SOCIAL GREEN DEAL - Role and prospects for industrial relations and social dialogue in green transition management of local economic systems

National baseline report: Italy

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1. Introduction

2. General information about the country

a. Area, climate, location, connection

Italy is to be found at the centre of the Mediterranean basin and its climate is typical of the zone: in the North of the country a temperate humid climate prevails, while the Centre-South has a climate that is Mediterranean with dry summers. Its position in the heart of the Mediterranean means Italy acts as a link between Europe and Africa and the Middle East. It is thanks to these aspects that Italy has assumed a central role in the development of new energy supply chains and renewable energy sources (linked above all to solar energy). Despite this, Italy is also poor in raw materials and geographically marginal with respect to the large markets of central Europe, and so a strategic objective of primary importance for the country is to support the transition to a circular economy model in order to adequately address the major transformations that are affecting the global economy.

b. Population

A population of about 59 million lives in an area of roughly 302,000 square kilometres, with an average population density of 195 inhabitants per square kilometre (this is highest in the regions of Lombardy and Campania, with over 400 inhabitants/km^2, and lowest in the regions of Valle d'Aosta, Basilicata, Trentino-Alto Adige, Sardinia, and Molise, which all have less than 100 inhabitants/km^2).

Surface area and resident population by region (2022)

Region	Surface	Population
Piedmont	25,386.7	4,256,350
Aosta Valley	3,260.9	123,360
Liguria	5,416.2	1,509,227
Lombardy	23,863.1	9,943,004
Trentino-Alto Adige	13,604.7	1,073,574
Veneto	18,345.4	4,847,745
Friuli-Venezia Giulia	7,932.5	1,194,647
Emilia-Romagna	22,444.5	4,425,366
Tuscany	22,987.4	3,663,191
Umbria	8,464.2	858,812
Marche	9,401.2	1,487,150
Lazio	17,231.7	5,714,882
Abruzzo	10,831.5	1,275,950
Molise	4,460.4	292,150

Campania	13,670.6	5,624,420
Apulia	19,540.5	3,922,941
Basilicata	10,073.1	541,168
Calabria	15,221.6	1,855,454
Sicily	25,832.5	4,833,329
Sardinia	24,099.5	1,587,413
Italy	**302,068.3**	**59,030,133**

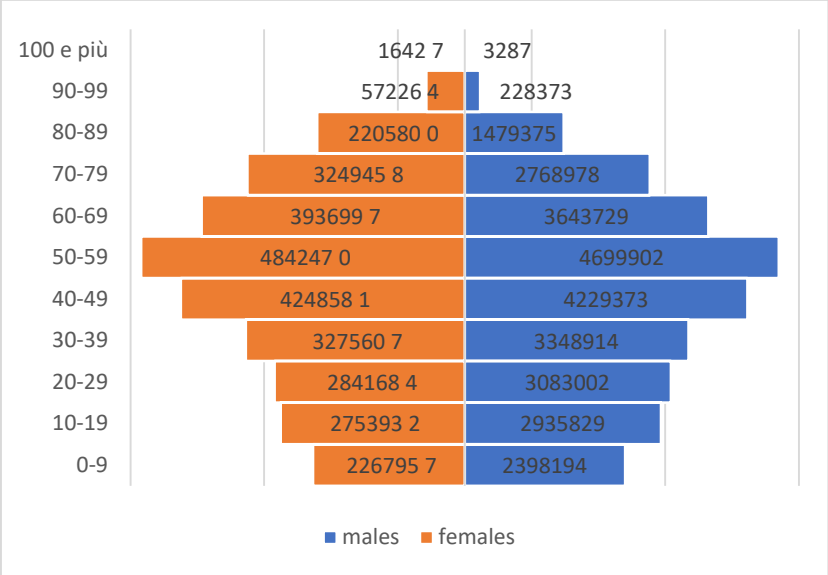
Source: ISTAT

Population density (2022)

Source: ISTAT

The demographic pyramid of the population of Italy shows a rather high median age, and a distribution concentrated in the 40-69 age bracket. According to ISTAT, moreover, the pandemic has accentuated the drop in the birth rate in 2020, which will then continue in 2021: in 2020 there were 404,892 births (down 15 thousand compared to 2019). The decline (-2.5% in the first 10 months of the year) was accentuated in November (-8.3% compared to the same month in 2019) and December (-10.7%), the months when children conceived at the start of the epidemic start to be counted. The average number of children per woman also falls in 2020 to 1.24 for all residents, from 1.44 in 2008-2010, the years of relative maximum fertility.

Population by age group and gender in Italy (2022)



Source: ISTAT

With regard to the foreign population (around 5 million residents in 2022), one important demographic indicator is the share of the foreign population of working age. This indicator highlights the most attractive regions from the point of view of employment opportunities: at the top are Emilia-Romagna and Lombardy with values close to 9%, while Apulia and Sardinia bring up the rear at below 3%. On average, in Italy the foreign population of working age is 6.6% of the total resident population.

Foreign population (15-64) resident by region and as a percentage of the total population (2022)

Region	Foreign population aged 15-64	% of total population
Emilia-Romagna	417,228	9.4%
Lombardy	874,807	8.8%
Tuscany	313,045	8.5%
Lazio	487,422	8.5%
Umbria	68,669	8.0%
Veneto	375,822	7.8%
Piedmont	313,151	7.4%
Liguria	110,447	7.3%
Friuli-Venezia Giulia	86,852	7.3%
Trentino-Alto Adige	74,394	6.9%
Marche	98,070	6.6%
Italy	**3,875,626**	**6.6%**
Aosta Valley	6,195	5.0%
Abruzzo	63,016	4.9%
Calabria	73,920	4.0%
Campania	193,632	3.4%
Basilicata	17,957	3.3%
Molise	9,234	3.2%
Sicily	145,554	3.0%
Apulia	107,274	2.7%

Sardinia	38,937	2.5%

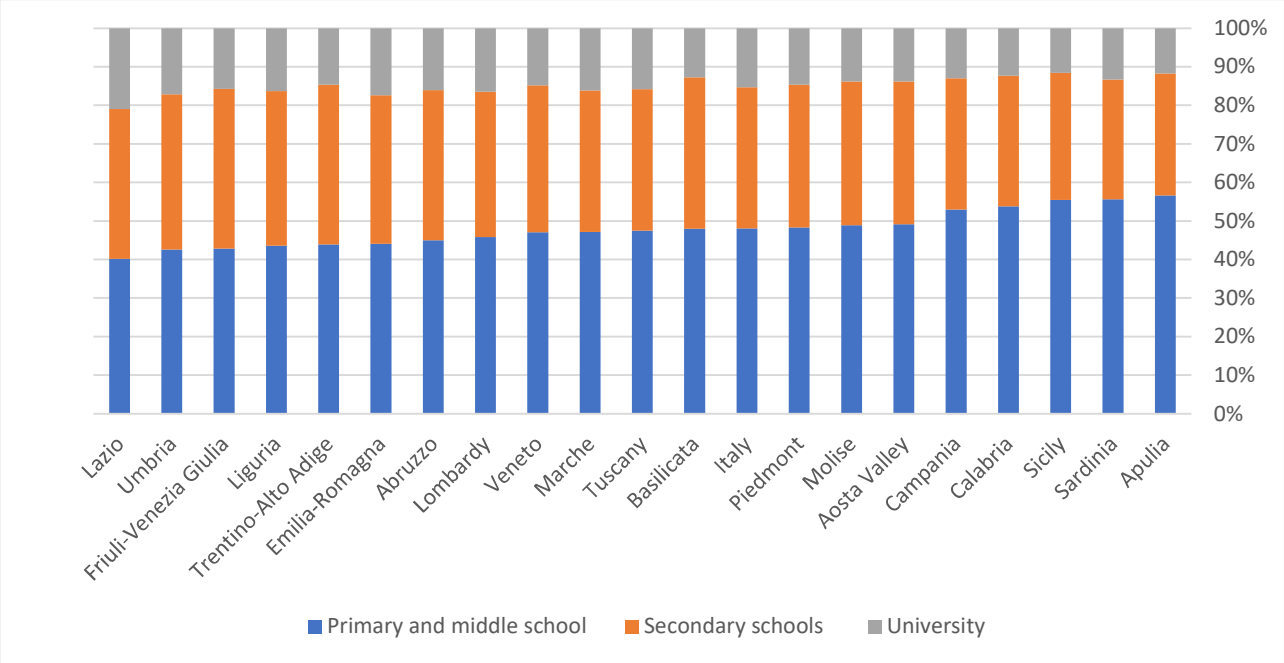
Source: ISTAT

i. General information about the population

ii. Education levels

In Italy, 48% of the population has a primary or middle school qualification, almost 40% a secondary school qualification, and just over 15% a university degree. As regards university qualifications, only Lazio has a proportion of residents with a degree that exceeds 20% of the total, while, instead, in some regions of the South and the Islands, the percentage of the resident population with only a primary or middle school qualification is over 50% of the total. There is therefore quite a clear differentiation between the regions of the South and those of the Centre and North with respect to levels of education.

Population aged 15 years and over by educational qualification (2020)

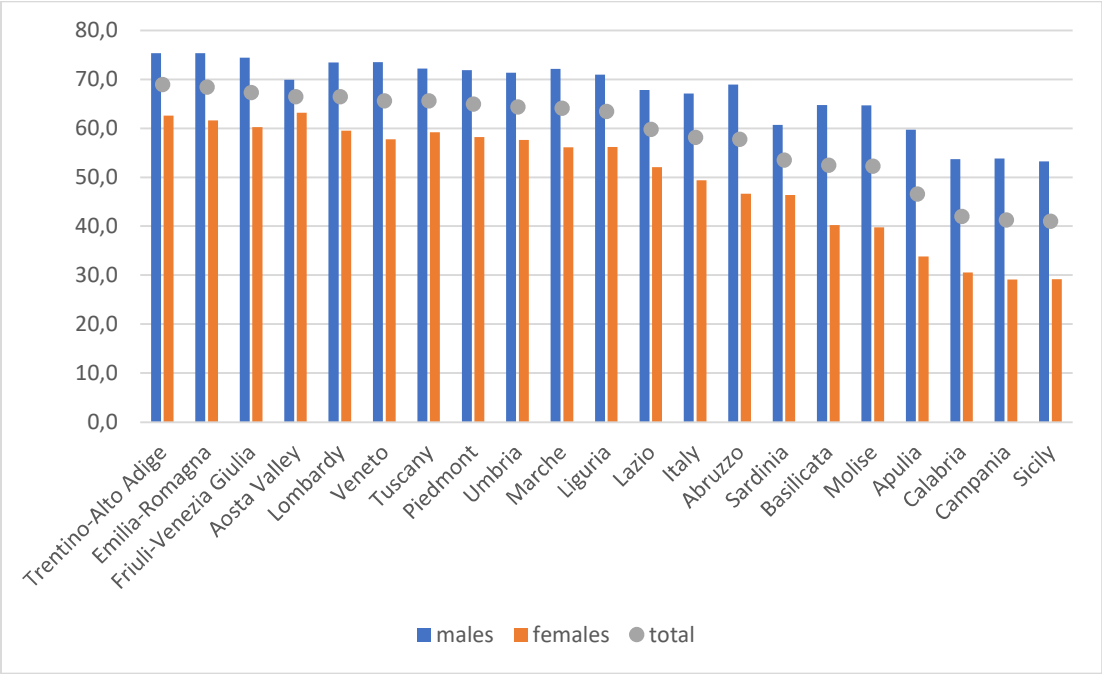


Source: ISTAT

iii. Qualitative and quantitative employment data

As regards the labour market, in 2021 in Italy the employment rate (the ratio of people employed aged 15-64 to the total population) is 58.2%, with a difference of about 20% between the employment rates for males and females (67.1% and 49.4% respectively). The regions with the highest employment rates include Trentino-Alto Adige, Emilia-Romagna and Friuli-Venezia Giulia (with close to 70%), while the regions with the lowest rates are Sicily, Campania and Calabria (with close to 40%).

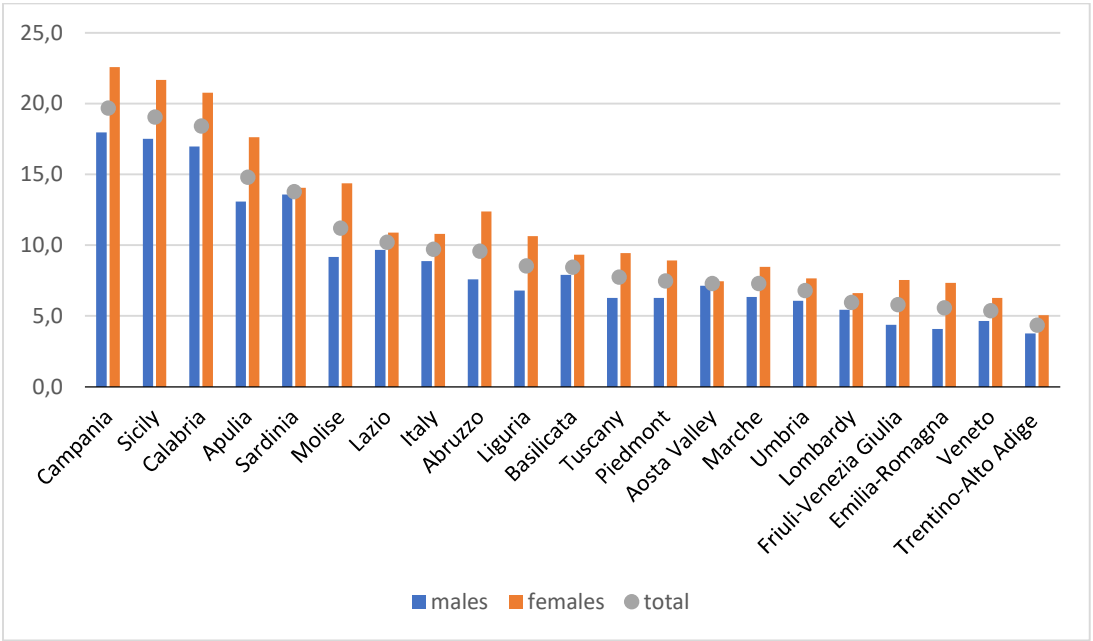
Employment rate by region, age group 15-64 (2021)



Source: ISTAT

The unemployment rate (the ratio of unemployed people in the 15-64 age group to the total labour force) in Italy in 2021 is 9.7%, with higher rates for females than for males (a gap of about 2%). The unemployment rate is close to 20% in the regions of Campania and Sicily, while only the region of Trentino-Alto Adige has below 5%.

