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## Solutions and technologies for responsible energy usage



Since it operates in the energy sector, Plenitude is aware of the fundamental role that it can play in promoting the energy transition.

The Company defined a decarbonization strategy that aims to achieve

carbon neutrality Scope 1, 2 and 3 by 2040 through increasing the installed capacity of the renewable energy production plants, offering energy-saving solutions such as energy saving and distributed photovoltaic interventions for homes and compa-

nies, progressively offsetting the CO<sub>2</sub> emissions from gas combustion by customers and the developing electric mobility services.

PURPOSE	MACRO-OBJECTIVES	OBJECTIVE DESCRIPTION
<p><b>PROVIDING SOLUTIONS AND TECHNOLOGIES FOR RESPONSIBLE ENERGY USAGE</b></p>	<p>RENEWABLE ENERGY</p>	<p>Enhancing renewable energy production and selling activities.</p>
	<p>ENERGY EFFICIENCY</p>	<p>Development of solutions available to Customers to increase energy efficiency.</p>
	<p>E-MOBILITY</p>	<p>Expansion of the network of charging points for electric vehicles powered by renewable energy throughout Italy and abroad.</p>

## 2.1

## Renewable energy

MACRO-OBJECTIVES	2022 TARGETS	2022 PERFORMANCE	FUTURE TARGETS
<b>RENEWABLE ENERGY</b>	Over 2 GW of renewable energy capacity installed in 2022	2.2 GW of installed capacity of renewable energy production plants (46% wind and 54% photovoltaic), which allowed 2.55 TWh of renewable energy to be produced. In 2022, emissions of 1,211 thousand tonnes of CO <sub>2</sub> eq were avoided (+ 136.5% compared to 2021). <b>✔ OBJECTIVE ACHIEVED</b>	Over 3 GW of capacity installed from renewable energy generation plants in 2023
	Increase in certified renewable electricity supply in 2022	12.5 TWh of certified electricity sold with European guarantees of origin in Europe <b>✔ OBJECTIVE ACHIEVED</b>	Additional increase in certified renewable electricity supply in 2023
	Extension of the project entailing thermography through the use of a drone in 2022	In 2022, thermographic drone inspections were extended to 13 plants in Italy (8 plants) and France (5 plants) compared to the pilot plant conducted in Italy in 2021. <b>✔ OBJECTIVE ACHIEVED</b>	In 2023: • Continue <b>thermographic inspections</b> by drone • Start experimenting with inspection of <b>wind blades</b> by drone

2022 saw Plenitude strengthen its presence in renewables by reaching an installed capacity of 2.2 GW, doubling the 2021 result and expanding the project pipeline to around 13 GW. This growth was achieved through the organic development of projects in the United States, Kazakhstan and Spain, as well as through acquisitions in Europe and the United States.

## 2022 Performance

In Italy, the Company completed the acquisition of **PLT Energia**, a major player in the energy sector with a portfolio that includes over 400 MW of assets in Italy, a pipeline of projects under development<sup>5</sup> in Italy and Spain, and a base of 90,000 retail customers in Italy. Growth also involved **GreenIT**, the joint venture dedicated to the production of electricity from renewable sources in Italy, which was created through a partnership between CDP Equity<sup>6</sup> and Plenitude. GreenIT acquired a portfolio from the Fortore Energia Group con-

sisting of four onshore wind farms operating in Italy with a total capacity of 110 MW, of which 56 MW in Plenitude.

In Spain, Plenitude acquired the El Monte wind farm that, with its 105 MW and 5.5 MW turbines, is the largest wind farm in its portfolio and has completed the 50 MW photovoltaic plant in Cerillares. Also in the United States, more precisely in Texas, Plenitude significantly expanded its portfolio by purchasing a 266 MW photovoltaic system and complet-

ing another system for a further 263 MW.

In 2022, Plenitude achieved its announced goal of increasing installed capacity to more than 2 GW, reaching **2.2 GW**, doubling the year-end 2021 figure (1.1 GW). Of this capacity, 37% is located domestically and 63% abroad (mainly in the United States, Spain and France), with **54%** relating to **photovoltaic systems** and the remaining **46%** to **wind farms**. Renewable energy production amounted to 2.55 TWh in 2022, al-

5 - For further information, please consult the following link: [Plenitude strengthens its presence in Italy and Spain by signing an agreement to acquire 100% of PLT](#)

6 - For further information, please consult the following page: [GreenIT acquires 110 MW wind projects in Italy](#)

most three times as much as in 2021 (1 TWh). About 70% is located abroad (mainly in the United States, Spain and Kazakhstan) and the remaining 30% is in Italy. As a result, emissions of **1,211 thousand tonnes of CO<sub>2</sub>eq (tCO<sub>2</sub>eq)** were avoided in 2022<sup>7</sup>, an increase of 136.5% compared to the avoided emissions of 512 thousand tCO<sub>2</sub>eq in 2021.

