STUDY

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Climate adaptation using Cohesion Policy

Fostering adaptation, regional resilience and economic sustainability

Regional Development

Policy Department for Structural and Cohesion Policies
Directorate-General for Internal Policies
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RESEARCH FOR REGI COMMITTEE

Climate adaptation using Cohesion Policy

Fostering adaptation, regional resilience and economic sustainability

Abstract

This study examines how Cohesion Policy can support climate adaptation, regional resilience and sustainable businesses in the EU. It identifies regional and sectoral adaptation needs, maps relevant EU policy instruments and assesses current Cohesion Policy investment support. The study finds increased but still insufficient funding for adaptation, with gaps between support and needs. Recommendations include improving the integration and tracking of adaptation, developing tailored sectoral strategies, improving business awareness and funding access, and enhancing regional capacity for adaptation.

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DISCLAIMER

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LIST OF ABBREVIATIONS

CAP	Common Agricultural Policy
CF	Cohesion Fund
DNSH	Do No Significant Harm principle
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
EIB	European Investment Bank
EIOPA	European Insurance and Occupational Pensions Authority
EMFAF	European Maritime, Fisheries and Aquaculture Fund
ERDF	European Regional Development Fund
ESF+	European Social Fund Plus
EU	European Union
GHG	Greenhouse Gases
HERA	Health Emergency Preparedness and Response Authority
JTF	Just Transition Fund
MA	Managing Authority
MFF	Multiannual Financial Framework
OP	Operational Programme
PO	Policy Objective
SEAR	Solidarity and Emergency Aid Reserve
SME	Small and Medium-sized Enterprises
TEN	Trans European Network
TEN-E	Trans European Networks for Energy
TEN-T	Trans European Transport Network
UCPM	EU Civil Protection Mechanism

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EXECUTIVE SUMMARY

Background

Climate change poses growing risks across the European Union (EU), with weather and climate-related extremes causing over EUR 650 billion in economic losses from 1980 to 2022. The EU has responded by including adaptation in its policy framework, notably through the 2021 EU Adaptation Strategy. Cohesion Policy, with a EUR 392 billion budget for 2021-2027, stands out as a key instrument for driving adaptation and resilience building across Europe's diverse regions.

Aim

This study assesses how Cohesion Policy can foster climate adaptation, regional resilience, and sustainable businesses in the EU. It aims to identify climate risks and adaptation needs, map relevant EU policy instruments, evaluate current Cohesion Policy support, and identify gaps. Additionally, the study offers recommendations, and showcases success stories and initiatives that can strengthen the role of Cohesion Policy in advancing climate adaptation.

Key Findings

Regional and Business Climate Adaptation Needs

The study identifies various climate risks and adaptation needs across different types of EU regions including urban areas, rural areas, coastal zones, mountainous regions, islands, and outermost regions. For example, urban areas face risks from flooding, heatwaves and air quality degradation, requiring improved drainage systems, expansion of green spaces, and promotion of sustainable transport. Rural areas are vulnerable to drought, extreme heat and wildfires, needing sustainable water management and agricultural practices, while coastal zones and islands face sea-level rise and extreme weather events. Mountainous regions face melting snow cover and glacier retreat, which enforce the need for sustainable water management and biodiversity conservation.

For businesses, climate risks and adaptation needs vary significantly across economic sectors. Agriculture and forestry require strategies to deal with changing temperatures and precipitation patterns. The tourism sector needs to diversify what it can offer, in order to build resilience, while energy, transport, environmental, and communication infrastructure require greater protection from the worsening physical impacts of climate change. The study also highlights key barriers faced by businesses in implementing adaptation measures, including a lack of information, financial constraints, and regulatory uncertainty.

EU Adaptation Strategy and Policy Framework

The 2021 EU Adaptation Strategy sets three key objectives: Smarter Adaptation, More Systemic Adaptation, and Faster Adaptation. To implement these objectives, the EU employs a multi-faceted policy approach with 48 different instruments including funding mechanisms, information platforms, legislative frameworks, initiatives, and emergency response mechanisms.

Cohesion Policy plays a key role in this framework through instruments such as the European Regional Development Fund (ERDF), Cohesion Fund (CF), and Just Transition Fund (JTF), among others. These funds support climate adaptation through various mechanisms, from investments in adaptation projects, to support for businesses in transitioning to more resilient practices.

Current State of Cohesion Policy Support for Climate Adaptation

The study finds that Cohesion Policy support for adaptation has increased from EUR 8 billion in 2014-2020 to EUR 17 billion planned for 2021-2027. However, this still represents only 3% of the total Cohesion Policy budget, a relatively small portion compared to the 30% climate target of the ERDF or

the 37% target of the CF. The geographical distribution of funding varies significantly, with some Member States such as Poland allocating substantial amounts whilst others have not invested in adaptation at all. Survey results indicate that 29% of Managing Authorities (MAs) consider their programmes to be only partially or not at all aligned with adaptation needs. While 70% of the business respondents also find that Cohesion Policy moderately or slightly aligns with their sectoral needs, businesses have mixed perceptions about the availability and effectiveness of funding, with 46% rating availability as 'fair' and 41% as 'poor'.

The study identifies several **success factors** for effective implementation of adaptation projects, including strong stakeholder engagement and buy-in, adequate technical capacity, and sufficient financial resources. For businesses, **common barriers** to using Cohesion Policy funding for adaptation include lack of awareness and complex application procedures.

Gaps, opportunities, and future adaptation priorities for Cohesion Policy

The analysis reveals some gaps between current Cohesion Policy support and adaptation needs:

- Insufficient availability of direct support for adaptation and insufficient targeting of specific local adaptation needs in different territories.
- Partial misalignment of Cohesion Policy support for adaptation and the perceived needs of businesses.
- Insufficient use of Cohesion Policy for business adaptation due to the barriers identified.
- Further efforts are needed to ensure that, in terms of supporting adaptation 'on the ground', the potential of Cohesion Policy instruments is fully achieved.

Policy Recommendations

Four key policy recommendations are proposed in view of the key findings of the study:

- The European Parliament could task the European Commission with improving the tracking of climate spending, to distinguish between funding for mitigation and for adaptation. This would ensure more accurate reporting and understanding of the funding. Meanwhile, Member States (including Managing Authorities) could be encouraged to better mainstream[1] adaptation in all Cohesion Policy investments.
- The European Commission and Member States could work together to develop tailored sector-specific strategies or pathways to access Cohesion Policy, in order to ensure that specific regional (including regions with common climate risks such as outermost, coastal or mountainous regions) and/or sectoral adaptation needs are addressed, together with better coordination between different EU funding instruments.
- The European Commission and Managing Authorities could enhance business awareness and accessibility of Cohesion Policy through awareness raising of the needs and benefits of climate adaptation, and targeted communication efforts regarding the available Cohesion Policy funding for adaptation.
- National authorities (in partnership with EU institutions such as the European Parliament, European Commission and European Committee of the Regions) could work towards strengthening regional and local capacity for adaptation by improving the knowledge and expertise within regional and local authorities. This would include increasing the awareness of local and regional authorities of existing support programmes and making better use of existing training opportunities.

[1] 'Climate mainstreaming' is a concept used by financial institutions to refer to the systematic integration of climate considerations into all of a financial institution's strategies and operations (see Mainstreaming climate in financial institutions). The European Commission highlights that its approach to climate mainstreaming (of which adaptation mainstreaming is a logical part) requires 'EU programmes in all policy areas to consider climate priorities in their design, implementation and evaluation phases' (see European Commission - Climate mainstreaming).

1. INTRODUCTION

Context and Background

The impacts of climate change pose growing risks to communities, economies and ecosystems across the European Union (EU). From 1980 to 2022, weather and climate-related extremes caused more than EUR 650 billion in total economic losses in the EU, with average annual losses increasing steadily in recent years[2], reinforcing the urgent need for greater climate adaptation and resilience building across Europe. However, the impacts of climate change are manifested differently across the EU's diverse regions, creating a **need for adaptation** strategies to be tailored to the regional and potentially local contexts they are intended to benefit[3].

At the same time, the EU has committed to becoming climate neutral by 2050 through the European Green Deal and the European Climate Law[4], which will require transformational shifts across all sectors of the economy. Businesses have a critical role to play in this transition, but they also face their own challenges in adapting to the physical impacts of a changing climate. As these impacts intensify year after year, delaying efforts to enhance the resilience of European businesses results in escalating costs, both in terms of addressing damages and the rising expenses of protection. In the long-term, failing to transition to a more sustainable economic model also increases costs in terms of reduced productivity, which could severely undermine Europe's competitiveness on the global stage.

Recognising the urgent need to adapt to climate change, the EU has taken steps to integrate adaptation into its policy framework. **The 2021 EU Adaptation Strategy**[5] sets out the long-term vision for the EU to become a climate-resilient society by 2050. The purpose of various policy instruments at EU level is to translate this vision into action, at both regional and local levels. Among these instruments, **Cohesion Policy** stands out as the EU's main investment tool for supporting the development of its regions. With a **EUR 392 billion budget for the 2021-2027** period[6], Cohesion Policy has significant potential to drive adaptation and resilience building across Europe. However, questions remain about the effectiveness of Cohesion Policy in addressing regional adaptation needs and whether reforms may be needed to strengthen its impact in the context of the Multiannual Financial Framework (MFF) 2028-2034.

Study Objectives

Against the backdrop of the climate challenges facing the EU, this study provides a focused assessment of how Cohesion Policy can foster climate adaptation, regional resilience, and sustainable businesses in the EU. The aim of the study is to achieve five main objectives:

- Firstly, **Chapter 2** aims to establish the climate risks and **adaptation needs of different EU regions**, as well as the business community and its different **economic sectors**.
- Secondly, **Chapter 3** seeks to provide a thorough **mapping of all EU-level policy instruments** that support the EU's Adaptation Strategy, with a focus on Cohesion Policy.
- Next, **Chapter 4** assesses the **current Cohesion Policy support** in addressing adaptation needs of EU regions and businesses, including identification of good practices.

[2] European Environment Agency, 2023, *Economic losses from weather- and climate-related extremes in Europe*. Retrieved from Link. Last accessed 23 February 2024.
[3] European Environment Agency, 2017, *Climate change, impacts and vulnerability in Europe 2016: An indicator-based report*. Retrieved from Link. Last accessed 23 February 2024.
[4] Regulation (EU) 2021/1119.
[5] COM(2021) 82 final.
[6] European Commission, *Available budget of Cohesion Policy 2021-2027*. Retrieved from Link. Last accessed 23 February 2024.

- Subsequently, **Chapter 5** identifies the **main gaps** between current Cohesion Policy support and the level of ambition that is required of regions and businesses.
- Finally, **Chapter 6** provides actionable **recommendations** for strengthening the role of Cohesion Policy in preparing European regions and businesses for the climate challenges ahead, with a view to informing the design of the MFF 2028-2034.

Methodology

To achieve these objectives, the study adopts a mixed-methods approach, combining desk research, policy mapping, quantitative analysis of funding data, and stakeholder consultations. The desk research included a targeted review of the **academic and grey literature** on climate adaptation needs and policies in the EU, focusing on Cohesion Policy instruments. This was complemented by a **mapping of EU-level policy instruments** that support the EU Adaptation Strategy, including an in-depth look at how Cohesion Policy supports adaptation across the EU's diverse regions and sectors in qualitative (i.e. how adaptation is supported) and quantitative (i.e. direct funding for adaptation intervention fields) terms.

The **stakeholder consultation** gathered insights and experiences from two key groups: **managing and other authorities** involved in implementing Cohesion Policy and **business stakeholders** across different sectors operating in the EU, including small and medium-sized enterprises (SMEs) and large enterprises. The consultation was carried out through two targeted surveys – one for each group – designed to capture the perceived effectiveness of Cohesion Policy support for climate adaptation, to identify gaps and explore future needs. The surveys received 89 responses from authorities in 22 Member States[7] and 37 responses from business stakeholders in 14 Member States[8] (for details see Annexes 2 and 3). The responses were analysed quantitatively (to highlight the prevalence of certain responses, and identify trends) and qualitatively (to draw conclusions).

However, it is important to recognise the **limitations** of this methodological approach, particularly in terms of the survey questionnaires, which largely reflect and are influenced by the perspectives of those stakeholders who chose to share their views in this study, rather than those who did not[9]. In addition, the quantitative mapping of Cohesion Policy support focused on the funding allocated to the adaptation intervention fields defined in the relevant fund legislation and as reported on the Cohesion Open Data Platform. It is possible that in practice, investments under other intervention fields may also include elements relevant to adaptation, but without detailed project information it is not possible to capture this support[10]. Furthermore, the quantitative data provides comparable indications across countries and time periods, but it does not contain explanatory information about the choices or reasoning behind the spending. Finally, the mapping of EU-level policy instruments was based on the instruments identified and mentioned in the EU Adaptation Strategy itself.

[7] Responses were not received from representative stakeholders from Greece, Finland, Luxembourg, Malta, and Slovakia.
[8] Responses were not received from stakeholders representing Austria, Czechia, Denmark, Estonia, Finland, Greece, Latvia, Lithuania, Luxembourg, Portugal, Slovakia, Slovenia, and Sweden.
[9] Information about the survey respondents is provided in Annex 2 and Annex 3.
[10] Project specific information is not readily available on the Cohesion Open Data Platform.

2. REGIONAL AND BUSINESS ADAPTATION NEEDS

KEY FINDINGS

- EU regions face diverse climate risks and have varying adaptation needs spanning from effective engagement with local communities, improvement of infrastructure resilience, and conservation of local biodiversity and ecosystems to better water management.
- Primary sectors, including agriculture, forestry, fishing, and mining, are highly climate-sensitive, facing significant risks from variations in precipitation, temperature shifts, and extreme weather events. Sectors essential for the provision of horizontal services, such as water, energy, transport, and healthcare, are vulnerable to extreme weather conditions that can damage infrastructure and disrupt essential services. Secondary and tertiary sectors, including construction, real estate, manufacturing, retail, and tourism, are also at risk due to potential disruptions to supply chains, raw material availability, and operations as a result of extreme heat, flooding, and other climate-related challenges.
- Similarly, as a result of climate change different economic sectors need to tackle different risks and must deploy varying adaptation approaches including: mitigation of the negative climate impacts on the labour force, using new technologies and climate-resilient materials or changing operating processes, and making entire sectors more sustainable as a way of ensuring their survival. An example of this is tourism.
- Nevertheless, businesses also face some challenges when implementing adaptation strategies including lack of information and data; financial constraints; regulatory and policy uncertainty; risk aversion; information and technological gaps; and lack of collaboration and coordination within sectors.

2.1. Climate risks and adaptation needs across EU regions

The primary **climate risks**[11] facing various EU regions, and the relevant adaptation needs are categorised according to Eurostat's territorial typologies, which are essential in European regional statistics and play a significant role in determining eligibility for Cohesion Policy funds[12,13,14]. The classification identifies **urban**, **rural**, **coastal**, and **mountainous areas**, along with **islands** and **outermost regions**.

The following table provides an overview of the adaptation needs across different EU regional typologies. Engaging local communities in adaptation efforts through awareness raising, capacity-building programmes, and active participation in adaptation planning and implementation is critical for the success of any adaptation strategy and is vital in any context[15]. While all adaptation needs are important, the table shows that some are more critical depending on the specific challenges faced by each EU region, as explained in the rest of this section.

[11] IPCC, 2023, *Summary for Policymakers*. In: *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* Retrieved from Link. Last accessed 26 August 2024. Also European Environment Agency, 2024, European Climate Risk Assessment (EEA Report No. *1/2024)*. Retrieved from Link. Last accessed 29 August 2024.
[12] Hincks, S., Carter, J., & Connelly, A., 2023, A new typology of climate change risk for European cities and regions: Principles and applications. Retrieved from Link. Last accessed 28 August 2024.
[13] Eurostat, 2024, Territorial typologies: Coastal areas, European Commission. Retrieved from Link. Last accessed 22 August 2024.
[14] Eurostat, 2018, *Methodological manual on territorial typologies* (Latest edition*)*. Retrieved from Link. Last accessed 22 August 2024.
[15] Khatibi, F. S. et al., 2021, *Can public awareness, knowledge and engagement improve climate change adaptation policies?*. Retrieved from Link. Last accessed 29 August 2024.

Table 1: Priority adaptation needs across different types of regions

Adaptation Needs	Urban Areas	Rural Areas	Coastal Areas and Islands	Mountainous Regions	Outermost Regions
Improved drainage systems and flood defences	✓		✓		✓
Expansion of green spaces and passive cooling designs	✓				
Promotion of public transport and cleaner technologies	✓				
Resilient infrastructure	✓		✓	✓	✓
Sustainable water management (irrigation, desalination)		✓	✓		✓
Diversifying agricultural practices and promoting conservation		✓			✓
Biodiversity protection and ecosystem conservation		✓	✓	✓	✓
Coastal defences (natural and artificial)			✓		
Integrated coastal management			✓		✓
Disaster risk reduction and early warning systems			✓		✓
Community engagement and capacity building	✓	✓	✓	✓	✓

Source: Authors own elaboration, based on European Environment Agency, 2024, *European Climate Risk Assessment*.

a. Climate risks and adaptation needs in urban areas

Urban areas across the EU face a diverse array of climate risks, exacerbated by the concentration of people, infrastructure, and economic activities. The most significant risks include **pluvial** (when extreme rainfall creates a flood) and **river flooding**, **heatwaves**, and the **urban heat island effect**[16], as well as **air quality degradation**[17]. Flooding, exacerbated by heavy rainfall and inadequate drainage, is a major threat, particularly to cities in the UK, Scandinavia, and coastal regions of north-western Europe. Heatwaves, intensified by the urban heat island effect, are becoming more frequent, especially in southern Europe, leading to higher temperatures and increased energy demands for cooling[18]. Additionally, poor air quality, worsened by pollutants from vehicles, industry, and climate change, poses serious health risks (e.g. respiratory diseases) in densely inhabited urban areas[19].

[16] The Urban Heat Island effect can be described as a distinct urban climate, characterised by higher temperatures in densely built-up areas compared to the surrounding areas. Source: Oke, T. R., 1982, The energetic basis of the urban heat island, Quarterly Journal of the Royal Meteorological Society, 108(455), 1-24. Retrieved from Link. Last accessed 22 August 2024.

[17] European Environment Agency, 2024, *European Climate Risk Assessment (EEA Report No. 1/2024)*, Publications Office of the European Union, Luxembourg, p. 19. Retrieved from Link. Last accessed 29 August 2024.

[18] European Environment Agency, 2020, *Urban adaptation in Europe: How cities and towns respond to climate change (EEA Report No. 12/2020)*, European Environment Agency. Retrieved from Link. Last accessed 25 August 2024.

[19] European Environment Agency, 2024, *Europe's air quality status 2024*, 6 June 2024. Retrieved from Link. Last accessed 29 August 2024.

Adaptation in urban areas requires a combination of measures including:

- **Flood management:** Urban areas must invest in improved drainage systems, green infrastructure, and flood defences to manage the increased risk of flooding. This includes the development of permeable surfaces, green roofs, and rain gardens to absorb rainwater and reduce runoff, and retrofitting of ageing infrastructure to cope with modern climate conditions[20].
- **Heat mitigation:** To combat the urban heat island effect and the increased frequency of heatwaves, cities need to expand green spaces, plant trees, and create urban parks that provide shade and cooling. To reduce the need for air conditioning, building design standards should incorporate passive cooling techniques, such as the use of reflective materials and better insulation[21].
- **Air quality management:** Reducing air pollution in urban areas requires a multifaceted approach, including the promotion of public transport, cycling, and walking, as well as the adoption of cleaner technologies and fuels. Policies to limit emissions from industrial sources and vehicles, along with urban planning that reduces traffic congestion, are critical to improving air quality[22].
- **Resilient infrastructure:** Transportation, energy, and water systems must be made resilient to withstand the impacts of climate change. This includes upgrading infrastructure to withstand extreme weather events, improving energy efficiency, and ensuring that critical services can continue operating during and after climate-related disruptions[23].

b. Climate risks and adaptation needs in rural areas

Rural areas in the EU face significant climate-related risks, particularly **drought**, **extreme heat**, and **wildfires**, with southern Europe being most affected. Droughts severely impact agriculture, leading to reduced crop yields, soil degradation, and water scarcity, especially in the Mediterranean region. In addition, rural areas are also vulnerable to **floods** and **storms**, which cause soil erosion and damage infrastructure. Wildfires can spread from forests to agricultural lands and settlements, especially in areas with land abandonment and urban sprawl, characterised by the low-density expansion of large urban areas[24].

Adaptation strategies in rural areas need to focus on sustainable water management and agricultural practices to mitigate the impacts of climate change. Key measures include[25]:

- **Water management:** Improved irrigation systems, including drip irrigation and advanced water management techniques, are crucial for reducing water waste and ensuring that crops receive adequate moisture during dry periods. The reuse of wastewater for irrigation and the promotion of rainwater harvesting are also vital strategies. In regions where groundwater is

[20] European Environment Agency, 2017, *Green infrastructure and flood management: Promoting cost-efficient flood risk reduction via green infrastructure solutions* (EEA Report No. 14/2017), European Environment Agency. Retrieved from Link. Last accessed 27 August 2024.
[21] European Environment Agency, 2024, *Urban adaptation in Europe: What works?* (EEA Report No. 14/2024), Publications Office of the European Union, Luxembourg. Retrieved from Link. Last accessed 29 August 2024.
[22] Vos, P. E. J. et al., 2013, *Improving* local air quality in cities: *To tree or not to tree?*, Environmental Pollution, 183, pp. 113-122. Retrieved from Link. Last accessed 27 August 2024.
[23] Rathnayaka, B., Robert, D., Siriwardana, C., Adikariwattage, V. V., Pasindu, H. R., Setunge, S., & Amaratunga, D., 2023, Identifying and prioritizing climate change adaptation measures in the context of electricity, transportation and water infrastructure: A case study, *International Journal of Disaster Risk Reduction, 99*, 104093. Retrieved from Link. Last accessed 27 August 2024.
[24] European Environment Agency, 2024, *European Climate Risk Assessment (EEA Report No. 1/2024)*, Publications Office of the European Union, Luxembourg. Retrieved from Link. Last accessed 29 August 2024.
[25] Ibid.

overexploited, policies must encourage more sustainable extraction practices to prevent depletion of these critical resources.

- **Conservation agriculture:** Techniques such as crop rotation, reduced tillage, and cover cropping help maintain soil health, enhance water retention, and reduce erosion. These practices can also increase the resilience of crops to extreme weather events and improve long-term agricultural productivity.
- **Agroforestry and diversification:** Integrating trees and shrubs into agricultural landscapes can provide shade, reduce water stress, and improve soil quality. Diversifying crops and livestock can reduce the risk of total crop failure and provide alternative income sources for farmers.
- **Biodiversity protection:** Creating migration corridors and expanding conservation areas are essential for maintaining biodiversity and the related ecosystem services in rural areas, particularly as species migrate in response to changing climate conditions. Ex-situ conservation methods, such as seed banks, can also play a role in preserving genetic diversity[26].

c. Climate risks and adaptation needs in coastal areas and islands

Coastal areas and islands in Europe are particularly vulnerable to increasing climate risks such as **sea-level rise**, **coastal erosion**, and **extreme weather events** such as storm surges, hurricanes, and tropical storms. These threats are exacerbated by maladaptive seawall constructions, riverbed mining, urban development, and the overexploitation of natural resources. Sea-level rise poses a significant long-term threat, leading to increased flooding, saltwater intrusion, and damage to infrastructure, while coastal erosion endangers natural habitats and communities[27]. Both coastal areas and islands face the degradation of marine ecosystems, with coral reefs, fisheries, and biodiversity at risk, impacting local economies reliant on fishing, marine tourism, and ecosystem services.

To address these risks, coastal areas and islands require comprehensive and forward-looking adaptation strategies that include[28]:

- **Integrated coastal management:** A holistic approach is needed that considers the interactions between land and sea, including the protection of natural defences, such as dunes, wetlands, coral reefs, and mangroves, along with the development of artificial defences such as seawalls and dykes where necessary. Sustainable development practices and the regulation of activities contributing to erosion and habitat degradation are crucial[29].
- **Water resource management:** Both coastal areas and islands must adopt strategies to protect freshwater resources from the risks of saltwater intrusion and overuse. This includes the development of desalination plants, rainwater harvesting, the restoration of natural barriers, and the promotion of water-efficient technologies in agriculture and industry[30].

[26] Ex-situ conservation involves protecting elements of biological diversity by conserving them outside their natural habitats in controlled environments. Source: Swingland, I. R., (2013), *Biodiversity: Definition of,* In S. A. Levin (Ed.), *Encyclopedia of Biodiversity* (2nd ed., pp. 399-410). Academic Press. Retrieved from Link. Last accessed 27 August 2024.

[27] European Environment Agency, 2024, *Seas and coasts*, 31 May 2024. Retrieved from Link. Last accessed 27 August 2024.

[28] European Commission: Directorate-General for Research and Innovation, Vojinovic Z., 2020, *Nature-based solutions for flood mitigation and coastal resilience: Analysis of EU-funded projects*, Publications Office of the European Union. Retrieved from Link. Last accessed 27 August 2024.

[29] Climate-ADAPT, 2024, *Integration of climate change adaptation in coastal zone management plans*, 17 May 2024, European Environment Agency. Retrieved from Link. Last accessed 27 August 2024.

[30] Chartzoulakis, K. S., Paranychianakis, N. V., & Angelakis, A. N., 2001, *Water resources management in the Island of Crete, Greece, with emphasis on the agricultural use*, *Water Policy*, 3(3), 193-205. Retrieved from Link. Last accessed 29 August 2024.

