A skills gaps and needs assessment for the sustainability transformation

Ebun Akinsete, Senior Researcher, ATHENA Research and Innovation Centre, eakinsete@athenarc.gr

Phoebe Koundouri, Professor, Athens University of Economics and Business, Athena Research Centre, Danish Technical University, SDSN Europe, pkoundouri@aueb.gr

Lydia Papadaki, Researcher, Athens University of Economics and Business, Athena Research Centre, lydia.papadaki@athenarc.gr (corresponding author)

Angelina Taneva-Veshoska, Professor, Director, Institute for Research in Environment, Civil Engineering and Energy, angelina@iege.edu.mk

Slavica Trajkovska, Founder, Institute for Research in Environment, Civil Engineering and Energy, slavica.trajkovska@iege.edu.mk

Ana Tomikj, Researcher, Institute for Research in Environment, Civil Engineering and Energy, ana.tomik@iege.edu.mk

Abstract

To make European economies and communities more sustainable, resilient, and ready for the green and digital revolutions, new VET skills are needed. The CATALYST project—the "European VET Excellence Centre for Leading Sustainable Systems and Business Transformation"—supports the new industrial and SME strategies and the European Green Deal with this study. In autumn 2022, Austria, Germany, Greece, North Macedonia, and Portugal performed online surveys and local language interviews. 504 professionals and SME representatives completed the survey; 64 participated in 1:1 interviews. The research seeks to investigate the business sector's sustainability and governance practises and identify market skills gaps. The study's findings were validated by a series of roundtables in all five countries from November to December 2022 that brought together businesses, educational institutions, public bodies, and civil society organisations to discuss sustainability challenges and opportunities. The national roundtables discussed policies, regulations, tactics, business, and education to define competencies. Businesses faced financial restrictions, a lack of human resources, opposition to change, and legislative inconsistency when implementing sustainable practises. Management, analysis, problem-solving, and sustainability problems including legislation were identified as key development areas. The poll and roundtables recommended upskilling staff, promoting collaboration amongst varied industries, implementing regulations to foster cooperation, and providing sustainability awareness training. The CATALYST project focuses on influencing attitudes towards sustainability, using real-world examples, and showing the benefits of sustainable practises in future courses.

1. Introduction

Climate change and environmental degradation top the list of global challenges in today's world, the impacts of which often disproportionately affect the most vulnerable populations. Addressing these challenges requires broad transitions towards more sustainable developmental pathways and policymakers are aware that these transitions mean that certain economic sectors will experience an irreversible decline in economic production and employment. By authorizing the Paris Agreement on climate change and the UN 2030 Agenda for Sustainable Development (UNFCCC, 2022; United Nations, 2022), governments from around the globe decided in 2015 to adopt a more sustainable path for our planet and our economy. The 2030 Agenda and (Sustainable Development Goals) SDGs pledge to leave no one behind. All UN Member States pledge to end all kinds of poverty, stop discrimination and exclusion, and diminish the inequities and vulnerabilities that leave people behind and weaken the potential of individuals and the human race. UN 2030 Agenda is based on the 17 SDGs. These goals will help us prepare for a stable, healthy planet, just, inclusive, and resilient society, and flourishing economies in the next 15 years. In December 2015, 195 nations signed the Paris accord, the first universal, worldwide climate accord to keep global warming to far below 2°C and boost climate change resilience.

The European Commission unveiled the European Green Deal on December 11, 2019, with the goal of creating the European Union the world's first climate-neutral continent by 2050 (European Commission, 2019a), while ensuring that no one is left behind. To achieve this goal, all sectors of the European Union's economy must take concerted action, including investing in environmentally friendly technologies, encouraging industry to innovate, implementing cleaner, less expensive, and healthier modes of private and public transportation, decarbonizing the energy sector, ensuring that buildings are more energy efficient, and collaborating with other nations to raise international environmental standards. The European Climate Law codifies the European Green Deal's goal of a climate-neutral economy and society by 2050 (European Union, 2021). The law requires a reduction of at least 55 percent in net greenhouse gas emissions from 1990 levels by 2030. The EU must achieve net-zero greenhouse gas emissions by 2050, which will be accomplished primarily through emission reduction, financing of green technology, and environmental protection.

As outlined in the European Green Deal, the European Skills Agenda aids in the development of essential skills among individuals and enterprises (European Commission, 2020)– in order to support a "Just Transition", i.e. *to protect, conserve and enhance the EU's natural capital, and protect the health and well-being of citizens from environment-related risks and impacts*. This five-year strategy, which began in 2020 and ends in 2025, aims to boost resilience, assure skill development for all, and promote sustainable competitiveness. It promotes sustainable competitiveness and social justice by implementing the first pillar of the European Pillar of Social Rights, "universal access to education, training, and lifelong learning." It improves crisis response using COVID-19 lessons. The European Skills Agenda contains 12 initiatives in four categories: collaborating, ensuring job-related skills, facilitating, and promoting. In 2022, JRC published a reference framework for competences related to sustainability, the European sustainability competence framework – GreenComp, in an effort to bridge the gap between what sustainability entails and the knowledge, skills, and attitudes that professionals need to have in order to adapt to the new era (Bianchi et al., 2022). This framework completes the three-year-old EntreComp framework, the European Entrepreneurship Competence Framework, which seeks to provide the entrepreneurial mindset milestones, including the necessary knowledge, skills, and competencies (European Commission, 2019b). Entrepreneurship is defined by EntreComp as the capacity to act on opportunities and ideas to create value for others. The value created may be monetary, cultural, or social.