Since April 2022, Plenitude has been offering all of its *Business To Consumer* segment customers energy **certified through guarantees of European origin**, as generated by plants fuelled by 100% renewable energy<sup>8</sup>. This made it possible to arrive at about **12.5 TWh of certified electricity** through guarantees of origin in 2022, out of a total of energy supplied on the European market, amounting to approximately 18.8 TWh.

Furthermore, to drive change in an ever-changing external environment, Plenitude searches for innovations that promote the sustainable develop-

ment of new business and technology solutions through partnerships with start-ups and industry-leading companies. It is with this in mind that, through Eni Joule<sup>9</sup>, Plenitude has selected a start-up company that proposes a variable-geometry micro-wind solution with passive self-adaptation, capable of producing energy even in weak, intermittent and short-duration winds. Plenitude then initiated developments of the technology towards residential applications, which, being typically located at low altitudes, are often in such conditions.

At the same time, Plenitude has extended the project started in 2021 that envisages the use of drones for **thermographic inspections** to 13 plants distributed between Italy and France. In photovoltaic modules, malfunctions at the individual cell level can affect the performance of the module and the photovoltaic string to which it belongs. In causing production losses, the malfunction usually has an abnor-

mal temperature rise at certain points. In situations such as these, a thermographic analysis of the operation of the photovoltaic system is a simple and quick procedure to understand where to intervene, allowing production losses to be reduced.

In summary, thermography is able to detect insulation, losses, infiltration and humidity and is therefore essential to conduct precise measurements and immediately identify energy-critical areas. More specifically, compared to traditional ground thermography, the thermographic inspections carried out with drones allow a greater number of photovoltaic modules to be examined in less time, increasing the efficiency of operations and the safety of the operator.

## Future targets

In 2023, Plenitude intends to expand its portfolio under management further, **exceeding 3 GW of installed capacity**<sup>10</sup> and, in the long-term, aims to exceed 7 GW by 2026 and more than 15 GW in 2030. Based on forward-looking forecasts, by 2040, the electricity generation capacity from renewable

sources from proprietary plants will be able to meet the energy needs of the customer base.

Furthermore, the Company is committed to **extending the project involving thermographic inspection by drone** to other plants and launching a pilot

project in Italy to use drones also for inspections of wind farm blades. Finally, field tests of **innovative wind power technology** developed in 2022 are planned for 2023.

7 - Avoided emissions represent the amount of CO<sub>2</sub>eq that would have been emitted into the atmosphere given the same electricity production with the current generation mix of the various producing countries. For details on the calculation methodology, please refer to paragraph 3.1.2. [Calculation methods](#).




8 - The electricity consumed by residential Customers does not come directly from a renewable electricity generation plant. Instead, Plenitude acquires the Guarantees of Origin from third party renewable energy producers to certify that electricity produced from renewable sources has been generated in a quantity that equals to the Customer's annual consumption.

9 - Eni's business school has supported the growth of sustainable enterprises with training courses and acceleration programmes since 2020. For more information, please visit the following page: [Our mission for innovation | Joule Eni](#)

10 - For further information, please consult the following link: <https://www.eni.com/assets/documents/eng/investor/presentations/2023/2023-capital-markets-update/2023-Capital-Markets-Update-presentation.pdf>

