CO-CLEAN

Co-designed and implementation of local sustainable energy action

CROSS BORDER RES & RUE DEVELOPMENT PLAN

PROJECT MAIN OUTPUT O.T1.1

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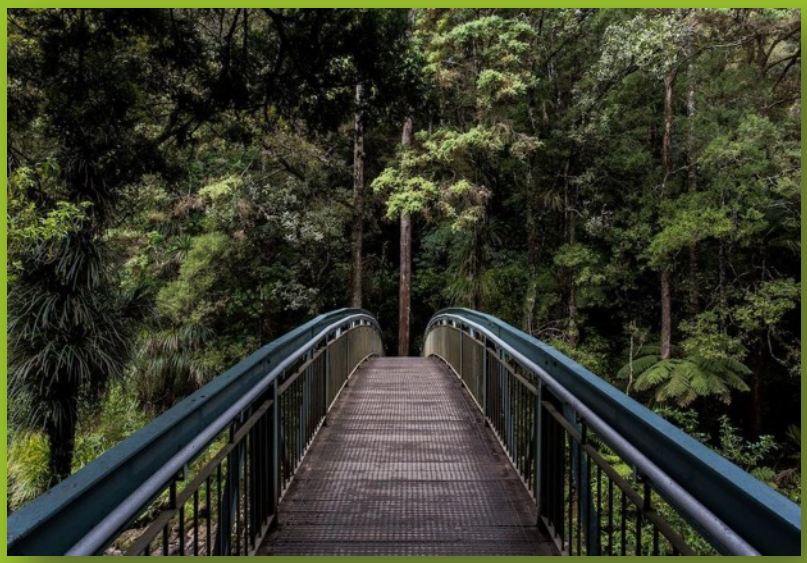

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1. Introduction

1.1 Summary

The cross-border RES and RUE development plan aims to advocate for local sustainability and energy transition, with a specific focus on establishing renewable energy communities. In particular, it aims to provide opportunities to learn about innovative energy market strategies for transitioning from a fossil fuel-based system to a sustainable model based solely on renewable energy.

The main beneficiaries are the five local public bodies and their communities that have benefited from concrete interventions for the rational use of energy and the implementation of production and self-consumption renewable energy systems.

The document begins with an overview of the European CO-CLEAN project, funded by the Interreg IPA CBC Italy-Albania Montenegro 2014/2020 Programme, by stating the project's objectives, presenting the main partners and their pilot actions, and briefly describing the main outputs of the project.

After a short introduction to the energy transition process, the development plan provides insight into the partner countries' policy and legal framework for renewable energy production, energy efficiency, and Renewable Energy Communities. In particular, this section aims to inspire and encourage reflection on each country's legal framework based on what has already been done regarding the topic.

With the same aim, the road-map continues with practical actions and solutions meant to transition from a fossil-fuel system to a renewable one, thereby reducing energy consumption from fossil fuels. These actions include working on a preliminary energy diagnosis, assessing the feasibility of a photovoltaic power plant, implementing energy efficiency measures, and finally, establishing a renewable energy community.

In the following chapter, the document transitions from theory to practice, providing a full description of each of the project's case studies that implemented the actions and solutions explained in the previous chapters. Each case study details the measures that were implemented during the CO-CLEAN project. The energy consumption reduction measures were directed at public buildings, particularly schools, municipal swimming pools, city cultural centers, kindergartens, and

the administrative headquarters of the Biferno Valley Industrial Development Consortium. The common goal of all energy efficiency interventions was to improve thermal comfort within the environment while ensuring that energy costs are offset by energy production from renewable sources or low-impact energy resources. Concrete actions were preceded by an energy audit phase and followed by energy certification to verify energy consumption and certify new energy performances. Where applicable, the production of green and renewable energy was ensured through photovoltaic panels. Additionally, an innovative pilot action, inspired by the principles of energy democracy, aimed to create a renewable energy community to increase families' awareness of energy use, activate collective actions and interactions among members, build mutual benefit relationships among stakeholders in a win-win strategy, and create job opportunities in energy management.

Finally, the last section of the document is dedicated to the possibility of using the funds of the new Community Programming 2021-2027 in the field of renewable energies and energy communities. The report considers this as a bridge for potential new future project ideas, including capitalization of the CO-CLEAN project.

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1.2 The CO-CLEAN project

This report has been prepared in the framework of the European CO-CLEAN project, funded by the Interreg IPA CBC Italy-Albania Montenegro 2014/2020 Programme.

CO-CLEAN “Co-designed and implementation of local sustainable energy action” aims to increase energy efficiency and the use of renewable energies in the involved territories through the implementation of innovative and consolidated actions, training and awareness-raising activities. The project started in July 2020 and ended in June 2023.

The **objectives** of the project were:

- Generate a positive change in the behavior of citizens and stakeholders on the sustainable use of energy sources and on issues related to CO2 growth and climate change;

- Increase, in the public sector, levels of energy efficiency and the use of renewable energy through the implementation of actions aimed at improving the knowledge of public employees as well as the expertise and technologies on energy efficiency;
- Reduce know-how disparities among project partners and create a permanent network to promote the exchange of good practices, data and information on energy efficiency.

The CO-CLEAN **consortium** was composed by 5 partners:

- *Municipality of Brindisi* (Lead Partner, Puglia) - *LP;*
- *Municipality of Racale* (Puglia) – *PP2;*
- *COSIB - Consortium for the Industrial Development of the Biferno Valley* (Molise) – *PP3;*
- *Municipality of Valona* (Albania) – *PP4;*
- *Municipality of Berane* (Montenegro) – *PP5.*

The project included 5 **pilot actions,** which were focused on the design and implementation of different energy production or energy efficiency solutions:

- Municipality of Brindisi: **installation of a photovoltaic system** on the Sant'Elia Commenda Comprehensive Institute;
- Municipality of Racale: **installation of a photovoltaic system** on the municipal swimming pool;
- Consortium for the Industrial Development of the Biferno Valley: **updating of the current air conditioning system** dating back to 1998 in its administrative headquarters;
- Municipality of Vlore: **installation of solar panels** on a municipal nursery;
- Municipality of Berane: **installation of a heating system** in the Municipal Cultural Center.

The project's **main results** were:

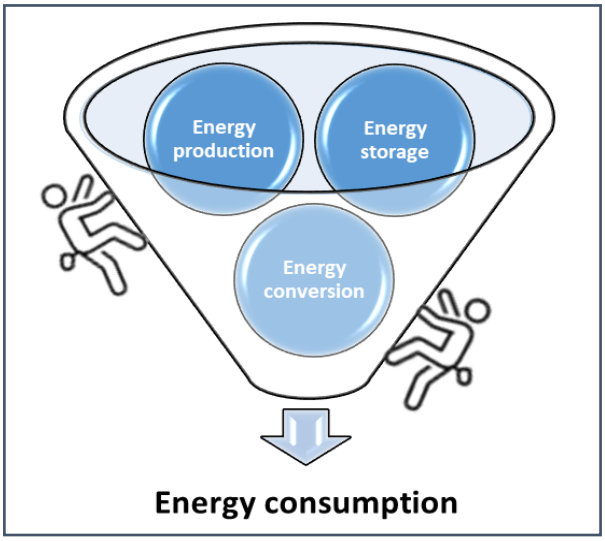
- The creation of an energy community composed of citizens and SMEs;
- The implementation of energy efficiency measures on public buildings based on already tested good practices;
- The realization of the Energy Festival to generate a positive change in the behavior of citizens and stakeholders on the rational and sustainable use of energy sources;
- The realization of a cross-border e-learning training course for public and technical employees.

2. What is the energy transition?

Scientific publications report numerous historical datasets (e.g., average air and sea water temperatures, atmospheric greenhouse gas concentrations, polar cap surface extension) that show a clear and unequivocal trend: **the climate is changing**, and, in particular, the Earth is warming.
According to the European Environmental Agency (EEA), around two-thirds of **greenhouse gas emissions** are linked to the energy sector (energy production and energy use).
This is why we urgently need an energy transition to reduce energy-related CO2 emissions and limit climate change.

The **energy transition** is a pathway towards transforming the global energy sector from fossil-based to **zero-carbon** by the second half of this century (2050) (Irena).
Moreover, it involves shifting from a centralized energy production system, managed by a few companies, to a **decentralized system** handled by a network of millions of energy citizens, where energy is produced at the location of consumption, in the required amounts, and at the right moment.

Renewable energy production and **energy efficiency** measures have the potential to achieve up to 90% of the required carbon reductions. However, contributions from the **heating & cooling** sector and **transport** sector are also needed.



Energy storage (both electricity and heat) is a key element of the energy transition process as it allows for an effective use of all renewable energy sources, including intermittent and non-predictable ones (e.g., PV and wind).

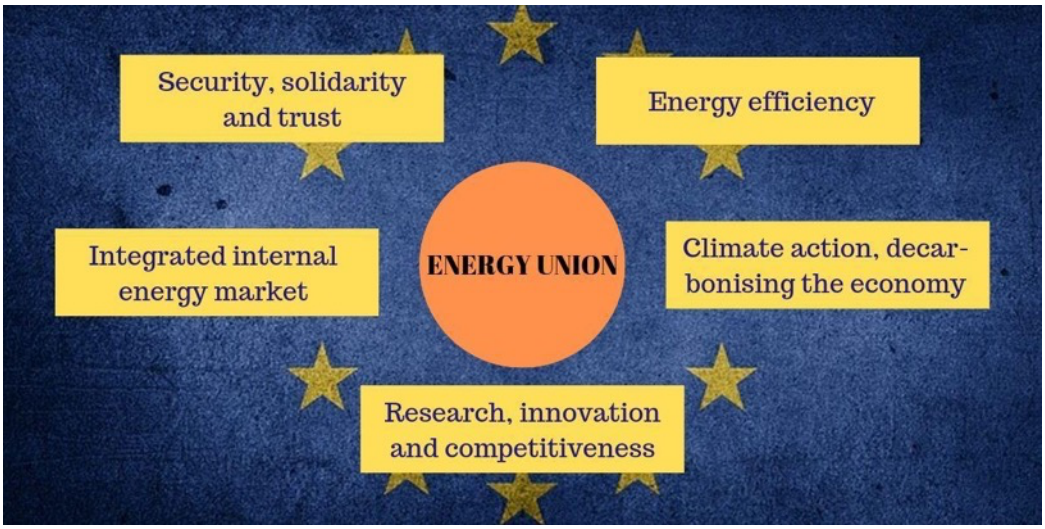
Lastly, to empower citizens and ensure a fair and inclusive energy transition, many societal challenges need to be addressed, from **raising awareness** to improving education and training resources.

Indeed, what we need is a **holistic approach**, which considers the energy system as a whole.

3. The policy and legal framework for renewable energy production, energy efficiency and Renewable Energy Communities

3.1 The overall European framework

In 2015 the European Commission approved the **Energy Union Strategy**, with the aim to ensure to EU consumers - households and businesses - secure, sustainable, competitive and affordable energy. The Energy Union Strategy builds on 5 closely related and mutually reinforcing dimensions, that are shown in the figure below:



The governance mechanism is based on integrated **National Energy and Climate Plans** (NECPs) covering 10-year periods starting from 2021 to 2030.

Between 2016 and 2019 the EU revised its overall energy policy framework and approved the so called **Clean Energy for all Europeans Package** (link), a set of 8 Directives complemented by 2 non legislative initiatives (the coal regions in transition initiative and the clean energy for EU islands initiative).
The aim of the Clean Energy Package was to foster the energy transition process from fossil fuels to renewable energy, to implement the Energy Union Strategy and to comply with Paris Agreement commitments for reducing greenhouse gas emissions. (link)

In particular, the **RED II directive** (link) establishes a new binding target for renewable energy in the EU's energy consumption that has been revised and increased up to 40% share of renewable energy in the gross final consumption by 2030.

The directive also introduces new measures for heating / cooling and transport sectors.
Additionally, explicitly acknowledges both "**Prosumers**" and "**Renewable Energy Communities**" as key players of the energy system and explicitly encourage them to play an active role by producing and sharing renewable energy.

In December 2019 the European Commission approved the **Green Deal** (link), which is a set of policy initiatives which aim to make the European Union climate neutral by 2050 and address different sectors, including construction, biodiversity, energy, transport and food.
The EU plans to finance the policies set out in the Green Deal through an investment plan – **InvestEU** - which forecasts at least €1 trillion in investment. It also leans on **Horizon Europe**, to play a pivotal role in leveraging national public and private investments. Through partnerships with industry and member States, it will support research and innovation on transport technologies, including batteries, clean hydrogen, low-carbon steel making, circular bio-based sectors and the built environment.

3.2 The current energy crisis

Since the beginning of 2020, with the **COVID pandemic** blast, the energy sector had to face some unexpected and extraordinary circumstances, like the sudden fall in energy demand due to the lockdown measures implemented in many EU countries.

This emergency situation, besides the dramatic economic and social effects, raised citizens' awareness and induced them to re-think many of their usual behaviours, including transport modes and energy consumptions, which are strictly related to our health.
After only 2 years, when the global situation started to re-stabilize, the **war in Ukraine** heavily impacted again on our lives, putting in front of us the dependence of many EU countries from the Russian gas supply and, overall, the weakness of energy systems based on fossil fuels imported from countries with unstable or undemocratic governments.

