

D.T2.1.1

REPORT ON MEASURES AND PROPOSALS FOR MICROGRIDS AND ENERGY COMMUNITIES

PP2-PP6-PP10 - IRE Liguria-DeMEPA-Udine

ALPGRIDS Policy Document

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Short Description
<p>The document summarizes the specific measures proposed by PP2 IRE Liguria; PP6 DeMEPA; PP10 Udine to public authorities in charge of energy plans, both at local and regional level.</p> <p>The energy plans were previously selected and analysed by the partner.</p> <p>The measures reported can be already integrated in the energy plan or just proposed to the public decision maker in view of next coming plan updates.</p> <p>Measures are supported by a preliminary qualitative and quantitative analysis estimating their potential impacts, associated costs and recommendations for the implementation.</p>

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Introduction

One of the most important activities that the Alpgrids Project carries out is the inclusion of measures in favor of Local Energy Communities in local, regional and national planning tools. During the project activities, the partners analysed the existing planning tools in 5 target countries and structured a joint methodology for the integration of the LECs in the planning tools in force and / or to be defined.

The integration of measures in favor of LECs in planning tools represents a fundamental step for their development in local communities. To achieve this ambitious goal, the project partners developed a common 3-step strategy:

Phase 1: identification of existing planning tools in target countries and selection of plans within which it was appropriate to integrate specific measures in support of Local Energy Communities.

Phase 2: structure a model of action sheet through which the PPs were able to define one or more measures in favor of the Local Energy Communities, specifically designed and contextualized, taking into consideration the characteristics of the regional/local plan to be integrated.

Phase 3: propose the new measures in favor of the Energy Communities Local measures identified by the PPs to the public authorities responsible for the Plans and facilitate a possible integration of the LEC measures in a future update of the identified Plans.

This document presents the results deriving from the Phase 3 activities carried out by the Italian partners of the Alpgrids Project: IRE Liguria, DeMEPA and the Municipality of Udine. The 3 Italian partners involved in the activities worked on various planning levels to achieve their objectives, respecting the very nature of the partners and with the aim of achieving the best possible results regarding the integration of LECs in the identified planning tools.

1 CONTEXT ANALYSIS: LOCAL, REGIONAL AND NATIONAL LEVEL

To better understand the context of analysis, it is important to clarify the nature of the partners involved in the process. IRE Liguria, DeMEPA and the Municipality of Udine are three partners of a distinct nature.

IRE Liguria is a fully public company, in house of the Liguria Region. Therefore IRE, as a Regional Agency, is configured as an institutional partner of the Regional level. This status allows IRE to cooperate with the Liguria Region and with some Ligurian Municipalities.

DEMEPA is an engineering and consulting company operating in the electrical infrastructure sector able to make available innovative and sustainable design solutions.

Municipality of Udine is a municipal level institutional entity (Local Authority).

Considering these aspects, each of the Italian partners has focused its activities on certain existing planning tools on which to focus its efforts in order to introduce measures in favor of LECs.

In particular, the Italian PPs analysed the following existing planning tools:

Table 1 Phase 1 General framework: selection of the plans analysed (Task AT2.1)

Partner	Plan level	Plan details
PP2 IRE	Regional + Local	Regional Plans Regional Environmental and Energy Plan (PEAR 2014-2020); The draft of a Regional Strategy for adaptation to Climate Change and a Regional Climate and Energy Plan is foreseen for the future
		Local Plans Over 50 SEAPs/SECAPs ; Sustainable Urban Mobility Plan (PUMS) of Metropolitan City of Genoa
PP6 DeMEPA	Regional + Local	Regional Plans The Environmental Energy Program ("PEAR- Programma Energetico Ambientale Regionale") of the Lombardy region the 'Regional Plan Energy, Environment and Climate' ("PREAC-Programma Regionale Energia Ambiente e Clima") of the Lombardy region
		Local Plans 'Plan Air and Climate of the Municipality of Milan' ("Piano Aria e Clima del Comune di Milano")
PP10 Udine	Regional + Local	Regional Plans PREME FVG – Regional Plan for Electric Mobility (2017); PRTP – Public Local Transport Regional Plan (2013); PREMOCI - Regional Plan for Cycle Mobility (2018); Regional Energy Plan(2015)
		Local Plans PEC - Municipal Energy Plan (2008); SEAP (2009); SECAP - draft (2021); PEG – Municipal General Action Plan (2020); Municipal Triennial Works Plan (2020); PUM - Urban Mobility Plan (2011); PUT - Traffic Urban Plan (2002, currently under review)

After the drafting of the possible measures to support the LECs to be introduced in the planning tools identified by the partners during Phase 2, Phase 3 was launched. During Phase 2 and 3 the partners have established stable relationships with the subjects responsible for the identified Planning tools. These relationships have generated choices on planning tools on which to focus more efforts for the integration of LECs.

The choices of the partners were determined by different aspects:

IRE Liguria: considering the delay relating to the structuring of the new Energy and Climate Plan of the Liguria Region, initially scheduled by 2020, it was not possible to continue cooperation with the Region on this specific activity. IRE has been involved by the Region to cooperate in other sustainability tables, in particular by pushing on microgrids. The support of IRE to the Region is concentrating on identifying the regional strategy for sustainable development and adaptation to climate change and suggest suitable actions for the new POR-FESR funding to concentrate the resources of the regional funds on the topic of Local Energy Communities. However, at the same time, the opportunity opened up for IRE Liguria to cooperate in the preparation of the SECAP of the City of Genoa.

IRE supported the Municipality of Genoa in the inclusion in the SECAP of a set of actions relating to the development of LECs. SECAP foresees 2 pilot projects on small energy communities in the Municipality of Genoa. The SECAP of the City of Genoa [has been approved](#) and therefore represents a planning tool that has implemented the measures to support the LECs deriving from the Alpgriids Project thanks to the support of the partner IRE Liguria.

DeMEPA: The Regional Energy, Environment and Climate Plan of the Lombardy Region is being drafted, the drafting will end in 2022. It is a thirty-year plan 2020-2050. The draft Plan contains 46 identified shares with potential interest on RES and self-consumption. The Plan includes measures of Smart Management, Energy Systems, distributed generation and self-consumption systems, measures to support collective self-consumption mainly dedicated to condominiums and self-consumption of commercial / industrial realities, private homes and public buildings with also integration of efficiently integrated electric vehicles with the power grid.

DeMEPA has made itself available to carry out the feasibility study of some cases deemed to be of interest in order to obtain qualitative and quantitative elements from which to define appropriate measures to be included in the plan. To this purpose DeMEPA developed a demonstrative feasibility study of a renewable energy community involving the City Hall, 110 households, a commercial shop and a SME, connected to the same electric substation and located in a small Lombard suburban town (Terranova dei Passerini in province of Lodi). Assuming the installation of 200 kW photovoltaic panels, 50% of which on the roof of the SME factory and the remaining distributed between the City Hall and the private buildings, the energy and environmental benefits achieved as well as the reduction of the end-user electricity bills have been assessed in accordance with the current national legislation on collective self-consumption.

The results of this feasibility study were presented to the Lombardy Region representatives. Then a decision to select three areas (at first identified in a mountain area, an urban area with energy poverty problems and a suburban cluster) in which to develop similar feasibility studies was agreed in a meeting held in late May 2021, being the choice of the three areas under the responsibility of the Lombardy Region. Later we have got any further information or/and proposals on the subject despite several our calls and e-mails. Although the situation is not currently evolving, it seems appropriate to wait for new developments in the coming months.

