OECD Development Pathways

Production Transformation Policy Review

SPOTLIGHT ON THE AZORES' INTERNATIONALISATION

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Foreword

The global economic landscape is uncertain, complex and fast changing. Governments, businesses and societies are engaged in better understanding and governing the ongoing reorganisation of global trade to make the most of it, preserving openness and inclusiveness, while achieving an environmental and sustainable transition.

Since 2013, the OECD Development Centre has hosted the OECD Initiative for Policy Dialogue on GVCs, Production Transformation and Development. As of 2017, the Development Centre has implemented a series of Production Transformation Policy Reviews (PTPRs). The PTPRs are a policy assessment and guidance tool to support policy makers in the creation and implementation of better strategies for transforming their economies. They benefit from international peer dialogue and discussions under the aegis of the OECD Initiative for Policy Dialogue on Global Value Chains, Production Transformation and Development. The PTPRs enrich the OECD Development Pathways Series with their perspective on economic transformation and governance for change.

This *Production Transformation Policy Review (PTPR): Spotlight on the Azores' Internationalisation* is one of the key outcomes of the EU-OECD Project on *Transforming Economies in EU ORs: fostering learning, making the most of interconnectedness.* Over more than two years, this project has supported a process of dialogue and knowledge sharing between EU ORs and international partners to identify opportunities for sustainable value creation and enhanced participation in global and regional value chains.

The European Outermost Regions (EU ORs) are EU member states' territories located in the Atlantic Ocean, Caribbean basin, South America and the Indian Ocean and they are an integral part of the Union. They include Guadeloupe, French Guiana, Martinique, Reunion, Saint-Martin and Mayotte (France), the Azores and Madeira (Portugal), and the Canary Islands (Spain). Due to their remoteness, insularity, small size, difficult topography and climate they benefit from targeted support measures. Thanks to their distinctive characteristics and assets, including a rich biodiversity and strategic location, the EU ORs can play an important role in the overreaching EU internationalisation and co-operation strategy and policy.

The Spotlight on the Azores involved a nine-month peer review process carried out by the OECD Development Centre with the support and collaboration of the European Commission's Directorate-General for Regional and Urban Policy and the Regional Government of the Azores. The review process included a wide range of consultations and activities with local and foreign stakeholders including the OECD, the European Commission and public and private stakeholders from the nine ORs and other countries including Brazil, the United States and Iceland. It provides an analysis of the potential internationalisation opportunities and challenges, with perspectives on agro-food, innovative oceans and renewable energies. It also clarifies future opportunities for increasing internationalisation and co-operation with partners beyond the EU, including Macaronesia and other developing and emerging economies like Small Island Developing States (SIDS). Furthermore, the report identifies opportunities for future reforms to make the most of the multi-annual planning and resources of the EU, including the Communication on *"Putting people first, securing sustainable and inclusive growth, unlocking the potential of the EU's outermost regions"* adopted in 2022.

Acknowledgements

The *Production Transformation Policy Review (PTPR): Spotlight on the Azores' Internationalisation* is one of the key outcomes of the Global Outermost Regions EU-OECD Project *"Transforming Economies in EU ORs: fostering learning, making the most of interconnectedness'*

The report was produced by the OECD Development Centre under the responsibility of Ragnheiður Elín Árnadóttir, Director, OECD Development Centre. The PTPR process and the report have come together under the co-ordination of Annalisa Primi, Head of the Economic Transformation and Development Division, who provided strategic guidance and oversaw the entire project implementation. Manuel Toselli co-co-ordinated the project and was the lead economist in the report's elaboration. Daniel Gay, Vasiliki Mavroeidi and Antonio Vicencio contributed to the drafting and research. The report benefited from comments and contributions from several colleagues. From the OECD: Nadim Ahmad, Dorothée Allain-Dupre, Claire Charbit, Stefano Barbieri, Peter Haxton, Michael Flood and Aline Matta from the Centre for Entrepreneurship, SMEs, Regions and Cities (CFE), Claire Jolly from the Directorate for Science, Technology and Innovation (STI), Piera Tortora from the Development Co-operation Directorate (DCD) and Koen Deconinck from the Trade and Agriculture Directorate (TAD). From the European Commission Directorate General for Regional and Urban Policy: Paula Duarte Gaspar (Head), Germán Esteban (Deputy Head) and Katherine Fournier-Leroux (Policy Coordinator) of the Outermost Regions Unit, Catherine Wendt (Head) Smart and Sustainable Growth Unit and Tomas Salazar Brier (Programme Manager) Regio G2 Unit Portugal and Spain.

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Peer learning and knowledge sharing lie at the heart of the PTPR process. This report has been shaped and enriched by the contributions of domestic and international peers who actively participated in PTPR activities and contributed ideas to the review.

- Valuable input emerged from the three Peer Learning Group (PLG) meetings that took place during 2021 and counted with the participation of more than 90 high-level participants from 25 countries and regions, four international organisations and four OECD Directorates. We are especially thankful to (in alphabetical order): Mariane Crespolini, Director of the Department of Sustainable Production and Irrigation, Secretariat for Innovation, Rural Development and Irrigation, Ministry of Agriculture, Brazil; Karl-Christian Göthner, Senior Expert, German National Metrology Institute (PTB), Germany; Michael Jones, President, TMA BlueTech, San Diego California, United States;

Ikram Malan Sangadji, Deputy Director, Capture Fisheries Management, Coordinating Ministry for Maritime Affairs and Investment, Indonesia; Thor Sigfusson, Founder, Iceland Ocean Cluster, Iceland; Max Teplitski, Chief Science Officer, International Fresh Produce Association, United States; Drishty Ramdenee, Head of Department Ocean & BIO Economy, Economic Development Board (EDB), Mauritius and Jónas Viðarsson, Director of Division of Value Creation at Matis, Iceland

- Semi-structured interviews with experts from business and government in the Azores were extremely relevant in shaping the report. In addition to the people mentioned above, we acknowledge the time and contributions of (in alphabetical order): Nuno Alves, Regional Director for Planning and Cohesion Policy Funds; Helga Barcelos, Quinta dos Açores; Miguel Bello, AIR Centre – TERINOV; Mário Fortuna, Chairman, Chamber of Commerce of Ponta Delgada; Maria Madalena Motta, Gorreana; Gabriela Queiroz, Rector, University of Azores; Joana Rita, Regional Directorate for Energy; Emiliana Silva, Regional Director for Rural Development; Francisco Tavares and Francisco Wallenstein, Azores Mission for Space.

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Editorial

Our member countries said it loud and clear at the 60th anniversary of the OECD Development Centre: as multiple local events have increasingly strong ripple effects across the globe, international co-operation has become central to achieving better development at home.

This has been a founding principle of our Production Transformation Policy Reviews (PTPRs) since their start in 2017. By identifying innovative ways to tap into international flows and networks, the PTPRs support governments as they transform their economies into more resilient, sustainable and inclusive models.

Building on the longstanding international vocation and large marine territory of the Azores, this PTPR Spotlight looks at how the region can leverage its assets more effectively to create jobs and value. Multi-annual financing and planning for development, as well as new international partnerships, including a more active role in EU co-operation with its partners, are critical ways the Azores can begin to tap into this potential.

I hope that this timely report, built on strong empirical evidence and through a comprehensive, international peer-review process, will help implement the priorities outlined in the European Commission's strategy for its outermost regions: "putting people first", securing sustainable and inclusive growth, and unlocking the potential of the EU's outermost regions. I also believe it can enrich the wider international community's understanding of the variety and uniqueness of development trajectories, including among small island developing states (SIDS).

In our complex, fast-changing times, the PTPR series and this report in particular, illustrate how we can do "strong, shared and green development together".

Ragnheiður Elín Árnadóttir
Director
OECD Development Centre

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Abbreviations and acronyms

ABC	Brazil's Adaptation, Resilience and Mitigation plan
ANACOM	National Communications Authority of Portugal
APREN	Portuguese Renewable Energy Association
ARM	Atmospheric Radiation Measurement
BPF	Portuguese Development Bank (Banco Portuguese de Fomento)
DRAIC	Regional Directorate for the Support of Investment and Competitiveness
EAE2030	Azores Energy Strategy 2030
EAFRD	European Agricultural Fund for Rural Development
EDA	Azorean Energy Company
EEZ	Exclusive Economic Zone
EMFAF	European Maritime Fisheries and Aquaculture Fund
EMFF	European Maritime and Fisheries Fund
EPA	European Partnership Agreement
ERDF	European Regional Development Fund
ESA	European Space Agency
ESF	European Social Fund
EU	European Union
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GI	Geographical Indication
GVA	Gross Value Added
GVCs	Global Value Chains
IANOS	Integrated Solutions for Decarbonisation and Smartification of Islands
IMAR	Institute of Marine Research
INE	Portuguese National Statistical Office
IP	Investment Priorities
IRENA	International Renewable Energy Agency
LDCs	Least Development Countries
LREC	Azores Regional Laboratory of Civil Engineering
OACPS	African, Caribbean and Pacific Group of States
ORs	Outermost Regions
PLOCAN	Oceanic Platform of the Canary Islands
PO SEUR	Operational Programme for Sustainability and Efficient Use of Resources
POSEI	EU Special Agricultural Programme
PPP	Purchasing Power Parity
REACT-EU	Recovery Assistance for Cohesion and the Territories of Europe

RIS3	Smart Specialisation Strategy
RRF	Recovery and Resilience Facility
SIDS	Small Island Developing States
SOMABRASIL	Agriculture Observation and Monitoring System of Brazil
TFEU	Treaty of the Functioning of the European Union
UNCLOS	United Nations Convention on the Law of the Sea

Executive summary

The archipelago of the Azores, located in the mid-Atlantic, is an autonomous region of Portugal and a European Union Outermost Region. With a GDP per capita of EUR 19 100 PPP in 2020 (USD 20 600), it is, together with four other regions in Portugal, one of the European Union's 78 less developed regions (below 75% of the EU-27 average GDP per capita). The economy of the Azores is mainly specialised in services, which in 2019 accounted for more than 70% of total GDP and employment.

Once central to international trade routes, the Azores are now aspiring to regain a prominent international role by leveraging their unique geographical, natural and historical attributes. Over the centuries, improved oceanic navigation techniques and technological developments have made the archipelago less central to international sea routes, challenging local development and contributing to depopulation. Remoteness and relative isolation thus challenge economic growth. Critical infrastructure challenges include vulnerability to natural disasters and poor digital connectivity. Support from the EU and national institutions have cushioned the effect of the Azores' increased isolation over time.

The region has, however, experienced some economic progress in recent decades. In the early 2000s it showed a significant level of convergence towards the EU average. GDP per capita moved from 68% to 75% of the EU average and the productivity gap with respect to the EU-27 average improved slightly. However, COVID-19 severely affected tourism in the region. After a sharp drop of 70% in total arrivals in 2020, tourism only partially rebounded in 2021 with total turnover still below 65% of pre-pandemic levels. The merchandise trade balance remains negative because the region largely depends on imports of both intermediate and final products such as food, machinery and equipment, and fuels. Exports, however, are growing, three-quarters of which are agricultural and food products. Portugal accounts for 80% of total trade, while international trade plays only a marginal role, at 15% of GDP. The main international trading partners are other EU countries such as Spain, Italy and Germany. Important emerging markets are gaining momentum, including North America and West Africa, which account for 11% and 9% of international merchandise trade, respectively.

Leveraging uniqueness will be central to the future internationalisation strategy. Three areas appear particularly relevant: agro-food, the ocean economy and renewable energies.

- Prioritising high-end markets, strengthening the role of the circular economy, diversifying production and improving sustainability could support higher value-addition in agro-food production and exports. At the same time, ensuring the preservation of local ecosystems and leveraging the untapped potential of the diaspora could support the wider dispersal of Azorean products.
- With an exclusive economic zone of 1 million km², the ocean represents a key opportunity for innovation and sustainable value creation for the Azores. From deep-sea research to seamount ecosystems and research activities related to the impact of human activities, the archipelago is a natural open laboratory for understanding the functioning of seas and the potential synergies between ocean and space activities. To do so, the region needs to strengthen and expand its global research and scientific partnerships.

- The Azores generates around 40% of its electricity from renewable energy, above the EU average. Yet the region's energy matrix still largely relies on imported fossil fuels. Major challenges to the energy transition relate to the dispersed nature of the archipelago, including the presence of nine small, separate grids, limited battery storage capacity and small market size. The electrification of the energy matrix seems to be the most promising area for development, alongside further exploitation of geothermic energy, wind, photovoltaic and marine renewables such as wave power.

In going forward, the Azores could increase their global interconnectedness to support regional development. In particular, the region should aim at:

- **Updating the policy approach towards internationalisation** to better leverage the resources of the EU programming period 2021-27 and the additional ones from the Recovery and Resilience Facility (RRF). In addition to the necessary compensation schemes linked to remoteness, environmental vulnerabilities and biodiversity preservation, it would be important to channel support to science, research and innovation activities and to enable effective international partnerships for innovation. The Azores' use of EU cohesion policy funds could be further modernised and made forward-looking. Traditional sectors such as commercial activities associated with tourism, like hotels and restaurants, remain a priority but have limited spillover effects on the economy. Therefore, increased priority should be given to scientific and knowledge-intensive services to maximise the long-term impact of cohesion policy funds. The design of policies and instruments will require more synergies and co-ordination across different areas and between cohesion policy funds in order to avoid duplication, redundancy and dispersion of resources.
- **Increasing private sector commitment to internationalisation and innovation.** The proactive participation of the private sector with an innovation mind-set and stronger partnership with local institutions will be essential to make the most of the EU resources and unlock international partnerships, develop new businesses and innovate in traditional activities. The private sector contributes only 15% of total regional R&D investment in the Azores, whereas in other peer regions and countries the private sector accounts for double if not triple the amount of R&D expenditures. The region can leverage available infrastructure and resources such as the technology parks and university, which could act as innovation catalysts.
- **Increasing synergies with national strategies.** The areas where the region has a strategic potential to increase sustainable value creation through enhanced internationalisation coincides with those at the national level. This is the case for agro-food, in which the uniqueness of Azorean products could benefit from the overarching branding of Portugal. The same applies in the area of international development co-operation where the Azores, given their deep ties with key partners in Africa and ongoing projects such as the Interreg MAC and in the Interreg Atlantic Area, could be an important partner in the national development co-operation strategy.

1 The Azores in a nutshell

The archipelago of the Azores is an Autonomous Region of Portugal and a European Union Outermost Region located in the middle of the Atlantic Ocean. This chapter provides a snapshot on the past and current economic development of the archipelago by highlighting the progress made over recent years as well as the structural vulnerabilities that hamper future progress including remoteness, exposure to external shocks, high dependence on imports of essential goods and limited insertion in international markets.

A European and Portuguese hub in the Atlantic

The Azores (Portugal) is an archipelago of nine islands located in the middle of the Atlantic Ocean, 1 500 km from the European continent and 2 000 km from the east coast of North America. Together with Madeira (Portugal), the Canary Islands (Spain) and Cabo Verde, it belongs to the geographic region of Macaronesia. The Azores account for 2.3% of the population of Portugal (236 000 inhabitants in 2021, 75% of which is located on the Islands of São Miguel and Terceira) and 2% of the national GDP (EUR 4 178 million in 2019). With a GDP per capita of EUR 19 100 PPP in 2020 (USD 20 600), it is, together with four other regions in Portugal, one of the EU's 78 less developed regions, with a GDP per capita below 75% of the EU-27 average (INE, 2021[1]).