Unemployment rate by region, age group 15-64 (2021)

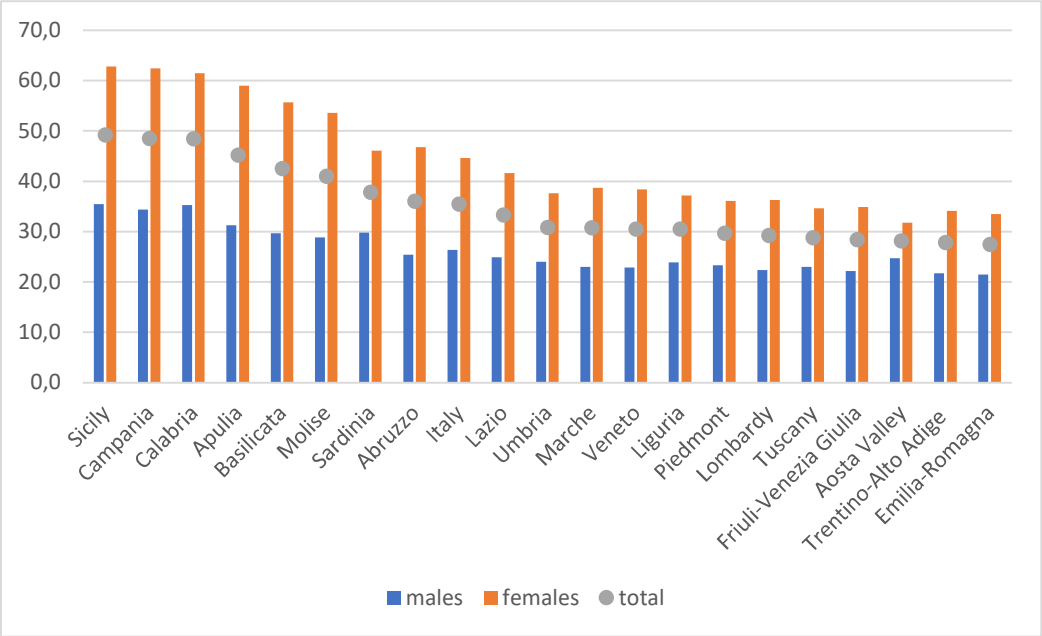


Source: ISTAT

Looking instead at the inactivity rate (the ratio of people not in the labour force in the 15-64 age group to the total resident population), 35.5% of the population aged 15-64 is inactive; again the difference between the rate for males and females is close to 20%. Sicily, Campania and Calabria

report inactivity rates very close to 50% and, furthermore, inactive females in this region make up 60% of the female population of working age.

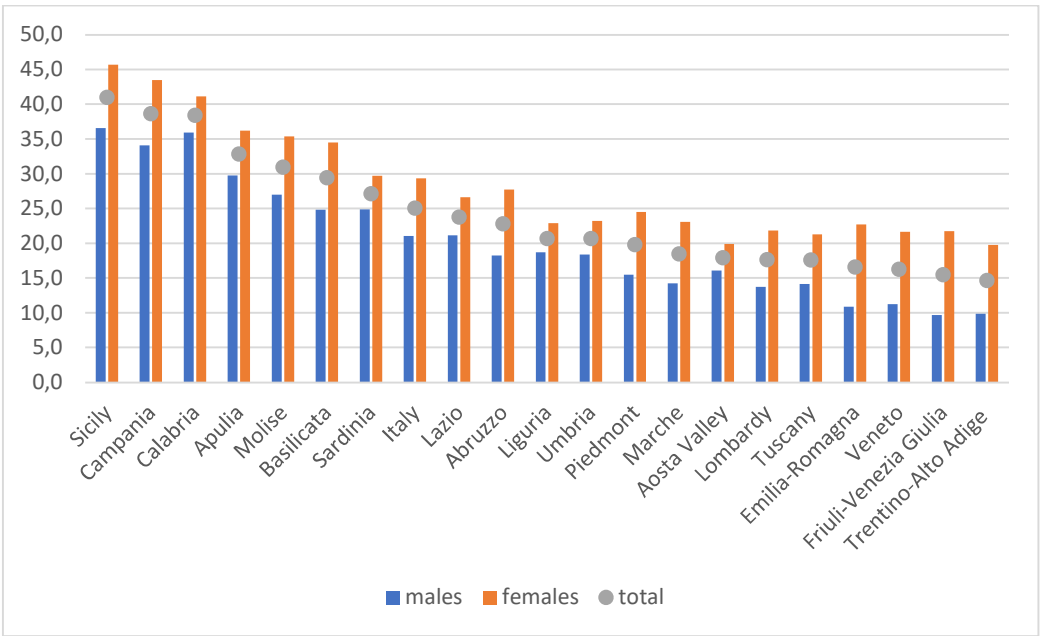
Inactivity rate by region, age group 15-64 (2021)



Source: ISTAT

Another important indicator for assessing the health of the regional economic system is the number of NEETs (Not in Employment, Education or Training): this indicator allows us to assess, in particular, the capacity of employers to take on young people and stimulate them with adequate training. In all Italian regions, the incidence of NEETs is higher if we consider only females compared to the total. In 2020, in Italy, 1 in 4 people in the 15-34 age group will not have a job and not be in training. This figure rises dramatically in the regions of Sicily, Campania and Calabria where more than 1 in 3 people are considered NEETs.

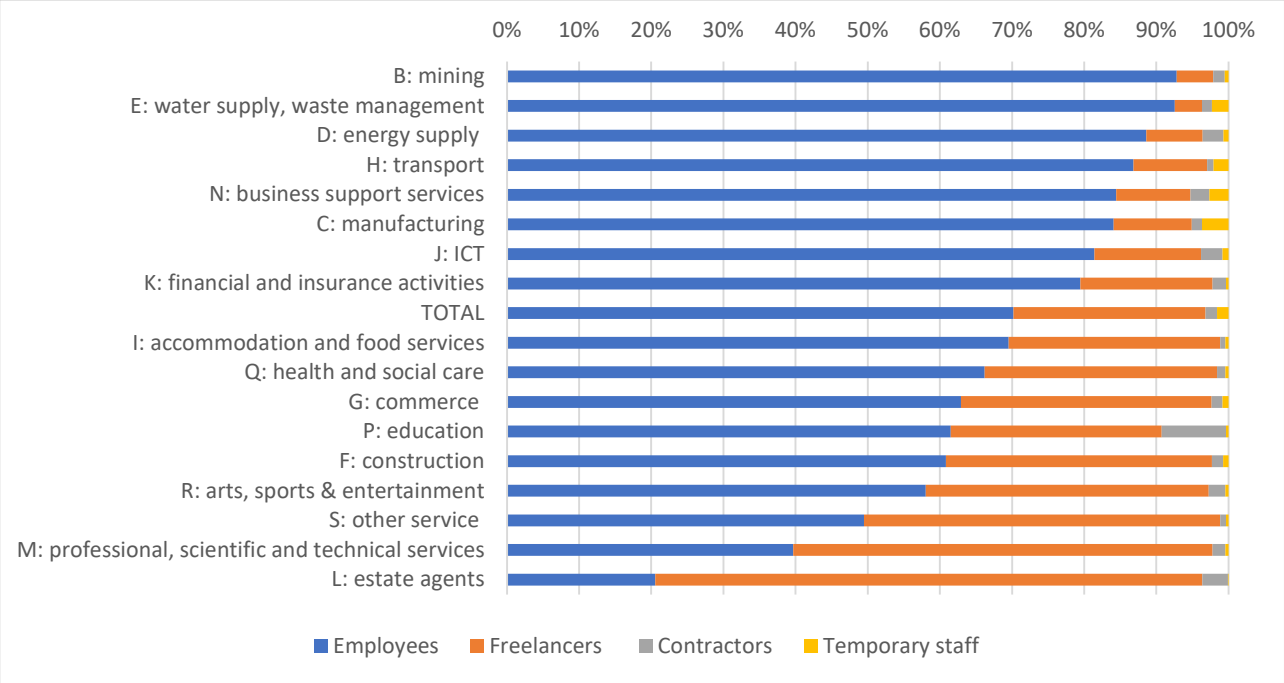
Percentage of NEETs aged 15-34 by region (2020)



Source: ISTAT

Moving on to a sectoral analysis of employment, 2020 saw 12.4 million employees in the various sectors of the Italian economy (70.2% of the total number of workers). In the same year, 22% of those employed were in the manufacturing sector, 19.5% in the retail sector, followed by close to 8% in the hospitality and food services and business support services sectors. The number of employees is over 90% in the mining sector and in the water supply and waste management sector; in contrast, the highest share of self-employed workers in terms of total employment is in the real estate sector (above 70% of total jobs).

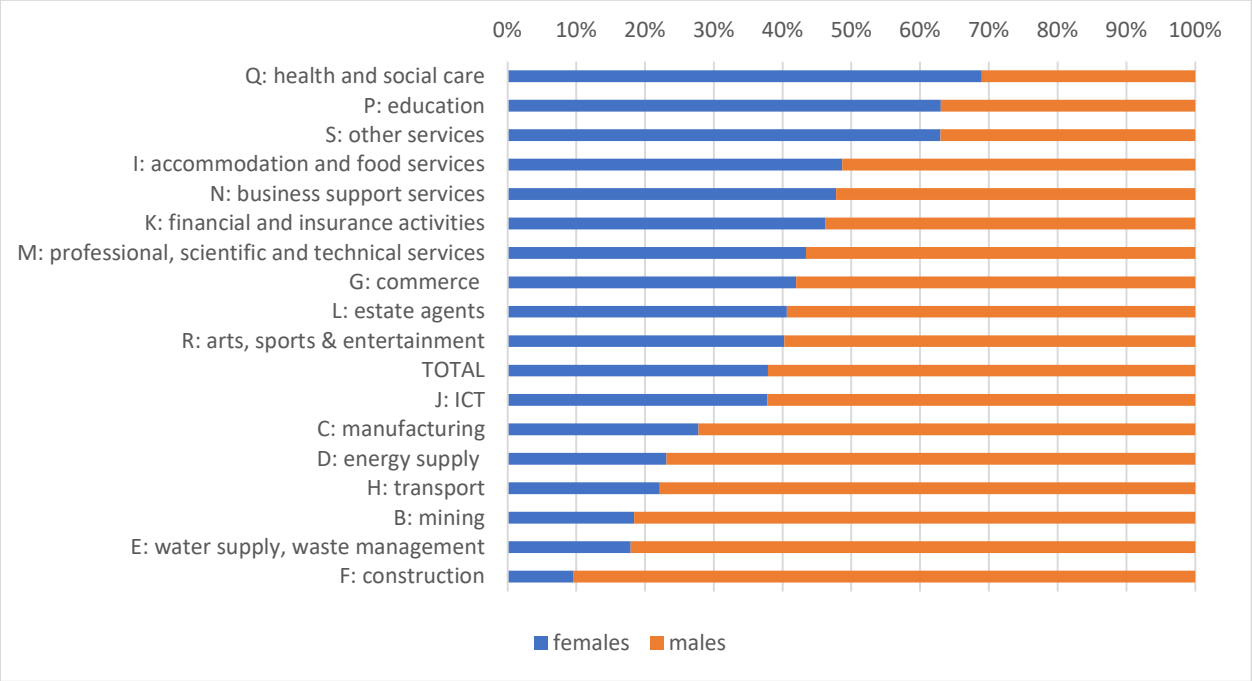
Employment by type of job and economic activity section (annual averages, in percentages, 2020)



Source: ISTAT

As regards the gender of those in employment, the highest percentage of female workers is in the health and social care sectors (around 70%), followed by over 50% in the education and service sectors. In contrast, the lowest incidence, with percentages below 20%, is in the construction, water and waste management, and mining sectors. Overall, females account for 38% of total employees (6.6 million).

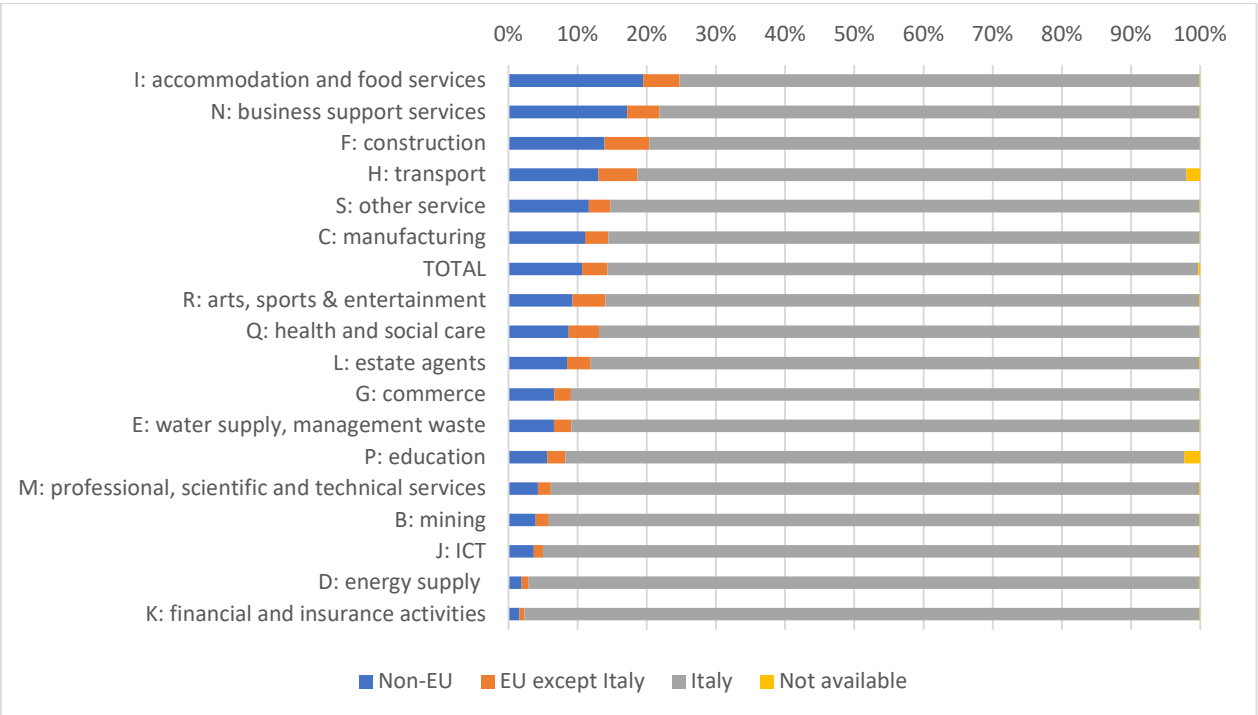
Employment by gender and economic activity section (annual averages, in percentages, 2020)



Source: ISTAT

In 2020 in Italy, 1.7 million employees are of foreign origin (14.3% of total employees). The highest incidence of foreign workers (over 20%) is in the hospitality and food services, business support services and construction sectors.

Employees by economic activity section and country of birth (annual averages, in percentages, 2020)



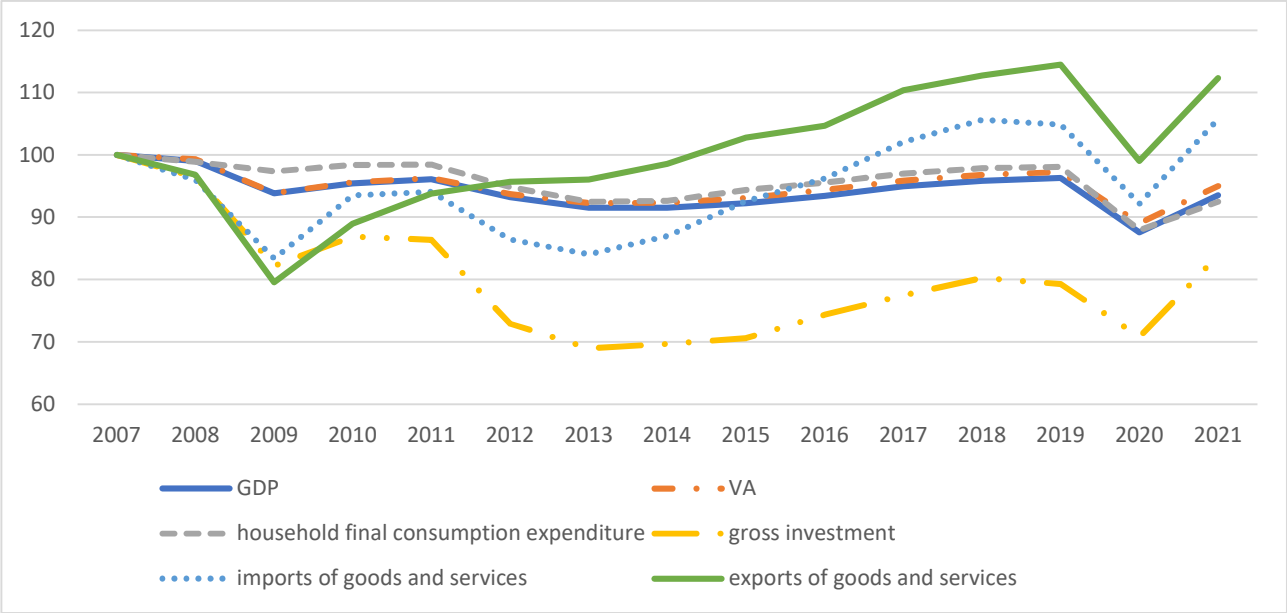
Source: ISTAT

c. Economy of the country

i. Macroeconomic indicators of the economy (GDP, inflation rate, gross foreign exchange, reserves...)