- **Resilient infrastructure and disaster preparedness:** Infrastructure in both coastal areas and islands must be designed to withstand the impacts of extreme weather events. This includes stronger building codes, elevated structures, improved drainage systems, and the implementation of disaster preparedness and early warning systems to reduce the loss of life and property during storms and other extreme events[31].
- **Sustainable fisheries and marine conservation:** Protecting marine ecosystems is crucial for the sustainability of coastal economies. This includes the implementation of sustainable fishing practices, the establishment of marine protected areas, and efforts to restore degraded coral reefs and other critical habitats. Community involvement in conservation efforts is key to their success, as local knowledge and participation can enhance the effectiveness of management strategies[32].

d. Climate risks and adaptation needs in mountainous regions

Mountainous regions (usually starting at an altitude of 300m) in Europe are increasingly affected by climate risks such as **rising temperatures**, **changing water availability**, **declining snow cover**, and **glacier retreat**[33]. These changes impact water resources, biodiversity, and local economies, particularly those dependent on winter tourism and hydropower. Shrinking snowpacks and glaciers reduce water availability, especially in summer, and increase risks of glacial lake outburst floods, landslides, and debris flows. Biodiversity is also at risk, with alpine habitats shrinking and species being displaced as treelines move upward. This threatens species adapted to cold and high-altitude environments, leading to significant biodiversity loss[34].

Adaptation strategies in mountainous regions must address the complex and interconnected impacts of climate change on ecosystems, water resources, and human activities[35] using:

- **Water management:** Long-term strategies are needed to manage the decreasing availability of water due to shrinking glaciers and snowpacks. This includes optimising the use of water for agriculture, hydropower, and domestic consumption, as well as developing infrastructure to store and distribute water more efficiently. In some cases, artificial snowmaking and the construction of reservoirs may be necessary to maintain water supplies.
- **Biodiversity conservation:** This involves creating migration corridors, expanding protected areas, and managing invasive species. In some cases, assisted migration – relocating species to more suitable habitats – may be necessary. Additionally, ex-situ conservation efforts such as seed banks and captive breeding programmes can help preserve species unable to adapt to changing conditions in their natural environments.
- **Infrastructure resilience:** Infrastructure in mountainous regions, including roads, bridges, and buildings, must be designed or retrofitted to withstand the increased risks of landslides,

[31] Climate-ADAPT, 2016, *Establishment of early warning systems*. Retrieved from Link. Last accessed 29 August 2024.
[32] Jacquemont, J., Blasiak, R., Le Cam, C., Le Gouellec, M., & Claudet, J., 2022, *Ocean conservation boosts climate change mitigation and adaptation*, *One Earth*, 5(10), 1126-1138. Retrieved from Link. Last accessed 29 August 2024.
[33] Federal Office for the Environment (FOEN), 2018, *Climate-related risks and opportunities: A synthesis for Switzerland – Short version*. Extended summary of the publication 'Klimabedingte Risiken und Chancen. Eine schweizweite Synthese', Bern, Switzerland. Retrieved from Link. Last accessed 27 August 2024.
[34] Barredo, J. I., Mauri, A., & Caudullo, G., 2020, *Impacts of climate change in European mountains — Alpine tundra habitat loss and treeline shifts under future global warming*, EUR 30084 EN, Publications Office of the European Union, Luxembourg. Link. Last accessed 27 August 2024.
[35] Climate-ADAPT, 2024, *Accelerating transformative climate adaptation for higher resilience in European mountain regions (MountResilience)*, 19 January 2024. Retrieved from Link. Last accessed 27 August 2024.

avalanches, and flooding. In some cases, managed retreats from high-risk areas may be necessary, particularly where the costs of protecting infrastructure outweigh the benefits[36].

e. Climate risks and adaptation needs in outermost regions

The EU's outermost regions[37], including territories in the Caribbean, the Indian Ocean, and the Atlantic, face significant climate risks due to their remoteness, unique ecosystems, and socio-economic challenges. These regions are highly vulnerable to extreme weather events such as **hurricanes, rising sea levels, and changes in temperature and precipitation patterns**. Extreme weather events are becoming more frequent and intense, causing extensive damage to infrastructure and economies. Rising sea levels threaten low-lying coastal areas, leading to erosion, saltwater intrusion, and land loss. Biodiversity is also at risk, with ecosystems such as tropical forests, mangroves, and coral reefs facing threats from climate change, potentially leading to habitat loss and species extinction[38].

Adaptation strategies in the outermost regions must address the unique challenges posed by their geographical and ecological characteristics as follows:

- **Biodiversity and ecosystem conservation:** The protection and restoration of ecosystems such as tropical forests, mangroves, and coral reefs, establishment of protected areas, and promotion of sustainable land-use practices to maintain biodiversity and essential ecosystem services are all necessary[39].
- **Water and food security:** Water security through desalination, improved water management, and freshwater protection should be enhanced. The promotion of sustainable agriculture, local food production, and diversification of food sources to ensure food security can further support the protection of water resources[40].
- **Disaster risk reduction:** The implementation of early warning systems, construction of resilient infrastructure, and development of community-based disaster preparedness programmes are key measures for managing risks. Adapting building codes (i.e. the set of regulations that specify the minimum standards for the design, construction, and occupancy of buildings[41]), and land-use planning to reduce exposure to extreme weather events are also important[42].
- **Sustainable economic development:** The development of green and blue economies to sustainably use natural resources, including through the adaptation of tourism, agriculture and

[36] Climate-ADAPT, 2018, *Pilot project 'Climate Adaptation Strategy for the Grimsel area', funded by the Swiss pilot programme for climate adaptation (1st funding phase: 2013-2017)*, 20 December 2018, European Environment Agency. Retrieved from Link. Last accessed 27 August 2024.

[37] The outermost regions include Guadeloupe, French Guiana, Réunion, Martinique, Mayotte and Saint-Martin (France), the Azores and Madeira (Portugal), and the Canary Islands (Spain).

[38] European Environment Agency, 2024, *European Climate Risk Assessment (EEA Report No. 1/2024)*, Publications Office of the European Union, Luxembourg. Retrieved from Link. Last accessed 29 August 2024.

[39] WWF, 2024, *Sustainable planning for the largest EU marine areas is fractured and incomplete – WWF report*, 7 May 2024, WWF European Policy Office. Retrieved from Link. Last accessed 29 August 2024.

[40] European Parliament, 2023, *Report on the assessment of the new Commission communication on outermost regions (A9-0156/2023)*, Committee on Regional Development, Rapporteur: Álvaro Amaro. Retrieved from Link. Last accessed 29 August 2024.

[41] European Commission, Directorate-General for Climate Action, 2023, EU-level technical guidance on adapting buildings to climate change (Publications Office of the European Union), Luxembourg. Retrieved from Link. Last accessed 26 September 2024.

[42] European Environment Agency, 2024, *European Climate Risk Assessment (EEA Report No. 1/2024)*, Publications Office of the European Union, Luxembourg. Retrieved from Link. Last accessed 29 August 2024.

fisheries practices, can contribute to the diversification of income sources and the sustainability of local economies[43].

2.2. Climate risks and adaptation needs of businesses in the EU

2.2.1. Climate risks and adaptation needs across different economic sectors

The adaptation needs of businesses across different economic sectors are shaped by the distinct climate risks they face, including according to the regions where they operate, and the specific characteristics of their operations. The following table shows how different regions and economic sectors[44] intersect in terms of climate risks and adaptation needs.

Table 2: Sectors most affected by climate change across different types of regions

Region	Most affected sectors
Urban areas	Construction, real estate, healthcare, transportation, energy
Rural areas	Agriculture, forestry, energy, small-scale industries, tourism
Mountainous areas	Tourism, agriculture, forestry, water management, infrastructure
Coastal areas	Fishing, tourism, real estate, ports, transportation
Islands	Agriculture, fishing, tourism, energy
Outermost regions	Tourism, blue economy, agriculture, water management, healthcare

Source: Authors own elaboration, based on European Environment Agency, 2024, *European Climate Risk Assessment*.

As climate change continues to influence weather patterns, resource availability, and environmental conditions, each sector must implement tailored adaptation strategies to ensure resilience and sustainability. Below is a detailed examination of the specific adaptation needs of key sectors[45].

Primary sectors

Agriculture and forestry are among the most climate-sensitive sectors, deeply affected by variations in precipitation, temperature shifts, and extreme weather events such as floods and droughts. To adapt, these sectors require the use of more drought-resistant crop varieties and the implementation of advanced irrigation systems to optimise water use. Crop diversification is also crucial in relation to spread risk and increasing resilience against climate-related shocks[46]. Sustainable forest management practices, such as controlled logging and reforestation, are necessary for maintaining biodiversity, protecting soil quality, and enhancing the ability of forests to sequester carbon, thereby contributing to both climate adaptation and mitigation[47].

[43] European Commission, 2022, Outermost regions at a glance – assets, challenges and opportunities (SWD(2022) 133 final), accompanying the document 'Putting people first, securing sustainable and inclusive growth, unlocking the potential of the EU's outermost regions', (COM(2022) 198 final), Publications Office of the European Union, Luxembourg. Retrieved from Link. Last accessed 26 September 2024.

[44] *For the sake of the analysis, the NACE classification system, short for the Statistical Classification of Economic Activities in the European Community, was adopted. NACE is essential for organising and presenting statistical data across various domains, including economic, social, environmental, and agricultural sectors*. Source: European Commission, 2023, *Glossary: Statistical classification of economic activities in the European Community (NACE)*, *Statistics Explained*. Retrieved from Link. Last accessed 25 August 2024.

[45] European Environment Agency, 2024, *European Climate Risk Assessment* (EEA Report No. 1/2024), Publications Office of the European Union, Luxembourg. Retrieved from Link. Last accessed 29 August 2024.

[46] Climate-ADAPT, 2024, *Agriculture and climate adaptation*. Retrieved from Link. Last accessed 29 August 2024.

[47] Climate-ADAPT, 2024, *Forestry: Climate adaptation in EU policy sectors*. Retrieved from Link. Last accessed 29 August 2024.

The fishing industry faces significant challenges as climate change alters marine ecosystems, influencing fish migration patterns, spawning times, and population dynamics. To adapt, the industry must shift towards sustainable fishing practices that reduce overfishing and protect marine biodiversity. Investment in aquaculture offers an alternative to traditional fishing, providing a controlled environment that can help meet demand while reducing pressure on wild fish stocks. Additionally, enhanced monitoring systems are essential for tracking changes in fish populations and water quality, enabling timely responses to environmental changes[48].

The mining and quarrying sector faces significant risks from extreme weather events, which can damage infrastructure, disrupt operations, and pose safety hazards to workers. To adapt, companies in this sector must focus on improving the resilience of mining infrastructure, including the reinforcement of facilities against floods and landslides. Sustainable water management practices are crucial in areas prone to drought, ensuring that mining operations do not exacerbate water scarcity. Additionally, implementing safe working conditions during extreme weather events is essential for protecting the workforce and maintaining operational continuity[49].

Sectors essential for the provision of horizontal services

Providers of essential services such as water, sewage, waste management, energy, and transport are vital across all sectors, with a particular focus on ensuring the resilience of infrastructure to climate change.

Water services require advanced management strategies to safeguard resources against droughts, while infrastructure must be upgraded to cope with extreme weather events that can overwhelm sewer systems. In **waste management**, the adoption of practices that reduce greenhouse gas (GHG) emissions is critical to resilience[50].

The **energy sector** needs to improve the resilience of infrastructure so that installations can withstand climate-related disruptions, and to invest in renewable energy so that dependence on fossil fuels can be reduced[51]. Similarly, **transport infrastructure** needs to be strengthened to withstand extreme weather conditions, using climate-resilient materials, such as heat-resistant paving and flood-resistant asphalt, and adopting climate-resilient technologies[52]. In addition, contingency plans for transportation networks are essential to maintaining the continuity of the supply chain in the event of disruption[53].

The health sector is on the frontline of climate change impacts, facing increased incidences of climate-related illnesses, such as heatstroke and vector-borne diseases, as well as the strain of extreme weather events on healthcare systems. To adapt, the sector must strengthen healthcare infrastructure, ensuring that facilities are resilient to floods, heatwaves, and other climate extremes. Emergency response systems need to be improved in order to handle a growing number of climate-related health crises.

[48] Climate-ADAPT, 2024, *Marine and fisheries: Climate adaptation in EU policy sectors*. Retrieved from Link. Last accessed 29 August 2024.
[49] World Economic Forum, 2023, *The Global Risks Report 2023*, Cologne/Geneva, Switzerland. Retrieved from Link. Last accessed 29 August 2024.
[50] European Environment Agency, 2024, *European Climate Risk Assessment (EEA Report No. 1/2024)*, Publications Office of the European Union, Luxembourg. Retrieved from Link. Last accessed 29 August 2024.
[51] Climate-ADAPT, 2024, *Energy: Climate adaptation in EU policy sectors*. Retrieved from Link. Last accessed 29 August 2024.
[52] Ebinger, J. O., & Vandycke, N., 2015, *Moving toward climate-resilient transport: The World Bank's experience from building adaptation into programs*, *Transport & ICT Global Practice*, The World Bank Group. Retrieved from Link. Last accessed 29 August 2024.
[53] Climate-ADAPT, 2024, *Transport: Climate adaptation in EU policy sectors*. Retrieved from Link. Last accessed 29 August 2024.

Additionally, enhancing public health surveillance and early warning systems is essential to preparing for and mitigating the impacts of emerging health threats related to climate change[54].

The information and communication sector must ensure that digital infrastructure can withstand climate-related disruptions, including extreme weather events that may damage both submarine and terrestrial networks, as well as landing stations and data centres. Rising sea levels can inundate these critical facilities, threatening the integrity of cables. Increased storm surges can cause direct damage to infrastructure through scour and abrasion, while tropical cyclones can trigger turbidity currents, leading to higher costs due to prolonged project timelines. Coastal erosion and shifting seabed sediments can expose and wear down previously buried cables, and changes in ocean currents and offshore weather conditions can disrupt cable laying and maintenance[55]. Adaptation strategies include enhancing data centre cooling systems to cope with rising temperatures, increasing the armouring and burial depth of cables at shore-ends to protect against coastal erosion and storm surges, and mitigating deep-sea fishing risks by using more resilient cables and clearing discarded gear from routes. Additionally, leveraging local knowledge and geographic analysis helps in selecting the most resilient locations for infrastructure and optimising cable routes. Together, these measures will strengthen the sector's ability to withstand climate-related disruptions and ensure service continuity[56].

Secondary and tertiary sectors and services

The construction and real estate sectors must adapt to climate risks such as extreme heat, flooding and storm damage by using climate-resilient materials and designs. Retrofitting existing buildings for energy efficiency and resilience is essential to maintaining property value and safety[57]. Urban planning should incorporate green infrastructure, such as green roofs and permeable pavements, to manage heat and storm water[58]. In addition, integrating climate considerations into building codes, property valuations and insurance assessments is critical for long-term sustainability and financial risk-management[59].

The **manufacturing**, **wholesale** and **retail sectors** are all vulnerable to climate risks that can disrupt supply chains, reduce the availability of raw materials and affect energy supplies. To adapt, these sectors need to diversify supply sources to mitigate the impact of localised climate events and reduce dependence on any single source[60]. Investing in energy-efficient technologies and advanced inventory management systems (which optimise stock levels, automate processes, and improve supply chain visibility) will help to reduce operating costs and increase resilience. In addition, adopting circular economy principles, such as recycling and reusing materials, and developing strategies to manage shifts in consumer preferences towards sustainable products are essential for long-term adaptability and sustainability[61].

The accommodation and food service sectors, including tourism, are highly sensitive to climate change impacts, particularly those affecting tourism and food supply chains. To adapt, businesses in this sector must diversify in what they can offer, such as promoting off-season travel or eco-tourism, in

[54] European Environment Agency, 2024, *European Climate Risk Assessment (EEA Report No. 1/2024*), Publications Office of the European Union, Luxembourg. Retrieved from Link. Last accessed 29 August 2024.
[55] Clare, M.A. et al., 2023, Climate change hotspots and implications for the global subsea telecommunications network (Earth-Science Reviews, Volume 237, 104296). Retrieved from Link.. Last accessed 26 September 2024.
[56] Climate-ADAPT, 2024, *ICT: Climate adaptation in EU policy sectors*. Retrieved from Link. Last accessed 29 August 2024.
[57] Climate-ADAPT, 2024, *Buildings: Climate adaptation in EU policy sectors*. Retrieved from Link. Last accessed 29 August 2024.
[58] Adriadapt, 2022, *Climate proofing of building codes*. Retrieved from Link. Last accessed 29 August 2024.
[59] European Environment Agency, 2021, *Cities are key to a climate-resilient Europe*. Retrieved from Link. Last accessed 26 August 2024.
[60] European Environment Agency, 2024, *European Climate Risk Assessment (EEA Report No. 1/2024)*. Retrieved from Link. Last accessed 26 August 2024.
[61] Ibid.

order to mitigate the effects of changing weather patterns and to contribute to local ecosystem preservation. Improving energy and water efficiency in hospitality operations can reduce operational costs and environmental impact[62]. Sourcing food from climate-resilient suppliers, such as farms employing sustainable practices (agroecology or 'high nature value' farming[63] for example), ensures a stable supply chain, even as climate conditions affect agricultural production.

Various other sectors, such as financial services, education, and professional services, also face unique climate risks and must adapt accordingly. For instance, **financial services** must assess and manage climate risks in their investment portfolios, develop climate-resilient investment strategies, and provide financial products that support adaptation efforts. The **education sector** needs to integrate climate literacy into curricula to prepare future generations for the challenges posed by climate change. Each sector must tailor its adaptation strategies to address the specific climate risks it faces while also contributing to broader societal resilience[64].

In addition, **all sectors** will have to adapt to **a labour force affected by different climate risks**. This includes potential impacts on human health, such as illnesses caused by heat stress, dehydration and heat strokes, hypothermia, worsening of cardiovascular and respiratory diseases, and mortality due to heatwaves or cold spells; mortality or illnesses associated with chemical hazards and poisoning due to incidents caused by extreme weather events, floods or wildfires; new illnesses and the spread of communicable diseases due to changing patterns in the activity of pathogens, viruses and parasites[65,66]. Poor health resulting from these risks can in turn reduce the productivity of the workforce and require businesses or even entire economic sectors to adapt their existing practices (e.g. timetables, technology, use of manual labour). For example, as temperatures and humidity increase so does blood flow and sweating, which makes the performance of physical and cognitive tasks more difficult. Some studies have reported that labour productivity starts to decline at around 25°C[67]. Finally, the difficulty in finding skilled or trained staff who are willing to work in increasingly challenging conditions further exacerbates these challenges.

2.2.2. Key barriers businesses face in implementing climate adaptation measures

Businesses across the EU are increasingly recognising the urgent need to adapt to climate change. This adaptation is crucial not only to safeguarding their operations but also to ensuring long-term sustainability and competitiveness in a rapidly changing environment. Despite the growing awareness of the need for climate adaptation, businesses face several key barriers that hinder the implementation of effective adaptation measures[68], as follows:

[62] Climate-ADAPT, 2024, *Tourism: Climate adaptation in EU policy sectors*. Retrieved from Link. Last accessed 26 August 2024.

[63] Agroecology integrates ecological principles into farming, using sustainable methods such as crop rotation and organic practices to enhance soil health, biodiversity, and resilience to climate change. High Nature Value farming is an approach that promotes biodiversity and the preservation of traditional rural landscapes through low-intensity, environmentally valuable farming practices. Sources: European Commission, Directorate-General for Environment, 2023, *Agroecological practices may enhance food production by increasing ecosystem services* (News article, 15 March 2023). Retrieved from Link. Last accessed 26 September 2024. European Commission, Directorate-General for Agriculture and Rural Development, 2017, *High Nature Value (HNV) farming indicator in RDPs 2014-2020: Overview from a Survey – Final version*. Retrieved from Link. Last accessed 26 September 2024.

[64] European Environment Agency, 2024, *European Climate Risk Assessment (EEA Report No. 1/2024*), Publications Office of the European Union, Luxembourg. Retrieved from Link. Last accessed 29 August 2024.

[65] Kendrovski, V. et al., 2018, Public Health and Climate Change Adaptation Policies in the European Union, Final Report. Retrieved from Link. Last accessed 26 August 2024.

[66] European Environment Agency, 2017, *Climate change adaptation and disaster risk reduction in Europe: Enhancing coherence of the knowledge base, policies and practices*, EEA report No 15/2017. Retrieved from Link. Last accessed 26 August 2024.

[67] Ciscar, J. C. et al., 2018, *Climate impacts in Europe: Final report of the JRC PESETA III project*, JRC Science for Policy Report, Joint Research Centre. Retrieved from Link. Last accessed 26 August 2024.

[68] Klein, R. J. T., & Mikaelsson, M. A., 2022, *The Role of Businesses in Climate Adaptation*. Retrieved from Link. Last accessed 26 August 2024.

- **Lack of information and data:** Businesses often struggle with inadequate access to data concerning climate risks and vulnerabilities, making it difficult to assess risks accurately or to plan appropriate adaptation strategies. This includes identifying vulnerabilities in supply chains, infrastructure, and workforce, and understanding how these risks may evolve over time. This lack of information can lead to underestimation of risks or misallocation of resources[69]. Access to accurate, localised climate data and predictive models is critical for enabling companies to make informed decisions (including strategic planning and investment decisions), anticipate potential disruptions, and proactively mitigate risks[70].
- **Financial constraints:** A notable barrier is the cost of implementing certain adaptation measures. Many businesses, particularly SMEs, may struggle with limited financial resources to invest in climate-resilient infrastructure, technologies, and practices[71].
- **Regulatory and policy uncertainty:** The absence of strong commitment from policymakers and authorities to adaptation can result in lax requirements concerning resilience, adaptation, and environmental sustainability more generally. This in turn does not provide sufficient incentives (including financial ones) to businesses to take adaptive measures[72].
- **Risk aversion:** Due to their smaller size, SMEs tend to be more risk-averse, particularly when it comes to investing in long-term adaptation strategies that may not yield immediate returns. In some cases, resistance to change within a business or community can hinder adaptation efforts[73].
- **Information and technological gaps:** Many SMEs encounter challenges related to both information and technology. They may have limited awareness of the benefits and opportunities associated with green practices and may be unsure about the best technologies and methods for adaptation[74]. Additionally, in some sectors, the technology needed for effective climate adaptation is either still developing or relatively costly, making it more difficult for businesses to implement adaptation strategies fully [75].
- **Lack of collaboration and coordination within sectors:** Businesses need to engage in collaboration with other firms, industry associations, and government authorities in the sectors where they operate so they can share knowledge, best practice, and innovations in climate adaptation. Sector-wide collaboration can lead to more coordinated and effective adaptation strategies[76] and can raise industry standards as a whole.

[69] World Bank & European Commission, 2024, *From Data to Decisions: Tools for Making Smart Investments in Prevention and Preparedness*. Retrieved from Link. Last accessed 26 August 2024.
[70] Williams, C., & Barnes, A., 2024, *When mitigating climate risks, companies should look at their most valuable asset*. Retrieved from Link. Last accessed 26 August 2024.
[71] Bureau for Employers' Activities (ACT/EMP) & International Labour Organization, 2022, *Enabling business mitigation and adaptation to climate change: Green policies and the role of employer and business membership organizations*. Retrieved from Link. Last accessed 26 August 2024 (p. 31).
[72] Ibid.
[73] Bureau for Employers' Activities (ACT/EMP) & International Labour Organization, 2022, *Enabling business mitigation and adaptation to climate change: Green policies and the role of employer and business membership organizations*. Retrieved from Link. Last accessed 26 August 2024 (p. 31).
[74] Ibid.
[75] World Economic Forum, & Boston Consulting Group, 2024, *Innovation and adaptation in the climate crisis: Technology for the new normal*. Retrieved from Link. Last accessed 26 August 2024.
[76] World Bank & European Commission, 2024, *From Data to Decisions: Tools for Making Smart Investments in Prevention and Preparedness*. Retrieved from Link. Last accessed 26 August 2024.

3. EU ADAPTATION STRATEGY AND POLICY FRAMEWORK

KEY FINDINGS

- The 2021 EU Adaptation Strategy focuses on *Smarter, More Systemic,* and *Faster Adaptation*, aiming to make Europe climate-resilient by 2050.
- The EU uses 48 non-Cohesion Policy instruments to support climate adaptation, including funding mechanisms, information platforms, networks, and regulatory frameworks, among others.
- From strengthening the built environment to human capital development, Cohesion Policy instruments – mainly the European Regional Development Fund (ERDF), Cohesion Fund (CF), Just Transition Fund (JTF), and European Social Fund+ (ESF+) – each play a key role in supporting regional climate resilience and business adaptation across different geographies and sectors of the economy.

3.1. Overview of the EU Adaptation Strategy

The **EU Adaptation Strategy**[77], adopted in 2021, builds on and significantly enhances the 2013 Strategy and lays the ground for comprehensive action at EU, national, and sub-national levels. The development of the 2021 Strategy was underpinned by a need to respond to the challenges encountered in the implementation of the 2013 Strategy[78] and included the definition of **three key objectives at EU level**[79], each accompanied by specific goals and actions.

Under the first objective, **Smarter Adaptation**, the Strategy sets out to 'push the frontiers of knowledge on adaptation' using the latest science and technology in order to improve climate modelling and deepen our understanding of health and ecosystem effects. The Strategy also:

- highlights the need for 'more and better data on climate-related risks and losses', addressing the current lack of standardised and accessible data on climate disaster losses;
- aims to make Climate-ADAPT the premier European adaptation platform by growing its resources and user base; and
- aims to leverage Copernicus data[80] for better integration with other adaptation platforms.