Udine: The Municipality of Udine has focused on the inclusion of measures in favor of LECs within its SECAP. The Udine Action Plan was approved on 30 September 2021 and presents an overall package of 60 mitigation and adaptation actions to climate change. 6 of these actions are directly related to the development of LECs within the territory of the Municipality of Udine. The measures envisage the development of LECs based on the local production of renewable photovoltaic electricity both in the private sector (Residential, Tertiary, Industry) and for buildings owned by the Municipality. Furthermore, 2 of the 6 measures in favor of LECs envisage an enhancement of the existing Energy Desk (*Sportello Energia*) and the creation of a "One Stop Shop" aimed at promoting the diffusion of LECs on the territory and facilitating the meeting between supply and demand for solutions related to energy efficiency and local energy production.

2 ENERGY PLAN(S) SELECTION AND ANALYSIS

2.1 Udine

During the development of this phase of the Alpgrids Project, Udine found itself in a favorable contingency situation: having to evolve and approve its SECAP. For this reason, the City's effort was mainly focused on the inclusion of measures in favor of LECs within its own Action Plan for Sustainable Energy and Climate (SECAP) developed thanks to the contribution of the European Project Compete4SECAP in which Udine was among the target municipalities.

This opportunity gave the Administration the possibility to coordinate and convey all policies and projects in favor of sustainability that the City manages, within a single planning tool: the SECAP of the City of Udine. Hence the idea of inserting measures in favor of LECs in a Local Planning tool such as SECAP.

2.2 IRE Liguria

During the implementation of Alpgrids IRE Liguria promoted the diffusion of Local energy communities both at a regional and local level. At a regional level IRE participated in working tables focused on the identification of the regional strategy for sustainable development and adaptation to climate change and the identification of priority axes for future funding from the POR FESR. At a local level IRE supported the Municipality of Genoa in the draft of its SECAP, suggesting the inclusion of one action on energy communities.

2.3 DeMEPA

Three plans were taken into consideration and analysed:

- The Environmental Energy Program ("PEAR- Programma Energetico Ambientale Regionale") of the Lombardy region,
- the 'Plan Air and Climate of the Municipality of Milan' ("Piano Aria e Clima del Comune di Milano"),
- the 'Regional Plan Energy, Environment and Climate' ("PREAC-Programma Regionale Energia Ambiente e Clima") of the Lombardy region.

The Environmental Energy Program of the Lombardy region, valid for the period 2015-2020, has now exhausted the planned actions aimed at reducing the energy consumption from fossil sources and the related greenhouse gas emissions.

The others two plans are both under development and therefore with greater possibility to be integrated with measures involving microgrid and local energy communities.

The Plan Air and Climate of the Municipality of Milan provides a 45% reduction in carbon emissions by 2040 and net carbon neutrality by 2050, through the following main measures:

- 45% reduction of fossil fuel consumption for households and by 10% in the tertiary and industrial sectors,
- energy upgrading of 50% of the municipal building stock,
- further development of district heating networks,
- ten-fold the green covered area of the city,
- halving of the motorised personal mobility.

The Regional Plan Energy, Environment and Climate, with validity valid from 2023 onwards, also sets very ambitious targets with a strategic vision to 2030 and 2050 in full compliance with the Paris Agreement on climate change and the EU Clean Energy Package. The strategic objectives of plan can be summarized in:

- a reduction of energy consumption between 28% and 32% compared to 2005 levels,
- at 40% reduction of carbon emission by 2030 and net carbon neutrality by 2050.

Unlike the Plan Air and Climate of the Municipality of Milan this plan in addition to urban areas also considers peri-urban, peripheral and mountain areas and provides for interventions in the residential, industrial and agricultural sectors.

The plan specifies 46 specific actions related to the efficiency in the final use of energy, the development of RES and the promotion of self-consumption. Among these actions the following are to be outlined:

- smart management of energy systems in urban and industrial districts,
- promotion of distributed generation and self-consumption;
- supporting collective self-consumption schemes in condominium buildings;
- in the framework of the national regulations on the collective self-consumption
- bi-directional energy exchanges between the grid and the electric vehicles.

The local energy communities are specifically considered among the solutions proposed to achieve the strategic objectives of the plan according to the following guidelines:

- in mountain areas through combined use of biomass, solar thermal and PV systems,
- in the agricultural and livestock sector using biogas,
- in urban and peri-urban areas through PV plants connected to the upstream grid.

At last being the Lombardy Regional Plan Energy, Environment and Climate under draft, with the final release scheduled for the end of 2022, it represents a considerable opportunity for including measures favoring energy communities.

2.4 Barriers for Local Energy Communities

2.4.1 IRE, DeMEPA, Udine

According with what reported in A.T2.5 *SHARING ENABLING POLICIES AND INSTRUMENTS*, the Italians partner have identified the following barriers and recommendations for LECs development in target areas:

Barrier(s)	Recommendation(s)
<ul style="list-style-type: none"> Only a scheme of collective self-consumption from renewable sources has been regulated, by transposition, with some restrictions, the EU directive 2018/2001 (renewable self-consumers) For renewable energy communities including a plurality of self-consumers (public, commercial and industrial users) the 200 kw renewables power limit is too restrictive For self-consumers of the same building (condominium) the definition of the convenient power of renewable source to be installed is quite impossible or too expensive: end users have only data on a monthly basis while the incentive is defined on an hourly basis. The establishment of a renewable energy community has to be performed through a private writing among the self-consumers, without any format or guidelines for the main significant aspects (such as the allocation of incentives among the self-consumers, how to operate in the event of recession from the community by a self-consumer). 	<ul style="list-style-type: none"> Transposing also the EU directive 2019/944 (citizen energy community) To extend the limit considering that already exists the geographic constraint of a same substation for all the self-consumers.
<ul style="list-style-type: none"> 1. The presence of an extremely complex incentive scheme: in Italy the user can currently choose among 4 types of incentives or agreements: Scambio sul posto (exchange on site), Ritiro dedicato (remuneration of excess energy), Tariffa Omnicomprensiva (all-inclusive tariff), Renewable Energy Community/Collective Self-consumption 2. In 2020 about 750MW of new PV capacity has been installed in Italy, (+3.8% with respect to 2019). The most used incentive has been the Scambio sul Posto (57%). The current trend is very far from that necessary 	<ul style="list-style-type: none"> GSE, the public company in charge of paying the incentive, must provide the hourly consumption data of the renewable energy community using the same procedure adopted to evaluate the incentives. A set of simple applicable rules must be defined (and updated over time) by the regulating authority (or by a public body delegated for the purpose)
	<ol style="list-style-type: none"> 1. Define a new and simpler incentive scheme. In the case of a multiple choice, could the incentive level be prioritized based on the most promising configuration? 2. If the REC is pursued as one of the preferred schemes, should the associated incentive be the greatest in all the most likely configurations? 3. Standards and technical rules cannot generally be applied retroactively except for security requirements. To facilitate the installation of photovoltaic systems on existing buildings, a specific incentive scheme should be applied <p>The deduction of expenses for generation from</p>

Commenté [pm1]: kW

Commenté [pm2]: may be too restrictive in some cases

Commenté [pm3]: only cumulative

to match the 2030 target. If the REC incentive scheme will not significantly overcome the benefits from the past schemes, the major effort to establish and manage an Energy Community could not be justified. Furthermore, the trend of RES installations towards 2030 will not improve significantly

3. Target on photovoltaic roofs: the present law requires a low level of PV capacity only for new buildings. For existing buildings, it is not mandatory to install any photovoltaic plant
4. The rules for expenses deduction on building makeover (from 50% to 110%) (included RES self-generation as intervention for efficiency increase) are not stable but extended year by year causing uncertainty for investors

RES installations on existing buildings should be extended at least for 3-5 years

2.5 Local/regional potentials for Local Energy Communities

2.5.1 Udine

The activities for the development of LECs at local level for the City of Udine have been launched since the structuring of the Sounding Board. The structuring of the SB has allowed the City to identify the relevant stakeholders for the purpose of launching initiatives to support LECs at the local level. In addition to the involvement of the municipal offices for the energy management of the municipal heritage and the urban sector, entities of institutional level have been identified and involved such as APE FVG (Regional Energy Agency of Friuli Venezia Giulia), the Friuli Venezia Giulia Region and a series of local actors from the world of research and innovation.

