women in the population who would like to start their own business or believe they are "very likely" to eventually start their own business. The study compared 10 countries worldwide (including the Czech Republic). The Czech Republic has the lowest percentage of women interested in starting their own business, with only 21% of women expressing an interest and only 6% of women believing they are "very likely" to start their own business. Germany had the lowest results. It appears that the culture of female entrepreneurship in the Czech Republic is not as strong as in the other countries surveyed.

The findings of the European Parliament's study³ signify that Czech women face the following disadvantages (McCracken et al., 2015):

- Female entrepreneurs in the Czech Republic tend to **request financial assistance less frequently** than their male counterparts, and when they do, they typically request smaller amounts.
- Little usage of bank debt finance, such as loans or overdrafts by female entrepreneurs. Crowdfunding was identified as a potential alternative source of finance for women when more traditional options such as venture capital and angel investment are unavailable.
- Women entrepreneurs face additional challenges related to the disproportionate **burden of childcare**.
- Women have **lower self-confidence** and optimism, affecting their ability to succeed as entrepreneurs.

The study by Dvouletý, O. et al. (2022) examines the characteristics of self-employed Czech women. The study suggests that a cultural shift in the Czech labor market has enabled women to live <u>flexibly in families</u>, establish relationships, and start their own businesses. The study also indicates that migrant women are more likely to be self-employed than Czech women. The authors suggest that promoting women's entrepreneurship can be achieved by sharing experiences and establishing clubs. Additionally, empowering women can be achieved by sharing stories of successful women entrepreneurs.

³ Women's Entrepreneurship: Closing the Gender Gap in Access to Financial and Other Services and in Social Entrepreneurship

Authors Dlouhá and Pospíšilová (2018) add that women are often exposed to these negative phenomena and find themselves in precarious situations even within self-employment. Their analysis focuses on women's self-employment and precarious situations characterized by short-termism and risk of dismissal, lack of control over working conditions, lack of protection, low income, and maternity discrimination. The authors propose several measures to combat these precarious situations. The first measure is promoting part-time and flexible working hours (Watson & Pearson 2016). Complementary actions include promoting childcare services (Lewchuk et al. 2013; Zahi & Poláček 2013) and others. Addressing the general issue of discrimination against women in the labour market is also important. The second is to support self-employed women in precarious situations through improved access to social security and greater involvement of men in domestic duties. The third recommendation is to provide support through various forms of association. Training, coaching, mentoring and psychological support can also positively impact the aforementioned issues.

Sectoral specification (S3)

This section provides a detailed view of self-employment by economic activity in the Czech Republic (for the year 2020). The most striking finding is that the 'Trade' sector has the highest percentage of self-employed women at 21%. This is followed by 'Professional scientific and technical activities' at 15%, and 'Agriculture' at 13%. On the other hand, sectors such as 'Finance', 'Real estate', 'Transport/storage', and 'Info. and comm' have the lowest representation of women, each with 2% or less. While it's challenging to pinpoint the sectors with the highest gender gap without the exact data for men, sectors like 'Construction' and 'Transport/storage OECD (2020).

The Czech Republic also has a low representation of women in research, especially in senior positions. There are many barriers to returning after parental leave, and insufficient attention is paid to this issue by research institutions and governments (Ministry of Industry and Trade of the Czech Republic, 2022). The National Research and Innovation Strategy for Smart Specialisation of the Czech Republic 2021-2027 (National RIS3 Strategy) proposes to address this situation mainly by promoting and supporting young female researchers.

The Czech government has adopted an updated version of the RIS3 strategy for 2019. It provides a detailed strategy of smart specialization in various segments of the Czech economy and presents a list of Key Enabling Technologies (KETs): advanced materials,

nanotechnology, micro and nanoelectronics, photonics, advanced manufacturing technologies, industrial biotechnology. In addition to these sectors, the strategy presents specific objectives to be supported by government institutions in the following areas: entrepreneurship and innovation, research and development, human resources, and social innovation.

Focus sectors with the highest potential for digital and circular transition

The National Research and Innovation Strategy for Smart Specialisation (RIS3) in the Czech Republic emphasizes the importance of sectoral specialization in promoting economic growth and innovation. Within this framework, the role of women's entrepreneurship is crucial in driving sectoral progress and regional development.

- Engineering, energy, and metallurgy: Women entrepreneurs in this sector have contributed to technological innovation and sustainable practices. Their involvement ranges from engineering firms to renewable energy start-ups, promoting environmental sustainability and technological progress.
- **Electronics, electrical engineering, and ICT:** The ICT sector is a key area for smart specialization. These entrepreneurs are driving digital innovation, which is crucial for the Czech Republic's competitiveness in the global market.
- **Transport equipment manufacturing:** Women entrepreneurs are increasingly visible in the automotive and aerospace industries. Their companies focus on high-tech manufacturing, supply chain optimization, and innovative design solutions, contributing to the modernization and global competitiveness of Czech transport equipment manufacturing.
- **Pharmaceuticals, biotechnology, and medical devices:** Women entrepreneurs are making a significant contribution to the life sciences sector. Their ventures in pharmaceuticals, biotechnology, and medical devices are leading to advances in healthcare solutions, medical research, and the development of cutting-edge medical technologies.
- **Cultural and creative industries:** Women entrepreneurs excel in the cultural and creative industries, which include traditional crafts, design, and modern digital arts.
- Agriculture and environment: In agriculture and the environment, women-owned businesses focus on sustainable agricultural practices, environmentally friendly technologies, and conservation efforts. Their

contributions are vital in addressing environmental challenges and promoting sustainable development.

Women entrepreneurs play a role in the specialized sectors outlined in the Czech National RIS3 Strategy. Their contributions drive innovation, sustainability, and economic growth across key industries. By addressing the challenges, they face and supporting their endeavours, the Czech Republic can enhance its smart specialization strategy and ensure inclusive and sustainable economic development.

Interaction between ecosystem actors and female companies (e.g. support services, events, etc,);

The actors play different roles in the support system of women entrepreneurs in the Czech Republic. State institutions at the national level (Ministry of Industry and Trade⁴, Ministry of Labour and Social Affairs⁵, Ministry of Education, Youth and Sports⁶) mainly create the legislative framework for entrepreneurship and implement policies to strengthen inclusion through various strategies. Another important body of the Czech government is the Government Council for Equal Opportunities for Women and Men⁷, a permanent Government advisory body for creating equal opportunities for women and men. Moreover, *CzechInvest* assists in creating, scaling, and developing businesses and also focuses on developing business knowledge among the Czech population. It also focuses on supporting the female entrepreneurial ecosystem through special networking opportunities.