Since 2004 the Azores have been designated a European Outermost Region. Since 1976 the region has enjoyed autonomous status and has its own political and administrative organisation that includes a Regional Government and a Legislative Assembly, elected every five years. In practice, the autonomy is reflected in a set of prerogatives that include the possibility to legislate in areas spanning from agriculture and fisheries, to trade, industry, energy, tourism and fiscal policies (Law N.º 318-B/76 (30 April 1976), 1976[2]). Due to its geographical location *off continent* and the structural challenges associated with this, it is one of the nine European Outermost Regions (ORs). As such, the EU legislation provides specific support measures, including tailored application of EU law and access to EU programmes as well as ad hoc strategies (Box 1.1).

Box 1.1. The European Union Outermost Regions and their 2022 renewed strategy

The EU Outermost Regions (ORs) are nine European territories geographically located in the western Atlantic Ocean, the Caribbean basin, the Amazonian forest and the Indian Ocean. They include French Guiana, Guadeloupe, Martinique, Mayotte, Reunion and Saint-Martin (France), Azores and Madeira (Portugal), and the Canary Islands (Spain). In total, they are home to 4.8 million citizens, equivalent to 1% of the EU total. Due to the idiosyncratic challenges related to remoteness, vulnerability to climate change, small market size and high economic dependence on the mainland, since 2004 the EU has provided specific measures for the EU ORs regarding the EU legislation in accordance with Article 349 of the Treaty of the Functioning of the European Union (TFEU).

With their rich biodiversity and unique ecosystems, the outermost regions provide unique assets for the EU as a whole in three geographical areas.

The European Commission adopted on 3 May 2022 a Communication on "Putting people first, securing sustainable and inclusive growth, unlocking the potential of the EU's outermost regions". The Strategy for the outermost regions focuses on:

1. Putting people first – improving living conditions for people in the outermost regions, ensuring people's quality of life, tackling poverty and developing opportunities for the youth.
2. Building on each region's unique assets such as biodiversity, blue economy or research potential.
3. Supporting a sustainable, environmentally friendly and climate-neutral economic transformation grounded on the green and digital transitions.
4. Strengthening outermost regions' regional co-operation with neighbouring countries and territories.

Source: European Commission (2022[3]), *Putting people first, securing sustainable and inclusive growth, unlocking the potential of the EU's outermost regions*, https://ec.europa.eu/regional_policy/en/information/publications/communications/2022/putting-people-first-securing-sustainable-and-inclusive-growth-unlocking-the-potential-of-the-eu-s-outermost-regions

An ocean territory aspiring to rebuild its international standing

Once central to international trade routes, the Azores are now aspiring to regain a prominent international role (Governo Regional dos Açores, 2021[4]). Since the beginning of human settlement in the 15th century, the Azores relied on their strategic location as a gateway for commercial navigation that connected Europe to America, Africa and Asia. However, the vulnerability to external factors, the natural fragility of the archipelago and global technological progress pushed the Azores towards relative isolation over time.

The ocean and the specific climate conditions induced by the Gulf Stream with subtropical climate and mild temperatures all year long have been central to the economic development of the archipelago, which has been historically associated with fishing, including whale catching, agro-food and shipping services. The region exported wheat until the middle of the 20th century, ink plants in the 17th and 18th centuries and oranges in the 19th century, a luxury good whose main destination was England. In addition, tea, introduced in the middle of the 19th century from the People's Republic of China, also found the Azores an ideal environment to grow, and the region today still hosts the only commercial production facility in Europe. However, the combination of increased competition from other countries and the upsurges of different plagues, like the *Coccus Cochonilha*, a pest that decimated the citrus production, severally affected and reshuffled the agro-food system over time.

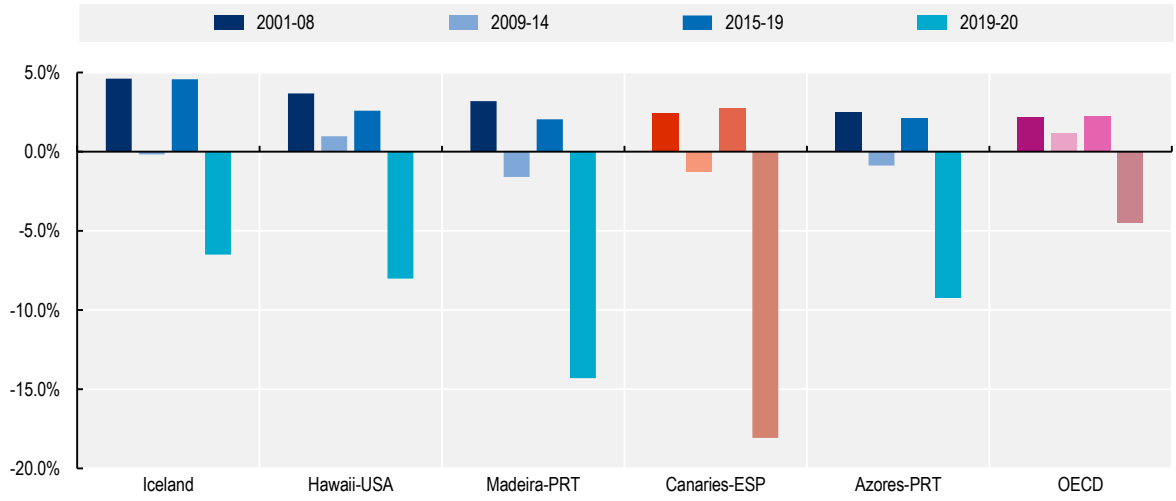
Located on the Mid-Atlantic Ridge the archipelago is subject to different geological and meteorological hazards (Gaspar et al., 2011[5]). Since the beginning of human settlement, more than 30 important earthquakes, countless seismic crises and extreme weather events, such as the 2019 hurricane Lorenzo and the more recent earthquake swarm in 2022 in São Jorge Island, have affected the archipelago, challenging supply-chain activities and damaging essential infrastructure, including ports.

Improved oceanic navigation techniques and technological developments, such as steam engines, made the archipelago less central to international sea routes, challenging local development opportunities and contributing to depopulation (Haddad et al., 2015[6]). Consequently, from the early 19th century, several migration waves contributed to the emergence of Azorean communities abroad, mostly in Brazil, Canada and the United States. The establishment of an important diaspora community in the United States was consolidated when in 1958, following the volcanic eruptions of the Island of Faial, the United States Congress approved the Azorean Refugee Act, sponsored by senator John Kennedy of Massachusetts, authorising non-quota visas for displaced Portuguese citizens. According to the most recent estimates 1.4 million Portuguese-Americans – the vast majority with Azorean descendants – live in New England, Massachusetts, California and Hawaii (US Census Bureau, 2020[7]). These communities account for much as five times the current population of the region and represent an important legacy and cultural connection that strengthen the international visibility of the archipelago.

Together, the support from EU and National Institutions cushioned the effect of the Azores' increased isolation over time. The region experienced some economic progress and in the early 2000s it showed a significant level of convergence towards the EU average. GDP per capita moved from 68% to 75% of the EU average. In 15 years, the productivity gap with respect to the EU-27 average also slightly improved, moving up from 58% in 2004 to 61% of the EU-27 average in 2019 (Eurostat, 2022[8]). Economic growth was mainly driven by investments in infrastructure and construction, which also benefited the nascent tourism sector (Haddad et al., 2015[6]). The region observed an infrastructure boom. In fact, 70% of a total 25 000 construction projects built in the Azores in 2000-19 were concentrated between 2000 and 2008 (SREA, 2022[9]). From 2009-14, GDP convergence to the EU average slowed due to the economic and financial crisis of 2008-09 and the European debt crisis of 2012-13. From 2014, counter-cyclical measures partially cushioned the negative effects of the crisis and the rebound of the economy from 2015 onwards was driven by the partial liberalisation of air transport and the expansion of tourism. While the incidence of tourism on the regional economy is less prominent with respect to other EU ORs, such as Madeira and the Canaries, over the 2010-19 period the number of tourists increased almost threefold, from 380 000 to 970 000 (SREA, 2022[10]). COVID-19 severely affected tourism in the region. After a sharp drop of 70% of

total arrivals in 2020, tourism only partially rebounded in 2021 with total turnover still 65% below pre-pandemic levels. As a consequence, in 2019-20 GDP dropped by 9%, in line with the national trend, double the OECD average, but still less when compared with other EU ORs like Madeira and the Canaries (Figure 1.1).

Figure 1.1. Average GDP growth, Azores, selected regions and countries, 2000-20

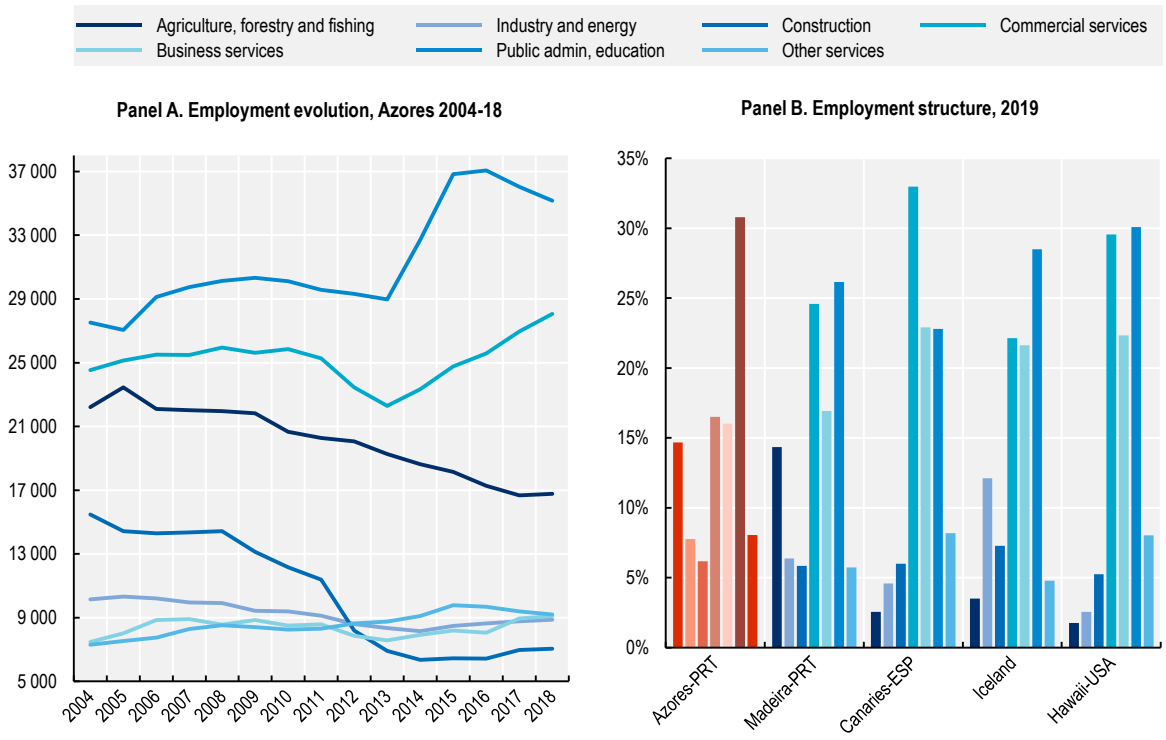


Note: 2020 is provisional. For Hawaii, original chain constant price estimates are referenced to 2010, and for other regions and countries 2015.
Source: Authors' elaboration based on OECD National Accounts, OECD Regions and Cities, https://stats.oecd.org/ and national and regional statistical offices. Canaries, http://www.gobiernodecanarias.org/istac; Azores and Madeira, https://www.ine.pt; Hawaii, http://dbedt.hawaii.gov.

Today the economy of the Azores is mainly specialised in services activities, which in 2019 accounted for 75% of total GDP and 71% of total employment. Public administration accounts for 32% of employment – 7 percentage points more with respect to 2004 – and 25% of GDP, followed by commercial services, with 25% of employment and 16% of GDP. Business services, which include more sophisticated activities such as scientific and technical support, remain limited, accounting for 16% of employment and 20% of GDP. These figures are lower than other insular ecosystems such as the Canaries (Spain), Iceland and Hawaii (United States) (Figure 1.2). The rest of the economy relies on agriculture, forestry and fishing, which employ around 15% of the workforce and contribute 9% of GDP, whereas industry remains marginal with 5% of regional GDP, and mostly relates to food processing.

Figure 1.2. More than 70% of jobs are in services

Employment structure of the Azores and selected peers, 2004-19

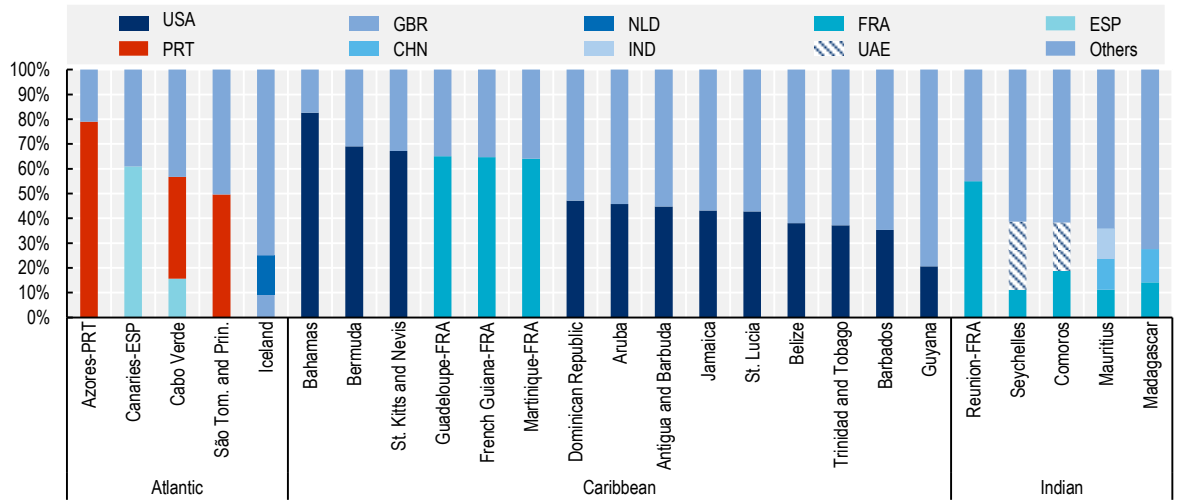


Source: Authors' elaboration based on OECD Regional statistics, https://stats.oecd.org/.

Remoteness makes economic ties with mainland Portugal and the EU pivotal assets for the regional economy. Portugal accounts for 80% of total trade for the Azores, a figure that is above other EU ORs, including the Canary Islands or Guadeloupe (Figure 1.3). Besides being located far from the European continent the Azores face additional challenges such as isolation from the main commercial trade lines and from third-country markets, exacerbated by the isolation of the scattered archipelago. The Azores are largely dependent on imports of both intermediate and final products such as food, machinery and equipment, and fuels.

