

Regional Profile

Sardinia, Italy

Initiative for coal regions in transition

EUROPEAN COMMISSION

Directorate-General for Energy

Directorate B – Just Transition, Consumers, Energy Security, Efficiency and Innovation

Unit B.1 - Consumers, Local Initiatives, Just Transition

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ISBN: 978-92-68-18294-9 doi: 10.2833/41896 MJ-05-24-524-EN-N

Manuscript completed in February 2024

1st edition

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Luxembourg: Publications Office of the European Union, 2024

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Sardinia, Italy

GENERAL INFORMATION

Country: Italy

Region Name: Sardinia

Region NUTS2 code¹: ITG2 - Sardinia

Region NUTS3 code: ITG2C - Carbonia-Iglesias

Main urban centres in the region²:

Cagliari (147,504)

Sassari (120,847)

Quartu Sant'Elena (68,533)

Olbia (61,527)

Alghero (42,311)

Nuoro (33,667)

Oristano (30,270)

Carbonia (26,030)

Iglesias (24,964)



1. NUTS: Nomenclature of Territorial Units for Statistics

2. ISTAT: November 2023. Resident population: Sardinia. <http://dati.istat.it/Index.aspx?QueryId=18975>

Regional socio-economic profile

General description of the socio-economic profile of the region

Sardinia is the second-largest island in the Mediterranean and one of the twenty regions of Italy, with a population of approximately 1.6 million inhabitants.¹ Sulcis Iglesiente is one of the eight provinces of Sardinia, located in the south of the region with around 330 thousand citizens.¹ The province hosts the last remaining coal mine in Italy, the mine of Monte Sinni which has been in the decommissioning phase since 2018.

The closure of the Monte Sinni coal mine led to a gradual disappearance of important companies related to the mining and manufacturing sector from the area, such as Eurallumina S.p.A. and the former Alcoa S.r.l. This process has resulted in the loss of approximately 1,400 direct and indirect jobs, to which further redundancies will be added when the transition process is completed and the thermal power plant is decommissioned. In the manufacturing sector, employment fell by 28% from 2012 to 2018, with

steelworkers accounting for about 60% of the overall losses. Persistent challenges include an undersupply of job guidance services, a shortage of skilled workers, and a decline in entrepreneurship. The province lags behind both Sardinian and national averages in the establishment of new SMEs and innovative start-ups (13 in the province, 21 in Sardinia, and 25 for Italy).²

This area is particularly vulnerable to the transition for several reasons: high percentage of elderly inhabitants, few university graduates, high youth unemployment rate (35.7 %), low per capita income, and an overall low quality of life. Furthermore, the historical presence of mining and steel activities left a significant footprint on the environment, necessitating reclamation efforts for over 360 ha, with around 50 concentrated in the municipality of Portoscuso.³ All these factors also make the territory unattractive for investments, hence the need for an effective transition process and plan which can lead the region to a more diversified economy and improved social context.

Regional coal industry profile			
Coal mining			
Type of coal	Lignite		
Type of coal extraction	Underground		
Number of operating coal mines	0 (the last coal mine “Monte Sinni” ended extraction activity in 2018, and is now in the decommissioning phase until 2026) ⁴		
Production of coal [Mt annual]	0	Year of prod. Data:	
		2021 ⁵	
Main (largest) coal mining enterprises			
Name	Ownership	Number of employees	Year of employee data
Carbosulcis S.p.A.	Public	116 ²	2021
Total level of employment in coal mining (in the region)		116	2021

3. Territorial Cohesion Agency. 2022. Territorial Just Transition Plan for Sulcis Iglesiente. <https://www.agenziacoese.gov.it/wp-content/uploads/2022/12/sfc2021-PRG-2021/IT16JTPR001-1.1.pdf>

4. Carbosulcis S.p.A. The Company. https://www.carbosulcis.eu/index.php?option=com_content&view=article&id=44&Itemid=41

5. Alves Dias, P., Conte, A., Kanellopoulos, K., Kapetaki, Z., Mandras, G., Medarac, H., Nijs, W., Ruiz Castello, P., Somers, J. and Tarvydas, D. 2021. Recent trends in EU coal, peat and oil shale regions. <https://publications.jrc.ec.europa.eu/repository/handle/JRC123508>