This study aimed to gain insight into the understanding of sustainability by professionals and SME representatives as well as the actions and requirements of their organisations in complying with sustainability. In addition, we sought to determine the market-lacking skills and, consequently, the ways in which the CATALYST project will be able to provide assistance. We employed both quantitative and qualitative tools, by conducting an online survey and interviews and organizing national roundtables in the five CATALYST Partner countries (Austria, Germany, Greece, North Macedonia, and Portugal).

Campbell and Fisk pioneered the concept of combining various methods in 1959 when they used multimethods to examine the validity of psychological traits. This prompted others to combine methods, and soon field-based approaches, such as observations and interviews (qualitative data), were combined with traditional surveys (quantitative data; Sieber, 1973). Researchers believed that, despite the fact that all methods have limitations, the inherent biases of a particular method could neutralise or cancel out the inherent biases of other methods (Creswell, 2009). Joseph Check & Russell K. Schutt (2011) define survey research as "the collection of information from a sample of individuals through their responses to questions".

Surveys can produce both quantitative and qualitative data, allowing for a thorough comprehension of the relationship between formal and informal decision-makers (Ponto, 2015). Quantitative data, including Likert-scale ratings and multiple-choice questions, can provide statistical analysis and numerical comparisons (Gliem & Gliem, 2003). Qualitative data collected via open-ended queries can capture nuanced insights, personal experiences, and detailed narratives (Hoffmann, 2007; Nelson, 2010). In comparison to other methodologies, surveys have the advantage of reaching a greater number of participants. This extensive participation permits the incorporation of a wide variety of perspectives, resulting in a deeper comprehension of the issues. Surveys can be disseminated via a variety of channels, including online platforms, email, and traditional paper-based methods, ensuring that a wide range of participants can access them (Concannon et al., 2005; Regmi et al., 2016).

Surveys provide a standardised approach to data capture, ena.bling consistency and comparability among responses (De Leeuw, 2005; Leeuw et al., 2012). By using the same set of survey questions, common patterns, trends, and areas of agreement or disagreement can be analysed, compared, and aggregated. This standard method facilitates data analysis and the identification of critical problem areas. In order to gain a deeper understanding of the issues at hand, survey results should be supplemented with other methods, such as qualitative interviews and focus group discussions (Dawadi et al., 2021; Margaret C. Harrell & Melissa A. Bradley, 2009).

A valuable technique for promoting dialogue and problem-solving among various stakeholders, including policymakers, academics, businesses, and NGOs are the Roundtables (Van Asselt Marjolein & Rijkens-Klomp, 2002). Between formal and informal decision-makers, roundtables facilitate the sharing of knowledge and expertise (Brinkerhoff & Crosby, 2002). Formal decision-makers can provide insight into policies, regulations, and institutional frameworks, while informal decision-makers can contribute knowledge of the grassroots, community perspectives, and practical experiences. This knowledge exchange can lead to a deeper understanding of the issues and potential solutions (Lowry et al., 1997).

This diverse representation guarantees that a variety of perspectives and experiences are evaluated, thereby enhancing comprehension of the issue at hand (Brinkerhoff & Crosby, 2002). Through the roundtable's discussions and interactions, participants can generate recommendations for addressing the identified issues (Coleen Vogel et al., 2011; Wiek et al., 2012). These recommendations may take the form of policy suggestions, practical interventions, capacity-building initiatives, or collaborative projects (Wiek et al., 2012). Participants' collective knowledge contributes to the creation of well-informed and context-

specific solutions (Kirchner, 1992). Roundtables offer formal and informal decision-makers an opportunity to interact, develop relationships, and establish trust. This technique has the added benefit of bringing to light the shared aims and interests of the various types of stakeholders. By identifying areas where collaboration and cooperation are possible, participants can develop more effective problem-solving and decision-making processes (O'Leary & Bingham, 2003).

This study conducted an online survey and in person interviews between September and November 2022. Both surveys and interviews were administered to professionals and SME representatives in an effort to gain insight into their comprehension of sustainability as well as the actions and needs of their organizations in complying with sustainability. In addition, we sought to identify the skills that are lacking on the market and, as a result, the ways in which the CATALYST project will be able to provide assistance. Finally, six roundtables were organized in the five CATALYST Partner countries (Austria, Germany, Greece, North Macedonia, Portugal) in order to reflect on the policy and sector trends and gaps in each country, their needs, and the training they would be willing to undertake in order to achieve the aforementioned EU and national goals.

2.   Methodology and data collection

The survey and interview followed the following format. The first section of the survey consisted of several demographic questions, while the main section consisted of questions pertaining to sustainability and governance, the purpose of which was to assess respondents' awareness of the Sustainable Development Goals (SDGs), their actions related to sustainability and management, and the significance and need for training on a variety of topics. Based on the competencies identified in EntreComp and GreenComp, these topics were developed (Bianchi et al., 2022; European Commission, 2019b). Then, the interview questions, which included the same demographic questions as the survey, were designed to gain a deeper understanding of the actions organizations are taking to implement sustainability and manage their employees. It included both multiple-choice and open-ended inquiries to promote an open dialogue between the interviewer and participant, while maintaining a standard format across all five countries.