Figure 1.3. Mainland Portugal accounts for 80% of the Azores' trade in goods

Share of total merchandise trade by partners, EU ORs and selected OACPS Countries 2018-19 or latest available years

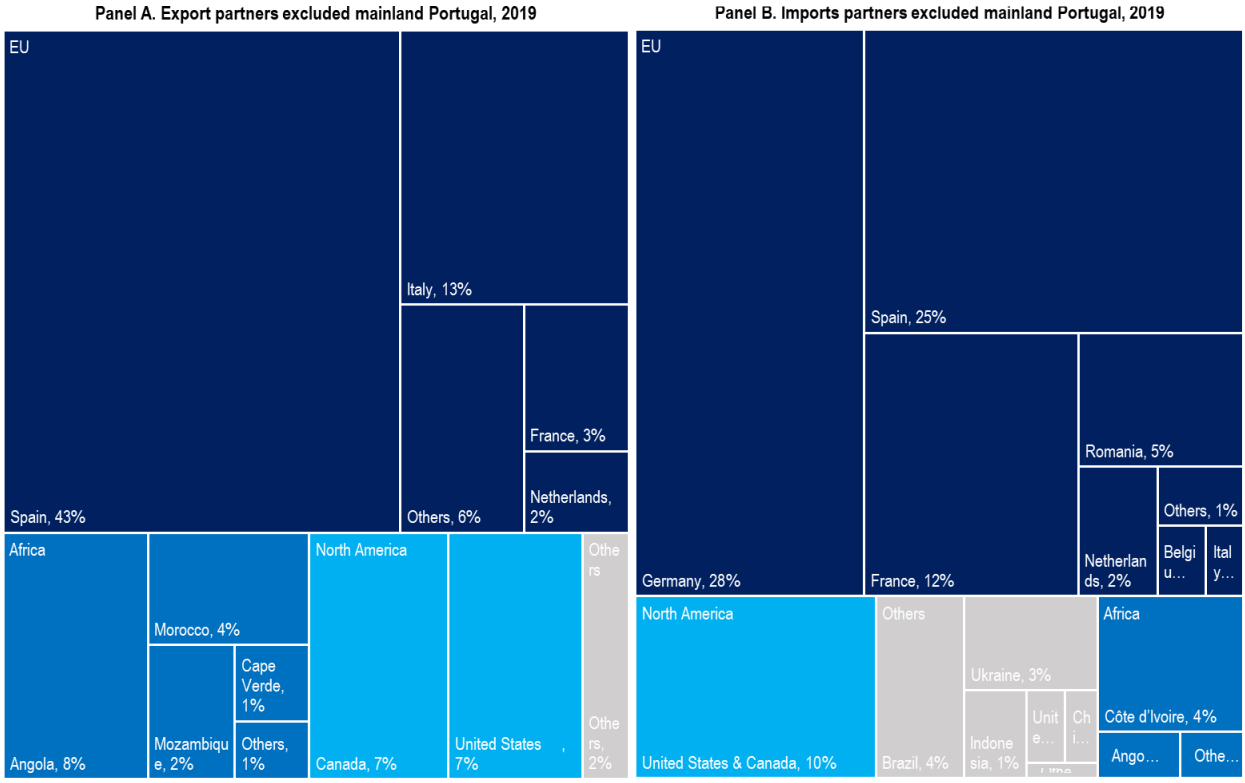


Source: Authors' elaboration based on Nationals Institute of Statistics, UN COMTRADE, https://comtrade.un.org/.
Note: For Madeira there is no available information for intra Portugal trade.

International trade in goods currently plays a marginal role in the regional economy, but exports are growing. International trade in goods has remained at around 15% of GDP over the last ten years. Exports increased from EUR 77 million to EUR 132 million (+70%) and imports from EUR 127 million to EUR 142 million (+12 %) over 2009-21. These trends positively affected the foreign trade balance, which, despite remaining negative, improved from -6% to -2% from 2009 to 2019. In addition to the EU, which accounts for 73% of total trade, North America and Africa are the main trade partners, at 11% and 9% respectively. The Azores specialise in exporting agricultural and food products (including fish and related products, meat, and both fresh and processed dairy products) which account for 72% of total exports, up from 68% in 2009. The main destinations in the EU, beyond mainland Portugal, are Spain, Italy, Denmark and the Netherlands. Outside the EU, top destination markets are North America and Africa (mostly Morocco, Angola and Mozambique). On the other hand, 60% of imports are concentrated in agro-food products, such as feed for livestock and other intermediary products for local agro-food processing as well as consumer products for households, followed by capital goods, such as machinery equipment and vehicles at 25%. The region mostly imports from the EU (Germany, Spain and France) and the United States (Figure 1.4).

Figure 1.4. Beyond the EU, North America and Africa are the main trade partners of the Azores

Share of total exports and imports by partners, 2019



Source: Authors' elaboration based on Regional Statistical Office of Azores (SREA), https://srea.azores.gov.pt/.

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2 Options for a sustainable internationalisation of the Azores

Once central to international trade routes, the Azores are now aspiring to regain a prominent international role. This chapter provides an analysis of the policy support for internationalisation of the region and identifies future opportunities and reforms that should leverage its unique geographical, natural and historical attributes in three pivotal economic areas: agro-food, ocean economy and renewable energies.

Prioritising investments to seize the opportunities of EU multi-annual planning and financing

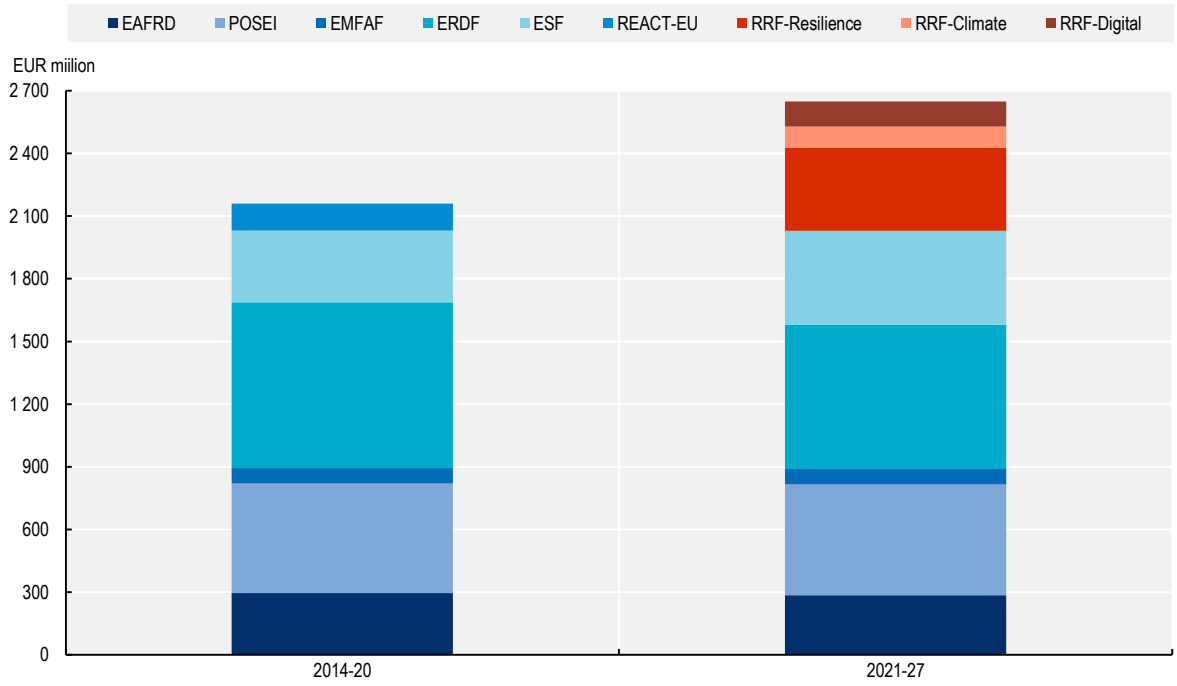
Regional, national and EU support are crucial to cushion the effect of the Azores' structural vulnerabilities. In particular, the autonomy and Outermost Region (EU OR) status provide policy space to tackle the structural handicaps in the form of compensating measures such as subsidies, exemptions and special provisions. For example, in 2021, the regional parliament approved a reduction of 30% of personal income tax (PIT) and corporate income tax (CIT) and decreased value added tax (VAT) from 18% to 16% to support the post-pandemic recovery. The region also benefits from measures to ensure territorial continuity via subsidised fare rates for residents on flights to the mainland, in line with the EU Public Service Obligation. As an EU OR, the Azores benefit from specific conditions and higher co-financing rates from most of the EU funds and programmes compared to other regions. Together, the Portuguese Government and European Commission, although subject to some variations, finance 50% of the budget of the Regional Government (Região Autónoma dos Açores, 2021[1]; Dentinho and Fortuna, 2019[2]).

The EU cohesion policy funds since 1978 have not only sustained economic growth and modernisation in the Azores, but have also enabled the Regional Government to increase local institutional capacities to plan and manage long-term projects. The Regional Government has shown over time an increased aptitude to co-ordinate, design and implement complex projects with specific conditionalities together with national and EU institutions. This has also contributed to improving the efficiency of funds disbursement. For example, the disbursement rate of the ERDF and ESA funds in the Azores is, at 77%, above the EU average of 63%.

The new EU programming period 2021-27 matched with additional resources from the Recovery and Resilience Facility (RRF) opens up new opportunities for the Azores. In addition to the traditional European Regional Development Fund (ERDF), European Social Fund (ESF), European Agricultural Fund for Rural Development (EAFRD) and the European Maritime Fisheries and Aquaculture Fund (EMFAF), the EUR 800 million from the RRF provides a unique occasion for the Azores to continue its progress of convergence towards a sustainable and equitable economy. The new resources will increase financing from the European Commission by 22% with respect to the 2014-20 Multiannual Financial Framework (Figure 2.1). The RRF provides financing until 2026 to fast-track reforms to mitigate the economic and social impact of the COVID-19 pandemic and make the European economy more sustainable and resilient. It includes several pillars that essentially aim to support green, cohesive and resilient economic growth. The Azores benefit from the RRF resources through the Portuguese National Resilience Plan (Ministerio do Planeamento, 2021[3]; European Commission, 2021[4]). 65% of the RRF are associated with the resilience pillar with both a social and competitive component, 19% with digital transition including education and modernisation of public infrastructure, and 16% with green transition including the expansion of renewable energy capacity and the development of the Azores Ocean Cluster (*Cluster do Mar dos Açores*). An additional EUR 117 million are also earmarked for the Azores, for the capitalisation of companies through the Portuguese National Development Bank (Banco Portuguese de Fomento- BPF) (Azores Government, 2021[5]).

Figure 2.1. The RRF will provide additional resources to the Azores

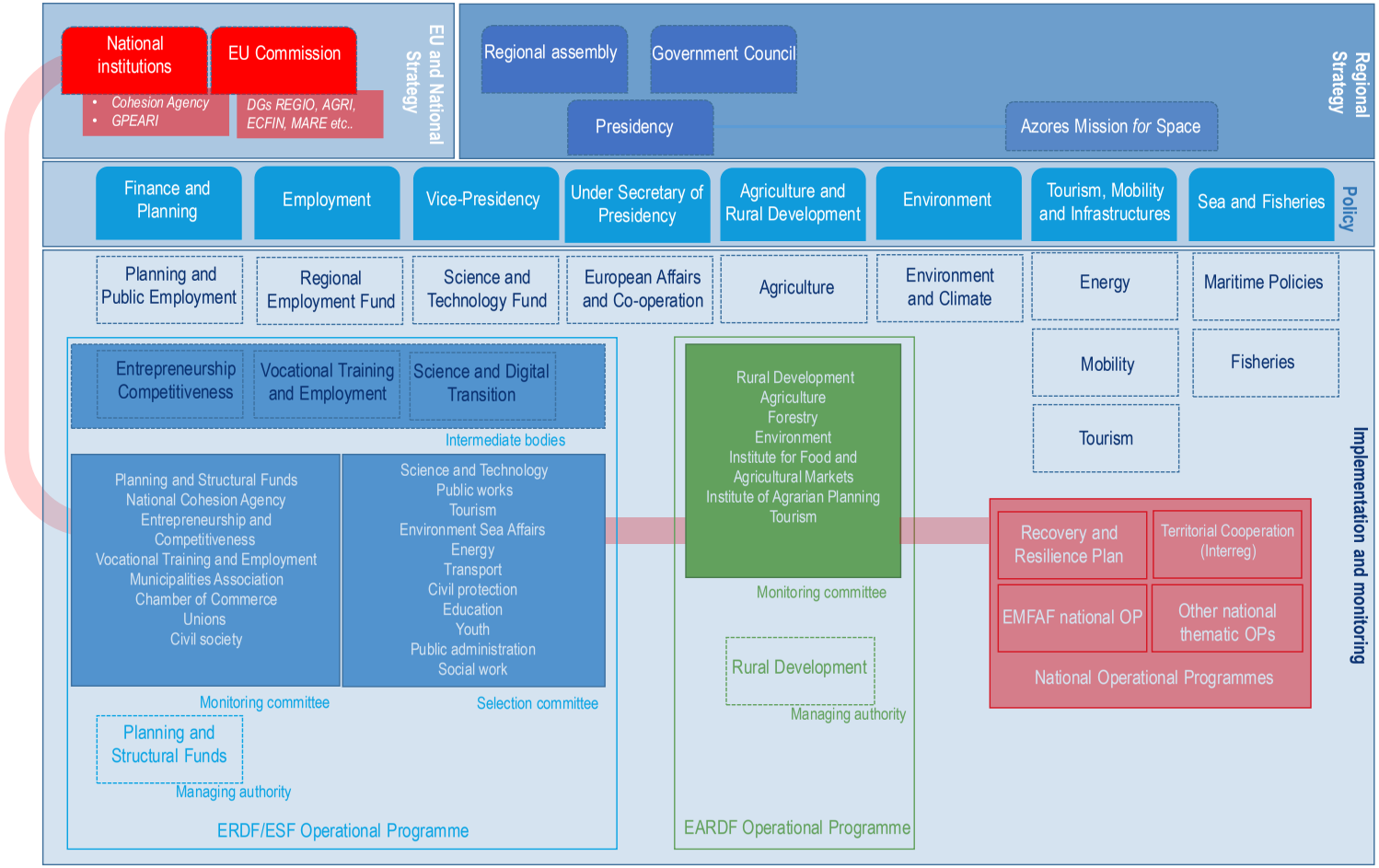
Earmarked financing mechanisms of the European Commission for the Azores and RRF, 2014-20 and 2021-27, EUR million at current prices



Note: ERDF - European Regional Development Fund, ESF - European Social Fund, POSEI - Special Agricultural Programme, EAFRD - European Agricultural Fund for Rural Development, EMFAF - European Maritime Fisheries and Aquaculture Fund, REACT-EU - Recovery Assistance for Cohesion and the Territories of Europe, RRF - Recovery and Resilience Fund. The figures for 2021-27 are preliminary until approval of ERDF/ESF and EARDF Operational Programmes.
Source: Authors' elaboration based on Portuguese National Cohesion and Development Agency, https://www.adcoesao.pt/; Azores Operational Programme 2014-2020, http://poacores2020.azores.gov.pt; National Recovery and Resilience Plan, https://recuperarportugal.gov.pt; Rural Development Plan, https://proruralmais.azores.gov.pt; and 2022 Renewed Strategy for the EU's Outermost Regions, https://ec.europa.eu/commission/presscorner/detail/en/IP_22_2727.

Several institutions are in charge of different areas of internationalisation and production transformation (Figure 2.2). Currently, the external co-operation and political affairs are co-ordinated by the Under Secretary to the Presidency, whereas economic affairs such as attraction of investment as well as planning, management and implementation of EU cohesion policy funds are under the responsibility of other Secretariats. The Regional Secretary of Planning and Finance and the additional directorates are in charge of the ERDF/ESF Operational Programme that account for 60% of total earmarked EU funds. The Directorate for Planning and Cohesion Policy Funds is the managing authority. It co-ordinates, along with the other line directorates, the implementation, selection and monitoring of the funds to secure coherence in planning and implementation. Another important regional programme is the EARDF Rural Development Programme. It is managed by the Rural Development Directorate under the Secretary for Agriculture. The regional authorities are also engaged within the framework of other EU funding schemes. These include the Interreg-Macaronesia (MAC), managed by the Canary Islands, and in co-operation with Madeira, Mauritania, Senegal and Cabo Verde and other national operational programmes associated with other funds such as the EMFAF.