Each of the 6 Actions in support of the LECs included in the SECAP of the City of Udine specifically reports the Stakeholders involved in the process and the respective roles assigned to them.

2.5.2 IRE Liguria

The approval of a national regulation, as well as the allocation of a significant amount of money in the PNRR, provides the regions and local bodies in general with an important opportunity to develop LECs in their territories.

In this context, this theme becomes a chance for Regions and Local Authorities to implement regulatory, training and programming initiatives to encourage widespread activation of the initiatives in their territories.

In particular, Liguria Region and the Municipality of Genoa are encouraging the spread of energy communities at a local level by promoting dedicated funding initiatives and pilot projects

2.5.3 DeMEPA

The Official Guidelines (“Atto di indirizzo”) of Lombardy Regional Plan Energy, Environment and Climate expressly provides for actions supporting the Energy Communities.

In the development framework of RES (including not less than 3400 MW of new PV plant) and the promotion of self-consumption they are explicitly considered:

- promotion of distributed generation and self-consumption also through distributed energy storage scheme,
- supporting collective self-consumption schemes in condominium buildings in the framework of the national regulations on the collective self-consumption
- local energy communities, identified as one of the pillars for a more resilient energy system, considering the max power of 200 kW allowed by the current national law, actions on limited areas are envisaged according to the following guidelines:
 - in mountain areas through combined use of biomass, solar thermal and PV systems,
 - in the agricultural and livestock sector using biogas,
 - In urban and peri-urban areas through PV plants connected to the upstream grid.

Moreover, regional incentives (not yet quantified and additional to the national ones) shall be provided in order to support local electricity self-generation and the participation in local energy community.

3 LOCAL/REGIONAL AUTHORITIES IN CHARGE OF THE PLAN

3.1 Strategic vision

3.1.1 Udine

The Action Plan of the City of Udine is developed on 6 main Axes (macro-areas), which are coordinated with the energy and environmental sustainability policies of the Municipality and with the programmatic tools, planners and municipal regulators.

Each of the Axes includes a package of Actions identified by the Municipality and by the stakeholders capable of intervening in a plurality of areas.



Azioni per Asse

Asse 1 - Una Città più efficiente: 16 Azioni
Asse 2 - Una Città ad energia rinnovabile: 5 Azioni
Asse 3 - Una Città che si muove meglio: 10 Azioni
Asse 4 - Una Città resiliente: 23 Azioni
Asse 5 - Una Città sicura: 7 Azioni
Asse 6 - Una Città che informa: 4 Azioni



Figure 1 Udine City SECAP Axes

Measure per Axes	Energy Saving (MWh)	Local Energy Prod. (MWh)	Emissions avoided (tCO ₂)
1 - A more efficient city	385,082	-	71,030
2 - A city with renewable energy	429	38,274	23,083
3 - A city that moves better			31,415
4 - A resilient city	-	-	653
5 - A safe city	-	-	-
6 - A city that informs			
Total	385,510	38,274	126,181

Table 2 General framework of the Actions and quantitative objectives of the measures

Each identified Action is described and reported using the model Action Sheet (Action Sheet Template), suitably structured and able to collect projects, information, data and initiatives covering the three axes of the Covenant of Mayors Climate and Energy initiative:

- Mitigation;
- Adaptation;
- Fight against Energy Poverty.

3.1.2 IRE Liguria

The regional strategy for sustainable development and adaptation to climate change of Regione Liguria is based on several issues that are part of the National Plan for Adaptation to Climate Change.

They are:

- Agriculture and zootechnics
- Aquaculture and fishing
- Energy
- Forests
- Terrestrial ecosystems
- Marine ecosystems
- Coast
- Transport
- Urban systems
- Tourism
- Hydrogeological instability
- Health

The work done with the different regional sectors brings definition and construction to the impact chains.

These impact chains aim at identifying the connections between ongoing and expected climate changes (climate drivers) and the effects on the different sectors. For each impact chain, the exposed areas and their characteristics in terms of vulnerability and adaptive capacity, which use indicators to describe the elements of fragility and response capacity have been identified.

SECAP of Genoa: With the drafting of the Sustainable Energy and Climate Action Plan (SECAP), the Municipality of Genoa renewed the commitment made in 2010 with the previous Covenant of Mayors initiative, further reducing emissions on its territory and starting a path to improve its ability to adapt to climate change.

As far as adaptation to climate change is concerned, with this SECAP the Municipality of Genoa has outlined a first step to consolidate the state of knowledge on this issue, which will be progressively improved in the years to come. The SECAP in particular contains a preliminary analysis, according to the simplified approach (Indicator-based vulnerability assessment) defined by the Joint Research Centre within the Guidelines for the drafting of the SECAP. This methodology allows for a qualitative approach, based on the experience of a group of experts set up for this purpose. Experts from Civil Protection, Resilience Office, Territorial Planning, Energy Policies, IRE, UNIGE and CIMA Foundation have collaborated in the identification of priority climate hazards (extreme precipitation, extreme heat and forest fires) and in the construction of useful indicators for climate characterisation (current and future), territorial vulnerability analysis and impact assessment. Through the drafting of the Risk and Vulnerability Assessment, the Municipality of Genoa has carried out a context analysis in relation to the main climatic (both current and future trends) and territorial specificities, which constitutes the basis for the Programme of Adaptation Interventions.

3.1.3 DeMEPA

The strategic vision to 2030 and 2050 of Lombardy Regional Plan Energy, Environment and Climate intends to implement climate policies and the development of a competitive and sustainable regional economic system with the following strategic objectives:

- reduction of energy consumption between 28% and 32% compared to 2005 levels by increasing energy end-use efficiency;
- 40% reduction of carbon emission by 2030 and net carbon neutrality by 2050;
- 32% of final energy consumption from renewable energy sources;
- 40% reduction in carbon emissions compared to 2005 level by 2030 (that means 5,2 t CO₂eq/inhabitant in 2030 year).

Specific guidelines for residential, civil, industrial, agricultural and transport sectors have been identified for the achievement of the stated strategic objectives.

The Plan specifies 46 specific actions related to the efficiency in the final use of energy, the development of RES and the promotion of self-consumption schemes.

In particular the energy communities are considered transformation levers towards greater resilience of the electricity sector. For instance, an energy community able to store and return energy to electric vehicles is considered as a possible tool for electricity grid stabilization in connection with an increasing penetration of renewable intermittent sources.