Big support is provided through projects implemented by regional innovation centres or non-profit organizations and covers various activities, mainly at the local/regional level. These include initiatives by innovation centres⁸ or activities by NGOs⁹ (These initiatives include activities such as support for networking, mentoring, funding opportunities, and education or training.

⁴ <u>https://www.mpo.gov.cz</u>

⁵ <u>https://www.mpsv.cz</u>

⁶ <u>https://www.msmt.cz</u>

https://vlada.gov.cz/cz/pracovni-a-poradni-organy-vlady/rada-pro-rovne-prilezitosti/the-government-c ouncil-for-equal-opportunities-for-women-and-men-29830

⁸ Such as Innovation Centre INION in Karlovy Vary or South Moravian Innovation Centre (JIC)

⁹ Such as South Bohemian Women Entrepreneurs (*Jihočeské podnikatelky*), For the Entrepreneurs (*Propodnikave.cz*) or projects of IREAS).

On the one hand, several actors in the Czech Republic are involved in inclusive business, including a focus on gender balance. However, there is no national coordination between them. Activities are often fragmented and buried in individual strategies, such as the Gender Equality Strategy for 2021-2030 (Office of the Government of the Czech Republic, 2021).

Financial mechanisms/policy support measures for circular and industrial transition for women, including digital, business and other skills improvement

A study by (Maříková et. al, n.d.) shows that women entrepreneurs in Czechia need more support for entrepreneurship from state institutions, especially in the area of financial support for starting a business. Women entrepreneurs are critical of the information provided by the state in the field of entrepreneurship in general, especially in relation to the possibilities of their support. In recent years, significant progress has been made in promoting inclusive entrepreneurship in the Czech Republic by revising various national strategies, as OECD/European Commission (2023) shows in the study The Missing Entrepreneurs 2023, particularly the Gender Equality Strategy 2021-2030.

The Czech Republic has developed various legislative frameworks to support the transition to a circular economy, focusing on reducing waste, promoting recycling, and fostering sustainable business practices. These frameworks include tax incentives, subsidies, and other support mechanisms aimed at encouraging businesses, including those led by women, to adopt circular economy principles.

The strategic framework "**Circular Czechia 2040**" (in original: Cirkulární Česko 2040) outlines the nation's vision and objectives for transitioning to a circular economy. It includes measures to support businesses adopting circular practices, such as financial incentives and support for innovation in sustainable technologies. The Czech National Recovery Plan aligns with the EU's Next Generation EU initiative and includes substantial investments in sustainable development and circular economy projects.

Waste Management Act (Act No. 541/2020 Coll.) provides the legislative framework for waste management in the Czech Republic, promoting recycling and reducing waste production. It supports businesses adopting circular economy practices by setting out requirements and incentives for waste reduction and resource efficiency. Moreover, the *Act on Investment Incentives* (Act No. 72/2000 Coll.) offers tax relief and financial incentives for investments in sustainable and innovative projects, including those

related to the circular economy. Businesses can benefit from corporate tax exemptions for up to ten years if they meet specific sustainability criteria. The Czech government also offers various tax incentives for companies investing in environmentally friendly technologies and practices. These include accelerated depreciation for equipment that reduces environmental impact and tax deductions for research and development in sustainable technologies.

In summary, the Czech Republic has a robust legislative and policy framework to support the transition to a circular economy, with specific incentives and support mechanisms to foster women's entrepreneurship. These include tax incentives, grants, and dedicated support programs to promote sustainable business practices and innovation.

Creating opportunities for women entrepreneurs to network with each other is also an important part of supporting women entrepreneurs in the country. A number of actors are involved in this activity (networking platforms, etc.).



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Analysis of skills gaps and needs of women entrepreneurs for digital and circular transition



We received 43 responses. The respondents were distributed in the following sectors:

Figure 4: Distribution of respondents per sectors



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Figure 4 illustrates the distribution of respondents by economic sector. The Retail and e-commerce (16%), Textiles and Fashion (12%), and Technology, electronics, IT (9%) sectors are significantly represented. 48% of respondents (21 responses) selected the "Other" option. In the "Other" category, the majority of responses were from service sector activities, such as Education, Consulting, and Digital Marketing. In the case of "Other Services", the respondents were engaged in sectors such as accommodation and catering, psychotherapy, fitness, arts, local services, interpreting, or just services without further specification.



Figure 5: Experience of businesses - years on the market

In terms of the duration of respondents' businesses, the distribution is almost balanced. The respondents consist of both new entrepreneurs who have been in business for less than one year (28%) and entrepreneurs who have been in business for more than ten years (17%).





Figure 6: Enterprise size (number of employees)

In terms of enterprise size, the vast majority of respondents (93%) reported that they run enterprises with less than 10 employees. Only 7% of respondents run enterprises with between 10 and 49 employees. None of the female entrepreneurs participating in this survey run an enterprise with more than 50 employees.



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1.3 Circular Economy (CE)



Figure 7: Familiarity and engagement with the CE

In terms of familiarity across sectors, the responses for the construction and real estate sector averaged 5 (absolutely familiar), while the average value for the retail and e-commerce sector was 4.25. In the other category, which includes mainly women in the service sector, the average value was 4.2. Women in sectors such as technology, electronics, IT or textiles and fashion rated their knowledge of the circular economy as 4, indicating a high level of familiarity. In contrast, women in manufacturing and production had an average value of 3.5, indicating a moderate level of familiarity. Women in consumer goods had an average value of 2, indicating a slight level of familiarity.



Figure 8: Application of CE technologies/models

Regarding the differentiation in dependence on the size of the business, given the strong representation of smaller businesses (93% of all respondents), the analysis is particularly revealing for women entrepreneurs running businesses with fewer than 10 employees.

In terms of applying circular economy technologies or models to their business, a total of 61% of respondents said they were applying the technologies or models in some way.

39% of women entrepreneurs said they have not yet applied circular economy technologies or models to their business.