Figure 2.2. Governance for internationalisation and economic transformation, Azores 2022

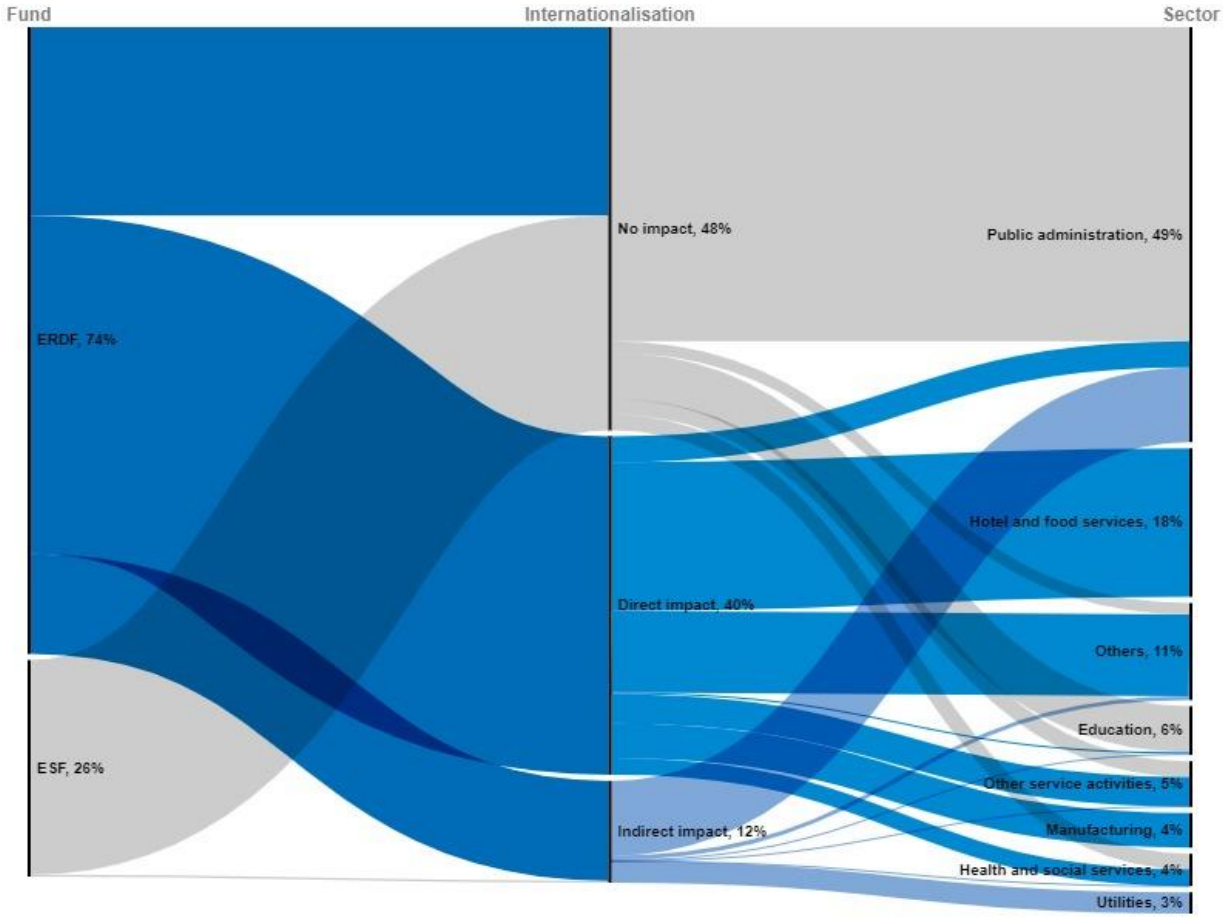


Note: The representation is not meant to be exhaustive. Rather it is intended to provide an overarching governance structure of the Azores Regional Government associate to economic transformation.
Source: Authors' elaboration.

Internationalisation is an important component of the Azores' planning for EU cohesion policy funds that could be modernised and strengthened. A granular analysis of the 2014-20 ERDF and ESF operational programme of the Azores shows that more than 50% of the resources are channelled either directly or indirectly to supporting the internationalisation strategy (Figure 2.3). These measures include several areas of intervention and beneficiaries. Indirect measures include specific actions that support the development of public goods such as the transition to a low-carbon economy, climate change and environmental protection. Direct measures to foster internationalisation include the co-financing of grants and loans to the private sector and research institutions or fiscal incentive schemes channelled via public administration like the *Competir+* scheme under the Regional Directorate for Support to Investment and Competitiveness (DRAIC).

Figure 2.3. More than 50% of the ERDF and ESF funds in 2014-20 supported internationalisation

Breakdown of ERDF and ESF by impact on internationalisation and beneficiaries, Azores 2014-20



Note: Direct impact on internationalisation includes the Investment priorities (IP) 1.01, 1.02, 3.01, 3.02, 3.03 and 3.04 whereas indirect impact includes 4.01, 4.02, 4.03, 4.05, 5.01, 5.02, 6.03, 6.04, 6.05, 7.02, 7.03, and 8.05. The figure does not consider the funds of the REACT-EU facility.
Source: Authors' elaboration based on Operational Programme "Regional Azores 2014-2020", http://poacores2020.azores.gov.pt/.

However, while it is important to take into account the archipelago nature of the Azores and the need to leave no one behind, the current compensation logic through subsidies might create dependency and distortion while at the same time limiting the region's capacity to benefit from multi-annual resources (OECD, 2020[6]). It also makes it difficult to mobilise private co-funding for transformative regional projects

and to identify pivotal game changers that will require more innovation and competitiveness. At the same time, the design of policies and instruments may require more synergies and co-ordination in different areas and between funds. Moving forward, some limitations need to be taken into account for planning and project identification:

- Prioritisation of activities and policy actions remains anchored to traditional sectors that may have limited spillover effects on the economy. For example, almost 20% of total ERDF/ESF resources from the 2014-20 programming were channelled to activities associated with commercial activities such as restaurants and hotels, followed by services activities related to tourism promotion such as local associations and chambers of commerce with 11%. Taking into account all measures that address the internationalisation potential of the Azores, tourism related activities absorb almost 70% of resources. Although tourism is and will remain an important activity, there are opportunities to enhance internationalisation through a more balanced and diversified economy in areas that are less exposed to external shocks, more innovation-oriented and with high spillovers on other sectors. Currently only 1% of internationalisation measures affect scientific and knowledge-intensive services that traditionally show high returns and economic spillovers.
- There is a risk of duplication, redundancy and dispersion of resources. For example, in 2014-20 the ERDF funds were used to support similar activities across multiple islands such as the creation of seven start-up and business incubators which operate in isolation without an overarching co-ordination. The large number of projects and priorities within each Operational Programme amplifies this issue. For example, the ERDF/ESF Programme shows that the Azores designed policy intervention and instruments in 35 out of 38 available policy priorities. This could create a large number of micro projects with limited impact as well as make it more difficult for beneficiaries to understand and navigate through the several financing and support measures.

The regional authorities are putting in place additional efforts to improve the design and implementation of measures that could tackle the above-mentioned issues. For example, for the 2021-27 programming, there are currently specific and ad hoc instruments under study that could lead to greater impact such as more complementarity between ERDF and ESF as well as grant disbursements conditioned to effective results. To shift from a compensation to a transformative approach in prioritisation, design and implementation, the following areas of intervention seem the more relevant:

- **Increase co-ordination at both policy and implementation level.** In order to leverage the potential of internationalisation as an instrument of effective economic transformation it will be important to narrow the prioritisation of intervention to a few macro areas such as digital and environmental transitions that could lead to greater long-term impact and results. In doing so, there should be a better co-ordination of different policy and implementation authorities. For example, the institutions of agricultural, rural development and maritime affairs should be integrated in the different committees of the ERDF and ESF programmes and vice versa. The same should apply for the local institutions in charge of international and EU affairs at political level to secure a greater co-ordination with partners including the other Outermost Regions.
- **Make the most of the synergies between the recovery plan and cohesion policy funds**. The RRF and cohesion fund regulations provide room for complementarities between policy actions and coherence in project pipelines. For example, the RRF could support areas that are not priorities under the ERDF/ESF. The two funds could also address different beneficiaries, with the RRF targeting public beneficiaries and the ERDF targeting private ones. At the same time, the different time frames of the funds could expand the life of projects by up to a decade. The shorter timeframes for the results of the RRF that must be achieved by 2026 could be complemented with further actions financed by the cohesion policy since the eligibility horizon extends until 2029 (European Institute of Public Administration (EIPA), 2022[7]). In the case of the ERDF/ESF Operational Programme, for example, several measures show complementarity and could be strengthened, particularly in the case of innovation activities under the smart specialisation strategy (RIS3) in

which, for example, the improvement of research infrastructures and equipment funded under the ERDF could be supported by ad-hoc initiatives for training and networking via the ESF. The RIS3 could also be used as a benchmark for the entire development strategy of the archipelago, including activities associated with the ocean, sustainable agriculture and renewable energies. At the same time, there is room to improve the cross-fertilisation among different operational programmes and parallel funds. For example, in the case of ICT infrastructure the ERDF could support the overarching infrastructure and the EARDF could be in charge of local extension in remote areas.

- **Strengthen the capacity building and institutional development of both public administration and potential beneficiaries.** Prioritisation planning and implementation of policies often require navigating complex procedures and rules that might change over time, such as in the case of the differences between the EU programming periods 2014-20 and 2021-27. Supporting the local authorities with ad hoc technical capacity building will be an important area of intervention that could involve authorities at national and EU level (OECD, 2022[8]). At the same time, local authorities could implement proactive action in support of potential beneficiaries in presenting high quality projects. For example, the national Operational Programme for Sustainability and Efficient Use of Resources (PO SEUR) – has put in place proactive actions to support the quality of projects presented by potential beneficiaries through a dense network of policy officers that provide updated information on the possibilities associated to the EU cohesion policy funds.

Making the most of internationalisation by leveraging uniqueness

The geographical, natural and historical uniqueness of the Azores could be used to turn the region into a relevant player to identify new sustainable solutions for internationalisation, while at the same time opening up opportunities for local development (OECD, 2022[9]; OECD, 2020[6]).

The peer review process of the PTPR on the Azores identified three potential areas for internationalisation and value chain participation that are particularly relevant for the regional economy and which reflect the specific uniqueness of the Azores in the future: agro-food, the ocean economy and renewable energies. Nevertheless, to make the most of them a renewed and expanded international partnership is needed including with national and EU partners, and in co-operation with emerging and developing countries, in particular SIDS. The latter face comparable challenges to the Azores including the relevance of the ocean in their economies and the exposure to external shocks in agriculture and energy prices. These specific industries and value chains are pivotal to ensure the environmental sustainability of consumption, production and trade and, at the same time, embed the larger spillover effects in other important activities for the region such as sustainable tourism (OECD, 2022[10]). They will help preserve the local ecosystem, whose vulnerability is increased by the growing frequency and disruptiveness of extreme meteorological events, and ensure competitiveness in key areas, including tourism, agro-food and ocean-related activities. Sustainability will also be key to reducing economic vulnerability, as 90% of total energy supply in the region relies on imported fuels, and 60% of regional imports are in agro-food, making the local ecosystem highly vulnerable to external shocks (Direcao Geral de Enrgia e Geologia, 2022[11]; SREA, 2022[12]). The following sections provide a snapshot on the current strengths, challenges and opportunities for internationalisation in the three identified value chains.

Preserving sustainability and prioritising high-end markets in agro-food

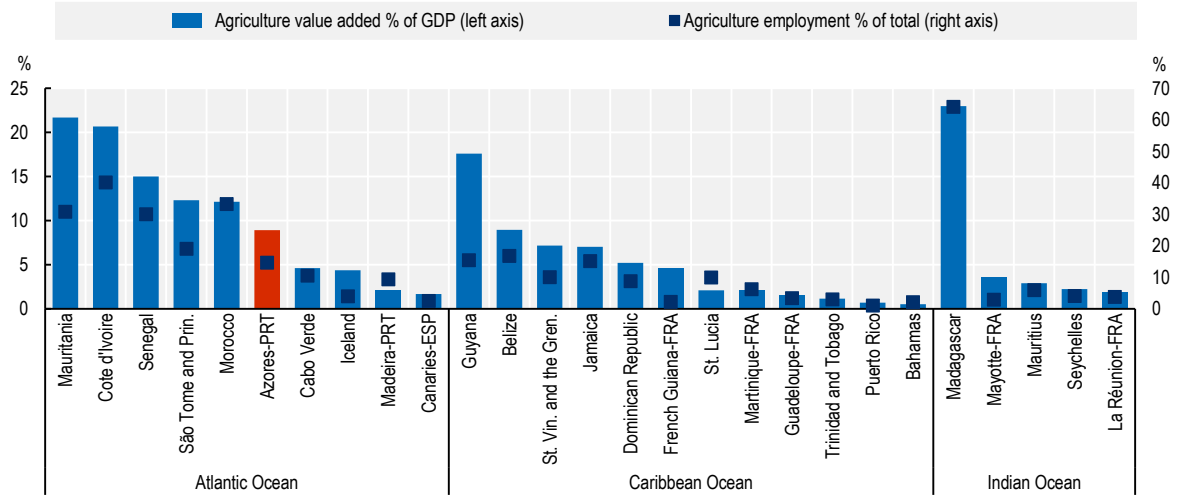
Agro-food value chains are changing globally. Emerging trends, accelerated by the pandemic, and rising global tensions point towards enhanced self-sufficiency and sustainability. Access to food is a growing concern as disrupted agro-food trade pushes staple prices up. In April 2022, food prices were 34% higher than the same period in 2021 and crude oil prices had increased by around 60%. Gas and fertiliser prices

more than doubled, challenging food security especially in the poorest areas (FAO, 2022[13]). Prior to the pandemic, new trends were also emerging, including growing consumer attention to the traceability, nutritional, health and environmental impact of food products. The market for healthy food is growing. The global market for natural and organic cosmetics reached USD 18.5 billion in 2020 and is expected to increase to USD 32.3 billion by 2027. Food systems are a major stress for the environment, accounting for between 21-37% of anthropogenic greenhouse gas emissions. Extreme and unpredictable events caused by climate change are putting pressure on production, particularly commercial fruits and vegetables that can only be grown in specific ecosystems. Global production is also challenged by climate change-induced shifts in pest and diseases patterns (FAO, 2021[14]; OECD/FAO, 2021[15]; OECD, 2021[16]; Research and Markets, 2021[17]). For the Azores, this implies an updated model that points to diversification of production and the discovery of high-value end markets.

Agro-food is one of the main pillars of the Azores' economy. Despite its decline in relative terms, mostly due to the rise in services and the development of tourism in the last decade, agriculture plays an important role, particularly when compared with other EU ORs (Figure 2.4). Agriculture contributes 9% of regional GDP and absorbs 15% of the labour force, whereas in other EU ORs it accounts for 3% of GDP and 10% of the labour force, on average. In the Azores, agricultural production mostly relates to family-run small farms, which account for 80% of the total. Agro-food is also the backbone of regional exports, accounting for 80% of total regional exports. Over the last two decades, new niche high-quality products emerged in the regional export basket including subtropical fruits like pineapple and globally recognised volcanic wines. Food processing is particularly challenging due to the high costs related to insularity, including transport, time to market and limited production capacities. As such, successful companies tend to integrate production stages and pursue economies of scope rather than scale. This is the case for dairy production, fish and wine, which are often organised in cooperatives that aim to reduce the dependency on foreign markets for intermediate inputs and reduce shipping costs. Despite these developments, the Azores' agro-food system is essentially led by two main segments: livestock farming and fishing activities.