Simple random sampling was used to obtain data from business owners and representatives from all sectors in Austria, Germany, Greece, North Macedonia, and Portugal. In total, 504 professionals and employees responded to the online survey, and 64 interviews were conducted to gain a deeper understanding of the current priorities and challenges facing businesses. Prior to data collection, all participants were required to provide consent under the GDPR. The survey was completed in an average of 11 minutes, while the interview lasted approximately 30 minutes. Depending on the preference of the participants, surveys and interviews were administered in either English or the native language.

The five participating countries in the CATALYST project, namely North Macedonia (25%), Greece (19%), Portugal (18%), Austria (16%), and Germany (15%), accounted for 93.4% of the responses. Men and women participated in the survey at similar rates (48.9% versus 49.5%). 64.5% of the participants were between the ages of 30 and 49, 25.7% were older than 50, and 9.8% were younger than 30. 31% of respondents were company executives, while 28%, 26%, 7%, 6%, and 2% were professionals, managers, administrative employees, junior/entry level, and technicians, respectively. 35% and 45% of the sample, respectively,

held a bachelor's or master's degree, while 9% also held a doctorate and 11% had completed high school (see Table 1).

Table 1 - Subjects characteristics

Gender	Percentage
Male	48.91%
Female	49.50%
Age	
<30	9.78%
30-39	31.14%
40-49	33.33%
50-59	18.76%
60-69	6.59%
>70	0.40%
Education	
High-school diploma	10.82%
BSc. / BA	35.07%
MSc. / MA / MBA	45.49%
PhD	8.62%
Role in the organisation	
Top Management	30.82%
Middle Management	25.65%
Junior Management	5.77%
Professional	28.43%
Administrative Staff	7.16%
Technician	2.19%

57% and 18% of the survey responses came from SMEs and large corporations, respectively, while the remaining 26% came from universities and research institutes, VET providers, public institutions, and NGOs/CSOs. SMEs are businesses with fewer than 250 employees, as defined by the OECD in 2022, and can be further subdivided into micro enterprises (fewer than 10 employees), small enterprises (10 to 49 employees), and medium-sized enterprises (50 to 249 employees). Large businesses employ over 250 employees. In our sample, 48% of the responses were from large companies that employed more than one thousand people, while 52% employed between 250 and 999. SMEs are also distributed evenly, with 29% representing medium-sized businesses, 33% representing small businesses, and 37% representing micro businesses. 29% of the companies generated less than € 1 million in revenue, 31% between € 1 and € 10 million, and 19% over € 10 million (see Table 2).

Table 2 - Companies' characteristics

Type and size of organisation (in terms of employees)	Percentage
Large company	17.76%
with more than 1000 employees	*48.31%*
with 250-999 employees	*51.69%*
Small-Medium Size Enterprise (SME)	56.69%
with 50-249 employees	*29.23%*
with 10-49 employees	*33.45%*
with 1-9 employees	*37.32%*
University / Research Institute	7.58%
VET provider	3.59%
Public institution	6.99%
NGO/CSO	6.59%
Size of organisation (in terms of turnover)	
less than € 1 million	28.63%
more than € 1 million less than € 2 millions	10.34%
more than € 2 million less than € 10 millions	20.48%
more than € 10 million less than € 50 millions	9.34%

more than € 50 millions	9.34%

The majority of responses came from the manufacturing, construction, college, university, and VET education sectors, as well as the environment, scientific or technical services, finance and insurance, software, and telecommunications industries. This outcome is consistent with the RIS3 priorities presented by country. SDG8 (Decent work and economic growth), SDG 5 (Gender equality), SDG 13 (Climate action), SDG 9 (Industry, innovation and infrastructure), SDG 3 (Good health and well-being), and SDG 17 (Partnerships for the objectives) account for 36%, 33%, 28%, 27%, 23%, and 21% of the companies' efforts, respectively.

Six national roundtables on "Challenges and Perspectives in Leading Sustainable Systems and Business Transformation" were conducted in November and December 2022 in North Macedonia, Germany, Austria, Portugal, and Greece, based on the initial findings of the desk and field research presented above. Managers of SMEs and corporations, representatives of educational and research institutions and organisations, non-profit organisations, business associations and public institutions, distinguished experts, project managers in the field of sustainable policies and practices, the academic public, representatives of various sectors, and representatives of relevant institutes and state institutions were among the 214 individuals who attended the events (see Table 3).

Table 3 – Roundtables' participants breakdown

Type of Institutions	Total
Academia, Research Institute, other Educational Organisations	62
NGOs, Non-Profit Organisations	10
Companies, SMEs, Corporations	79
Chamber, Business, Associations	31
Public Institutions	23
Total	217

The discussion was framed by the challenges, impediments, and support for the sustainable transformation of organizations, with a particular emphasis on skills, education, and training. Every roundtable utilized the identical methodology. The roundtables were intended to include at least 30 individuals. The roundtables lasted between two and three hours and took place in-person or online. All workshop organizers were provided with agenda templates, guidelines, and materials, and they attended a "Train the Facilitator" workshop designed to familiarize them with the tools that should be utilized during the workshop. All participants were then instructed to complete an evaluation form. Each roundtable was conducted in the native tongue. Finally, all responses were translated and organized in Miro, an online visual platform that allows users to connect, collaborate, and work collaboratively on online boards.