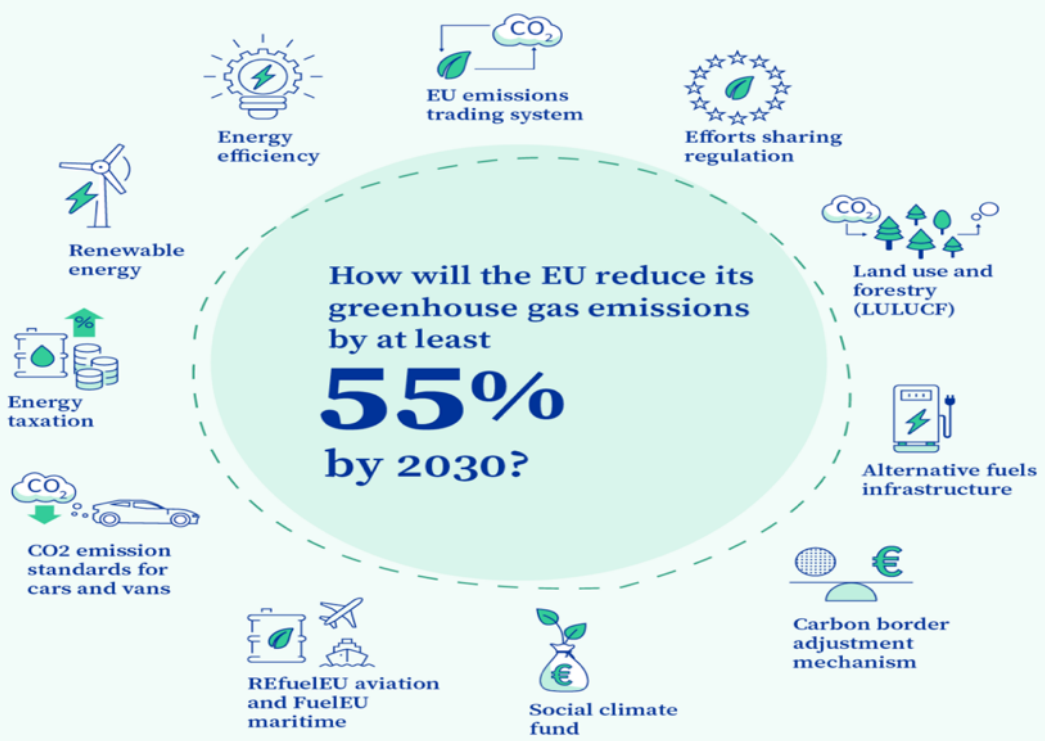
The European Commission and many national EU governments set down **special urgent emergency measures** to face the critical situation, trying at the same time:

- to stabilize the energy markets and to put a cap to the huge increase in energy prices,
- to reduce the overall energy consumptions, by optimizing uses, implementing energy efficiency measure, avoiding wastages and, where necessary, by legally limiting energy uses of consumers (e.g. max hours of heating system usage, max power withdrawal in peak hours),
- to sustain consumers (especially vulnerable ones) and economic activities through financial or fiscal supports.

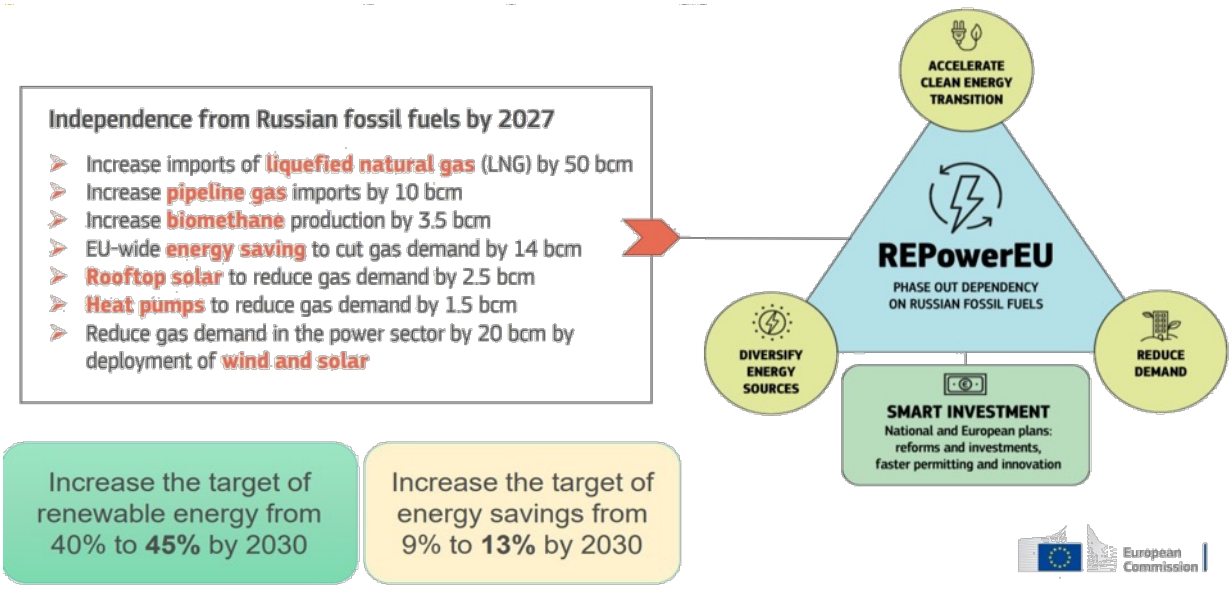
Nevertheless, **medium and long terms interventions** were also designed and implemented.
First of all, in July 2020 the EU Council approved the **Next Generation EU (NGEU)**, (also known as *Recovery Plan*) (Link) that is a EU temporary economic recovery instrument to support EU member states to recover from the COVID-19 pandemic and to build a greener, more digital and more resilient future. The NGEU will be in place from 2021 to 2026 and funds are being provided to Member States in line with their **national Recovery and Resilience plans**.

The overall Recovery Plan framework envisages investments and reforms in the areas of energy efficiency, clean power and energy networks. Nevertheless, the energy dimension of the National Recovery and Resilience Plans (NRRPs) varies across the Member States, depending on factors such as their specific challenges, priorities and preferences in green spending, and size of the plans.

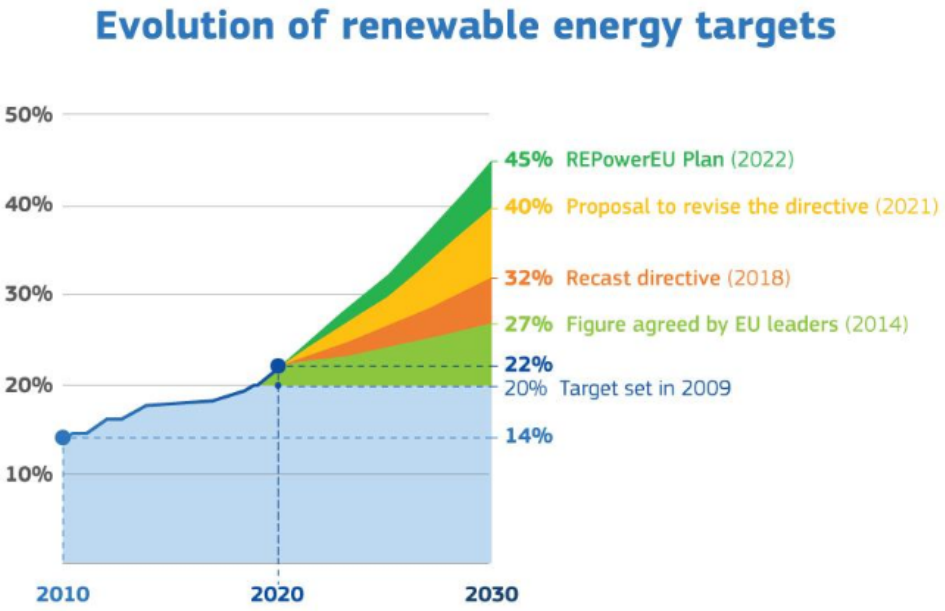
Afterwards, in July 2021 the EU Commission presented the so called **Fit for 55** package (link), a set of proposals which aims to revise and update the Clean Energy for EU package targets and in particular to accelerate the take-up of renewables in the EU and to help reaching the 2030 energy and climate objectives by reducing net greenhouse gas emissions by at least 55% by 2030 (compared to 1990 levels). The Fit for 55 package has been officially approved by the EU Parliament on April 2023.



Finally, in May 2022 the EU Commission published the **REPowerEU** plan (Link), which sets out a series of measures to rapidly reduce EU's dependence on Russian fossil fuels well before 2030 by accelerating the clean energy transition. The REPowerEU plan is based on three pillars: saving energy, producing clean energy and diversifying the EU's energy supplies. As part of its scaling up of renewable energy in power generation, industry, buildings and transport, the Commission proposes to increase the target in the RED II directive *to 45% by 2030*.



As clearly emerges from this summarizing graph, the ambition of the European Union for a rapid and significant increase of the share of renewables in energy production and consumption has rapidly boosted in the last years, both for political reasons and also for unexpected contingency. This is in turn pushing the Member States to adopt and implement strategic and practical measures to contribute to reach these ambitious targets.



3.3 The policy and legislative framework in Italy

Italy's energy system has changed notably since 2010 and today the country's energy mix includes more natural gas and renewable energies and less coal and oil (IEA, 2023).

With a population of about 60 million inhabitants, Italy is a **net energy importer**, and in particular heavily relies on natural gas imports. **Natural gas** dominates Italy's electricity mix and in 2021 covered 50% of total electricity generation. Hydro was the second-largest source of electricity (16% of electricity output) in 2021, followed by solar (9%), bioenergy and waste (8%), and wind (7%). Coal accounts for a minor and decreasing share (5% in 2021), followed by oil (3%) and geothermal (2%).[1]

Between 2005 and 2020 in Italy the consumption of energy from renewable sources doubled, while there was an overall **contraction of the overall gross final consumption** of energy, with the significant decrease in 2020 due to the covid-19 pandemic emergency (GSE, 2020)

In 2020, in Italy, 20.4% of total gross final energy consumption is covered by **renewable sources**, with the target set by the 2009/28/CE directive and by the NAP for RES (2010) of 17% fully achieved (GSE, 2020).

[1] IEA, Italy 2023, Energy Policy Review, link

The main **strategic and policy documents** currently in force are:

→ ***Integrated National Energy and Climate Plan*** (INECP): In June 2023, Italy updated its INECP, the main strategic document guiding Italy's energy policy to 2030. It has thus begun the updating process that will lead to the definitive approval of the new text by June 2024. The Plan is now under examination by the Community bodies. The new proposal upgrades Italy's 2019 INECP's targets in accordance with the new European Green Deal and the new European Union's energy and climate targets, including cutting the European Union's net GHG emissions by 55% by 2030 (from 1990 levels). The plan focuses on expanding the use of renewables, especially wind and solar electricity generation, and increasing energy efficiency across the economy, with a focus on the building stock and transport. In particular, it envisages a 40% share of renewables in gross final energy consumption which rises to 65% for electricity consumption only. 37% of energy from renewables for heating and cooling, 31% in transport, 42% of hydrogen from renewables for industrial uses.

→ ***Ecological Transitional Plan*** *(ETP):* adopted in March 2022 in line with the programmatic lines outlined by the NRRP, the ETP envisages the objective's achievement of cutting emissions by 55% by 2030 in compliance with the European target. The plan also hypothesizes a further effort in energy saving policies, especially in the transport and building sectors. Electricity generation, in turn, will have to stop using coal by 2025 and will have to increase the share of renewables up to 72% by 2023, reaching levels close to 95-100% in 2050. 2050 should then be the year in which Italy will achieve the clear and ambitious objective of operating "at zero net carbon emissions".

→ ***Long-term National Strategy on Reducing Greenhouse Gas Emissions*** *(LTS):* in January 2021, the Italian Ministry of the Environment published the Long-term National Strategy on reducing greenhouse gas emissions which outlines possible pathways to reach carbon neutrality by 2050. According to the strategy, Italy will need to cut GHG emissions by 84-87% to be carbon neutral by 2050. To do so, the LTS envisages more than doubling electricity production, with 95% generated from renewables by 2050; massive electrification, with over half of energy demand covered by electricity, and even more in the transport and buildings sectors; sector coupling and new forms of flexibility, like Power-to-X; progressively replacing natural gas with hydrogen and other synthetic fuels; shifting transport demand from private cars to public/shared transport modes; accelerating the energy renovation of buildings.

→ **National Recovery and Resilience Plan** (NRRP): the plan was approved in July 2021, and it allocates around 60 billion of investments to the "Green Revolution and Ecological Transition". Of these, 23.78 billion are aimed overall at renewable energies and specifically 2.2 billion for the development of energy communities (RECs) and self-consumptions schemes (SCSs). Aside the specific call for RECs and SCSs, within the Recovery Fund Mission 2 (Green Revolution and Ecological Transition) there are at least two other calls, already

launched, which can indirectly support the setup of RECs: Green Islands (M2C1I3.1), which allocates 200 M€ for the 13 Municipalities of the 19 small islands not interconnected with the italian national electricity grid, and Green Communities, which allocates 135 M€ for the setup of 30 "green communities", namely groupings of local administrations who join and work together to implement sustainable development plans. The borad objectives to be achieved are to increase the share of energy produced from energy sources renewable energy (RES), enhance and digitize the network infrastructures to be able to accommodate the increase in production from RES.