3.2 Contacts and meetings

3.2.1 Udine

For the purposes of structuring the SECAP Shares, various meetings were organized with internal and external stakeholders of the Municipality. In particular, APE FVG (Energy Agency of Friuli Venezia Giulia) and representatives of the Friuli Venezia Giulia Region (Infrastructure and Territory Central Directorate) were involved among the relevant external parties. As regards the internal stakeholders, meetings were organized with the municipal political representatives (Mayor, Deputy Mayor - Councilor for Mobility, Public Works, School Building, Councilor for Territorial Planning and European Projects, Councilor for Litigation, Environment) and with the Municipal Energy Manager and the 3rd Sector Manager (Public Works - Expropriation) and 4th Sector (Urban Planning - Private Building). The formulation of the SECAP has therefore been followed since its inception by both the political side and the most involved municipal officials. In particular, the Actions of the Plan dedicated to the development of LECs in the territory could also be developed with the support of external stakeholders and are perfectly in line with sustainability policies, with energy planning and with the sustainability objectives that Municipality of Udine has set out to achieve.

3.2.2 IRE Liguria

Not applicable

3.2.3 DeMEPA

Several exchanged emails were exchanged between DeMEPA the DG Environment and Climate of Lombardy Region as well as on line meetings. The following table lists the more significant of these meetings with the relevant meeting subject.

Date	Meeting subject
3/02/2021	Presentation of the ALPGRIDS project and T2 activity
25/02/2021	Deepening about the enabling policy environment for energy communities
18/03/2021	The Official Guidelines of Lombardy Regional Plan Energy, Environment and Climate
23/04/2021	DeMEPA proposal on the way to define measures in the Regional Plan Energy, Environment and Climate supporting energy communities
5/05/2021	Presentation of the feasibility study of a renewable energy community in locality Terranova dei Passerini
28/05/2021	First definition of priority areas of interest for Lombardy Region on the renewable energy communities

4 DEFINITION OF THE MEASURES/Strategies SUPPORTING Local Energy Communities

4.1.1 Udine

The Municipality of Udine officially approved its Sustainable Energy and Climate Action Plan (SECAP) within the framework of the Covenant of Mayors for Climate and Energy initiative. Udine SECAP draft contains about 60 measures which concern the following areas: mitigation, adaptation to climate change and the fight against energy poverty.

Therefore, the identified Plan within which to insert measures in support of LECs, shared self-consumption and LECs is precisely the SECAP of Udine. The development of Local Energy Communities represents a fundamental step for the energy transition of the City of Udine. The study conducted in the SECAP regarding the Inventory and Monitoring Emissions Baselines of the City, showed that in Udine the consumption of fossil-type thermal energy is still very impactful. To improve the emission impact of fossil fuels used for heating in the domestic, tertiary and industrial sectors, the city will have to focus strongly in the coming years at a significant increase in local production of energy from renewable sources. These objectives are perfectly in line with the sustainability policies of the City and with the programmatic objectives that the Municipality of Udine pursues.

4.1.2 IRE Liguria

In the regional strategy for sustainable development and adaptation to climate change, local energy communities have been included among the actions that contribute to reduce the risk of blackouts mainly due to heat waves caused by climate change.

In the SECAP of the Municipality of Genoa an action directly linked to Local Energy Communities has been identified. It foresees:

- awareness campaigns on the environmental, social and economic benefits of energy communities;
- tools providing information on locally available resources (e.g. renewable potential on the Municipality's Geoportal website), case studies at a national level and on regulatory paths for launching initiatives;
- promotion of financial opportunities and existing calls for funding at a national and regional level;
- realisation of demonstrators on a local scale

4.1.3 DeMEPA

In compliance with the guidelines of the of Lombardy Regional Plan Energy, Environment and Climate, DeMEPA would propose the following measures aimed to foster the penetration of renewables and favouring the energy communities for the different sectors:

- **Residential and Civil:** Promotion of self-consumption schemes, particularly for condominiums, and use of heat pumps supplied by PV systems;
- **Industry:** Development of local energy communities, particularly in case of high energy demand;
- **Agriculture:** Promotion of energy communities focused on the sustainable use of local resources for the self-production of energy (biomass, biogas);
- **Behavioural measures for citizens:** Promotion and support the self-production and storage of electricity (prosumer) in a context of end-user's empowerment for a rational use of energy.

4.2 Reasons for proposing the measure

4.2.1 Udine

1.1 Promotion of the use of energy from photovoltaic systems in private sectors

This is a preparatory measure that aims to support the installation of photovoltaic systems in the private sectors for the purpose of structuring a local context that aims to exploit and maximize local production of renewable energy and self-consumption by exploiting existing national incentives.

1.2 Promotion and development of Renewable Energy Communities

This action aims to create a local fabric that is aware, trained and informed on the topic of microgrids, Energy Communities and collective self-consumption by exploiting the activities and skills of the Energy Desk in the city and maximizing relations with local stakeholders.

1.3 Renewable Energy Communities Pilot Project - Alpgrids Project

This is the Alpgrids pilot action within which the Municipality of Udine is developing its first collective energy / self-consumption community. It contains the activities carried out, the feasibility study and the expected results.

1.4 Investments for the production of energy from municipal photovoltaic systems

This action aims to increase the installation of photovoltaic systems on public buildings and at the same time evaluate the opportunity to create energy communities or collective self-consumption between buildings of the Municipality by exploiting the production of electricity from photovoltaic systems.

1.5 Strengthening of the Energy Desk (*Sportello Energia*)

This action aims to enhance the activities of the City Energy Desk by expanding cooperation with the stakeholders of the territory that manage it (Regional Energy Agency and the Friuli Venezia Giulia Region) in order to encourage the development of investments in the renewable energy sector, energy efficiency, RECs, self-consumption, etc.

1.6 Creation of the “One Stop Shop”

This is a long-term action that aims at an evolution of the Energy Desk and at the supply of energy services with complete packages from consultancy to the feasibility of projects, identification of suppliers, banks and credit institutions.

4.2.2 IRE Liguria

Energy communities represent a different way to produce and consume energy, increasing the responsibility of individual citizens, giving them a role that is no longer exclusively passive. In addition, as specified in the Clean Energy Package, they actively contribute in the achievement of European objectives to reduce greenhouse gas emissions.

In this context it becomes essential to include actions in favour of LEC in the planning tools and territorial programming.

4.2.3 DeMEPA

The planned 40% reduction in carbon emissions by 2030 by the Lombardy Regional Plan Energy, Environment and Climate necessarily requires a huge increasing of the share of energy generated by renewables. This greater penetration of renewables is well running with the energy communities that locally generate at least part of their energy needs, thereby leading to:

- a reduction in losses in the transmission and distribution networks; in the feasibility study of the pilot of Udine it has been assessed that 4 social housing blocks organized in collective self-consumption schemes allow to avoid 0,4 MWh /year of losses in upstream grids; similar

schemes applied to 50% of the more than 100.000 condominiums of the Lombardy Region lead to about 100 GWh per year of energy saving;

- the end users involved in the energy communities have to participate the decision on the investment related the local generation sources and they can directly evaluate the acquired benefits in terms of lower energy bills and a better environmental quality of the territory; this improve their awareness on energy issues and encourage a more efficient use of energy resources;
- in perspective the energy communities shall become full player of the electrical system, with the possibility to buy and sell energy as well as to provide services to the system thus making the electricity system more flexible, resilient and participated in the choices concerning the local territories.