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Figure 9: Type of applied practices

The following circular economy technologies or models were most commonly reported by respondents. The most frequently selected options were 'Repair, refurbish, reuse and recycle products' (20%), 'Minimise waste pollution in product and process design' (16.4%) and 'Use renewable, recyclable or biodegradable resources' (14.5%). On the other hand, the least applied practices are 'Using platforms for sharing, renting materials of monitored products' (5.5%), 'Increasing the lifetime of products through their durability and reparability' (7.3%) and 'Reusing natural systems for energy and material sources' (7.3%).



Figure 10: Main motivation factors

The main motivations for implementing circular economy technologies and models were 'mentality, know-how, commitment and involvement of management in the ecological transformation' (35.1%), 'digital technologies used to accelerate the digitalisation of the business to ensure competitive advantage' (18.9%) and 'inspiration from other companies' (18.9%). Conversely, the least frequently cited motivating factors

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were 'support from available policy measures' (5.4%) and 'need to reduce raw material costs' (5.4%).



Figure 11: Reasons for not using technologies

Regarding the challenges women entrepreneurs face, the most frequently cited reason was 'I don't know what options are right for my business or how to do it' (44.9%). Other reasons included lack of knowledge about technological options, lack of time due to heavy workload, family or domestic responsibilities or insufficient financial resources.

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Figure 12: Need for trainings

The most popular training topics for women entrepreneurs are "Possibilities of financing the transition to a circular economy" (22.4%), "Artificial intelligence and its use in the circular economy" (16.3%), and "How to use digital technologies for the transition to a circular economy" (14.3%). The least popular training topics are "Introduction to the circular economy (benefits for business and society)" and other topics.

Regarding the preferred methods of supporting women entrepreneurs in their transition to the circular economy, respondents identified several potential avenues. One approach could be the systematic dissemination of information and awareness among consumers and customers, a regular information service on circular economy legislation, the availability of educational platforms for women entrepreneurs, as well as for the general public, informative videos or webinars. Other areas of support that were identified as preferred include financial support for the transition to circular economies and assistance with identifying potential and guidance for the transition of a business to a circular tailoring model.

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1.4 Industry 4.0 (i4.0)



Figure 13: Level of adoption of digital technologies

The survey revealed that the most frequently adopted digital technologies by women entrepreneurs are mobile technology, team collaboration tools, cloud storage, e-commerce platforms and digital marketing tools. These technologies are shown in the colour scale with the number 5 = strongly adopted. Conversely, technologies such as "Digital Twin Technology", "3D printing", "Blockchain" or "Robotisation and Automation" are significantly under-adopted by women entrepreneurs (colour scale with number 1 = very weakly implemented). The primary drivers for the implementation of these technologies were not cost reduction, perceived improvements in production efficiency and quality, gaining a competitive advantage or support through policy measures such as financing, training, etc.

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Figure 14: Barriers to implementing more advanced digital technologies

The most frequently cited barriers to the implementation of digital technologies in business are: high investment costs (29.4%); the lack of the requisite skills and knowledge to implement digital technologies (29.4%); a lack of proper planning when implementing the technology (14.7%); and the lack of public support in the form of funding, training, etc. (14.7%).

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A survey of women entrepreneurs revealed that they perceive a particular need for digital skills in the areas of cyber security and programming and software development. These were identified as the most important skills for 22.4% and 22.4% of respondents, respectively. The next most important skills were those related to design and simulation software, with 20.4% of respondents indicating a need for improvement in this area. Finally, 14.3% of respondents identified a need for improvement in their use of e-mail, social media, and video calls for business communication.

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Figure 16: Demanded information and communication technologies

1.5 Smart Specialization (S3) and external impacts



Figure 17: Familiarity with the smart specialization strategy (S3)

In terms of familiarity with the Smart Specialization (S3) strategy in the region, 63% of women entrepreneurs indicated that they were not familiar with the strategy.

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Figure 18: Adoption to Smart Specialization Strategy

When adapting their business activities to the smart specialisation strategy (S3), women entrepreneurs adapt most effectively through "upskilling and retraining employees to meet the requirements of the new innovation areas identified in S3 (in Czechia called RIS3). This is a positive outcome, with over 30% of respondents indicating that their enterprise "understands the specific industries, technologies and challenges identified by RIS3 in its region". Regarding the perception of their company as a successful example that contributes to achieving the goals of RIS3, only a small proportion (around 25%) of respondents agree with this statement.

In addition, over 70% of women entrepreneurs believe that the COVID-19 pandemic or the crisis caused by the war in Ukraine has affected their business and business strategies.

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Figure 19: Kind of professional support to restart business

Finally, we investigated the most effective forms of support for women entrepreneurs looking to restart their businesses, whether due to the impact of the COVID-19 pandemic or the crisis related to the war in Ukraine. While the responses were relatively evenly distributed between the options, the most frequently mentioned form of support was "Training, mentoring or coaching to improve digital skills" (24.4%), followed by "Training related to business knowledge and skills" (17.1%) and "Entry into formal/informal communities of (women) entrepreneurs".

Successful women entrepreneur



EcoHaus¹⁰, established by young WE Petra Doubková, is a young and innovative company founded with the aim of reducing plastic waste and water consumption in ordinary households. The company specialises in the production of environmentally friendly detergents, especially laundry papers, which make a significant contribution to protecting the environment. EcoHaus



has been on the market since 2021, during which time it has gained the support and trust of thousands of customers who appreciate sustainable and efficient products. The company's main vision is to provide people with environmentally friendly solutions to help them reduce their ecological footprint and contribute to the protection of our planet.

The founder of the company started her first entrepreneurial activities while she was still in high school. Initially, she focused mainly on sustainable fashion. The entrepreneur does not see herself as an outright businessperson, but as someone who constantly needs to achieve new goals. Her entrepreneurial spirit comes from this setting. Another prerequisite is that one must enjoy what one does. The environment she grew up in was also a big motivation for her. Gradually, she began to formulate the idea of incorporating sustainability approaches into fashion care itself. During her studies at the Technical University of Liberec (TUL - Nanotechnology), she participated in the Start-up university competition with her business idea - laundry papers. She then raised enough money to start her own business through two crowdfunding collections worth a total of CZK

1 million. CZK. For commercial investors, it was not a lucrative business idea in terms of profitability.

