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BRIEF

Circular Economy: a lever for business competitiveness

Key Messages

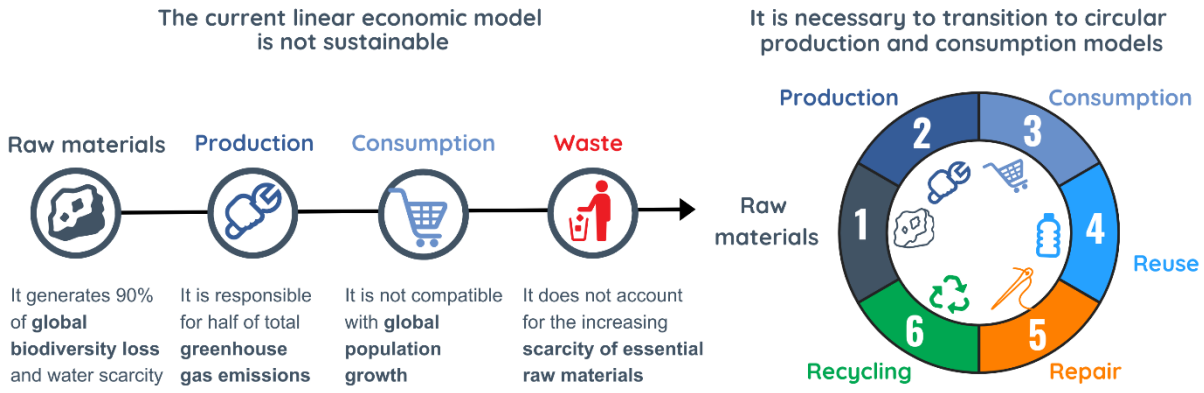
This document has been prepared as part of the activities of the Sectoral Strategies and Impact Department, with the coordination of Andrea Montanino and Simona Camerano. The authors are: Claudio Bonomi Savignon, Alessandra Locarno, Maria Gerarda Mocella, and Margherita Viti. Special thanks to Cristina Dell'Aquila and the Circular Economy Competence Center for their valuable contribution. The opinions expressed and conclusions are solely attributable to the authors and do not in any way engage the responsibility of CDP. The data reported refer to the information available as of December 15, 2024.

- **Circular production and consumption models** – which aim to preserve the value of materials and products for as long as possible, minimizing waste production – can contribute to **more sustainable resource management** and can **reduce the risk of value chain disruptions**.
- Italy managed to turn limited availability of natural resources into a strength and now stands out in Europe as **one of the leading countries** in the transition to a circular economy.
- In 2024, **almost half of the Italian firms** – especially large ones based in Northern Italy – **have already adopted at least one circular economy practice**. **Recycling** emerges as the predominant strategy, while solutions aimed at **extending the use** of products and components remain less widespread.
- Overall, the practices adopted by manufacturing firms have generated **savings in production costs** exceeding **16 billion euros**, which represents only 15% of the theoretical potential estimated for 2030.
- In terms of economic and financial performance, circular companies have shown a **greater ability to cover interest expenses** with their earnings and **acquire long-term assets** using free cash flow. Generally, they also rely less on debt compared to traditional companies.
- In the last three years, circular firms have also shown a **lower probability of default**, even during periods marked by strong exogenous shocks related to raw materials.
- In terms of **innovation**, these companies reveal a **higher potential**, as they develop new technologies, processes, services and business models. Italy ranks second in Europe in terms of circular patent applications, more than half of which are filed by SMEs.
- Despite excellent levels of circularity, Italy is struggling to improve its performance, partly because of **lower investment** compared to other major European countries. This result is influenced by the recent unfavorable economic conditions, but also reflects the Italian **entrepreneurial structure**, mainly composed of **small and micro-enterprises** with limited investment capacity.
- Enhancing the driving force of SMEs for the transition to a circular economy is therefore crucial and will require:
  i. better access to investments in **machinery and technologies** as well as in intangible assets;
  ii. **sustainable finance** to bridge investment gaps, an area in which National Promotional Banks and Institutions, as long-term investors, play a major role;
  iii. inclusion in **ecosystems** that allow collaboration and exchange of practices and knowledge.