Hence the series of measures that would be proposed for all sectors, from residential one (both for new and existing buildings), to the civil, industrial and agricultural sectors.

4.3 Measure/Strategy description

4.3.1 Udine

Promotion of the use of energy from photovoltaic systems in private sectors

Action n° 1.1

DESCRIPTION

Action

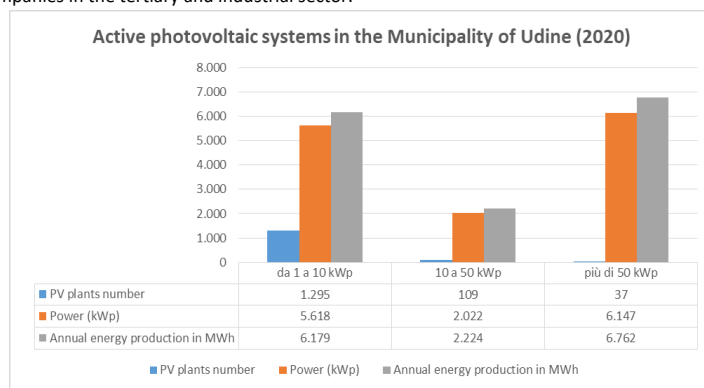
The investment action to increase production from private photovoltaic systems consists of two interventions: the promotion of photovoltaic systems and the Incentive for the purchase of monocrystalline systems in the private sector.

From the annual publication of the savings obtained from municipal photovoltaic systems, the propensity to investment of individuals is promoted. Starting from the national energy strategy, compared to the data recorded in 2017, an increase in installed photovoltaic production is expected to be about 2 and a half times the current one.

The municipality also chooses to provide a non-repayable incentive for private individuals who choose to install a photovoltaic system with monocrystalline panels on the entire surface of the roof available. The municipal goal is to make the most of the area available for photovoltaic production.

The use of these panels and not of the polycrystalline ones, will allow an increase in the average production capacity of 15%. In fact, with the same surface area occupied, the intervention will increase the installed peak power, favoring an increase in the average annual production, to the benefit of municipal production. The cost difference between the two technologies is 50% financed by the municipality.

The action is particularly aimed at the private sector and companies. In the province of Udine, in Friuli Venezia Giulia more generally and in particular in the city of Udine, in fact, the [Atlaimpianti GSE](#) data show a high number of plants but of low peak power. This is justified by a prevalence of photovoltaic diffusion among domestic users and a low use of systems for companies in the tertiary and industrial sector.

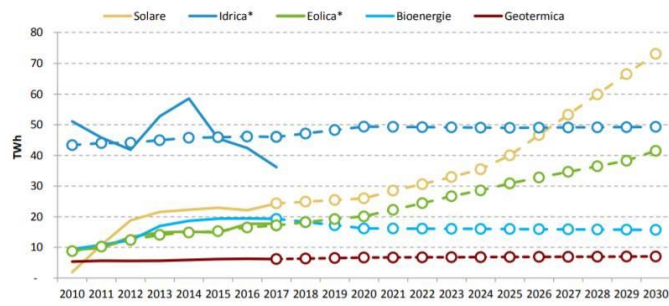


In the case of systems for homes, the occupied surface may be the maximum available and / or the equivalent calculated with a polycrystalline system with a power equal to the contractual one (Eg. Contractual power of 4.5kW -> polycrystalline photovoltaic system with a power of 4, 5kW occupies 30sqm, therefore financing is required for a 30sqm polycrystalline plant, or 5kWp. The numbers shown are indicative and not significant).

The Italian Legislative Decree 28/2011 "Renewable Energy Decree" requires all buildings that are newly constructed or have undergone significant renovations. In particular, it is envisaged

	<p>that in these buildings, starting from 1 January 2017, systems powered by renewable sources will be installed above or inside the building or in the related appurtenances, with electrical power measured in kW, calculated according to the following formula : $P = 0.02 * S$ where S is the plan area of the building at ground level, measured in sqm.</p> <p>In all other cases there are no specific obligations but there are forms of incentives that stimulate the market, in particular tax deductions. Also on this front, the Municipality has the possibility to intervene to accelerate the transition process towards renewable sources, acting in particular through communication campaigns, favoring the meeting of supply and demand through the organization or support for the creation of groups of purchase, etc. It is therefore assumed that the activation of these policies on the territory, together with the stimuli induced by the fiscal incentive mechanisms promoted at the national level, may also stimulate the owners / tenants of existing residential buildings to increase the share of consumption satisfied by renewable electricity.</p>
Expected results	<ul style="list-style-type: none"> - Increase in installed photovoltaic power - Reduction of CO₂ emissions - Reduction of the power used in the grid (lower grid losses, lower consumption, lower emissions) - Increased variability of energy supply sources - Punctual integration with smart grid and smart city systems (electric vehicle charging, noise reduction on transmission networks, ...) <p>The future planning of this action cannot be separated from the use of municipal storage systems distributed throughout the territory, from the exploitation of the development flywheel of photovoltaic systems guaranteed by the new National Incentive Superbonus 110% and from the local development of the Energy Communities.</p> <p>The total investment for the action is therefore equal to approximately 62,000,000 € in 10 years (just over 0.1% financed by the municipality) with an increase in electricity production from photovoltaics by approximately 37,914 MWh / year at 2030. Of the latter, a share of self-consumption equal to 65% and a share of injection into the grid equal to 35% are considered.</p> <p>The reduced polluting emissions of 6,802 tCO₂ / year by 2030 are due to the lower withdrawal of energy from the national electricity grid. In the calculation of the saving of polluting emissions, the components concerning the reduction of network losses have not been included (as a precaution).</p> <p>The effects of this action are closely related to the development of the Energy Communities (Action 1.2) within the municipal area. The Renewable Energy Communities (REC) will favor an increase in the share of renewable energy self-consumption in the municipal area, producing a reduction in emissions from non-withdrawal from the grid. These emissions avoided thanks to the development of the REC are evaluated and quantified in the Action 1.2.</p> <p>For this action, recourse, where possible, to financing through other forms of public and / or private financing is envisaged, to be assessed from year to year.</p>

Figura 11 - Traiettorie di crescita dell'energia elettrica da fonti rinnovabili al 2030 [Fonte: GSE e RSE]



Italian national trajectory on electricity produced by Renewable Energy systems by 2030

Promotion and development of Renewable Energy Communities

Action n° 1.2

DESCRIPTION

Action

Thanks to the activities conducted by the Municipality in the framework of the "Interreg Alpine Space Alpgrids - Promotion of renewable sources in the Alps through energy microgrids" project, the Municipality of Udine has launched a process aimed at connecting users and electricity producers. The aim of the project is to create both energy networks intended as autonomous islands, and groups of users scattered throughout the territory and served by the national electricity network that are structured in the so-called Renewable Energy Communities (REC) with the aim of optimizing their production and consumption. exploiting the possible synergies.

The Municipality's action aims to achieve two specific objectives:

1. Make access to the technical-legal information underlying the establishment of the Renewable Energy Communities (REC) and the collective *self-consumption* groups available to the territory as regulated by current legislation.
2. Define a favorable context for the meeting of supply and demand in which the subjects who want to establish themselves in RECs or *self-consumption* groups are certain of the congruity of prices and the economic operators able to offer different degrees of service find informed and motivated subjects to establishment of energy communities.