Figure 2.4. In the Azores, agriculture is more relevant than in other Outermost Regions

Share of total gross value added and employment in agriculture, Azores and selected countries and regions, 2019 or last available year



Note: 2018 for Guadeloupe, Reunion, Martinique, Mayotte, French Guiana; 2019 for the Canaries, the Azores, Madeira and EU-27.
Source: Authors' elaboration based on OECD Regional statistics https://stats.oecd.org; French Portuguese and Spanish National Regional Institute of Statistics and Economic Studies, https://www.insee.fr, https://srea.azores.gov.pt/, https://estatistica.madeira.gov.pt/, http://www.gobiernodecanarias.org/istac.

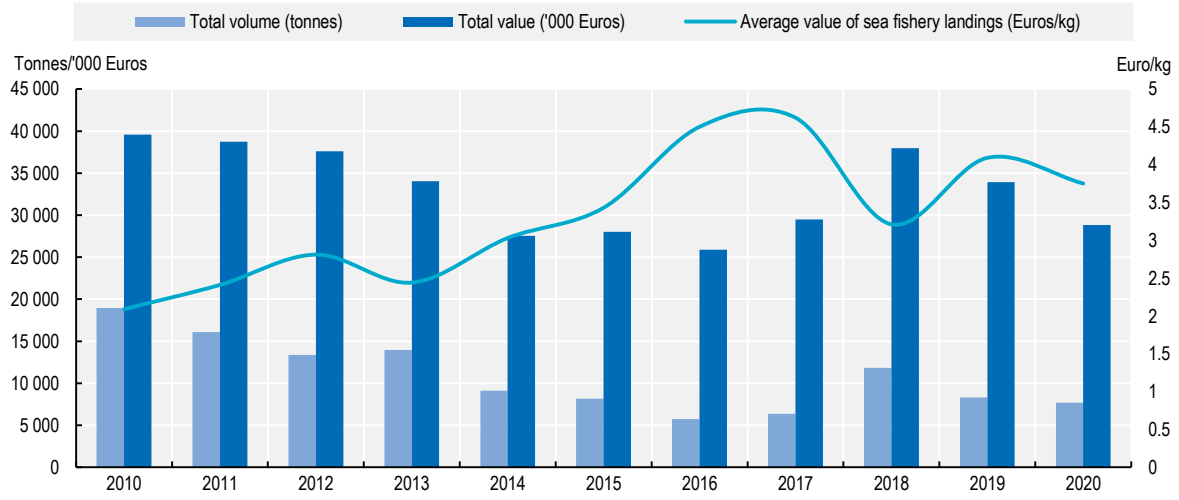
Livestock farming accounts for 80% of total agricultural output. Of the 50% of the total Azores territory that is occupied by agriculture, pasture takes up 80%. In 2019, 82% of total agricultural output was associated with the production of milk, dairy products and meat, making the archipelago essentially a monoculture agriculture system. Despite the relatively small farm size – 8.9 ha, equivalent to half of the EU average, the Azores are an important milk producer that accounts for more than 30% of total Portuguese production. This is mainly associated with the transition of the EU milk quota. From 2008 until 2015, the reduction of milk produced in mainland Portugal allowed the expansion of the production in the Azores within the national EU quota. After the end of the quota system in 2015, the expansion of production to the natural capacity of the Azores islands allowed an increase in milk production of more than 30 million litres. However, even if the average productivity per cow, 7.3 t/l, grew by 17% in 2011-20, it remains below the national average of 8.6. Milk and dairy production is concentrated on two islands: São Miguel (89%) and Terceira (11%) and the dairy processing plants correspond to 11% of total Portuguese output, with cooperatives leading. Both in São Miguel and Terceira two cooperatives specialise in different dairy products for the domestic market, collecting 40-45% of the milk produced, whereas a large private company, collecting around 20-25% of the milk, focuses mainly on the foreign markets (de Almeida, Alvarenga and Fangueiro, 2021[18]).

Although monoculture farming brings advantages associated with productivity maximisation, pursuing scale economies and consequently reducing unit cost even for a small archipelago, several challenges are associated with it. Monoculture farming faces difficulties related to pest infestations, erosion of the natural balance of soils and decrease in biodiversity (Earth Observatory System, 2020[19]). These economic activities in the Azores face additional challenges associated with the lack of infrastructure, increasing cost of imports of animal feed and low profit margin at farm level in comparison to continental competitors due to transport costs. For example, all things being equal, some estimates indicate that the cost of transport for each kilogramme of meat to the mainland from the Azores is EUR 2 more expensive compared to a competitor in mainland Portugal (Autoridade Tributária Aduaneira, 2021[20]). In addition, agro-food in the Azores is particularly subject to climate-change hazards. In the most adverse scenario, estimates consider that 90% of local plant and animal species could be at risk of losing a suitable climate environment (Alatalo, Jägerbrand and Molau, 2014[21]).

Small-scale and sustainable fishing point to an emphasis on quality over quantity. Located in a privileged point of passage on the migratory route of many marine animals, and due to the temperature of the waters and volcanic origins, the Azores present ideal conditions for the reproduction of fish species. The fishing activities in the Azores are dominated by small-scale boats – less than nine meters long – using artisanal and traditional methods. These account for 65% of total vessels and are mainly active on the coastal area given the limited narrow belt of shallow water around the islands. Considering the limited market size, only 15% of fresh fish is consumed locally, whereas the remainder is exported to mainland Portugal or third countries. Only 4% is intended for local processing, mainly canned tuna. With an average 8 000 tonnes caught, with high levels of variability and a value of EUR 31 million between 2015 and 2020 (Figure 2.5), Azorean fisheries account for 8% of national production and contribute to 14% of total value (SREA, 2022[12]). The increase of the average price has been driven by several factors, including global demand. Consumers globally are increasingly paying attention to the quality and sustainability of fishing methods that preserve the natural biological behaviour of fish. For example, greater care in handling and conservation have led to major improvements in the quality of the fresh product, gaining globally recognised certification such as Naturland and Friends of the Sea (European Commission, 2017[22]; Fauconnet et al., 2019[23]). However, several challenges persist for fishing activities in the Azores. The poor qualifications of fisherman, with limited business management capacities, hinder diversification possibilities and catch techniques. Likewise, infrastructure for supporting the development of non-fresh storage is lacking. Illegal fishing practices threaten the sustainability of the local fish value chains. Moreover, the volatility in catches hampers investments in the downstream processing industry (ORFISH, 2016[24]).

Figure 2.5. The value of fish landings has increased

Sea fishery landings in the Azores: Volume, value and average value per kg, 2010-20



Source: Authors' elaboration based on Portuguese National statistical office, (INE) 2022, https://www.ine.pt.

Regional, national and EU funds are central to the development of the agro-food sector in the region (Polido, João and Ramos, 2016[25]). For example, the region received 46% of the European Union funds allocated to Portugal to support milk producers. The Regional Government strongly supports milk production in the Azores, through subsidies fixed annually according to the regional budget, in order to offset the increased transport costs of raw materials and products. In 2018, the amount of the subsidy was EUR 6/1000 l.

The EU resources are channelled through three main funds. The Azores benefit from the specific measures and scheme for agriculture in favour of the regions of the Union (POSEI) that replace the measures of the first pillar of the Common Agricultural Policy (CAP). POSEI, with a yearly contribution of EUR 77 million, of which 75% for milk and cattle, aims at guaranteeing the supply to the Outermost Regions of essential agricultural products, securing the development of the livestock and crop-diversification sectors and maintaining the development of traditional agricultural activities. This is implemented with two specific instruments. Specific supply arrangements (SSA) that exempt import duties from third countries and allow aid for the supply of Union products, and Support to local production (SLP) that supports the production, processing and marketing of traditional and emerging local agricultural products. In the Azores, SSA focuses on cereals and other by-products for its animal feed industry and livestock sector and SLP focuses on traditional production such as milk and meat (European Commission, 2021[26]). In 2014-20, the European Agricultural Fund for Rural Development (EAFRD) allocated EUR 295.3 million and the European Maritime and Fisheries Fund (EMFF) EUR 105 million. Together the two funds are equivalent to 25% of total gross value added in agriculture and fishing (SREA, 2022[12]). The EAFRD mainly supported the competitiveness of farmers with 40% of total budget, whereas climate change and environmental protection counted for 15% of resources each. The EMFF channelled resources for infrastructure and landing sites and for processing and the development of new markets (European Commission, 2019[27]).

Public policies also support innovation and digitalisation in agro-food. The technological park of Nonagon is hosting the local operations of an international platform to develop the circular economy based on the development of fibre-based products from agricultural waste. It is being developed jointly by Fibrenamics, the international platform of the University of Minho, and the Regional Laboratory of Civil Engineering (LREC-Azores). New technologies are opening up unprecedented opportunities for innovation and sophistication of the agro-food value chain. Digital technologies, for example, are improving production,

marketing, logistics and retail. Smart farming, the Internet of Things, and Big Data are enabling precision agriculture through advanced monitoring systems that can lead to increased yields, higher productivity, reduced environmental impact and lower impact from natural disasters (OECD/UNCTAD/ECLAC, 2020[28]). The Azores Agricultural Innovation Support Programme (i9agri) aims to enhance farmers' access to new technologies by disbursing financial support (EUR 1 000-20 000) for investments in computerisation and digitalisation, decision-making tools, residue and by-product valorisation, environmental sustainability and precision agriculture, among others.

Local and international partnerships will be key to de-risking and diversifying local fruit and vegetable production, reducing post-harvest waste and increasing quality to reach new high-quality, niche markets. Key options going forward include fostering innovation and exploring options in the circular economy, diversifying production and ensuring the preservation of the local ecosystem (Box 2.1).

Box 2.1. Promoting climate-resilient and sustainable agriculture in Brazil: The ABC+ plan 2020-2030

Brazil's Adaptation, Resilience and Mitigation plan (ABC) aims to foster climate adaptation and reduction of carbon emissions by supporting farmers to adopt agriculture and livestock integrated systems that aim to recover degraded pastures, improve irrigation systems and better manage agro-food waste through pest and pollinator management practices.

Agricultural production occupies 30% of the total area of Brazil. Environmental conditions greatly influence the sector and climate change is one of the most important risks to sustainable production. In 2012, Brazil committed to increasing and strengthening the sustainability of its agricultural systems and to promote resilient production with the ABC Plan.

The Brazilian government intends to continue its efforts in this direction with the Brazilian Agricultural Policy for Climate Adaptation and Low Carbon Emission - 2020-2030 or ABC+ Plan (MAPA, 2021). The ABC+ Plan is a national policy developed in synergy with regional policies and with the involvement of private stakeholders. The plan fosters the adoption of standardised practices and technologies through technical extension, dedicated financial instruments, and empowerment through the ABC Platform. ABC+ also expands the goals for Brazil in its efforts to combat climate change. For example, during the period 2020-30, Brazil aims to mitigate 1.1 billion tonnes of CO_2 equivalent, compared to 133-163 million tonnes during 2010-20.

The ABC Platform, a multi-institutional monitoring and evaluation of the ABC+ Plan, evaluates studies and indicators regarding the resilience of agricultural systems and the adaptive capacity of such systems. The platform has information and planning instruments, such as Sisdagro (a decision-support system for agriculture from the National Meteorological Institute), SCenAgri (simulation of future agricultural scenarios) and the SOMABRASIL (an observation and monitoring system for agriculture in Brazil), both co-ordinated by Embrapa. These systems are increasingly adjusting their methodologies for facing climatic uncertainty in order to improve decision making by farmers and governments.

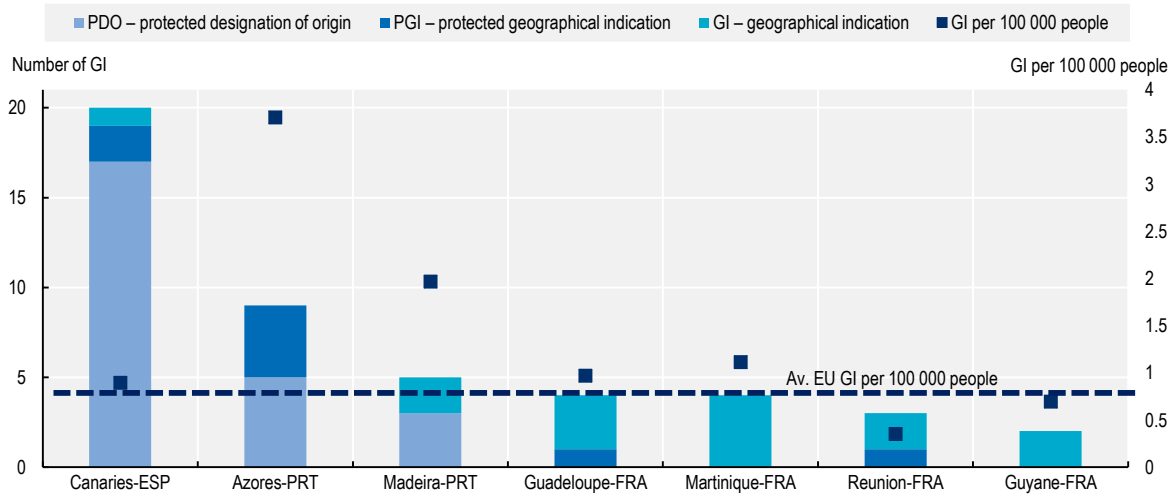
Source: Mariane Crespolini, "Innovation in Agro Food Value Chains", Department of Sustainable Production and Irrigation, Secretariat for Innovation, Rural Development and Irrigation, Ministry of Agriculture, Brazil, presentation at the First Peer Learning Group (PLG) Meeting "Innovating in agro-food value chains", 21 January 2022.

The Azores are prioritising quality and certification to push agro-food exports. In 2015 the local brand *Marca Açores* was launched, aimed at promoting the identity and cultural value of the Azores, but also to provide a label of origin for food and non-food products, crafts, services and facilities. Moreover, the archipelago has nine products protected under the EU geographical indication schemes. Along with the

Canaries and Madeira, the Azores have a higher number of Geographical Indication (GI) products per 100 000 people than the average of the EU, Spain and Portugal (Figure 2.6). Some of the GI products in the Azores include among other volcanic wines, tropical fruits like pineapple and maracuja, and dairy products. The uniqueness of Azorean products could benefit from the overarching branding of Portugal that could further support visibility and positioning in high-end markets. Insisting on prioritising quality and certification will be key to further expand the promotion and traceability of the Azorean products and leverage on high value end market. In this respect new technologies such as blockchain and Distributed Ledger Technologies (DLTs) applications can be set the path for future certification but also induce new business opportunities (Bianchini and Kwon, 2020[29]).

Figure 2.6. The Azores have higher number of geographical indication products per capita than the EU average

Number of protected geographical indications by type and per 100 000 people, ORs and EU average, 2022



Note: Mayotte and Saint Martin do not have registered geographical indications.
Source: Authors' elaboration based on EU geographical indications register eAmbrosia, https://ec.europa.eu/info/food-farming-fisheries/food-safety-and-quality/certification/quality-labels/geographical-indications-register/.

Access to international markets remains a challenge for the archipelago. Leveraging strategic partnerships with national and international star businesses and retailers could open up new opportunities to explore the returns of high-end markets in strategic locations such as the EU and the United States, and could contribute to reducing the high logistical costs. The Azores and mainland Portugal could also benefit more from leveraging increasingly on the national branding promotion system. At the same time, relying on the untapped potential of the diaspora could support further penetration of Azorean products. The over 1.4 million of Portuguese diaspora in the United States with a median of USD 80 000 household income could not only contribute to local development through potential investment, they also provide a foothold into wider commercialisation channels. In fact, migrant-entrepreneurs act as co-creators of goods, services and intellectual property and often operate as collaborators, investors and distributors in international markets (OECD/UNCTAD/ECLAC, 2020[28]).