3.   Results and Discussion

This section presents the results of the online survey, interviews, and roundtables. Respondents were asked to rate several statements regarding corporate governance practices on a scale from 1 ("I do not agree") to 5 ("I strongly agree"). As shown in Figure 1, more than half of the respondents do not believe that the company they work for incorporates practices such as setting clear strategies, investing in R&D and supporting the proposal of new ideas. However, they believe that their companies treat fairly the employees and have adopted anti-fraud policies. It is also argued that it is satisfying to work in their company, that they are provided with fair salaries, while there is flexibility in terms of work from home, repositioning, and upskilling.

Nevertheless, a substantial percentage of the online survey respondents believe they are neither satisfied nor fairly compensated, despite being treated fairly, with only 25.5%, 30.6%, and 52.3% claiming they are completely satisfied, fairly compensated, and treated fairly, respectively. Respondents from Greece appear to be more satisfied than those from the other four countries, although the pattern appears to be the same for all five nations. As of 65.4%, employees of companies where decisions are made in a collegial manner believe they are treated equitably, but the other two parameters, salary and overall satisfaction, appear to remain relatively constant (34.4% and 35.5%, respectively). Another interesting fact is that all three of these factors increase considerably for employees of companies with less than €1 million in annual revenue, with 72.3%, 46.3%, and 44.1% believing they are treated and compensated fairly and being completely satisfied, respectively. Comparing the company's scale by number of employees yields comparable outcomes. The majority of respondents believe that micro enterprises provide a more agreeable work environment (see Table 4).
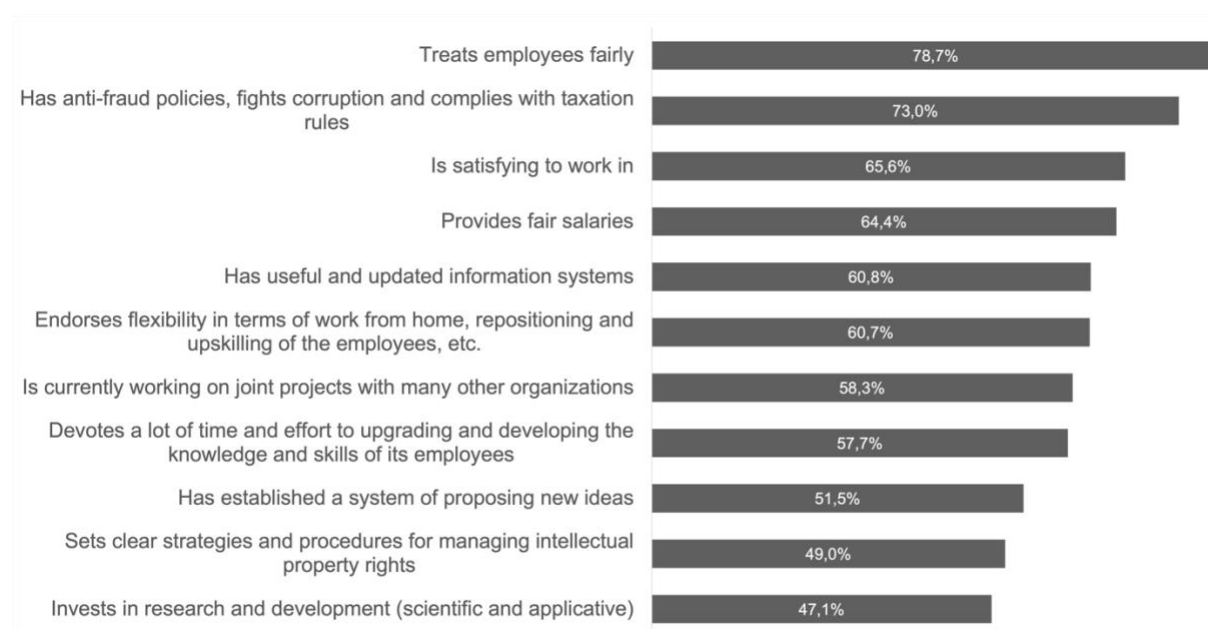

Figure 1 - Employees beliefs about the company they work for (source: online surveys)

Table 4 - Fair treatment, salaries and overall satisfaction (source: online surveys)

Size of the company (in terms of employees)	Employees are treated fairly	Employees are paid fairly	Employees are satisfied
1-9	76.9%	30.8%	53.8%
10-49	5.6%	30.%	22.4%
50-249	42.9%	21.2%	14.3%
250-999	43.8%	23.3%	17.8%
1000+	30.0%	14.0%	14,.0%
Size of the company (in terms of turnover)			
≤ € 1 million	72.3%	46.3%	44.1%
> of € 1 million and ≤ € 2 million	52.1%	30.2%	25.3%
> € 2 million and ≤ € 10 million	52.1%	30.2%	25.3%
> € 10 million and ≤ € 50 million	52.1%	30.2%	25.3%
> € 50 million	52.1%	30.2%	25.3%
Decision-making within the organisation			
By the founder and his/her family/inner circle	45.2%	31.5%	23.8%
In a collegial way	6.4%	34.4%	35.3%
By a few individuals/experts	45.7%	25.1%	16.9%

Regarding team collaboration, an average of 87% of respondents affirm that they work as closely as feasible with teams from diverse backgrounds within their organization. In a few cases, even though the desire for collaboration is substantially high, there is a strong aversion to teamwork and collaboration, which is an intriguing result. In Austria, for instance, 93.8% of respondents stated that they strive to work closely with their co-workers, while 48.1% stated that they avoid interaction when formulating an idea.