In order to achieve the objectives, the Municipality, in collaboration with the stakeholders in the area identified in the initial phase of the Alpgrids Project, has structured the action into two phases:

PHASE 1 - Presentation of RECs / self-consumption groups to the territory:

- identification of interested parties and first contact;
- definition of the forms / occasions for meeting (also at the district level);
- choice of content / information to be shared;
- methodologies for conveying information (first of all if online or in person);
- identification of mediators / speakers;
- production of information material;
- scheduling of meetings and subdivision into modules / days.

This phase is characterized by the following additional related activities:

- ✓ Collection of the expressions of interest of interested and motivated subjects to establish renewable energy communities;
- ✓ Support in evaluating convenience and opportunities to be collected by a set date;
- ✓ Continuation of the support of the most motivated subjects in the establishment of 1) REC or 2) self-consumption groups.

PHASE 2 - Identification of economic operators / intermediaries who offer technical services on the market related to the establishment of RECs.

- Identification of the parameters with which to classify the intermediaries (CV and experience of the staff, type of assistance insured, coverage offered on the way to the REC).
- Definition of a price range for the various services offered.
- Contact and direct involvement of intermediaries.

Facilitation of the meeting between supply and demand ("MatchMaking"), capitalization of the experience already gained with the patronage of the purchasing groups of PV modules.

Expected results

The activities as described will produce the following effects:

1 Organizational effects:

To address the two phases of the activities, the Municipality and [APE FVG \(Regional Energy](#)

	<p>Agency responsible for the Energy Desk) identified as stakeholders in support of the Local Authority, will have the following specific roles in the process:</p> <ul style="list-style-type: none"> - Role of the Municipality with respect to training activities: contact search, organization of meetings, management of some interventions, promotion of activities in the area. - Role of the Municipality as patron: promotion with APE of forms of meeting between supply and demand with a profile of guarantor of the congruity of prices for operators who register / adhere to an agreement to be defined - Role of the Municipality with respect to energy communities: 1) “simple” member; 2) leading and reference subject, 3) facilitator for the birth of the REC by supporting a charismatic guide, without entering the community. - Role of APE FVG in phase 1: support from a technical point of view of the promoter of the community until the feasibility study has sufficient detail to positively conclude the evaluation of economic convenience in carrying it out and a good degree of consensus is developed among potential members. - Role of APE FVG in phase 2: assessment of the adequacy of the estimated costs once the design phase has reached a good degree of economic detail. However, this activity is carried out after the community manager, in complete autonomy, has chosen the intermediary technicians and has received the requested estimates. <p>2- Environmental effects:</p> <p>As defined in Sheet Action 1.1 on the development of private photovoltaic systems, it is estimated that photovoltaic electricity production will increase by approximately 37,914 MWh / year by 2030.</p> <p>Thanks to the development of Renewable Energy Communities, in addition to the 65% of self-consumption already recorded, it is estimated that a further 15% can be added to the self-consumption quota.</p> <p>The share of injection into the grid will be 20%, the polluting emissions reduced by 1,570 tCO₂ / year by 2030 thanks to the self-consumption contribution deriving from the development of RECs.</p> <p>3- Effects of a social nature - Fight against energy poverty and access to energy goods and services</p> <p>RECs represent an instrument for fighting energy poverty. Some fundamental principles for the creation of a Renewable Energy Community represent in themselves practices for the mitigation of energy poverty. RECs involve both the installation of shared systems for monitoring individual energy consumption and protocols for their optimization / reduction but at the same time involving consumers, making them aware of their own behaviors and also of the feasibility of efficiency actions. The collective approach and the feasibility of exchanges between participants of an Energy Community can be a further way of involving citizens in renovation works with economy-of-scale operations or reinvestment of profits.</p>
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Renewable Energy Communities Pilot Project - Alpgrids Project

Action n° 1.3

Action

The Municipality of Udine has been a partner since 2019 of the [European project ALPGRIDS](#), funded under the Alpine Space program and which sees 12 partners from France, Italy, Austria, Germany and Slovenia engaged in the promotion and development of energy micro-grids. In particular, for the Municipality of Udine, the project activities focused on the structuring of an energy community as regulated by Law no. 8 of 28/02/2020 which transposes the RED II Directive (2018/2001) on renewable energy.

At the end of 2020 with regard to the issue of energy communities, the structuring of the first legislative phase was completed at national level, which in addition to the aforementioned Law no. 8 led to the definition of implementation tools both by ARERA (Resolution 318/2020 / R / EEL of 04.08.2020) and by the GSE (Technical Rules published 22.12.2020) to which is added the incentive tariff for energy communities fixed by the Ministerial Decree of 16.09.2020 of the MiSE (GU n.285 of 16.11.2020).

Since 2021 Udine has been involved in the testing and verification phase of the regulatory instruments, promoted and monitored by the GSE. For the case study of the ALPGRIDS project, various scenarios were therefore evaluated aimed at establishing an energy community in the southwestern area of the urban territory in an area between via della Roggia and via Sabbadini. The site includes seven buildings of the municipal assets: the primary school "Lea D'Orlandi", the nursery school "Dire, fare, giocare", the Friulian Museum of Natural History and four buildings for social and welfare use (Social Housing) for a total of 45 apartments.

The energy monitoring of the case study began in September 2020 and various energy integration scenarios were outlined from the processing of the data collected by [DeMEPA srl](#), partner in the ALPGRIDS project. In March 2021, the optimal configuration of the various users took shape:

The three public buildings, primary school, kindergarten and museum integrated into an energy community, the four social housing buildings structured according to a group in collective self-consumption mode.

With regard to the three public buildings, the installation of a cogenerator (indicated power: 45.8 kWt and 20 kWe) was proposed, capable of operating in master mode and always at its maximum power, connected to a thermal storage. The two boilers already in service (225 kWt each) have a function to cover the remaining thermal load.

Based on the processing of the data collected, DeMEPA srl expects the cogenerator to be able to meet 44.6% of the school's heat needs while simultaneously covering 43.7% of the electricity consumption of the three public buildings. The investment required in March 2021 is valued at approximately 51,500 euros, with an expected payback time of 8.2 years.

As regards the self-consumption group, on the other hand, the installation on two of the four buildings of a PV system with a total of 73 modules, installed on the roof pitches facing south-east and south-west, was proposed. Energy production was estimated at 29 MWh / year against a power of 25.5 kWp. The management of the complex, if entrusted in an agreement to a third party such as ATER Udine (Social Housing responsible), would allow the return of an investment valued at 27,650 euros in 7.9 years thanks to a 50% tax bonus over 10 years.

The scenario for the self-consumption group also includes the implementation of a series of preparatory interventions for energy efficiency both on the envelope (fixtures and coat) and on the thermal systems (intervention under evaluation). In 2020 it was estimated that the interventions would involve an investment of between a maximum of 231,250.00 euros and a minimum of 193,750 euros excluding VAT for each of the four buildings.

It is expected that the work, to be included in the 2022-24 Three-Year Plan, can be built in lots, favoring two buildings out of four, which would form the first nucleus of the self-consumption group being set up.