The main **legislative and regulatory acts** governing the energy sector are:

→ Law on the **promotion of the use of energy from renewable energy sources:** in December 2021, Italy adopted the Legislative Decree No. 199/2021 to transpose the EU Directive 2018/2001 on the promotion of the use of energy from renewable energy sources. The Decree aims to accelerate the Italian sustainable growth path, in line with the European objective of ensuring a 32% share of renewable energy sources in the EU's gross final energy consumption by 2030. In order to do so, the Decree restructures the incentive system for the electricity's production by renewable power; it identifies a set of criteria for the classification of suitable and unsuitable areas for the installation of renewable power plants in order to simplify and accelerate the authorization processes; it completes the regulations on self-consumption, collective self-consumption and energy communities with the respective incentive systems; it introduces specific incentives for hydrogen, biogas and biomethane production plants and simplified construction and operation of electrolysers; it defines the characteristics and function of guarantees of origin for providing retail customers with the amount of energy from renewable sources in the energy mix supplied to them by sellers[2]. Finally, it contains provisions for implementing the National Recovery and Resilience Plan (NRRP), with the aim of identifying a set of coordinated policies and instruments.

→ Law on **the electricity's internal market**: in November 2021, the Italian government transposed the EU Directive 2019/994 about the electricity's internal market into the Italian legislation under the Legislative Decree No. 210/2021. This new legislation lists the principles under which the Italian electricity market is to be organized. In particular, the decree gives the provisions to strengthen the rights of end customers in terms of transparency, it envisages a greater opening of the market in relation to demand and storage systems, it gives the possibility to establish closed distribution systems and it introduces a long-term supply system of storage capacity. It also regulates the new configurations of citizens energy communities (CEC). In particular, it establishes the methods of participation and sharing of energy, and it defines the figure of active customers, who have the right to sell self-produced electricity on the market, where they can participate individually, in aggregate or through

[2] https://www.globallegalinsights.com/practice-areas/energy-laws-and-regulations/italy

citizen energy communities. Finally, Legislative Decree launches the process for the gradual abolition of the National Single Price (NSP) and also simplifies the current regulation on dispatching and wholesale energy markets, in order to take into account the new needs for flexibility of the system.

→ Laws on **authorizations' simplification**: the Italian Legislator, by means of Law Decree no. 17/2022 ("Energy Decree"), Law Decree no. 21/2022 ("Ukraine Bis Decree"), and Law Decree no. 4/2022 ("Aid Decree"), updated and further simplified the regulations on measures for the authorization of the construction and operation mainly of photovoltaic plants[3].

→ Law on **Energy Efficiency**: in July 2020, the Italian government transposed the EU Directive 2018/2002 and amended the EU Directive 2012/27 on energy efficiency with the Legislative Decree 73/2020. The Decree updates measures for improving energy efficiency aimed at the national energy savings target and contributes to the implementation of the European energy efficiency first principle, mainly White Certificates and Thermal Account scheme.

3.4 The Energy Community treaty4

The Energy Community is an international organisation consisting of the EU, represented by the European Commission, and of **Albania**, Bosnia and Herzegovina, Georgia, the Republic of North Macedonia and Kosovo*, Moldova, **Montenegro**, Serbia, and Ukraine, which are known as the *contracting parties*.
The Energy Community aims to extend the EU's internal energy market to southeastern Europe and the Black Sea region.

The activities cover gas, electricity, security of supply, renewable energy, oil, energy efficiency, environment and competition and are 94.5% financed by the EU budget.
The Energy Community treaty was signed in 2006 and in 2016, during the tenth anniversary, the parties agreed to initiate an update to the treaty.
The six Western Balkan countries, and a number of EU countries, agreed on a roadmap for a regional electricity market for the Western Balkan 6 in July 2016.
The countries also endorsed a Western Balkan sustainability charter. In it, the six Western Balkan countries commit to efforts to increase the sustainability of national and regional energy markets as well as their generation and consumption patterns.

[3] ibidem
[4] Energy Community (europa.eu)

3.5 The policy and legislative framework in Albania

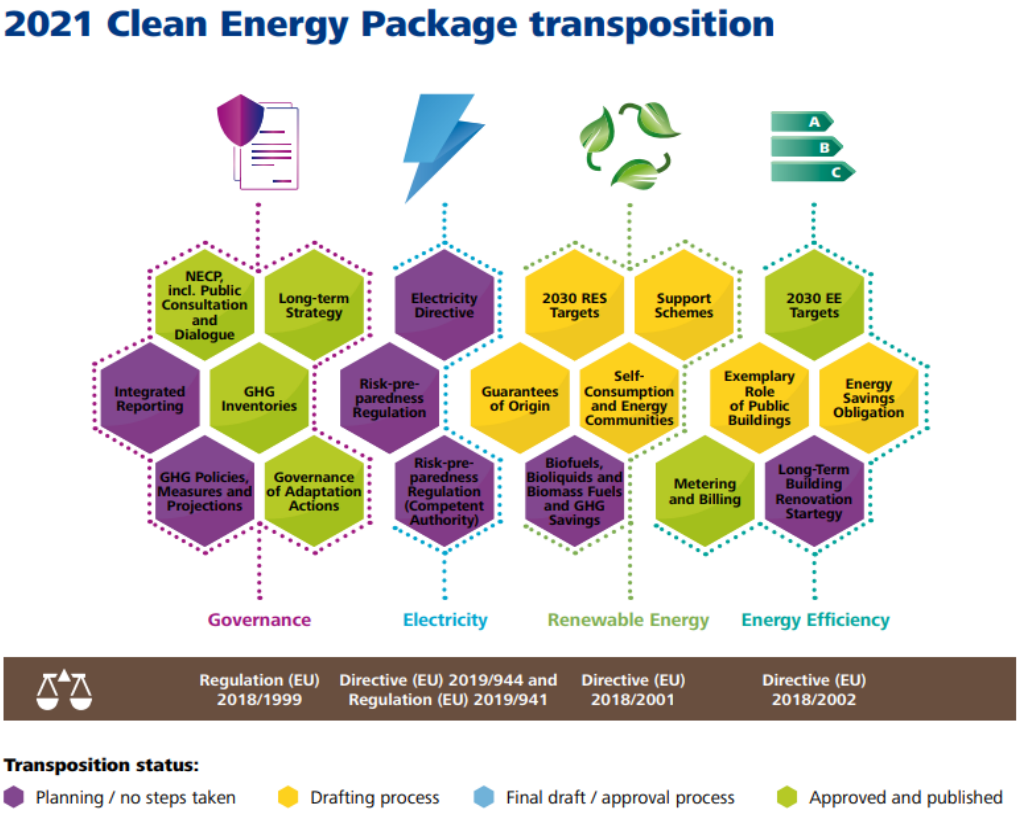
Albania, with a population of around 2.8 million, has been almost **entirely dependent on hydropower** for its power supply for decades. While this is advantageous for decarbonizing its energy sector, it also makes the country highly **vulnerable to the changing climate**, leading to the need to import electricity for most of the years.

Therefore, Albania's energy transition does not involve a shift from fossil-based sources to renewables, but rather a **transition from hydropower to diversified renewables**. To achieve this, it is crucial to use electricity more efficiently for heating, adopting heat pumps, and to electrify the transport sector.

Until 2017, Albania only offered renewable energy incentives for hydropower, resulting in underdeveloped solar photovoltaic (PV) and wind sectors. However, in that year, the country changed its legislation to provide **incentives for solar and wind developments** and introduced an auction system for awarding them. As of 2020, solar photovoltaics contributed only 0.4% of electricity generation, while just under 70% came from hydropower, and the remaining 30% was provided through imports. Although the electricity sector in Albania is almost entirely renewable, additional efforts are required, especially in the **heating** and **cooling** as well as the **transport** sectors.

As a Contracting Party of the EU Energy Community Treaty, Albania committed to implementing selected EU rules on market reforms, renewable energy, and energy efficiency. (Law on the ratification of The Energy Community Treaty (EnCT) (Law No. 9501, date 03.04.2006) provides a legal framework for convergence with the European Union's energy acquis).

Albania has adopted a first version of its National Energy and Climate Plan, and partial transposition of the Governance Regulation has been carried out. However, the transposition of the 2021 electricity legislation is yet to begin, while the transposition of the new Renewables and Energy Efficiency Directives is at an early stage.



The main **strategic and policy documents** currently in force are:

→ ***National Strategy on Energy*** (NSE) approved by DCM no. 480, date 31.07.2018: This document has defined the country's energy targets to enable Albania's European integration in the entire European energy infrastructure. It includes targets for the share of renewable energy, GHG emission reduction, energy savings, electricity market opening, and losses reduction.

→ ***National Energy Efficiency Action Plan*** (NEEAP): The Albanian Government has approved the 1st, 2nd, and 3rd NEEAP, which define the Energy Efficiency targets for all economic and social sectors. Measures undertaken during the 1st NEEAP were predominantly carried out with the direct support of international financing institutions (IFIs) or other donors, or provided through local commercial bank loans supported by IFIs or other donors. This support came via financial and technical means, as analyzed and presented under the 2nd and 3rd NEEAP. To scale-up Energy Efficiency actions, the availability of increased domestic funds (public and private) is required. The EE law calls for the development of an Energy Efficiency Fund to provide financial support for implementing EE projects in the public and private sectors. The funding proposed from the State Budget should be seen as a tool to leverage greater resources from external parties (IFIs and donors, as well as private banks). To achieve this, the EE Fund has the option of providing loan guarantees, subordinate debt, investment gap financing, or interest rate buy-downs.

→ ***National Renewable Energy Action Plan*** (NREAP): The Albanian Government has approved the 1st and the 2nd NREAP, which define the RES targets for all electricity, transport, and heat sectors. The NREAP is based on Albania's obligations as a Contracting Party to the Energy Community Treaty to comply with EU Directives on the promotion of renewable energy sources. Albania is obliged to increase the portion of renewables to 38% of the total final energy consumption by 2020, which should be further increased to 42.5% by 2030.
NREAPs are updated every two years, and the latest was adopted in September 2019 as a consolidated Action Plan for the years 2019-2020. This action plan superseded the previous NREAP for 2018-2020 by reducing the targets for hydropower production and increasing targets for solar and wind to diversify the energy mix through the penetration of wider renewable energy technologies. Going forward, the NREAP will be superseded by the National Energy and Climate Plan (NECP), which is still to be developed and will set out renewable energy targets to 2030. In February 2021, Albania adopted a decision to prolong the revised National Renewable Energy Action

The main **legislative and regulatory acts** governing the energy sector are:

→ Law on **Renewable Energy Sources**: The Albanian Parliament approved a new Law on RES (Law no. 7/2017), replacing the former Law on RES. The new RES Law partially transposes the Directive 2009/28/EU on the "Promotion of the use of energy from renewable sources." The objective of the RES Law is to facilitate the harnessing of Albania's significant renewable energy resources, particularly in the area of Small Hydropower Plants (SHPPs), Solar Hot Water Systems, PV Power Plants, efficient traditional and industrial biomass heating systems, as well as other renewable energy sources. The law outlines the adoption of the National Renewable Energy Action Plan (NREAP), which sets forth targets for the share of renewable energy in the country's total energy consumption, including electricity, transport, and heating and cooling. Furthermore, it stipulates policies and support measures to achieve these targets. The methodology of support schemes, according to the capacity of the renewable energy plant, is approved by DCM 369/2017 based on Law no. 7/2017. Article 15 regulates net-metering for consumers with installed capacity up to 500 kW. Surplus electricity can be sold to the universal service supplier. However, its implementation is still pending, and the methodology defining the price at which the surplus is to be redeemed is yet to be adopted. The regulation on "Methodology for calculating the electricity price for self-producers benefiting from the Net Metering Scheme" is under preparation, based on the order of the Minister of Infrastructure and Energy No. 3, dated 20.06.2019, "On the approval of the procedure for the authorization of connection to the distribution grid of small renewable self-producers using solar energy."

→ Law on the establishment of facilities for **construction of new power generation capacities** (Law no. 8987, date 24.12.2002)

→ Law on **Energy Efficiency**: in November 2015, Albania adopted the Law on Energy Efficiency (Law No. 124/2015) to transpose the provisions of the EU Directive 2012/27/EU into the Albanian legislative framework.

→ Law on **Energy Performance of Buildings**: Albania has prepared a stand-alone law transposing the EU Directive on Energy Performance of Buildings - EPBD (Law no. 116/2016). This includes the requirements for new buildings occupied and owned by public authorities to meet the Nearly Zero Energy Buildings (NZEB) definition.

→ Law on **Labelling of energy-related products**: in 2012, Albania adopted the Law on Indication of Consumption of Energy and Other Sources by Energy-related Products (Law no. 68/2012, dated 21.06.2012), which fully transposes the EU Directive 2010/30/EU. This law establishes an obligation to inform consumers about the energy consumption of energy-related products.