The second core objective, **More Systemic Adaptation**, has the aim of supporting policy development in all sectors, based on the latest science, and developed by national, regional, and local authorities, with support from the European Commission (EC) to for enhancing cooperation and sharing best practice. This objective also:

- underscores fostering local, individual, and just resilience through EU funding programmes, digital solutions for local needs, and the European Climate Pact in order to encourage individual level action;

[77] COM/2021/82 final.
[78] SWD/2021/26 final.
[79] COM/2021/82 final. A fourth objective is defined for actions outside the EU.
[80] These data are provided by several different services, such as the Copernicus Climate Change Service (C3S) and the Copernicus Atmosphere Monitoring Service (CAMS). In particular, C3S data can provide current and future climate information and tools to support climate adaptation strategies used by both policymakers and businesses across the EU and globally.

- seeks to integrate climate resilience in national fiscal frameworks, advocating for thorough risk assessments and budgetary planning; and
- focuses on promoting the expansion of nature-based solutions for resilience, aligning with the European Green Deal's objectives and calling for innovative financing methods, including through the Cohesion Policy and the Common Agricultural Policy (CAP).

Finally, the third objective, **Faster Adaptation**, centres on accelerating the rollout of adaptation solutions through enhanced support for innovation. This objective also aims to:

- reduce climate-related risks by steering infrastructure investment towards climate-resilient projects, while also protecting Europe's existing building stock from climate impacts through wide-scale renovations;
- close the climate protection gap, where only 35% of climate-related economic losses are currently insured, by increasing insurance penetration, encouraging national disaster insurance schemes, and developing tools such as a natural catastrophe dashboard; and
- prioritise actions to ensure the availability and sustainability of freshwater by promoting nature-based solutions, and encouraging efficient water-management practices, including drought management and water reuse.

In order to translate these strategic objectives into concrete actions, the EU has developed and deployed a wide range of policy instruments, presented in the following section.

3.2. EU policy instruments for regional climate adaptation

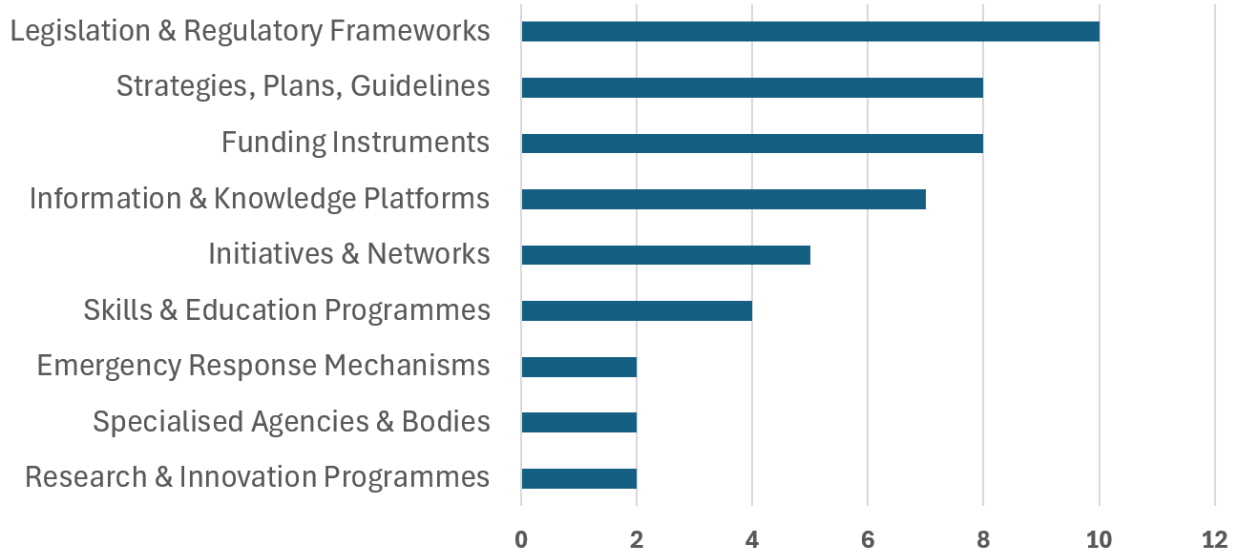
To implement and deliver on the ambition of the EU Adaptation Strategy and its objectives, the EU has adopted a multi-faceted policy approach. The policy mapping identified **48 different instruments at EU level** supporting the Adaptation Strategy (as mentioned in the Strategy itself and excluding Cohesion Policy) across different geographical scales, levels of government and economic sectors. The 48 policy instruments are divided into nine types.

Figure 1 provides an overview of the various types of instruments. This vast and multi-layered approach reflects the all-encompassing nature of the challenge posed by climate change. Moreover, it provides a solid basis for strengthening the EU's regional resilience and for supporting businesses in their adaptation efforts by combining several key components, including:

- Funding mechanisms;
- Information and knowledge platforms;
- Legislation and regulatory frameworks; as well as
- Initiatives and networks, among others.

These components work together to create an enabling environment for regions and businesses to increase their resilience to climate change. Among these, funding instruments play a crucial role in the implementation of adaptation measures, translating the objectives of the Strategy into concrete actions.

Figure 1: EU climate adaptation policy instruments, by type



Source: Authors own elaboration, based on the 2021 EU Adaptation Strategy.

As shown in Box 1, **funding instruments** such as the LIFE Programme or CAP, and financing from the European Investment Bank (EIB) are integral to supporting this process. These instruments often include specific allocations for climate-related actions. For instance, the LIFE programme[81] earmarked EUR 1 billion for its Climate Change Mitigation and Adaptation sub-programme for 2021-2027, while the Recovery and Resilience Facility requires at least 37% of each national plan to be allocated to climate action. At the same time, the EIB has committed EUR 44.3 billion in 2023 alone for climate action and environmental sustainability projects, which includes mobilising private sector investment to support businesses in their adaptation efforts. Financial instruments can also be tailored to sector-specific needs. In particular: the European Agricultural Fund for Rural Development (EAFRD) to promote resource efficiency and climate resilience in the agriculture, food, and forestry sectors; or the European Maritime, Fisheries and Aquaculture Fund (EMFAF) to finance innovative projects for the sustainable use of aquatic and marine resources.

Complementing these financial tools are **information and knowledge platforms** that help achieve the EU Adaptation Strategy's goal of pushing the frontiers of adaptation knowledge and making that knowledge accessible to all. As such, the aim of these platforms is to facilitate evidence-based decision making and expand capacity to support better climate adaptation measures. Platforms such as Climate-ADAPT provide tailored information by sector and region, including agriculture, coastal areas and urban development. The EU is also investing in advanced digital technologies and data systems, as exemplified by initiatives such as the Risk Data Hub, which centralises Europe-wide risk data to support robust climate risk assessment and adaptation planning at different levels of governance. By facilitating widespread access to complex climate data, these platforms can be beneficial for smaller regions or businesses that lack the resources to undertake climate risk assessments.

[81] The Programme for the Environment and Climate action (LIFE programme) is a key EU-level funding instrument for the environment and climate change in general and is implemented through four sub-programmes, one of which is dedicated to climate change mitigation and adaptation.

Box 1: Mapping of EU policy instruments for climate change adaptation

Funding instruments			**Information and knowledge platforms**		
LIFE Programme	Common Agricultural Policy	Connecting Europe Facility	Climate-ADAPT	European Climate and Health Observatory	Copernicus Climate Change Service
Digital Europe Programme	European Investment Bank	Recovery and Resilience Facility	Destination Earth Digital Twin	Smart Cities Marketplace (EIP-SCC)	Risk Data Hub
European Agricultural Fund for Rural Development	European Maritime, Fisheries and Aquaculture Fund		European Marine Observation and Data Network		
Legislation and regulatory frameworks					
INSPIRE Directive	Revised Energy Performance of Buildings Directive		Construction Products Regulation	Water Framework Directive	
Floods Directive	Common fisheries policy		EU taxonomy for sustainable activities	EU Marketing Directives[82]	
EU-wide certification scheme for carbon removal			Regulation on the Governance of the Energy Union		
Strategies, plans, and guidelines			**Initiatives and networks**		
Guidelines on National Adaptation Strategies	Technical Support Instrument	Natura 2000 Guidance	National Recovery and Resilience Plans	European Climate Pact Initiative	Education for Climate Coalition
The EU Forest Strategy for 2030	Climate proofing guidance	European Climate Risk Assessment	Green Public Procurement Criteria and Requirements	Intelligent Cities Challenge	Fisheries Local Action Groups (FLAGS)
				EU Covenant of Mayors and Adaptation Policy Support Facility	
Skills and education programs		**Research & innovation**		**Specialised agencies & bodies**	
Erasmus+	EU Solidarity Corps	Horizon Mission Europe		Health Emergency Preparedness and Response Authority	
European Skills Agenda	Reinforced Youth Guarantee	Nature-based solutions		European Insurance and Occupational Pensions Authority	
Emergency response mechanisms					
Solidarity and Emergency Aid Reserve		EU Civil Protection Mechanism			

Source: Authors own elaboration, based on the 2021 EU Adaptation Strategy.

Legislative and regulatory frameworks are another key component of the EU adaptation policy toolbox. Instruments such as the EU's taxonomy for sustainable activities guide businesses and regions in making climate-resilient investments. In addition, sector-specific legislation, such as the revised Energy Performance of Buildings Directive and the Construction Products Regulation, integrates climate resilience considerations into building and infrastructure standards, with significant implications for the construction and real estate sectors.

Supporting the EU's legislative framework are **strategies, plans, and guidelines** that provide overarching direction and practical support for translating the broad objectives of the EU Adaptation Strategy into actionable plans and sector-specific guidance. These include instruments such as the EU Forest Strategy for 2030, which sets out clear actions to, for example, restore and enhance the biodiversity of Europe's forests, while also setting the ambitious target of planting 3 billion additional trees by 2030. In addition, the EC's technical guidance on climate-proofing infrastructure investments

[82] Directives on the marketing of forest reproductive material, Directives on the marketing of seed and other propagating material.

helps to ensure that investments are resilient to current and future climate impacts. Together, these strategic and guidance documents are demonstrative of a more coordinated and informed approach to adaptation at the sectoral level.

There is also a strong focus on fostering adaptation at local and individual levels. The aim of **Initiatives and networks** is to engage and activate citizens, local authorities, and organisations in adaptation efforts. For example, the EU Covenant of Mayors and its Adaptation Policy Support Facility support local and regional authorities in planning, implementing, and monitoring adaptation actions. They support local and regional involvement by serving as important bridges between high-level EU policy and implementation on the ground, recognising the importance of bottom-up approaches in building resilience to climate change. On the other hand, the Intelligent Cities Challenge provides tailored support to help cities develop Local Green Deal partnerships and action plans for key sectors such as energy, mobility, and the built environment.

Additionally, **skills development and education** such as the European Skills Agenda and Erasmus+ play a role in building the adaptive capacity of regions and businesses by equipping the workforce with the skills needed for the transition to a climate-resilient and green economy. In part, this is achieved through the inclusion of climate adaptation topics in its educational exchanges and training programmes, thereby increasing awareness and knowledge among students and professionals from different sectors and disciplines. These types of instruments are thus key to ensuring that efforts to strengthen adaptation are inclusive and contribute to a just transition in the midst of potentially disruptive sector-wide transformations.

The range of instruments focused on **research and innovation**, such as the Horizon Europe Mission on Adaptation to Climate Change, directly benefit regions and businesses by stimulating the development of innovative adaptation solutions. The aim of this Mission is to support at least 150 regions and communities by 2030, in particular by helping them to better understand their specific climate risks, develop tailored adaptation pathways, and test innovative solutions on the ground. At the same time, it promotes knowledge sharing across different European cities and regions, enhancing collective learning and accelerating the adoption of successful adaptation strategies.

The EU has also established **specialised bodies and mechanisms** to address specific risk aspects of regional and business adaptation. For example, the European Insurance and Occupational Pensions Authority (EIOPA) manages climate-related financial risks and aims to close the climate finance gap, thus strengthening the climate resilience of businesses, while the Health Emergency Preparedness and Response Authority (HERA) strengthens Europe's capacity to respond to health emergencies exacerbated by climate change, thereby supporting regional health resilience.

Lastly, the EU has also established **emergency response and mechanisms** that address the *faster adaptation* goal of the Strategy. These instruments are the Solidarity and Emergency Aid Reserve (SEAR) and the EU Civil Protection Mechanism (UCPM), which were established prior to the current Strategy but have since been integrated into its framework. The UCPM, first implemented in 2001, and the more recent SEAR provide financial assistance and strengthen cooperation between EU countries on disaster preparedness and response.

3.3. Cohesion Policy instruments for regional climate adaptation

One of the key funding instruments in the EU's toolbox for implementing the various aspects of the Adaptation Strategy is Cohesion Policy. It has a number of policy instruments with significant financial resources that can be used to achieve the objectives of the Strategy, with a particular focus on strengthening the resilience of the EU's different regions and businesses.

3.3.1. The European Regional Development Fund (ERDF)

A cornerstone of the EU's Cohesion Policy is the ERDF, which plays an important role in enhancing economic, social, and territorial cohesion within the EU by **addressing disparities between regions**[83]. The ERDF, with approximately EUR 214 billion in planned EU financing for the 2021-2027 period[84], operates within a framework of cooperation between the EC and national and regional authorities, allowing Member States to tailor the Fund to local priorities. One of its five priorities for the 2021-2027 period is Policy Objective (PO) 2: 'making Europe and its regions greener, low-carbon, and resilient'[85]. The ERDF addresses climate resilience through various mechanisms, aligning with the objective of the EU Adaptation Strategy of fostering *More Systemic Adaptation*, especially at local and regional levels.

At its core, the ERDF promotes climate change adaptation, risk prevention, and disaster resilience under PO2[86]. This approach entails several interventions, including: **ecosystem-based approaches to adaptation**; investments in disaster monitoring, preparedness, warning, and **response systems against natural disasters**; support for **sustainable water management**, crucial for adaptation in water-stressed regions; and enhancing **biodiversity and green infrastructure**. Beyond these direct measures, the ERDF contributes to adaptation indirectly through several complementary areas such as the transition to a circular economy, which can strengthen system-wide resilience to climate-related disruptions by reducing resource dependency and promoting more sustainable practices on the production side as well.

Box 2: ERDF support for adaptation

Target Regions	Key Sectors
• Less developed regions	Manufacturing
• Transition regions	Energy
• More developed regions	Water and waste management
• Rural areas	Construction
• Outermost regions	Transportation
• Northern sparsely populated areas	Professional, scientific and technical activities

Source: Authors own elaboration, based on Regulation 2021/1058 of the European Parliament and of the Council of 24 June 2021 on the European Regional Development Fund and on the Cohesion Fund.

Infrastructure forms another key pillar in the ERDF's approach to adaptation. Funding is used to improve climate resilience, ensuring that both existing and new infrastructure can withstand and recover from climate-related stresses and shocks. Underpinning all these efforts is the ERDF's substantial financial commitment to climate action. Specifically, 30% of all funding provided to each region and Member State must be committed to PO2, which focuses on creating a greener, low-carbon Europe. This requirement applies to both more and less developed regions, ensuring a consistent commitment to climate objectives across the EU.

While the ERDF's direct support for adaptation initiatives is central, its role in fostering climate-smart businesses and sustainable economic growth is equally important in strengthening regional climate resilience. The Fund's approach to business support targets different aspects of business operations and development by, for example, focusing much of its support on SMEs. The aim of the Fund is to provide assistance to businesses through a number of key areas, such as by: funding **productive**

[83] European Commission, n.d., European Regional Development Fund. Retrieved from Link. Last accessed 23 February 2024.
[84] European Commission, 2024, *2021-2027 Cohesion Policy overview*. Retrieved from Link. Last accessed 24 September 2024.
[85] Ibid.
[86] Regulation 2021/1058.

investments to enhance growth, competitiveness, and job creation; supporting the **development of skills for smart specialisation**, **industrial transition**, and **entrepreneurship**; promoting **energy efficiency measures** and renewable energy in businesses; and funding **innovation, digitalisation, and smart energy systems in enterprises**.

The ERDF's support for business adaptation goes beyond these specific measures, to encompass broader economic transitions. It also focuses on supporting sustainable tourism and promoting a circular and resource-efficient economy, which could lead to new business opportunities.

Recognising the unpredictable nature of climate-related disruptions, the ERDF also provides flexibility in its support mechanisms. In exceptional circumstances, such as those resulting from climate-related shocks, the Fund can finance working capital for SMEs by providing short-term funding to cover operational business expenses. For example, this can include assisting farmers in securing liquidity to overcome periods of drought or flood recovery[87]. This flexible funding can be crucial to helping businesses recover from and adapt to sudden climate-related challenges.

3.3.2. The Cohesion Fund (CF)

The CF specifically targets Member States with a Gross National Income per capita **below 90% of the EU average**. Similar to the ERDF, the CF contributes to mainstreaming climate adaptation by requiring that 37% of its total EUR 39 billion of planned EU funding be devoted to climate change objectives[88,89]. Focusing on environmental sustainability and the development of Trans-European Networks (TEN), the Fund plays an important role in aligning the EU with its climate change adaptation objectives, in part through the TEN-E(nergy) Regulation, which aims to improve resilience and adaptation in the European energy system, and the TEN-T(ransport) Regulation, which requires the resilience of the transport infrastructure to climate change to be strengthened.

Box 3: CF support for adaptation

Target Regions	Key Sectors
• Urban areas	Energy
• Outermost regions	Water and waste management
• Cross-border regions	Construction
• Non-contiguous regions[90]	Transportation

Source: Authors own elaboration, based on Regulation 2021/1058.

The CF, while primarily focusing on large-scale infrastructure, also plays a role in supporting businesses and promoting sustainable economic growth, thereby contributing to regional climate resilience[91]. This support includes: investing in **transport infrastructure (under TEN-T)**, which can improve business connectivity and regional economic development; and promoting **energy efficiency measures and renewable energy in businesses**. Taken together, these interventions have the potential to not only help businesses reduce their emissions, but also increase their resilience to climate-related disruptions. For example, improving energy efficiency and promoting the use of

[87] FI-compass, 2023, *Financial instruments provided real returns in the real economy*. Retrieved from Link. Last accessed 24 September 2024.
[88] European Commission, 2024, *2021-2027 Cohesion Policy overview*. Retrieved from Link. Last accessed 24 September 2024.
[89] European Commission, n.d., *European Regional Development Fund*. Retrieved from: Link. Last accessed 23 February 2024.
[90] An area that is not physically connected to the main territory of a country or administrative unit, separated by an intervening land or waters belonging to another jurisdiction.
[91] Regulation 2021/1058.

renewable energy can buffer businesses against energy price fluctuations and supply disruptions, which are likely to become more frequent in a changing climate.

3.3.3. The Just Transition Fund (JTF)

A EUR 19.2 billion funding programme under the EU's Cohesion Policy[92], the JTF is designed to aid regions most affected by **industrial change**, focusing on **economic diversification and the re-skilling of the workforce**[93]. Programme beneficiaries are selected through negotiations between Member States and the Commission, in line with Just Transition Plans. As a cornerstone of the Just Transition Mechanism – which also includes the InvestEU Just Transition Scheme and a Public Sector Loan Facility – the JTF is designed to mobilise EUR 65-75 billion for the regions undergoing the toughest transitions. The Public Sector Loan Facility, implemented by the EIB, provides loans to public sector projects in these transition regions, complementing JTF grants and the InvestEU scheme's support for private investment[94]. This funding is crucial to supporting the EU's adaptation objectives and ensuring that the move towards sustainability is both fair and inclusive, particularly in regions at risk of economic and social disruption.

Box 4: JTF support for adaptation

Target Regions	Key Sectors
• Regions most negatively affected by the economic and social impacts of the transition • Islands, insular areas, and outermost regions most impacted by the socio-economic challenges of the transition	Manufacturing Mining and quarrying Energy Water and waste management Construction Transportation Professional, scientific and technical activities Education

Source: Authors own elaboration, based on Regulation 2021/1056 of the European Parliament and of the Council of 24 June 2021 establishing the Just Transition Fund.

The JTF contributes to climate adaptation through a range of mechanisms aiming to enable regions and individuals to address the wide-ranging impacts of transitioning towards the EU's 2030 climate and energy targets and a climate-neutral economy by 2050[95]. This includes: deployment of **affordable clean energy technology and infrastructure**, including energy storage technologies and GHG emission reduction; investments in renewable energy and energy efficiency measures, including for **reducing energy poverty**; upgrade and rehabilitation of district heating networks and investments in heat production from **renewable energy** sources; and **regeneration and decontamination of brownfield sites**; land restoration, including green infrastructure; and repurposing projects.

Taken together, these measures increase the adaptive capacity of regions by promoting more resilient and sustainable energy systems and transport networks. For example, investments in renewable

[92] European Commission, 2024, 2021-2027 Cohesion Policy overview. Retrieved from Link. Last accessed 24 September 2024.
[93] European Commission, 2021, *Questions and Answers on the EU Cohesion policy legislative package 2021-2027*. Retrieved from Link. Last accessed 23 February 2024.
[94] Invest EU, 2023, Contribution to the Green Deal and the Just Transition Scheme. Retrieved from Link. Last accessed 24 September 2024.
[95] Regulation 2021/1056.

energy and energy efficiency not only reduce GHG emissions but can also help territories adapt to changing energy availability caused by climate-related impacts.

There are a number of ways in which the JTF can play a key role in supporting businesses to improve their climate adaptation efforts, including through: **productive investments in SMEs**, including microenterprises and start-ups, leading to economic diversification, modernisation and reconversion; **investments** in **creating new firms**, including through business incubators and consulting services; support for **research and innovation activities**, including by universities and public research organisations, and fostering the transfer of advanced technologies; **upskilling and reskilling** of workers; and job-search **assistance for jobseekers**.

The JTF also offers **sector-specific support** in order to reduce challenges that emerge as different industries take part in the transition towards a climate-neutral economy, including:

- Mining and quarrying: Targeting territories facing serious socio-economic challenges from the transition process;
- Manufacturing: Supporting the transformation of emissions-intensive industrial activities;
- Energy: Investments in clean energy technology, renewable energy, and energy efficiency;
- Construction: Supporting site rehabilitation and energy efficiency for housing;
- Transportation: Investing in smart and sustainable local mobility.

While the primary objective of this support is to help the most affected regions and sectors to manage the transition to a climate neutral economy, what this often means in concrete terms is to create opportunities for both businesses and workers to adapt to the new economic realities of a climate-resilient future, particularly for those working in greenhouse gas-intensive industrial sectors that are highly exposed to the transition[96]. In addition, the Fund's emphasis on upskilling and reskilling workers can be used to help the workforce adapt to the changing demands of the labour market, while ensuring that businesses have access to the skills they need as industry priorities shift over time.

3.3.4. The European Social Fund Plus (ESF+)

With a budget of EUR 99.3 billion for the 2021-2027 period[97], the ESF+ is the EU's main policy instrument for investing in human capital[98]. The aim of the ESF+ is not to support physical climate adaptation measures, instead it supports the EU's climate adaptation objectives by **preparing the workforce for the low-carbon transition** to a climate-neutral economy. This is in line with the EU Adaptation Strategy's objectives of fostering local, individual, and just resilience, as well as promoting *More Systemic* and *Faster Adaptation*.

According to its implementing legislation, there are several ways through which the ESF+ can contribute to climate adaptation, such as by: supporting the policy objective of 'a greener, low carbon Europe' by **improving education and training systems** necessary for **adapting skills and qualifications**; and promoting the **adaptation of workers, enterprises, and entrepreneurs**, including climate-related transitions[99]. By focusing on the development of skills and the adaptability of the labour market, ESF+ provides the necessary mechanisms that can improve the adaptive capacity of the EU's workforce and businesses.

[96] European Parliament, 2024, *Just Transition Fund*. Retrieved from Link. Last accessed 24 September 2024.
[97] European Commission, 2024, *2021-2027 Cohesion Policy overview*. Retrieved from Link. Last accessed 24 September 2024.
[98] European Commission, 2021, *Questions and Answers on the EU Cohesion policy legislative package 2021-2027*. Retrieved from: Link. Last accessed 23 February 2024.
[99] Regulation 2021/1057.

Box 5: ESF+ support for adaptation

Target Regions	Key Sectors
• National level	Manufacturing
• Outermost regions	Energy
• Coastal regions	Water and waste management
• Urban and rural areas	Education
• Northern sparsely populated regions (specific NUTS 2 regions)	

Source: Authors own elaboration, based on Regulation 2021/1057 of the European Parliament and of the Council of 24 June 2021 establishing the European Social Fund Plus (ESF+) and repealing Regulation (EU) No 1296/2013.

One of the key aims of the ESF+ is to support businesses and promote sustainable economic growth. Accordingly, support for these aims is provided through: **modernising labour market institutions** and services to assess and anticipate skills needs, ensuring timely assistance for labour market matching, transitions, and mobility; **promoting lifelong learning, flexible upskilling, and reskilling opportunities** for all, better anticipating change and new skill requirements based on labour market needs; and contributing to a 'greener, low carbon Europe' by supporting skills development and job creation in sectors related to the **environment, climate, energy, circular economy, and bioeconomy**.