In 2021, Italy's gross domestic product at market prices was 1,678,489 million euros, up from the previous year. Looking at the trend of the GDP and its main components, a negative trend can be seen for all the areas under consideration, except for the export and import of goods and services. The curve that shows a sharply declining trend is that for gross fixed capital formation, i.e., the indicator that describes the tendency of the economic system to build new productive capacity.

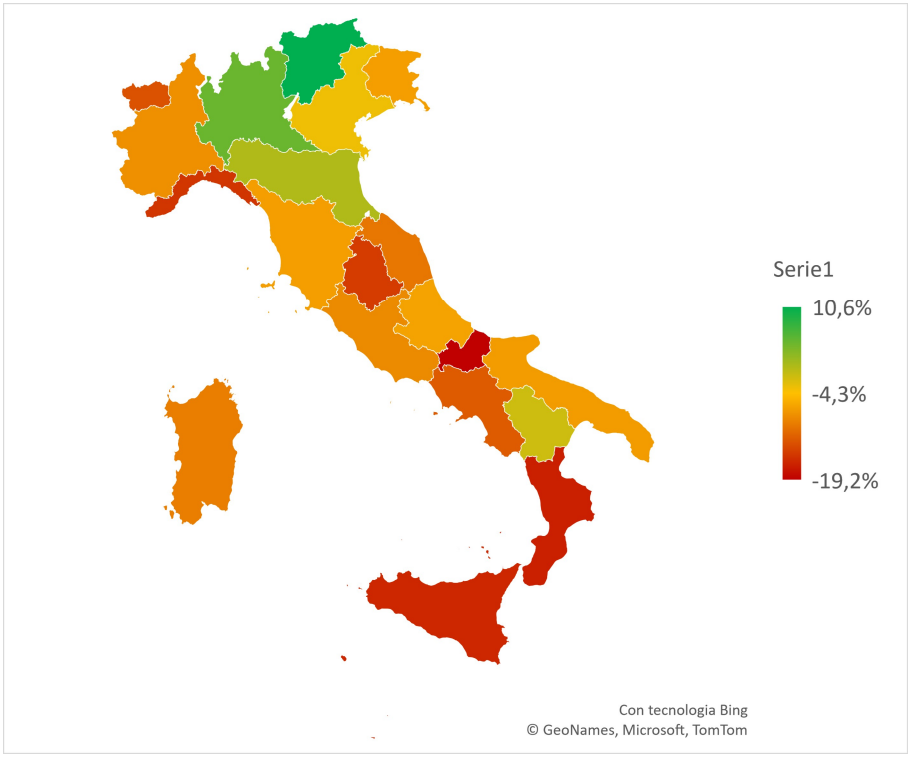
Gross domestic product and main components, chain-linked volumes as of 2015 (2007=100)



Source: ISTAT

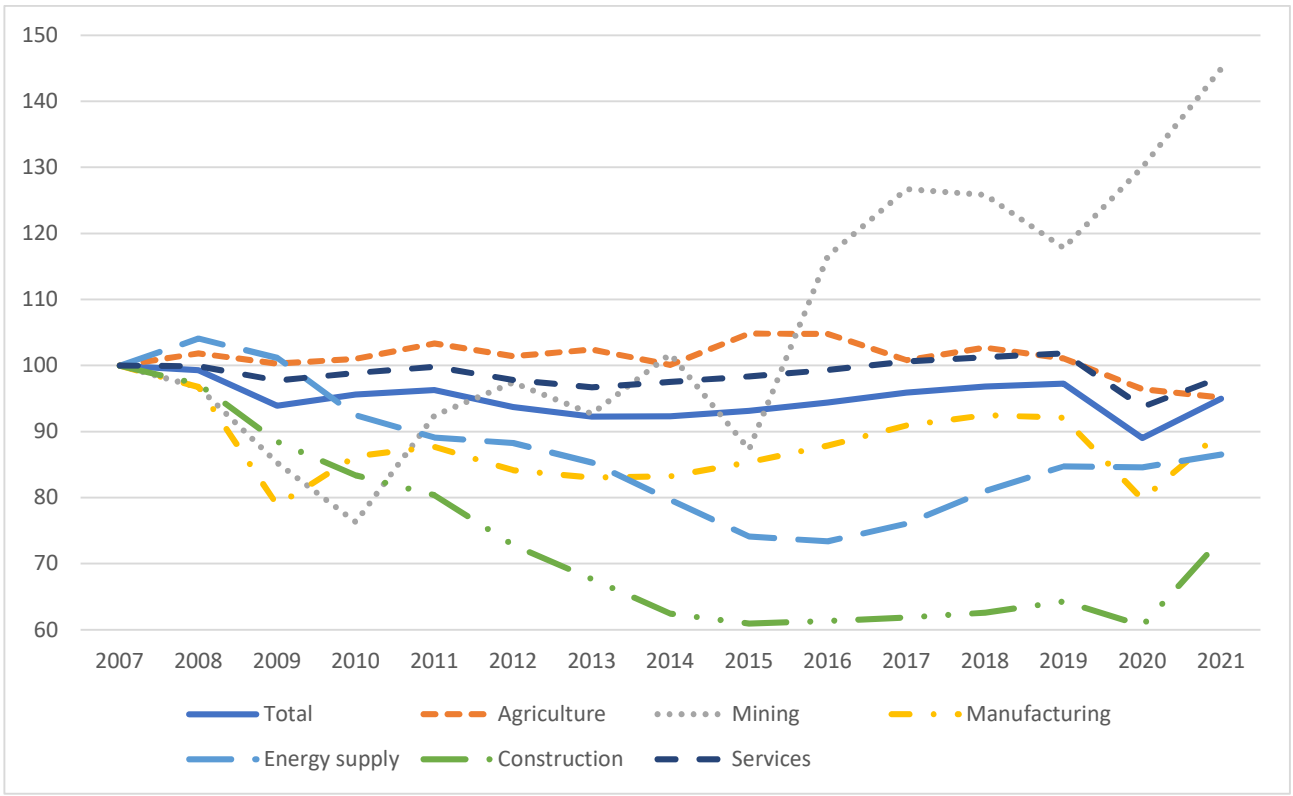
Focusing on the dynamics of added value at a regional level, the graph shows that the only regions with a positive variation compared to 2007 are Trentino-Alto Adige (+10.6%), Lombardy (+4.4%) and Emilia-Romagna (+0.3%); the regions with a negative variation of more than -15% are Molise, Calabria and Sicily. Overall, the added value produced by Italian economic activities in 2021 is 1.5 billion euros (22.8% in Lombardy).

Change in added value at base prices by region, chain-linked volumes as of 2015 (2021/2007)



Source: ISTAT

Added value at base prices by main branches of activity, chain-linked volumes as at 2015 (2007=100)

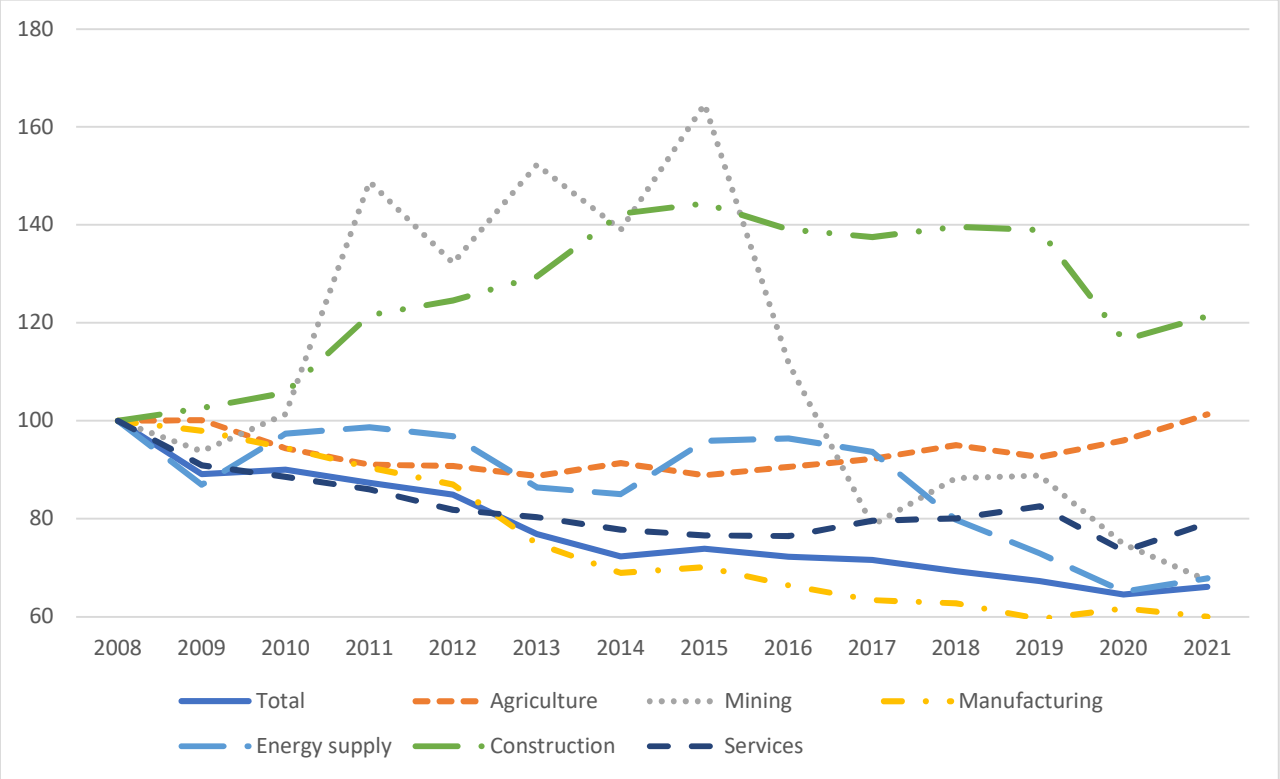


Source: ISTAT

The two indicators below allow an assessment of the most carbon-intensive sectors, from the point of view of added value and employment. Considering GHG emission reduction policies, this indicator allows us to make a prior assessment of the sectors of economic activity that will be significantly affected by decarbonisation policies.

With regard to the first indicator showing the ratio of CO2 emissions to added value, there is undoubtedly that of energy supply, which records 2,738 tonnes of CO2 per million units of added value in 2021. Looking at the historical trend of the ratio of emissions to added value, however, we can see that this sector has intensified its efforts to achieve a lower emission impact. The construction sector deserves special attention as it is the only sector to show a relatively stable trend in the indicator over the period considered, bearing in mind that, as can be seen in the previous graph, the added value of the sector drops dramatically over the same period.

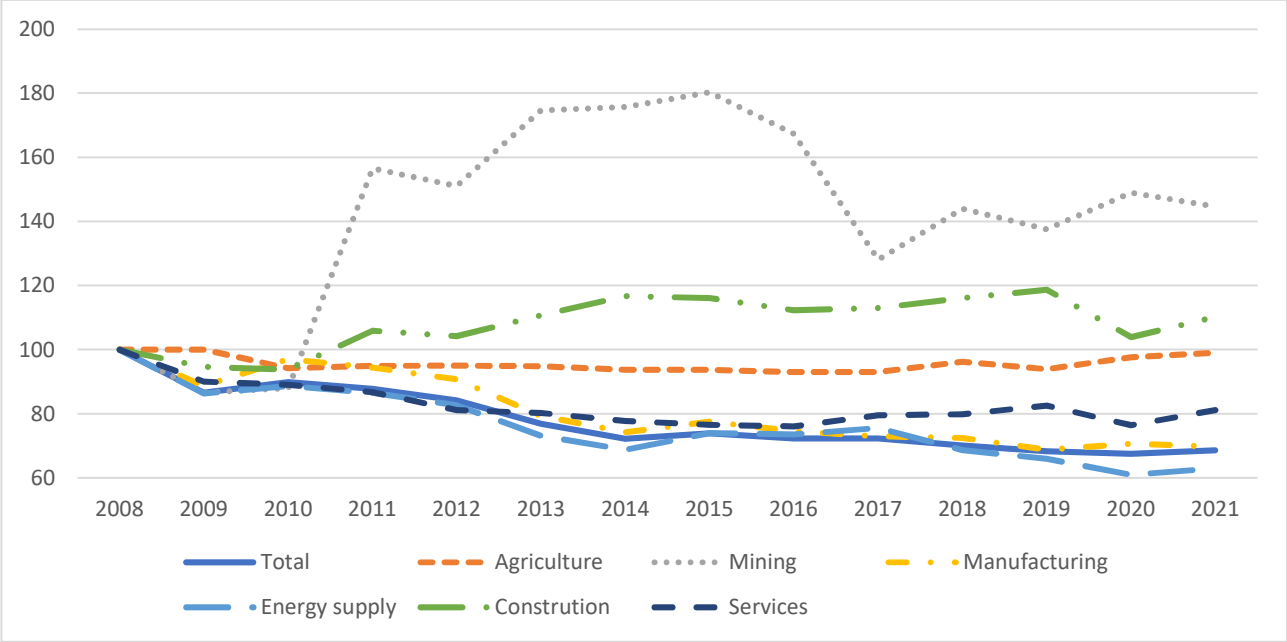
Emission intensity of value added (tonnes CO2/million), chain-linked values as of 2015 (2008=100)



Source: ISTAT

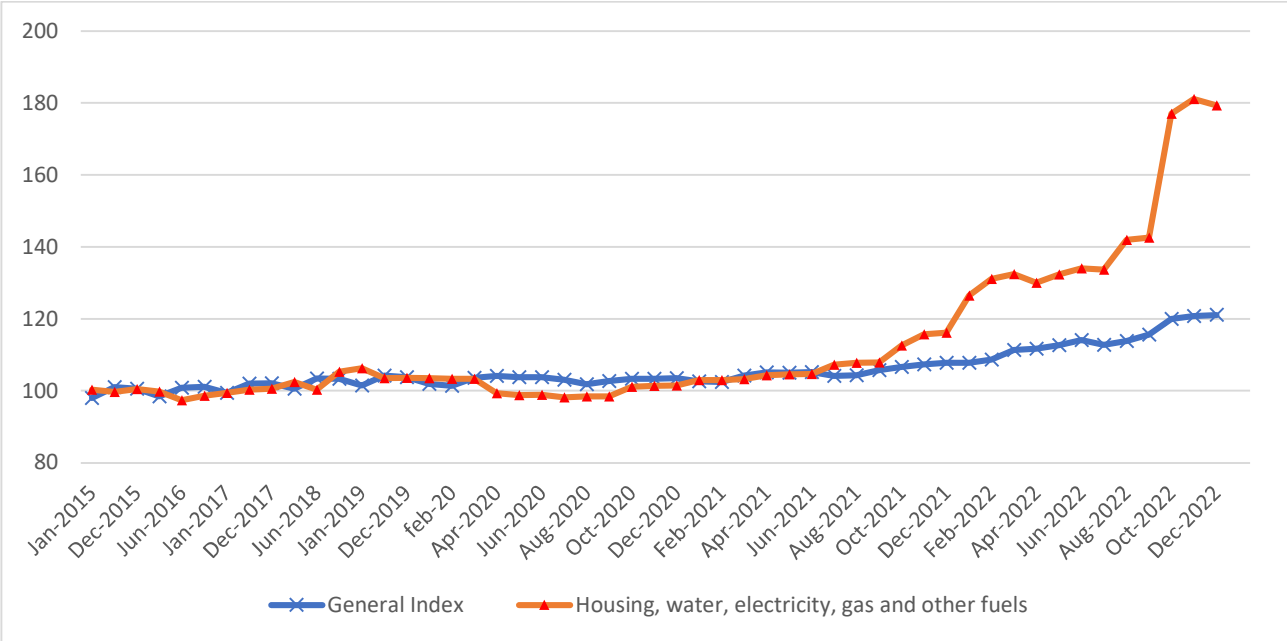
As far as the GHG intensity of employment is concerned, most sectors show a constant negative trend in the indicator over the period under consideration. The mining industry and the construction sector, instead, show a positive change in the indicator (in the case of mining, the gradual decrease in the workforce of the sector due to coal phase-out processes also has to be taken into account).