Regional coal power plant profile			
Coal power plants			Year of data
Number of coal power plants		2	2023
Installed capacity [MW]			
1. Coal Thermal Power Plant Portoscuso "Grazia Deledda"		590 MW ⁶	2023
2. Coal Thermal Power Plant Fiume Santo		590 MW ⁷	2022
Share of coal in national power generation mix [%]		7.6%	2022 ⁸
Main (largest) coal power plant operators			
Name	Ownership	Number of employees	Year of employee data
Coal Thermal Power Plant Portoscuso	Private (Enel S.p.A.)	285 ⁴	2021
Coal Thermal Power Plant Fiume Santo	Private (Enel S.p.A.)	192 ⁶	2022
Total level of employment in coal power plants (in the region)		477	2021/2022

Regional and local transition strategies and plans

Status and timeline of coal transition / phase-out

In 2017, Italy announced its commitment to phase-out coal-fired electricity by 2025 as part of the National Energy Strategy. However, in November 2023 ENEL disclosed in its Strategic Plan 2024-2026 that, due to delayed interconnections with Sicily and Italy's mainland, the coal-fired thermoelectric power plant's closure might be deferred to 2027. Consequently, Italy's national coal phase-out date is now projected for the same year.⁹

Mining activity in the coal mine of Monte Sinni ceased in 2018. Carbosulcis S.p.A. is implementing a divestment plan that spans until 2027 and envisages the environmental rehabilitation of the site and the simultaneous development of technological activities. By adding up the annual total production over the span of 165 years, almost 30 million tonnes of coal were extracted in the Sulcis coal basin from 1850 to 2015, employing up to 20 thousand miners.²

Current regional strategies and plans for transition (including for economic development, diversification, and decarbonisation)

The **Territorial Just Transition Plan for Sulcis (TJTP)** (2021) allocates over ERU 367 million for the subregion. In particular, the plan focuses on countering the effects

of the transition by increasing the use of renewable energy, implementing energy efficiency measures for SMEs, deploying intelligent energy distribution and storage systems, and reclaiming sites for new economic activities. Additionally, there is an emphasis on promoting diversification in the local production system through support for the transition and diversification of the local economy, including research projects and enhancing technical support for innovation processes. Furthermore, the plan aims to mitigate social and employment effects by providing support for up-skilling and re-skilling paths, job-search enhancement, and active inclusion of jobseekers. Services to reconcile work and family life are also part of the strategy to increase activity rates in the region.²

The Regional office for employment and occupation launched a **Strategic Plan for Sulcis** in 2012 to revitalise the employment and entrepreneurship in the area of Sulcis Iglesiente. The Plan outlined a comprehensive development strategy for the area and is regularly updated. It is an instrument for guiding, planning and coordinating measures aimed at preserving the economic framework, fostering research and technological development activities, implementing infrastructure interventions, conducting environmental reclamation, and facilitating financial investments. The overarching goal is to stimulate the development and growth of the Sulcis Iglesiente area. The plan was financed under the regional allocation of ESF and offers €55.7 million for enterprises, research activities, site enhancement and economic-financial feasibility studies. In summary, the plan has four intervention lines. Firstly, it provides incentives for SMEs in the sustainable industry (construction, energy, biotechnology), tourism and agroindustry. Secondly, it supports research on topics such as land restoration and reclamation, energy, environment

6. ENEL S.p.A. 2023. Thermal Power Plant Sulcis – Environmental Statement 2023. <https://corporate.enel.it/storie/articoli/2016/11/certificazioni-emas>

7. EPH S.p.A. 2022. Thermal Power Plant Fiume Santo – Environmental Statement 2022. <https://sostenibilita.epproduzione.com/wp-content/uploads/2023/07/FS2022-19.06.2022web-Ps.pdf>

8. Ember Electricity Data Explorer. 2023. Italy electricity generation by source. <https://ember-climate.org/countries-and-regions/regions/europe/>