These interventions can help support businesses and workers in adapting to the evolving needs of a climate-resilient economy. For example, by addressing skill mismatches and shortages in key sectors for the green transition, the ESF+ can help create a more adaptable workforce. This is especially important for SMEs, which often face acute challenges in accessing the skills needed for adapting to changing market demands. The ESF+ can provide sector-specific support for:

- Manufacturing: Supporting industrial transition and skills for key enabling technologies;
- Energy sector: Supporting job creation in energy-related fields;
- Water and Waste Management: Promoting job creation in environmental and circular economy sectors; and
- Education: Enhancing the market relevance and quality of education and training systems.

This more people-centred approach to adaptation by the ESF+ has an important complementary role to play with the more infrastructure-focused Cohesion Policy funds (i.e. ERDF and CF) in forming a comprehensive climate adaptation strategy for the EU.

3.3.5. Interreg programmes

The Interreg programmes are key instruments of the EU's Cohesion Policy, designed to foster cooperation across and between borders. Without a clear focus on any one economic sector, the four strands of Interreg target different geographical scales, regions, and types of cooperation, including: **cross-border (Interreg A), transnational (Interreg B), interregional (Interreg C),** and **cooperation between outermost regions (Interreg D).** While not explicitly focused on climate adaptation per se, these programmes can play a role in supporting adaptation efforts through their emphasis on regional cooperation and knowledge sharing[100].

[100] Regulation 2021/1059.

Box 6: Interreg support for adaptation

Interreg A	Interreg B	Interreg C	Interreg D
Operates at the **most local level**, targeting **NUTS level 3** regions along all internal and external land borders, as well as maritime borders separated by a maximum of 150 km of sea.	Covers **larger transnational areas,** including **NUTS level 2** regions and, where appropriate, macro-regional or sea-basin strategies.	The **broadest geographical scope**, covering the **entire territory** of the Union, including the outermost regions.	Focuses specifically on all **outermost regions**.

Source: Authors own elaboration, based on Regulation 2021/1059 of the European Parliament and of the Council of 24 June 2021 on specific provisions for the European territorial cooperation goal (Interreg) supported by the European Regional Development Fund and external financing instruments.

At the most local level (NUTS 3), **Interreg A** bridges neighbouring regions in order to tackle shared climate challenges[101]. There are a number of key mechanisms through which the programme can support climate adaptation, such as by promoting integrated regional development between adjacent land and maritime border regions. Moreover, by facilitating cooperation not only between EU Member States but also with third countries and partner countries, Interreg A opens up possibilities for cross-border adaptation strategies. Key features of the climate adaptation support offered by Interreg A include: enabling **joint actions** to address shared climate risks in **border areas**, and facilitating cooperation between **EU and non-EU countries** for broader impact.

Expanding the scope of cooperation, **Interreg B** operates at a more macro-regional level (NUTS 2), promoting collaboration over larger transnational territories or around sea basins. In turn, this widened scope allows for the coordination and planning of adaptation actions across broader geographical areas. Key mechanisms through which Interreg B supports climate adaptation are: supporting large-scale, **transnational adaptation initiatives**, and allocating at least **60% of ERDF contributions** to Interreg B for Policy Objective 2 (**a greener, low carbon Europe**).

The mechanisms through which **Interreg C** supports climate adaptation in the EU are less direct than the instruments discussed above, serving primarily as an important **knowledge hub**. As a result, the programme addresses climate adaptation only indirectly, for example through the exchange of experiences, innovative approaches, and capacity building. However, Interreg C can support the exchange of experiences on integrated and sustainable urban development, which can result in more climate-resilient urban planning.

Recognising the particular vulnerability of the EU's outermost regions, **Interreg D** establishes a specific **framework for cooperation between these territories** and with their neighbouring countries, overseas territories and regional organisations. Again, this cooperation framework is not specific to climate adaptation as such, but it could, for example, allow for the development of joint adaptation efforts to address the particular climate-specific challenges these regions face.

As a result of the indirect manner through which all four Interreg strands support climate adaptation, it follows that the ways in which these programmes could be directly leveraged to strengthen the adaptive capacity of businesses are highly uncertain and not precisely known.

[101] Ibid.

4. CURRENT STATE OF COHESION POLICY SUPPORT FOR ADAPTATION

KEY FINDINGS

- Cohesion Policy funding for climate change adaptation has increased significantly from EUR 8 billion for 2014-2020 to a planned EUR 17 billion for 2021-2027, reflecting the growing prioritisation of adaptation.
- Most Managing Authorities report that their Operational Programmes are well-aligned with regional adaptation needs and cross-sectoral strategies. The application of the Do No Significant Harm principle proves particularly effective in ensuring this.
- Strong stakeholder engagement and acceptance, adequate technical capacity, and sufficient financial resources are identified as critical success factors for implementing adaptation projects using Cohesion Policy.
- While businesses value Cohesion Policy for its ability to drive more sustainable practices and innovation, complex application procedures and a lack of awareness about funding opportunities remain significant barriers to accessing support, particularly for SMEs.

4.1. Cohesion Policy funding for adaptation

The state of Cohesion Policy support for adaptation was assessed based on publicly available funding data and the results of the two surveys carried out as part of this study. In addition, examples of good practices were identified throughout the research.

4.1.1. Overview of funding data

Adaptation has been explicitly supported by Cohesion Policy since 2014[102], when adaptation to climate change was pursued under Thematic Objective 5 '*promoting climate change adaptation, risk prevention and management*'. A specific intervention field[103] '*87 adaptation to climate change measures and prevention and mitigation of climate risks*' was used to track adaptation investments in awareness raising, civil protection or infrastructure to manage erosion, fires, floodings, storms and drought[104]. In the 2021-2027 period, adaptation is supported under PO2 on a greener Europe, with several intervention fields that aim to more accurately track the different adaptation investments: '*58 adaptation [measures]: floods and landslides*', '*59 adaptation [measures]: fires*' and '*60 adaptation [measures]: others, e.g. storms and drought*'[105].

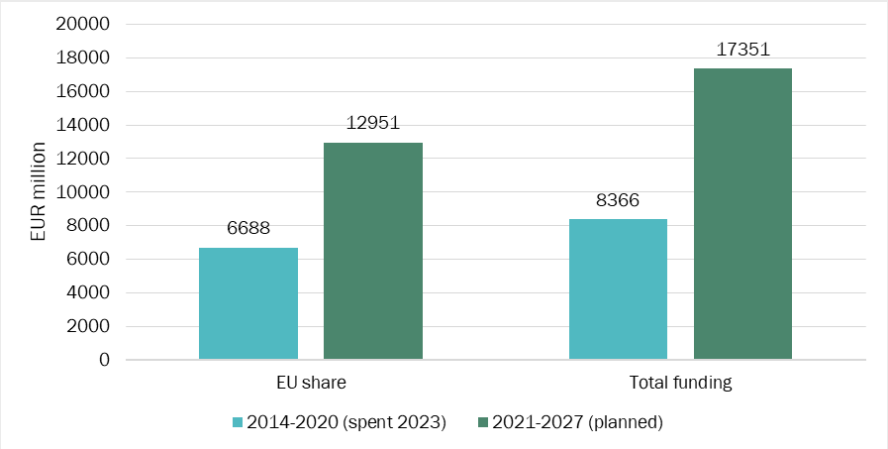
Comparing the data from the Cohesion Open Data Platform[106] for both funding periods, Figure 2 shows that around **EUR 8 billion in total were directly spent on adaptation in 2014-2020** (of which EUR

[102] In earlier periods, disaster risk prevention was supported but adaptation to climate change was not specifically targeted.
[103] Each investment or 'intervention' funded by Cohesion Policy funds is assigned a code according to the list of dimensions and codes for the types of interventions that the funds can support. In short, these codes are known as 'intervention fields' and the complete list for each funding period is provided by the European Commission in the relevant fund legislation.
[104] Based on Regulation (EU) No 1303/2013 and Commission Implementing Regulation (EU) No 2015/2014.
[105] Based on Regulation (EU) 2021/1060, including Annex 1.
[106] Data was retrieved on 26 June 2024 from https://cohesiondata.ec.europa.eu/. It contains the updated data for the 2014-2020 period as of 31.12.2023 and the planned allocations for the 2021-2027 period as of the time of download.

6.7 billion were the contribution from the EU budget). This represents **2% of all the Cohesion Policy spending during the period**[107].

In the **2021-2027 period, the planned direct spending on adaptation is higher - EUR 17 billion in total** (of which nearly EUR 13 billion EU contribution) or around **3% of the total allocations for the period**[108]. Nevertheless, this amount may evolve over the period, either as the funding is decided and actually spent or as priorities evolve. It is possible that some of the 2021-2027 Cohesion Policy funds are not yet allocated and that the current figures underestimate the adaptation support that will actually be provided by the end of the 2021-2027 MFF. Furthermore, it is possible that some investments under other intervention fields may have adaptation benefits or include elements of business or regional adaptation but are not captured in this analysis as it considers only the adaptation-specific intervention fields[109].

Figure 2: Cohesion Policy support for adaptation in the periods 2014-2020 and 2021-2027



Source: Authors own elaboration, based on data from the Cohesion Open Data Platform.

Note: The 'EU share' refers to the portion financed by the EU. 'Total funding' includes contributions from both the EU and national sources, following the co-financing principle. The data covers all EU funding programmes that contribute to the climate adaptation intervention fields (87 in 2014-2020 and 58-60 in 2021-2027). For 2014-2020, the data covers the latest reporting as of December 2023.

While support is primarily channelled under the objectives that focus explicitly on adaptation, relevant investments in the intervention fields have also been funded or funding is planned under other objectives, highlighting the cross-cutting role that adaptation and resilience have in the economy (see Figure 14 in Annex 1). In the 2014-2020 period, the support for adaptation came almost in equal parts from the ERDF and the CF (around EUR 3 billion each). In the current period, the support comes primarily from the ERDF (82% or EUR 10.6 billion), followed by the CF (EUR 2.3 billion) and only a small share (around 0.3% or EUR 0.035 billion) of the planned adaptation funding comes from the JTF (see Figure 15 in Annex 1).

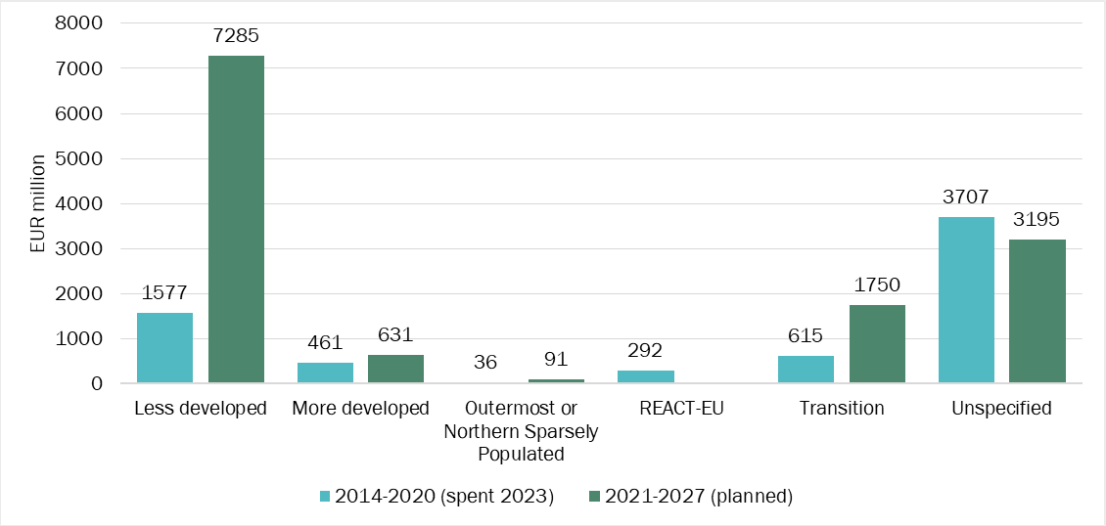
In terms of geographical distribution across countries, several Member States have not invested in adaptation in either of the two periods: Ireland, Luxembourg, Malta, and the Netherlands. Among the Member States that invest in adaptation, **the largest amount in both periods has been observed in Poland**. **Many countries** such as Bulgaria, Czechia, Greece, Italy, and Latvia have considerably

[107] As of 22.08.2024, the Cohesion Open Data Platform for 2014-2020 (https://cohesiondata.ec.europa.eu/cohesion_overview/14-20) indicates that the total costs spent in 2023 was about EUR 511 billion.
[108] As of 21.08.2024, the Cohesion Open Data Platform for 2021-2027 (https://cohesiondata.ec.europa.eu/cohesion_overview/21-27) indicates that the total planned funding for the period is about EUR 528.5 billion.
[109] The data publicly available on the Cohesion Open Data Platform does not provide detailed project descriptions, which can allow for a granular analysis beyond intervention fields.

increased their allocations for adaptation compared to spending in the 2014-2020 period. Several countries such as Hungary, Lithuania, and Romania appear to have decreased their planned spending on adaptation (see Figure 17 in Annex 1).

Looking at the categorisation of regions as they are defined in the context of Cohesion Policy, **the majority of the funding for adaptation goes to less developed regions** (which also tend to receive the most funding overall). They are followed by 'transition' and 'more developed' regions, excluding a large part of the regions for which the category is unspecified in the data (Figure 3).

Figure 3: Cohesion Policy support for adaptation by type of region (EU contribution)



Source: Authors own elaboration, based on data from the Cohesion Open Data Platform.

Note: The data covers all EU funding programmes that contribute to the climate adaptation intervention fields (87 in 2014-2020 and 58-60 in 2021-2027) and excludes any co-financing. For 2014-2020, the data covers the latest reporting as of December 2023. REACT-EU is the Recovery assistance for cohesion and the territories of Europe.

While in the 2014-2020 period it is not easy to distinguish between the types of adaptation measures supported, the intervention fields in the 2021-2027 period provide at least an indicative picture. In the current period, most of the adaptation measures planned will address floods and landslides, followed by measures to address other climate risks (e.g. droughts) and measures to address fires (see Figure 16 in Annex 1).

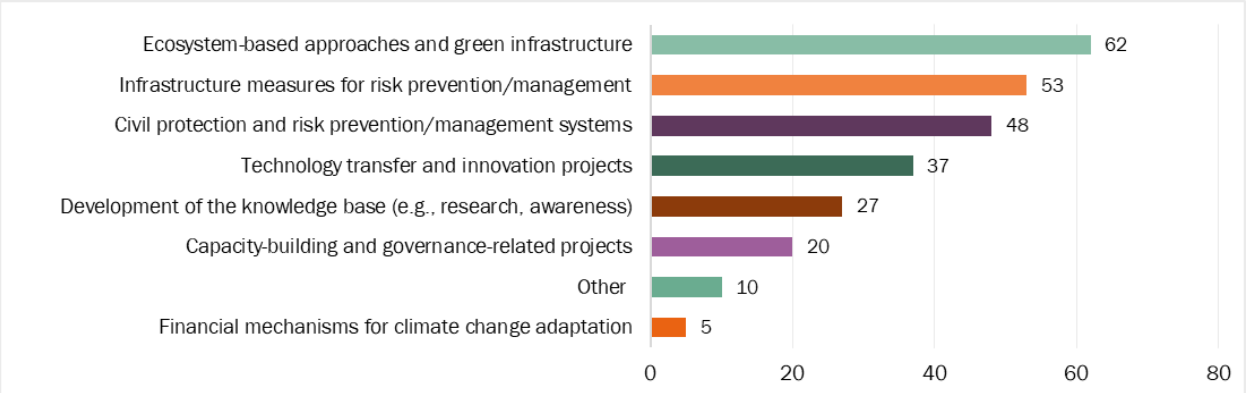
4.1.2. Overview of survey findings

The funding data does not provide a breakdown of adaptation support per sector, nor of business type, nor of specific investments supported. Therefore, information collected from stakeholders via the surveys was used to complement the funding data analysis and provide a more granular picture of the adaptation support in the EU in the 2021-2027 period.

According to the majority of the Managing Authorities (MAs) surveyed, the Operational Programmes (OPs) they oversee allocate over 15% of the total OP funding to adaptation (see Figure 18 in Annex 2) and the **support for adaptation increased over time** (see Figure 19 in Annex 2).

The majority of the adaptation projects supported address **ecosystem-based approaches and green infrastructure**, followed by infrastructure measures and civil protection/risk prevention and management (Figure 4). In terms of beneficiaries, the main recipients of adaptation funding by far are public institutions, followed by NGOs and SMEs (see Table 3 in Annex 2). Box 7 provides examples of specific adaptation measures supported.

Figure 4: Main types of adaptation projects supported by the OPs



Source: MA survey (n=89). Number of responses to the question: Which three main types of climate adaptation projects are supported by your OP?

Box 7: Technical and infrastructure solutions, best practice

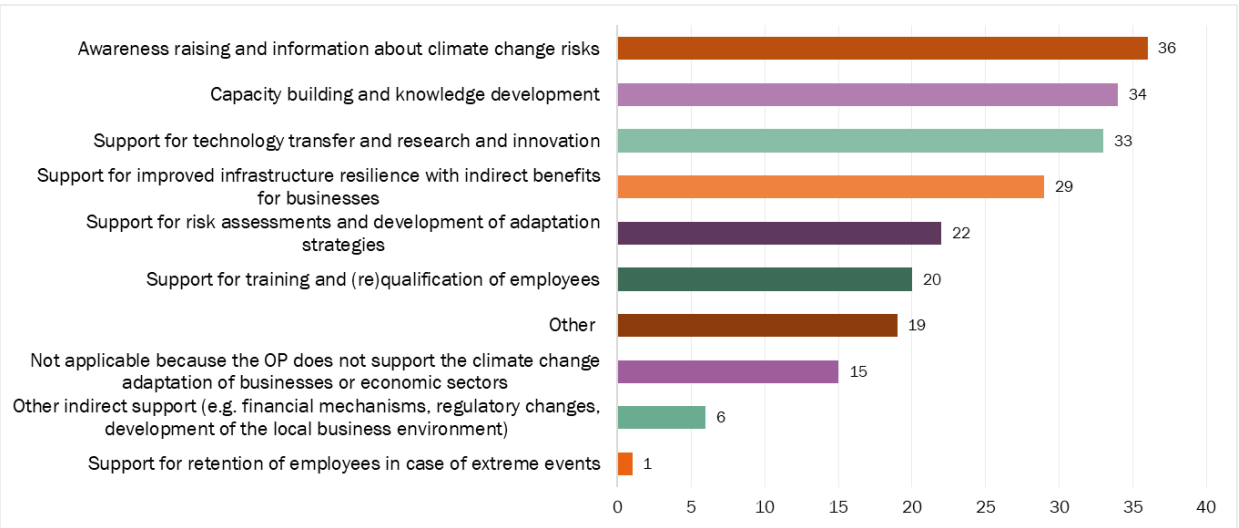
Implementing specific technical measures and infrastructural projects to enhance resilience

Building renovation with renewable energy: The Romanian North-West Regional Programme supports the renovation of public and heritage buildings by incorporating renewable energy sources to enhance energy efficiency and resilience. Financial instruments are utilised to assist in refurbishing buildings, with SMEs also supported in adopting renewable energy solutions for the renovation of public and residential structures (Source: MA survey).

Simplified Cost Options for renovation: The Regional Council of Provence Alpes Côte d'Azur has introduced Simplified Cost Options for renovating public buildings, aiming to streamline processes and increase impact. While these simplified options are intended to enhance collaboration between previously unconnected stakeholders, the region has yet to see significant changes in practices or results. The costs associated with this model are exceptionally high, and some disruptive economic models, particularly in renewable energy, are not yet fully operational (Source: MA survey).

According to authorities, the **main types of support provided to businesses** to meet their climate adaptation needs are awareness raising/information about climate risks, capacity building and support for technology transfer and innovation. Support is also provided indirectly through improvements to the resilience of infrastructure to climate change (Figure 5).

Figure 5: Main types of adaptation support provided to businesses



Source: MA survey (n=89). Number of responses to the question: What are the main types of support your OP provides to meet businesses' climate adaptation needs?

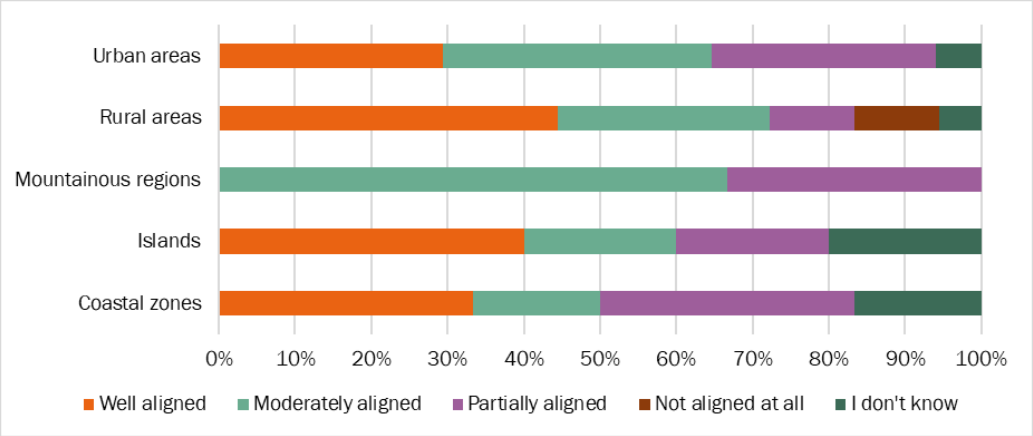
4.2. Cohesion Policy effectiveness

Building on the overview of Cohesion Policy funding for adaptation as presented in the previous section, this analysis goes further by examining its effectiveness in fostering regional resilience, supporting business adaptation, and meeting the perceived adaptation needs of both groups of stakeholders. This section outlines the factors that contribute to success and identifies the limitations that challenge the effectiveness of Cohesion Policy instruments.

4.2.1. Aligning funding with adaptation needs

According to MAs, the **current allocations of the Cohesion Policy largely align with the climate adaptation needs** of the key economic sectors operating within the regions that they serve (see Figure 20 in Annex 2). For example, results of the survey indicate that 68% of MAs consider their programmes to be well aligned (32 respondents) or moderately aligned (25 respondents) with the adaptation needs of key sectors active in their regions. Considering the types of territories represented, MAs in rural and urban areas report the strongest alignment between their OPs and local adaptation needs. MAs from mountainous regions consider that their OPs are moderately or only partially aligned with adaptation needs (Figure 6).

Figure 6: Alignment of sectoral adaptation needs with Cohesion Policy by type of territory (MA perspective)



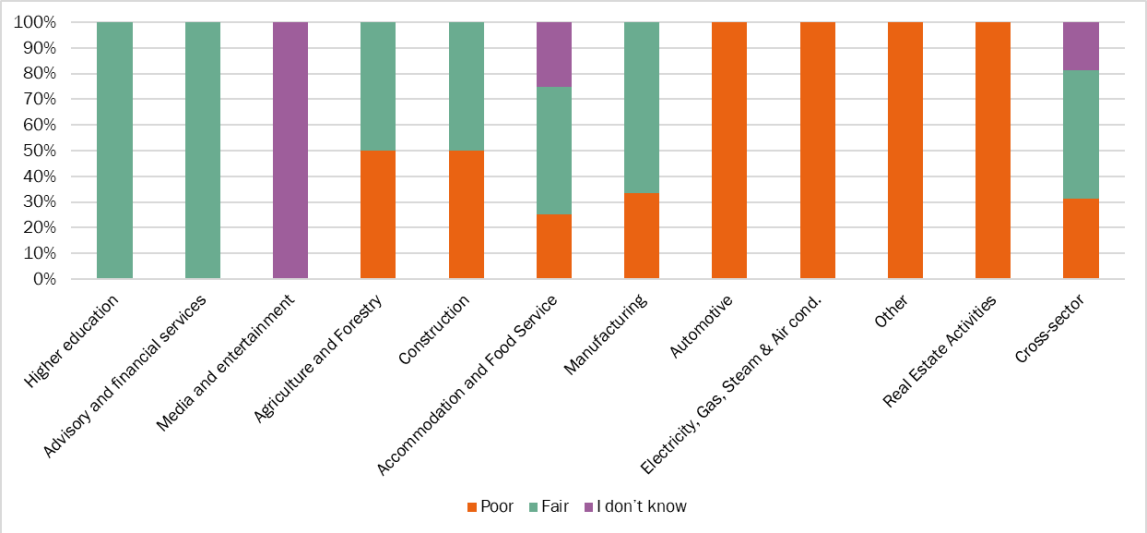
Note: MA survey (n=89). Share of responses to the question: To what extent do you believe that the climate change adaptation needs of these key sectors align with the adaptation funding provided by your OP?

While MAs generally consider Cohesion Policy instruments to be well aligned with sectoral adaptation needs, the perspective from businesses is more varied. In total, 70% (26 respondents) believe that Cohesion Policy moderately or only slightly aligns with their sectoral needs (see Figure 23 in Annex 3). Furthermore, **business stakeholders rated the availability of Cohesion Policy funding for adaptation** as **'fair'** (46%) and even as **'poor'** (41%).

However, interesting trends emerged when looking at the results through a sectoral lens (Figure 7). For example, business stakeholders in **higher education, advisory and financial services**, and **media and entertainment predominantly** rated the availability of funding as **'fair'**. At the same time, sectors that are typically considered to be highly exposed to the impacts of climate change, such as **construction, agriculture and forestry,** as well as **real estate activities** exhibited a more varied view, with a significant share rating availability as both '**fair'** and **'poor'**. This sectoral divide may be attributable, for example, to the differing nature of climate adaptation needs and challenges across industries. Knowledge-based sectors such as higher education and financial services generally face fewer physical risks from the impacts of climate change, and may therefore require less capital-

intensive adaptation solutions. On the other hand, sectors such as agriculture and construction often face more tangible, infrastructure-related climate risks, requiring larger-scale investments that may exceed or misalign with their current funding provisions.