GHG intensity of employment (tonnes of CO2/thousands of AWU, 2008=100)



Source: ISTAT

Harmonised Index of Consumer Prices (base 2015=100), monthly data



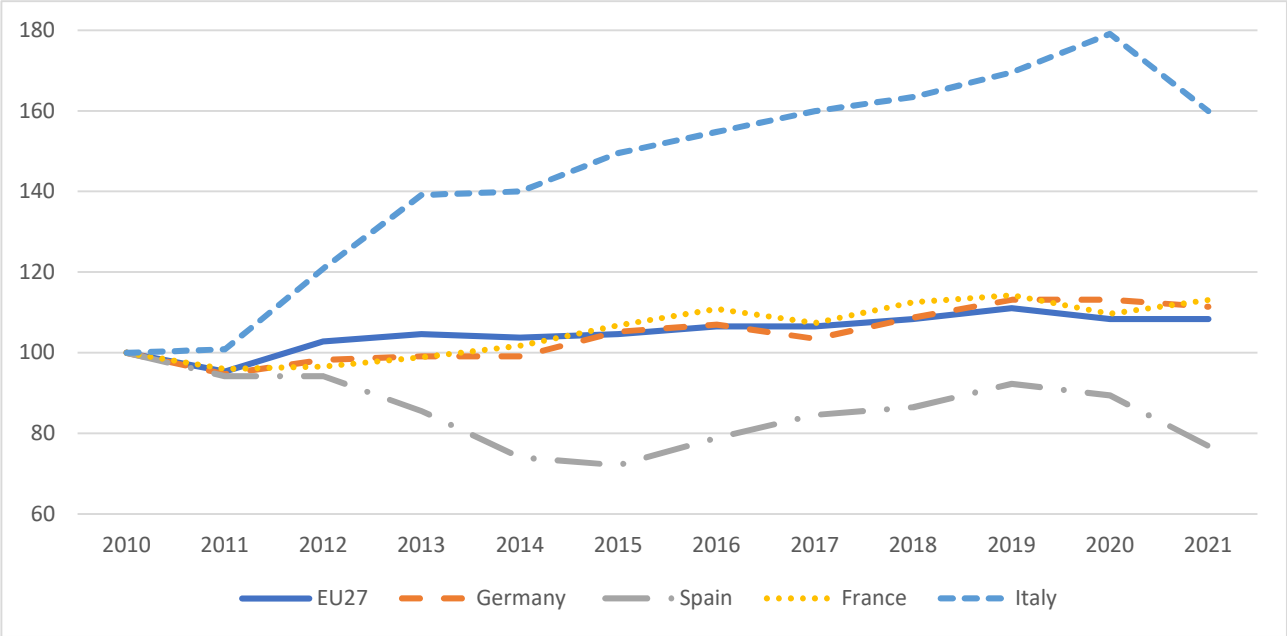
Source: ISTAT

ii. Application of the green economy (Eurostat indicators)

The circular material use rate (CMUR) measures the share of materials that are recovered and reintroduced into the economy as a proportion of total use of materials. CMUR is defined as the ratio of the circular material use rate to the total material use. While it is true that over the period in question the rate sees a growth in all the countries considered (with the exception of Spain), Italy

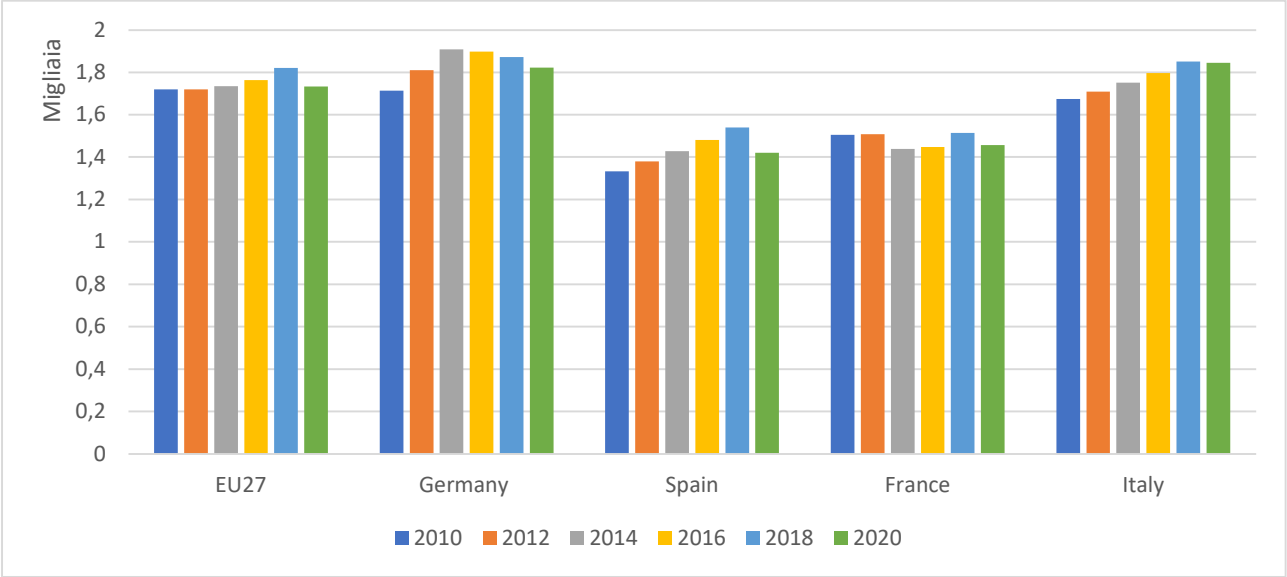
shows a performance of great and constant growth, until the year of the pandemic that seems to have had an effect on this indicator.

Circular material use rate (2010=100)



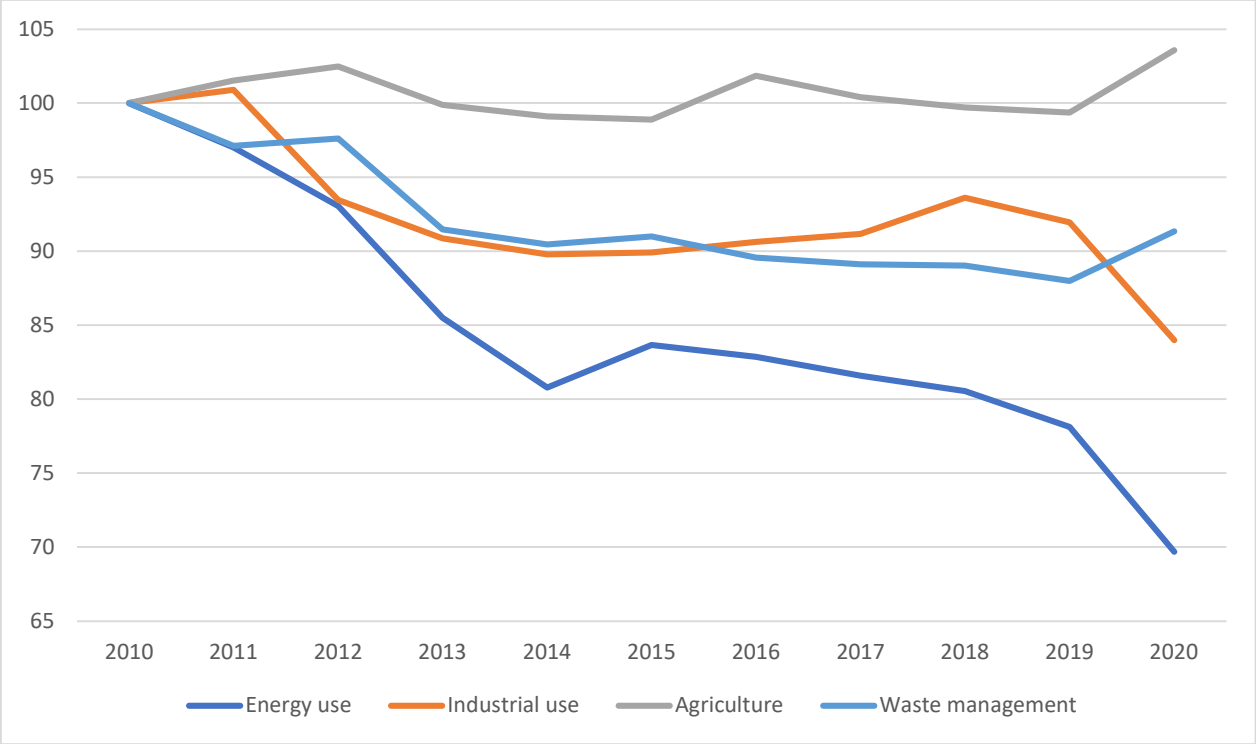
Source: EUROSTAT

Waste generation excluding large mineral waste (kilograms per capita, 2010=100)



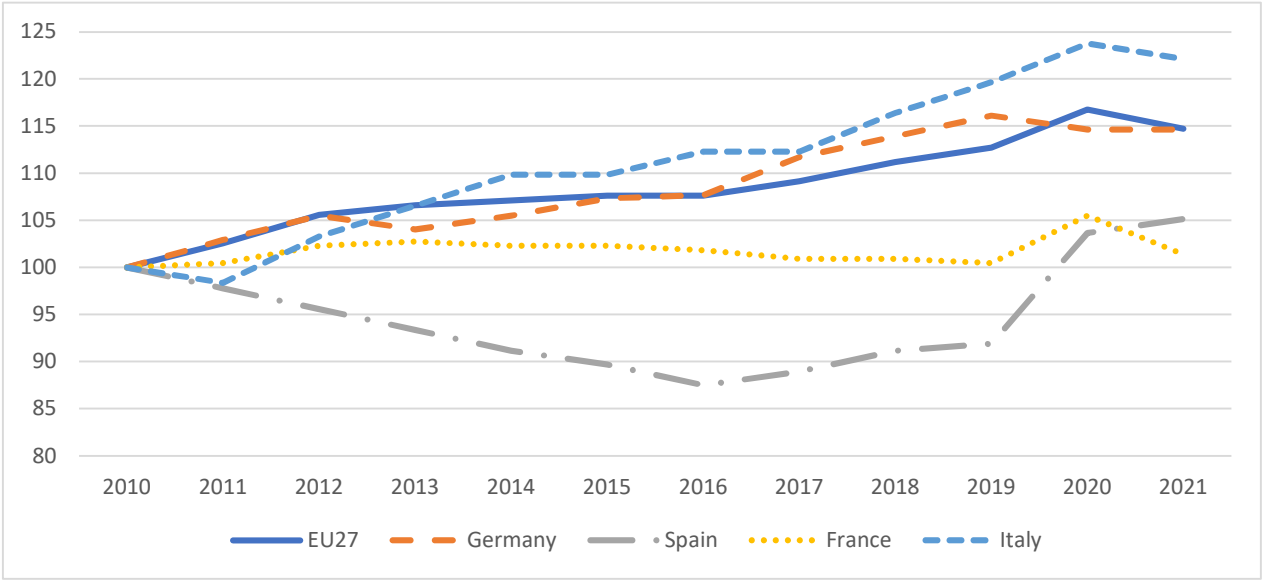
Source: EUROSTAT

Greenhouse gas emissions by source sector (CO2eq., 2010=100)



Source: EUROSTAT

Gross domestic expenditure on R&D (% of gross domestic product, 2010=100)



Source: EUROSTAT

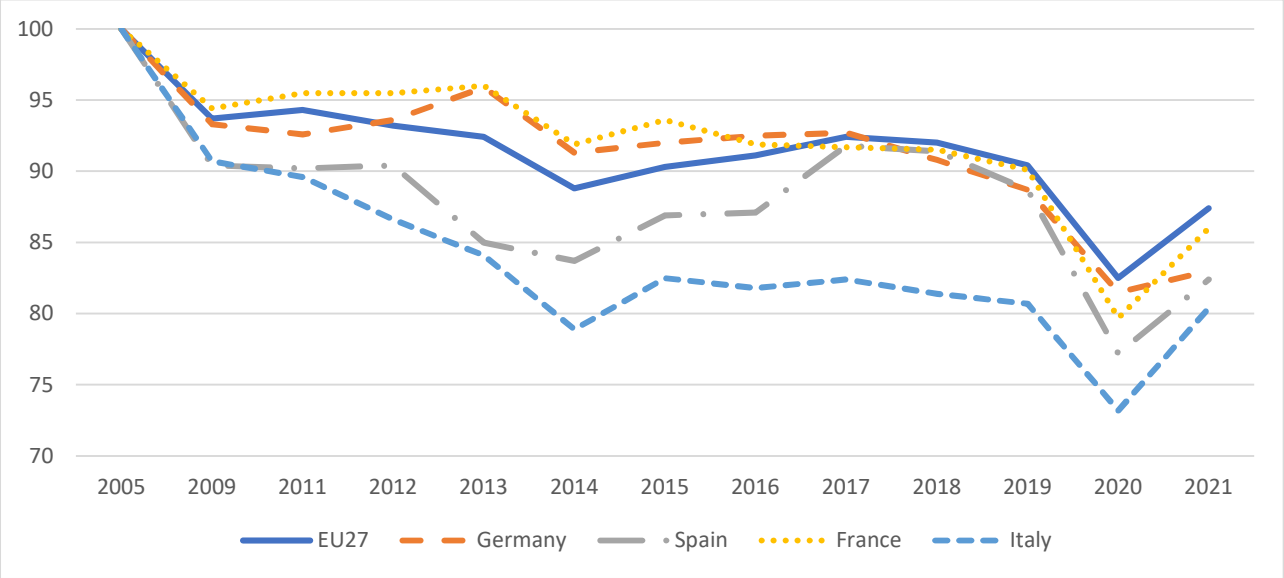
National expenditure on environmental protection (percentage of gross domestic product and percentage change)

	2010	2019	2019/2010
EU27	2	2	0.0%
Germany	2	2.2	10.0%
Spain	1.7	1.6	-5.9%
France	2	2	0.0%
Italy	1.8	1.8	0.0%

Source: EUROSTAT

The indicator below measures the total energy demand of a country. "Primary energy consumption" consists of energy consumption by end users, such as industry, transport, households, services and agriculture, plus the energy consumption of the energy sector itself for the production and transformation of energy, and the losses that occur during the transformation of energy. Again, Italy's efforts to reduce primary energy consumption are evident and far greater than the European reduction trend.