Regarding sustainable development, the majority of the online survey respondents (69%) are aware of the Sustainable Development Goals (SDGs), with Greece lagging behind and Germany dominating with 84% of respondents aware of the SDGs. In addition, 80.6% of respondents believe that if we all change our consumption habits, we can mitigate climate change, while over 65% of respondents believe they are capable of contributing to CO2 emission reduction, being familiar with Sustainable Development European policies and environmentally conscious consumers. Seventy-eight percent of respondents believe that their organization's interest in sustainability has grown over the past five years, as evidenced by increased investments and sustainability-related actions. This accords with survey and interview findings.

The findings indicate that economic, social (employees/customers), and environmental factors are the most important drivers of sustainability within an organization. When addressing sustainability, the companies believe that long-term (economic) sustainability of the organization and cost reduction are of the utmost importance, followed by social and environmental aspects such as health, safety, and well-being, environmental issues, and energy conservation.

As   shown   in
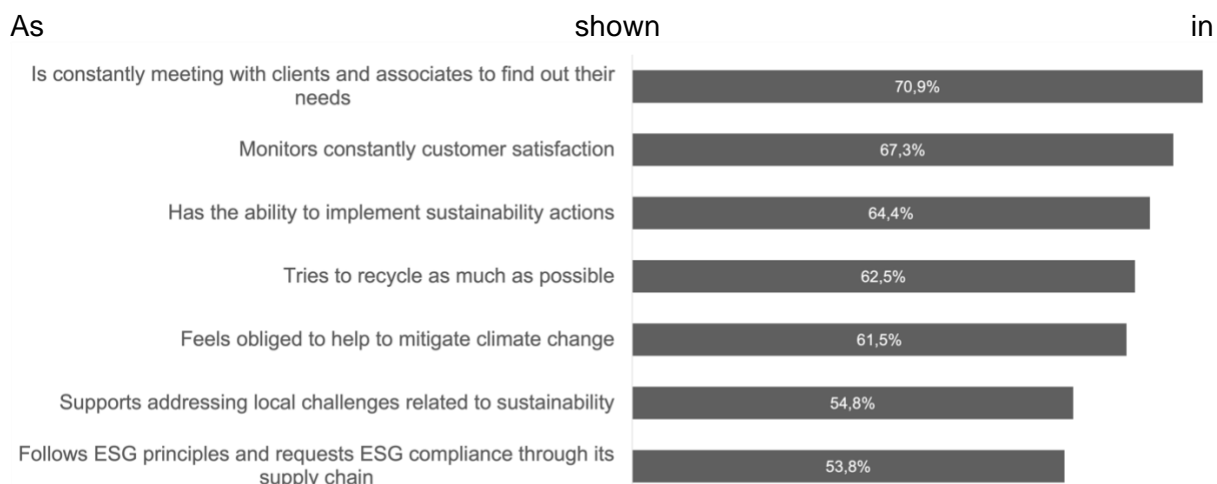
Figure 2, the majority of survey respondents affirm that their employer engages in sustainable practices such as recycling, adhering to ESG principles, supporting local sustainability-related challenges, and monitoring client satisfaction. In addition, they affirm that their company has the capability and the moral obligation to combat climate change. 59% of respondents indicated that their company is presently engaged in collaborative projects with other organizations. Although customer satisfaction ranks last among the companies' priorities (according to the interviews), 71% of respondents said that their company meets frequently with clients and employees to determine their requirements.

Is constantly meeting with clients and associates to find out their needs	70,9%
Monitors constantly customer satisfaction	67,3%
Has the ability to implement sustainability actions	64,4%
Tries to recycle as much as possible	62,5%
Feels obliged to help to mitigate climate change	61,5%
Supports addressing local challenges related to sustainability	54,8%
Follows ESG principles and requests ESG compliance through its supply chain	53,8%

Figure 2 - Employees beliefs about the company they work for (source: online surveys)

In alignment with the above-mentioned results, the interviews prioritized the actions taken to achieve sustainability with the order presented in Table 5. However, when asked during the interviews if they measure the environmental footprint of their organization, 69% of interviewees responded that they do not. In addition, only four of the sixty-four interviewees verified that they conduct sustainability reports in their organizations and provided the relevant links. As anticipated based on the results presented above, economic considerations rank among the greatest obstacles to adopting and practicing sustainability. Specifically, higher cost of adoption/higher operating costs, customers' willingness to pay for a sustainable product/service, lack of funding mechanisms, and lack of expertise/unskilled employees on sustainability practices are the most significant obstacles, as validated by 19%, 15%, 15%, and 12% of the interviewees, respectively.