Today, in addition to the sustainable product, the company also supports comprehensive sustainability by using social enterprises as suppliers of certain products (wipes) or services (packaging). Although more expensive, this is a more socially sustainable approach.

¹⁰ Websites: <u>https://ecohaus.cz</u>.



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The motivation

The entrepreneur was primarily motivated by the need to reduce the environmental impact of traditional detergents, which are full of plastic and contain large amounts of water. She wanted to provide an effective and sustainable solution that would help protect our planet. In addition, she saw a growing demand for environmentally friendly products, which gave the company the economic motivation to adopt the principles of the circular economy.

The biggest challenge in adopting CE principles was finding reliable suppliers who met environmental standards and ensuring that production was ethical. There was a need to invest in new technologies and processes to support the company's goals. She also encountered logistical problems and challenges in optimizing the e-shop and supply chain.

Success factors

The subscription model, which allows customers to subscribe to products on a regular basis at a lower cost, has been very successful for the company. As a result, the company has a stable income and customers are satisfied with regular deliveries. The company has seen an increase in profits and improved resource efficiency as a result of implementing this business model. Customers are very satisfied, as evidenced by more than a thousand positive reviews.

The entrepreneur also actively sought various forms of support, including training and workshops focused on sustainability and digital technologies. She also took advantage of mentoring from more experienced entrepreneurs and sought out funding opportunities for innovation. This proactive approach to acquiring new skills and contacts was a key factor in her success.

Skills needed

In terms of building the business, it was essential for the entrepreneur to have knowledge of sustainability, digital marketing and e-commerce. She also needed to develop skills in supply chain management and logistics. She attended several training courses and workshops on the circular economy.

Recommendation

The entrepreneur recommended that WE provide access to mentoring and training on sustainability and digital technologies to improve the overall situation. She also highlighted the importance of networks and communities where women entrepreneurs

can share experiences and support each other. She also spoke about the problem of access to finance for women. Supporting initiatives that provide funding and grants specifically for women entrepreneurs in the circular economy would be very useful.

Stakeholder Perspectives

General information

In the Czech Republic, a total of 5 in-depth interviews were conducted with relevant stakeholders from different sectors of WE support.



Figure 20: Distribution of responses per type of stakeholder, Source: own elaboration, stakeholder respondents of the empirical study (in-depth interviews)

The group of respondents included a variety of stakeholders. R1 was a representative of the NGO supporting women entrepreneurs ACADEMIA IREAS, o.p.s (R1), another respondent was a representative of the industry expert TRAFIN OIL, a.s. (R2). In addition, two representatives of policy makers were interviewed, namely the Ministry of Industry and Trade of the Czech Republic (R3) and the Ministry of Labor and Social Affairs of the Czech Republic (R4). This group was complemented by the perspective

of an academic and researcher from the Prague University of Economics and Business (R5). Summaries of the interviews are included in the annexes to the report.

Digitisation and Industry 4.0

All respondents agreed that the market plays a crucial role in the adoption of digital technologies in business. Those who do not digitalize will be left behind. Quality and good digital transformation, based on a digital audit, will have a major impact on the competitiveness of enterprises. In the short term, digital technologies can provide a competitive advantage. Training people is an important complement to digitalization. Respondent R5 indicates that the implementation of i4.0 and Al tools is relatively low, and even the area of automation is relatively weak in the Czech Republic. Respondent R3 notes that digitalization is a gradual process. Conversely, Respondent R3 notes that digitalization is driving a significant transformation in business practices in the Czech Republic, with the country leading the way in e-commerce. Digitalization is also profoundly reshaping the way companies interact.

Interviewee R4 notes a significant gender gap in IT education, citing recommendations from the OECD. The anti-discrimination law can also be leveraged to strengthen the position of women in this field, allowing employers to prioritize the gender that is currently underrepresented. Respondent R3 notes that the Czech Republic's population has a solid grasp of basic digital skills. However, there is room for improvement in advanced IT skills.

The in-depth interviews revealed that few initiatives of the WE support were mentioned. The Ministry of Industry and Trade of the Czech Republic (MoIAt) is preparing a call for proposals for the "Implementation of a Virtual Enterprise" for a digital enterprise (non-production technologies—software and hardware solutions in the field of storage, communication with suppliers, interconnection of business processes). In its policies, the MoIaT does not provide special support to WE. Respondents R2 and R5 noted that this approach is the fairest from a macro perspective. MoIaT is also the driving force behind the Support Strategy for SMEs, which was created in collaboration with numerous stakeholders. Furthermore, Respondent R3 cites an example of effective EC practice established by EDIHs²⁰ as part of the Digital Europe Program.

All respondents agree that **digital technologies have recently become more accessible to women**, presenting an opportunity for women to participate in business

in predominantly male-dominated sectors. However, as respondents R1 and R4 point out, there is still a significant gender divide in the entrepreneurial environment. According to Respondent R1, the feminine principle in business can lead to the discovery of the social dimension of entrepreneurship in industrial sectors. Respondent R4 notes that digitalization introduces risks, including blurring boundaries between personal and professional lives and the potential for double-edged time flexibility, which could lead to a gender imbalance²¹.

Smart specialisation

In the Czech Republic, the RIS3 strategy is designed to promote smart specialization (S3). This strategy is perceived differently by the interviewees, with some viewing it positively and others negatively. One interviewee, R3, made a comparison with the Netherlands, where this type of strategy is only developed at the regional level and is relatively short. In the Czech Republic, regional and national strategies are both lengthy, comprising hundreds of pages. This makes them ineffective and lacking in sectoral focus. Expert R5 also believes there is potential for greater decentralization of RIS3. Regions with strong negotiation skills can adapt the national strategy to their advantage, which respondent R5 views as a positive aspect.

Entrepreneurs in the circular economy

The majority of respondents are familiar with the fundamental principles of the circular economy. Some respondents have noted that women are more attuned to environmental and social issues, making them more likely to implement CE principles than male entrepreneurs, who tend to prioritize economic considerations. Respondent R2 notes that ecological principles often coincide with the adoption of digital technologies in business, as data is crucial for the CE.

Respondent R5 indicates that the Czech Republic is making commendable progress in implementing CE principles. To further reinforce the implementation of CE principles, it is essential to quantify and regularly monitor companies' environmental footprint. It is crucial for companies to understand the management structure and responsibilities for materials, processes, and other key areas. One method for achieving this is through an energy audit, which can demonstrate how the CE agenda can be advanced within companies. The implementation of CE principles can provide companies with a short-term competitive advantage.