3.6 The policy and legislative framework in Montenegro

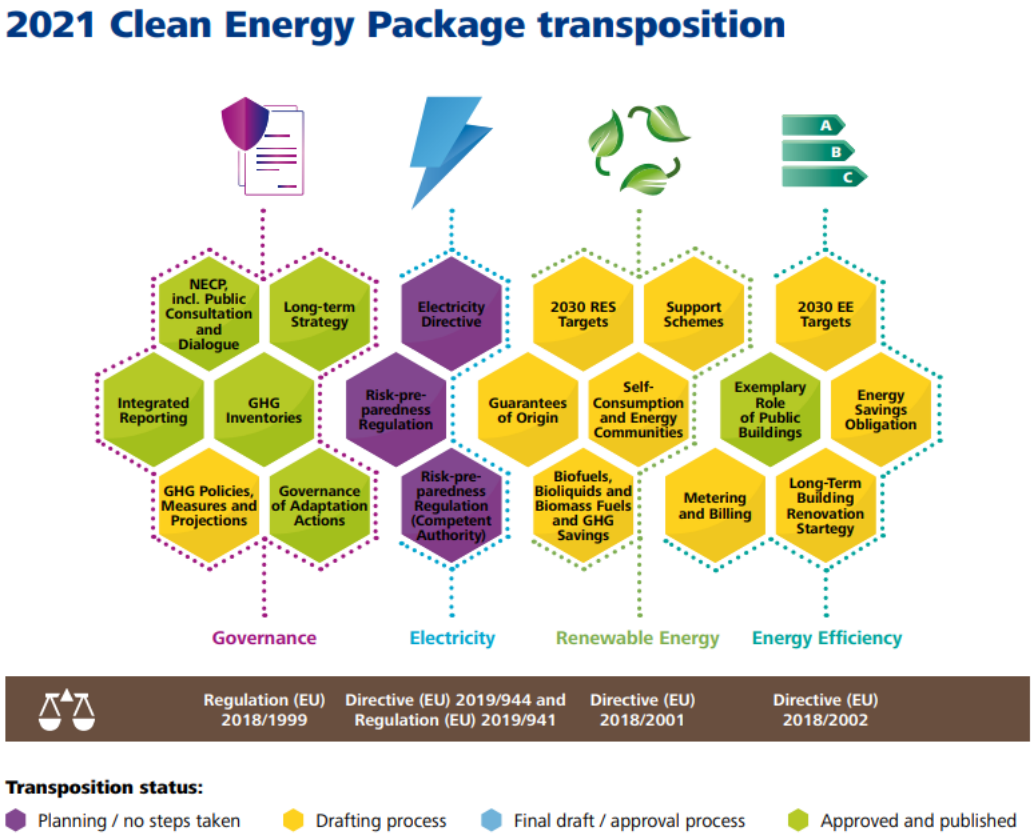
With around 621,000 inhabitants, Montenegro's electricity needs are primarily met by the 225-MW **lignite power plant** at Pljevlja and the 307MW Perućica and 342MW Piva **hydropower plants**, all operated by the state-owned utility Elektroprivreda Crne Gore (EPCG). Consequently, Montenegro's ability to meet its electricity demand domestically has varied over the last decade **depending on the hydrological situation**.

In 2020, coal accounted for nearly 46% of electricity generated in Montenegro, hydropower around 44%, wind 9.9%, and solar 0.1%.

With an overall **share of renewable energy at 43.77%,** the country exceeded its 2020 target. Sectorial targets for electricity and heating and cooling were also surpassed; however, the share of renewables in the **transport** sector remained very low. In June 2021, the government declared a coal phaseout date of 2035.

As a Contracting Party of the EU Energy Community Treaty, Montenegro committed to implementing selected EU rules on market reforms, renewable energy, and energy efficiency. The

transposition of the Governance Regulation is well advanced, but the lack of a policy decision on the future operation of Pljevlja effectively blocked the finalization of the country's National Energy and Climate Plan. The transposition of the new Renewables and Energy Efficiency Directives is at an early stage, while work to transpose the 2021 electricity legislation is yet to begin.



The main **strategic and policy documents** currently in force are:

→ ***The Energy Development Strategy of Montenegro until 2030*** (2014): It is a strategic energy sector development and management policy that sets the national energy strategy. The priorities indicated in this text are as follows:

- Security of energy supply: ensuring a constant, safe, high-quality, and diverse energy supply.
- Competitive development of energy markets: Ensuring a liberalized, non-discriminatory, competitive, and open energy market based on transparent conditions. This includes enabling free market competition in non-monopolistic activities such as electricity and natural gas production and supply. The pricing policy for energy products should be based on market forces, and conditions should be created to allow for the free entry of new participants to the market, including independent energy producers, suppliers, and traders.
- Sustainable energy development: Promoting energy development based on accelerated yet rational use of own energy resources while adhering to principles of

environmental protection. This includes increasing energy efficiency and a greater utilization of renewable energy sources. Additionally, the strategy should address the needs of Montenegro's socio-economic development.

→ ***National Renewable Energy Action Plan:*** the Government has approved a 1st NREAP in 2014, which set the RES targets to 2020 for electricity (51,4%), transport (10,2%) and heating and cooling (38,2%) sectors. Thereafter, every two years, reports on the progress towards the targets have to be submitted to the Energy Community Secretariat.

→ ***National Energy Efficiency Action Plan***: The 1st adopted NEEAP covered the period 2010-2012, while the 2nd NEEAP set the line of action for 2013-2015, in accordance with the requirements of the repealed Energy Services Directive 2006/32/EC. Subsequently, the Energy Services Directive 2006/32/EC was replaced by the Energy Efficiency Directive 2012/27/EU. As a result, the 3rd NEEAP covered the period 2016-2018, and the 4th NEEAP covers the period 2019-2021. Montenegro has successfully met the national 2020 energy efficiency target. Several building renovation programs are currently ongoing, although a long-term building renovation strategy is still pending. The majority of buildings in Montenegro use individual heating systems supplied by either electricity or biomass. In 2022, the "Energy Efficient Home" project continued to provide support to households through interest-free loans for the installation of modern heating and cooling systems, heat pumps, and thermal insulation. The National Energy and Climate Plan (NECP) is currently being prepared to incorporate the 2030 energy efficiency policy framework and extend the targets for the renovation of central government

The main **legislative and regulatory acts** governing the energy sector are:

→ **Energy Law** (2015): This law sets the basic principles and necessary rules for all energy-related activities, providing conditions and regulations to ensure quality and sustainability in the energy production and consumption sector. It also encourages energy production from renewable energy sources and high-efficiency cogeneration, granting grid access priority to renewable energy projects. According to the Energy Law, administratively set feed-in tariffs are applicable for projects up to 1 MW, while support must be awarded through a competitive process for larger projects. However, the first competitive process is yet to be organized. The 2020 amending law (issued to align with the Energy Community) notably supports the build-up of renewable energy capacity for commercial purposes and self-consumption.

→ **Law on Efficient Use of Energy**: Starting in 2010, the Law on Energy Efficiency legally regulated the energy efficiency field in Montenegro for the first time. This law was significantly improved by the Law on Efficient Use of Energy approved in 2014 (Official Gazette of Montenegro 57/2014). Furthermore, with the aim to harmonize the national legislation with the EU legal framework, amendments to the Law on Efficient Use of Energy

were adopted by the Parliament of Montenegro on 4th April 2019. The text of the Law on Efficient Use of Energy complies with the main EU directives in the field of energy efficiency, including Directive 2012/27/EC on energy efficiency, Directive 2010/31/EC on the energy performance of buildings, Directive 2010/30/EU on energy labeling of energy-related products, and Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products. Finally, new amendments to the Law on Efficient Use of Energy have been finalized and submitted to the Assembly of Montenegro for adoption in 2022. The Ministry of Economy, through the Directorate for Energy Efficiency, is responsible for defining and implementing energy efficiency policy. The Budget Law for 2006 approved the establishment of a separate consumers unit with an associated separate budget (Energy Efficiency Fund) within the overall budget of the Ministry of Economy. The Energy Efficiency Fund aims to support the implementation of programs and projects related to energy efficiency.

4. How to reduce energy consumption from fossil sources and reduce energy costs?

Many people believe that the energy transition is a long, complex, and massive process, leading them to think that their individual contributions are not meaningful or relevant in the overall scheme.

However, this is not true. **Every citizen can play a crucial role** in the energy transition at various levels and in different ways.

First and foremost, individuals can contribute by becoming more **aware and conscious** of their energy consumption habits and committing **to change their energy behaviors**. Simple actions like turning off lights and appliances when not in use or adjusting thermostat settings can make a difference.

Moreover, citizens can take more concrete steps such as:

- **Reducing energy consumption** by improving the energy efficiency of their homes or workplaces. This could involve interventions like enhancing thermal insulation or replacing old appliances with more energy-efficient ones.
- Engaging in **self-production of renewable energy** to cover at least a portion of their electricity needs and becoming prosumers. For instance, installing a small solar PV system on the roof of their building can enable them to generate their electricity sustainably.
- Participating in **Renewable Energy Communities** within their neighbourhoods or cities. By coming together and pooling resources, communities can collectively install larger-scale renewable energy projects, fostering a sense of community ownership and benefitting from the shared energy production.

All these individual actions will collectively contribute to improving the **environmental sustainability** of energy consumption while also generating **economic benefits** in the form of cost savings on energy bills.

Remember, energy transition is not solely the responsibility of governments or large corporations. **Each person's contribution**, no matter how small, adds up and plays a significant role in shaping a more sustainable and greener energy future.

5. The importance of a preliminary "energy diagnosis"

The first step to effectively reduce energy consumption and improve the energy performance of a building is to conduct an energy diagnosis. The diagnosis involves a systematic evaluation of the building or facility and typically includes the following elements:

- A general description of the building's architectural structure, including a cadastral map and a list of the different internal spaces and their respective uses.
- A technical description of the building envelope, detailing the materials, thickness, and window fixtures used in construction.
- Collection of main energy consumption data, encompassing both electricity and gas usage, along with an estimation of the associated CO2 emissions.
- Description of the technical characteristics of the primary building systems, such as the heating system, air conditioning system, hot water heater, etc.
- Assessment of the lighting system, including the type, capacity, and number of different lamps installed.
- Inclusion of additional electrical utilities, like computers and home appliances.
- A detailed analysis of monthly energy consumption data for both electricity and gas, including peak values.
- Evaluation of energy costs, considering both economic (in €) and environmental (in TOE - Ton of Oil Equivalent) aspects.
- Detailed modeling of gas and electricity consumption to identify specific sources of consumption, assess their energy performance index, and subsequently define potential improvements.

The **outcome** of the energy diagnosis is a **list of recommended interventions** that can be implemented to enhance the overall energy performance of the building and reduce its energy consumption.

Additionally, the diagnosis provides an **estimation of the costs and potential savings** associated with each intervention. This information helps in **selecting the most cost-effective measures** and devising a plan for future additional interventions.

6. Assessing the feasibility of renewable energy production: the photovoltaic technology

Renewable sources encompass solar energy, wind energy, hydropower, biomass energy, and geothermal power. Each source exhibits distinct **geographical distribution**, limiting the local availability of a specific source for renewable energy production. Additionally, the **seasonal or daily availability** of these sources requires a combination of different options, as **they complement each other** in terms of availability.
For instance, wind and hydro generally produce more during autumn, winter, and spring seasons, while photovoltaic energy peaks during the summer. Moreover, photovoltaic systems produce energy only during daylight hours, whereas wind and hydropower plants can operate during the night.

In this report, the focus is solely on the **photovoltaic option** for the following reasons:

- Solar radiation is the most widely available renewable source, present almost everywhere.
- Photovoltaic technology is highly modular and scalable, allowing for its application in diverse energy needs, from individual households to industrial facilities.
- Data on average yearly/monthly sun radiation are accessible for most countries, facilitating the estimation of potential PV plant productivity and required capacity to meet specific energy needs.
- Authorization procedures for PV plant installation are usually simpler and faster compared to other renewable sources like wind or hydropower.
- The installation and connection process of a PV plant are relatively shorter compared to other renewable energy sources, such as hydropower or wind power, which often require significant civil works (e.g., foundations, channels, dams).
- The overall cost of a PV plant is generally manageable even for individual citizens or citizen groups, making it an attractive option for becoming prosumers.

Nevertheless, to assess the **feasibility of installing a PV plant**, the following elements need consideration and analysis:

- A preliminary environmental assessment to evaluate potential impacts in relation to territorial context and city planning restrictions, identifying the best technical solution.
- A reference list of regulations governing permissions and prescriptions for plant installation and grid connection.
- A presentation of the location, including images of the building, a satellite image of the area, and a cadastral map.
- An analysis for sizing the PV plant, considering available roof surface, potential tilt, azimuth, and shadowing effects.
- An estimation of the PV plant's electricity production, taking into account site characteristics, latitude, available average solar radiation, module power, and potential losses.
- A proposed design solution for the PV plant, defining main technical characteristics such as module number, power density, inclination, spatial distribution, anchoring system, and inverter type and power.

7. The implementation of energy efficiency measures: thermal insulation, heating and cooling solutions

The most sustainable form of energy is the energy that is not consumed at all.

Prioritizing energy savings through behavioural changes and **avoiding wastage** should be the primary focus. Before investing in renewable energy production, it is essential to ensure that energy is used efficiently and responsibly.

When considering energy efficiency improvements in buildings such as houses, schools or offices, several interventions can be implemented to increase their energy efficiency:

1. **Substituting existing heating and cooling systems** with more efficient ones, preferably powered by renewable energy sources. Common market technologies include biomass boilers fuelled with pellets or wood chips and electric heat pumps powered by PV (solar photovoltaic).
2. **Insulating the building envelope and replacing windows** with less heat-transmitting ones. Applying thermal insulation to the building can significantly reduce thermal dispersion, resulting in decreased heating needs during winter and reduced cooling requirements during summer.

These interventions were tested in pilot cases in various locations, such as the Municipality of Berane and COSIB premises, and more information is available in the specific section of this report (chapter 9).

Additionally, there are many other potential interventions that can be **tailored to the specific needs** of each building, focusing on the main sources of energy consumption. Conducting a preliminary **energy diagnosis** is crucial to identify a set of potential interventions and **prioritize** them based on their impact and cost-effectiveness.

By focusing on energy efficiency first and implementing targeted interventions, we can optimize the use of energy and **maximize the benefits of renewable energy production** in a sustainable manner.