Figure 7: Availability of Cohesion Policy funding for adaptation by sector



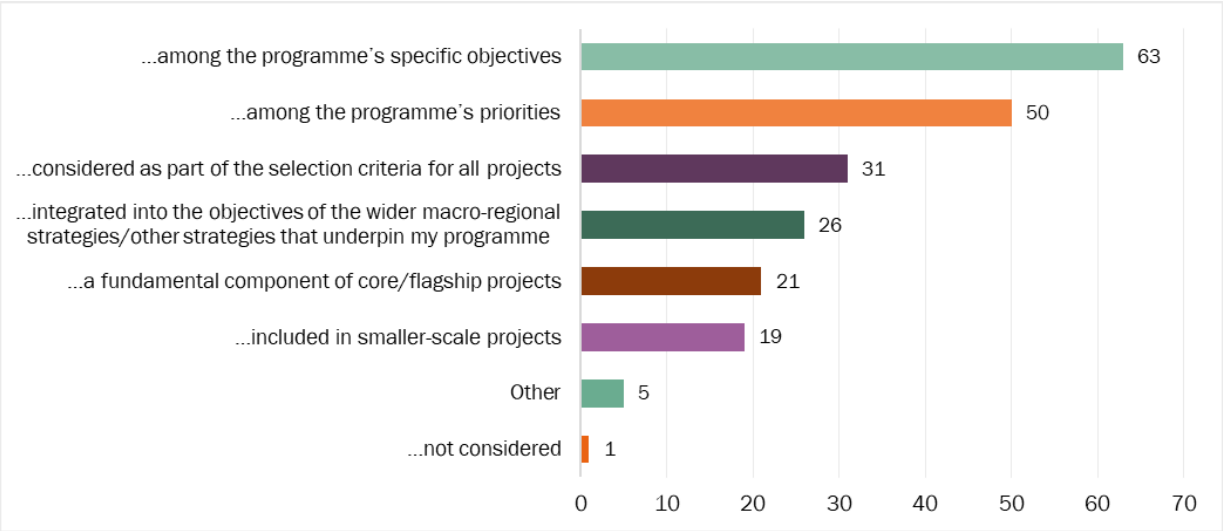
Source: Business survey (n=37). Share of responses to the question: How would you rate the availability of Cohesion Policy funding for climate change adaptation for your business or sector?

The majority of the business respondents considered that the **availability of adaptation support from Cohesion Policy increased over time**, although this varies per sector (see Figure 24 in Annex 3). The views of business stakeholders also varied across countries (see Figure 25 in Annex 3) and different types of territories (see Figure 26 in Annex 3). **Rural and coastal areas, for example, expressed a higher proportion of 'poor' ratings** compared to other regions. In addition, most respondents who were unaware of such funding opportunities were concentrated on islands, in rural areas and, to a lesser extent, urban areas. Interestingly, business stakeholders with a wider geographical presence, in particular those operating in either 'urban and rural areas' or 'all types of territories', uniformly considered the availability of Cohesion Policy funding for adaptation to be sufficient.

4.2.2. Success factors and challenges in supporting regional resilience

Unpacking these initial results further, a number of key themes were revealed from the survey results, which demonstrated exactly how different OPs manage to effectively address the adaptation needs of key economic sectors operating within their region. One **key approach** that emerged points to the fact that many programmes have implemented a **specific objective on climate change adaptation** in particular (Figure 8). Many OPs reported benefits from, for example, establishing climate adaptation as an overarching priority in their programmes, including specific climate change adaptation measures or considering adaptation as part of the selection criteria for all OP funded projects.

Figure 8: The role of climate adaptation in Operational Programmes



Source: MA survey (n=89). Number of responses to the question: Please complete the following sentence: In my OP, adaptation to climate change is… (Select all that apply).

A further finding is that some respondents highlighted the **adoption of cross-sectoral and interdisciplinary strategies**. As a result, these approaches were found to effectively facilitate investments addressing climate adaptation needs across sectors, such as in water management and urban development, among others. Programmes that integrated adaptation concerns across multiple domains were better equipped to tackle the complex, interconnected challenges of climate adaptation. This approach recognises that adaptation issues often transcend individual sectors of the economy. Consequently, it resulted in a more holistic and flexible strategy for addressing climate-related risks and vulnerabilities within different regions. Good practice examples are provided in Box 8.

Box 8: Innovative policies and strategic planning, best practice

Integrating climate adaptation into broader policy frameworks and alignment with long-term strategic goals
Fáilte Ireland's Regenerative Tourism strategy: The Eastern and Midland Regional Assembly, supported by the EU's Just Transition Fund, has developed an innovative tourism strategy that aligns with other existing strategies and serves as a prime example of how such integration can future-proof industries and foster broader economic growth (Source: MA survey).
Climate change adaptation plans: The Ministry of Environmental Protection and Regional Development in Latvia has developed the 'Latvian Climate Change Adaptation Plan Until 2030'. This plan serves as a strategic framework for guiding climate adaptation efforts and can be used as a basis to apply for funding (Source: MA survey).
Adapt Northern Heritage: Funded under the Interreg programme for the Northern Periphery and Arctic, the project tackles the impacts of climate change on northern cultural heritage by engaging communities in conservation policy planning. The initiative includes developing an online tool for assessing risks and vulnerabilities of historic sites and creating adaptation action plans (Source: MA survey).

The survey results also highlight the **application of the Do No Significant Harm (DNSH) principle** as a valuable tool in several of the programmes. Interestingly, this has been used not only to ensure that investments do not have an adverse impact on the environment, but also as an educational tool for applicants, encouraging them to integrate environmental and climate considerations into their projects from the outset. One such example of this effect is that the application of the DNSH principle

often leads to a climate-proofing analysis or screening, where the conclusions of the analysis are integrated into, for example, infrastructure development, resulting in greater climate resilience of the built environment. Further good practice examples are provided in Box 9.

Box 9: Monitoring and evaluation, best practice

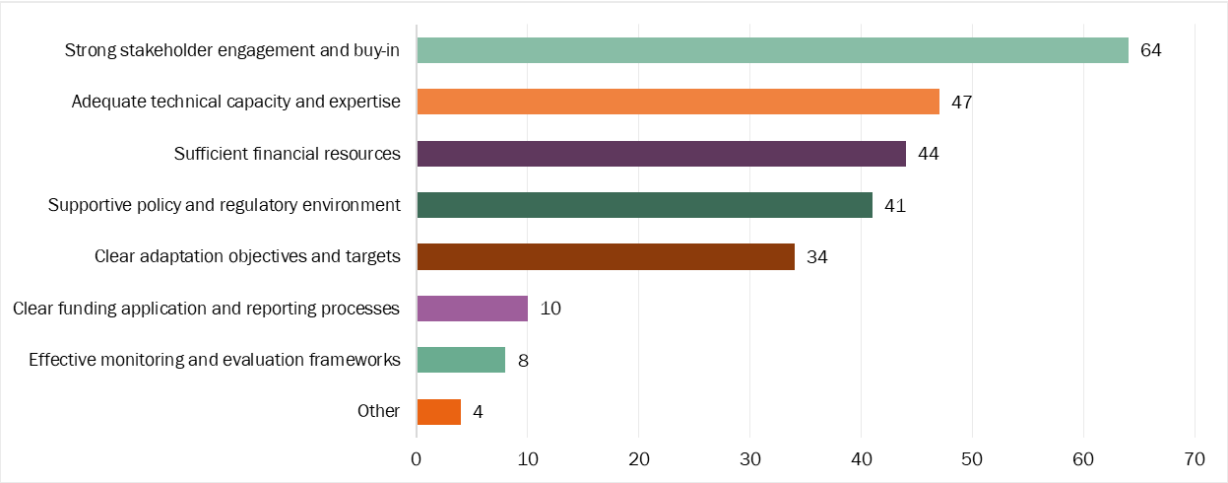
Ensuring continuous learning and improvement through monitoring, evaluation, and lessons sharing
Harmonised proposal assessment: The Programme managed by the Ministry of Finance in Latvia has established unified guidelines for assessing climate-related project proposals (Source: MA survey).
Regione Friuli Venezia Giulia: The Interreg VI-A Italy-Slovenia programme has yielded several effective practices which strengthen climate adaptation in the region. Firstly, it has invested in joint early-warning and risk monitoring systems, including small-scale infrastructure using bio-engineering techniques. Secondly, the programme has focused on promoting community-level awareness of climate change risks, particularly to local ecosystems and forest areas, by actively involving citizens and schools in the process (Source: MA survey).

To better understand why Cohesion Policy is effective in supporting climate adaptation, several **success factors** were identified (Figure 9). The MAs overwhelmingly indicated **strong stakeholder buy-in and engagement** as the most critical factor, selected by 72% of the MAs, reinforcing the importance of collaborative approaches in activating local support on the ground where such measures are to be implemented. Examples of good practices in stakeholder engagement are provided in Box 10.

This is closely followed by the importance that MAs give to having **adequate technical capacity and expertise** (53%) and **sufficient financial resources** (49%), which confirm the importance of ensuring that the necessary human and financial resources are both in place. Next, a **supportive policy and regulatory environment** (46%) and **clear adaptation objectives and targets** (38%) were also identified as important, emphasising the need for an enabling policy framework. Interestingly, factors related to project administration, such as clear funding processes and monitoring frameworks, were considered less important by MAs.

On the other hand, **businesses** ranked **a supportive policy and regulatory environment and adequate funding** as the two most important factors for successfully implementing adaptation projects using Cohesion Policy, followed by clear funding application and reporting processes (see Figure 27 in Annex 3).

Figure 9: Success factors for Cohesion Policy support for adaptation (MA perspective)



Note: MA survey (n=89). Number of responses to the question: In your opinion, what are the most important factors for the successful implementation of climate change adaptation projects under your OP?

Box 10: Stakeholder engagement and knowledge sharing, best practice

Building partnerships, involving diverse stakeholders, and fostering collaboration

Meet-and-Match events: The Programme Interreg Italy-Austria is organising events to connect potential beneficiaries and public institutions, encouraging collaboration and project development on thematic objectives such as climate adaptation (Source: MA survey).

Knowledge sharing among Atlantic clusters: Interreg Atlantic Area creates opportunities for cross-sectoral project development and knowledge transfer to address climate challenges holistically. The programme plays a crucial role in both a facilitating and providing financial support, promoting the exchange of best practice and operational collaboration among the Atlantic clusters through a quadruple helix approach (Source: MA survey).

EUSDR 'Embedding Weeks' and Tools: The EU Strategy for the Danube Region (EUSDR) facilitates collaboration and knowledge sharing among Managing Authorities across the Danube Region to align efforts with strategic goals (Source: MA survey).

Despite these successes, the survey results also reveal a number of **challenges** in fully leveraging Cohesion Policy to further strengthen regional climate resilience.

Limited financial resources emerge as a major constraint, with several MAs noting that the climate adaptation needs of their territories far exceed the amount of available funding. The results also indicate that this financial constraint is exacerbated by the need to balance climate adaptation with other pressing development priorities, suggesting a challenge in allocating resources within Cohesion Policy funds between adaptation projects and other competing priorities.

Another notable challenge is the **difficulty of aligning projects with programme conditions**, especially given the relatively novel nature of climate change adaptation as viewed by many stakeholders potentially receiving programme funding. To elaborate further, some respondents indicated that while their OPs are well-designed for addressing climate adaptation needs, the ability of applicants to prepare projects that meet these conditions remains a significant hurdle. In turn, these challenges suggest the need for greater capacity building and knowledge sharing in order to improve the ability of regional actors to develop and implement eligible and effective adaptation projects.

The results of the survey also highlight the **need for greater coordination between policy instruments and relevant actors**. This challenge manifests in several ways, including: lack of sufficient coordination between different EU-level policy instruments; public regional actors lacking competence in climate adaptation; limited regional partnerships with expertise on environmental and adaptation issues; and low concern for environmental issues in the entrepreneurial sector due to lack of partnerships. These findings point to a recurring theme among the limitations of Cohesion Policy in strengthening regional climate resilience: a lack of regional capacity and a greater need to foster partnerships more effectively so as to address climate adaptation challenges at local level.

Looking more closely at the limitations of Cohesion Policy in strengthening regional adaptation and resilience to climate change, certain **sector-specific challenges** were also identified. Notably, respondents indicated that support for the agricultural and forestry sectors falls outside the scope of Cohesion Policy instruments, as they are covered by other funds (notably the CAP). As a result, the survey respondents argue that this leads to a more fragmented policy and strategic approach to climate adaptation, and greater perceived complexity among regional stakeholders.

4.2.3. Opportunities and challenges for supporting businesses' adaptation efforts

Businesses experience successes and challenges when using Cohesion Policy to support their adaptation efforts, as many key sectors and industries aim to transform their operations in line with a climate-neutral economy.

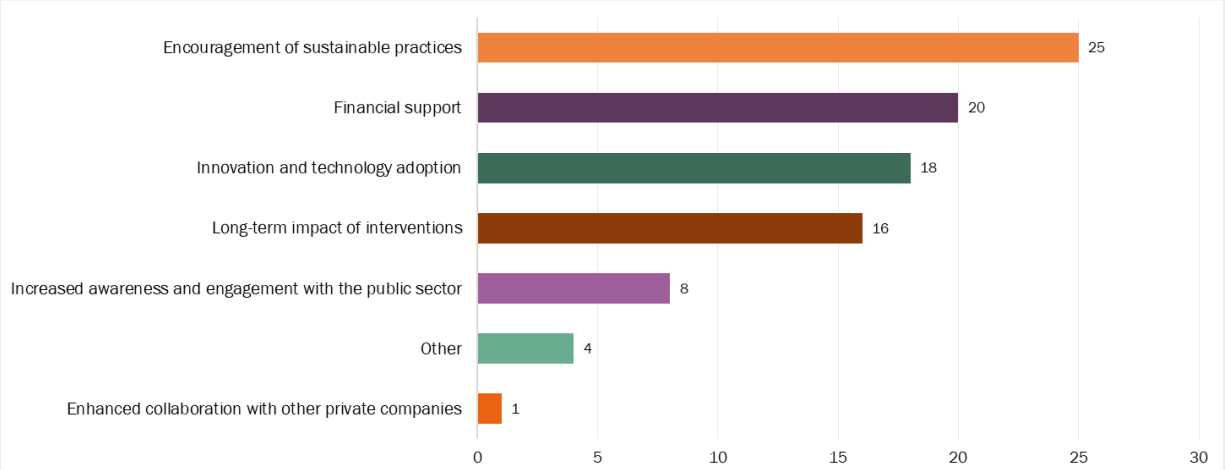
Business stakeholders see several key **benefits** in the use of Cohesion Policy funding for adaptation projects. The most frequently identified advantage that was selected by 68% of business stakeholders is the **encouragement of sustainable practices** (Figure 10). This, in turn, suggests that Cohesion Policy funding can play a key role in encouraging longer-term changes in business behaviour by incentivising more environmentally sound practices, potentially resulting in a multiplier effect that goes beyond individual projects to influence broader business strategies and sector-wide norms.

The benefits of **financial support** emerge as the second most important benefit for 54% of business stakeholders. This reinforces the **crucial role of Cohesion Policy** in providing the necessary **capital for businesses to undertake adaptation projects**. The importance of this financial support is particularly noteworthy given the well-recognised challenge of significant up-front investment for adaptation measures, which some businesses face.

Closely linked to financial support is the benefit of **innovation and technology adoption,** identified as the third most significant factor by 49% of respondents. This connection suggests that Cohesion Policy funding not only helps to address immediate adaptation needs, but also catalyses the development and implementation of new technologies and innovative solutions. By supporting innovation, Cohesion Policy appears to be enhancing the long-term resilience and competitiveness of businesses, potentially positioning EU businesses at the forefront of climate-adaptive technologies and practices. The **long-term impact** of these instruments, as noted by 43% of respondents, further reinforces the enduring value and benefits of Cohesion Policy support, suggesting that businesses view Cohesion Policy not only as a source of short-term funding, but also as a strategic investment in their future viability.

Less frequently reported by business stakeholders were the benefits of increased awareness, and engagement with the public sector (22% of respondents) and, in particular, enhanced collaboration with other private companies (1 respondent).

Figure 10: Cohesion Policy benefits for businesses



Note: Business survey (n=37). Number of responses to the question: What do you think are the main benefits of using Cohesion Policy funding for adaptation projects?

In terms of **challenges**, a fairly clear hierarchy of barriers to the use of Cohesion Policy emerges among businesses. Firstly, **complex application and reporting procedures** are revealed as the top barrier, selected by 46% of business stakeholders (Figure 11). This finding suggests that the administrative burden associated with Cohesion Policy funding may act as a significant deterrent, particularly for SMEs with limited resources to manage the required application process.

Figure 11: Barriers for businesses to using Cohesion Policy (business perspective)

Note: Business survey (n=37). Number of responses to the question: What do you think are the key barriers to using Cohesion Policy funding for adaptation projects?

Next, the **lack of awareness about available funding** was identified as the second most common barrier according to 14 business stakeholders (38%), which may indicate the existence of an information gap among businesses in general, suggesting that despite the availability of funding, many businesses may remain uninformed about these opportunities. In addition, the prevalence of this barrier may be demonstrative of the need to improve current communication strategies and outreach efforts by Cohesion Policy implementers.

Regulatory barriers, identified by 30% of business stakeholders, represent another key challenge. Other notable barriers identified by businesses include a **lack of expertise or technical support for**

applications and project reporting, **limited scope for use of funds**, and the perception that **funding amounts are too small to justify the effort**.

The survey results from the MAs provide a complementary view of the barriers businesses face in accessing Cohesion Policy funding for adaptation needs (see Figure 21 in Annex 2). From the MA perspective, **complex application and reporting processes** also emerge as a significant barrier to businesses for 36% of MAs. The extent of alignment with the business perspective reinforces the notion that administrative complexity is a major hurdle in the funding process. Moreover, the recognition of this issue by the MAs suggests a certain degree of awareness of the problem among the implementing bodies themselves.

The **lack of awareness about available funding** is another key barrier, identified by 35% of MAs. These results, which closely correspond with the perspective of businesses, suggests a widespread recognition of the need for improved communication and outreach channels on funding opportunities. The fact that the surveyed MAs also identified this as a major barrier indicates that the information gap identified earlier is more than just a perception issue on the part of businesses, but rather a legitimate shortfall of these policy instruments in particular. Other significant barriers identified by MAs include **funding amounts that are too small to justify the effort** (28%) and **strict eligibility and/or selection criteria** (23%). The prevalence of these factors suggests that MAs recognise both the resource constraints and the regulatory challenges that businesses may face in accessing programme funding.

While in many respects the challenges of accessing and using Cohesion Policy were broadly shared by both businesses and MAs, there were a number of areas where their perspectives diverged. In particular, 28% of the MAs surveyed identified the **perception that adaptation and building resilience is not a priority for businesses** as a key barrier. This view contrasts sharply with that of businesses, only 5% of which cited the same barrier. This discrepancy, in turn, points to a potential misunderstanding between the two groups about how much value businesses place on climate adaptation efforts. In light of the findings discussed above, this may in fact be attributable to one of a number of factors, such as complex application procedures or funding amounts that do not justify the effort, acting as strong disincentives for businesses in engaging with these programmes.

The barriers faced by businesses in accessing funding may be experienced differently by businesses of different sizes. When asked whether the main barriers to accessing Cohesion Policy funding varied between SMEs and large enterprises, MAs pointed to the fact that the **funding eligibility varies**. In particular, many Cohesion Policy programmes restrict or exclude funding for large enterprises, instead prioritising SMEs. MAs also reported that large enterprises, if eligible, can only access funding for certain types of projects, such as research and development collaborations.

The **administrative and reporting capacity** of SMEs and large enterprises emerges as another key differentiating factor. As large enterprises tend to have greater administrative capacity to handle the application and reporting processes, it is easier for them to access programme funding. SMEs often face further challenges related to limited resources and expertise such as less access to climate adaptation knowledge, and hesitancy to invest in adaptation due to limited resources. This points to a difference between SMEs and large enterprises in the level of **awareness and prioritisation** of climate adaptation.

5. GAP ANALYSIS AND FUTURE ADAPTATION PRIORITIES FOR COHESION POLICY

KEY FINDINGS

- Gaps are identified in relation to the availability of direct support for adaptation and the targeting of specific local adaptation needs in different territories.
- There is also a partial misalignment of Cohesion Policy support for adaptation and the perceived needs of businesses.
- Factors such as complex application and reporting procedures, unawareness among businesses about Cohesion Policy, and other capacity issues make the wider use of Cohesion Policy funding for business adaptation challenging.
- The future adaptation priorities for Cohesion Policy identified by survey respondents align with the design of its instruments. However, further efforts are needed to ensure their potential is fully realised 'on the ground'.

5.1. Regional adaptation needs versus current Cohesion Policy support

In view of the results of this study, two main gaps have been identified between the current level of EU support for climate adaptation through Cohesion Policy and the adaptation needs of different regions across the EU.

Firstly, despite increased allocations in the 2021-2027 programming period, the **Cohesion Policy funding directly dedicated to climate adaptation** (i.e. in terms of adaptation intervention fields) **appears to be insufficient** in light of the scale and diversity of adaptation needs faced by the diverse regions of the EU, and the critical necessity of adapting to the impacts of climate change. For instance, as detailed in Chapter 4, adaptation accounted for only 2% of total Cohesion Policy spending in 2014-2020, amounting to EUR 8 billion. While planned allocations have increased to EUR 17 billion for 2021-2027, this still represents a mere 3% of the total Cohesion Policy budget. While this might not capture indirect support for adaptation, it appears low compared to the ambitious target of spending at least 30% of the EU budget on climate action[110] (this target is even higher for specific funds). Furthermore:

- 29% of Managing Authorities consider their programmes to be only partially or not at all aligned with adaptation needs, indicating some room for improvement in this regard.
- Several Managing Authorities noted that available funding falls short of what is needed to meet the climate adaptation challenges in their regions.

This gap points to an opportunity to **increase the share of Cohesion Policy funding directly allocated to adaptation** in order to better reflect the magnitude and range of regional needs. Funds more clearly earmarked for adaptation could support investment in more projects in vulnerable sectors, such as tourism and energy.

The second major gap relates to **a potentially insufficient targeting of the needs of specific territories**. The current allocation of Cohesion Policy support does not appear to sufficiently account

[110] European Commission, n.d., *Supporting climate action through the EU budget*. Retrieved from: Link. Last accessed 1 September 2024.

for the distinct climate vulnerabilities of these different areas and geographies. As outlined in Chapter 2: regions such as the Mediterranean face mounting risks from rising temperatures and water scarcity; low-lying coastal zones are increasingly exposed to sea-level rise and flooding. Yet the survey responses suggest that funding availability is viewed less positively in rural and coastal areas, and some MAs from mountainous regions considered that the adaptation funding is only moderately or partially aligned with local needs. While these views may be partly due to insufficient awareness or visibility of the Cohesion Policy funding, they may also point to potential misalignment of priorities and adaptation needs.

To address this shortcoming in the context of the shared-management spirit of Cohesion Policy, **MAs may need more capacity-building support** to be able to better account for both levels of regional development and degrees of climate vulnerability in the OPs they oversee. This would help ensure that all regions, from urban centres and coastal zones to remote and mountainous areas, receive targeted support aligned with their specific risk profiles and adaptation needs, and strengthen the mainstreaming of adaptation across policy areas.

5.2. Business adaptation needs versus current Cohesion Policy support

Turning to the business dimension, the analysis uncovers several gaps between existing Cohesion Policy support for climate adaptation and the needs of enterprises, especially those in climate-sensitive sectors, as well as SMEs.

The **limited coverage of some economic sectors** with Cohesion Policy support for adaptation was identified as an issue with notable gaps in assistance for economic activities that are particularly vulnerable to climate impacts. While some sectors, such as agriculture and forestry, fall outside the remit of Cohesion Policy instruments (and are covered by other dedicated funding instruments), stakeholders identified a fragmentation of the EU-level approach to funding adaptation. This, in turn, reinforces the broader need for **improved coordination between different EU policy tools and with regional actors** to better support all economic sectors.

Another issue is **a partial misalignment of the adaptation support provided by Cohesion Policy and the sectoral needs perceived by businesses**. According to MAs, the main types of adaptation projects supported are those covering ecosystem-based approaches, infrastructure and measures for civil protection (Figure 4). In terms of specific support to businesses, current OPs provide awareness raising, capacity building and technology transport opportunities (Figure 5). Nevertheless, the main adaptation needs identified by the majority of the business stakeholders surveyed include infrastructure modifications, policy and regulatory support, and technology, research and innovation (see Figure 22 in Annex 3). There is also a **difference in perceptions between MAs** (responsible for the design of OPs) **and businesses** (potential beneficiaries of the funding). Businesses appear to recognise the need for adaptation, and view Cohesion Policy as a widely beneficial tool for its ability to drive more sustainable business operations, provide financial support, foster innovation, and create lasting impacts with the potential to support a transformation of business practices. MAs consider that business are not sufficiently aware of the need to invest in adaptation. Both of these issues point to the **need for improved dialogues and cooperation across sectors and stakeholders**.

A significant barrier to using cohesion funding for adaptation is the **complexity of application and reporting procedures**, which can deter businesses, particularly SMEs, from seeking support for adaptation. This challenge is acknowledged by both businesses and MAs in the surveys. The analysis also points to a substantial **information deficit among businesses** regarding available Cohesion

Policy support for adaptation, as well as a general lack of awareness about climate risks and the need for resilience-building measures. As evidenced in Chapter 4:

- 38% of businesses and 35% of Managing Authorities identified limited awareness of funding opportunities as a key impediment.
- 14% of enterprises indicated they were unaware of relevant Cohesion Policy support in their region, with this information gap being especially pronounced in islands and rural areas.