Conversely, the legislation pertaining to the Green Deal and the implementation of ESG is complex and has the greatest impact on SMEs. According to interviewee R3, small companies lack the capacity to fulfil all obligations. Furthermore, Respondent R3 notes that not every company operates in a sector where it makes sense to implement the EU taxonomy or other forms of environmental approaches. Conversely, interviewee R2 notes that the EU taxonomy facilitates a transition to CE principles and other ecological practices, thereby enhancing the competitiveness of companies within the given legislative framework.

Furthermore, respondents R1 and R5 highlight the crucial role of awareness-raising in the field of CE in the Czech Republic. CE is often perceived as a form of greenwashing. Additionally, the Czech customer is primarily concerned with price, with little consideration given to the product's historical impact on the planet or society. It is of great importance for companies to implement effective communication strategies that highlight the significance and advantages of their products manufactured in accordance with CE principles.

The following skills are perceived as crucial for CE or i4.0 transition: Time management, Presentation skills, Negotiation skills, Assertiveness, Networking skills, Business skills (including pricing, business plan, finance strategy, etc.), Environmental knowledge, Social and soft skills, Knowledge of foreign languages, Adaptability, Openness to new technologies, Visionary/strategic thinking, Self-confidence, Knowledge of physics and chemistry.

Identified gaps in the support provided to Women Entrepreneurs (WE) for S3 and i4.0 transition and recommendations and proposed actions from stakeholders

Respondent R1 explained that women generally have less time because they are socially perceived as the main caregivers (for children, the elderly) in the Czech Republic. At the same time, as all respondents suggest, they have less financial resources and less access to start-up capital (less creditworthy from the point of view of investors).

Respondent R1 concurs with R2, R4, and R5 that motivation, showcasing examples of good practice, showcasing successful women entrepreneurs, meeting each other and networking, coaching, training, and mentoring (forms of non-financial support) are crucial in supporting women's entrepreneurship. Incubators excel in this area. There is

Interreg Danube Region professional support, process support, and a community of women. It is also beneficial if support activities are conducted at the local level in the regions. Many women cannot travel across the country due to childcare responsibilities, among other reasons. Respondent R1 adds that training for women should be highly practical.

Interviewee R4 points to the existence of the Government Strategy for Gender Equality in the Czech Republic for the period 2021-2030, but it is relatively general. A crucial initial step is to map the current policies addressing gender issues, link them, and harmonize the overall approach.

According to respondent R1, the primary challenge is that women have less time and are overlooked in the context of motherhood. Providing support for men on parental leave would be beneficial (see the example of Sweden²²). Another challenge for mothers in the Czech Republic is the lack of childcare facilities, which are essential for providing women with the time they need.

As interviewee R4 confirms, another barrier is financial support and women's access to financial resources. There is currently no banking product designed to support women's businesses. It is also important to mainstream this need among banks. Many women choose to start businesses in fields that are close to them, but sometimes the profitable side is missing. Furthermore, support for more ambitious goals is required.

R5 suggests revising the basis for social entrepreneurship in the CZ. This could facilitate the growth of CE. The interviewee proposes incorporating an environmental dimension into the initiatives launched by the Ministry of Labour and Social Affairs of the Czech Republic to support social entrepreneurship. In these circumstances, social entrepreneurship could be a viable option, potentially driving stronger implementation of CE principles. Unfortunately, social entrepreneurship in the Czech Republic is often confused with non-profit organizations.

Interviewee R5 suggest opening one-stop shops within business and innovation centres in the regions, which could offer specific activities for women entrepreneurs. This is linked to the transfer of more decision-making power to the regions from the central (national) level. This should enable the regions to identify their needs more effectively and tailor support to reflect them in their policies.

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Female entrepreneurs could influence the creation of national and regional policies through their involvement in associations and women's lobby groups. This is according to respondent R5. Furthermore, interviewee R4 suggests that decision-makers should prioritize an evidence-based approach and work with facts. At the same time, it is important to support activities and tools that have a proven track record, rather than those that are ideologically correct. Furthermore, greater acceptance of verified approaches from abroad would also be beneficial. Monitoring the social impact of policy decisions is an essential part of the overall development of society. Interviewee R4 also emphasizes the importance of striking a balance between simplicity (in terms of procedures and costs) and social compatibility.

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Conclusion

The entrepreneurial ecosystem in the Czech Republic is characterized by a significant presence of SMEs and self-employment, particularly among women. Despite the challenges of a gender gap in entrepreneurship, women are increasingly contributing to the nation's economy across various sectors. National strategies and initiatives have been implemented to support inclusive entrepreneurship, with a focus on empowering women entrepreneurs, especially those over 50, to mitigate the risk of poverty in retirement.

The analysis of skills gaps and needs among women entrepreneurs for digital and circular transition reveals a growing familiarity with the Circular Economy (CE). However, challenges such as a lack of knowledge about technological options and insufficient financial resources hinder the adoption of CE practice. The survey indicates a strong need for training in financing the transition to CE, artificial intelligence, and digital technologies to support this transition.

In the realm of Industry 4.0 (i4.0), women entrepreneurs have adopted digital technologies such as mobile technology, team collaboration tools, and cloud storage. The main barriers to further adoption include high investment costs and a lack of skills and knowledge. There is a perceived need for digital skills development in cybersecurity and programming, highlighting the need for targeted support and training programs.

These findings underscore the importance of tailored interventions and support mechanisms to bridge the skills divide and foster an environment where women entrepreneurs can lead the charge toward a sustainable and digital future in the Czech Republic.