8. What is a Renewable Energy Community?

8.1 Definition, scope, main characteristics

The final Clean Energy Package (CEP) includes two definitions of energy communities: **Citizen Energy Community (CEC)**, which is found in Directive (EU) 2019/944, **and Renewable Energy Community (REC)**, which is outlined in Directive (EU) 2018/2001. These definitions share some similarities, but also have some differences.

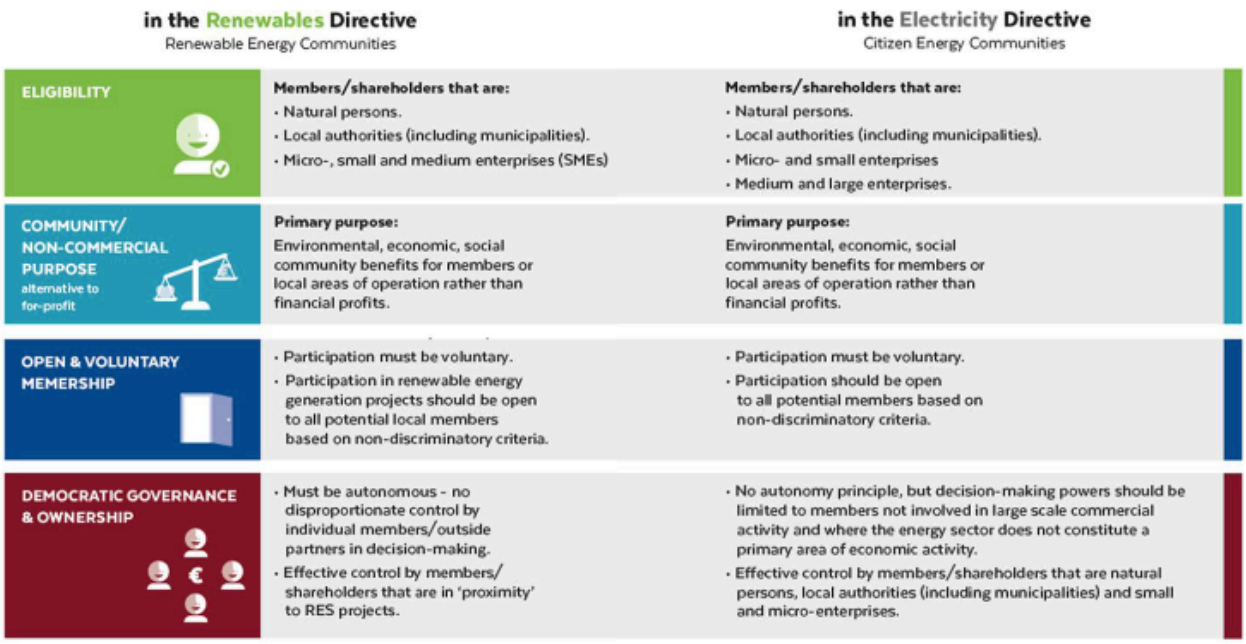
Both definitions propose a way to organize **collective cooperation** for energy-related activities based on specific ownership, governance, and a non-commercial purpose, distinct from traditional market actors. However, there are discrepancies between them, particularly in terms of the scope of activities and eligibility criteria, leading renewable energy communities to be seen generally as a subset or type of citizen energy community.

The **distinctions** between citizen and renewable energy communities lie in their activities and eligibility criteria:

- → **Activities**: Citizen energy communities are involved in various aspects of the electricity sector, whereas renewable energy communities focus solely on renewable energy.
- → **Eligibility** to participate: Citizen energy communities are open to entities of any size, while renewable energy communities restrict participation to micro-, small, and medium-sized enterprises.
- → **Effective control**: Citizen energy communities must be under the effective control of natural persons, local authorities, or micro- and small enterprises. On the other hand, renewable energy communities must be effectively controlled by members who are located close to the community's projects, without any reference to size.
- → **Autonomy**: Renewable energy communities must demonstrate autonomy (and thus be more democratic) in their internal decision-making, although this requirement is not specified for citizen energy communities.

Conversely, both citizen energy communities and renewable energy communities share the following **similarities**:

- → Participation in these communities must be open and voluntary.
- → The focus is on involving citizens, local authorities, and smaller businesses that are not already active in the energy sector.
- → The primary purpose of both community types is to provide environmental, economic, or social benefits for their members or the local areas in which they operate, rather than pursuing financial profits.



In many European countries, a legal framework for RECs and CEC's **transposing** the provisions of RED II and IEMD have been established, albeit with varying degrees of detail. Indeed, European directives are not directly applicable throughout Member States, but require national laws to incorporate their rules into the national legislative framework. In this case, the EU legal framework for energy communities includes many indefinite legal terms, leaving a great deal of transposition's details up to the national level (COME RES, 2022).

For this reason, in most countries, **transposition gaps** can be detected and several governments transposed the EU definitions more or less literally. In many cases, further legislation is under development to specify indeterminate legal concepts, like "effective control", "proximity", or "energy sharing" (COME RES, 2022).
At heart, it can be said that the shaping of the national transposition needs to follow a work scheme that goes from understanding and analysing the different characteristics of Renewable Energy Communities to defying those concepts into the national legislative context. To better explain this process, an example is reported hereafter.

As for the concept of "**energy sharing**", different countries studied different mechanisms to enhance it. The article 22 of the RED II directive introduced the concept by saying "renewable energy communities are entitled […] to share within the renewable energy community, renewable energy that is produced by the production units owned by the renewable energy community, subject to the other requirements laid down in this article […]."
In **Italy**, "shared energy" equals to the minimum value, calculated on hourly basis, between the total electricity produced and fed into the grid by the REC's renewable plants and the electricity collectively withdrawn by all REC's members located under the same high/medium voltage substation ('primary transformation cabin'). Targeted financial incentives have been established to encourage energy sharing. Within the Italian energy framework, it was decided to consider virtual

energy sharing instead of physical energy sharing, since it is easier to implement it: there is no need to duplicate sections of electric grid, therefore lower costs and shorter time are requested for its implementation. Moreover, by encouraging the contemporaneity between production and consumption at local level, the Italian Energy Authority (ARERA) expects that grid losses will be reduced and grid balancing will be improved.

The **Netherlands'** new legislation considers energy sharing as a form of energy supply. For this reason, it is regulated by the same rules applying to energy supply to end consumers by other market players with the exception that the REC does not have the need for an official license as energy supplier as long as the amount of energy supplied to the REC's members does not exceed the amount of energy produced by the collective installation. In this country, shared energy is not promoted through the exemption of fees or charges (COME RES, 2022).

In **Portugal**, the regulatory framework allows energy sharing and REC's are entitles to pay the tariffs associated with the access of the grid, with some exemptions and reductions on the self-consumption and electricity conveyed into the grid by RECs and prosumers (COME RES, 2022).

In order to give an overview on the state and the quality of the transposition process over Europe, **REScoop.eu** - the European federation of renewable energy cooperatives - has been working on a monitoring tool that evaluates the national transposition of the EU provisions related to energy communities – called the **Transposition Tracker** (link). The purpose of the transposition tracker is to assess the progress of the transposition of the provisions on definitions for RECs and CECs, as well as enabling frameworks and national support schemes for RECs. A map provides an overall comparative assessment of the progress of the transposition with regards to the definitions in the different European Member States following a modified traffic light grading system. Each Member State has a specific colour to represent how far they have progressed towards transposing EU rules on energy communities. The tracker is subject to change based on collection of new information.
It is important, indeed, to gain full knowledge about the transposition process around Europe for different reasons:

- it can inform and advice other countries that are drafting the energy community model into their national boundaries;
- for those who have already transposed the directives, it is useful to better understand the underpinnings of each owns' legislative orientation;
- finally, it is useful to monitor how the REC's model is working out in different types of contexts and whether the directives' objectives are put in danger, so it can be taken proper actions at the EU level through advocacy interventions.

In relation to this last point, RESCoop is also investing in **advocacy actions** at the EU level. An example is given by the recent directives' amendments that the EU Parliament has been working on and upon which RESCoop is doing advocacy. As an example, among the topics under discussion, the Parliament is considering open up energy sharing to all customers, including large industrial customers and to raise the threshold for third party ownership of production installations.

RESCoop is collecting positions from different countries on this topic, in order to collect experiences and thus, to better understand how **to ensure strong consumer rights** and **to protect the model** from being turned into an alternative supply model for large utilities.

In Italy, the third party ownership and the participation of large industrial customers is partially admitted and regulated. In this case though, the real problem is not their presence in the scheme which will mostly be an opportunity as it will allow to install significant renewable capacity for local sharing. In the Italian case, it lacks the provisions that protect the rights of the members and benefits for the territories, and that ensure that the economic benefits are adequately shared among members and third part investors.

This is then another example on how the transposition can be different from country to country and how one's experience can give precious insights on specific topics.

8.2 How to setup a REC

Setting up a REC is a complex process involving **social, technical, and economic** factors, with a low level of standardization due to the unique characteristics of each project in its operating context. However, to guide the process of establishing a REC, it is possible to define a reference scheme that provides some general insights.

Firstly, it is necessary to **map the stakeholders** in the area to identify local authorities, nonprofit organizations, and businesses that share a common vision for the region, emphasizing social objectives such as revitalizing local communities, fostering social inclusion, and promoting the local economy. Once these entities are identified, it is essential to engage with them to define the **REC's objectives**, which will be discussed with the local community at a later stage. During this phase, it is crucial to determine the level of involvement of each stakeholder in different project steps, defining their roles and responsibilities. For instance, in a REC promoted by a local authority, non-profit organizations in the area may play a key role in involving citizens and SMEs, while the municipality oversees the design and implementation of the renewable energy systems.

After defining the stakeholders and objectives of the initiative, the local committee should identify **suitable areas to host the renewable energy power plant** that will supply energy to REC members. At this point, technical partners can offer support to develop a business plan that outlines the expected economic, social, and environmental benefits for all stakeholders involved.

The phase following the **business plan definition** is focused on presenting and discussing the project with citizens to introduce **participatory processes** that validate the previously defined objectives or collectively identify new ones. Tools such as public events for citizens, stakeholder focus groups, and a dedicated information desk on the project can be employed to implement this scheme.

Once the local committee has identified the objectives, selected suitable areas for installing renewable energy systems, and commissioned the drafting of a business plan, the next step is to establish the **legal entity** that will manage the operations of the REC. The options of establishing a not-for-profit association or a cooperative should be compared and assessed based on factors such as the capacity of the plant(s) to be installed, estimated annual economic flows, expected number of members, and the involvement of the municipality. This stage should consider that cooperatives may have higher set up and administrative fees compared to not-for-profit associations but are better suited to manage more complex projects. Therefore, the choice of the legal form should be based primarily on the annual economic flows generated and the level of management complexity of the REC.

The final stage involves the **installation of the renewable energy systems** and the necessary **administrative procedures** to be legally recognized as a REC. Workshops can be organized during this phase to provide members with the knowledge to effectively manage the REC and **empower communities** through democratic and inclusive practices."

By following this reference scheme, stakeholders can work together to establish a successful Renewable Energy Community that contributes to the sustainable development of the local area while promoting renewable energy use and energy efficiency.

8.3 Examples from Italy

According to the ENEA Observatory, there are currently seventeen approved Renewable Energy Communities (RECs) and thirty-seven approved Collective Self-Consumption groups (CSC) in the Italian context, with nearly a hundred initiatives seeking recognition.

This section highlights three REC projects promoted by municipalities and supported by ènostra: the REC of Villanovaforru, the REC of Ussaramanna, and the "Lomellina" REC.

The **REC of Villanovaforru and the REC of Ussaramanna** are situated in two small Sardinian towns with the same names. Their respective municipalities have recently collaborated to establish these community-led projects. Operating in the same area, these RECs share similar objectives, including reducing energy costs for citizens and local small and medium-sized enterprises (SMEs), strengthening community relations, fostering cooperation between stakeholders, providing economic development opportunities to prevent depopulation, and combating land grabbing and the substitution of cultural heritage and landscape with large industrial power plants for renewable energy production.

After carrying out a feasibility assessment and involving the local community and stakeholders, both renewable energy communities were legally founded as associations in July 2021.

The REC of Villanovaforru generates renewable energy from a 53 kW photovoltaic (PV) system on the roof of the school's gymnasium, serving 45 households and a small hotel. The REC of Ussaramanna includes 56 households and four small businesses benefiting from clean energy produced by two installations located at the town hall and social center, with a total installed capacity of 71 kW.

The strong support from their municipalities has been crucial, with Villanovaforru and Ussaramanna allocating necessary resources for consultants' fees and solar panel installation. This support has facilitated broad citizen participation, especially for residents who cannot afford PV panels. The municipalities' active involvement has also addressed scepticism in the area.

In both cases, economic benefits are distributed among REC members based on their daily energy consumption, directly linked to their energy sharing profile. The surplus is invested in social and environmental projects to address community needs.

Both the Villanovaforru REC and the Ussaramanna REC were officially registered and approved by GSE (Gestore Servizi Energetici), the Italian national body providing incentives, in March and July, respectively.

Currently, with the support of ènostra, the next step for these RECs is their management. "Plug&play" smart meters have been installed to directly monitor production and consumption for subsequent distribution of economic flows through a dedicated cloud platform, based on energy sharing among the members.

Another noteworthy initiative is the Lomellina REC (Lombardy region), located in **Torre Beretti e Castellaro** (PV), a small town with around 500 inhabitants. The main objective here is to combat energy poverty, to favour social inclusion and to foster mutual support within the community.

The Lomellina REC manages a 19 kWp PV plant on the roof of the local sports center, involving 25 households. Once again, the municipality's strong support played a pivotal role in its success, covering legal and consultancy fees and acting as the project's guarantor.