This is exacerbated by other **capacity issues of businesses**, especially smaller ones. For example:

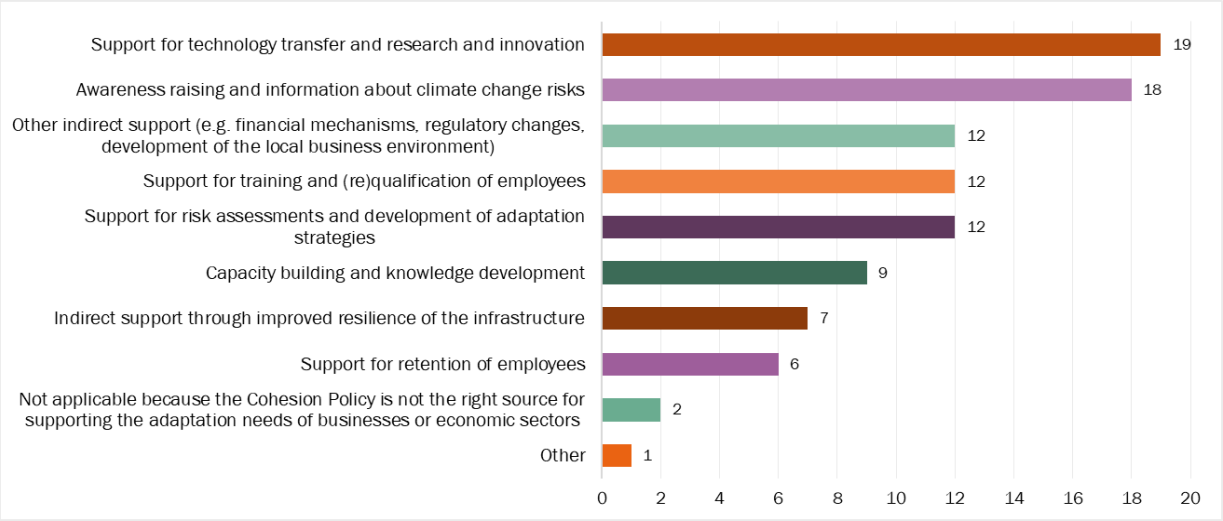
- SMEs frequently lack access to adaptation know-how and can be reluctant to invest in resilience-building due to resource constraints (either in terms of staff availability or financial resources), while large firms tend to display greater awareness of adaptation imperatives.
- 28% of Managing Authorities reported that funding amounts are often too small to justify the administrative effort for businesses.

Taken together, these results suggest that there is room for improvement in **making adaptation funding** not only more available but also **more visible to key business stakeholders**. In response, more effective communication and outreach efforts are needed to close this awareness gap. Businesses struggle not only to access funding, but also to make effective use of it once they have received it, confirming the **need for further support in the form of capacity building,** and **technical assistance**.

5.3. The future of adaptation support in Cohesion Policy

Survey respondents were asked to identify the three main adaptation priorities for Cohesion Policy in the future. Businesses focused on the needs to support technology transfer, research and innovation, raise awareness about climate risks, support training of employees and aid the development of risk assessments. They also recognised the need for authorities to support business adaptation efforts indirectly – through availability of diverse financial mechanisms, as well as adequate regulatory and policy environments (Figure 12). According to authorities, the adaptation priorities of Cohesion Policy should be in supporting SMEs to undertake adaptation actions, improving the resilience of infrastructure, and in providing support for vulnerable economic sectors and areas (Figure 13).

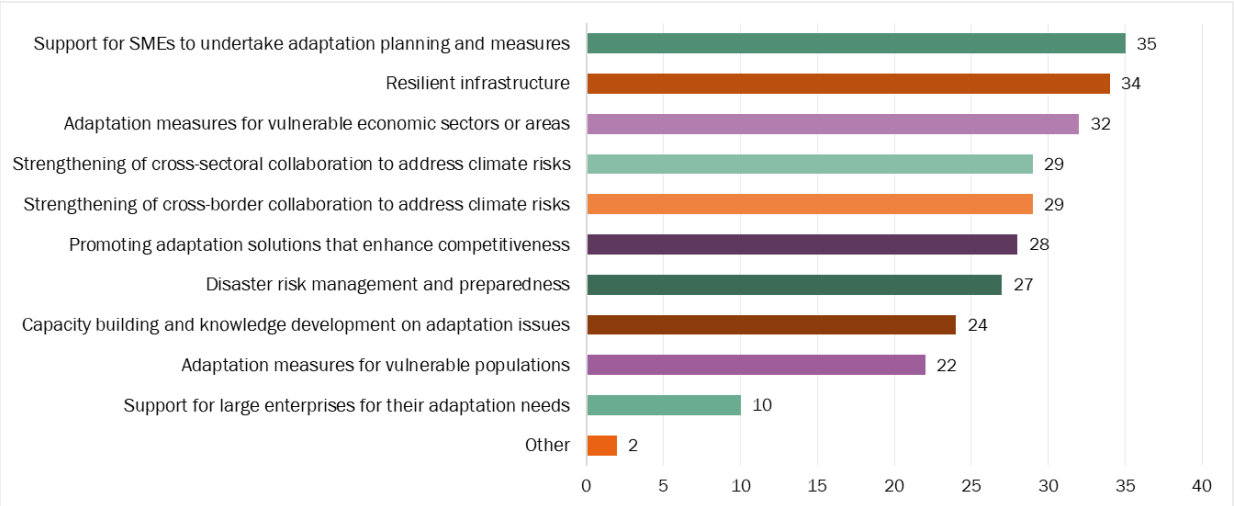
Figure 12: Future adaptation priorities of Cohesion Policy (business perspective)



Source: Business survey (n=37). Number of responses to the question: What adaptation funding priorities should the future Cohesion Policy focus on in the next programming period to effectively address the changing climate adaptation needs of your business or economic sectors? (Select the three main ones).

These results generally align with the design of the different Cohesion Policy instruments and the various ways they can support adaptation. However, **further efforts may be necessary to ensure that the vast potential of Cohesion Policy is realised** and that resilience is improved 'on the ground', including in the most vulnerable territories and sectors, while at the same time significantly increasing the awareness and capacity of all stakeholders.

Figure 13: Future adaptation priorities of Cohesion Policy (MA perspective)



Source: MA survey (n=89). Number of responses to the question: What adaptation funding priorities should the future Cohesion Policy focus on in the next programming period to effectively address the changing climate adaptation needs of your region and its key economic sectors? (Select the three main ones).

6. RECOMMENDATIONS FOR ENHANCING THE ROLE OF COHESION POLICY IN CLIMATE ADAPTATION

KEY FINDINGS

Based on the analysis, the following recommendations were defined for enhancing the role of Cohesion Policy in climate adaptation:

- Improve tracking of climate spending to distinguish mitigation from adaptation funding, and better mainstreaming of adaptation in all Cohesion Policy investments.
- Developing tailored sector-specific strategies or pathways for accessing Cohesion Policy to ensure specific regional and/or sectoral adaptation needs are addressed, together with better coordination between different EU funding instruments.
- Enhancing business awareness and accessibility of Cohesion Policy through awareness raising of the needs and benefits of climate adaptation, and targeted communication efforts on the available Cohesion Policy funding for adaptation.
- Strengthening regional and local capacity for adaptation by improving the knowledge and expertise within regional and local authorities.

Based on the analysis presented in this report, four key recommendations have been identified to strengthen the role of Cohesion Policy in supporting climate adaptation across the EU. These recommendations address the main challenges and opportunities identified by the research and aim to create a more effective framework for supporting regional and business adaptation through Cohesion Policy. They were formulated based on the analysis in the previous chapters and careful consideration of their feasibility and coherence with the relevant legal framework.

6.1. Better tracking and mainstreaming of climate adaptation

The first recommendation addresses the need for better tracking and mainstreaming of climate adaptation efforts within Cohesion Policy. The analysis in Chapter 4 reveals a striking disparity: while Cohesion Policy allocations for adaptation have increased over time, they currently represent only 3% of the total Cohesion Policy budget. This figure is notably low compared to the overall target of 30% climate spending, suggesting either: a possible underestimation of adaptation investments due to limitations in the way such funds are tracked, or an indication that mitigation projects have received a considerably higher share of climate funding.

To address this issue, the European Parliament could task the European Commission with revising and improving the climate tracking methodology for Cohesion Policy to **more accurately capture funding for adaptation projects,** particularly any relevant funding under non-adaptation intervention fields. This could involve further disaggregating the climate tracking into mitigation or adaptation financing[111] to provide a more nuanced and accurate picture of adaptation investments. This is an

[111] Currently the contribution of the EU budget to the climate spending objective is tracked with the Rio Markers, which assign 100%, 40% or 0% markers to investments that have respectively: entirely climate objectives, some contribution to climate, or no contribution to climate. Under Cohesion Policy, the Rio Markers are assigned based on the intervention fields with the markers corresponding to each intervention field being defined in Annex 1 of Regulation (EU) 2021/1060. As such, the budget contribution to climate change mitigation and adaptation are tracked together.

important pre-condition for understanding how funding allocations for climate change adaptation compare to the actual investment required.

Moreover, Member States (including Managing Authorities) could be encouraged to ensure that **climate adaptation considerations are more widely mainstreamed across all Cohesion Policy** funded projects, not just those explicitly labelled as 'adaptation' interventions. This could be achieved through, for example, climate-proofing requirements for funded projects, including those in sectors such as transport and energy, as well as consistent application of the DNSH principle. Additionally, more explicit links could be established between regional and local adaptation strategies (expected in the context of the EU Adaptation Strategy goal of More Systemic Adaptation) and OPs, in order to ensure that funding is directed to the most relevant local adaptation priorities.

6.2. Sector-specific pathways for Cohesion Policy adaptation support

Cohesion Policy funding for businesses should be targeted strategically at sectoral level, 'packaging' support for both SMEs and larger enterprises within broader regional and sectoral adaptation initiatives. This approach recognises that businesses in the same sector often face similar climate risks and adaptation needs, allowing for more efficient and impactful interventions. To achieve this, the European Commission and Member States should work together to **develop tailored sector-specific strategies or pathways for accessing Cohesion Policy** funding, to ensure that climate-sensitive sectors (e.g. tourism) that may be vital for particular regions in the EU (e.g. the Mediterranean, outermost, coastal or mountainous regions) have adequate access to adaptation funding to improve regional resilience and meet local development goals. Such an approach could require Member States to more consistently draw up sectoral adaptation strategies that are then integrated into Cohesion Policy (and other) funding or to utilise the potential of Interreg programmes for addressing common cross-border issues at territorial rather than national level.

In addition, **improved funding coordination within the broader EU policy framework** could help ensure that actors in all sectors of the economy receive sufficient funding to transform and adapt to the challenges posed by climate change, whether this means using Cohesion Policy to fund projects in the building, transport or energy sectors, or tapping into CAP funding to address the diverse and pressing adaptation needs of the agricultural sector. By focusing on sectoral strategies within the remit of Cohesion Policy and improving policy coordination across the board, the EU can foster a more coherent and joined-up policy response to climate adaptation needs across its different economic sectors.

6.3. Enhancing business awareness and accessibility of Cohesion Policy support for adaptation

The third recommendation focuses on improving awareness and accessibility of Cohesion Policy support for climate adaptation among businesses, particularly SMEs. The survey results show that both business stakeholders and MAs consider lack of awareness as an important barrier for businesses. Moreover, only six of the business respondents reported having a direct experience of using Cohesion Policy funding for adaptation, while most MAs reported that the main recipients of OP funding are public authorities.

To address this, **more targeted communication efforts should be undertaken by the European Commission and Managing Authorities to raise awareness among businesses** of their vulnerability to climate impacts and the need for them to adapt, as well as how Cohesion Policy funding opportunities can be used for this purpose. This recommendation is supported by the analysis in

Chapter 5, which identifies the 'lack of awareness about available funding' as the second most common barrier for businesses in accessing Cohesion Policy support, cited by 38% of business stakeholders and 35% of MAs.

Additionally, clearer guidance should be provided on how businesses can benefit from Cohesion Policy funded adaptation projects, even if they are not direct funding recipients themselves. For example, a possible approach would be to **package sectoral funding opportunities in coordination with key local and regional actors** (e.g. relevant business associations, chambers of commerce, SME networks). These actors could then proactively reach out or even re-distribute support to relevant businesses, both large and small, operating in their sector. This approach would ensure that businesses are both aware of and have access to the funding they need to adapt their operations in response to the specific challenges and vulnerabilities facing their sector. By drawing on the expertise and networks of local and regional stakeholders, this strategy could help overcome the barriers posed by complex application processes, while maintaining the necessary oversight inherent in Cohesion Policy funding mechanisms.

6.4. Strengthening regional and local capacity for climate adaptation

The final recommendation addresses the need to **build capacity for climate adaptation taking into account regional and local characteristics and peculiarities.** National authorities, in partnership with EU institutions such as the European Parliament, European Commission, and European Committee of the Regions, should work towards strengthening regional and local capacity for adaptation. This effort should focus on improving knowledge and expertise within regional and local authorities responsible for Cohesion Policy implementation. Investments should be made in building climate adaptation competencies and expertise within these authorities, as supported by the survey results presented in Chapter 4, which revealed that MAs consider 'adequate technical capacity and expertise' as the second most critical factor for successful implementation of adaptation projects. This could involve training programmes, recruitment of specialised staff, or partnerships with academic and research institutions. Furthermore, technical assistance and tools should be provided to help regional and local authorities better assess climate risks, identify adaptation needs, and develop effective projects. Practically, the development of regional and local adaptation strategies promoted by the EU Adaptation Strategy could be an opportunity to increase local expertise and mainstream adaptation in Cohesion Policy funding at sub-national level.

Finally, it is important to **better facilitate the exchange of knowledge and best practice** between regions on how to integrate adaptation into Cohesion Policy programming. For example, as highlighted in Chapter 4 of the report, some regions face challenges in preparing projects that meet the programming conditions for adaptation funding, while businesses and MAs have varying perceptions of the readiness of businesses to invest in adaptation. Knowledge exchange, peer learning and coordination with different local and sectoral stakeholders could help bridge these gaps.

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ANNEX 1: ADDITIONAL FUNDING DATA

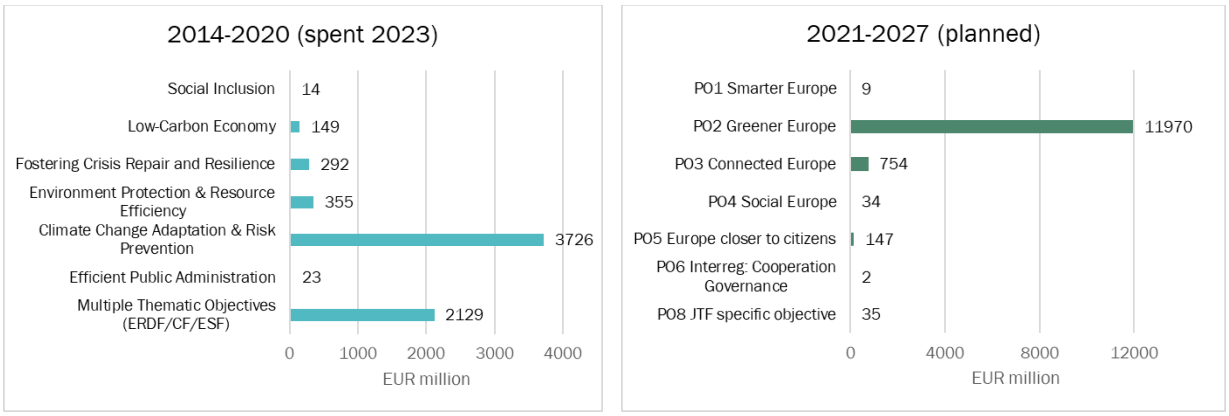
Methodological note

The quantitative analysis in this study is based on funding data extracted from the Cohesion Open Data Platform[112]. For each of the two funding periods, the data concerning the relevant adaptation intervention fields was retrieved and used for further analysis. This is expected to provide an accurate representation of the adaptation investments, as intervention fields are assigned to each individual investment/project funded regardless of the objective under which they are financed. Therefore, even any adaptation investments funded under other thematic or priority objectives can be captured. For the 2014-2020 period, the data on spent amounts (as compared to planned or decided amounts) was used. While it may be lower than the planned amounts, it is assumed to be most accurately representing the actual spending that took place. For the 2021-2027 period, only data on the planned allocations is currently available and was thus used for the analysis. In most cases, the analysis focused on the EU contribution data i.e. the amount of funding originating in the EU budget without any additional national funding provided through the principle of co-financing.

Additional findings

This annex provides some additional data and graphs to complement section 4. The following figure shows the thematic or priority objectives under which adaptation investments were identified.

Figure 14: Cohesion policy support for adaptation by objective (EU contribution)



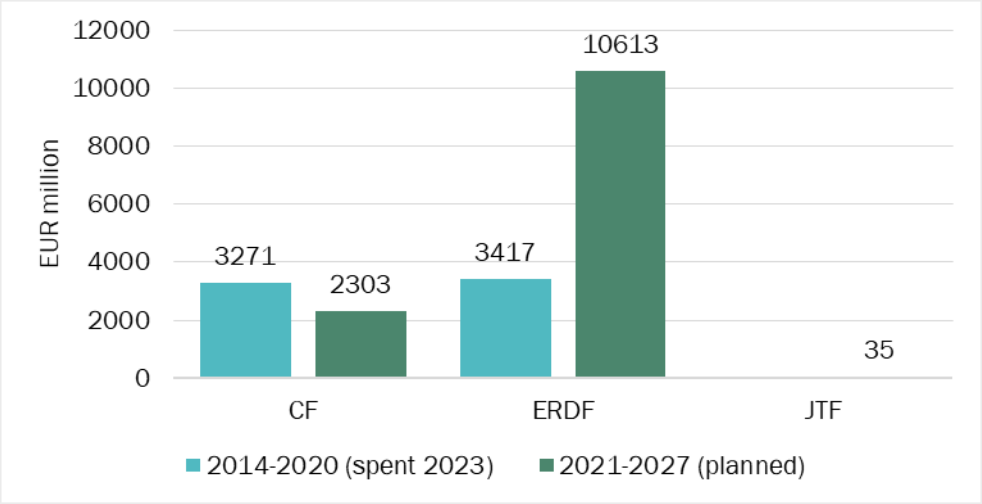
Source: Authors own elaboration, based on data from the Cohesion Open Data Platform.

Note: The data covers all EU funding programmes that contribute to the climate adaptation intervention fields (87 in 2014-2020 and 58-60 in 2021-2027) and excludes any co-financing. For 2014-2020 the data covers the latest reporting as of December 2023.

[112] Data was downloaded on 26 June 2024 from https://cohesiondata.ec.europa.eu/. It contains the updated data for the 2014-2020 period as of 31.12.2023 and the planned allocations for the 2021-2027 period as of the time of download.

The following figure shows the distribution of adaptation support by fund.

Figure 15: Cohesion Policy support for adaptation by fund (EU contribution)

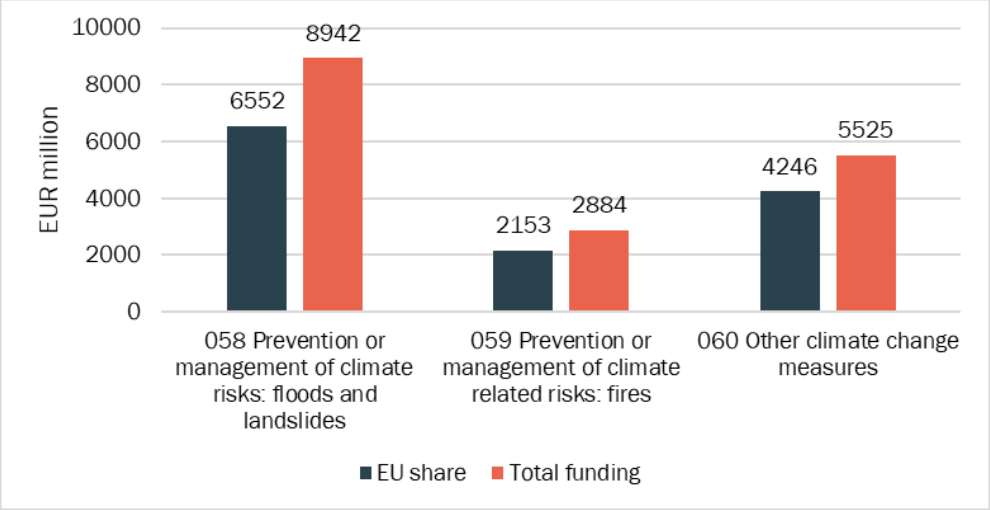


Source: Authors own elaboration, based on data from the Cohesion Open Data Platform.

Note: The data covers all EU funding programmes that contribute to the climate adaptation intervention fields (87 in 2014-2020 and 58-60 in 2021-2027) and excludes any co-financing. For 2014-2020 the data covers the latest reporting as of December 2023.

The following figure shows the distribution of adaptation support in the 2021-2027 period according to intervention field.

Figure 16: Cohesion Policy support for adaptation in 2021-2027 by intervention field

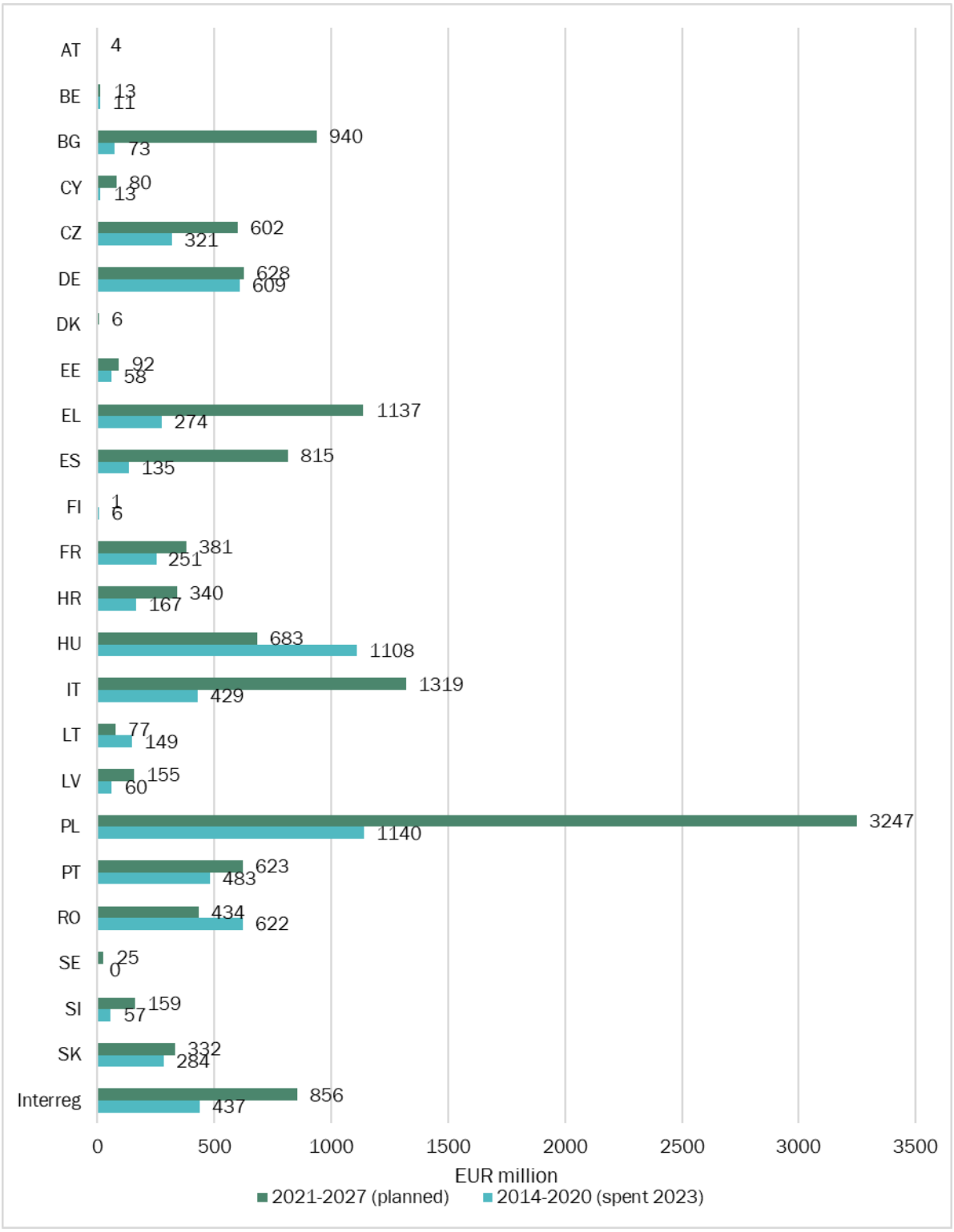


Source: Authors own elaboration, based on data from the Cohesion Open Data Platform.

Note: The data covers all EU funding programmes that contribute to the climate adaptation intervention fields.

The next figure shows the geographical distribution of adaptation support across countries.