Table 5 - Sustainability practices performed by the companies (source: Interviews)

Sustainability practices performed by the companies	Percentage
Improving energy efficiency	11,75%
Developing new innovative and sustainable products/services	10,84%
Having a long-term commitment to all employees and encourage their personal and professional development through career planning, training, equal promotion opportunities, psychological support, health assurance, safety provision etc.	10,24%
Introducing Circular Economy principles (reduce, reuse, recycle) in the design, manufacturing, and waste treatment stages of production or in the daily operations (if the organization is not a manufacturer)	9,94%
Using energy coming from renewable sources	8,73%
Monitoring sustainable practices	8,13%
Reaching out to external stakeholders about sustainability issues	6,63%
Mitigating Climate Change, i.e., directly reducing green-house gas emissions	6,33%
Adapting to Climate Change, i.e., investing in resilient solutions	5,72%
Assessing the financial payoffs of sustainability investments	5,42%
Applying sustainability criteria when making purchasing decisions or selecting project partners and subcontractors	4,52%
Reducing water use	4,22%
Sponsoring and supporting community activities related to sustainability	3,92%
Developing strategies, public annual reports and press releases on its sustainability performance	3,61%

Collaboration and partnerships, behaviour change and sustainability values, and systems thinking appear to be the most important areas for the businesses that participated in the online survey. This finding is consistent with the preceding ranking, in which the firms believe that the organization's (economic) long-term viability and cost containment should take precedence over social and environmental concerns. However, the majority of respondents agreed that they would require additional training and skill development in all presented sustainability areas, with a particular emphasis on understanding and adapting sustainable business models and circular economy, forming collaborations and partnerships, applying sustainable entrepreneurship frameworks, and embracing sustainability values and best practices.

Employees with greater managerial responsibilities appear to be more interested in ESG reporting than those in less senior positions. However, employees with less professional experience are interested in learning more about overarching concepts such as the circular economy, climate change, and behavior modification. In addition, it is important to note that employees with more than three years of experience position sustainable business models and sustainable entrepreneurship significantly higher. Senior employees, who may be accountable for expanding their institution's collaborations and network, also appear to place a high value on partnerships.

Policy frameworks, corporate needs, and educational requirements dominated roundtable discussions. The first part of the discussion introduced participants to the most important EU and national policies, identified any missing or forthcoming policy documents in their country/expertise, and discussed how these documents affect their organizations. The European Green Deal, which aims to make the EU a modern, resource-efficient, and competitive economy, was generally praised in the five consortium countries' roundtables. All consortium members considered the EU Taxonomy and EU Action Plan on Financing Sustainable Growth strategic papers because they provide green financing. In North Macedonia, a non-EU state with limited access to such money, these documents were irrelevant. All six roundtables emphasized European political initiatives and legislation over national ones. Businesses need help identifying the policies that will directly affect them due to the complexity of EU, national, and regional policy laws. The roundtables covered the fields of climate change, sustainability, energy, and skills (*Table 6*). Stakeholders selected about seventy strategic national policies that are relevant/important to their work.

Table 6 - European and national policies

Climate change	Sustainability	Energy	Skills
Agenda 2030 Sustainable Development Goals, Biodiversity Strategy, low greenhouse emissions strategy, EU strategy on adaptation to the climate change, European Climate Law, Climate Protection Act, European Climate and Energy Framework for 2030	European Sustainable Development Strategy, Corporate Sustainability Reporting Directive, Circular Action Plan, New Generation EU	Renewable Energy Directive, Directive for the deployment of alternative fuels infrastructure, EU taxonomy framework for the taxation of energy production, Directive on the promotion of the use energy from RES	European Skills Agenda, GreenComp, Entre Comp, Osnabrück declaration of Vocational Education and Training, European agenda for adult learning.

The second part categorized the organization's most significant obstacles, challenges, and strategies for implementing sustainability and management practices. The stakeholders who participated in the roundtables identified a number of common obstacles to the implementation of sustainable practices in their organizations, as well as future plans and solutions geared at addressing these obstacles. Costs, resistance to change, a lack of qualified workers and the need for new competencies, rigid structures, digitalisation, a lack of knowledge regarding financing options, return on investment (ROI), and greenwashing are the most typical

obstacles. Creating a new narrative within organizations, education for sustainable development, mobility, utilizing core competencies for the greatest benefits, cooperation process optimization, investment in training, work flexibility, energy efficiency measures, use of green energy, installation of solar panels, managing intellectual capital, a green workplace, training for mentors, and improved communication were cited as business opportunities in implementing sustainable practices.

The third part of the discussion focused on identifying the skillsets lacking in their organization's workforce and gaining an understanding of the measures taken (e.g. investments in trainings, collaborations, etc.) to bridge the gap between employee expertise and international and national sustainability trends. The participants identified a need for a wide variety of courses and competencies (76 in total) to support the transition towards sustainability. Sustainability, circular economy, creativity, digital competencies, design thinking, knowledge management, environmental regulations, people management, behavioural skills, collaboration, critical thinking, system thinking, lifelong learning, green skills, and cultural intelligence were cited as the most necessary courses.

4.   Conclusions

The CATALYST project seeks to influence attitudes toward sustainability through the use of real-world examples and by demonstrating the advantages of sustainable practices in future courses. This pursuit is aligned with UN's vision of "leaving no one behind" and the "Just Transition", as defined in the European Green Deal. Our study integrated both quantitative and qualitative methods to assess the efforts taken towards sustainability and the major challenges that companies face today in this transition.