This small REC, with the municipality and ènostra's backing, has implemented new redistribution criteria to support vulnerable groups. A portion of total revenues is allocated to a Solidarity Fund, offering economic support to vulnerable citizens identified by the municipality's social services.

Currently, the Lomellina REC awaits GSE's recognition to start receiving incentives and become fully operational.

In conclusion, these REC projects, supported by municipalities and driven by community collaboration, hold the promise of not only reducing energy costs and fostering local economic development, but also promoting environmental sustainability and social inclusion in their respective regions.

9. CO-CLEAN case studies

The CO-CLEAN projects included 5 pilot cases (3 in Italy, 1 in Albania and 1 in Montenegro) which were focused on the design and implementation of different energy production or energy efficiency solutions:

- *Municipality of Brindisi*: **installation of a photovoltaic system** on the Sant'Elia-Commenda Comprehensive Institute;
- *Municipality of Racale*: **installation of a photovoltaic system** on the municipal swimming pool;
- *Consortium for the Industrial Development of the Biferno Valley*: **updating of the current air conditioning system** dating back to 1998 in its administrative headquarters;
- *Municipality of Vlore*: **refurbishment of a municipal kindergarten building** and **installation of thermal solar panels**;
- *Municipality of Berane*: **installation of a wood pellets heating system** in the Municipal Cultural Center.

In the following paragraph each pilot case is presented by highlighting its main objective and results.

9.1 Municipality of Brindisi: installation of a PV plant and creation of a REC

Specific pilot's scope

The Municipality of Brindisi planned to install a photovoltaic plant on the roof of one local primary school (Istituto Comprensivo Sant'Elia-Commenda) and to setup a Renewable Energy Community in the neigbourhood around the school.

Once connected to the public grid, the PV plant can supply energy to the school itself and to the households who joined the energy community.

Main pilot's objectives

- to reduce the energy bill of the municipality (who pays for the school's bill) and of the energy community members;
- to increase families' awareness on energy use;
- activate collective actions and foster interactions among members;
- to build mutual benefit relationships among stakeholders in a win-win strategy;
- to create job opportunities on energy management.

Main Steps

1 - Preliminary feasibility study for the installation of a PV plant

This activity included a first site survey to inspect the roof surface, the electrical system, the site access (being a school, special safety conditions need to be observed) and potential surrounding shading elements.

Based upon this information, a first feasibility study has been produced which includes:

- a design solution for the PV plant (modules number and power, technical characteristics, inclination, spatial distribution, anchoring system, inverter type and power)
- an estimation of the capacity that can be installed, considering the available roof surface, potential tilt and azimuth, potential shadowing effects;
- an estimation of the electricity that could be produced considering the site characteristics, the site latitude and the available average solar radiation, the modules power and all the potential losses;
- an estimation of the amount of energy which will be consumed by the school itself and of the amount of energy which will be available for sharing among the REC's members.
- a reference list of the regulations to be considered regarding permissions and prescriptions for the plant installation and for the connection to the grid;
- a preliminary environmental assessment, where the potential impacts of the intervention have been evaluated in relation to the territorial context and to the possible city planning restrictions, in order to identify the best technical solutions.

Overall, from the feasibility study emerged that the PV plant installation will not negatively affect any of the considered environmental elements (air quality, water resources, soil, ecosystem, noise), but rather produce a positive impact, by reducing the amount of grid electricity consumption and, consequently, reducing the CO2 emissions linked to the electricity production.
The proposed technical solution consisted of:

- 75 PV modules of 400 Wp each, for an overall power of 30 kWp;
- 1 three-phases hybrid inverter of 30 kW which should allow for an average electricity production of 40 MWh/year.

2 - Ex-ante energy diagnosis of the pilot site building

In parallel with the feasibility study, an ex-ante energy diagnosis of the school building was carried out, in order to contextualise the PV plant installation within the specific site energy needs.
The energy diagnosis included:

- a general assessment of the building, with a map and a list of the different internal spaces and related use (e.g. classrooms, gym, administrative offices, toilets, etc);
- a technical description of the building envelope (materials, thickness, window fixtures);
- a description of the technical characteristics of the main plants: the heating system, the air conditioning system and the hot water heater;
- a survey of the lighting system: type, capacity and number of the different lamps;
- a survey of the further electrical utilities (computers, printers, autoclave, others);
- a collection of the main energy consumption data, related to both electricity and gas, together with an estimation of the connected CO2 emissions;
- a detailed analysis of the energy consumption data for both electricity and gas (monthly data, peak values);

- an assessment of the energy costs, both from an economic (€) and from an environmental (TOE) point of view;
- a detailed modelling of the gas and electricity consumption, in order to identify the main specific sources of consumption, to assess their energy performance index and consequently to define potential improvements;
- a list of interventions that could improve the overall energy performances of the building and reduce its energy consumption, including the installation of the envisaged PV plant and the replacement of fluorescent lamps with LED lamps, together with an estimation of costs and savings and the suggestion to setup a dedicated monitoring system.

3 – Public tender for the executive design and installation of the PV plant

Once acquired the outcomes of the feasibility study and of the ex-ante energy diagnosis, the Municipality of Brindisi appointed an engineer for the executive plant design and issued a call for tender to purchase and install the PV panels.

Once installed, the PV plant has been connected to the public grid, in order to inject the excess energy after satisfying the school electricity real-time consumptions.

4 – Renewable Energy Community setup

In order to setup a renewable energy community that involves citizens and families living in the school's neighbourhood, the Municipality of Brindisi, with the support of ènostra cooperative, promoted the following activities:

- a campaign to inform citizens and other relevant stakeholders about the CO-CLEAN project and the specific renewable energy community initiative;
- a first information desk to meet the neighbourhood citizens and collect some first expressions of interest;
- an agreement with the community cooperative already active within the school quarter for a direct involvement in the setup and management of the energy community;
- a public event to officially launch the energy community creation and engage citizens;
- a training course to enable one or more REC's members to manage the community;
- a constitutive Assembly to formally approve the Statute and internal rules of the Community

Outcomes

- to containment of the energy bill of the Municipality of Brindisi, who pays for the primary school's bill;
- the reduction of the CO2 emissions linked to the school building energy consumptions;
- a raised awareness of the citizens regarding the concept of "energy community" and the importance of energy efficiency and energy behavioural changes;
- the constitution of a REC which will provide social and economic benefits to the members and to the neighbourhood.

The primary school of via Mantegna

The first public meeting

The installed PV plant

The REC's constitution

9.2 Municipality of Racale

Specific pilot's scope

The Municipality of Racale planned to install a photovoltaic plant on the roof of the municipal swimming pool, which will serve to partially cover the energy consumption of the structure and will inject the excess energy into the public grid.

Main pilot's objectives

- to reduce the electricity consumption of the facility, which will serve to partially cover the energy consumption of the structure;
- to make the building much more efficient from an energy point of view;
- to employ renewable resources for the self-production of electricity.

Main Steps

1 – Ex Ante Energy Diagnosis

The Municipality of Racale appointed an expert to carry out an energy diagnosis of the swimming pool facility, which analysed the main energy consumption sources/vectors and the building energy balance. It emerged that the building is already equipped with a small PV plant of 4,5 kWp and that the water treatment and pumping system is one of the most energy consuming system within the building, since they work 24h/day.

Based upon the outcomes of the study, the diagnosis proposed a list of potential interventions to improve the overall energy efficiency of the facility, among which the followings where selected:

- Installation of a new bigger PV plant;
- Installation of a high-performance storage system

2 – Public tender for the executive project and for the installation of the PV plant

The municipality of Racale launched a public selection procedure to appoint a company for the elaboration of the executive project and for the installation for the PV plant and the storage system. The building is now equipped with a PV plant of 24,9 kWp, integrated with a 30,72 kWp storage system. The new installation has been inaugurated on the 26th of June 2023.

Outcomes

The overall detected benefits are:

- the containment of energy costs, due to a reduction of the electricity purchased by the grid;
- the reduction of the CO2 emissions linked to the building energy consumptions.
- the battery system allows to optimize the self-consumption, since it stores the electricity when is produced in excess and makes it available when the PV plant is not producing (e.g. during of low insolation day or in the evening).

The public swimming pool in Racale

The installaed PV plant

The inauguration

9.3 COSIB

Specific pilot's scope

Cosib planned to update the current air conditioning system, dating back to 1998 and thus obsolete and highly energy-consuming, in its administrative headquarter.

Main pilot's objectives

- improvement of the energy class of the building with a consequent reduction in energy consumptions;
- improvement of the thermal comfort of the workers;
- containment of energy costs offset by the production of energy from renewable sources.

Main Steps

1 – Ex Ante Energy Diagnosis and Executive project

Cosib published a tender to appoint an engineer to carry out an energy diagnosis of the selected building, to identify potential interventions to improve its energy efficiency and to elaborate the executive project.

The energy audit highlighted that the electricity consumption (the building's only energy carrier) was mainly due to air conditioning (heating and cooling) and lighting. In addition, the existing air conditioning system used R22 refrigerant gas that, since January 2004, is forbidden in newly built machines.

Based upon this information, the diagnosis proposed to following interventions:

- the replacement of the existing air conditioning system (serving the floor basement, first floor and second floor) with a more efficient and better performing heat pump AIR - AIR – VRV system (overall COP of approximately 4.5), which employs R410 as refrigerant gas.
- The installation of a 11 kWp photovoltaic system.

2 – Public tender for the installation of the air conditioning system

After the ex-ante diagnosis and the definition of the executive project, COSIB launched a public tender for the installation works and appointed a company. The works started in October 2022, due to problems related to the supplying of materials.

Outcomes

The overall detected benefits are:

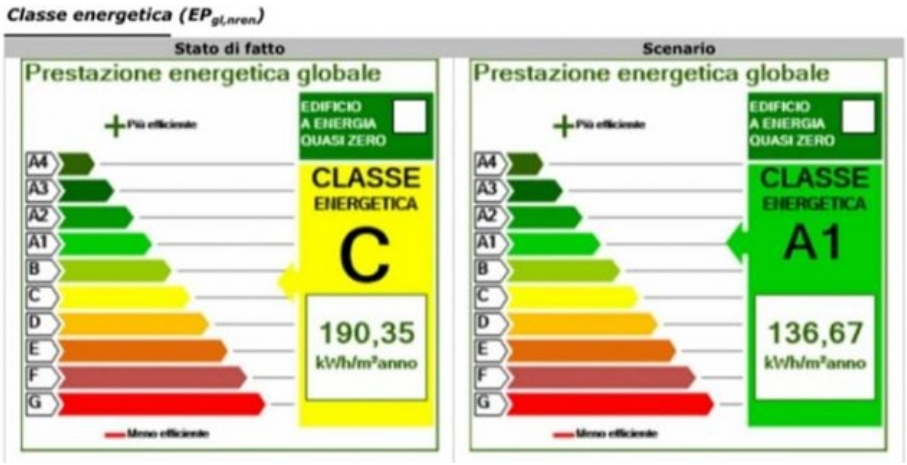
- the improvement of two energy classes from C to A1, thus reducing the overall CO2 emissions and ensuring a higher environmental sustainability;
- the improvement of environmental indoor comfort, thanks to a better performance control of the proposed plant;
- the introduction of an eco-sustainable technology, thanks to the replacement of refrigerant gas R22;
- the containment of energy costs offset, through the self-production of electricity from the PV plant.

COSIB administrative headquarter

The installed PV plant

The new heating system

Energy efficiency improvements



9.4 Municiaplity of Berane

Specific pilot's scope

The Municipality of Berane planned the replacement of the existing electric heating system of the Municipal Cultural Center, which was installed in 1973 and consumed a large amount of electricity, with a new wood pellet heating system.

Main pilot's objectives

- to increase energy efficiency and to reduce the electricity consumption and the associated costs for this facility;
- to raise awareness on energy use, through presentation of energy efficiency measures
- to foster the replication of this kind of interventions, by showcasing it to private owners of households and public institutions.

Main Steps

1 – Ex Ante Energy Diagnosis

The energy diagnosis was carried out with the aim to define the current conditions of the building, to measure the overall energy consumption, to analyze the associated costs and to define potential measures to increase energy efficiency and sustainability, to improve the thermal comfort for the building users and to quantify the needed investments.

Based upon this information, the diagnosis proposed the following intervention: to replace the existing electric heating system with a new wood pellet heating system.

2 - Public tender for the Supply and installation of heating system

Once acquired the ex-ante energy diagnosis, the Municipality of Berane announced tender for the supply and installation of the heating system in the building of Cultural Center.

The new heating system consists of 2 hot water boilers, with a capacity of 110 kW and 90 kW, powered by wood pellets. The system includes, in addition, a pellet tank, an equipment for automatic pellet cleaning with a cyclone system, an hot water buffer with a capacity of 1000 liters, circulating pumps, an expansion vessels of 1000 liters, flue gas sets, boiler manifold with three busbars, aluminum radiators and thermoregulation other accessories.

3 - Ex post - monitoring and analysis of results

After the commissioning of the central heating system, the consumption of electricity was analyzed until the end of the heating season, in order to compare the estimated and the real savings.

The aim of this diagnosis was to monitor and analyze the operation of the system from the point of view of providing optimal conditions for the use of the facility as well as for savings in electricity consumption estimated by the Detailed Energy Review (DER).

Additionally, this analysis provided recommendations for new steps to further improve the energy efficiency of the facility.

Outcomes

- the improvement of environmental indoor comfort, thanks to a better performance control of the proposed plant;
- the improvement of the building environmental performances;
- a raised awareness of the citizens and employees in local public institutions regarding energy efficiency measures and actions;
- the containment of energy costs.