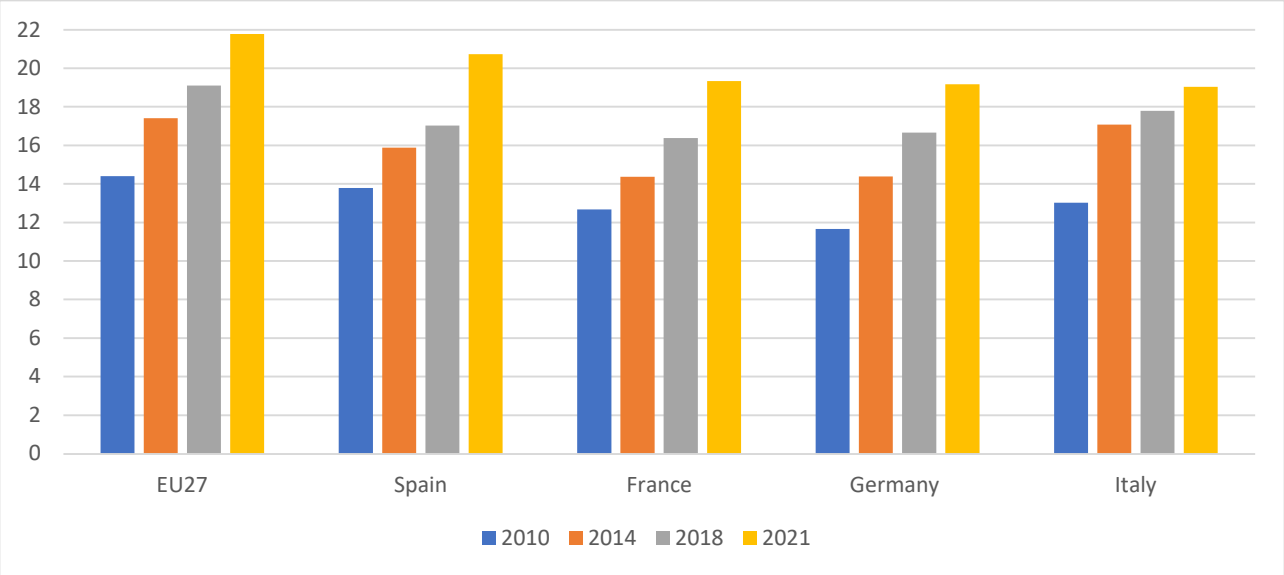
Primary energy consumption (2005=100)



Source: EUROSTAT

Instead, as regards the penetration rate of renewable energy sources in final energy consumption, Italy shows a percentage share in 2021 in line with Germany and France, but lower than the Spanish and EU figures. The growth trend of renewables penetration between 2010 and 2021 is substantially similar in all the countries considered.

Share of renewable energy in gross final energy consumption (as a percentage of total consumption)



Source: EUROSTAT

3. Documents about green transition and sustainable development

The analysis of the national policies on the topics of the ecological transition and decarbonisation of the economic system is taken from the work carried out as part of the Italian Report for the international project *REJEnerAXion* by the Di Vittorio Foundation[1].

Italy has adopted three main instruments to respond to the challenges posed by the environmental and energy crisis, in line with European strategies to reduce emissions, decarbonise the economy and strengthen the energy system. The national regulatory framework, targets and action strategies are gathered together in the **Integrated National Energy and Climate Plan (PNIEC, 2019), the Italian Long-Term Strategy for Reducing Greenhouse Gas Emissions (2021) and the National Recovery and Resilience Plan (PRRN, 2021)**.

The plans and strategies are positioned within a broad framework of European strategies (Climate Law, Fit for 55, Commission Governance Regulation, Next Generation EU), which have encouraged Italy to work continuously on environmental policies and, in recent years, to further tighten decarbonisation targets (with the introduction of Fit for 55, emission reduction targets have gone from -40% to -55% by 2050 compared to 1990). It is clear that in the next few years decarbonisation will be the most powerful driver of development in the Italian and European economy and therefore the prior assessment of economic and employment impacts is an important tool to reduce the social impacts of the transition.

At the operational level, the Italian Emission Reduction Strategy was developed in continuity with the work of the PNIEC, setting up an inter-institutional "steering committee" composed of the Ministries of the Environment and Economic Development.

The COVID-19 pandemic placed the European economy in a difficult situation, but the response of the institutions for market and labour protection was not long in coming. The **Next Generation EU (NGEU)** plan is a multi-year (2021-2026) investment plan made up of a range of instruments and initiatives with the aim of not only overcoming economic and social difficulties, but also of strengthening decarbonisation processes in the economy. Italy is one of the countries that has benefited most from the resources allocated by the EU, which, if the Complementary Fund and the Development and Cohesion Fund are considered as well, amount to a total of 248 billion euros. The measure within the National Plan to which most resources are dedicated is the green transition (68.6 billion), followed by digitalisation (49 billion), education (31.9 billion), infrastructure and sustainable mobility (31.5 billion), inclusion and cohesion (22.6 billion), and health (18.5 billion).

This is an unprecedented investment package and, as many people have said, a unique opportunity for Italy not only to finally have the necessary resources to relaunch the economy, but also to implement the reforms that have been at the centre of public and political debate for many years. One of the most important reforms for Italy's ecological transition is clearly the **simplification of authorisation systems**, which would provide a new impetus for the use of renewable resources. The main objective is, in fact, to substantially simplify the provisions concerning the environmental impact assessment (EIA) and consequently to streamline the procedures for the installation of renewable energy plants. The "Simplification Decree" (Decree no. 77 of 31 May 2021) is an important first step in this direction with the provision of a PRRN-PNIEC Technical Commission.

[1] REJEnerAXion - "Energy for a just and green recovery deal: the role of the industrial relations in the energy sector for a resilient Europe" is a European Union co-funded action-research project (Project no. 101052341/SOCPL-2021-IND-REL) for the period 2021-2023. The project leader is the Fondazione Di Vittorio. The partners are - FILCTEM CGIL (Italy), la Fundacion 1° de Mayo (Spain), Association travail emploi Europe société-ASTREES (France), wmp consult - Wilke Maack GmbH (Germany), Laboratoire d'Etudes sur les Nouvelles formes de Travail, l'Innovation et le Changement (LENTIC), Université de Liège (Belgium), Central European Labour Studies Institute (CELSI) (Slovakia and Hungary), Instytut Spraw Publicznych (Poland), with support of the European Federation of Public Service Unions – EPSU and European Trade Union Institute - ETUI.

The body, in fact, will have the task of carrying out the environmental assessment procedures for a series of projects that are the responsibility of the state; but all other types of environmental procedures, including and especially those that are the responsibility of the regions, are still excluded and are awaiting a regulatory response. Clearly, the regional institutions play a central role in the definition of regional investment plans, especially in certain sectors of specific responsibility such as infrastructure, sustainable mobility, education and health. The issue that arises in the distribution of funds is that of not creating inequalities between regions or between different territorial areas (cities and small towns) at a local level; instead, the Recovery and Resilience Plan aims to overcome inequalities in the territory.

Regarding **labour policies**, Mission 5 "Inclusion and cohesion" foresees a transversal management for all the measures to stimulate the employment prospects of young people and, more generally, of workers affected by the ecological transition. Component 1 "Employment policies" (6.01 billion) brings together funds to support workers' employability through an expansion of active labour policies and a revision of the governance of the vocational training system, through the **New Skills Fund**. The fund, which was established in 2020 on an experimental basis, has within the NRRP the task of enabling companies to promote training activities on the basis of detailed collective agreements with trade unions. The New Skills Fund partly finances the training needed in a specific company, sector or territory. The fund can also be activated for companies using wage supplementation tools (CIG) and when the training activities promoted turn out to be crucial to accompany processes of outplacement for the workforce (known as employment transition).

Another important intervention is related to the new **National Programme for the Guaranteed Employability of Workers (GOL)**, which, on the one hand, attempts to overcome regional gaps in active policies and, on the other, highlights the need for transition policies. However, according to Asvis, "*the possibility of creating a national computer network to manage and coordinate active and passive policy interventions does not seem to have been contemplated, and references to the possible contribution of employment agencies are absent.*" In this case as well the lack of programme integration and interoperability between the regions is seen as a critical point of weakness. Also not to be underestimated, as the CGIL has repeatedly reminded us, is the concern about *i. the "historical" institutional and administrative inability to spend, already experienced with respect to European structural funds under the cohesion policies; ii. the simplification of bureaucratic requirements; iii. the failure to exploit the potential synergies between the various projects of the plan* (Sabato, Fronteddu 2020); *iv. the insufficient assessment of the economic and social impact of the proposed projects; v. the lack of clarity in the definition of the governance system, with respect to which the involvement of the social partners and territorial institutions appears to be lacking* (Rugiero, 2021, p. 70).

The **PNIEC**, which predates the pandemic and energy crisis, comprehensively addresses energy system issues with five dimensions of action shown in the table below (some targets have been updated as a result of the RePowerEU Plan, but not yet in the National Plan, which will be updated in line with the EU Commission's request by June 2023):

National objectives and targets
Decarbonisation
ETS emissions -43% compared to 2005
ESR emissions -33% compared to 2005
RES share by 2030 30% of which: 55.0% in electricity, 33.9% in heat, 22.0% in transport
Coal phase-out by 2025
Energy efficiency
Primary energy consumption -43% compared to PRIMES 2007 reference scenario
Final energy consumption -39.7% compared to PRIMES 2007 reference scenario
Energy security (objectives before the Russian crisis)

Energy dependency is expected to decrease from 77.7% in 2016 to around 68% in 2030
Internal energy market
Development of interconnection capacity: development of cross-border power lines with new public grid projects
Strengthening energy transmission infrastructure
Market integration by increasing the flexibility of the internal energy market
Reducing energy poverty
Research, innovation and competitiveness
Presiding over and developing product and process technologies essential for the energy transition
Promoting the introduction of technologies, systems, and organisational and management models functional to energy transition and security

The **Plan for Ecological Transition** (PET) was approved in March 2022. The plan offers a general framework on the strategy for the Italian ecological transition, also defining a conceptual framework for the interventions envisaged by the PRRN. In particular, the plan is a connecting tool for policies concerning:

1. the reduction of emissions,
2. sustainable mobility,
3. combating hydrogeological instability,
4. water resources,
5. air quality,
6. the circular economy.

In order to achieve the European targets for 2030 and 2050, the PET sets the attainment of the contribution of renewable energies to electricity generation of at least 72% for 2030, and for the total primary energy mix for 2050. A priority area of environmental policies is sustainable mobility, which, according to the PET, is to be based on greater use of rail traffic, the use of fuels with a lower carbon footprint, and the electrification of motor vehicles.
In addition, the PET pays close attention to **social inclusion processes, the employment dimension and the upskilling and reskilling needs of the workforce**, with a powerful appeal to the principles of the Just Transition.

As far as the national application of the ***Just Transition Fund*** **Plan** is concerned, the European Commission, on the instructions of the National Agency for Territorial Cohesion, has identified the areas of Taranto and Sulcis Iglesiente as being among the territories most severely affected by the transition to a climate-neutral economy. The investment projects are described in detail in the **National JTF Programme,** which is managed by the same agency. For each area, therefore, the relevant territorial plans are developed with resources that are equivalent to 1.211 trillion euros https://op.europa.eu/it/publication-detail/-/publication/d3e77637-a963-11eb-9585-01aa75ed71a1
6.9% of the total European resources). The **Territorial Plans**, consistent with the ERDF and ESF+ Regional Programmes, describe in detail, on the one hand, the set of challenges to be faced and the related social, economic and environmental effects and, on the other, the interventions and investments to be implemented in the territories. The priorities of the Territorial Plans include:

1. Counteracting the effects of the transition by increasing the share of energy produced from renewable sources for businesses and households and intervening in situations of environmental impairment (124 million euros for Sulcis Iglesiente, 149.7 million euros for Taranto)
2. Promoting a diversification of the local production system with a view to countering the effects of transition (127.7 million euros for Sulcis Iglesiente, 365.8 million euros for Taranto)
3. Mitigating the social and employment effects of the transition (115.5 million euros for Sulcis Iglesiente, 280 million euros for Taranto)

Finally, under **Heading 3 of the Structural Funds Agreement** (Natural Resources and Environment), the resources for ecological transition foreseen for Italy amount to approximately 500 million euros. These resources will finance territorial strategies to foster, within the framework of cohesion policies, a just and environmentally compatible transition in the Taranto and Sulcis areas. In addition, targeted actions and structural reforms are planned to support youth employment, education and training, which will complement the youth employment initiative of the European Social Fund Plus (ESF+). In general, with regard to the Structural Funds Partnership Agreement 2021-2027, the total of available resources amounts to approximately 83 billion euros. This agreement envisages a close integration between NRRP strategy and the European and national cohesion funds, through which the pursuit of the objectives of inclusive growth and social and territorial cohesion can be further strengthened.

In general, to better frame Italian policies for the development of a green economy, the Circular Economy Strategy, the Bioeconomy Strategy and the Biodiversity Strategy to 2030 should also be considered.

National Strategy for the Circular Economy

The "National Strategy for the Circular Economy" is a policy document that identifies actions, objectives and measures to be pursued in the definition of institutional policies aimed at ensuring an effective transition to a circular economy. The strategy defines new administrative and fiscal tools to strengthen the market for secondary raw materials, so that they are competitive with virgin raw materials in terms of availability, performance and cost. To this end, the strategy acts:

1. on the material purchasing chain (minimum environmental criteria for green procurement in the public administration),
2. on end-of-waste criteria,
3. on extended producer responsibility and the role of the consumer,
4. on the dissemination of sharing and "product as a service" practices.

The governance of the strategy envisages a multi-level participation of the (institutional and non-institutional) actors involved and coordination and monitoring by the Ministry of the Environment and Energy Security. The strategy also established an "Observatory on the Implementation of the National Circular Economy Strategy", composed of ministries and regional and territorial institutions, with the task of:

- Monitoring the status of implementation of the circular economy measures identified in the strategy;
- Identifying any obstacles and proposing initiatives to resolve them;
- Ensuring dialogue with the **social partners** and the most representative trade associations through involvement in thematic working groups and consultation on policy documents;
- Carrying out effective communication and dissemination to the public administration, public and private operators, and citizens;
- Drawing up summary documents on the status of the implementation of the measures and any critical issues.

Italian Strategy for the Bioeconomy

The strategy aims to connect the main sectors of the bioeconomy to create longer value chains rooted in the territories. The overall goal is to increase turnover (approx. 250 billion euros/year) and employment (approx. 1.7 million jobs) in the Italian bioeconomy by 50 billion euros and 350,000 new jobs, respectively, by 2030.

The aim of this strategy is to produce new knowledge, technologies, services, but also to build capacity, regulation and public awareness by promoting policy coordination and integration at international and local level. The implementation of the strategy is essentially based on the

development of research and innovation policies and the dissemination of technology transfer practices, identifying four priorities for action:

1. Sustainable agriculture and forestry
2. Sustainable and competitive agribusiness for healthy and safe food
3. Bio-based industries
4. Water resources and the marine and maritime bio-economy

National Biodiversity Strategy to 2030

The strategy seeks to enhance the element of biodiversity for combating climate change, improving health and stimulating the economy.

Overall, the National Strategy for Biodiversity to 2030 consists of two strategic objectives divided into eight fields of action:

- Strategic Objective A: Building a coherent network of protected areas on land and at sea, broken down into one field of action;
- Strategic Objective B: Restoring terrestrial and marine ecosystems broken down in seven fields of action.

Again, the governance of the strategy is entrusted to a management committee consisting of ministries and regions, a stakeholder consultation working group and a technical/scientific secretariat run by ISPRA.