Based on the findings from the analysis, here are the main recommendations and proposed actions for skills improvement of women entrepreneurs (WEs) for Smart Specialization (S3) and Industry 4.0 (i4.0) transition fulfilling the aspects of the Circular Economy (CE) in the Czech Republic:

- Foster a supportive entrepreneurial ecosystem by strengthening networks and collaboration among WEs, industry experts, academia, and government. This could involve organizing networking events, facilitating industry-academia collaborations, and promoting the sharing of best practices.
- Improve access to finance for WEs to support their entrepreneurial activities. This could involve creating financial products tailored to the needs of WEs, providing financial literacy training, and promoting the use of alternative financing options such as crowdfunding.
- Enhance digital literacy among WEs to facilitate the adoption of digital technologies and Industry 4.0 practices. This could be achieved through workshops, online courses, and mentorship programs.
- Provide targeted support for WEs to transition to a Circular Economy. This could include training on sustainable business practices, access to green technologies, and financial incentives for businesses that adopt CE practices.
- Equip WEs with the necessary skills for Smart Specialization. This could involve providing training on emerging technologies, promoting lifelong learning, and aligning education and training programs with industry needs.
- Advocate for policy interventions that support WEs, such as gender-responsive policies, inclusive entrepreneurship policies, and policies that promote the digital and circular transition.

These recommendations and actions could serve as a base for the development of a comprehensive training program aimed at empowering WEs in the Czech Republic for the S3 and i4.0 transition while fulfilling the aspects of the CE. The program could include modules on digital literacy, sustainable business practices, financial literacy, networking, emerging technologies, and policy advocacy. It could be delivered through a blend of online and face-to-face sessions, ensuring flexibility and accessibility for all participants. The program could also include a mentorship component, where successful women entrepreneurs and industry experts provide guidance and support to the participants. This would not only enhance the skills of WEs but also inspire and motivate them to drive the digital and circular transition in the Czech Republic.

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Summaries of the interviews with stakeholders



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ACADEMIA IREAS, o.p.s. is a nonprofit organization based in Prague that specializes in training, mentoring, and providing support to target groups such as teachers, students, women entrepreneurs, etc. It implements several projects funded by OPZ+, Norway Grants, and other sources. The NGO's activities support the i4.0 transition and CE principles through the education of WE in digital skills..

TRAFIN OIL, a.s. is a company that deals with the collection, import, and recycling of oils and fats. It provides its services to restaurants, towns, and citizens, with 34,000 collection points. All collected waste oils and fats are then processed for secondary use in the company's own plant. The subsequent mechanical purification process renders the material suitable for the production of modern fuels. The company is founded on the principles of CE.

The **Ministry of Industry and Trade of the Czech Republic** is responsible for preparing, implementing, analyzing, and evaluating national policies, strategies, programs, and measures designed to support the growth of small and medium-sized enterprises (SMEs). The respondent represents the Czech Republic on the OECD Working Group on SMEs and Entrepreneurship and the European Commission Working Group on the Single Market Programme.

The respondent from the **Ministry of Labour and Social Affairs of the Czech Republic** is the head of the Gender Equality Projects Unit, which oversees the administration of ESF projects since 2024 (previously also the National Recovery Plan). The department now comprises three units: children's groups, social innovation, and gender equality. Its activities include the empowerment of women in pre-retirement age, gender-oriented projects (NGOs, local actors, etc.), promotion of equal pay, pay transparency, and gender mainstreaming.

The respondent from the **Prague University of Economics and Business** has extensive experience in research on entrepreneurial activities, evaluation of public policies to support entrepreneurship, and the economics of entrepreneurship. The respondent is also actively involved in several international projects and in the development of the scientific community. The respondent's research also covers gender differences in entrepreneurship.

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Table of Stakeholders

Actor	Role	
Nationwide		
Ministry of Labour and Social Affairs of the Czech Republic (<i>Ministerstvo práce a sociálních věcí ČR</i>)	Responsible for facilitating the integration of women entrepreneurs into the labour market.	
Ministry of Industry and Trade of the Czech Republic (<i>Ministerstvo průmyslu a obchodu ČR</i>)	Promoting entrepreneurship and economic growth in general, with initiatives aimed at supporting women entrepreneurs being a part of their broader agenda.	
Ministry of Education, Youth and Sports of the Czech Republic (<i>Ministerstvo školství mládeže a tělovýchovy ČR</i>)	Responsible for integrating entrepreneurship into the formal education system at all levels.	
Business and Investment Development Agency (<i>Czechlnvest</i>)	Plays a role in supporting women entrepreneurs by offering various services, such as advisory and financial assistance, aimed at helping them start, grow, and internationalize their businesses.	
Research Institute for Labour and Social Affairs (RILSA) (Výzkmný ústav práce a sociálních věcí)	Research institute that conducts independent research in the field of labour and social affairs at regional, national and international levels.	
Czech Chamber of Commerce (Hospodářská komora ČR)	The legal representative of Czech entrepreneurs to create opportunities for entrepreneurship, promote and support measures that contribute to the development of business environment.	
Reg	gional	
Association of Small and Medium-Sized Enterprises and Crafts of the Czech Republic (Asociace malých a středních podniků a živnostníků ČR)	Apolitical platform for SMEs, self-employed persons and their organisations. In cooperation with important companies and partners the association offers discounted bundles of products and services to its members.	
Innovation centre INION (<i>Inovační centrum INION</i>)	Regional innovation centre in Karlovy Vary Region. Provides support to women entrepreneurs by offering mentoring, training, and access to funding opportunities. They also facilitate networking opportunities for women entrepreneurs.	
Association of enterprising women from the Pardubice Region (<i>Spolek podnikavé ženy z Pardubického kraje</i>)	Women business club (NGO) in the Pardubice Region of the Czech Republic.	
Czech-Moravian Association of Businesswomen and Managers (Českomoravská asociace podnikatelek a manažerek)	NGO (volunteer organization) which supports women entrepreneurs and business leaders to share experiences, be inspired by each other and help each other develop their business and themselves.	
JIC INMEC (Jihomoravské inovační centrum)	Innovation centre has a number of activities focused on business development, including inclusive entrepreneurship. The Up2Circ project is also related to the theme of the project.	
For the enterprising (Pro podnikavé)	inis platform provides entrepreneurs with inspiration, learning opportunities and resources for	

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	growth based on real data-driven needs. They share practical experiences and address the specific needs of women.
Central Bohemian Association of Women Managers and Entrepreneurs (<i>Středočeská</i> asociace manažerek a podnikatelek)	NGO that provides a platform for meetings and cooperation for women entrepreneurs and managers operating mainly in Prague and the Central Bohemian Region.
Club of Women Entrepreneurs from the Zlín Region (<i>Klub podnikatelek ze Zlínska</i>)	NGO aiming to create a space for meeting, sharing, mutual support and cooperation of people from the Zlín Region who are thinking about entrepreneurship, starting a business or are already in business.
Prague University of Economics and Business (<i>Vysoká škola ekonomická v Praze</i>)	The university supports women entrepreneurs through educational programs, research initiatives, and networking opportunities designed to enhance their skills, knowledge, and visibility. They also conduct research in this topic (see Assoc. prof. Ondřej Dvouletý, and others).
University of Jan Evangelista in Ústí nad Labem (UJEP) (<i>Univerzita Jana Evangelisty Purkyně v Ústí nad</i> <i>Labem</i>)	UJEP is a key research and educational institution in the Ústí Region, playing a significant role in socio-economic relations regionally, nationally, and internationally. It commits to quality and responsibility, uses and develops IT systems for educational and creative activities, and adapts to societal, labour market, and technological changes.
South Bohemian women entrepreneurs (Jihočeské podnikatelky)	Platform (NGO) for women entrepreneurs in the South Bohemian Region.