1. Circular Economy: a long-standing vocation in Italy

- The global economy mainly operates according to a **linear model** ("take-make-dispose"), with companies extracting raw materials, producing and selling goods that are discarded as waste at the end of their lifespan.
- This approach is extremely wasteful with significant environmental implications: about **90% of global biodiversity loss** and **water scarcity** is due to the extraction and transformation of materials, fuels, and food, which contribute to about **half of total greenhouse gas emissions**.
- In a global context marked by escalating geopolitical and commercial tensions, access to raw material markets – both energy and strategic for the development of new technologies – makes economies dependent on foreign supplies particularly vulnerable.
- In this perspective, **circular production and consumption models** – aiming to preserve the value of materials and products as long as possible and minimizing waste production (figure 1) – can contribute to a **more sustainable resource management** and **reduce the risk of value chain disruptions**. For example, greater recycling capacity reduces dependence on foreign imports, particularly significant in the case of metals and critical raw materials.
- From this point of view, Italy ranks fifth among EU countries in terms of **import dependency** (48% compared to an overall EU value of 22%[1]) (figure 2). Italy's limited availability of natural resources has pushed the country to develop more efficient and sustainable production models, turning a structural weakness into a strength.
- Italy stands out in Europe as one of the most virtuous countries in the transition to a circular economy[2]. In particular, the best performances are achieved in:
  1. the **recycling rate of total waste** (urban and special), an area where Italy has no equal in Europe, demonstrating a manufacturing system strongly oriented towards recovering waste from production activities;

Figure 1 – Paradigm shift from a linear model to a circular model



Source: IRP

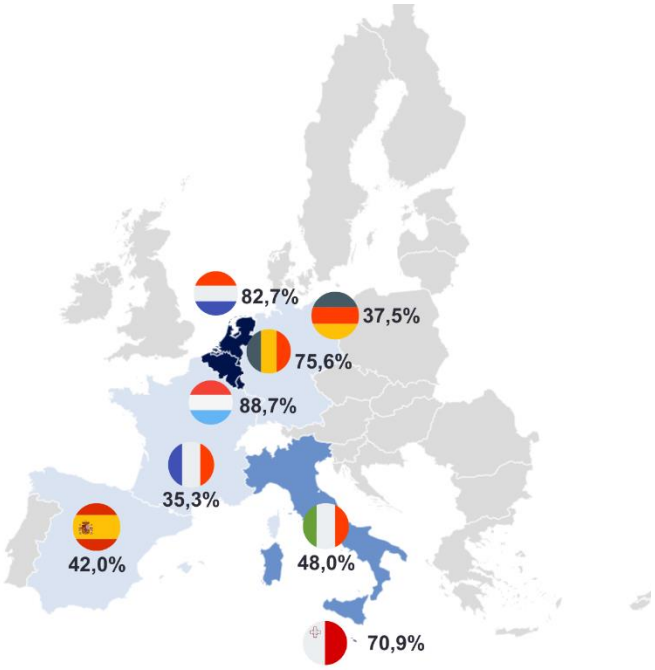
[1] Eurostat - Circular Economy, Monitoring framework 2023

[2] To monitor the progress made in terms of circularity, no universal indicator currently exists, as a single index or 'score' would not adequately capture the complexity and multiple aspects of the transition towards a circular economy model.

2. **resource productivity**, in relation to maximizing the economic value generated per unit of material consumption (Italy ranks fourth in the EU, preceded by the Netherlands, Luxembourg, and Ireland only);

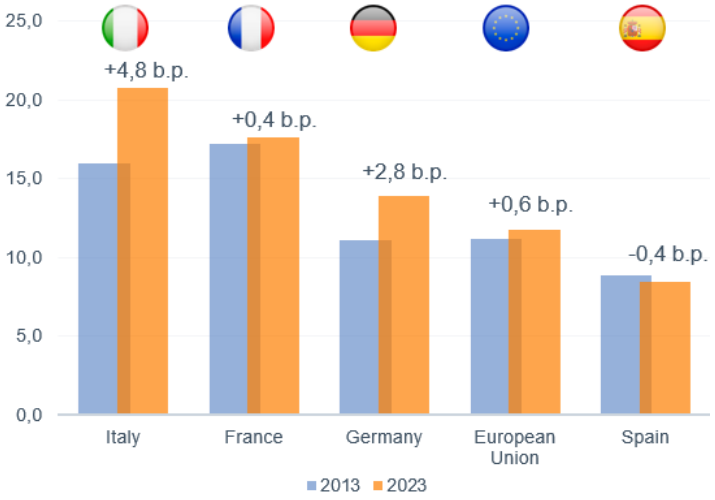
3. the **circular material use rate**, which in 2023 stood at 20.8%, is almost double the EU average (11.8%) and higher than the main European economies[4] (figure 3).