From the point of view of the expected effects in terms of economic benefit, the following is

	<p>highlighted:</p> <p>1) Energy community School, Kindergarten, Museum (evaluated on the period October 2020 - February 2021)</p> <p>Savings € 7,053 with an O&M cost of € 756 (to be subtracted from the savings for the purposes of the resulting total benefit)</p> <p>2) Self-consumption group of the 4 condominiums with PV installation for 25.5 kWp</p> <p>Shared energy = 26,859 MWh / year</p> <p>Energy fed into the grid = 29,054 MWh / year</p> <p>Economic benefit: € 2,930 / year</p> <p>O&M cost (including insurance) 810 € / year (to be subtracted from savings for the purposes of the resulting total benefit)</p>
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Investments for the production of energy from municipal photovoltaic systems

Action n° 1.4

Action The investment action to increase production from photovoltaic systems under municipal responsibility, consists of two different interventions united by the same long-term objective, that of increasing the share of municipal consumption satisfied by production with photovoltaic systems under municipal responsibility:

- Installation of photovoltaic systems on municipal buildings
- Installation of photovoltaic systems in the buildings of companies with municipal participation (public utilities)

The photovoltaic systems on municipal buildings, installed according to the Exchange modality on the Elsewhere site and with an increasing planning over the years, are financed starting from the consolidation of the systems suggested in the energy audits (or APE) arranged by the Municipality. The total investment for this intervention is approximately € 420,000 in 10 years (approximately € 35,000 net of savings). The intervention involves an investment of € 50,000 in the first year and a decreasing commitment from the municipality. The net savings generated each year are reinvested in the following year. A rough investment scheme is presented below.

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
New installed power (kWp)	0	45	85	120	150	180	215	249	286	328
New Production (MWh / year)	0	50	94	132	165	198	237	274	315	360
Annual savings (€)	0	10.000	20.000	28.000	35.000	42.000	50.000	57.000	66.000	76.000
Annual investment of the municipality (€)	50.000	34.000	19.000	7.000	-	-	-	-	-	-
Total new investment (€)	50.000	44.000	39.000	35.000	35.000	42.000	50.000	57.000	66.000	
Emissions avoided (tCO ₂ eq)		15	28	39	48	57	68	78	88	100

For the installation of photovoltaic systems in municipal companies, the municipality establishes an annual investment of € 20,000 to expand photovoltaic production attributable to investee companies (and controlled private-law entities). This investment will be supported (on average) at 40% by the other shareholders and proportionate to the consumption of the individual company and to the total investment capacity of the municipality. The total investment of the municipality in 10 years is equal to € 180,000 and the technical and economic results of the investments are shown below:


Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
New installed power (kWp)	0	24	48	73	97	121	145	169	193	218
New Production (MWh / year)	0	27	53	80	106	133	160	186	213	239
Annual savings (€)	0	5.583	11.165	16.748	22.330	27.913	33.495	39.078	44.660	50.243
Annual investment of the municipality (€)	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	
Total new investment (€)	29.000	29.000	29.000	29.000	29.000	29.000	29.000	29.000	29.000	
Emissions avoided (tCO ₂ eq)		8	16	24	31	38	46	53	60	66

The future planning of this action cannot be separated from the use of municipal storage systems distributed throughout the territory.

At the same time, the Municipality will evaluate the opportunity to promote renewable energy communities (REC) using the installations of photovoltaic systems on public roofs in order to maximize the benefits deriving from the installation of renewable energy systems on its buildings. The opportunity of developing REC or self-consumption groups on municipal buildings will also be taken into consideration in view of the available resources, incentives and the opportunity to exploit the production of renewable electricity from systems installed on municipal users near other buildings of

	<p>the Municipality .</p> <p>At the same time as this activity, the Municipality will evaluate the opportunity to expand the solar thermal systems installed on its municipal buildings. The Municipality currently manages 28 solar thermal systems installed on heritage structures and buildings for a total of 432sqm of solar panels installed.</p>
Expected results	<p>The total investment for the action is therefore equal to € 180,000 in 10 years with a production of electricity from photovoltaics increased by about 360 MWh / year and polluting emissions reduced by 166 tCO₂.</p> <p>For this action, recourse, where possible, to financing through public and / or private forms of financing is envisaged, to be assessed from year to year.</p> <p>Last but not least, the creation of CERs and / or self-consumption group systems represents an opportunity that the Municipality wants to take to maximize the effectiveness of the plants to increase the energy supply of its buildings using electricity produced from renewable sources.</p>

Strengthening of the Energy Desk

Action n°	1.5
Action	<p>Sportello Energia FVG (Energy Desk) is managed by APE FVG with the contribution of the Friuli Venezia Giulia Region, dedicated to the promotion of the culture of energy saving, as well as consultancy, information and training activities for companies and public administrations. The purpose of the Energy Desk is to communicate the incentive and promotion tools aimed at energy saving present at regional, state and community level, with particular reference to the interventions envisaged by the Conto Termico 2.0.</p> <p>The activities of the desk are aimed at three macro-categories of subjects:</p> <ol style="list-style-type: none"> 1. Citizens; 2. Businesses; 3. Public Administration <p>For each of these categories, the Energy Desk provides information on the incentives available and on the type of interventions that can be applied and financed.</p> <p>For example, for citizens, information is provided regarding the financing and deduction instruments corresponding to the categories of the Conto Termico 2.0, the 65% Ecobonus, the 50% Deductions for restructuring and the 110% Superbonus.</p> <p>Among the interventions on which information and clarifications are provided, there are all the topologies of interventions that respond to the three macro-categories of interventions dedicated to the building envelope, systems or other categories of interventions</p> <p>For businesses, information is provided regarding existing incentives, Conto Termico 2.0, Ecobonus 65% and reduced VAT for restructuring. Also in this case, technical solutions are provided that respond to the interventions applicable to enclosures and / or systems.</p> <p>For the Public Administration category, the counter provides services regarding available incentives such as the Conto Termico 2.0, the on-site exchange of photovoltaic systems, 10% subsidized VAT for restructuring and regional contributions for district heating. Also in this case the proposed interventions concern all those applicable to the envelope and systems categories.</p> <p>The activity of the Energy Desk is crucial for relaunching the objectives of energy efficiency, local production of renewable energy, promotion and development of Renewable Energy Communities and to support the increase of the resilience of the territory.</p> <p>The Municipality therefore undertakes to strengthen the activities of the Energy Desk, making it a central point for sustainable urban development policies in support of the objectives of the Public Administration within the framework of the Covenant of Mayors Climate and Energy initiative and within the framework and objectives that the Municipality pursues through participation in community tenders related to the themes of energy and environmental sustainability.</p> <div data-bbox="347 1456 948 1590">  <p>Sportello Energia FVG La consulenza gratuita sugli incentivi per l'efficienza energetica</p> </div> <p>Friuli Venezia Giulia Energy Desk</p>
Expected results	<ul style="list-style-type: none"> • Development of initiatives for the energy requalification of buildings and businesses; • Strengthening of the role of the Energy Desk and expansion of the services it provides; • Promotion of the Energy Desk as a meeting place and connecting element between municipal policies and the development of the territory • Support for the promotion and development of Renewable Energy Communities in the area

Creation of the One Stop Shop

Action n° 1.6

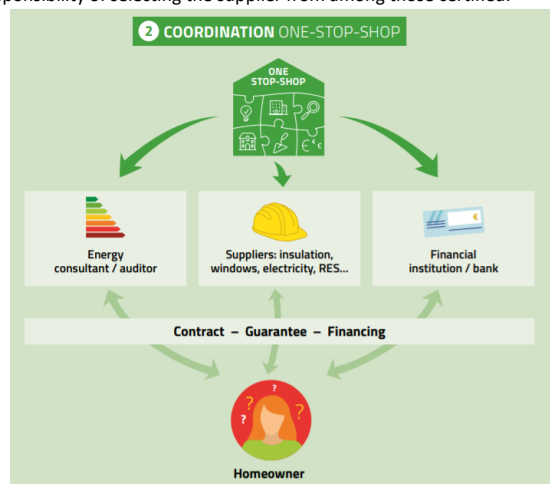
Action

The creation of the One Stop Shop represents the future natural evolution of the services provided through the Energy Desk.