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Summaries of 5 interviews with stakeholders

R1: Summary from an interview with the representative of the non-profit organisation ACADEMIA IREAS

ACADEMIA IREAS is a non-profit organisation focused on education and support of target groups such as teachers, students and women entrepreneurs. The organisation works on a project basis and implements projects funded by OPZ+ and Norway Grants. Current projects include the "Moving with the times" programme to support micro-entrepreneurs aged 50+, where women receive training through workshops and individual support, including coaching and psychological support.

Positions in the organisation:

The respondent has been working as a project manager since 2017 and has been with the organisation since 2013. She has a long-standing interest in supporting women, mentoring, training teachers and students, as well as mental health and interpersonal issues.

Circular economy:

The respondent is not very familiar with the concept of circular economy. She is familiar with exchange initiatives such as extending the life of clothes. She gives examples of projects such as the "Resisto Swap&Shop", "Toys and Stories" and "Semínkovna" that deal with sustainable practices.

Challenges and opportunities for female entrepreneurs:

Women have less time for entrepreneurship due to their primary role as caregivers, which affects their time and financial resources. "Holky z Businessu" ideas are often socially oriented, which can lead to lower returns and higher costs. Digitalisation and Industry 4.0 can help women, but the focus must be on supporting their specific needs.

Support structures and initiatives:

There are several initiatives to support women entrepreneurs, such as Czechitas, the Academy for Future Women Founders (Akademie pro budoucí zakladatelky), the Academy for Enterprising Women (Akademie podnikavých žen) and the Academy for Budding Entrepreneurs in the Pardubice region (Akademie pro začínající podnikatele v

PARádním kraji). These programmes support women in the transition to digitalisation and Industry 4.0.

Policy recommendations:

There is a need to promote equality in childcare, improve access to kindergartens and introduce gender-inclusive education programmes. Policymakers should increase support for women's entrepreneurship to better benefit from circular economy principles.

Key skills:

Skills such as time management, presentation, negotiation, assertiveness and networking are important. Women should be given practical training to test their business plans in practice.

Conclusion:

Entrepreneurship is about adapting to change and learning all the time. It is important for women entrepreneurs to understand and communicate the benefits of sustainable products for consumers and the planet. Support for women in business should be comprehensive and include social policy and education.

R2: Summary of the interview with the respondent from Trafin Oil a.s.

The respondent from Trafin Oil a.s. provided a comprehensive view on supporting women entrepreneurs in the transition to a circular economy, the use of digital technologies and participation in i4.0 (Industry 4.0). In her answers, she highlights several key points:

Promoting digitalisation and automation:

The respondent stresses that digitalisation and automation go hand in hand. Digitalisation enables efficiency, which is essential for the circular economy. Data from digital solutions is important for optimising logistics and material flows. He stresses the importance of efficient data processing to increase the competitiveness of companies.

The role of government and policy:

According to the interviewee, the state should not artificially intervene through regulations in favour of women entrepreneurs. The state should do the same for women entrepreneurs as it does for other entrepreneurs. She suggests a comprehensive social change based on the individual approach. The best way for the state to support foreign expansion is to participate in foreign missions and provide an informal quality guarantee. The networking of women entrepreneurs can be supported by the state through associations such as CzechInvest.

Challenges and opportunities of Industry 4.0:

According to the respondents, industry is still a man's world, especially heavy industry. Women find it more difficult to gain trust and partners. However, a female approach to business management can bring new and functional perspectives. She does not expect significant changes in the near future, but stresses that it is not the role of women to take over male roles.

Political and legislative measures:

The interviewee mentioned that the EU taxonomy is essential for the current situation where the transition to circular economy principles and green practices increases the competitiveness of companies. She sees this as an important factor in supporting businesses.

Specific recommendations and initiatives

To support women entrepreneurs, the interviewee recommends providing access to the necessary resources and training to enable them to take advantage of digitalisation and Industry 4.0 technologies. She sees an important role for the market in the adoption of digital technologies and i4.0 practices, and the importance of sharing experiences and networking. The participation of women entrepreneurs in these activities should be supported more.

Overall, the interviewee provides a practical perspective on how to support women entrepreneurs in the transition to the circular economy and digitalisation. She highlights the importance of individual access and social change, and practical steps to support women entrepreneurs in this area.

R3: Summary of the interview with the respondent from the Ministry of Industry and Trade of the Czech Republic

In the interview, the respondent from the Ministry of Industry and Trade of the Czech Republic focuses on supporting women entrepreneurs in the transition to the circular economy, the use of digital technologies and their participation in Industry 4.0.

Digitalisation and Industry 4.0

According to the interviewee, digital technologies and Industry 4.0 are fundamentally changing industries and business practices in the Czech Republic. Digitalisation is a key factor for the competitiveness and economic performance of companies. High-quality digitalisation, based on a digital audit, will have a significant impact on the success of companies. The respondent emphasises that a certain level of digitalisation will become standard in the future, which includes the need to train employees in this area.

Intelligent specialisation (RIS3)

The interviewee criticises the Czech version of the smart specialisation strategy (RIS3), which she describes as chaotic and too centralised. Unlike the Netherlands, where RIS3 is created at regional level, the Czech Republic has a national version that tries to support everything, which leads to inefficiency. There are also 14 different regional RIS3 strategies, which adds to the confusion. The interviewee believes that the Czech system should be simplified and more focused on the specific needs of the region.