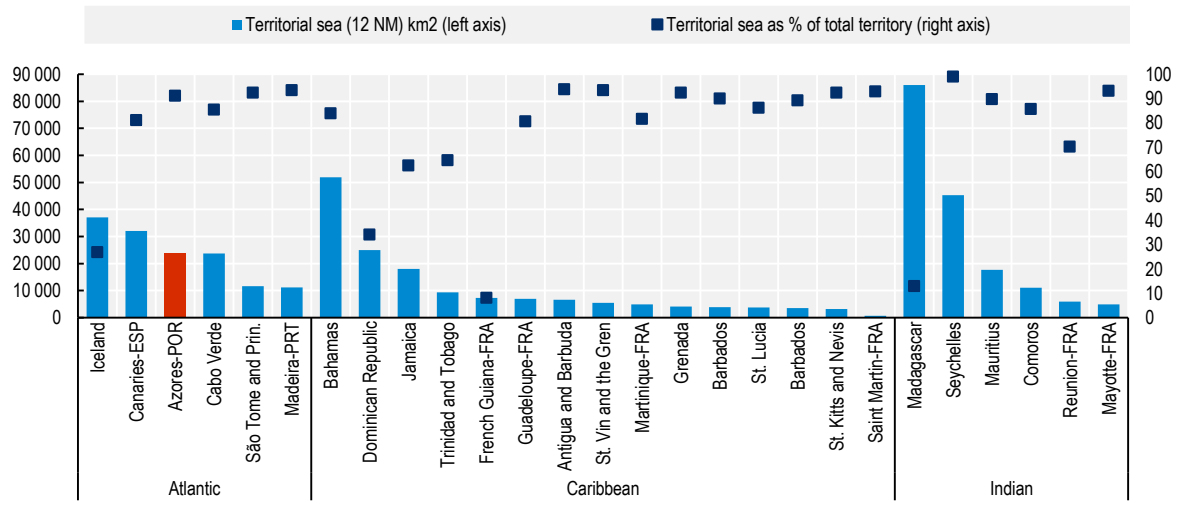
Connecting local and global players for innovative ocean solutions

The internationalisation of the Azores is intertwined with the oceans. Hosting a rich biodiversity and 4 out of Portugal's 12 UNESCO Biosphere Reserves, the Azores are encapsulated in an Exclusive Economic Zone

(EEZ) of nearly 1 million km², the second largest of the EU, that supports important activities including fishing, sustainable tourism and scientific research (IUCN, 2020[30]; European Commission, 2021[31]). Similar to other ORs and their neighbouring countries in Atlantic, Caribbean and Indian Oceans the territorial sea accounts for more than 90% of total territory of the Azores (Figure 2.7). From deep-sea research to seamount ecosystems and research activities related to the impact of human activities, the archipelago is a natural open laboratory for understanding the functioning of seas. This vast ecosystem is also subject to different geological and meteorological hazards that can severely undermine the economy and society.

Figure 2.7. The ocean represents 90% of the Azores territory

Territorial sea, km2 and share of total territory, ORs and selected countries, 2019

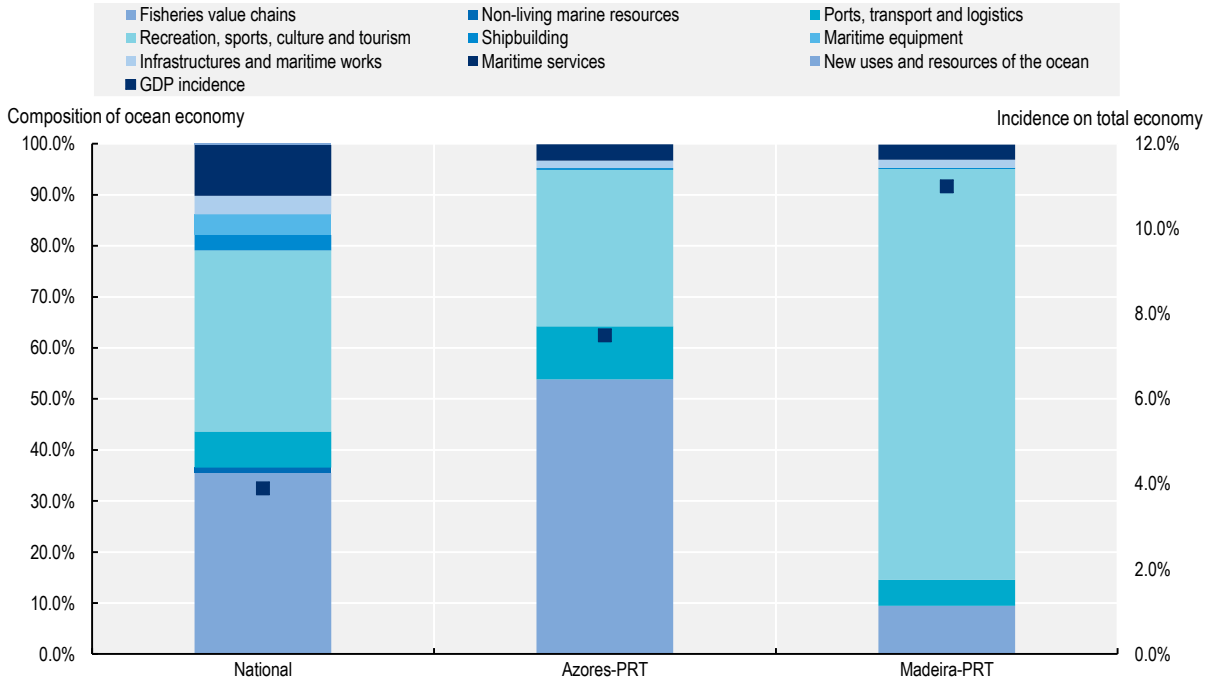


Note: Territorial sea follows the United Nations Convention on the Law of the Sea (UNCLOS) that establishes a legal framework for territorial sea out to 12 nautical miles (22 kilometres; 14 miles) from the baseline.
Source: Authors' elaboration based on Flanders Marine Institute (2019), *Maritime Boundaries Geodatabase, version 1*, https://www.marineregions.org/, https://doi.org/10.14284/382; Food and Agriculture Organization (FAO), https://www.fao.org/faostat/en/#data, and National statistical offices of France, https://www.insee.fr, Spain, https://www.ine.es and Portugal, https://ine.pt/.

It is vital for the Azores to make the most of the ocean economy. According to the Portuguese Ocean Satellite Account in 2018, the Azores contribute to 4% of Portugal's ocean gross value added and employment. Moreover, the regional gross value added associated with ocean activities stands at 7.5%, higher than the national aggregate of 4.4% (INE, 2020[32]). The vast majority of these activities, like in other ORs and Madeira, are associated with traditional value chains such as fishing and coastal tourism, which account for 85% of total value added. More sophisticated marine services like ocean R&D, biotechnology, maritime information and communication services and renewable energies account for only 3% (Figure 2.8). The specialisation in relatively low-value added activities that face greater risks of deteriorating marine ecosystems and are more vulnerable to external shocks, resembles the structural heterogeneity configuration of an ocean economy typical of low and middle-income countries, for which the contribution to GDP accounts on average for 11% and 6% respectively (OECD, 2020[33]). On the contrary, for high-income countries, the ocean economy accounts for less than 2% of GDP, with relative specialisation in technology and knowledge-intensive activities with higher returns such as biotechnology and bio-economy. In 2018, for example, the EU-27 ocean economy directly employed almost 4.5 million people (2.3% of the workforce) and generated around USD 200 billion of gross value added (1.5% of GDP) with a greater contribution from more sophisticated value chains (European Commission, 2021[34]).

Figure 2.8. Structural heterogeneity of the Azores' ocean economy

Composition of the ocean economy in the Azores, GVA (Gross Value Added) and incidence on total economy, 2018



Note: Figures for Portugal exclude Azores and Madeira.
Source: Authors' elaboration based on Portuguese Ocean Satellite Account, https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_destaques&DESTAQUESdest_boui=459804030&DESTAQUESmodo=2.

The regional government aims to go beyond traditional fishing, developing higher value-added activities associated with the oceans. Conceived and designed over the last ten years, the Azores launched the Azores Marine Cluster (*Cluster do Mar dos Acores*) in 2021. The cluster is part of the overall support on Blue Economy provided by the European Commission to Outermost Regions. In 2017 it encouraged all the ORs to develop strategic approaches to the ocean economy by developing a long-term strategy involving all actors and sectors and including strategic planning and innovative investments (European Commission, 2020[35]). All this in line with the policy framework mentioning Outermost Regions in the May 2021 EC Communication on a new Sustainable approach for the Blue Economy for the EU.

Supported by the financial contribution of the RRF, with a total budget of EUR 32 million, the cluster aims at supporting and developing economic activities associated with the oceans through two main initiatives:

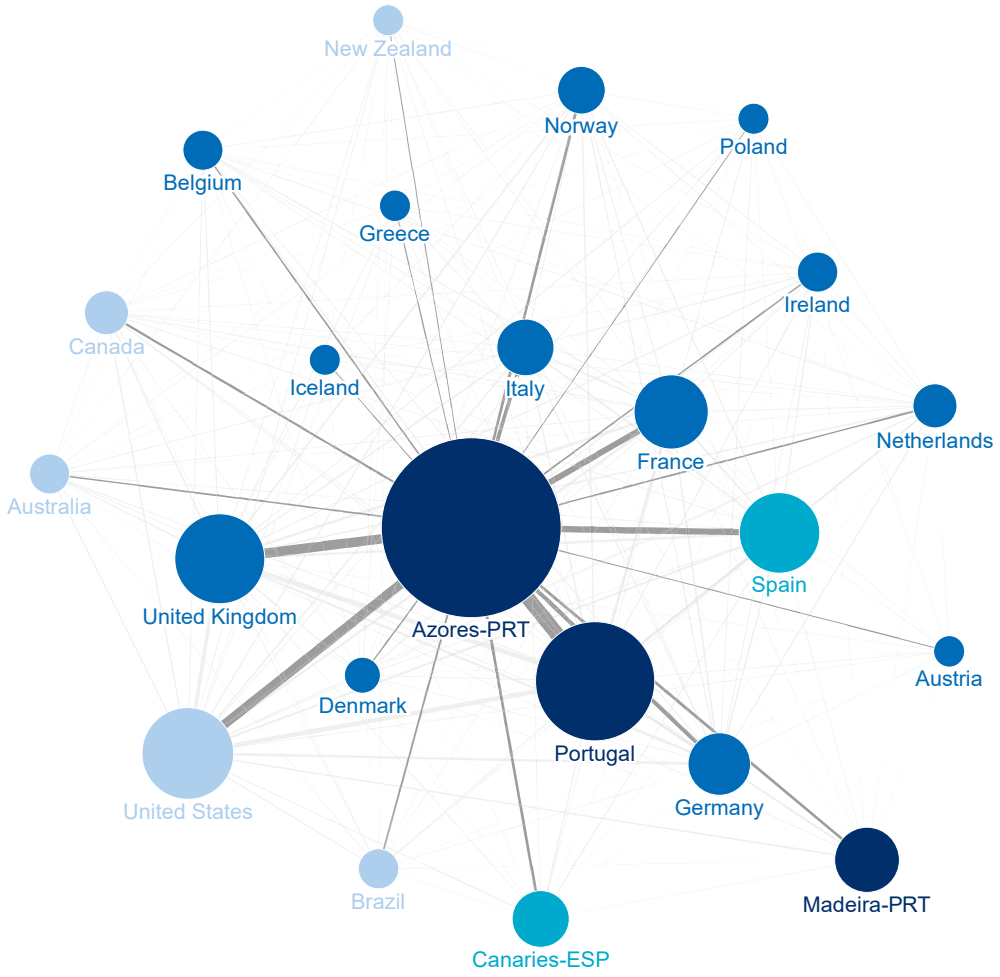
- The creation of an ocean experimental research and development centre on the island of Faial (Tecnopolo MARTEC) to host regional, domestic and international institutions involved with scientific and technological innovation associated with the entire ocean value chains including fisheries and aquaculture, marine biotechnology, biomaterials, marine technologies and engineering.
- Replacing and modernising the local fishing and shipping fleet with up-to-date technologies, standards and equipment that respond to current needs such as the improvement of marine research and monitoring, and the possibility of improving deep-sea fishing techniques.

The Azores are becoming an important actor in the ocean scientific community. The Azores, despite the limited human capital resources and the relatively small scale of the involved institutions are already very active in scientific research related to oceans and contributed to 10% of total Portuguese research output in

2000-21 (Figure 2.9). They have an extensive research network involving institutions from the top leading countries. 86% of total research publications in 2000-21 were published with a partner outside of the region. Of these 18% were with mainland Portuguese institutions, 11% with the United States, 10% with the United Kingdom and 8% with Spain. Scientific co-operation within Macaronesia, Madeira and the Canaries, accounts for 8%, showing the importance of cross-border scientific effort within the EU framework programmes. These include the competitive projects allocated under Horizon 2020 with a total allocation of EUR 9 million in 2014-20. Of these, 42% have been allocated to the Institute of Marine Research (IMAR) hosted by the University of Azores. The IMAR, along with 23 other institutions from the 9 ORs, participated in the H2020 FORWARD project that aimed to foster interregional research on eight scientific thematic areas, including marine science and technologies, earth, space and universe sciences. Another relevant example of cross-border co-operation is the Interreg Macaronesia programme with a total budget of EUR 150 million shared among all participants, including emerging and developing economies like Cabo Verde, Senegal and Mauritania.

Figure 2.9. The Azores contribute 10% of Portuguese research on oceans

Global research network of the Azores, 2000-21. Number of co-authored publications and institutions involved



Note: Ocean related scientific publications include all scientific publications that contain ocean/s, maritime or marine in either the title, abstract or keywords. Only journal publications referenced at least once were included in the final set that covers the years from 2000 to 2021.
Source: Authors' elaboration based on Scopus (Elsevier B.V.), https://www.scopus.com/.

The regional government is also prioritising the potential synergies between ocean and space activities. The Azores have been a hub for space activities since the early 2000s. They host the launcher tracking station of the European Space Agency (ESA), the Atmospheric Radiation Measurement (ARM) facility of the US department of Energy and the Galileo station and more recently a 15-meter telecommunications antenna in 2020 and the installation of EUMESTAT in 2021. In addition, in 2019 Portugal launched the Space 2030 strategy that aims to leverage the strategic position of the Azores as a launching platform for small satellites on the island of Santa Maria. The programme aims to stimulate the space sector in Portugal, creating conditions for the development of national capacity and expertise in the field of space industry within the framework of the Copernicus programme. By means of satellites, observations include detailed information that can serve end users for a wide range of applications, including assessment of protected marine areas, precision agriculture and climate change. The private sector is an important player in this area. Since 2016 the Atlantic International Research Centre (AIR Centre), an international collaborative organisation that promotes an integrative approach to space, climate, ocean and energy in the Atlantic has its headquarters in the Azores, with an executive committee that include representatives from Portugal, Spain, Brazil and South Africa.

Despite such efforts and these positive trends, the innovation ecosystem in the Azores is still at an early stage and private-sector commitment remains limited. The region would benefit from higher levels of investment in research and innovation. R&D investment is 0.3% of GDP, well below the national average (1.6%) and OECD average (2.7%) and similar to developing and emerging economies in Latin America. The private sector contributes only 15% of total regional R&D investment, whereas in islands that have built up Ocean Clusters models, the private sector accounts for a higher proportion of R&D expenditures (64% in Iceland and 32% in Hawaii and the United States) (Figure 2.10). More investment in research and innovation can have important implications in supporting the creation of new entrepreneurial activities. Start-ups have the potential to create new products and services that can increase the diversification and value added of local ocean-related activities and allow for new entrepreneurial discoveries. In this respect the renewed EU Atlantic Action plan 2.0 provides a space for the Azores to strengthen these areas together with other EU countries and regions from Ireland, Spain, France and Portugal (Box 2.2). Also, the Horizon Europe offers additional opportunities to support their research and innovation capacity in this area.