## 2.2

## Energy efficiency

MACRO-OBJECTIVES	2022 TARGETS	2022 PERFORMANCE	FUTURE TARGETS
ENERGY EFFICIENCY	Through SEA: <ul style="list-style-type: none"> <li>Continuation of interventions through CappottoMio and Energy Performance Contract</li> <li>Continuation of project management activities to obtain Energy Efficiency Certificates or White Certificates</li> </ul>	Energy requalification measures that avoided the emission of around 57,000 tonnes of CO <sub>2</sub> eq in 2022 (+168% compared to 2021) <b>by end customers.</b>  OBJECTIVE ACHIEVED	Through SEA, in 2023: <ul style="list-style-type: none"> <li>Continuation of energy efficiency measures (<b>CappottoMio</b>)</li> <li>Consolidation and growth in Energy Performance <b>Contracts</b></li> <li>Continuation of project management activities to obtain <b>Energy Efficiency Certificates or White Certificates</b></li> </ul>
	Through Evolvere: 28 MW of installed capacity from owned photovoltaic plants (in Plenitude)	Through Evolvere: 28 MW of installed capacity from owned photovoltaic plants (in Plenitude)  OBJECTIVE ACHIEVED	Through Evolvere, in 2023: Continued commitment to the installation of photovoltaic capacity for potential prosumers
	Finalisation of preliminary development activities for the management of Renewable Energy Communities (RECs)	Plenitude's commitment to the implementation of Energy Communities continued on the technological, dissemination, regulatory and operational levels. However, the preliminary activities under the 2022 target are still unfinished due to incomplete regulations.  IN PROGRESS	In 2023: <ul style="list-style-type: none"> <li>Extend the functionality of IT mediums to induce consumer behavioural changes</li> <li>Complete the preliminary development activities for the management of Energy Communities</li> <li>Initiate commercial activity for the realisation of RECs</li> </ul>

The **efficient management of energy demand and consumption** is a fundamental aspect of the energy transition, as it allows **its demand to be reduced** and, as a consequence, the impacts related to its production can be reduced. Thanks to the acquisition of important companies such as Sea (Plenitude's ESCO - Energy Service Company), Evolvere and Enera and the collaboration with a wide network of business partners, Plenitude offers its customers a vast range of energy efficiency solutions through **energy upgrades** on buildings and the **installation of photovoltaic systems** in the different countries where the retail business area operates.

## 2022 Performance

As it had set out to do in 2021, Plenitude continued to offer its customers various energy upgrades during 2022.

In particular, with the '**CappottoMio**' service, Plenitude, through its subsidiary SEA, undertook energy requalification and earthquake-proof consolidation works in condominiums and single-family buildings that resulted in

the avoidance of around 35,000 tCO<sub>2</sub>eq (an increase of 62% compared to 2021). Furthermore, with the signing of **energy performance contracts (EPC)**<sup>11</sup>, Plenitude and SEA carried out **interventions for requalification** and energy efficiency for industrial customers such as large enterprises and SMEs, thanks to which they were able to avoid the emission of 2,669 tonnes of CO<sub>2</sub>eq in

2022. Nevertheless, Plenitude continues to pursue project management activities to obtain **Energy Efficiency Certificates (TEE)**, which in 2022 resulted in the avoidance of 19,610 tCO<sub>2</sub>eq emissions. Overall, emissions avoided through energy upgrades by the end market amounted to around **57,000 tCO<sub>2</sub>eq**<sup>12</sup>.

11 - The EPC model implies that SEA covers the initial investment and management costs of the intervention, while the customer pays the Company a share of the energy savings generated.

Through its subsidiary **Evolvere**, Plenitude provides **sales, installation, management, and monitoring services for photovoltaic systems** directly to end customers, which thus become prosumers, meaning consumers who produce and consume energy and renewable, storing the unused energy and injecting the surplus into the grid. In 2022, Evolvere owned photovoltaic systems in Italy, corresponded to 40 MW, of which 28 MW of installed capacity in Plenitude. Evolvere assembles more than **160,000 prosumers** from all over Italy through

the **My Solar Family** digital community, which allows them to monitor the energy and economic flows related to their (mainly residential) photovoltaic system. This is possible, also thanks to **Eugenio**, a proprietary technology made up of a cloud system and hardware installed at the Customer's premises. **Eugenio** is Evolvere's smart energy ecosystem that allows to monitor and manage photovoltaic system, storage and energy flows, to maximise energy efficiency and self-consumption, making the investment virtuous and using renewable energy.

In 2022, an agreement was reached to set up a Joint Venture between Plenitude and Elmet, a company of the Gruppo Costruzioni Turistiche Immobiliari (Cotim), which will be dedicated to the design, construction, operation and maintenance of an energy system to meet the needs of the Chorus Life smart district in Bergamo.