Figure 2 – European countries by dependence on raw material imports[3] (2023)



Source: Eurostat

Figure 3 – Circular material use rate in major European countries (%, 2013-2023)[5]



Source: Eurostat

2. Circular economy strategies of companies: how widespread are they in Italy?

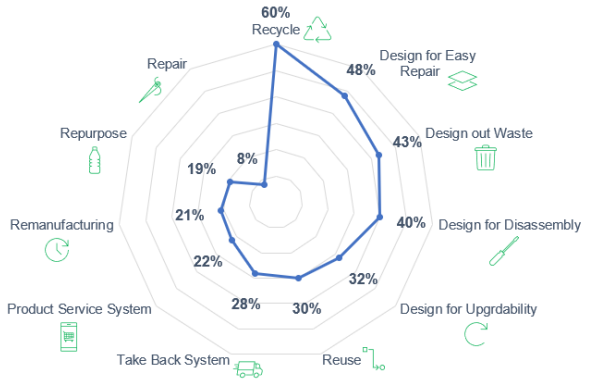
- Italy's excellent positioning is mainly due to indicators related to waste management, which, however, is only one dimension of the circular economy.
- Circular practices can be articulated along three distinct phases of the production and consumption process[6]:
  - **development**: through innovative processes oriented towards sustainability, products are developed to last longer and/or be easily repairable, upgradable, regenerated, or recycled;
  - **use**: the introduction of business models based on the concept of "product as a service" allows to maximize the lifespan and intensity of product use, which can be exploited by multiple customers during their life cycle[7];

[3] The indicator is given by the ratio between the total import of products and materials and the total direct material inputs, expressed as a percentage.
[4] Eurostat, Circular material use rate, 2023.
[5] With “b.p.” we mean the abbreviation for “basis points”.
[6] FinanCE Working Group, Money makes the world go round (and will it help to make the economy circular as well?), 2016, Ellen MacArthur Foundation.
[7] In 'product as a service' models, companies are more incentivized to produce goods that minimize the need for maintenance or replacement services at their own expense, as they retain ownership and responsibility for the product.

- **post-use**: transforming and valorizing end-of-life products into new goods or inputs allows companies to reduce waste through, for example, the development of reverse logistics[8], with a potential positive impact on disposal costs.

- Currently, in Europe and Italy, the **most mature experiences** in terms of circularity **are concentrated mainly on the post-use phase of products**, reflecting the long-standing focus on improving waste management practices.
- Overall, **42% of the Italian companies have already adopted at least one circular economy measure**[9], and a further 22% intend to do so in the future[10]. The highest concentration of these companies is in Lombardy, Piedmont, and Veneto, highlighting greater attention and awareness in Northern Italy.
- Among the most widespread practices, **recycling** emerges as the predominant one, with an average adoption rate of 60% (figure 4). Italian companies have a historical vocation for reintroducing waste into their production cycle as secondary raw materials, and where this is not possible, for creating networks of companies that allow their reuse in other businesses.

Figure 4 – Spread of circular economy practices in Italy (2024)



Source: Energy&Strategy Observatory, Politecnico di Milano

- **The packaging sector stands out as an excellence in recycling**, exceeding the European average and reaching the EU targets for 2025 well in advance[11].
- **Product design-related practices** are well-spread, with over two out of five companies adopting them. In this context, small and medium-sized enterprises particularly stand out, leveraging on Italy's strong artisanal tradition.
- In the furniture sector, for example, circular design principles are already being applied, particularly focusing on modular design and the use of recyclable or recycled materials. The Eco-design directive, already partially implemented in this area, will encourage a broader market introduction of products designed to be circular in other sectors (e.g., chemicals, textiles, and steel).

[8] Reverse logistics refers to the process opposite to the distribution chain, where consumers return the received products to the manufacturer or retailer through the same supply chain path. The goal is to maximize the value of returned products and minimize the costs associated with their management and handling.