SOCIAL GREEN DEAL – Role and prospects for industrial relations and social dialogue in green transition management of local economic systems

Regional report: Sicily

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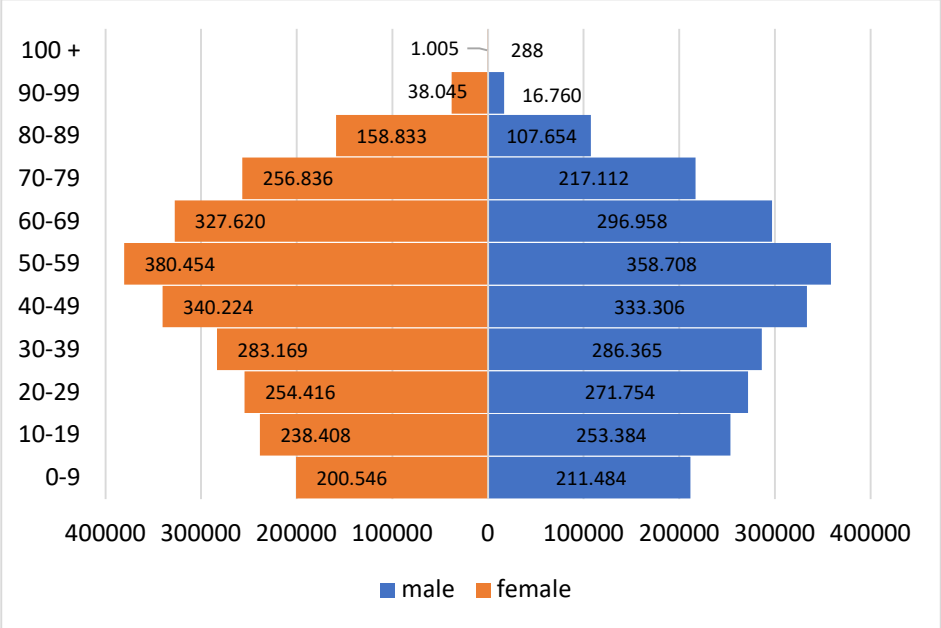
Section one: socio-demographic, economic and environmental profile

Socio-demographic aspects

As of 1 January 2022, the population of Sicily was recorded as 4,833,329 (**8.2% of the total resident population in Italy**). In terms of age there is a prevalence of young people compared to the national average, in particular in the 20-39 age group (22.7% against 21.3% nationally). The incidence of people aged 75 and over is significantly lower than the national figure (10.8% against 12.1%). Nevertheless, this component of the population is, on average, much higher in some municipalities, mainly mountainous ones.

Fig. - Population by age group and gender in Sicily (2022)



Source: ISTAT

For about a decade, the demographic dynamics in Sicily have been significantly affected by both the **progressive ageing of the population** and **migratory flows towards other areas.** According to ISTAT data, between 2011 and 2021 the population of Sicily decreased by 5.1%. This regional demographic decline, in line with that observed in the Mezzogiorno (the South of Italy) and more intense than the national average (-4.8% and -1.9%, respectively), can be attributed to both the rate of natural increase (the difference between births and deaths) and net internal migration (between departures to and arrivals from other regions in Italy); the net migration inflow from outside of Italy, instead, showed a result in the positive (Bank of Italy, 2022).

The contraction of the population of working age, together with the increase in the number of inhabitants aged 65 and over, has led to an **increase in the old-age dependency index** (i.e., the ratio between the population aged 65 and over and that of working age) of +6.9% (35.4% at the beginning of 2022, a value in line with that of the South and lower than the national

average). The most recent demographic scenarios provided by ISTAT project a drop of over a fifth in the working population in Sicily over the next 20 years, higher than the national average (Bank of Italy, 2022).

Population density is high in the suburban municipalities of the metropolitan areas of Palermo and Catania, which are highly integrated with the two provincial capitals.
In 2022, the average Sicilian household had 2.4 components, slightly higher than the national figure (2.3) and the distribution is more or less homogeneous across the region.
In Sicily (in 2019), **relative poverty indicators are significantly higher than the national ones** and highlight the lack of equity in the distribution of expenditure (and therefore of income) across the country. The incidence of relative poverty is almost double the national average (24.3% against 11.4% in Italy).
The main source of income in Sicily (2019 is the last year available in detail) **comes from the public sector** and is much higher than the national average (47.5% against 38.8% in Italy), followed by employees (41.2% against 45.7%) and lastly, the self-employed (9.3% against 13.1%).
In 2021, on the basis of the Prometeia estimates, the disposable income of Sicilian households grew by +2.9% at current values, aided by public support measures and a recovery in employment. In 2020, according to INPS data, the salaries of employees in the private non-agricultural sector in the region fell by -9% compared to 2019 (-8.1% in Italy).
During 2021, **a substantial share of Sicilian households continued to benefit from income support measures** such as the *Reddito di cittadinanza*, the *Pensione di cittadinanza* and the *Reddito di emergenza*[1]. As of December 2021, there were about 254,000 households receiving the Reddito or Pensione di Cittadinanza, the equivalent of one-eighth of resident households (+13% compared to 2020) (Bank of Italy).

Energy poverty[2]
According to Bank of Italy elaborations (2022) on data from Istat's *Indagine sulle spese delle famiglie* (Household Expenditure Survey), in 2020 **the share of Sicilian households experiencing EP was 18.1%**, a higher percentage than that of the South and Italy (13.4% and 8%, respectively). Despite more favourable climatic conditions, in the period 2014-2020, in

[1] *Reddito di Cittadinanza* (Citizenship Income – RdC), introduced as a measure to combat poverty, is an economic support aimed at reintegrating people into employment and social inclusion. If all the members of the household are aged 67 years or older, or if the household also includes people under 67 in a condition of severe disability or non-self-sufficiency, it takes the name of *Pensione di Cittadinanza* (Citizenship Pension – PdC). *The Reddito di Emergenza* (Emergency Income – RdE) is a further extraordinary income support measure introduced to support households in economic distress caused by the COVID-19 emergency.

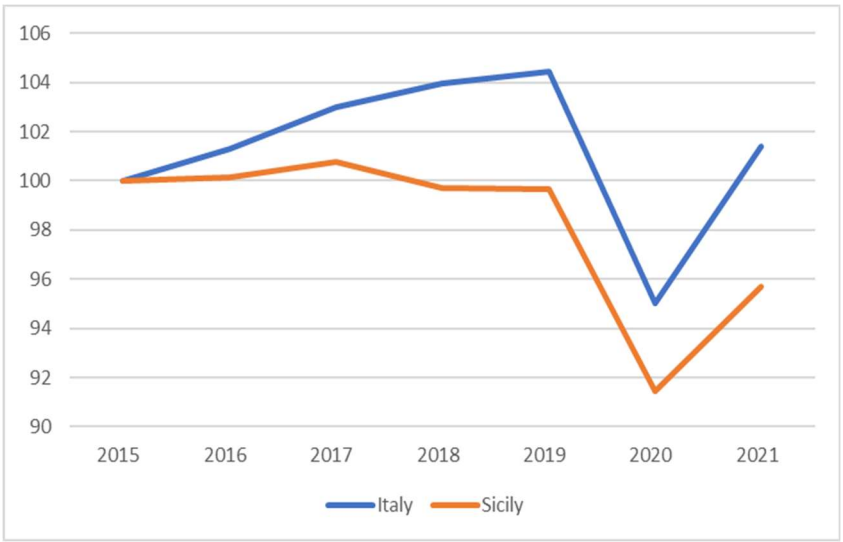
[2] According to the 2019 National Integrated Energy and Climate Plan (NIPEC), a household can be defined as being in energy poverty (PE) if it is unable to afford the purchase of a basket of energy goods and services considered essential, or if access to energy services implies a diversion of resources beyond what is socially acceptable. According to the indicator adopted by the Italian Government, both households with an excessively high share of expenditure on electricity and heating and those in deprived conditions and with zero expenditure on heating (the hidden poor) are considered to be in PE.

Sicily **energy poverty affected more than one-fifth of households on average**, the highest score among the Italian regions. In line with what has been observed in the other areas of the country, EP in Sicily was more widespread among households that are more economically fragile: on average in the 2014-2020 period, the indicator was higher for those households where the head of the household was young (25.9%) or had lower educational qualifications (27.5%) or was seeking employment (29.9%). In addition to the economic component, housing conditions are also particularly important for the spread of EP, and this is why the characteristics of residential housing are reflected in the composition of the energy expenditure of Sicilian households. Against a lower consumption of heating fuels, Sicily has **the highest use of electricity among the Italian regions**: on average in the period 2014-2020, the incidence of electricity expenditure on total expenditure in Sicily was 4.2% (the Italian average was 2.5%).

Economy and businesses

In 2021, economic activity in Sicily returned to growth. Before the outbreak of the conflict in Ukraine, which significantly changed the general economic picture, Sicily in fact had been experiencing a phase of strong economic recovery; the improved epidemiological conditions and the easing of restrictive COVID measures had an impact. According to estimates based on the Bank of Italy's Quarterly Indicator of the Regional Economy (ITER), regional output would have increased by +5.7% in 2021, with a less intense growth than the rest of the country and not yet at pre-pandemic levels.

Fig. x - Development of GDP on the production side (market prices, raw data, chain linked volumes with the year of reference 2015 where 2015=100)



Source: ISTAT

The analysis of the structure and size of businesses highlights **aspects of vulnerability affecting the productive structure** and the inevitable repercussions of this in social terms and on the economic wellbeing of Sicilian households.

In 2021, growth in production was seen in all the main sectors and was strongest in industry and construction. The exports of goods increased at a sustained rate, with reference to both petroleum products and the other main regional specialisations.

Sectoral trends and businesses

After the sharp decline in 2020 (-7.6%), the value added of the **primary sector** grew by 3.2% in 2021 (+3.7% and -1.3% in the South and Italy, respectively).

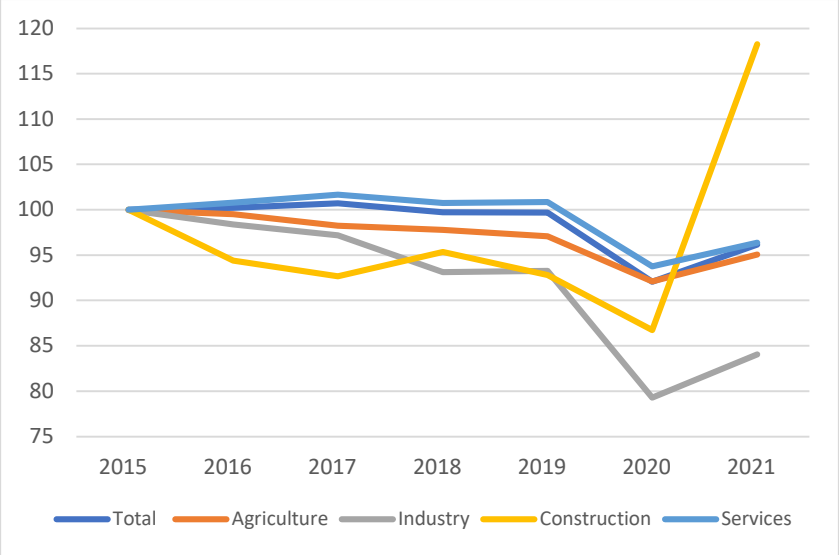
In 2021, Sicilian **industry** saw a slow recovery (+6% compared to 2020) but failed to reach 2019 levels. Compared to the other regions of the South and Italy as a whole, the sector's value added growth was less pronounced (+8.5% and +11.5%, respectively).

The Bank of Italy (2022) points out that in the second half of 2021, difficulties emerged for businesses, in particular **tensions on energy prices and problems with the supply of production inputs**, which, as in the rest of the country, affected activity, mainly reflected in an increase in prices or a reduction in profit margins. Furthermore, it has to be recalled that **the growth in energy prices could have a stronger impact on the Sicilian production system** than the national average, **because of its greater exposure to energy-intensive sectors.** According to ISTAT, in 2019 in the manufacturing sector overall, the share of value added of energy-intensive sectors was 15.9% (in Italy it was 14.6%). This figure reflects the higher relative importance of oil refining and non-metallic mineral processing, also offset by the lower impact of the metallurgical sector.

As regards the **construction** sector, the value added, which had been falling almost continuously since 2007, reversed this trend in 2021, recording an increase of +36.3%, higher than the average for the South (+26.1%) and Italy (+21.6%).

In the **services** sector, after a sharp decline in 2020 (-7%), the value added of the sector (which also includes financial activities and the public administration) grew by +2.8% in 2021, below the growth levels of the South (+4.4%) and Italy (+4.7%). However, this growth did not allow the sector to recover from the drop recorded during the year of the pandemic.

Fig x - Evolution of value added by industry (raw data, base prices, chain linked volumes with year of reference 2015 where 2015=100), Sicily



Source: ISTAT

Overall, 285,514 businesses were based in Sicily in 2021, accounting for 6.3% of the national total. Together, these businesses employ 776,790 people, 4.4% of the national total.

Trade is the predominant element of the region's production system, with 84,933 businesses (29.7% of Sicilian businesses and 1.9% of Italian businesses). More than one employee in four is employed in the sector, higher than the national figure which is less than one in five. Manufacturing activity records 20,041 businesses (7% of Sicilian businesses) and employs 86,372 workers (11.1% compared to the national figure of 21.3%).

In the same year, the net start-up rate for businesses increased to 2.1%, against a stable start-up rate and a slight decrease in the closure rate (from 5% to 4.1%). This drop, the result of the economic recovery and public measures to support businesses, was seen across all sectors (Bank of Italy, 2022).

The average Sicilian business has 2.7 employees, well below the national figure (3.9). Larger businesses (16.6 employees per business) belong to sector E (water supply, sewerage, waste management and sanitation activities), similar to the rest of Italy. In all other sectors, the average size is between the lowest value of 1.1 employees in sector L (real estate activities) and the highest value of 7.6 employees in sector B (extraction of minerals from quarries and mines). A comparison with national data shows that the average size of businesses in Sicily is below the Italian average, with the exception of sector C (construction, 3 employees at the regional level and 2.8 at the national level), sector P (education, 3.7 employees at the regional level and 3.2 employees for Italy as a whole) and sector R (artistic, sporting, entertainment and recreational activities, 2.8 employees for Sicily and 2.3 for Italy).

With regard to **foreign trade**, Sicilian exports benefited from the recovery in world trade by increasing volumes by +45.4%, more than offsetting the drop in 2020. **Growth was driven by the oil sector,** where sales gradually returned to pre-pandemic levels, thanks mainly to the increase in prices (the quantities exported increased by only +3.8%).

In the non-oil sectors overall, exports grew by 12.9% at current prices (in 2020 they saw a decrease of -2.8%). Foreign sales of the three largest regional specialisation sectors (agro-food, chemicals and electronics), which together account for 65% of non-oil exports, increased at rates slightly below 15%.

Tab x - Imports and exports by economic activity and region – 2021 (values in millions of euros and percentage change from 2020)

Imports						
	Oil		**Energy**		**Total**	
Sicily	1,269	*27.8%*	143	*4.8%*	16,874	*55.0%*
South	3,146	*50.4%*	754	*9.5%*	58,519	*34.7%*
ITALY	8,852	*56.8%*	19,914	*64.6%*	472,070	*27.6%*
Exports						
Sicily	5,886	*83.9%*	130	*22.4%*	10,462	*45.4%*
South	10,450	*80.2%*	852	*27.3%*	50,896	*18.3%*
ITALY	13,838	*78.0%*	14,394	*36.6%*	516,262	*19.1%*

Source: ISTAT-ICE

In 2021, the expenditure of local and regional authorities grew, encouraged by a large increase in the capital component; current expenditure instead decreased, despite the continued increase in transfers to households and businesses for measures aimed at mitigating the effects of the pandemic. Looking ahead, **investment spending may intensify thanks to the resources made available under the NRRP**; the first allocations in Sicily have mainly concerned the areas of social inclusion, public transport and health, the benefits of which on the territory will depend on the ability to reduce the timescale for tendering and the speed of expenditure, which in Sicily is lower in the territorial comparison (Bank of Italy, 2022).