9. Beyond Fossil Fuels. 2023. Overview of national coal phase out commitments. <https://beyondfossilfuels.org/europes-coal-exit/#:~:text=ITALY%3A%20COAL%20PHASE%20OUT%202027>

and agribusiness. Thirdly, it focuses on enhancement of places and skills equipments, including excellence schools and vocational courses. Finally, the plan foresees the provision of technical assistance service on the ground, delivered by Invitalia.¹⁰ There are several interventions aimed to support the productive sector currently ongoing: the most recent call, launched in October 2023, aims to support the creation and competitiveness of micro, small and medium-sized enterprises with a budget of €6 million from the Strategic Plan. The primary goal is to assist businesses intending to make investments for expansion, modernisation, or diversification of their activities, targeting sectors related to tourism, catering, culture, and the environment.¹¹

The **Regional Environmental Energy Plan of Sardinia** is the tool through which the regional administration pursues energy, socioeconomic and environmental objectives starting from the analysis of the energy system provided in the Regional Energy Balance. The plan's main goal is to halve CO₂ emissions by 2030 (compared to 1990 levels). Additionally, the plan includes the following objectives: ensure grid stability and energy security through the strengthening of energy infrastructure, upgrade the energy system to match the requirements of the regional production system, diversify the energy mix to ensure efficient supply, decrease reliance on fossil fuel products, ensure compatibility of power production and distribution with environmental protection requirements and harmonise the structure of energy grids.¹²

Finally, the **Sardinia 2030 Regional Strategy for Sustainable Development**, approved in 2021, delineates specific objectives and measures to be implemented by 2030 across five strategic regional development themes. These include the decarbonisation of human and economic activities and the conservation and sustainable management of natural resources. The effectiveness of Sardegna2030 is measured through a set of defined targets and indicators: for instance, the strategy aims to reach a 32% of share of energy from renewable sources in gross final energy consumption by 2030, alongside achieving a 50% reduction in greenhouse gas emission compared to 1990 levels.¹³

The **tourism strategic development plan for Sulcis Iglesiente** (2023), drafted by the Local Action Groups of Sulcis, is financed within the Smart Specialisation Strategy of the Region Sardinia (ERDF 2014-2020). The overall goal is to create new modalities of promotion of the tourist potential of South Sardinia. In particular, the project aims to build an exclusive and sustainable tourist destination in

the Sulcis by leveraging unique cultural and environmental resources of the area, including agri-food and fishing products.¹⁴

In July 2023, the municipality of Carbonia presented a comprehensive overview of investments falling under the **National Recovery and Resilience Plan for the Sulcis** call initiated in June. These investments amount to a total of €20 million and target investment areas such as energy efficiency, urban modernisation, and the enhancement of services in schools and culture.¹⁵

Principal actors in development and implementation of transition strategies and plans

At national level: the Territorial Cohesion Agency, ENEL S.p.A, Investitalia, Ministry of Economic Development, Ministry of Environment and Energy Security, Ministry for European Affairs, the South, cohesion policies and the PNRR.

At regional and local level:

- Regional authorities: Autonomous Region of Sardinia, Regional Programming Centre;
- Local authorities: municipalities of Carbonia, Carloforte, Iglesias, Portofino, Sant'Antioco;
- Industry: Carbosulcis S.p.A., Eurallumina S.p.A., SiderAlloys (former Alcoa S.r.l.), Portovesme S.r.l.;
- Industry associations: Industrial Consortium Sulcis Iglesiente (SICIP);
- Civil society organisations: Sulcis Local Action Groups
- Research centres: Sotacarbo S.p.A.

Regional and local transition projects and initiatives

Notable ongoing and recent transition-related initiatives and projects

Several ongoing initiatives could receive a substantial boost from investments tied to the transition in Sulcis Iglesiente. Sotacarbo S.p.A., a public research centre jointly owned by the Region of Sardinia and the Italian National Agency for New Technologies, Energy, and Sustainable

10. Invitalia. Strategic Plan Sulcis Sardinia. <https://www.invitalia.it/cosa-facciamo/sviluppiamo-i-territori/piano-sulcis>

11. LAG Sulcis. 2023. Territorial call for business support in the Sulcis Iglesiente region. <https://www.galsulcisiglesiente.it/bandoterritoriale>