Figure 17: Cohesion Policy support for adaptation by Member State (EU contribution)



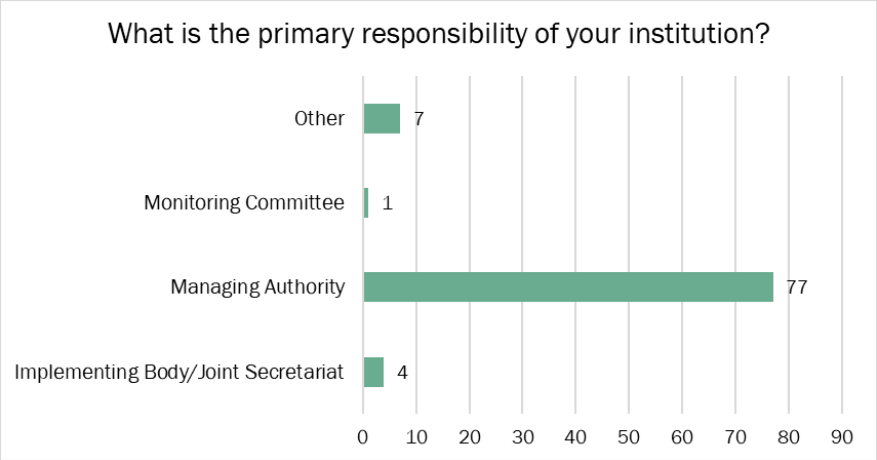
Source: Authors own elaboration, based on data from the Cohesion Open Data Platform.

Note: The data covers all EU funding programmes that contribute to the climate adaptation intervention fields (87 in 2014-2020 and 58-60 in 2021-2027) and excludes any co-financing. For 2014-2020 the data covers the latest reporting as of December 2023.

ANNEX 2: MANAGING AUTHORITIES SURVEY

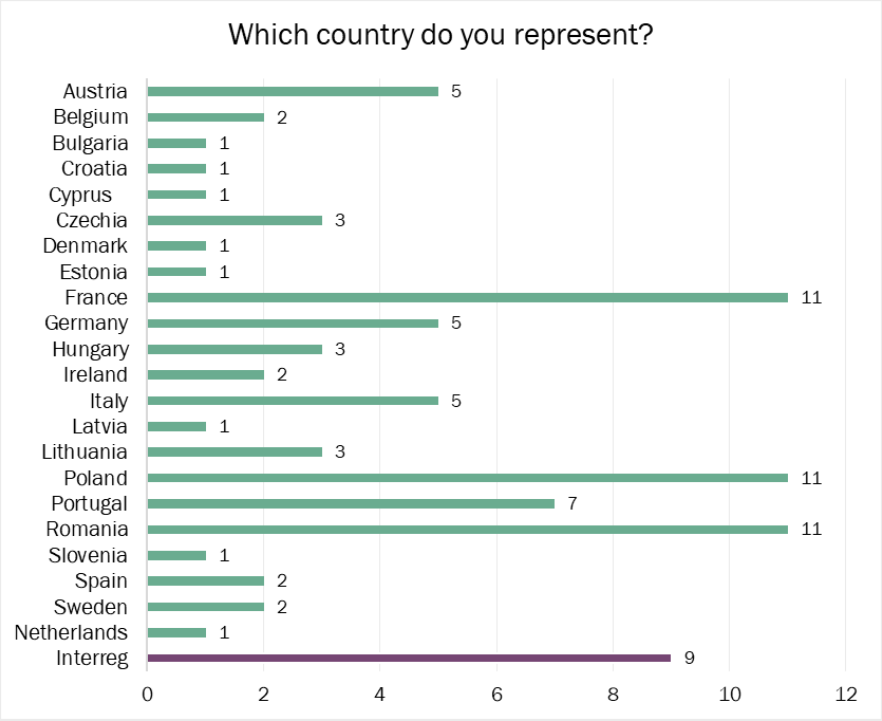
Methodological note and overview of responses

The survey was carried out in the period 24 May – 5 July 2024. The online questionnaire was translated and shared with the Managing Authorities and/or main contact points of OPs as available on the DG REGIO website. The survey received a total of **89 valid responses** from 22 Member States. The predominant source of responses to the survey were representatives of Managing Authorities (87%).



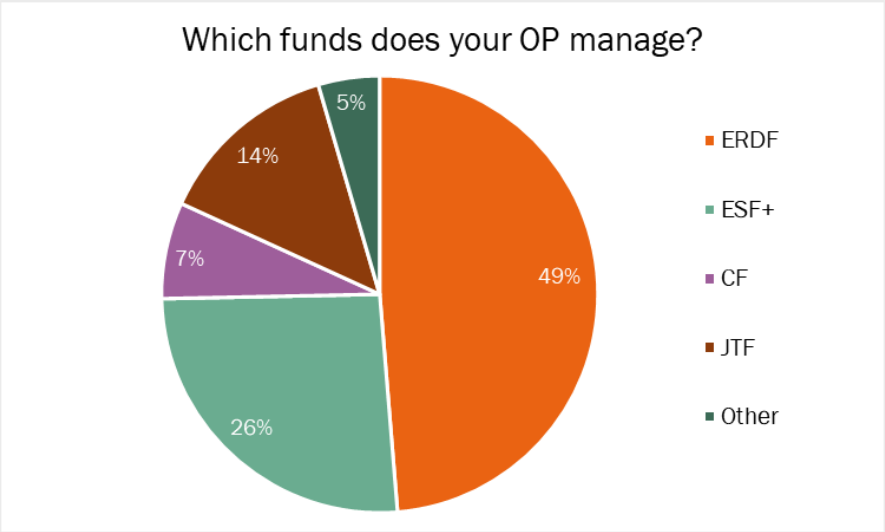
Source: MA survey (n=89).

The graph below illustrates the number of responses received from each Member State. Notably, France, Poland, and Romania accounted for the highest number of responses, together representing 38% of the total. Interreg programmes contributed 8.5% of the responses.

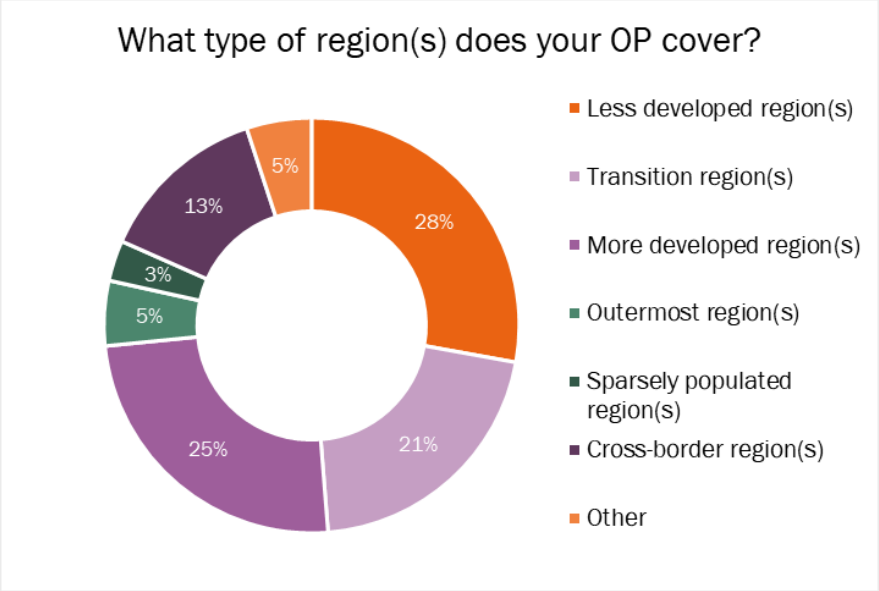


Source: MA survey (n=89).

The majority of the respondents manage OPs that distribute ERDF funding (49% of the respondents) and most OPs cover less developed regions (28% of the respondents). Transition regions and more developed regions followed closely with 25% and 21%, respectively.

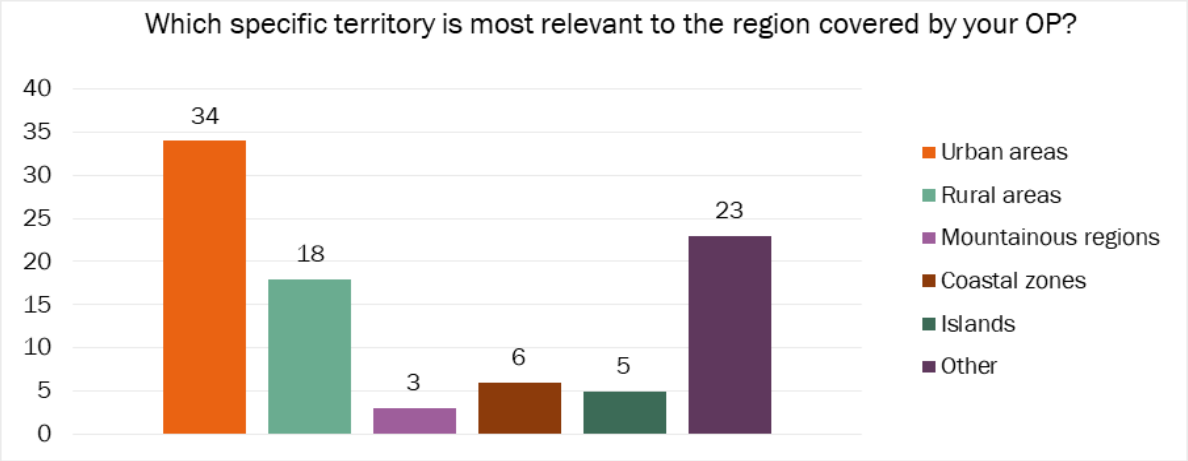


Source: MA survey (n=89).



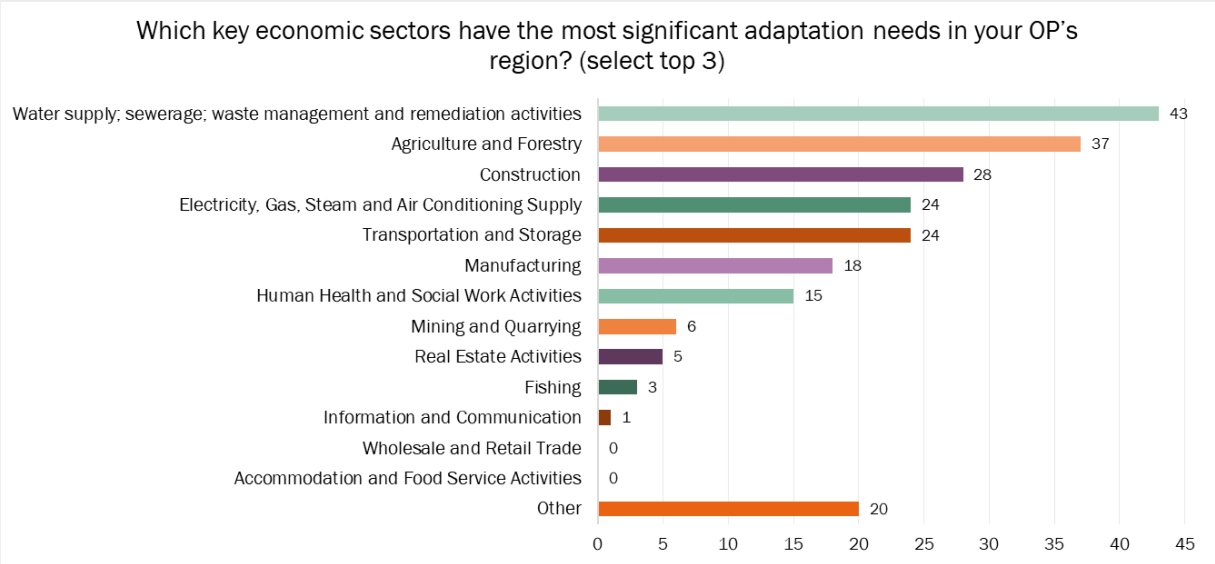
Source: MA survey (n=89).

According to the respondents, their OPs cover mainly urban and rural areas or mixes of those.



Source: MA survey (n=89).

MAs considered that the most important sectors in their regions are water supply and waste management, followed by agriculture and forestry and construction.



Source: MA survey (n=89).

Additional findings

This annex provides some additional data and graphs to complement those presented in the main body of the study.

The following table shows the main beneficiaries of adaptation funding:

Table 3: Primary beneficiaries of adaptation funding

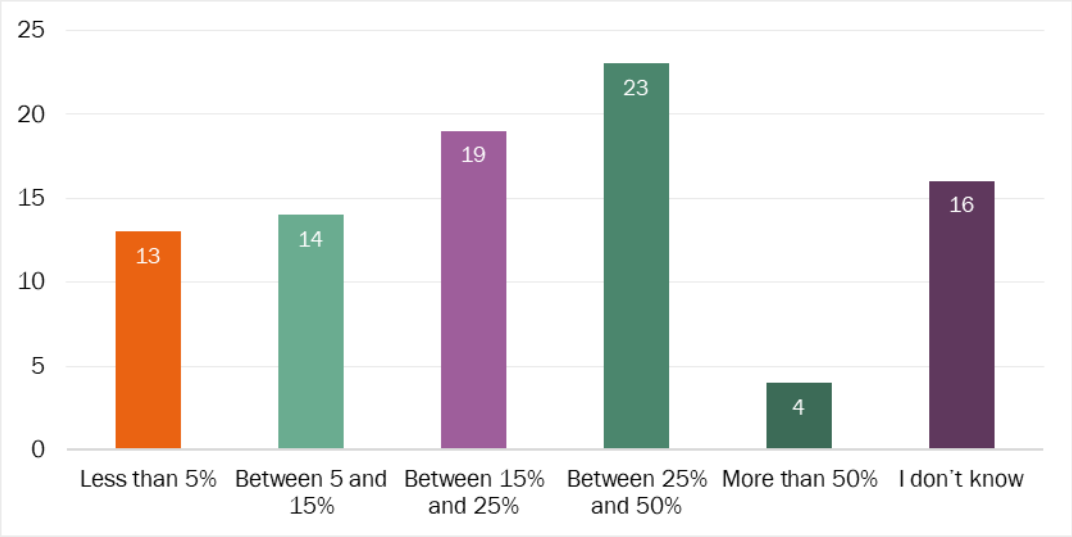
	Ranked as number 1
Public authorities	63
NGOs	19
SMEs	10

Business/industry associations	3
Research and innovation organisations	2
Large enterprises	1

Source: MA survey (n=89). Number of responses to the question: Who are the primary beneficiaries of climate adaptation funding in your OP? Rank them from 1 to 6.

The next figure shows the proportion of OP funding allocated to adaptation.

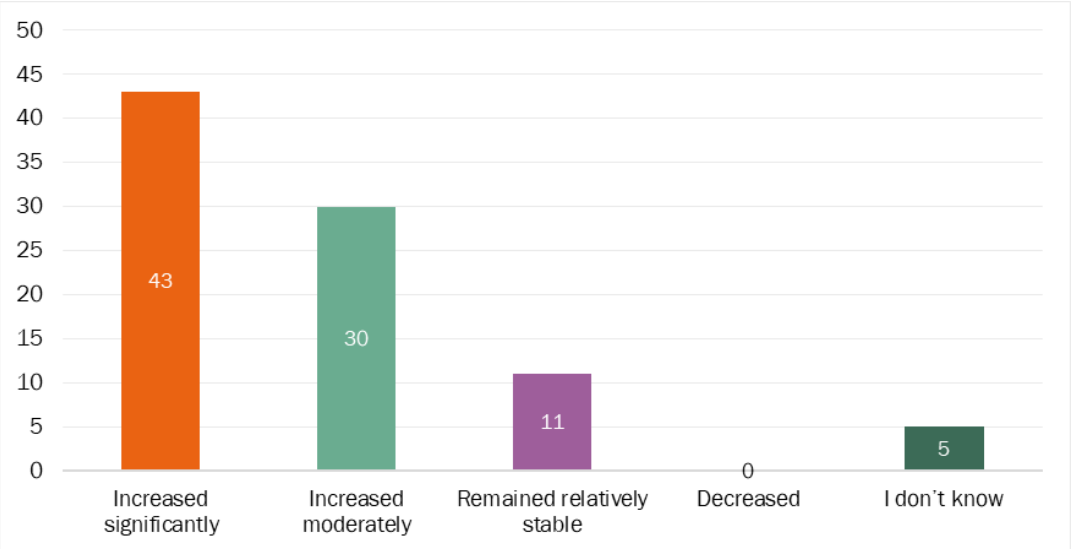
Figure 18: Proportion of OP funding allocated to adaptation



Source: MA survey (n=89). Number of responses to the question: Could you estimate the proportion of your OP's total funding that is currently allocated to climate adaptation?

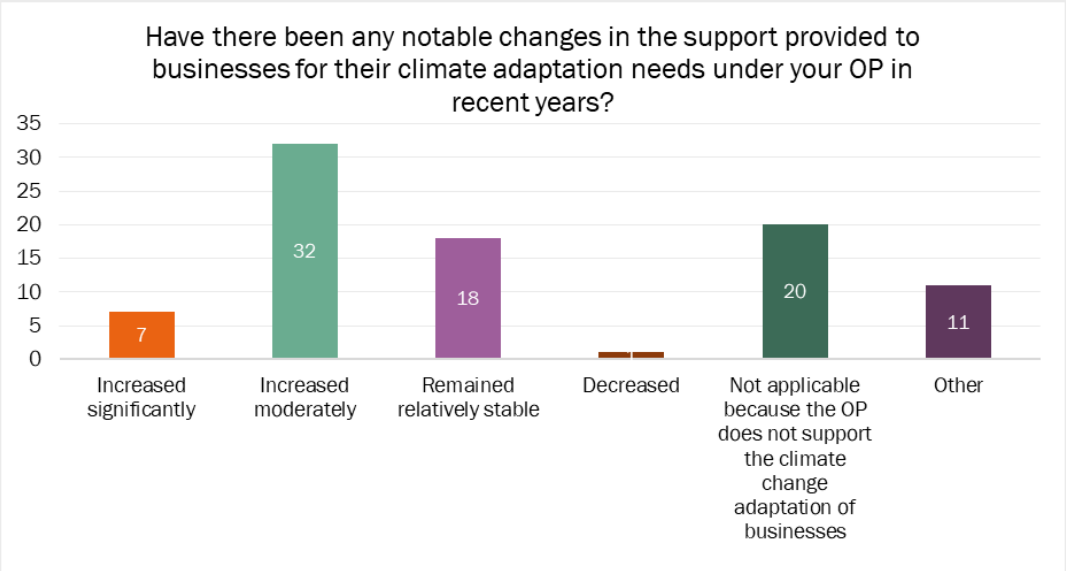
The following figure shows the evolution of Cohesion Policy funding for adaptation over the past decade.

Figure 19: Evolution of Cohesion Policy funding for adaptation



Source: MA survey (n=89). Number of responses to the question: Based on your OP's experience, how would you characterise the evolution of Cohesion Policy funding for climate change adaptation over the past decade?.

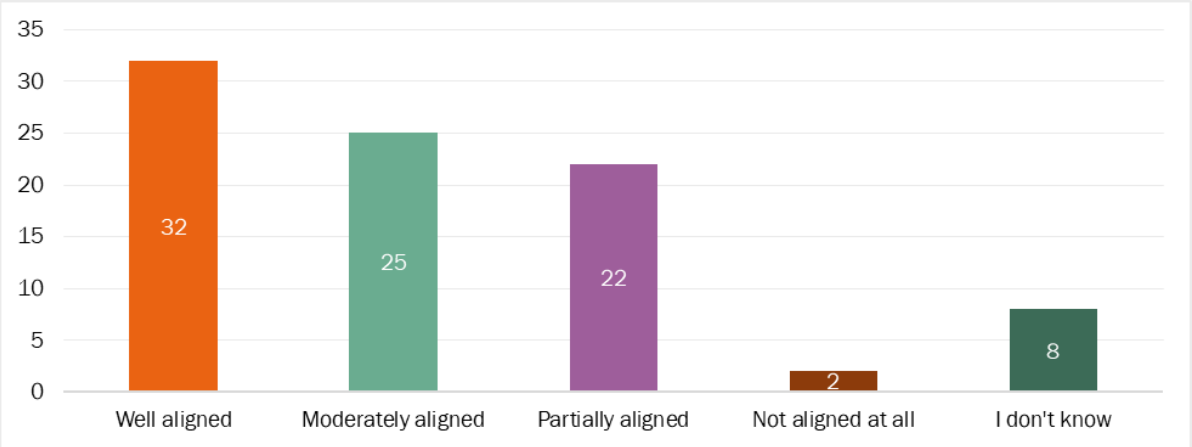
Nevertheless, the particular support for business adaptation needs is reported to have only moderately increased or to have stayed the same over time.



Source: MA survey (n=89).

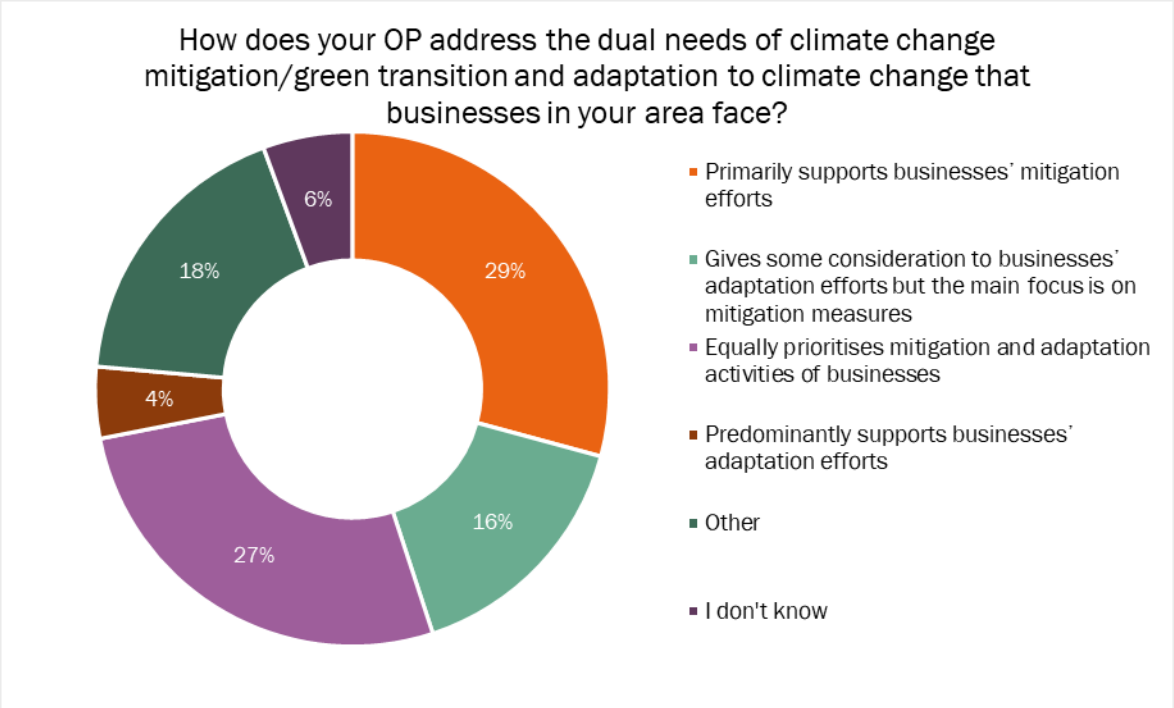
The next figure depicts the alignment of Cohesion Policy funding with sectoral adaptation needs.

Figure 20: Alignment of sectoral adaptation needs with Cohesion Policy (MA perspective)



Source: MA survey (n=89). Number of responses to the question: To what extent do you believe that the climate change adaptation needs of these key sectors align with the adaptation funding provided by your OP?

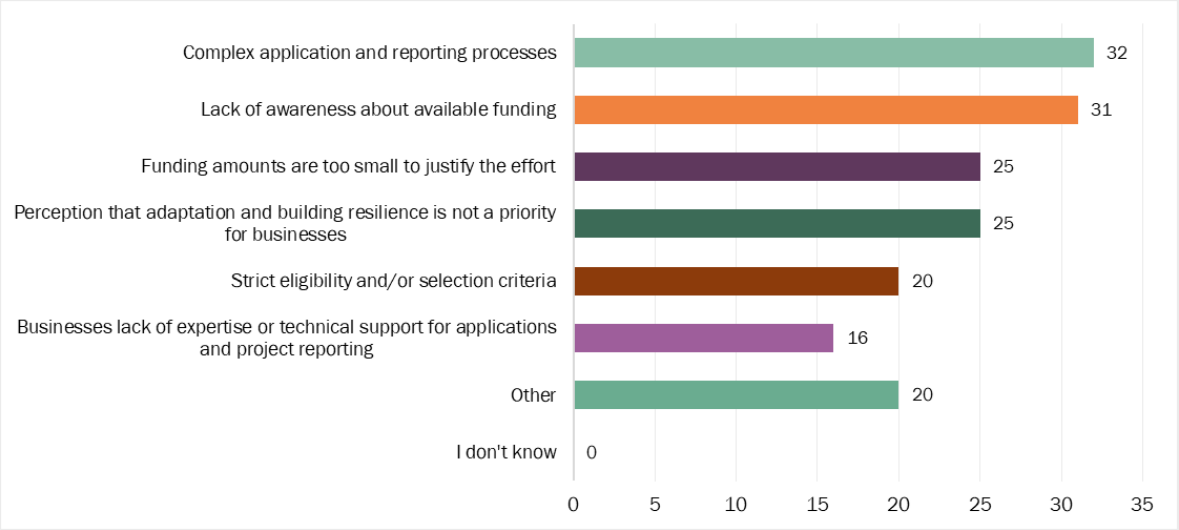
In the majority of the OPs, mitigation or joint mitigation and adaptation measures for businesses are supported.