Labour market

Employment

According to ISTAT data, after the sharp reduction recorded the previous year (-1.3%), employment will decrease slightly in 2021 (-0.2%), compared to increases of 1.3% and 0.6%, respectively, in the South and nationally.

The recovery in employment affected both men and, to a lesser extent, women, and was most intense for people aged between 15 and 34, categories that had been most affected by the pandemic (Bank of Italy, 2022).

The change in the number of employed should be seen in the context of a continuing reduction in the working-age population residing in the region, which led to an increase in the employment rate to 41.1% in 2021.

Tab x - Number of people employed (thousands) and % change from the previous year

	Italy				Sicily			
	2020		2021		2020		2021	
Total	24,954	*-2.2%*	25,092	*0.6%*	1,499	*-1.3%*	1,496	*-0.2%*
Agriculture	904	*-2.5%*	903	*-0.1%*	117	*0.0%*	117	*0.0%*
Industry and construction	5,766	*-1.0%*	5,864	*1.7%*	219	*1.8%*	236	*7.7%*
Services	18,284	*-2.5%*	18,325	*0.2%*	1,162	*-2.0%*	1,143	*-1.7%*

Source: ISTAT

Labour supply, unemployment and social welfare

The average labour supply in 2022 remained almost stable compared to the previous year. The employment rate for the population aged between 15 and 64, which remains the lowest among the Italian regions, increased to 51.2% (the national average is 65.5%). The increase was smaller for women, who suffered more during the pandemic, and for whom the burden of care within the family is heaviest.

With regard to the unemployment rate, it can be seen that after a slight increase in 2021 (18.7%) compared to 2020 (18.3%), the rate drops by almost two percentage points to 16.6% in 2022.

Sustainability indicators

The annual report drawn up by ASVIS (Italian Alliance for Sustainable Development) helps us to frame some vulnerabilities affecting the Sicilian territory, society and economy according to the criteria of achieving the SDGs. Below is a table with the main indications (the +, - and = trends refer to the ratio of the indicators considered between 2010 and 2021).

Goal 1: poverty	-	- increase in low work intensity (+6.7%) - increase in absolute poverty (level of distribution +4.5% of which +0.5% between 2019 and 2021) - increase in persons living in dwellings with structural problems (+7.4%) between 2019 and 2021
Goal 2: nutrition	=	- increase in the surface area under organic cultivation (+7.3%) - reduction in the use of crop protection products (-36.8% between 2020 and 2021) - decrease in the number of people with adequate nutrition (-2%)
Goal 3: health	+	- increase in the number of doctors (+1.6 per thousand inhabitants)

		- reduction in the number of people who use alcohol (-2.8%), smoke (-3.4%) and do not engage in physical activity (-10.1%) - decrease in hospital beds (-0.3 per 1,000 between 2010 and 2020)
Goal 4: education	=	- improvement in continuing education (+2.4%), and dropout rate (-4.4%) - increase in the number of school leavers with diplomas (+6.3%) - decrease in the number of people who habitually read books and newspapers (-4.8%) and students with adequate mathematical and literacy skills - reduction in the number of graduates, which, at 17.8% in 2021, is among the lowest
Goal 5: gender equality	=	- worsening of involuntary part-time work (+7.9%) and increase in the gender pay gap (-3.7%) - improvement in the employment ratio between women with and without children (+10.6%) - stability of female employment compared to 2010 levels (31.6% in 2021)
Goal 6: clean water and sanitation	-	- deterioration in the efficiency of water distribution networks - increase in the irregularity of water supply (+1.7% between 2019 and 2021)
Goal 7: energy	+	- increase in the share of energy from renewable sources, albeit to a limited extent (+4.5%) and energy efficiency (+6.7%)
Goal 8: jobs and economic growth	-	- increase in involuntary part-time work (+6.7%) and non-participation (+3.8%) - reduction in the employment rate (-2.6%);
Goal 9: infrastructure and innovation	+	- improved broadband availability (+38.6%) - increase in knowledge workers (+3.5%) in businesses with innovative activities (+15.8% between 2010 and 2020) - further reduction in frequent users of public transport
Goal 10: inequalities	=	- increase in resident's permits (+16.3%) - critical level of youth employment (-7.9%), which, at 38.5% in 2020, is among the lowest in Italy
Goal 11: cities	-	- increase in unauthorised building (+16.5%)

and local communities		- reduction in local public transport seat-km per inhabitant (-43.9%)
Goal 12: responsible consumption and production	+	- improvement in the share of sorted municipal waste (+32.9%)
Goal 15: life on earth	-	- increase in recorded annual soil consumption by +3 points (in 2021, 6.5% of Sicilian soil is sealed)
Goal 16: justice and institutions	-	- reduction in social participation (-8.8%) and - tripling of IT scams and frauds - reduction of prison overcrowding (92.4% in 2021)

Section two: risks and opportunities for green transition

The region of Sicily has been identified as an object of territorial in-depth analysis for a number of reasons, to do, on the one hand, with the vulnerability of the region's social and economic fabric and, on the other, the challenges posed by the ecological transition.
In fact, as we have already discussed, the stakes in the transition in this territory are very high if we consider the industrial structure of the economic fabric, the socio-demographic characteristics of the population and Sicily's elevated exposure to environmental risk. Today, moreover, the effects of geopolitical instability and the continuation of conflicts around the Mediterranean and in Europe, which have a greater impact on Sicily's economy than on the rest of the country, have to be taken into consideration.
The island's economy is particularly exposed to the ongoing trade and political developments in the world of oil and gas, as well as the need to renovate its industrial plants in order to abandon the use and processing of fossil fuels in compliance with the climate neutrality goals of Italy and the European Community.

As highlighted by the Bank of Italy (2022), **the economic risks related to the ecological transition in Sicily could be higher than the Italian average**. An initial assessment of the economic risk is provided by the Bank through an analysis of the sectors subject to the Emission Trading System (ETS): in 2020 there were 38 industrial plants subject to the ETS in Sicily (3.9% of the national total), with emissions of 13.6 million tonnes of CO2 eq. (10.8% of the Italian ETS total).
In particular, **petrochemical plants** account for just under a third of all Sicilian ETS installations and contributed more than half of the GHG emissions in 2020; among the other sectors, those with the highest emissions are **energy** and **cement** production (41.3% and 7.6% of ETS emissions in the region, respectively).

The distribution of emissions among the individual plants proved to be highly concentrated: the five most polluting plants produced 53% of the total emissions, and 90% of the gases were produced by the 15 plants with the highest emissions.
In Sicily, between 2005 and 2019, the volume of emissions from ETS installations more than halved, while in Italy the reduction was 37.6%; in 2020, coinciding with the reduction in economic activity linked to the pandemic, emissions decreased only slightly (-1.2%; -10.6% in Italy). At the sectoral level, between 2005 and 2020, **the majority of the decline in emissions is attributable to the energy sector (around 60%) and petrochemicals (around 30%)**. The trend in emissions partly mirrored that of production activity, with **larger reductions in the years when the value added contracted the most**.

The ratio between the climate-changing gas emissions of ETS installations and the value added they produce can be considered a **measure of the direct exposure of the regional economy to the costs of regulation**. According to the Bank of Italy's elaborations, referring to 2019, **ETS installations in Sicily produced over 170 tonnes of CO2 eq. per million euros of value added**, a figure in line with the average for the Mezzogiorno (the South of Italy) and about double that of the national average.
While the emission **intensity** (the ratio of emissions to the value added of ETS establishments) **of the Sicilian installations is almost six times higher than in Italy**, both the incidence of ETS

establishments on regional industry (5.9%, against 7.6% in Italy) and the weight of industry on the total value added (8.7% in Sicily, 19.6% in Italy) are lower in the region.
As we will see specifically with an in-depth look at the case studies, **the future and conversion of the industrial poles for processing petroleum products is linked to the social and economic development prospects of the whole of Sicily**, and in particular of certain areas, such as that around Siracusa, where refining-related activities play a very important role in the manufacturing sector, in terms of economic value, employment and environmental impact.

Among the institutional strategies to deal with risk areas for ecological transition, two initiatives have been adopted in Sicily: that of "**orphan sites"** and that of "**sites of national interest**".
Sicily is home to a large number of what are called orphan sites. An orphan site is defined as a potentially contaminated area for which the person(s) responsible for the pollution cannot be identified or do not comply with all the regulatory requirements. In these cases, reclamation procedures are the responsibility of the public administration. **The Region of Sicily has identified 36 orphan sites (13.8% of the national total),** second only to Campania (53 sites, 20.4% of the total), for which reclamation is a priority in terms of the environmental and health risk involved, thus defusing a potential source of danger.
The orphan sites will be reclaimed thanks to the investments provided for in the National Recovery and Resilience Plan (NRRP). In particular, Ministerial Decree 269 of 29 December 2020 allocates €13,557,665.35 to Sicily, the equivalent of about 13% of the resources allocated nationally (source: MITE). The Sicilian sites (1 in 3 of which are in the province of Caltanissetta) are disused landfills (28 for urban waste and 2 for special waste), disused industrial production areas (5) and a Contaminated Site of National Interest (SIN, Biviere di Gela). Through the NRRP investments, at least 70% of the orphan sites are to be reclaimed by 2026. The resources will be used for the implementation of interventions that favour the **securing, reclaiming and thus reusing of land compromised by contamination** and the reintegration into the real estate market so as to return to the population a territory that can be used in its entirety (ARPA Sicilia, 2022).

The regional territory also includes 4 SNIs (Sites of National Interest[3]): Gela (CL), Priolo (SR), Milazzo (ME) and Biancavilla (CT), which include both onshore and offshore areas. The progress of characterisation and safety/reclamation activities expressed as the number of areas, in 2021, shows greater progress for the Priolo site with 11 characterisation plans approved and 7 investigations, and for the Milazzo SNI with 3 characterisation plans and 1 reclamation completed.

SIN	**Sea (ha)**	**Land (ha)**
Gela (CL)	4,563	795
Priolo (SR)	10,068	5,815

[3] Sites of national interest are large contaminated areas classified as hazardous by the Italian state and in need of remediation of soil, subsoil and/or surface and groundwater to prevent environmental and health damage.

Biancavilla (CT)	0	330
Milazzo (ME)	2,190	549

The ecological transition, and in particular the energy transition, is not only a risk for Sicily, but there are also many **opportunities linked to the change of the energy system and the development of renewable energy sources**. As repeatedly recalled in the National Strategic Plans for the transition, Sicily enjoys a strategic position in the centre of the Mediterranean, and in this sense can act as a hub for energy connection between the various countries bordering the Mediterranean Sea.

With the new Environmental Energy Plan of the Sicilian Region (2021), the Region has equipped itself with an ambitious development plan towards the decarbonisation of the energy system, with precise targets:

- reduction in regional gross final consumption, to be implemented with the contribution of all sectors, from residential to industrial, and services to agricultural;
- promoting the development of RES, minimising the use of fossil fuels (RES in 2019 covered 29.5% of total production, the EEPSR target for 2030 is 67.57% coverage, with an increase in the share of electricity covered by RES of +136%);
- reduction of climate-changing gas emissions (transversal objective);
- promoting the sustainable expansion of energy infrastructures (smart grids);
- promoting the green economy in Sicily (also in terms of skills training).

Of particular interest is the Plan for the Development of Photovoltaics, which envisages the construction of photovoltaic plants with a total capacity of 1,100 MW, primarily in “attractive areas”. According to the plan, this value would be achievable by considering the potential installable in areas such as exhausted quarries and mines with a cessation of activity by 2029, Sites of National Interest, exhausted landfills, degraded agricultural land (no longer productive and unsuitable for use in agriculture).

Potenza installata fonte rinnovabile [MW]	2017**	2020*	2020**	2030
Idroelettrica	162,511	274,86	162,511	162,511
Fotovoltaica	1.390,187	1.474,48	1.556,686	4.018,286
Eolica	1.887,150	1.921,03	1.937,150	3.000,000
Termodinamica	0,033	ND	19,033	200,000
Bioenergie	74,000	102,99	77,000	98,00
Totale	**3.513,881**	**3.773,36**	**3.776,380**	**7.464,297**

*dati rilevati e pubblicati da TERNA sul sito https://www.terna.it/it/sistema-elettrico/dispacciamento/fonti-rinnovabili
**dato stimato nel 2017 ed inserito nel Preliminare di PEARS

Source: PEARS, Sicily Region

Renewable source installed potential
Hydroelectric
Photovoltaic
Wind
Thermodynamic
Bioenergy
Total
**Data gathered and published by Terna at https://www.terna.it/it/sistema-elettrico/dispacciamento/fonti-rinnovabili*
***Estimated data in 2017 and inserted in the Preliminary EEPST*

In the same document, the importance of the **development of renewable energy communities** is highlighted, committing the region to reorganising and simplifying the current regulations on configurations for self-consumption with the aim of encouraging the implementation of all self-consumption systems, including collective ones, from renewable sources.
The region has also moved to support the RECs through the public call for tenders "**Programme to Support Investments by Municipalities in Sicily for the Establishment of Renewable and Solidarity Energy Communities**" (PEARS), through which the investments will support 301 municipalities in the preparation of projects and documentation related to the establishment of the communities. The objective of the call is also to create a critical mass of entities potentially eligible to implement projects that can be subsidised with the resources of the ERDF Operational Programme 2021/2027 approved by the European Commission for Sicily with an allocation of 5.8 billion euros.

The PEARS also estimates the creation of 109,699 temporary AWUs and 4,708 permanent AWUs. Considering the period 2019-2030, **an average annual number of AWUs employed of about 9,534** can be assumed.

		ULA temporanee			ULA permanenti			ULA totali	
Fonte	MW	Dirette	Indirette	Indotte	Dirette	Indirette	Indotte	ULA temporanee	ULA permanenti
Fotovoltaico	2.850	20.423	14.727	15.047	1.119	876	1.021	50.197	3.016
Eolico	2.540	18.565	19.535	19.659	593	423	489	57.759	1.505
Biogas	7	160	162	150	24	19	20	472	63
Biomasse solide	17	408	442	420	57	28	40	1.270	125
Totale								**109.699**	**4.708**

Source: PEARS, Sicily Region

Source
Direct
Indirect
Related
Temporary AWU
Permanent AWU
Photovoltaic
Wind
Biogas
Solid biomass
Total

Section three: case studies identified

The case studies identified for the in-depth regional study aim to provide real insight into the **challenges and opportunities for energy transition in Sicily**. It was decided to focus specifically on the energy sector since, as we have seen above, the sector has a significant impact on all three dimensions for analysing economic, environmental and social transition processes.

The **Priolo Augusta petrochemical hub** (in the province of Siracusa) and the development of the **3Sun Gigafactory (**in the province of Catania) were chosen as case studies on industrial transition processes heading towards decarbonisation. The industrial clusters studied represent paradigmatic cases of energy transition: in the first case, this is an industrial site that has been central to the economic development of the territory since the Second World War and which in the near future will be called upon to abandon most of the activities related to oil refining and embark on new industrial paths; the second case focuses on the expansion of the photovoltaic panel factory in Catania, which is preparing to become Europe's largest next-generation photovoltaic module production complex.

The third case study concerns the establishment of a **renewable and solidarity energy community in the municipality of Roccavaldina**, an inland area in the province of Messina. The objective in this case is to analyse the development of alternative sources of energy provision and its social impact on the vulnerable conditions of the territory and its inhabitants. The analysis of this case offers an opportunity to look more closely at the health of social relations and the extension of territorial social dialogue that characterise the establishment of an energy community.

The methodology adopted for the case study analysis involved direct interviews with stakeholders (2 interviews) and in-depth analysis of regional sources.