Berane Municipal cultural center

The new boilers powered by wood pellets

9.5 Municipality of Vlora

Specific pilot's scope

The Municipality of Vlora planned to refurbish the building of "Kindergarden No. 5", by implementing energy efficiency interventions and by increasing the use of renewable energies.

Main pilot's objectives

- to reduce the amount of energy consumption by increasing the building's energy efficiency;
- to increase the share of renewable sources used to cover the energy consumptions by replacing traditional energy sources such as fuel or energy supplied from the electricity grid;
- to reduce the energy bill of the Municipality of Valona, who pays for the kindergarten's bill.

Main Steps

1 – Ex Ante Energy Diagnosis

The work started with a review of the available documentation (e.g. architectural and engineering aspects of the building, past interventions) and a number of meetings and site visits, aimed to identify and define the operational characteristics of the building (e.g. technical specifications of the existing energy systems, operational and maintenance procedures, limitations due to unusual situations).

Afterwards, the investigation focused on the most energy consuming processes within the building. The inspection analysed these key elements:

1. Operation of the systems in the building (include heating/cooling system);
2. Envelope of the Building (include wall insulation, windows, doors, ceiling etc.)
3. Lighting System (include the intensity of lighting, usage efficiency and control);
4. General characteristics of the electrical system;
5. Heating/Cooling System: general characteristics (Type of fuel, number of operating units, coefficient of performance etc.).

2- Preliminary feasibility study for the implementation of Energy Efficiency measures

Based upon the collected data, a preliminary feasibility study has been elaborated by an energy expert.

The report includes a description of the systems, their operation and their energy consumption, together with a description of the recommended improvement measures and their implementation costs.

The proposed technical solution consisted of:

1. Thermal insulation of external walls (5cm EPS);
2. Thermal insulation of the ground floor (3cm XPS) and all necessary layers;
3. Thermal insulation of the roof (10cm XPS) and all necessary layers,
4. Replacement of the old windows with new plastic double –glass windows;
5. Re-conception of a new HVAC system for heating and cooling;
6. Installation of roof solar panels for hot water (4m2 of solar thermal panels equipped with a 300l tank)

3 - Public tender for the realization of the interventions

This step included the public tendering process for the implementation of the selected interventions and was managed by the Municipality of Vlora.

The winner of the tender carried out the works for the implementation of energy efficiency measures in the kindergarden's building, according to the project specifications and requirements.

4 – Ex-post - monitoring and analysis of results

The ex-post energy diagnosis report shows the improvements that the energy parameters have undergone thanks to the interventions made in the kindergarten building to bring the thermal performance of the building to the optimal level.

The report includes:

- Audit of building structures/premises after interventions;
- Results achieved after interventions in improving the energy performance of the building;
- Interviewing and discussions with beneficiaries in order to conclude on the effects of implementing energy efficiency measures in this building.

Outcomes

- improved thermal comfort conditions in the Kindergarten building;
- more efficient energy use (overall reduction of energy consumption of about 73%);
- reduction of the energy bill;
- overall improved sustainability and environmental impact;

The municipal kindergarten before the intervention

Thermal insulation works

Old windows replacement

Solar panels for hot water

10. The new EU funding Programmes 2021-2027 available

A. The next generation EU

Apart from the 2021-2027 Multiannual Financial Framework (MFF), there is an additional budget line in this new 7 -year cycle.

As mentioned in the previous chapter, NextGenerationEU, with a total budget of 806.9 billion, is a recovery economic package aiming to support the EU member states to recover from the effects of the pandemic and to build a post-COVID-19 EU that is greener, more digital and more resilient.

Among other EU priorities, the NextGenerationEU **will focus on the green transition** contributing this way in EU's Green Deal main goals in order to achieve a clean energy transition carbon neutrality by 2050.

In particular, the majority of funds from NextGenerationEU (€723.8 billion) will be spent through the Recovery and Resilience Facility (RRF) Programme **for investments in green** and digital projects concerning **e.g. energy efficiency of buildings, clean technologies and renewables, sustainable transport**

In addition, NextGenerationEU will provide 83.1 billion to reinforce several existing EU programmes.

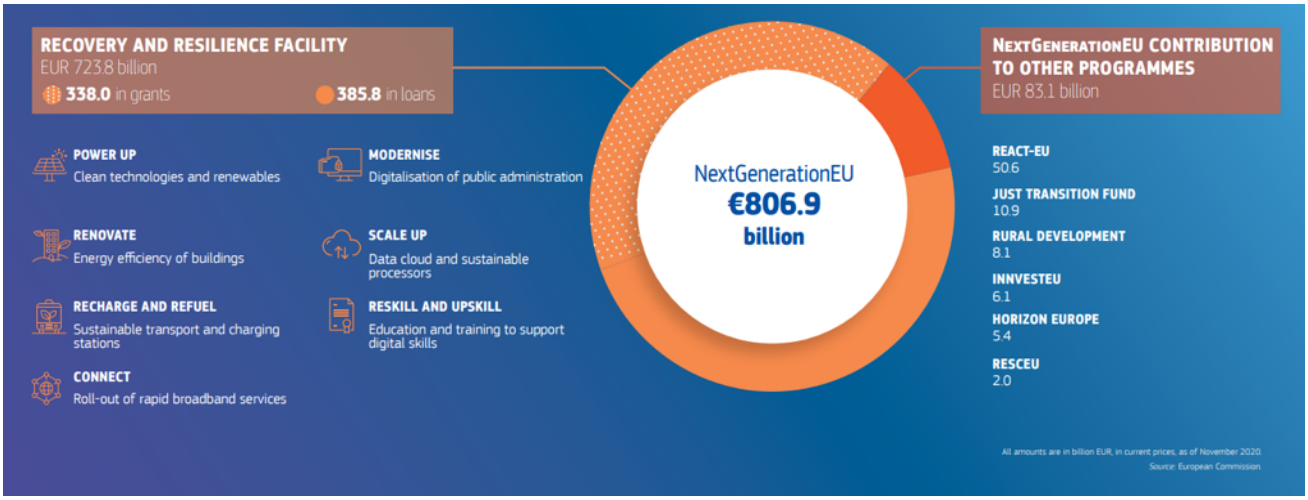


Figure 1. Allocation of the NextGenerationEU budget

The programmes funded under the NextGenerationEU are grouped into three headings, or expenditure categories. Each one is dedicated to a specific policy area: (1) Single Market, Innovation and Digital (2) Cohesion, Resilience and Values, **(3) Natural Resources and Environment.**

In particular, this last category has a budget of 401.00€ billion (covered by the multiannual financial framework) plus 18.94 billion € (covered by NGEU). Some of the programmes under this heading support the EU's environmental and climate objectives (such as the programme for environment and climate action (LIFE) and the Just Transition Fund).

B. Just transition fund

Just Transition Fund is a brand-new fund created under the 2021-2027 programming round. The fund is one of the elements of the Just Transition Mechanism for a transition towards climate neutrality.

With a budget of €17.5 billion (€7.5 billion from the core EU budget under the Multiannual Financial Framework and €10 billion from the Next Generation EU instrument) Just Transition Fund will be a key tool to support the territories most affected by the transition towards climate neutrality alleviating the socio-economic costs and providing them with tailored support.

In particular, funding will be available to all Member States, while focusing on regions with the biggest transition challenges.

This means backing productive investments in small and medium-sized enterprises, the creation of new firms, research and innovation, environmental rehabilitation, clean energy, up- and reskilling of workers, job-search assistance and active inclusion of jobseekers programmes, as well as the transformation of existing carbon-intensive installations when these investments lead to substantial emission cuts and job protection. JTF expected to mobilise close to €30 billion in investments.

Territorial eligibility –The Case of Italy

Italy is the EU's fourth largest producer of greenhouse gas (GHG) emissions, and its energy sector is the largest contributor to the total GHG emissions with a share of 56% in 2017. Italy's main sources of GHG emissions are coal power plants and iron/steel production. Two areas deserve specific attention, Taranto and Sulcis Iglesiente (Carbonia-Iglesias, in the South-West of Sardinia).

In this framework priority investment needs have been identified to make the economies of this area more modern and competitive.

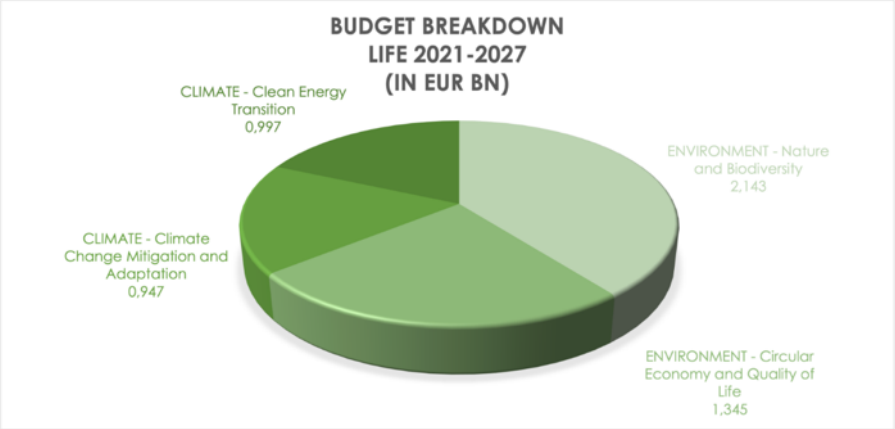
In the area of Taranto key actions of the Just Transition Fund could target in particular:

- Investment in the deployment of technology and infrastructures for affordable clean energy, energy efficiency and renewable energy, including in industrial sites that emit high GHG with the aim to reduce emissions;
- Investment in regeneration and decontamination of sites, land restauration and repurposing projects;
- Investment in the creation of new firms, including through business incubators and consulting services, considering Smart Specialisation Strategies
- Productive investments in SMEs;
- Upskilling and reskilling of workers;
- Job-search assistance to jobseekers,
- Active inclusion of jobseekers.

C. Life Programme

Created in 1992, the LIFE programme is the European Union's funding programme for the environment and climate action. For the new programming period 2021-2027 with a total budget of €5.4 billion the LIFE programme has been considerably strengthened to meet the targets set by the European Union towards a climate-neutral economy by 2050.

LIFE consists of four new sub-programmes: nature and biodiversity; circular economy and quality of life; climate change mitigation and adaptation; clean energy transition. The four sub-programmes started receiving financing from 2022.



LIFE Clean Energy Transition sub-programme

The LIFE Clean Energy Transition sub-programme has a budget of nearly EUR 1 billion over the period of 2021-2027 and aims at facilitating the transition towards an energy-efficient, renewable energy-based, climate-neutral and -resilient economy by funding coordination and support actions (Other Action Grants) across Europe.
Projects are co-financed under the LIFE Clean Energy Transition sub-programme in the following five areas of intervention: Building a national, regional and local policy framework supporting the clean energy transition; Accelerating technology roll-out, digitalisation, new services and business models and enhancement of the related professional skills on the market; Attracting private finance for sustainable energy; Supporting the development of local and regional investment projects; Involving and empowering citizens in the clean energy transition.

D. Horizon Europe

Horizon Europe is the European Union's flagship Research and Innovation programme, part of the EU-long-term Multiannual Financial Framework (MFF) with a budget of €95,5billion € designed to support European competitiveness by creating new growth and jobs based on scientific knowledge and technological development.
Among the key strategic orientations for EU research and innovation that have been defined for the period 2021-2024 there is making Europe the first circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

EU's ambition to substantially reduce greenhouse gas emissions by 2030, to become climate neutral by 2050 and turn into a more sustainable, climate-neutral, circular and competitive economy requires unprecedented changes in the way we produce, trade, build, move around and consume, which will boost our technological, economic and societal transformation and contribute to a green recovery. Horizon Europe investments will help deliver on the different dimensions of the European Green Deal, the European Union's new growth strategy.

The programme has been built on three main Pillars, each of them having a different objective:

Pillar I - Excellent Science: aims to increase the EU's global scientific competitiveness: It supports frontier research projects driven by top researchers through the European Research Council, funds fellowships for experienced researchers, doctoral training networks and exchanges through Marie Skłodowska-Curie Actions, and invests in world-class research infrastructures.

Pillar II - Global Challenges and European Industrial Competitiveness: supports research relating to societal challenges and reinforces technological and industrial capacities through thematic clusters. It sets ambitious goals for EU missions. It also includes the Joint Research Centre which supports EU and national policymakers with independent scientific evidence and technical support.

Pillar III - Innovative Europe: aims to make Europe a frontrunner in market-creating innovation via the European Innovation Council. It also helps to develop the overall EU innovation landscape through the European Institute of Innovation and Technology which fosters integration of the knowledge triangle of education, research and innovation.