## Renewable energy communities (RECs): a new model for sharing energy

Renewable Energy Communities are based on the **collaboration** between several actors to produce, self-consume and share photovoltaic energy through the public distribution network. They are backed by an incentive tariff, a reduction in grid charges (proportional to the energy that they can share), and the withdrawal of the fed-in energy by the GSE. Such measures encourage people to take part in **self-production initiatives**, even without being the owner of a roof or making investments but simply consuming the community energy. There is no need to buy and sell energy between participants, only to adhere to the community. This stimulates the installation of new photovoltaic power and the local use of the energy thus produced, with a double environmental benefit. As it has always been a convinced promoter of new energy solutions, Plenitude aspires to support the RECs throughout the useful life of the community and systems. To this end, for over three years the Company has been

monitoring the regulatory path (which has yet to be finalised) that is leading to the development of communities in Italy and took action on several fronts in 2022.

These include: technological (e.g. application and software development), dissemination (e.g. meetings and workshops with associations) and regulatory (e.g. participation in relevant regulatory consultations). However, the preparatory process slowed down, and by the end of 2022, it still needed to be completed. The delay was caused by the low demand for the design and start-up of RECs due to the wait for the Regulatory Authority for Energy, Networks and the Environment (ARE-RA) and the Ministry of Environment and Energy Security (MASE) to complete the regulatory framework and start publishing the National Recovery and Resilience Plan (NRP) calls for RECs. The expected completion of the regulatory framework in early 2023 will remove uncertainties and

complete the preparatory path, as well as build confidence in the ERC promoters and kick-start demand.

In particular, on the operational front, it activated, in cooperation with Evolvere and RSE, the **EvoNaRse project** involving a block of flats consisting of 30 residential units and two commercial businesses located on the ground floor of the building. In the building, the company installed a 10 kWp photovoltaic system on the roof and a 5 kW/12 kWh battery storage system in the technical rooms. The energy generated by the solar panels is used directly (or by means of storage) to power the common services as a priority, while the residual production is intended for sharing with the apartment blocks that have joined the project. One of the most interesting aspects of EvoNaRse is the integrated solution for real-time monitoring of the energy produced by the photovoltaic modules on the roof, stored in the batteries and consumed by each user.

12 - Avoided emissions related to requalification measures include CappottoMio, EPC and TEE, and refer to energy savings due to energy efficiency in buildings. For details on the calculation methodology, please refer to paragraph [3.1.2. Calculation methods](#).

### Future targets

Plenitude will continue offering energy requalification services for condominiums, single-family buildings, industries and small and medium enterprises. In 2023, the implementation of interventions through the CapottoMio and Energy Performance Contracts (EPC) will be continued. Project management activities to obtain Energy Efficiency Certificates (TEE) will also continue.

Evolvere confirms its commitment and objectives in continuing to install photovoltaic capacity for potential

prosumers, even in the face of an ever-changing regulatory environment in the renewable sector.

In 2023, the design and implementation of an energy system to meet the needs of the Chorus Life smart district in Bergamo are scheduled to begin. The energy system will be managed with an innovative, dynamic dispatching system based on artificial intelligence algorithms that will minimise CO<sub>2</sub> emissions.

In the smart district area, further evaluations of initiatives to maximise

the energy efficiency of the urban district are underway, as well as a number of initiatives to establish Energy Communities.

Plenitude is also expected to be increasingly involved in initiatives related to the issuance of European, national and regional calls (e.g. National Recovery and Resilience Plan (NRP)) related to energy efficiency.

## 2.3 e-mobility

MACRO-OBJECTIVES	2022 TARGETS	2022 PERFORMANCE	FUTURE TARGETS
<b>E-MOBILITY</b>	Through Be Charge: 12,950 charging points installed in Italy and Europe by the end of 2022	13,093 charging points for electric vehicles installed by the subsidiary Be Charge, which in 2022 avoided the emission of 7,405 tonnes of CO <sub>2</sub> eq into the atmosphere (+279% compared to 2021) by electric vehicles in mobility <b>🟢 OBJECTIVE ACHIEVED</b>	Through Be Charge: About 20,000 installed charging points as at 31/12/23
	Through Be Charge, advancement of projects in 2022 in the following areas: <ul style="list-style-type: none"> <li>• Demand response: real time despatching optimisation algorithms</li> <li>• Stationary storage</li> <li>• Digital products</li> </ul>	Through Be Charge: development of products based on big data & advanced analytics: <ul style="list-style-type: none"> <li>• Demand Response: qualifying charging infrastructure for UVAM project</li> <li>• Stationary storage: Four units ordered and delivered</li> </ul> <b>🟡 IN PROGRESS</b>	Through Be Charge, in 2023: <ul style="list-style-type: none"> <li>• Demand Response: developing algorithms for V1G and enabling V2G</li> <li>• Stationary storage: Order for four more units under approval</li> <li>• Finalise a product to be shared with selected targets of customers and potential partners.</li> </ul>

Through its subsidiary Be Charge, Plenitude invests in the electric mobility market, supporting the installation of **charging stations** for electric vehicles powered by renewable energy throughout Italy and abroad. Plenitude's objective is to accelerate the transition to a **more sustainable and less polluting mobility model**.