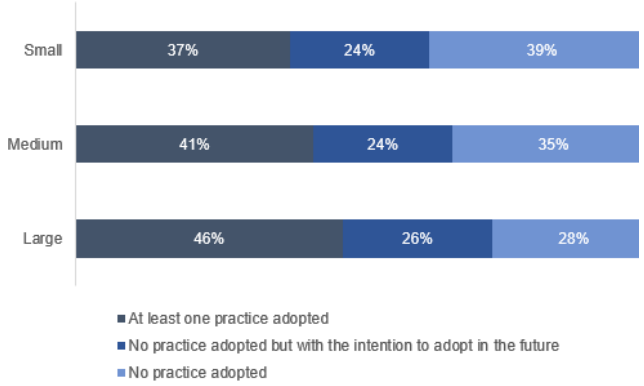
[9] Energy & Strategy, Circular Economy Report 2024, December 2024, Politecnico di Milano. A sample of 550 companies operating in various sectors.

[10] Circular economy practices refer to strategies dedicated to the design phase (e.g., Design Out Waste), extending the use of products and components (e.g., Repurpose), adopting servitization/reverse logistics models (e.g., Product Service System), and enhancing the end-of-life value of products (e.g., Recycle).

[11] By December 31, 2025, the goal is to recycle at least 65% by weight of all packaging waste; 50% for plastic; 25% for wood; 70% for ferrous metals; 50% for aluminum; 70% for glass; 75% for paper and cardboard.

- **Solutions aimed at extending the use of products and components** are less widespread. Among these, reuse sees greater adoption by companies, at a time when the second-hand economy is experiencing strong growth, driven mainly by younger generations.
- Conversely, the practice of repair is the one that struggles the most to gain traction (with an adoption rate of only 8%). The Right to Repair directive, which lays the groundwork for the creation of an integrated and widespread system, intends to support this goal. It ensures consumers have access to services that promote repair, thus limiting the planned obsolescence of products.
- The ability to adopt circular practices is significantly influenced by **company size**. In particular, the adoption rate by **large** companies is 46%, compared to 37% for **small** ones (figure 5). Persistent **structural and operational barriers** (e.g., difficulty in accessing credit and lack of know-how) continue to pose **obstacles for SMEs**, leading to an increase, compared to 2022, in the share of companies less inclined to undertake circular economy paths.
- In this sense, **the fragmentation the Italian's production business scenario poses the risk of having numerous small centers of excellence that are not systemically structured** and not full leveraged in terms of competitiveness.

Figure 5 – Circular economy practices: adoption level for Italian companies (2024)



Source: Energy&Strategy Observatory, Politecnico di Milano

3. Circularity as a lever for business competitiveness

- The good diffusion of the circular economy in Italy is linked to the growing awareness among companies of the economic advantages it can bring. Specifically, companies, especially large ones, report concrete benefits in terms of reducing waste generated in production processes, lower use of raw materials – often replaced with recycled materials – and improved product quality. Economically, these same benefits translate into brand strengthening, waste valorization, production cost reduction, and, as a consequence, better financials.
- In 2024, the adoption of circular practices generated **savings** in production costs for manufacturing companies exceeding **16.4 billion euros.** However, **this figure represents only 15% of the estimated savings potential**, which could reach 119 billion euros by 2030[12].
- In terms of creditworthiness, Cerved finds a **better economic-financial profile for companies adopting circular economy strategies**[13]. Specifically, the most virtuous companies report:
  - **higher cash generation** for investment, 1.5 times higher than traditional companies;

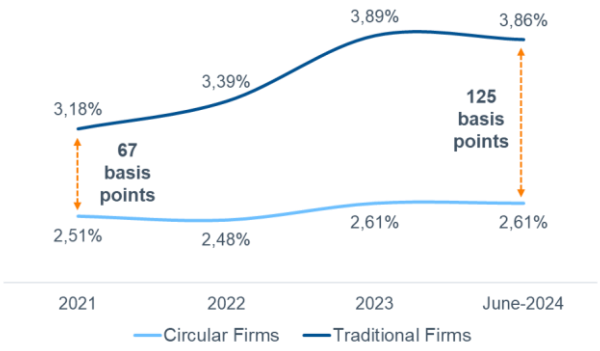
[12] The theoretical potential savings by 2030 have been estimated by the Energy&Strategy Observatory, assuming that within the sample, all companies in each macro-sector adopt circular economy practices.

[13] Cerved, The impact of circular economy on the risk profile of Italian companies, July 24.