In particular:

→ **Pillar II "Global Challenges and European Industrial Competitiveness"**

- Has a budget of EUR 53.5 billion € (out of EUR 95.5 billion) for 2021-2027 holding the lion's share of the programme funding.
- Supports research projects carried out (mostly) by international and inter-disciplinary consortia. The projects address specific topics which fall into **six different clusters**, each of them focused on specific societal challenges:(1) Health, (2) Culture Creativity and Inclusive Society, (3) Civil Security for Society, (4) Digital Industry & Space, (5)Climate, Energy & Mobility, and (6) Food, Bioeconomy, Natural Resources, Agriculture & Environment.
    - **Thematic cluster 5-Climate-Energy-Mobility:** Will tackle the transition of the energy and mobility sectors in a holistic approach, including with regard to their implications for citizens and society. **Cluster 5 aims at finding new and better ways to involve Europe's citizens in the low-carbon transition, including in cities, and in the sustainable economy.**

Pillar II

Budget for clusters & for JRC

in current prices

Cluster 1	Health	€8.246 billion (including €1.35 billion from NGEU)
Cluster 2	Culture, Creativity & Inclusive Societies	€2.280 billion
Cluster 3	Civil Security for Society	€1.596 billion
Cluster 4	Digital, Industry & Space	€15.349 billion (including €1.35 billion from NGEU)
Cluster 5	Climate, Energy & Mobility	€15.123 billion (including €1.35 billion from NGEU)
Cluster 6	Food, Bioeconomy, Natural Resources, Agriculture & Environment	€8.952 billion
	JRC (non-nuclear direct actions)	€1.970 billion

Clusters are including a budget for Partnerships and Missions
NGEU is Next Generation EU programme – Recovery Fund

European Commission

E. InvestEU Programme

InvestEU is the flagship programme of the European Union to boost private investment in Europe and foster growth and competitiveness. The focus of InvestEU will partially be on a sustainable recovery and making Europe greener. At least 30% of the investments that will be part of InvestEU will contribute to meeting the EU's climate objectives.

Programme's main objective is to carry out investments across the EU under four dedicated policy windows: **sustainable infrastructure (SIW)**, small and medium-sized enterprises (SMEW), research, innovation & digitalisation (RID) and social investments and skills (SISW).

The InvestEU Fund will trigger more than € 372 billion in investments [5]through an EU budget guarantee of €26.2 billion (coming from the Multiannual Financial Framework and NextGenerationEU resources). 9.9 billion out of the 26.2 billion guarantee is dedicated to Sustainable Infrastructure window.

In particular, *'The Sustainable infrastructure window'* is going to finance projects in:

- Transport, in particular clean and sustainable transport modes, multimodal transport, road safety, renewal and maintenance of rail and road infrastructure
- **Energy, in particular renewable energy, energy efficiency and building renovation projects** focused on energy savings and the integration of buildings into a connected energy source, storage, digital and transport system, improving energy infrastructure interconnection levels
- Digital connectivity and access including in rural areas
- Supply and processing of raw materials, space, oceans, water, including inland waterways, waste management in line with the waste hierarchy and the circular economy
- Nature and other environment infrastructure
- Cultural heritage, tourism
- Equipment, mobile assets and deployment of innovative technologies that contribute to the environmental climate resilience or social sustainability objectives of the EU, and meet the environmental or social sustainability standards of the EU

[5] See https://investeu.europa.eu/index_en

F. Interreg View 2021-2027

Interreg is one of the key instruments of the European Union (EU) supporting cooperation across borders through project funding. Its aim is to jointly tackle common challenges and find shared solutions in fields such as health, environment, research, education, transport, sustainable energy and more.

In the framework of the 2021-2027 Cohesion Policy, European Territorial Cooperation (ETC) can count on a budget of 8.05 billion euros at 2018 prices, an increase of 3% compared to the previous programming.

The ETC programs - better known as Interreg - are funded by the European Regional Development Fund (ERDF), the Instrument for Assistance and Pre-Accession (IPA III) and the Neighbourhood, Development and International Cooperation Instrument (NDICI), and are divided into 4 types: Interreg A for cross-border cooperation, Interreg B for transnational cooperation, Interreg C for interregional cooperation and Interreg D for cooperation in the outermost regions.

A particular importance was given to the issue of energy transition and green economy.

INTERREG for a greener carbon free Europe

The second policy objective for the programming period 2021-2027 is a greener, carbon-free Europe implementing the Paris Agreement. Fostering the transition towards a net zero carbon economy, promoting a clean and fair energy transition, circular economy as well as climate change mitigation are considered essential points in achieving the above policy objective.

Under the above frame INTERREG funds projects aimed at promoting the transition to a circular economy, energy efficiency measures and investments in green infrastructures supporting this way European countries to deliver a greener, climate neutral Europe in line with the European green deal.

In detail: *Interreg IPA South Adriatic Programme*

Priority Axis 2 - A greener South Adriatic programme area, by promoting clean and fair energy transition, green and blue investment, the circular economy, climate adaptation and risk management.

Specific Objective 2.3 - Promoting energy efficiency with joint cross border actions.

Actions supported - Within Specific Objective 2.3. (Energy), the actions shall contribute to promoting energy efficiency. This includes awareness-raising on CO2 emissions such as through solutions to decarbonize maritime mobility (e.g. fishing fleets) e.g. though innovative /sustainable electricity supply for vessels, energy efficiency measures targeting specific sectors (e.g. culture/tourism, construction, public facilities, etc.), but also efficiency & security of cross-border energy networks & pipelines, digital tools / processes for energy efficiency, integrated energy efficiency plans within RES strategies / actions, as well as the adoption of EU rules on energy. Typically, cooperation projects are required to implement soft measures, e.g. shared models, innovative applications/ instruments, common approaches, plans and strategies, energy communities etc., aimed at enhancing energy efficiency, as well as the use of diversified renewable resources.

Budget devoted to Priority Axis 2 - 25.11.085,00 € out of the 81.258.770,00€ approved.

Policy objective	Priority	Fund	Basis for calculation EU support (total eligible cost or public contribution)	EU contribution (a)=(a1)+(a2)	Indicative breakdown of the EU contribution		National contribution (b)=(c)+(d)	Indicative breakdown of the national counterpart		Total (e)=(a)+(b)	Co-financing rate (f)=(a)/(e)	Contributions from the third countries
					without TA pursuant to Article 27(1) (a1)	for TA pursuant to Article 27(1) (a2)		National public (c)	National private (d)			
1	PA 1	IPA III CBC	Total	14,819,555.00	13,361,773.00	1,457,782.00	3,146,758.00	3,009,539.00	137,219.00	17,966,313.00	82.4852322232 %	0.00
2	PA 2	IPA III CBC	Total	20,717,886.00	18,679,892.00	2,037,994.00	4,399,199.00	4,207,366.00	191,833.00	25,117,085.00	82.4852326614 %	0.00
3	PA 3	IPA III CBC	Total	11,327,476.00	10,213,205.00	1,114,271.00	2,405,257.00	2,300,372.00	104,885.00	13,732,733.00	82.4852270848 %	0.00
4	PA 4	IPA III CBC	Total	13,458,918.00	12,134,980.00	1,323,938.00	2,857,843.00	2,733,223.00	124,620.00	16,316,761.00	82.4852309843 %	0.00
6	PA 5	IPA III CBC	Total	6,702,649.00	6,043,317.00	659,332.00	1,423,229.00	1,361,167.00	62,062.00	8,125,878.00	82.4852280578 %	0.00
	Total	IPA III CBC		67,026,484.00	60,433,167.00	6,593,317.00	14,232,286.00	13,611,667.00	620,619.00	81,258,770.00	82.4852308249 %	0.00
	Grand total			67,026,484.00	60,433,167.00	6,593,317.00	14,232,286.00	13,611,667.00	620,619.00	81,258,770.00	82.4852308249 %	0.00

Interreg VI-A Greece-Italy Programme

Priority Axis 2 - Enhanced cooperation for a greener and low carbon GR-IT area
Specific Objective 2.6 - Promoting the transition to a circular and resource efficient economy.
Actions supported - Under this SO, the Programme is going to support synergies at cross-border level in order to enhance the implementation of circular economy policies and approaches in the Programme area. Cooperation actions may include joint action plans and strategies, education and awareness-raising campaigns, trainings and the development of relevant tools, pilot actions and other relevant solutions

Budget devoted to Priority Axis 2 - 46.272.834€ out of the 106.110.571€ approved.

PO No or TA	Priority	Fund (as applicable)	Basis for calculation EU support (total or public)	EU contribution (a)	Indicative breakdown of the EU contribution		National contribution (b)=(c)+(d)	Indicative breakdown of the national counterpart		Total (e)=(a)+(b)	Co-financing rate (f)=(a)/(e)	Contributions
					without TA pursuant to Article 27(1) (a1)	for TA pursuant to Article 27(1) (a2)		National public (c)	National private (d)			
	Priority 1	ERDF	Total eligible cost	14.445.016	13.500.015	945.001	4.815.005	4.815.005	0	19.260.021	75%	25%
	Priority 2	ERDF	Total eligible cost	34.704.626	32.434.229	2.270.396	11.568.209	11.568.209	0	46.272.834	75%	25%
	Priority 3	ERDF	Total eligible cost	27.149.540	25.373.402	1.776.138	9.049.847	9.049.847	0	36.199.387	75%	25%
	Priority 4	ERDF	Total eligible cost	3.283.747	3.068.922	214.825	1.094.582	1.094.582	0	4.378.329	75%	25%
	Total	All funds	Total eligible cost	79.582.928	74.376.568	5.206.360	26.527.643	26.527.643	0	106.110.571	75%	25%
		ERDF	Total eligible cost	79.582.928	74.376.568	5.206.360	26.527.643	26.527.643	0	106.110.571	75%	25%
	Total	All funds	Total eligible cost	79.582.928	74.376.568	5.206.360	26.527.643	26.527.643	0	106.110.571	75%	25%

Interreg Italy-Croatia CBC Programme

Priority Axis 2 - Green and resilient shared environment

Specific objective 2.7 - Enhancing protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.

Actions supported -The Programme has identified the following non-exhaustive list of actions that are expected to contribute to the specific aims of SO 2.7 Promoting information campaigns for responsible tourism activities aiming at safeguarding ecosystem and reducing pollution; developing joint strategies to spread good practices on nature protection, biodiversity and bioeconomy.

Budget devoted to Priority Axis 2 - 84.079.839,00 € out of the 216.232.834,00 € approved.

Policy objective	Priority	Fund	Basis for calculation EU support (total eligible cost or public contribution)	EU contribution (a)=(a1)+(a2)	Indicative breakdown of the EU contribution		National contribution (b)=(c)+(d)	Indicative breakdown of the national counterpart		Total (e)=(a)+(b)	Co-financing rate (f)=(a)/(e)	Contributions from the third countries
					without TA pursuant to Article 27(1) (a1)	for TA pursuant to Article 27(1) (a2)		National public (c)	National private (d)			
1	1	ERDF	Total	25,283,781.00	23,629,702.00	1,654,079.00	6,320,946.00	5,948,642.00	372,304.00	31,604,727.00	80%	0.00
2	2	ERDF	Total	67,263,871.00	62,863,431.00	4,400,440.00	16,815,968.00	16,363,618.00	452,350.00	84,079,839.00	80%	0.00
3	3	ERDF	Total	35,910,442.00	33,561,161.00	2,349,281.00	8,977,611.00	8,440,750.00	536,861.00	44,888,053.00	80%	0.00
4	4	ERDF	Total	33,284,064.00	31,106,602.00	2,177,462.00	8,321,016.00	8,204,522.00	116,494.00	41,605,080.00	80%	0.00
6	5	ERDF	Total	11,244,108.00	10,508,513.00	735,595.00	2,811,027.00	2,809,036.00	1,991.00	14,055,135.00	80%	0.00
	Total	ERDF		172,986,266.00	161,669,409.00	11,316,857.00	43,246,568.00	41,766,568.00	1,480,000.00	216,232,834.00	80%	0.00
	Grand total			172,986,266.00	161,669,409.00	11,316,857.00	43,246,568.00	41,766,568.00	1,480,000.00	216,232,834.00	80%	0.00

(Interreg VI-B) IPA Adriatic Ionian – ADRION Programme

Priority Axis 2 - Supporting a greener and climate resilient Adriatic-Ionian region

Specific objective 2.6. - Promoting the transition to a circular and resource efficient economy

Actions supported - IPA ADRION will support actions in the following thematic fields: Circular and resource efficient economy, waste management, consumers and buyers' empowerment and behavioral changes

Budget devoted to Priority Axis 2 - 86.837.409,00€ out of 160.810.020,00€ approved

Policy objective	Priority	Fund	Basis for calculation EU support (total eligible cost or public contribution)	EU contribution (a)=(a1)+(a2)	Indicative breakdown of the EU contribution		National contribution (b)=(c)+(d)	Indicative breakdown of the national counterpart		Total (e)=(a)+(b)	Co-financing rate (f)=(a)/(e)	Contributions from the third countries
					without TA pursuant to Article 27(1) (a1)	for TA pursuant to Article 27(1) (a2)		National public (c)	National private (d)			
1	1	Interreg Funds	Total	39,639,670.00	36,036,063.00	3,603,607.00	6,995,236.00	5,596,189.00	1,399,047.00	46,634,906.00	84.9999997856%	0.00
2	2	Interreg Funds	Total	73,811,797.00	67,101,634.00	6,710,163.00	13,025,612.00	10,420,490.00	2,605,122.00	86,837,409.00	84.9999992515%	0.00
3	3	Interreg Funds	Total	12,301,967.00	11,183,606.00	1,118,361.00	2,170,936.00	1,736,749.00	434,187.00	14,472,903.00	84.9999961998%	0.00
6	4	Interreg Funds	Total	10,935,081.00	9,940,983.00	994,098.00	1,929,721.00	1,929,721.00	0.00	12,864,802.00	84.9999945588%	0.00
	Total	Interreg Funds		136,688,515.00	124,262,286.00	12,426,229.00	24,121,505.00	19,683,149.00	4,438,356.00	160,810,020.00	84.9999987563%	0.00
	Grand total			136,688,515.00	124,262,286.00	12,426,229.00	24,121,505.00	19,683,149.00	4,438,356.00	160,810,020.00	84.9999987563%	0.00

11. MORE INFORMATION

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