The survey conducted in five countries revealed that over half of respondents do not believe their company incorporates practices such as clear strategies, R&D, and new idea proposals. Although they believe that their companies treat employees fairly and have adopted anti-fraud policies, a significant percentage of respondents feel neither satisfied nor fairly compensated, despite being treated fairly. In terms of team collaboration, 87% of respondents work closely with teams from diverse backgrounds within their organization. The majority of respondents are aware of the SDGs, with Greece lagging behind and Germany dominating with 4 out of 5 respondents being aware of the SDGs. Over 65% of respondents believe they are capable of contributing to CO2 emission reduction, being familiar with Sustainable Development European policies and environmentally conscious consumers. They also believe their company has the capability and moral obligation to combat climate change.

In spite of the positive statements above, 69% of interviewees do not measure their organization's environmental footprint, and only the 6% verified that they conduct sustainability reports. Economic considerations, such as higher costs, customer willingness to pay for sustainable products/services, lack of funding mechanisms, and lack of expertise, were the most significant obstacles to adopting and practicing sustainability. Collaboration and partnerships, behavior change and sustainability values, and systems thinking were identified as the most important areas for businesses. However, the majority of respondents agreed that they would require additional training and skill development in all sustainability areas, with a focus on understanding and adapting sustainable business models, circular economy, forming collaborations, applying sustainable entrepreneurship frameworks, and embracing sustainability values and best practices.

Policy frameworks, corporate needs, and educational requirements dominated roundtable discussions. The European Green Deal was praised in five consortium countries' roundtables,

while the European Taxonomy and EU Action Plan on Financing Sustainable Growth strategic papers were considered irrelevant in North Macedonia. Businesses need help identifying the policies that directly affect them due to the complexity of EU, national, and regional policy laws. Common obstacles include costs, resistance to change, a lack of qualified workers, rigid structures, digitalization, lack of knowledge regarding financing options, return on investment (ROI), and greenwashing. Opportunities for implementing sustainable practices include creating a new narrative within organizations, education for sustainable development, mobility, core competencies, cooperation process optimization, investment in training, work flexibility, energy efficiency measures, green energy, solar panels, managing intellectual capital, a green workplace, training for mentors, and improved communication.

The third part focused on identifying the skillsets lacking in an organization's workforce and gaining an understanding of measures taken to bridge the gap between employee expertise and international and national sustainability trends. A recommendation from our roundtables is the implementation of policies that encourage collaboration between businesses, research centers, and universities. In spite of a number of challenges and requirements, a number of measures are already in place or are planned for the future in order to make businesses more sustainable. These include the installation of renewable energy sources, process optimization, teleworking, and training. CATALYST should also include in its training plans an introduction to funding mechanisms, the economic benefits of adopting early sustainable practices, and an explanation of how regulatory frameworks are pertinent to the daily operations of businesses. Additionally, efforts should be made to raise awareness in order to a) inspire top management and shareholders to adopt sustainable practices and b) alter consumers' propensity to pay a higher price for sustainable products/services.

5.   Limitations

More research is needed to investigate the generalizability of these results. There are two major limitations in this study that could be addressed in future research. The first is related to the sample representativeness, as our sample was derived mainly from the social and professional networks of the CATALYST project partners, which may not fully represent the entire population of interest, and thus, the results may not be applicable to the broader population. The second limitation concerns the time constraint, which limited the ability to gather data over an extended period.

6. Acknowledgement

7. References

Bianchi, G., Pisiotis, U., Cabrera, M., Punie, Y., & Bacigalupo, M. (2022). *GreenComp: The European sustainability competence framework*. https://doi.org/10.2760/13286

Brinkerhoff, D. W., & Crosby, B. ,. (2002). *Managing Policy Reform: Concepts and Tools for Decision-makers in Developing and transitioning countries*. Kumarian Press. https://books.google.gr/books?hl=el&lr=&id=r-py_7AVh6oC&oi=fnd&pg=PR10&dq=Brinkerhoff,+D.W.+and+Crosby,+B.,+2002.+Managing+policy+reform:+Concepts+and+tools+for+decision-makers+in+developing+and+transitioning+countries.+Kumarian+Press.&ots=okmbEPu2DY&sig=5WkqnvzltdxuV9kRraONjkZ9Fak&redir_esc=y#v=onepage&q&f=false

Coleen Vogel, C. Moser Susanne, E. Kasperson Roger, & D. Dabelko Geoffrey. (2011). Linking Vulnerability, Adaptation, and Resilience Science to Practice: In *Integrating Science and Policy*. https://www.taylorfrancis.com/chapters/edit/10.4324/9781849775458-6/linking-vulnerability-adaptation-resilience-science-practice-pathways-players-partnerships1-coleen-vogel-moser-susanne-kasperson-roger-dabelko-geoffrey

Concannon, F., Flynn, A., & Campbell, M. (2005). What campus-based students think about the quality and benefits of e-learning. *British Journal of Educational Technology*, *36*(3), 501–512. https://doi.org/10.1111/J.1467-8535.2005.00482.X

Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches. *SAGE Publications Ltd*. https://www.ucg.ac.me/skladiste/blog_609332/objava_105202/fajlovi/Creswell.pdf

Dawadi, S., Shrestha, S., & Giri, R. A. (2021). Mixed-Methods Research: A Discussion on its Types, Challenges, and Criticisms. *Journal of Practical Studies in Education*, *2*(2), 25–36. https://doi.org/10.46809/jpse.v2i2.20

De Leeuw, E. D. (2005). To Mix or Not to Mix Data Collection Modes in Surveys. *Journal of Official Statistics*. www.websm.org

European Commission. (2019a). *COM (EU) 2019/640 The European Green Deal*. https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF

European Commission. (2020). *European Skills Agenda for sustainable competitiveness, social fairness and resilience*.