## 2022 Performance

With its acquisition of Be Charge in November 2021, Plenitude, with a total of **13,093 charging points** installed in December 2022 (+111% compared to 2021), is **now one of the most important operators in the electric vehicle charging services segment in Italy and Europe**. Thanks to the service offered, in 2022, the emission into the atmosphere of **7,405 tonnes of CO<sub>2</sub>eq<sup>13</sup>** by

electric mobility vehicles was avoided, tripling the result achieved in 2021 (1,950 tCO<sub>2</sub>eq).

The Company is playing a leading role in the radical transformations taking place in the energy sector. In its capacity as a high-tech Company, it integrates the innovative management of digital flows and the new activities

of the energy market with the electric mobility sector. It is also involved in innovative projects on both the technological and digital flow management fronts. In this regard, in 2022, it undertook several projects that will have a significant impact in terms of benefits for the energy system in the following areas:

### DEMAND RESPONSE

As part of the **Demand Response** activity, which enables the provision of flexibility resources to the distribution and transmission grid, several recharging infrastructures were qualified to provide flexibility services to the distribution and transmission grid.

These qualifications are part of the UVAM (Virtual Enabled Mixed Units) pilot project organised by Terna, the national electricity grid operator, which enables electricity consumption units, electricity production units and batteries, including electric vehicle charging stations, to provide flexibility services vital to the proper functioning of the electricity system. Flexibility consists of the readiness of these units to change their electricity consumption and production profiles should the need arise to balance electricity production and consumption at the grid level. In the case, for example, of the recharging operation of an electric vehicle, if there is an imbalance on the electricity grid between the energy produced and the energy consumed, it is possible to intervene by temporarily reducing the energy absorbed by electric vehicles connected to the Be Charge infrastructure.

### STATIONARY STORAGE

**The use of stationary storage systems combined with electric vehicle charging stations** is an enabling factor for users to enjoy the benefits of fast charging infrastructure, even in remote locations or in locations with limited grid connection potential.

During 2022, four booster batteries with 200 kW of power and 100 kWh of storage capacity were installed for each site. When combined with a limited power grid connection, they will enable the installation of high-power charging stations that would otherwise not have been possible to power.

13 - The calculation of the avoided CO<sub>2</sub>eq emissions is based on data provided by ISPRA on the average emissions of the Italian ICE vehicle fleet. For details on the calculation methodology, please refer to paragraph [3.1.2. Calculation methods](#).

## DIGITAL PRODUCTS

The development of new digital products based on big data was the focus of a pilot project that Be Charge implemented during the reporting year. The aim of the project is to offer a better service to customers by also developing communication in line with their characteristics through physical and digital touchpoints. The project has had its first analysis and design phase and will see the product finalisation part in 2023.

Again in the academic area, several Company executives are annually involved in research projects related to sustainable mobility, electricity markets and Big Data & Analytics in collaboration with the Energy Strategy Group of the Politecnico di Milano.

### Future targets

In 2023, Be Charge aims to further expand its network of public charging stations for electric vehicles in Italy and Europe, with plans to reach **about 20,000 charging points installed in Italy and Europe** by the end of the year<sup>14</sup>.

The Company will also still be engaged in innovative projects on both the technology and digital flow management fronts. In particular, as part

of the Demand Response activity, the development of real-time dispatching algorithms is underway, which will make it possible to perfect modulation in V1G mode (charging service without feeding electricity into the grid). Furthermore, tests are underway to enable V2G modulation (charging service with electricity fed into the grid). As far as stationary storage is concerned, an additional four units are expected to be delivered. In 2023,

the company plans to improve customer service by also working on dedicated communication.

The company will also continue its academic collaboration, with executives and employees already engaged in research projects on sustainable mobility, electric markets and the world of big data and analytics with the Energy Strategy Group of the Politecnico di Milano.

14 - For further information, please consult the following link: <https://www.eni.com/assets/documents/eng/investor/presentations/2023/2023-capital-markets-update/2023-Capital-Markets-Update-presentation.pdf>