Box 2.2. The EU Atlantic action plan 2.0: Towards a resilient and competitive blue economy

An updated action plan for a sustainable, resilient and competitive blue economy in the European Union Atlantic area

The original EU Atlantic maritime strategy was adopted in 2011 by the European Commission to support the sustainable development of the blue economy in the EU Member States bordering the Atlantic. In 2013, the European Commission put forward an Atlantic action plan to implement the strategy. In July 2020, the European Commission adopted a revised Atlantic Action Plan 2.0, further to a mid-term review of the Atlantic action plan published in 2018 by the European Commission to give a new boost to a sustainable maritime economy and as a contribution to Europe's recovery from the crisis triggered by the COVID-19 pandemic.

The AAP 2.0 sets out four thematic priorities for regional co-operation, following a bottom-up stakeholders' consultation. Its purpose is to unlock the potential of sustainable blue economy in the Atlantic area while preserving marine ecosystems and contributing to climate change adaptation and mitigation. This is in line with the global commitments for sustainable development and fully integrated in the European Commission's political priorities for 2019-24, notably a European Green Deal, an Economy that works for people and a stronger Europe in the world.

- Pillar i: ports as gateways and hubs for the blue economy
- Pillar ii: blue skills of the future and ocean literacy

- Pillar iii: marine renewable energy
- Pillar iv: healthy ocean and resilient coasts

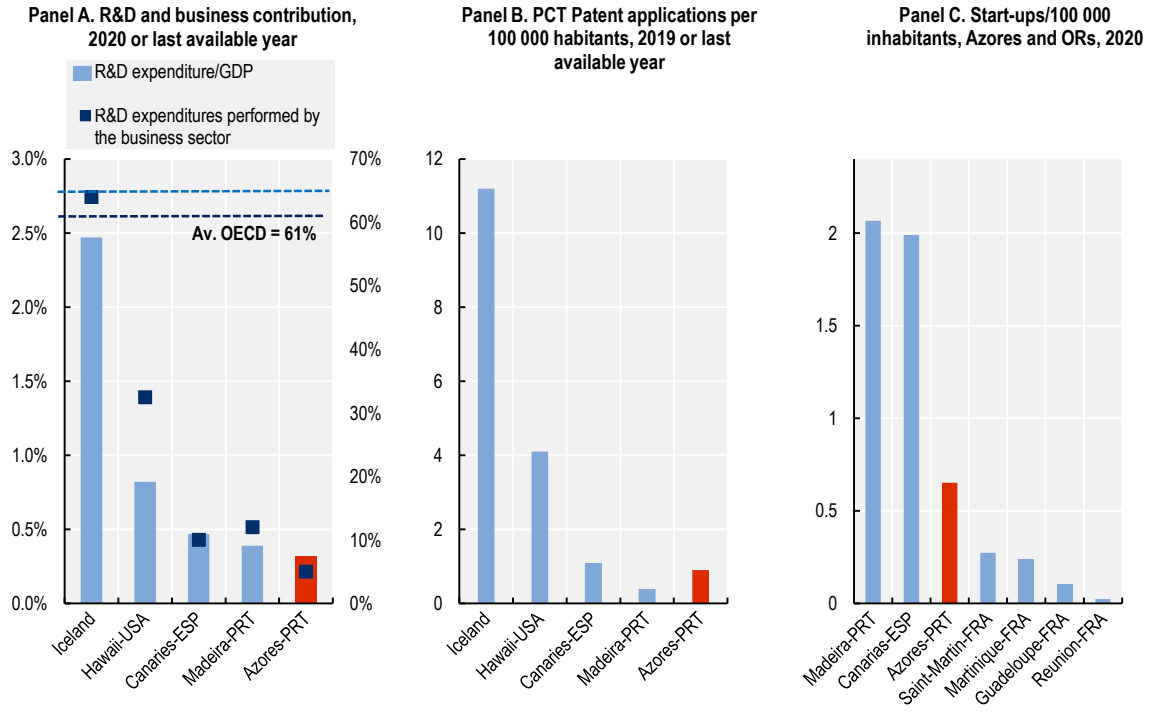
The Action Plan 2.0 strengthens regional maritime co-operation among the participating countries, including coastal regions and stakeholders from France, Ireland, Portugal and Spain. It is implemented through the Atlantic Assistance Mechanism which supports the three existing sea basin strategies.

Although no funding has been earmarked in the EU budget for the Atlantic action plan, it relies on the existing EU, national and regional funds and financing instruments relevant to the goals and actions that can be mobilised.

Source: COM/2020/329 final "A new approach to the Atlantic maritime strategy – Atlantic action plan 2.0 An updated action plan for a sustainable, resilient and competitive blue economy in the European Union Atlantic area", https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2020:329:FIN.

If managed strategically, the ocean economy can support the internationalisation of the Azores and its participation in global networks beyond the EU, focusing more on innovation, and fostering the development of global connections in science, research and exploration. To do so, the region needs to better seize the available resources, increase development of innovation activities and foster the development of global partnerships for the ocean economy. Due to their global nature, ocean innovation activities are often the result of networks in which public and private institutions interact and facilitate knowledge dissemination and flows by sharing financial resources, technologies and infrastructure facilities. There is no one-size-fits-all for structuring and organising an ocean cluster, but some models have proved to be highly effective, especially in leveraging local solutions through international partnerships. Worth mentioning among them are the public consortia, the Canaries' PLOCAN and the business-led clusters of TMA Bluetech in San Diego (United States) and the Iceland Ocean Cluster that focuses on 100% use of fish biomass (Box 2.3). Other potential partners in this area can be the US states of Hawaii and Rhode Island that, beside hosting Azorean descendants, have developed ocean strategies and clusters (U.S. Economic Development Administratio, 2022[36]).

Figure 2.10. The Azores invest seven times less on R&D than Iceland



Note: Panel A. for Azores, Madeira, Canaries and Hawaii most recent data refer to 2019. Panel B. for Azores, Madeira, Canaries and Hawaii most recent data refer to 2015.
Source: Authors' elaboration based on OECD Main Science and Technology Indicators, https://doi.org/10.1787/data-00182-en, 2022 and Crunchbase data 2022, https://www.crunchbase.com/.

Box 2.3. Ocean clusters: Lessons from Iceland and the United States

Iceland

Iceland, the second largest producer of seafood in Europe after Norway, has been transforming its fishing industry through the emergence of a vibrant start-up culture with strong connections to local marine-related businesses, academia and the public sector. Icelandic start-ups have developed new innovations based on fishing products that aim to add more value and minimise catch waste, such as Kerecis, a start-up developed in 2013 that develops skin grafts from fish skins. Connecting stakeholders to identify and exploit new market opportunities, and plugging the financing gap through mobilising private and public sector investments has been central to Iceland's experience. The Iceland Ocean Cluster, for example, was established in 2011 as a privately held cluster with the aim to connect entrepreneurs and knowledge partners in ocean-related economic activities. It operates largely as an accelerator and provides networking and other services to businesses, while it also invests resources in new projects. The Cluster has fostered more than 120 start-ups since its establishment.

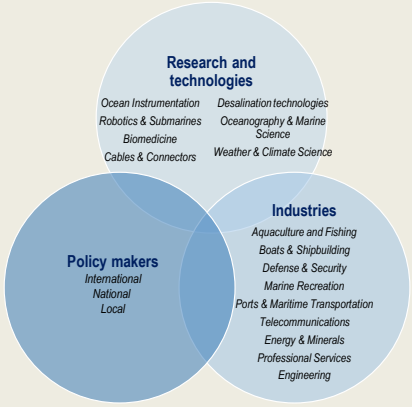
United States

Headquartered in San Diego, United States, TMA BlueTech is a non-profit industry association and cluster organiser founded in 2011 that promotes cross collaboration between academia, industry and policy makers to scale up scientific research on ocean-related activities and develop new business solutions. TMA supported the creation and expansion of ten clusters in eight different countries including

France, Portugal and Spain. Through knowledge sharing, national and international outreach and networking, the members of clusters share best practices and explore new ways to collaborate with the objective of developing new business opportunities. Clusters include members from 16 sectors that provide ocean-based solutions in the following areas:

- **Water shortage** such as exploration and conservation including submarine groundwater springs
- **Agro-food** including underwater greenhouses that require limited energy and provide options for algae-based fertilisers
- **Pollution** including the reuse of non-recyclable ocean plastic and transformation through pyrolysis into low-emission fuel and other products.

Figure 2.11. TMA Blue Tech cluster organisation



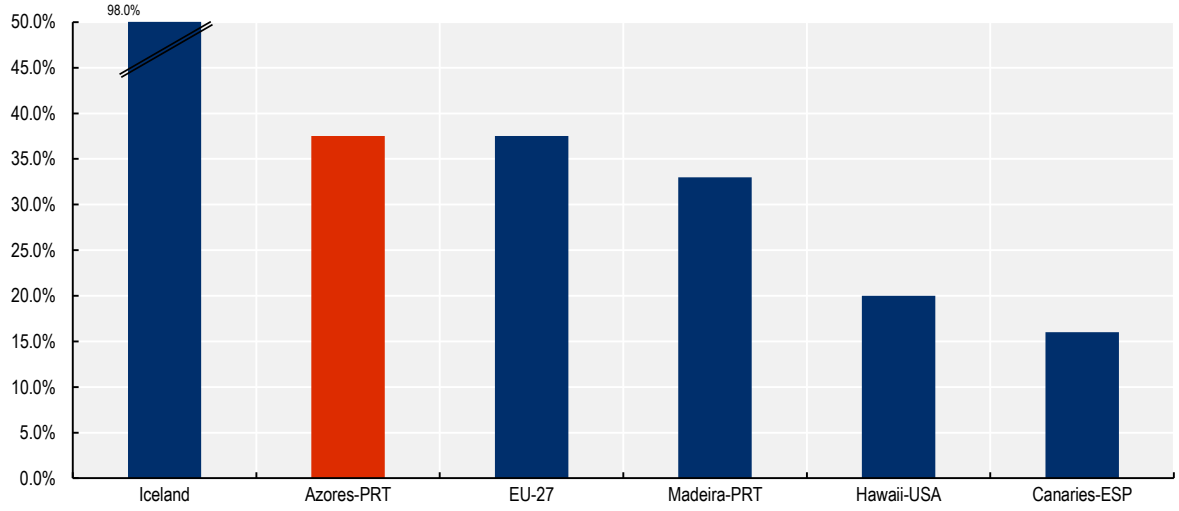
Source: Thor Sigfusson, Founder, Iceland Ocean Cluster, Iceland and Michael Jones (2022), President, TMA BlueTech, San Diego California, United States. Presentations at the Second Peer Learning Group (PLG) Meeting "Innovating Oceans", 3 March 2022.

Accelerating the green energy transition through partnerships and knowledge sharing

The Azores generate around 40% of their electricity from renewable energies. Over the last 20 years, the contribution of renewable energies in total electricity production rose from 19% in 2000 to 37% in 2021. This has brought the region above other EU ORs and in line with the EU-27 average but below the national average of 54% (Figure 2.12). Geothermal energy, given the volcanic characteristics of the archipelago, is the leading source of renewable energy, accounting for 55% of the total. Three geothermal plants operate, producing a total energy output of 34.4 MW per year. In 2019 two plants on the island of São Miguel contributed up to 40% of the island's total electricity and one in Terceira generated around 12.5% of the island's total energy requirements. Wind power is the second largest renewable source, accounting for 27% of total renewables. The Azores first experimented with wind energy in 1988 with the installation of wind turbines on the island of Santa Maria. Currently there are nine wind turbine parks spread across eight of the islands. Twelve hydroelectric plants account for 12% of total renewables (Melo et al., 2020[37]; Direcao Geral de Enrgia e Geologia, 2022[11]).

Figure 2.12. The share of renewables in electricity production in the Azores is on par with the EU average

Share of electricity generated from renewable energies, 2021 or last available year



Note: Azores 2021; EU-27, Iceland, Madeira 2020; Canaries and Hawaii 2019.
Source: Authors' elaboration based on data from IRENA, https://www.irena.org/; Portuguese Renewable Energy Association (APREN), https://www.apren.pt/; National Communications Authority ANACOM, https://www.anacom.pt/; Canaries Department of Ecological Transition, https://www.gobiernodecanarias.org/energia; Hawaii Department of Energy, https://energy.hawaii.gov/.

The path towards a sustainable energy transition requires further efforts. Despite the advancement in total RE capacity, the Azores, similarly to many small islands, largely depend on imported fossil fuels to sustain energy consumption. In 2019, around 90% of total energy supply relied on imported fuels. The most energy-intensive activities are land transport that accounts for 30% of total energy consumption, followed by electricity production and air transport with 29% and 16.5% respectively. Residential activities and services account for less than 10% each. Major challenges to the energy transition relate to the archipelagic nature of the Azores and include the presence of nine small, separate grids, the limited battery storage capacity for electricity originating from RE, and the small market size which makes the Azores less profitable for private investments.

The Azores have an ambitious energy transition strategy. In 2018, the regional government launched a participatory process to define the Regional Energy Strategy 2030 (*Estratégia Açoriana para a Energia 2030 EAE2030*). The strategy is structured around four objectives and seven targets, and it encompasses an increase of energy self-sufficiency, a reduction in the number of energy vectors though increased electrification, an improvement in energy efficiency by increasing the storage capacity of batteries and a shift towards reduced greenhouse emissions (Figure 2.13). The government also offers incentive packages to support the deployment and use of green energy sources. These include, for example, incentives for electric vehicles of up to EUR 4 500 and for the installation of micro power renewable energy plants of up to EUR 20 000.

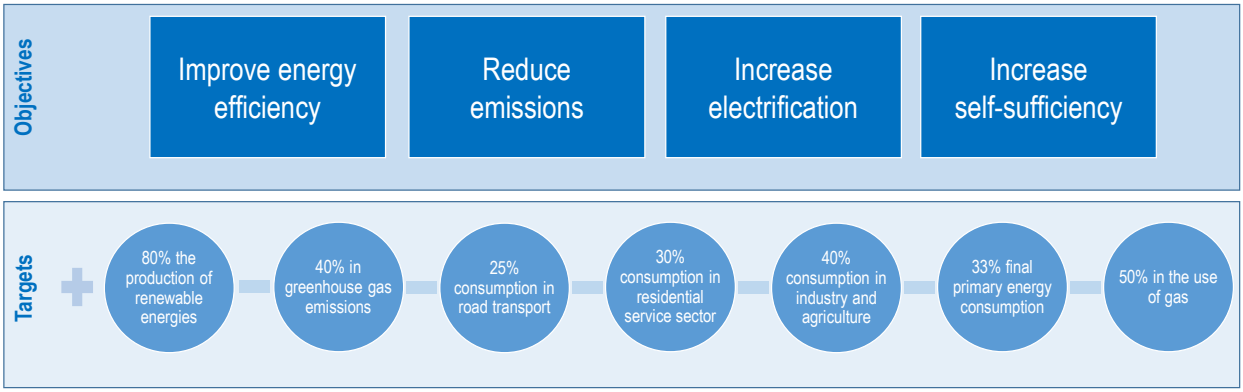
The Azores also participate in several cross-European initiatives that aim at fostering the transition away from fossil fuels and towards cleaner energy. The Azores participate in the Clean Energy for EU islands, a country- and island-led initiative that advocates and supports the EU islands in their energy transition agendas by promoting the exchange of best practices, guidance on the development of regional strategies and assistance in project preparation. Other initiatives include:

- IANOS (Integrated Solutions for Decarbonisation and Smartification of Islands), with a budget of EUR 8.8 million, channelled through H2020, focuses on maximising the opportunities for self-

sufficiency through the use of distributed renewable energy and storage technologies. The consortium consists of 35 partners from 10 European countries: Portugal, Finland, United Kingdom, the Netherlands, Italy, France, French Polynesia, Greece, Spain and Belgium.