12. Autonomous Region of Sardinia. 2023. Regional Environmental Energy Plan of Sardinia 2015-2030 (PEARS). https://sardegnaenergia.regione.sardegna.it/documenti/73_1066_20230323133912.pdf

13. Autonomous Region of Sardinia. 2021. Sardinia 2030 Regional Strategy for Sustainable Development. <https://delibere.regione.sardegna.it/protected/57126/0/def/ref/DBRS7095/>

14. LAG Sulcis. 2023. Living the South West. Presentation of the Strategic Tourism Development Plan for South West Sardinia <https://www.galsulcisiglesiente.it/articolo/piano-sviluppo-turistico-sud-ovest-sardegna>

15. Autonomous Region of Sardinia. 2022. Table of investments Sardinian region financed by PNRR. https://www.regione.sardegna.it/documenti/1_976_20220117163340.pdf

Economic Development, plays a pivotal role. Situated in Carbonia, Sotacarbo is dedicated to advancing clean coal technologies and engages in technological innovation, experimentation, and the design of low-carbon industrial plants. As part of the Strategic Plan for Sulcis, Sotacarbo is actively involved in establishing the **Technological Energy Pole**, which includes the creation of a **Center of Excellence on Clean Energy** (CEEP) and a project on energy storage from renewable energy sources and agro-food waste. The CEEP focuses on infrastructure research and experimental studies, particularly on topics like biomass gasification, membrane separation, and the utilisation and confinement of CO₂.¹⁶

Coal mining company Carbosulcis S.p.A. is actively participating in the **FeDE project**, which centres on product innovation in fertilisers and depolluters. Additionally, Carbosulcis S.p.A. collaborates on the **SPIRULINA 2.0 project**, a joint venture proposed by the University of Cagliari, which uses the hot water of the mine to grow spirulina algae.¹⁷

The **Centre of Excellence for Environmental Sustainability (CESA)** is making significant progress in research, particularly in the recovery of valuable substances from highly polluting areas, such as red sludge. This initiative is funded through the Strategic Plan for Sulcis.

Moreover, the Sulcis Iglesiente is currently beneficiary of the **Joint Assistance to Support Projects in European Regions (JASPERS)** provided by the European Investment Bank (EIB). The EIB will assist Italy in prioritising the Just Transition Fund project pipeline and support the development of the related investments in the Sulcis Iglesiente area. Additionally, JASPERS will provide assistance in building local capacities and competences to support ongoing project development activities. This assistance is designed to transfer knowledge and build the capacity of relevant counterparts, considering lessons learnt from other member states and regions.¹⁸

Notable planned transition-related initiatives and projects

A diverse range of entities, including universities, local enterprises, municipalities, and Local Action Groups (LAGs), have expressed interest in the JTF funding. A collaborative proposal from Sulcis Iglesiente LAGs and the Union of Sulcis Municipalities focuses on digitalisation and the transition towards a circular economy in the area. It includes upgrading the internet network infrastructure and establishing a network of physical hubs on the territory for teleworking for micro, small and medium-sized enterprises,

distance learning and training, telemedicine and teleassistance. Other areas of intervention to be funded by the JTF are green vocational training, circular economy initiatives across sectors like tourism, construction, education, sustainable business and transport, and the creation of energy communities.

Furthermore, Carbosulcis S.p.A. envisions a shift toward becoming an entity operating in the field of circular economy and in the production of RES, aligning with ongoing projects in the region.

Eurallumina S.p.A., whose plant has been inactive since 2009, plans to undergo a remodernisation project, revised based on the NECP's forecasts. This initiative anticipates investments of approximately EUR 300 million. Upon restarting, it is projected to employ over 360 direct employees (compared to the current 230) and generate an induced workforce of contractors and subcontractors, totalling about 1 500 employees.¹⁹

Regional and local transition challenges and opportunities

Nature and scale of key transition challenges

The challenges facing the territory are multifaceted and demand a comprehensive approach. One pressing issue is the inadequate preparation and skill mismatch of the workforce. The metallurgical and metal sectors, integral to the region, are particularly affected, exacerbated by one of the highest regional percentages of NEETs (not in education, employment, or training) in Italy. The issue of skill mismatch extends beyond metallurgy, impacting crucial sectors such as tourism. To address this, initiatives should be undertaken to activate upskilling and reskilling paths. However, it's essential to note that the development of these paths should not be limited to the green economy sector alone; instead, a comprehensive approach should encompass all sectors contributing to territorial development (e.g., tourism, hospitality, catering).¹⁰