- **lower reliance on debt** (-6%) and higher cash flows in relation to gross debt (+314 basis points);
- **greater ability to cover debt costs** through operating results (+24%);
- **lower probability of default**, regardless of company size (80 basis points differential for large companies and over 200 for SMEs).

- In the last three years, circular companies have shown a **lower default probability**, even during periods marked by strong exogenous shocks related to raw materials, demonstrating greater credit resilience (figure 6).

Figure 6 – Evolution of default probability (%, 2021-2024)



Source: Cerved Rating Agency

- Moreover, circular enterprises inherently demonstrate a **higher potential for innovation**, as the efficient use of resources and the treatment and transformation of waste require process and product innovations. For example[14]:
  - **Life Cycle Assessment (LCA) tools** help evaluate the environmental impact of products at every stage of their life cycle, guiding more sustainable decisions;
  - **IoT and blockchain technologies** can track the path of materials through supply chains, reducing waste and enabling material recovery at end-of-life;
  - **AI and Big Data** optimize resource use, predicting maintenance and replacement needs, leading to more efficient operational processes;
  - **new recycling technologies** allow recovering materials and substances from waste streams previously considered unrecoverable: notable examples include chemical recycling of plastics and hydrometallurgy for recovering Critical Raw Materials from electronic waste and batteries.

- In this context, **Italy stands out in Europe for the number of registered patents**, ranking second after Germany. The country has seen steady growth since 2016, reaching a peak in 2020 with over 60 circular patents registered. Out of these, **more than half (52%) were developed by national SMEs**, which thus emerge as key players in the country's circular innovation[15].

- Italian innovation is primarily concentrated in the **manufacturing sectors**, particularly in the **chemical industry** and **waste management**, showing a consistent trend with other European countries. In terms of activities, the **patents filed** mainly focus on areas that already represent **strengths of the national production system**, such as eco-design, recovery, and recycling. However, **innovations related to the supply chain** are less developed, which would instead allow for a more integrated and systemic approach to circularity.

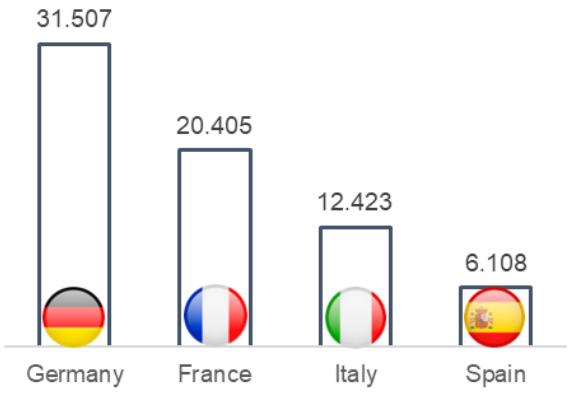
[14] Accenture, Circular Advantage; Ellen MacArthur Foundation, Building Prosperity, 2024.

[15] Energy & Strategy Report, Politecnico di Milano, December 2023

4. More investments to accelerate Italy's virtuous path

- To accelerate the transition towards a sustainable economic model, it is necessary to adopt effective measures that direct funding towards more sustainable production and consumption models.
- Globally, in the last five years, 334 billion dollars went towards financing and investing in circular economy through various asset classes. The number of corporate and sovereign bonds issued to support this transition has also increased more than 16 times.
- However, despite these positive international trends, Italy is lagging behind other major European countries in terms of circular economy. Only Spain invests less in sectors related to circular economy, such as recycling, repair, reuse, rental, and leasing (figure 7). For this reason, despite starting from excellent levels of circularity, Italy has struggled to improve its performance in recent years.

Figure 7 – investments in circular economy's sectors (millions €, 2021)



Source: Eurostat

- Companies engaged in the transition to a circular economy mostly make **small-scale investments** (amounts less than 50,000 euros)[16] with generally short payback times. This result, although partly influenced by the unfavorable economic context of recent years, reflects the Italian entrepreneurial structure, mainly composed of small and micro-enterprises[17], which generally have limited investment capacity.
- Therefore, it is necessary to create the conditions to enhance the driving force of SMEs towards the transition to a circular economy.