European Commission, D.-G. for E. S. A. and I. (2019b). *EntreComp: the European Entrepreneurship Competence Framework*. Publications Office. https://data.europa.eu/doi/10.2767/405164

European Union. (2021). *REGULATION (EU) 2021/1119 European Climate Law*. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1119&from=EN

Gliem, J. A., & Gliem, R. R. (2003). Calculating, Interpreting, And Reporting Cronbach's Alpha Reliability Coefficient For Likert-Type Scales. *Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education*. https://scholarworks.iupui.edu/handle/1805/344

Hoffmann, E. A. (2007). Open-ended interviews, power, and emotional labor. *Journal of Contemporary Ethnography*, *36*(3), 318–346. https://doi.org/10.1177/0891241606293134

Joseph Check, & Russell K. Schutt. (2011). *Research Methods in Education*. SAGE Publication. https://books.google.gr/books?hl=el&lr=&id=nSWYAAAAQBAJ&oi=fnd&pg=PP1&dq=Check,+J.,+%26+Schutt,+R.+K.+(2011).+Research+methods+in+education.+Sage+publications.&ots=U9mxQ_VKkf&sig=bdgl7hE2_Wj8i1YfV7YB2nGxqyc&redir_esc=y#v=onepage&q=Check%2C%20J.%2C%20%26%20Schutt%2C%20R.%20K.%20(2011).%20Research%20methods%20in%20education.%20Sage%20publications.&f=false

Kirchner, E. J. , 1992. (1992). *Decision-making in the European Community: The Council Presidency and European Integration*. Manchester University Press. https://books.google.gr/books?hl=el&lr=&id=TVbpAAAAIAAJ&oi=fnd&pg=PP9&dq=Kirc

hner,+E.J.,+1992.+Decision-making+in+the+European+Community:+The+Council+presidency+and+European+integration.+Manchester+University+Press.&ots=C8YzRngK81&sig=Huhqjb302b_leRIK68do6_5zTtA&redir_esc=y#v=onepage&q&f=false

Leeuw, E. D. de, Hox, J. J., & Dillman, D. A. (2012). Choosing the Method of Data Collection. *The International Handbook of Survey Methodology*, 113–135. https://doi.org/10.4324/9780203843123-7

Lowry, K., Adler, P., & Milner, N. (1997). Participating the Public: Group Process, Politics, and Planning. *Http://Dx.Doi.Org/10.1177/0739456X9701600302*, *16*(3), 177–187. https://doi.org/10.1177/0739456X9701600302

Margaret C. Harrell, & Melissa A. Bradley. (2009). Data Collection Methods: Semi-Structured Interviews and Focus Groups. *RAND National Defense Research Institute,*. www.rand.org

Nelson, I. A. (2010). From Quantitative to Qualitative: Adapting the Life History Calendar Method. *Http://Dx.Doi.Org/10.1177/1525822X10379793*, *22*(4), 413–428. https://doi.org/10.1177/1525822X10379793

O'Leary, R., & Bingham, L. B. (2003). *The Promise and Performance of Environmental Conflict Resolution*. Resources for the Future. https://books.google.gr/books?hl=el&lr=&id=x8uTMmkyX18C&oi=fnd&pg=PR9&dq=O%27Leary,+R.+and+Bingham,+L.B.+eds.,+2003.+The+promise+and+performance+of+environmental+conflict+resolution.+Resources+for+the+Future.&ots=G5bMt7ZNLI&sig=sEmt6JqrlLbbxL7HPZrK7wyO_XY&redir_esc=y#v=onepage&q&f=false

Ponto, J. (2015). *Understanding and Evaluating Survey Research*.

Regmi, P. R., Waithaka, E., Paudyal, A., Simkhada, P., & Van Teijlingen, E. (2016). Guide to the design and application of online questionnaire surveys. *Nepal Journal of Epidemiology*, *6*(4), 640. https://doi.org/10.3126/NJE.V6I4.17258

UNFCCC. (2022). *The Paris Agreement | UNFCCC*. https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

United Nations. (2022). *Transforming our world: the 2030 Agenda for Sustainable Development | Department of Economic and Social Affairs*. https://sdgs.un.org/2030agenda

Van Asselt Marjolein, B. A., & Rijkens-Klomp, N. (2002). A look in the mirror: reflection on participation in Integrated Assessment from a methodological perspective. *Global Environmental Change*, *12*, 167–184. www.cpm.mmu.ac.uk/firma/

Wiek, A., Ness, B., Schweizer-Ries, P., Brand, F. S., & Farioli, F. (2012). From complex systems analysis to transformational change: a comparative appraisal of sustainability science projects. *Manchester University Press.* https://doi.org/10.1007/s11625-011-0148-y