The phase-out of coal also introduced a significant risk to the region's transition. The uncertainty surrounding the energy supply could impact Sardinia's ability to meet its energy needs, necessitating strategic planning and investment in alternative energy sources. Moreover, Sulcis Iglesiente faces serious environmental concerns, with a concentration of landfills and contaminated mining sites in the area. The Sulcis Iglesiente Guspinese Site of National

16. Autonomous Region of Sardinia. 2019. The status of the Sulcis Extraordinary Plan – February 2019. https://www.regione.sardegna.it/documenti/1_529_20190301123512.pdf

17. Fruitbook Magazine. 2021. Spirulina algae is produced in the former mine in Sardinia. <https://www.fruitbookmagazine.it/lalga-spirulina-si-produce-in-miniera-la-riconversione-green-in-sardegna/>

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19. La Provincia. 2021. The proposal of the LAG Sulcis Iglesiente and the Union of the Sulcis Municipalities for the Just Transition Fund for a 'Connected and Circular South West Sardinia'. <https://www.laprovinciadelcislisiglesiente.com/2021/05/la-proposta-del-gal-sulcis-iglesiente-e-dellunione-dei-comuni-del-sulcis-per-il-just-transition-fund-per-un-sud-ovest-sardegna-connesso-e-circolare/>

Interest encompasses vast areas of mining and industrial zones, with a significant portion yet to undergo reclamation. Specifically, only 18% of the contaminated soils have been remediated, highlighting the pressing need for comprehensive environmental rehabilitation measures.²

Another critical challenge lies in the lack of coordination among relevant stakeholders, projects, and strategies related to the just transition in the province and the whole region. Establishing a cohesive “Sulcis system” is needed, fostering collaboration and awareness among key regional players. This collaborative effort aims to maximise synergies, align municipal interests, and provide a clear unified direction for a long-term territorial transition.

Nature and scale of key transition opportunities

Despite the several challenges, Sulcis Iglesiente also stands before many opportunities related to a just transition. In the coming years, efforts will be directed towards generating employment opportunities, with a focus on the economic diversification of the territory. One focal point is the advancement of RES, where the intervention extends beyond energy production to include entire value chains, incorporating aspects like installation, maintenance, and management of plants. This initiative aims not only to harness the abundant RES potential, which corresponds to 14.5% of the nation’s total technical potential, but also to counteract potential increases in electricity prices.²

Another opportunity lies in enhancing energy efficiency across civil sectors, production activities, and transport. This includes the encouragement of distributed energy generation, promoting local energy communities, and implementing smart distribution network models and energy districts. Additionally, the region aims to adopt electrochemical and hydraulic energy storage systems, coupled with key infrastructure investments, ensuring a robust and reliable energy supply.²

Moreover, Sulcis Iglesiente identifies the circular economy as a crucial sector for future growth, capitalizing on the substantial reserves of mining waste materials (approximately 65 million tonnes) in areas designated for reclamation. The retrieval and repurposing of these materials, including valuable resources like cadmium and zinc, present an opportunity for sustainable practices and the utilisation of secondary raw materials. In a broader sense, the revitalisation of former mining and industrial sites not only contributes to environmental recovery but also unlocks opportunities for transitioning into new economic activities.²

Building on existing strengths within the territory, other areas of focus includes agriculture, sustainable tourism, sustainable maritime economy, sustainable mobility, and research and innovation. Micro-entrepreneurship and

start-ups form integral components of the development of the Sulcis Iglesiente, supported by initiatives aimed at attracting new investments and facilitating technology transfer.²⁰

Overall, the challenge to establish a comprehensive “Sulcis system” also presents an opportunity for the future development of the territory, fostering economic growth and job creation. If successful, this approach could serve as a model for other regions facing similar challenges.

20. Information provided in the START application.

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Initiative for coal regions in transition

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