- RESOR (Supporting energy efficiency and renewable energy in European islands and remote regions) and EMOBICITY (Increase of energy efficiency by electric mobility in cities), with a budget of EUR 1.5 million and EUR 1.0 million each, channelled via the Interreg Programmes. RESOR aims to improve the regional support measures for energy efficiency and renewables in tertiary sectors. EMOBICITY aims to improve regional support measures for electric mobility in urban areas.
- LIFE IP CLIMAZ, with a budget of EUR 20 million, through the EU LIFE Programme, supports the Azores in accomplishing the climate change objectives through an integrated approach that also includes energy transition.

Figure 2.13. The Azores Regional Energy Strategy for 2030



Source: Authors' elaboration based on Direção Regional da Energia - Governo Regional dos Açores (2020), *Estratégia Açoriana para a Energia 2030*, https://portaldaenergia.azores.gov.pt.

Accelerating a green transition is paramount for the Azores. The multi-annual planning and financing of the EU provides a unique opportunity to advance in this respect. The effort should involve all economic activities including transportation and industry and will improve the image and attractiveness of the Azores as a sustainable tourism destination (OECD, 2022[9]). The electrification of the energy matrix seems to be the most promising area for further development, due to several factors including the availability of stable, predictable geothermal energy and of untapped renewable energy sources. The region would benefit from further exploiting geothermal potential, complementing it with other RE, including wind, photovoltaic and solar thermal energy but also marine renewables such as wave power, which currently only contributes to 0.3% of electricity production. The increasingly competitive costs in RE generation, matched with battery storage and new energy smart management software, open up new opportunities for the region. However, this would also require an update in the overall policy and the need to address potential trade-offs with current compensation mechanisms, such as the incentives currently in place for fossil fuels. In the Azores, for example, tax on fuel is 10% lower than the national rate on fuel, 18% for diesel (Fundo Regional de Apoio à Coesão e ao Desenvolvimento Económico, 2022[38]).

International partnerships are key to achieving a full green transition. Given the small size, insufficient human resources and remoteness from other EU regions and countries, the Azores need to scale up effective international partnerships in order to leverage untapped potential, including in areas linked to technology transfer and knowledge sharing. The Azores provide a natural environment for experimentation in innovative renewable solutions like wave energy (Box 2.4). Expertise in developing small integrated

energy systems can also be shared with other islands. Consolidating efforts in this area by learning and sharing good practices with EU regions and other partners could provide new internationalisation opportunities that could also lead to new commercial and business relationships. For example, in Northern Ireland, MJM Renewables, Geothermal Engineering Ltd, ARUP and Queen's University Belfast created in 2021 a consortium *Geothermal NI* to explore the development of the country's first deep geothermal project. The consortia will be exploring viable sites with the ultimate goal of developing a project which delivers continuous renewable heat and power to large commercial and industrial end users as well as local homes (Geothermal NI, 2021[39]).

Box 2.4. The Azores are experimenting in innovative renewable energy solutions with international partners

The Azores provide a natural environment for experimenting with a shift to renewable energies. In the late 90s, with the support of EU funds, a pilot wave power plant was installed on the island of Pico by a joint international consortium from Portugal, the United Kingdom and Ireland. Designed to be both an R&D facility for testing and demonstration and an additional source of electricity over time, the plant was damaged several times, leading to its closure in 2018 (Falcão et al., 2020[40]). The Pico plant engaged in wave energy research, development and innovation, with national and international partners. It attracted funding from more than 11 national and European projects including two European networks of test infrastructure for wave energy technologies (Marinet and Marinet 2). It led to more than 100 international scientific articles and was associated with more than eight doctoral theses.

More recently two projects have been developed: Siemens Smart Infrastructure, in partnership with Fluence, which has been contracted by EDA to build the energy storage system on Terceira. With a power capacity of 15 MW, the system will be one of the largest stand-alone (island) battery-based energy storage systems in Europe, increasing the share of renewable energy while limiting the consumption of fossil fuels and significantly reducing greenhouse gas emissions. At the same time, Finland's Wartsila in 2020 launched a hybrid renewable power plant, 1 MW of solar and 4.5 MW of wind along with a 6 MW energy storage system that aims to boost renewable energy consumption from 15% to 65% on the island of Graciosa. Supporting and scaling up these types of initiatives with the involvement of local firms and research centres will be crucial for supporting the development of local scientific and industrial capabilities.

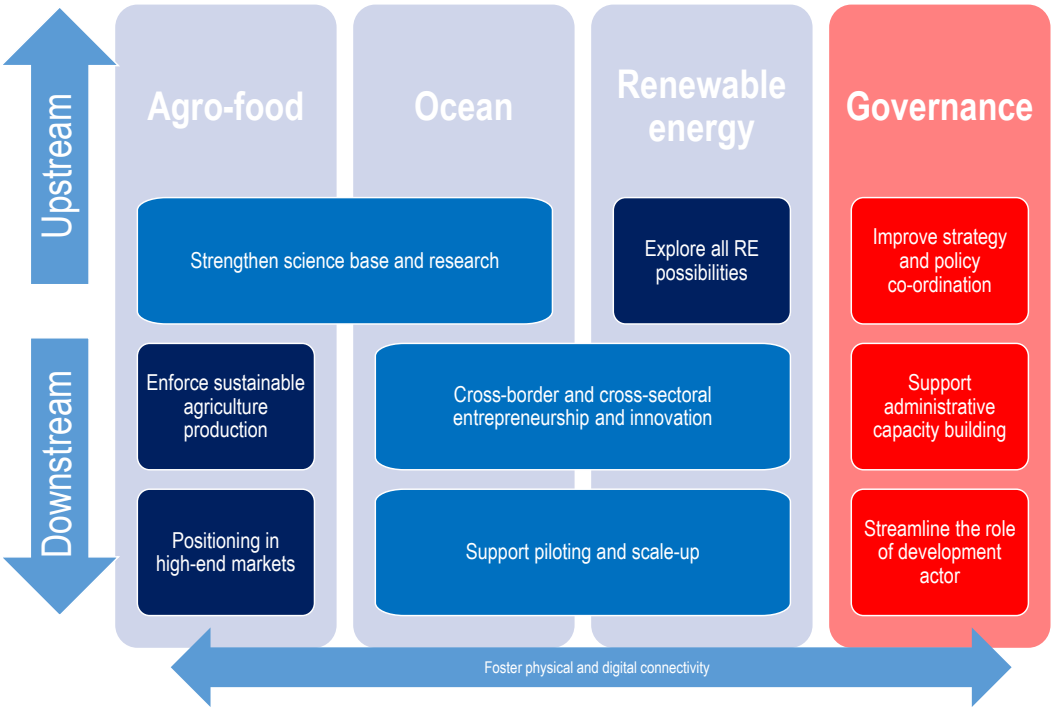
Source: (Melo et al., 2020[37]; Direcao Geral de Enrgia e Geologia, 2022[11]).

Conclusions and way forward

Connecting globally is key for the Azores. The region needs the world, and the world needs to tap into global talents and entrepreneurs to provide innovative solutions for fairer, more inclusive and environmentally sustainable production, consumption and trade. In the current challenging global context, the Azores could regain its international role, but on new grounds. The region could better leverage its uniqueness and could mobilise new partnerships to innovate in the area of environmental sustainability. In addition to traditional national and EU partners the Azores can strengthen partnerships following cultural and historical binds, such as Brazil and the United States, but also frontrunner countries and regions that share comparable challenges and opportunities, such as Iceland and Hawaii in the Pacific Ocean. It could also develop capacities to reach international niche and high-end markets in agro-food, strengthen global ties to unlock the potential of the ocean and space economy, and reinforce co-operation and knowledge sharing with islands and other remote, environmentally vulnerable locations.

In this context, the policy approach towards increased internationalisation would benefit from an update. A mind-set shift in the policy approach will be paramount. In addition to the necessary special provisions in EU law, tailored support and compensation schemes linked to remoteness, environmental vulnerabilities and biodiversity preservation, it is important to engender a systemic shift that identifies mechanisms that focus on and promote local entrepreneurial development and innovation. A regional development strategy centred on entrepreneurship discovery is key to achieve sustainability and increase economic resilience. If properly conceived and channelled, new partnerships can contribute to the emergence of new capabilities to compete in higher value-added segments of value chains (Figure 2.14). The Nexus Agenda, led by the Port of Sines that can provide good lessons learned in this respect (Box 2.5).

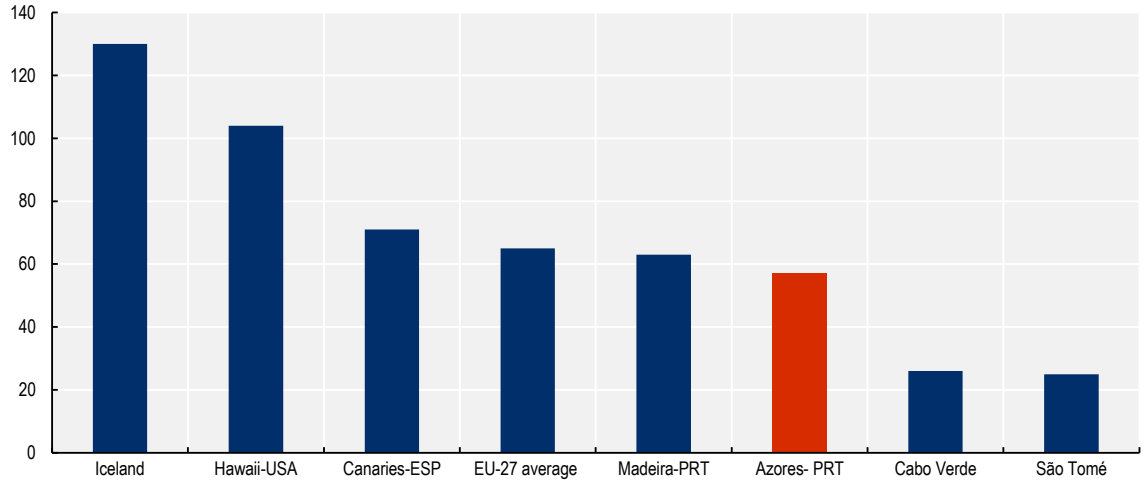
Figure 2.14. Summary of priorities and actions for enhanced internationalisation and GVC participation



The effective internationalisation of the Azores requires a committed private sector and improved digital connectivity. The rapid diffusion of digital technologies in production and processes has increased the need for access to fast and stable internet connections. The average broadband speed in the Azores is 57 Mb/s, below the EU average and as much as two times slower than partner countries like Iceland (Figure 2.15). The deployment of digital infrastructure including submarine cables will also be paramount in the future. Likewise, it would be important to develop public and private partnerships to advance in the development of ports and infrastructure (Box 2.5).

Figure 2.15. Broadband speed in the Azores is below the EU average

Average upload and download broadband speed, Mb/s, 2020



Source: Authors' elaboration based on broadband speedchecker data, https://www.broadbandspeedchecker.co.uk/.

Box 2.5. Leveraging ports and logistics networks as an asset for regional development

Infrastructure connections are key to support the internationalisation of countries and regions. Limited access to logistics networks may hamper opportunities for trade, as well as attraction of FDI, talent and visitors, particularly for remote regions.

The current shipping model, based on the presumption that more, bigger and cheaper is better, has reached its limits. The post-pandemic period has highlighted that congestion in only a few hub ports can result in severe disruption of global supply chains. Recent developments at the global level show that:

- The organisation of ports should be developed as complementary to other infrastructure, transport and logistics policies.
- Delivering better environmental performance would help rebalance the current race for critical mass and be more aligned to regional development objectives. This renewed approach could also allow new regions and territories, including those with mid-sized ports, to become more attractive to global trade.
- Shifting to such a model will present multi-level governance challenges, and require quality partnerships between stakeholders (e.g. national and regional governments, cities and the private sector, and ports).

For example, the Nexus Agenda, led by the Ports of Sines and the Algarve Authority in Portugal, is a consortium of 35 national and international representatives from the transport and logistics sector, academia, research institutions, and technology companies, that develops solutions for the digital and ecological transition of the transport and logistics sector in the Algarve. It is estimated that by 2030, products created under the Agenda will generate a thousand jobs and reduce the carbon footprint of the Port of Sines by 55%.

Source: OECD (forthcoming[41]), *Rethinking regional attractiveness in the new global environment*; OECD (2022[8]), *L'internationalisation et l'attractivité des régions françaises*, (The internationalisation and attractiveness strategies of French regions), https://doi.org/10.1787/6f04564a-fr.

The proactive participation of the private sector with an innovation mind-set and stronger partnership with the local institutions will be essential to make the most of the EU resources to unlock international partnerships, develop new businesses and innovate in traditional activities. The region can leverage the technology parks of Nonagon and Terinov, which could act as partnership and innovation catalysts. Through Terinov, for example, the region could exploit the potential of satellite imaging applied to agriculture precision and monitoring. In this respect, public policies would also need to address issues linked to awareness-raising on the region's potential as a science and technology actor.

Internationalisation also goes beyond participation in global value chains using the traditional market-oriented approach. Concretely, two other areas should be considered as potential drivers of enhanced international ties. First, since research, development and innovation will be central pillars in the future development of the region, strengthening and improving research and innovative networks with both EU and overseas partners in the Atlantic and beyond will be crucial, including the United States, Iceland and Brazil. Due to their specificities, such as the presence of an established diaspora, the natural characteristics and cultural ties, these represent potential partners for the future. Second, the Azores could be an important actor in international co-operation. The improved local governance and administrative capacities thanks to the different projects and planning processes implemented with the support of national and EU institutions, particularly in the areas of environmental risk management, agro-food and ocean activities, could be shared with other development actors. The Azores already has an active international collaboration strategy, for example within the Interreg MAC project, as well as bilateral co-operation with countries such as São Tomé and Cabo Verde. Scaling-up these efforts and expanding them to countries facing comparable challenges, such as SIDS, will be essential for a more comprehensive and effective implementation of the decentralised Portuguese and European Union development and co-operation strategies (OECD, 2022[42]). Concretely the Azores could be involved in triangular technical co-operation involving national authorities like Camões and multiple European Commission Directorates-General such as the Directorate General for International Partnerships. Instruments such as the European Economic Partnership Agreement (EPA) with West Africa, which includes a strong development and co-operation pillar, could build synergies with already established instruments of co-operation such as the Interreg MAC that includes the three ORs in the Atlantic as well as the Interreg of the Atlantic Area.

The Azores have advanced considerably in recent decades. The region should continue to leverage its uniqueness, putting sustainability at the core of development strategy and increasingly developing local entrepreneurial and research capacities. The EU multi-annual planning and financing processes are a major asset that should be further exploited, enabling the region to fulfil its potential as a laboratory for innovative solutions to global challenges, turning remoteness into an advantage by developing international partnerships grounded on research, entrepreneurship and innovation.

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OECD Development Pathways

Production Transformation Policy Review

SPOTLIGHT ON THE AZORES' INTERNATIONALISATION

Located in the mid-Atlantic, the archipelagos of the Azores is an autonomous region of Portugal and an European Union Outermost Region. Once central to global trade routes, the Azores are aspiring to regain a prominent international role by leveraging their unique geographical, natural and historical attributes. To that end, this *Production Transformation Policy Review (PTPR) Spotlight* identifies priority actions in several areas, including scientific research and collaborations, the ocean economy, agro-food and renewable-energy value chains. It shows the importance for EU Outermost Regions, as well as for Small Island Developing States (SIDS), of building resilient international ties. It benefited from an extensive peer review process involving public and private stakeholders from Brazil, Iceland and the United States.

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