Source: MA survey (n=89).

The next figure shows the perceptions of MAs about the barriers businesses face in accessing Cohesion Policy funding for adaptation.

Figure 21: Barriers to using Cohesion Policy (MA perspective)



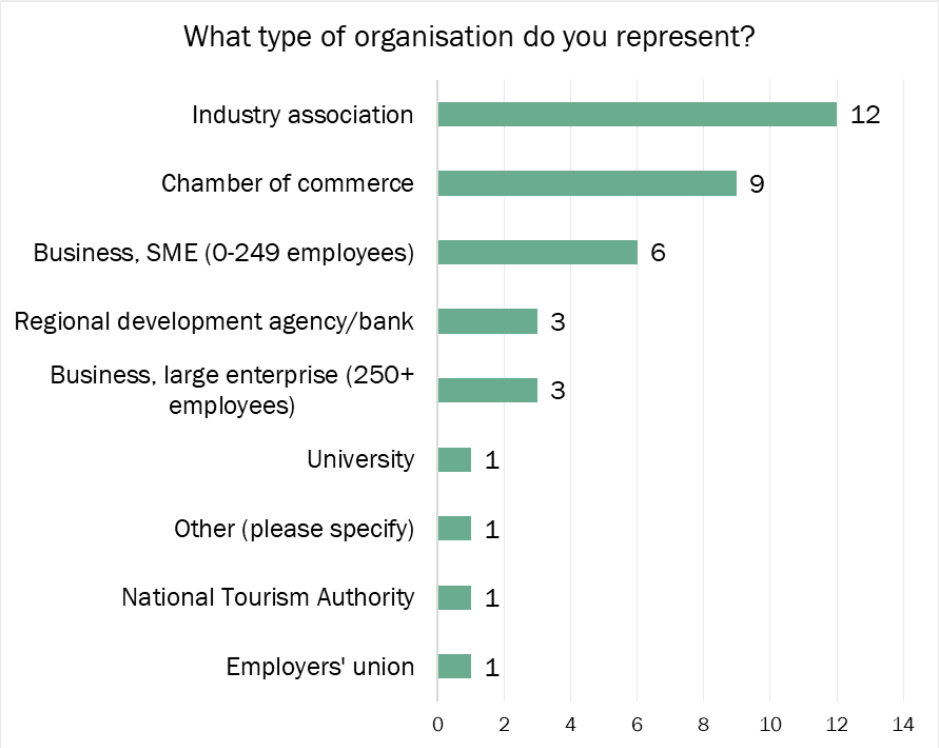
Note: MA survey (n=89). Number of responses to the question: What are the key barriers to businesses accessing funding from your OP for their adaptation needs? Please select the 3 main ones.

ANNEX 3: BUSINESS SURVEY

Methodological note and overview of responses

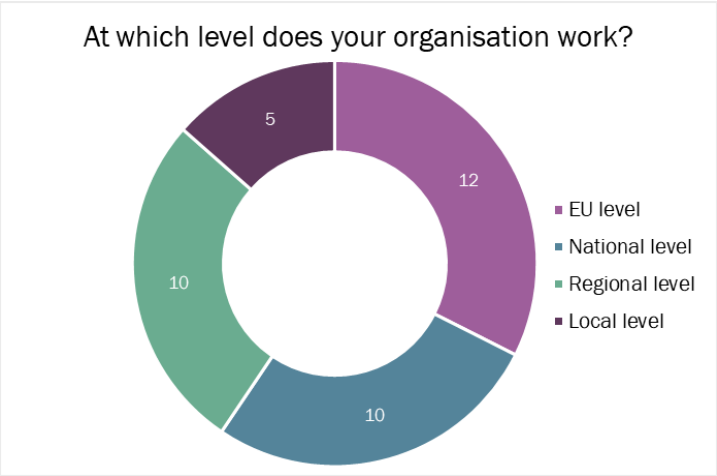
The survey was carried out in the period 24 May – 5 July 2024. The online questionnaire was translated and shared with business associations and chambers of commerce, which could then share the questionnaire with their members, including individual businesses.

The survey received a total of **37 valid responses** from 14 Member States. The graph below illustrates the distribution of responses based on the type of organisation represented.



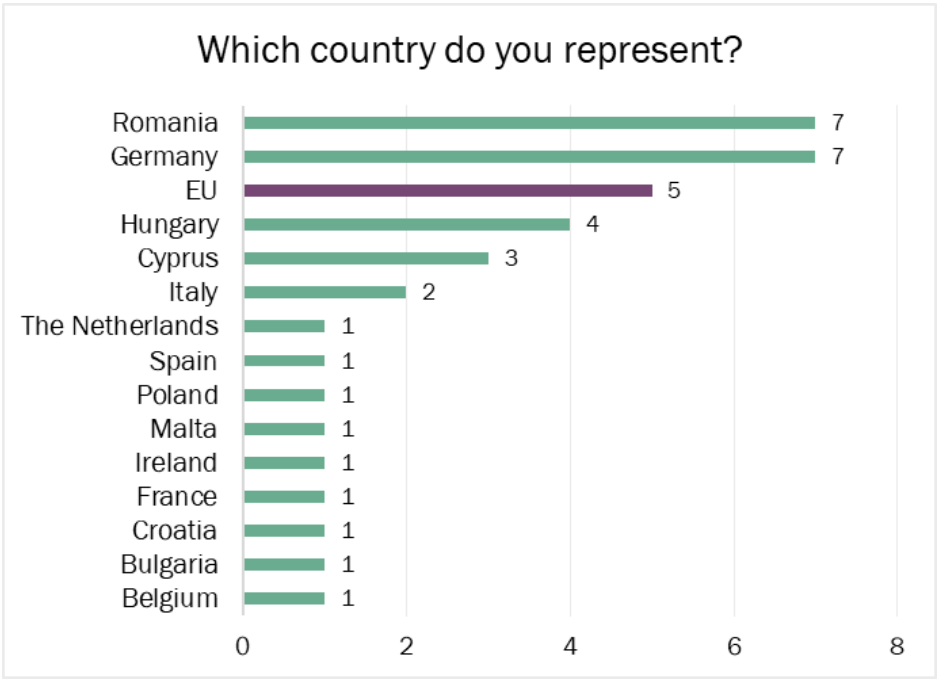
Source: Business survey (n=37).

The majority of organisations, 12 in total, operate at EU level. Both national and regional levels are equally represented, and only five organisations work at local level.



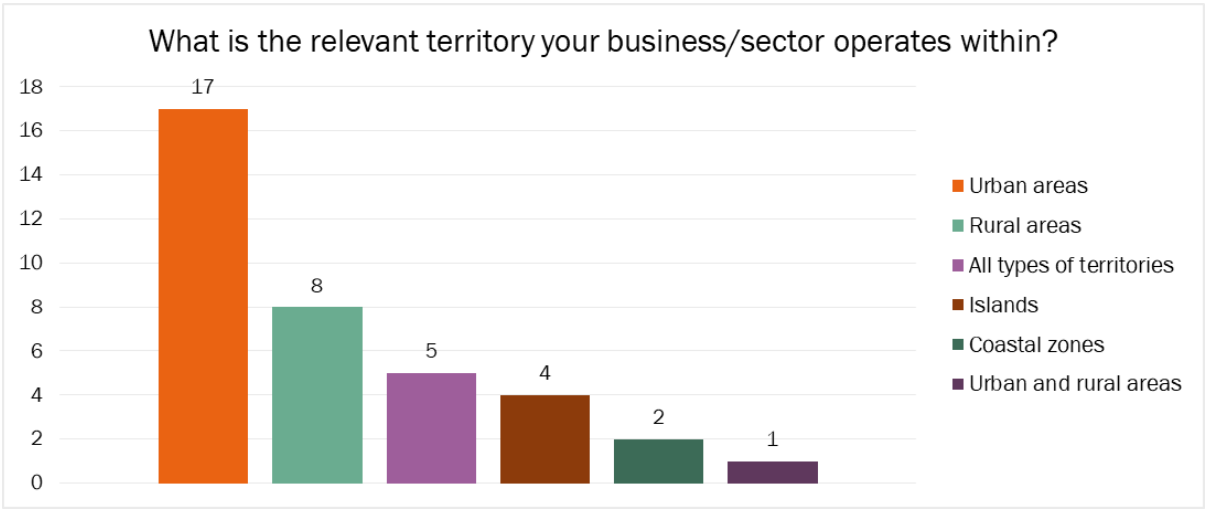
Source: Business survey (n=37).

The graphs below illustrate the number of responses received from each country.

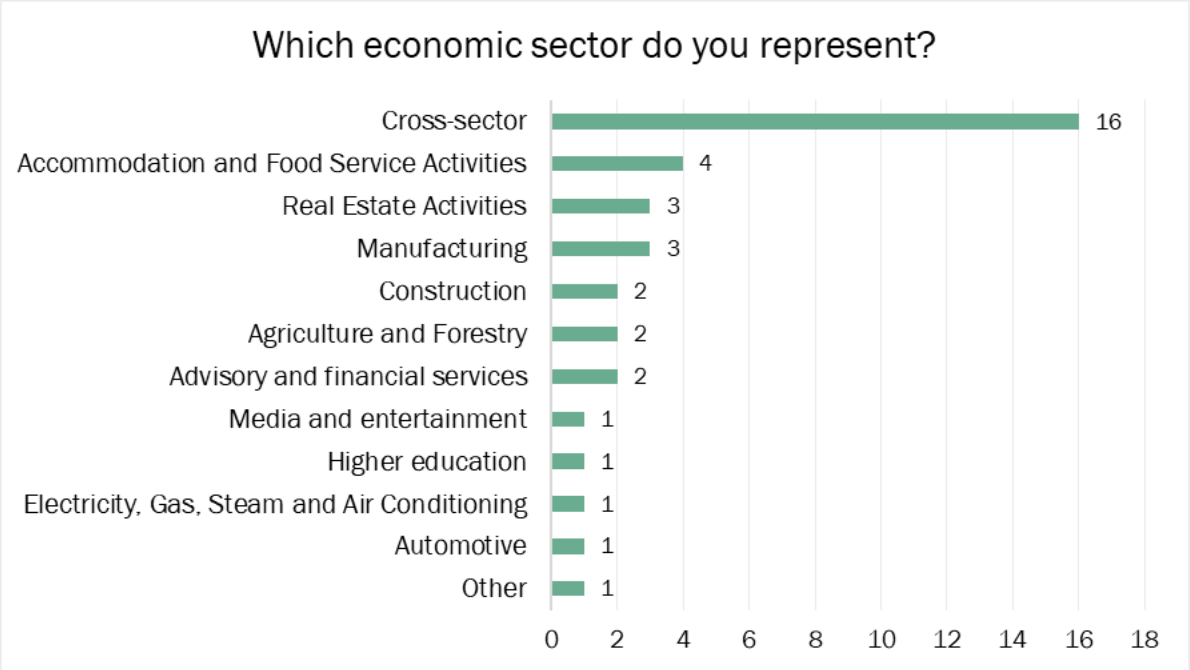


Source: Business survey (n=37).

The majority of the business respondents come from urban and rural areas and represent multiple sectors (see the next two figures).



Source: Business survey (n=37).



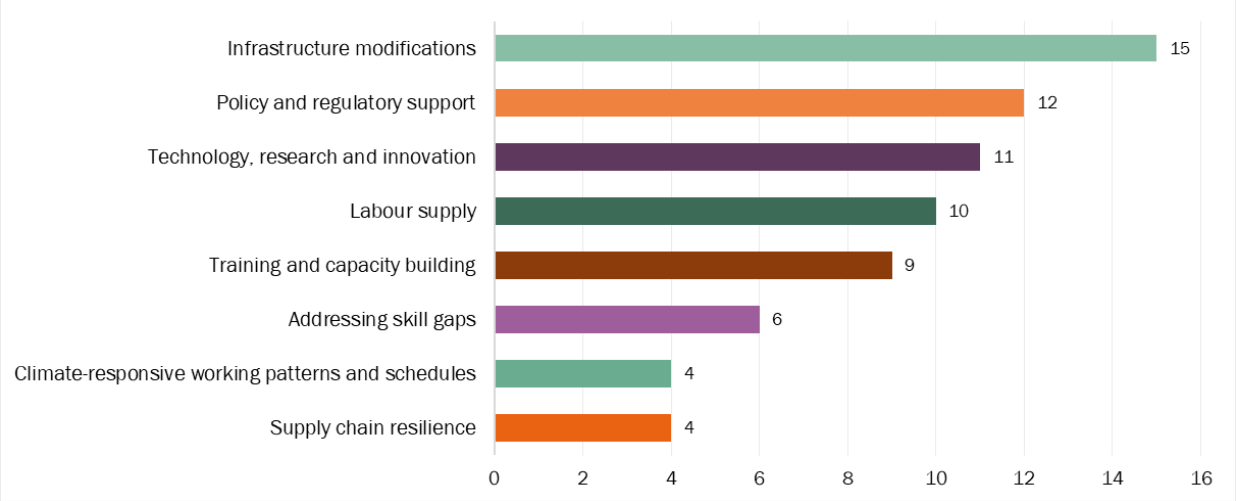
Source: Business survey (n=37).

Additional findings

This annex provides some additional data and graphs to complement those presented in the main body of the study.

The following figure shows the perceived adaptation needs of business respondents.

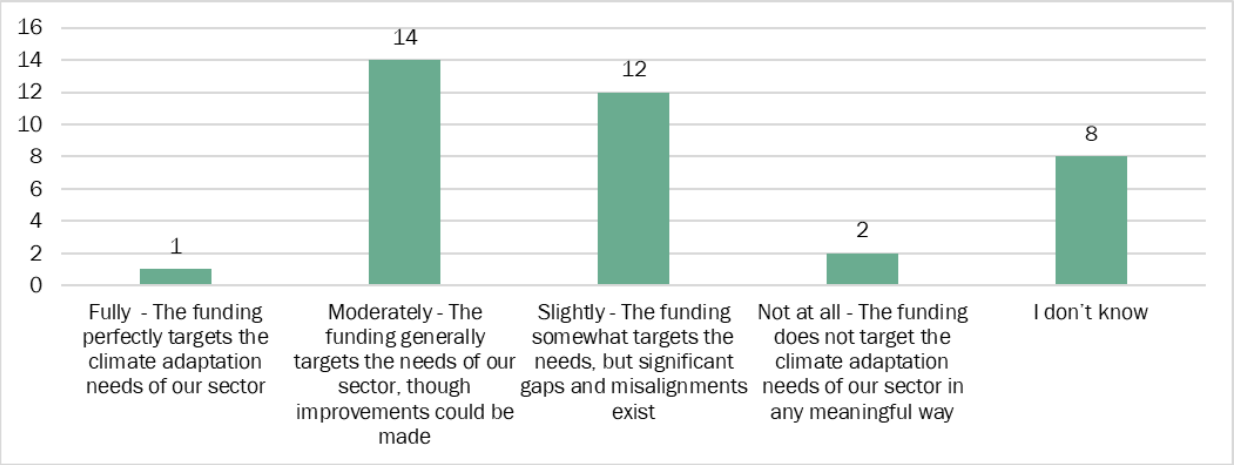
Figure 22: Main adaptation needs of businesses



Source: Business survey (n=37). Number of responses to the question: What do you think are the main adaptation needs in your economic sector? (Select the 3 main ones).

The next figure shows the perceptions of business respondents regarding the alignment of Cohesion Policy funding with the adaptation needs of their sectors.

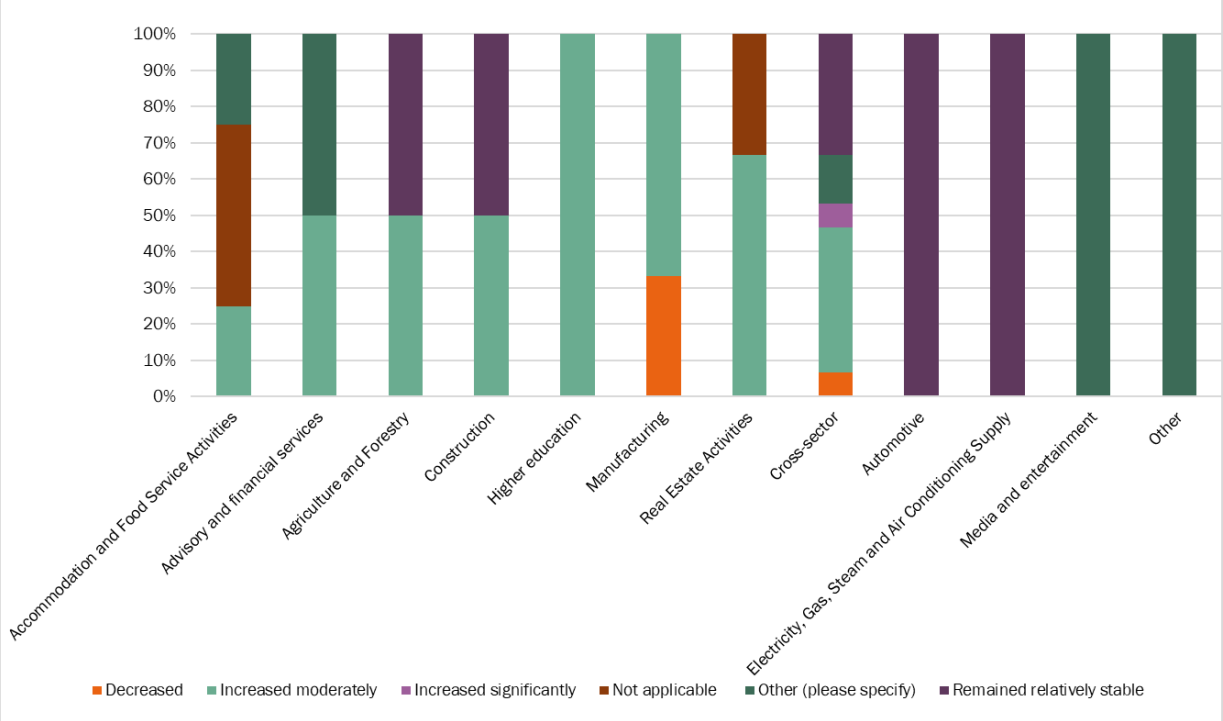
Figure 23: Alignment of Cohesion Policy with sectoral adaptation needs (business perspective)



Source: Business survey (n=37). Number of responses to the question: To what extent does the current Cohesion Policy funding target the right climate adaptation needs of your sector?

The following figure shows the perceived changes to the availability of funding by sector.

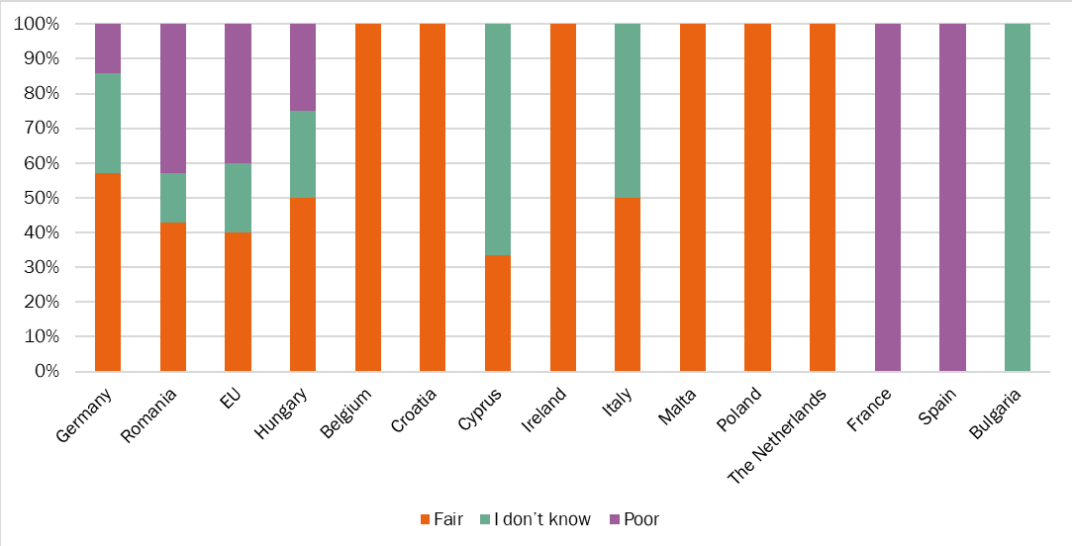
Figure 24: Evolution of Cohesion Policy funding for adaptation by sector



Source: Business survey (n=37). Share of responses to the question: Have you noticed any changes in the support provided for your business or sector from Cohesion Policy funding for climate change adaptation in recent years?

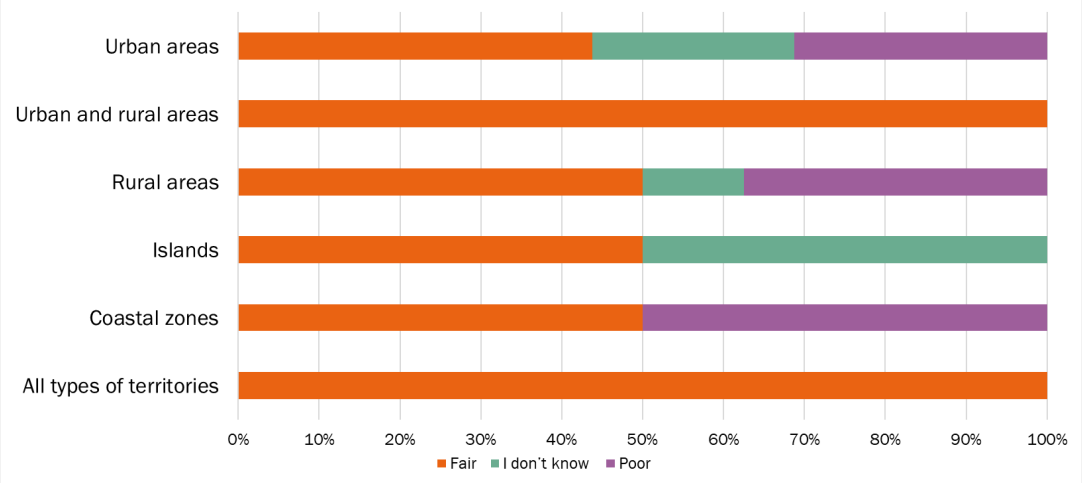
The next two figures show the perceptions regarding the availability of Cohesion Policy funding for adaptation by country and type of territory.

Figure 25: Availability of Cohesion Policy funding for adaptation by country



Source: Business survey (n=37). Share of responses to the question: How would you rate the availability of Cohesion Policy funding for climate adaptation in your country or region?

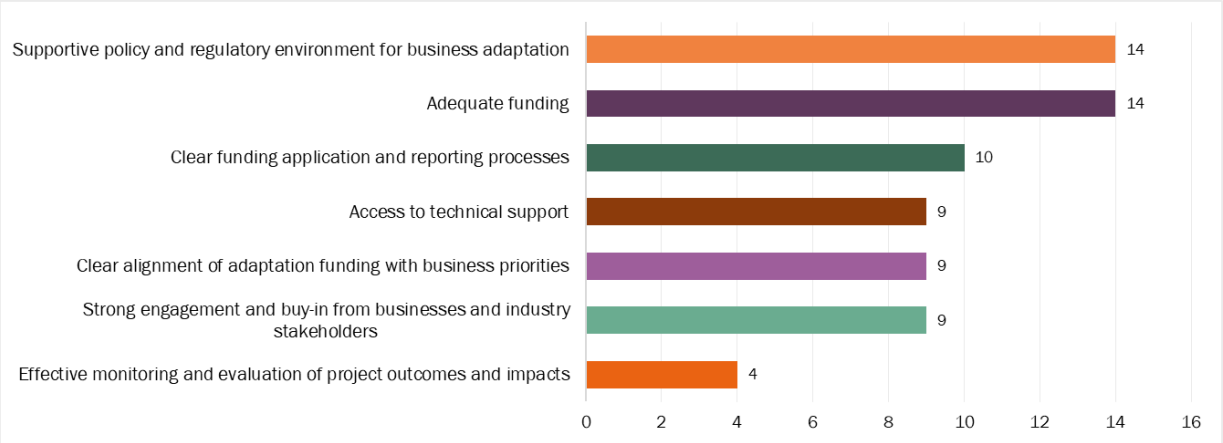
Figure 26: Availability of Cohesion Policy funding for adaptation by type of territory



Source: Business survey (n=37). Share of responses to the question: How would you rate the availability of Cohesion Policy funding for climate adaptation in your country or region?

The next figure shows the perceptions of businesses regarding the success factors for using Cohesion Policy to support adaptation.

Figure 27: Success factors for Cohesion Policy support for adaptation (business perspective)



Source: Business survey (n=37). Number of responses to the question: What are the most important factors for the successful implementation of climate change adaptation projects funded by Cohesion Policy in your business or sector? (Select up to 3).

Direct experience with Cohesion Policy for adaptation was reported by only six of the business respondents (predominantly business associations), mainly through Interreg (three respondents). Half of the respondents considered that the funding was moderately accessible, followed by those who thought it was slightly accessible and one respondent who found it not accessible. Nonetheless, five of the respondents considered that the implementation process was efficient, and the support was effective.

This study examines how Cohesion Policy can support climate adaptation, regional resilience and sustainable businesses in the EU. It identifies regional and sectoral adaptation needs, maps relevant EU policy instruments and assesses current Cohesion Policy support. The study finds increased but still insufficient funding for adaptation, with gaps between support and needs. Recommendations include improving mainstreaming and monitoring of adaptation, developing tailored sectoral strategies, improving business awareness and funding access, and enhancing regional capacity for adaptation.

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