Circular economy

According to respondents, the circular economy can make a significant contribution to sustainability, reducing waste and improving resource efficiency in the country's economy. Digital skills are key for women entrepreneurs to effectively transition to circular models. MIT organises an annual conference on the circular economy, which is an opportunity for women entrepreneurs to gain important information and contacts.

Recommendations

The interviewee recommends that companies do not delay digitalisation and take advantage of the public support available, even if it is fragmented. The MIT offers the portal podporapodniku.cz, which can be a useful source of information. The interviewee sees the circular economy and green policies as an administrative burden rather than a competitive advantage, which is a challenge for SMEs. Companies should be prepared for costly climate assessments, which may be required even for relatively small investments, such as the purchase of a new machine.

Challenges and opportunities

The biggest challenge for women entrepreneurs, according to the respondents, is the fragmentation of public support and the administrative burden associated with environmental policies. However, they see great potential in digitalisation, which can bring significant competitive advantages to businesses, and the respondent stresses that it is important for businesses to have enough skilled workers and not to be afraid of innovation and digital technologies.

The interviewee offers to be a contact point for relevant people at MIT working in specific areas such as circular economy and digitalisation. In this way, women entrepreneurs can get additional support and information needed to successfully transition to a more sustainable and digital economy.

R4: Summary of the interview with the representative of the Ministry of Labour and Social Affairs of the Czech Republic

The representative of the Ministry of Labour and Social Affairs of the Czech Republic, is the Head of the Unit for Gender Equality Projects. The department to which the unit belongs manages ESF projects from 2024 and includes three units focusing on: children's groups, social innovation and gender equality.

The respondent from the Ministry of Labour and Social Affairs of the Czech Republic highlights several key recommendations and approaches to support women entrepreneurs in the transition to a circular economy, the use of digital technologies and participation in Industry 4.0.

Supporting digitalisation and Industry 4.0

According to the respondent, digitalisation and Industry 4.0 can play a crucial role in improving women's participation in the labour market, especially in traditionally male-dominated sectors. Digitalisation allows for more flexible working conditions and opens up new opportunities for women, for example in IT, where a gender gap still exists. The OECD recommends focusing on improving IT training for women, as the success of businesses increasingly depends on digital technologies.

Working with experts

A key success factor, according to the respondent, is communication with experts and practitioners who work directly with the target groups. More use should be made of insights from the non-profit and private sectors, as well as from academia. This would ensure that women entrepreneurs have access to the necessary resources and training to take advantage of digitalisation and Industry 4.0 technologies.

Role of the market and public policy

The respondent sees an important role for the market in the adoption of digital technologies, but also points out that the process is slower than expected. The market needs to be supported by policies aimed at gender equality and removing barriers to women's access to financial and technological resources. The Ministry of Labour and Social Affairs also monitors the impact of digitalisation on the labour market and prepares forecasts of labour market needs.

Circular economy

While the Department is primarily concerned with the social pillar of sustainability and does not specifically address the circular economy, there is a link in the context of workforce adaptability to a low-carbon economy. This may include supporting entrepreneurs in sectors that focus on sustainability and efficient use of resources.

Importance of an evidence-based approach

The respondent emphasises the importance of an evidence-based approach to policy-making and supporting activities that are proven to work. She also recommends monitoring the social impact of decisions and adopting best practices from abroad. To

increase success, it would also be appropriate to link challenges with the Ministry of Industry and Trade and to coordinate programmes with the Ministry of Education.

Issues specific to women

Identifying the specific problems faced by women compared to men is another key issue. Women often have less money, less access to financial resources, contacts and networks. The respondent suggests that programmes should also focus on women approaching retirement age, who may be more disadvantaged.

These recommendations and approaches by the respondent from the Ministry of Labour and Social Affairs aim to better support women entrepreneurs in adopting digital technologies and in the transition to a circular economy, thereby increasing their participation and success in the economy.

R5: Summary of the interview with the representative of the Prague University of Economics and Business

The representative of the Prague University of Economics and Business studied economic policy at the Prague University of Economics and Business at Linnaeus University in Sweden. The representative works at the Department of Entrepreneurship at the Prague University of Economics and Business, where he also completed his PhD. He has a long-standing research interest in entrepreneurial activity, evaluation of public policies to support entrepreneurship and the economics of entrepreneurship. He is also actively involved in several international projects and in the development of the scientific community.

The interview with the representative of the Prague University of Economics and Business focuses on supporting women entrepreneurs in the transition to a circular economy, the use of digital technologies and their participation in Industry 4.0. As an academic and expert on entrepreneurial activity, respondent provides insights into various aspects of this topic.

Supporting women entrepreneurs in the circular economy:

Respondent emphasises the importance of education and raising awareness about the circular economy. He recommends supporting women entrepreneurs through specialised seminars and workshops that would provide them with the necessary knowledge and skills. He also suggests creating programmes to help women entrepreneurs implement circular principles in their businesses, such as grants or preferential loans for innovative projects.

Use of digital technologies:

In the area of digital technologies, respondent highlights the importance of digitising processes and automation, which can help women entrepreneurs increase efficiency and competitiveness. He suggests motivating women entrepreneurs to participate in digital literacy courses and providing them with advice on technology implementation. He also stresses the importance of sharing best practices and successful examples that can inspire other women to use digital technologies.

Participation of women entrepreneurs in Industry 4.0:

According to respondent, it is crucial to support the participation of women entrepreneurs in Industry 4.0 through mentoring and coaching. He recommends implementing more projects that include these elements, which can provide practical advice and support. He also mentions the importance of regional comprehensive support programmes, which should be flexible and tailored to the specific needs of different groups, including women entrepreneurs.

Financial support and one-stop shops:

Respondent highlights the benefits of non-financial support, such as one-stop shops, which can provide comprehensive advice and support to entrepreneurs in one place. These services should be accessible at regional level and offer specific activities for women entrepreneurs. It also suggests that regions should be able to decide on the allocation of funds for inclusion programmes according to their priorities.

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Conclusion:

In the interview, the respondent emphasises the complexity of supporting women entrepreneurs, which should include education, digitalisation, mentoring and flexible financial and non-financial support. His recommendations include practical steps that can contribute to greater participation of women in the circular economy, digital technologies and Industry 4.0, thereby strengthening their position in the entrepreneurial environment.

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