A) SUPPORT TOOLS

- Access to investments in machinery and technologies as well as intangible assets is essential to facilitate the **adoption of sustainable management technologies and practices.**
- Measures such as **Transition 4.0** and **Transition 5.0** are designed to support research and innovation by offering targeted tax incentives and promoting investments for the ecological and digital transition. However, the uncertainties related to the possibility of benefiting from the Transition 5.0 incentives for investments in the circular economy create an additional barrier for businesses. The Transition 5.0 Plan (unlike Transition 4.0) specifies digital and energy transition as its objectives, without explicit references to the circular economy.

B) SUSTAINABLE FINANCE

- SMEs face greater difficulties in credit **access credit**, which is why nearly one in two resorts to self-financing[18]. In this context, sustainable finance can be a critical tool to bridge investment gaps in the circular economy.
- By guiding the strategic behavior of companies to which it provides financial resources, **sustainable finance** could significantly contribute to promoting investments towards more sustainable practices, also **thanks to dedicated financial products** to support circular economy projects.

[16] Energy & Strategy Observatory, Circular Economy Report 2023, Politecnico di Milano.
[17] The share of medium-large enterprises is around 1%, with a contribution to added value of 55%. ISTAT, Annual Report 2023.
[18] Forum for the Sustainable Finance, Italian SMEs, policrisis and sustainable finance: the opportunities for enterprises.

- In this context, **National Promotional Institutions**, which promote sustainable growth through **long-term investments**, can play a central role. For example, in 2019, the main institutions of the EU launched the **Joint Initiative on Circular Economy (JICE)** with the aim of supporting projects that accelerate the transition to a circular economy, enhancing synergies and complementarities in areas where joint action can bring greater value.
- To date, the adoption of sustainable finance instruments (e.g., green loans, green bonds, sustainable private equity) is still low, especially among SMEs (only 26% use at least one similar tool[19]). Because of the high costs and lack of internal skills, SMEs have difficulty in measuring and communicating their environmental, social, and governance (ESG) performance, a key requirement to access sustainable finance.
- In this sense, the standardization and streamlining of ESG reporting for SMEs, as proposed carried out by the "**Sustainable Finance Table**" promoted by the Ministry of Economy and Finance[20], could be a significant stimulus. Producing relevant information could make bank credit access simpler, with lower costs and favorable conditions, as well as alternative and complementary sustainable financing tools. Among these, minibonds, which are small-scale bond issues, appear to be the most feasible option for SMEs.
- However, the **lack of shared standards** for measuring circularity at an international level remains a key challenge, which risks hindering the development and access to both dedicated and non-dedicated financing, credit risk assessment, and the transferability and replicability of projects and investments across regions and jurisdictions.

C) ACCESS TO "CIRCULAR" PRODUCTION NETWORKS

- With a view to support Italy's excellence expressed by the many small and medium-sized enterprises, it is fundamental to facilitate their access to **strategic projects** involving large companies or investors for the development of innovative products/processes with a circular approach.
- To this end, large companies that position themselves as driving forces in circular economy can act to stimulate the **involvement of SMEs** in such initiatives and, where possible, promote the activation of specific support measures.
- For SMEs belonging to district production systems, tools that intervene at district level may help to create an ecosystem of players with whom smaller businesses can easily interact and collaborate.
- Similarly, **digital infrastructures**, such as the Italian Platform of Circular Economy Actors[21] (ICESP) or the Industrial Symbiosis Platform[22], allow the connection of different subjects and key actors, fostering the exchange of practices and knowledge aimed at promoting the circular economy.

[19] The most used tools include guarantee funds with ESG constraints (17%), credit lines linked to ESG objectives, and sustainable private equity and private debt funds (both at 14%).
[20] Ministry of Economic and Finance, Consultation on SMEs and sustainable finance. December 6th, 2024.
[21] The Italian Platform of Circular Economy Actors (ICESP), the national interface of the European Circular Economy Stakeholder Platform (ECESP), represents a digital infrastructure capable of voluntarily and freely connecting various subjects and key actors, promoting the exchange of practices and knowledge aimed at promoting the circular economy. ICESP, under the presidency and coordination of ENEA, has over 170 members and about 800 experts from 290 organizations participating in the various Working Groups and Cross-cutting Groups.
[22] The Platform aims to serve businesses and other operators in the area by activating resource transfers such as materials, energy by-products, water, services, and skills, and by offering other operational tools (e.g., regulatory database, LCA and Ecodesign tools, best practices) particularly aimed at SMEs. The Platform was developed by ENEA as part of the Ecoinnovation Sicily Project with MIUR funds for the Sicily Region but can now be used throughout Italy.