The Priolo Augusta petrochemical complex

The area is one of the largest petrochemical poles in Europe and extends for almost 32 km along the east coast of the island. The petrochemical hub was created in the 1950s and passes through the municipalities of Augusta, Priolo Gargallo and Melilli to the outskirts of Siracusa. The main activities in the area are oil refining, the processing of its derivatives and energy production. The first refining complex dates back to 1949 (RAISOM, then Esso and today Sonatrach), and over the years it has seen the establishment of numerous industries for the production of chemicals (today ENI Versalis, Air Liquid and Sasol Italy), petrochemicals, asbestos, polymers and, in 1953, ENEL's first thermoelectric power plant run on fuel oil.

The creation of this vast industrialised area led to an increase in employment, an increase in the population due to labour demand, and an increase in per capita income. Right from the start, the area's 'dependence' in socio-economic terms on the industrial hub became evident, and today this still significantly characterises the socio-economic dynamics of Siracusa. There are, in fact, numerous economic activities that revolve around the petrochemical pole, which have developed since its establishment and which involve manufacturing activities in particular.

The effects of the industrial area, moreover, were wide-ranging and affected spheres beyond the economy and employment; in fact, "*private oil companies seem to have played a state-like 'civilising' role in regions where the state was slow to appear. Industrialisation*

freed Sicily from the past, purified it, laid the foundations for social living and provided welfare services for the new workers" (Benadusi, 2018).
However, starting in the late 1970s, the closure of several plants began due to the relocation of production cycles, resulting in job losses. Among the causes of this regression were the reduced refining of Middle Eastern crude oil, the emergence of new refineries elsewhere in Europe, the relocation of processing plants, and the appearance of China and India among the lower-cost producing countries. Consequently, those same years saw the start of the **gradual disintegration of the social safety nets put in place by that model of industrial development**, with a tangible impact on health, the environment, forms of sociality and levels of internal cohesion. As Benadusi (2018) reminds us, "*the slumbering consciences of the populations have been awakened, but their demands end up being framed as demands for compensation rather than for the creation of the conditions for an economic alternative*".
The crisis of the industrial model and the increased awareness of the environmental impact of the activities on the territory have together caused the disintegration of the long-lasting relationship of trust between the territory and industry. This is how the union representative describes this important transition:

> *The environmental impact until the 1980s and early 1990s was not felt particularly, because the issue itself was underestimated, and also because there were no environmental protection laws regarding the impact of industrial plants. So initially, an industrial settlement in a very poor area would be supported, accepting the new industrial perspective and identifying with it.*
> *As a result, with the disintegration of the industrial apparatus and the lack of alternative investments, the relationship of trust between territory and industry and, likewise, between territory and trade union has broken down. Even in the current process of ecological transition, due to the lack of industrial and economic development policies as alternatives to petrochemicals, the territory is reluctant to go along with and support transition processes, as it seems that the "work and health option" can no longer co-exist.*

The high level of environmental pollution in the area (subsoil, air, seabed) caused by the pole's activities led, in 1990, to the designation of certain areas in the municipalities of Priolo, Augusta, Melilli and Siracusa as "areas of high risk of environmental crisis", and, in 1998, to the establishment of the Site of National Interest "S.I.N. Priolo".

<u>Health risks for citizens and workers</u>
The sixth Sentieri report (National Epidemiological Study of Territories and Settlements Exposed to Risk from Pollution), prepared by the Italian Association of Epidemiology, devotes an in-depth study to the health risks associated with the activities of the Priolo industrial site. Since the early 2000s, the site's resident population has been the subject of epidemiological investigations carried out at both regional and national level, and the site is among the areas included in the Sicilian Region's surveillance plan on areas of high environmental risk. During these years, excesses of specific pathologies have been detected; among their recognised risk factors are the exposure to substances present on the site and considered priority contaminants, given the concentrations found in the various matrices and their hazardousness. One of these is exposure to asbestos, given the presence in the municipality of Siracusa of an asbestos-cement manufacturing industry, active from 1955 to 1991, and the risk of exposure to asbestos in the employment sectors present on the site, such as petrochemical plants and port activities.

Pole data

The data presented below are taken from the dossier "Complex Industrial Crisis Area Siracusa Pole" prepared on behalf of the Region of Sicily by IZI – *Metodi, analisi e valutazioni economiche*. The dossier structured the basis for the request submitted by the Region of Sicily to the Ministry of Economic Development to recognise the pole area as an "area of complex industrial crisis" in order to be able to access national funding for ecological transition. This document represents an important tool for the detailed analysis of the vulnerabilities and potentialities of the area and the economic and social dynamics that run through it, as well as being the result of an important understanding between the various social partners (in fact, the document was signed not only by the companies involved, but also by employers, the agencies governing business activities, representatives of the municipalities, and trade union representatives).

As far as the oil sector is concerned, it is important to emphasise from the outset that **oil processing in the pole is very significant at the national level**: the share of crude oil processing in the pole with respect to the national total is significant and fluctuates between 23% and 26%. Processing in the pole has been continuously decreasing over time, from 23 million tonnes in 2000 to 14 million in 2020. This reduction, however, is in line with the national trend.

In addition to the importance of the individual companies carrying out their activities, it is important to emphasise how **the companies are strongly interconnected**: the **refineries** supply raw materials to the **chemical plants**, which in turn generate the bulk of the **naval traffic** of the ports of Augusta and Siracusa. Therefore, the ending of operations of even one of the pole's production units could put the entire Siracusa production system at risk, with significant direct and indirect effects on employment levels, the supply system and the production system.

The activities of the pole within the local labour system[4] in Augusta make the local production and employment system very important at regional level: the system is central to the production of the regional GDP, as well as for the high number of people it employs.

The manufacturing sector is fundamental in the economy of Siracusa province, more so than in any other province in the region:

- 12% of the regional manufacturing added value is produced in the province of Siracusa;
- 8.6% of the provincial added value is produced by the manufacturing sector (the highest figure at regional level);
- 14.3% of the total workforce is employed in the manufacturing sector;
- In the Augusta labour system, 85.4% of the employees in the manufacturing sector are employed in the municipalities of Augusta and Priolo Gargallo, where the pole companies operate;

[4] Local labour systems represent a territorial grid whose boundaries, regardless of the administrative articulation of the territory, are defined using the flows of daily home-to-work trips. Since each local system is the place where the population resides and works and where it therefore exercises most of its social and economic relations, home-to-work trips are used as a proxy for the relations existing in the territory (ISTAT).

- In the Siracusa labour system, 78% of the employees in the manufacturing sector are employed in the municipality of Siracusa, where there are activities related to the pole.

The specialisation index for the municipalities of the pole shows that the sectors in which there is a high degree of specialisation are those related to industry: in Augusta, the highest values are those for the manufacture of basic chemical products (0.937) and the manufacture of tanks and storage facilities (0.965). Production specialisation shows, on the one hand, a high degree of representativeness in terms of the number of employees and, on the other, the presence of **highly specialised professional profiles**, which would be more difficult to redeploy in the event of the conversion or decommissioning of production facilities.

Investments and funding opportunities for the ecological transition of the pole:

- Private investment by pole companies: €3 billion for the reconversion of production cycles:
- European funds: Just Transition Fund (JTF), Next Generation EU, Horizon Europe, EIB Group (LIFE, EAFRD);
- National Funds: CDP (Sustainable Growth Fund, Fund for Technological Innovation (FIT)), Law 181/89, Development Contract, Development Agreement

Other projects on the site:

On the site of the former thermoelectric power plant in Augusta, Enel, the National Research Council and the Science and Technology Park of Sicily have set up a **research centre** and a 1.5 MW **photovoltaic plant.**

The research centre will be used by researchers from the "Nicola Giordano" Institute for Advanced Energy Technology and will be dedicated in particular to **sustainable reclamation** and the **mitigation of the environmental impact of power generation plants and infrastructures** related to them.

The photovoltaic plant built by Enel Green Power uses the latest generation of photovoltaic modules produced in the Catania 3Sun factory. The photovoltaic project saw the **active financial involvement of the people of Augusta and local communities**, who took part in a crowdfunding initiative, which allows those who invested in the fundraising to obtain a financial return, as well as the repayment of the investment itself.

The main barriers and opportunities related to the ecological transition of the site:

Barriers:

- Lack of adequate political support from local institutions (investment, local industrial policy, agency for companies to accelerate reclamation);
- Fragility of the relationship of trust between territory, industry and trade unions;
- Lack of public funds for the transition of hard-to-abate industries;
- Presence of multinationals and highly interconnected activities (industrial policy is needed to systemise the technological investments of private companies);
- The need to facilitate administrative procedures (from central government) to accelerate the establishment of new technology-related production activities.

Opportunities:

- Development of alternative economies by focusing on port activities;

- Development of an energy hub linking the Mediterranean to the rest of Europe;
- Infrastructure of services, especially related to tourism and the protection of the natural and historical-artistic heritage;
- Strengthening a fragmented social fabric through an extended social dialogue throughout the territory that takes into account the demands of workers as much as those of citizens;
- Restructuring the role of the trade union and the relationship with workers: role of informing and organising workers with respect to new demands that go beyond the economic-salary aspect.

The 3sun Gigafactory in Catania

The development of the RES supply chain is driven as much by politics as by the needs of companies to use clean energy sources. In this sense, the creation of Europe's largest Gigafactory for the production of photovoltaic modules (3 GW per year) in the province of Catania is an important experience at national level and above all for the stimulation of new territorial development.

The TANGO (iTaliAN pv Giga factOry) project is the result of a joint venture between the Italian company ENEL Green Power, the Japanese company Sharp and the Italian-French semiconductor manufacturer STMicroelectronics. ENEL subsequently became the sole shareholder of the 3Sun Gigafactory by acquiring the shares of the other two companies (2015).

The factory, opened in 2011 in the so-called Etna Valley, had a production capacity of 160 MW and covered an area of 240,000 square metres.

The breakthrough came in April 2022 with the signing of the *grant agreement* between Enel Green Power and the European Commission, as part of the first European Innovation Fund call for large-scale projects. Through the expansion of the plant, the new industrial-size plant will increase production capacity 15-fold to 3 GW per year from the current (2022) 200 MW.

The expansion process will (according to ENEL's estimates) increase direct and indirect local employment through the creation of around 1,000 jobs by 2024 and strengthen the photovoltaic value chain in Europe. Currently, within the factory, the jobs created include the recruitment of specialised figures, in particular 550 technical-operational positions and 50 positions for university graduates.

The total investment for the development of the project amounts to approximately €600 million, of which €188 million are public funds from the European Innovation Fund and the NRP.

On a geopolitical level, this new undertaking can contribute to reducing the Europe's energy dependency (in terms of both energy and technology imports).

The progress of the project has seen successful interaction between ENEL and the social partners, the result of structured industrial relations in the electricity and energy sector at national level. Particularly important is the agreement signed in 2022 between ENEL and the sectoral trade unions at national level, which envisages extending the protections of the national contract for electrical workers to all workers in the new factory.

The energy community of Roccavaldina

Roccavaldina is a small municipality located on the Tyrrhenian side of the Peloritani Mountains. It is a municipality characterised by **socio-economic and demographic indicators typical of inland areas** (ageing population, emigration, lack of social and economic

development alternatives). The industrial area of the locality, in particular, has been completely abandoned for years. In 2021, as part of the Strategic Plan of the **Messina Community Foundation**, the Foundation dedicated a fund to the development of the inland area of the metropolitan city of Messina. The funds, in particular, will be used for the creation of an **industrial pole specialising in the production of biomaterials and innovative bioplastics and the connection with the Renewable Energy Community** that will power the pole and the historic village.

The idea of the project is to intertwine urban and industrial regeneration processes with sustainable educational and social programmes and new forms of solidarity economies that develop starting from research and technological development. The industrial project consists of converting the waste from the *Birrificio Messina* (a workers' buyout promoted by the same foundation) into biomaterials that will then be transformed into finished products.

A biomaterials research centre, a factory for finished bioplastic products and a laboratory for the creation of design prototypes in bioplastics will then be set up in the new centre.

The entire industrial pole will be the main production node of the solidarity energy community that will enable the just energy transition not only of the production pole, but also of the village (avoiding impact on the landscape).

In particular, the project thus conceived has two important innovative elements that lie in its **pre-distributive and re-distributive policies.** People with socio-medical fragilities will be employed in the industrial centre and all profits will be allocated to support programmes to combat educational poverty in the area. The project, therefore, follows a **community-based approach, that is, it proposes a business model that allows the employment of disadvantaged persons and the generation of economic resources to be invested in actions for the sustainable development of Roccavaldina**. From an employment point of view, the project will lead to the creation of seven green and high-skilled jobs, two of which will be for people in a socio-economically disadvantaged situation.

Within three years of the end of the project, it is also planned to build at least four more new bioplastics production plants and to develop 35 new jobs by promoting the replicability of the project.

In this long process, the trade unions (in particular the CGIL) played a central role in **disseminating information and knowledge about the workers' (cooperative) buyout model** among the employees and accompanying them through the process. In fact, when they started to think about the possibility of taking over their brewery, the Birrificio Messina staff were already aware of the workers' cooperative option thanks to their CGIL membership.

In general, the approach of the Messina Community Foundation has been and is central to the creation of synergy in the area, supporting **new forms of welfare and new opportunities for economic and social development**.

The Foundation delivers complex territorial strategies that are developed in two variants: on the one hand, in the fight against economic and social inequalities and, on the other, in opposing or mitigating climate change processes. The strategic action is based on three pillars:

- Promoting socio-economic systems related to the **strategic economic and human development assets of territories** (ecological and energy transition are strategic assets);
- Transforming welfare systems from assistance models to **community welfare** models that aim to accompany individuals and families throughout the social process that affects them;

- Opening up local systems to **attract creative and scientific talent** and ensure that local systems can exchange knowledge, human resources and economic resources nationally and internationally.

The Roccavaldina project idea stems from an urban regeneration programme that the Foundation promoted to work on the theme of the housing crisis through the redevelopment of two slum areas in the city of Messina. In particular, after relocating the inhabitants of these areas, a shantytown area was transformed into a bio-architecture and bio-engineering park, where the most advanced practices in the construction and monitoring of alternative energy processes are being tried out: where the shantytown used to be, a horizontal condominium has been created in which a ***smart grid*** is being tested. In other words, an energy hub supported by a storage system that is capable of **redistributing energy among the nodes of the energy community according to social algorithms** (more energy at lower costs to people with greater economic difficulties) **and environmental algorithms** (a reward mechanism for those with more virtuous environmental behaviour). This type of innovation can be exported and scaled up to other Sicilian territories, in particular the industrial pole and the village of Roccavaldina.

Section four: the role of social dialogue and industrial relations

Here below are the main indications that can be deduced from the analysis of the case studies and the dialogue with the social partners in the area. These are not only useful indications for the renewal of the trade union's role in the context of the ecological transition, but also underline the importance of a rapid and decisive intervention of industrial and training policies at local and regional level.

- Strengthening the systematic nature of training and investment policies: public policies on social infrastructure and training are necessary for the success of territorial investments in industry renewal;
- Supporting private investment through public industrial planning, avoiding the risk of socio-economic desertification;
- Structuring public policies that offer a clear vision of territorial development, linking opportunities related to the development of renewable energy hubs and experimentation with new technologies;
- Rebuilding and strengthening the relationship of trust between trade unions and local communities, in order to adequately address the difficulties related to the crisis of the industrial model linked to fossil fuels;
- Strengthening the social partners' monitoring of private investments (e.g., assessing the growth of jobs in renewables over time);
- Protecting and enhancing, through skills certification, the highly specialised professional profiles that will be subject to retraining or relocation;
- Extending and supporting the development of energy communities, with a view to strengthening territorial social cohesion and community welfare systems.