This evolution is designed to amplify the effects of municipal policies in terms of energy and environmental sustainability and to maximize the effects of the implementation of the municipality's initiatives also in the context of activities deriving from European projects on these issues. The initiative takes its cue from the activities of the Energy Desk already in place, from the need of the Municipality to expand the field of application and development of the activities deriving from European projects and from the participation of the Municipality in the network of Energy Cities, an expert partner in the field, capable of to provide the founding elements of the initiative and the tools useful for its development.

The main activity of the One Stop Shop will be to create a stable connection between the Municipality and citizens and businesses in the area in order to maximize the match between supply and demand for energy services, energy efficiency and the development of renewable sources in the area. municipal. In this sense, the One Stop Shop represents the place and the coordination center of this activity, in which consultants, sellers and installers, financial institutions and banks and property or business owners meet to have a package of services available. 360 °.

Through this activity, playing the role of moderator of the process, the Municipality will put all the actors of the territory in the conditions to improve the energy and environmental performance of their respective properties, generating a flow of local economy resulting from the meeting between supply and demand. At the same time, the Municipality will be able to create a register / database of local actors capable of providing services to be made available to citizens and businesses in the area, capable of providing advice on technical, legal, financial and environmental aspects. This is essential for creating a list of suppliers certified by the One Stop Shop as "quality suppliers", developing standard templates and requirements for supplier quotes and contracts, checking quotes and assisting in the selection of suppliers. The One Stop Shop will then be able to work with its own network of certified suppliers, assuming the responsibility of selecting the supplier from among those certified.



Example of coordination of services provided by the One Stop Shop

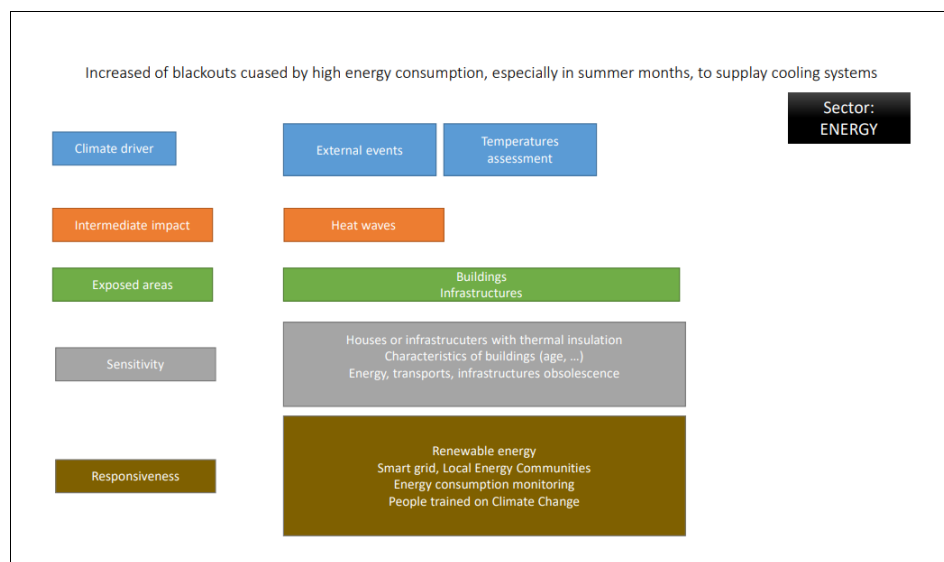
Expected results

The One Stop Shop is a single interface and the body responsible to the owner of the house / company. The benefits and expected effects include the following:

	<ul style="list-style-type: none"> • It is an interesting solution for homeowners and companies looking for a project manager (coordinator) for the entire renovation project. • Home / business owners sign a contract with a single legal entity (the One Stop Shop), although in some cases they also sign contracts directly with suppliers. • Home / business owners, even with (very) low income, can choose the One Stop Shop Financing Product or find their own way to finance jobs. • One-stop-shop contracts with suppliers and contractors. • The One-Stop-Shop guarantees the quality of the renovations and possibly energy savings. • The One-Stop-Shop ensures monitoring and follow-up in case suppliers fail to carry out the work correctly.
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4.3.2 IRE Liguria

Contribution on regional strategy for sustainable development and adaptation to climate change



Contribution to SECAP

PEL-L11 Energy communities

Description of the action

Energy communities are made up of a set of subjects able to produce, consume and exchange energy through a process of local governance capable of favouring users with a view to self-consumption and self-sufficiency.

They represent a significant element of the energy transition towards decarbonisation and distributed generation. Citizens and businesses (particularly small and medium-sized ones) are placed at the centre, so that they are the protagonists and beneficiaries of the energy transformation and not just the financial backers of active policies.

The Clean Energy Package and specifically the Directive 2018/2001 on the promotion of the use of energy from renewable sources (Renewable Energy Directive, RED II) indicate a privileged tool in the energy community to increase efficiency of installations of renewable source plants that will require the definition of governance tools to ensure the security of the system, consumer protection and the fair allocation of grid and system charges. The energy community, according to the definition of the Renewable Energy Directive, does not preclude any company or association as long as it is identifiable as a subject to which to assign legal responsibility. The proximity between final consumers and production facilities must also be guaranteed.

Currently in Italy there are regulatory uncertainties on this issue. However, the National Integrated Energy and Climate Plan devotes some significant passages to the theme of energy communities, intending to promote self-consumption "even in a collective form by enabling multi-user configurations within energy communities" and indicating among the main measures provided for the achievement of the objectives of «PNIEC» the simplification of authorisations for self-consumers and renewable energy communities.

In fact, it is noted that it is necessary to "define a regulatory framework for the development of citizens' energy communities, active in the generation, supply, distribution, storage, sharing, sale of electricity and provision of energy services which include energy efficiency services and electric vehicle charging".

The economic promotion of energy communities will be ensured, according to what is indicated in the PNIEC, through "direct support mechanisms on production, including from multiple plants (similar to the general mechanisms for production support) and on energy consumed locally, taking into account also the benefits that, in the latter case, are obtained in terms of grid use, and in any case having regard to the rights and obligations of the members of the community as customers. Within the framework of support mechanisms, these configurations will be able to have privileged access to such mechanisms."

The spread of self-consumption and energy communities will be supported in the years to come by technological developments (e.g. smart metres, digital technologies, internet of things) that make medium-small sized production and storage systems available, especially renewable sources and High Yield Cogeneration where costs for the user will gradually decrease.

The Municipality of Genoa can support the diffusion of energy communities, with particular regard to the self-production of renewable energy, both in the industrial/commercial field, and as an expression of citizens' initiatives aimed at social and environmental purposes.

Among the initiatives that may be supported by the Administration, in accordance with the regulatory and financial tools that will become available there are:

- information campaigns on the environmental, social and economic benefits of energy communities;
- information tools on locally available resources (e.g., renewable potential on the Municipality's Geoportal site), information on case studies at the national level and on regulatory paths for launching initiatives;
- promotion of any existing financial opportunities and calls for funding at a national and regional level;
- realization of demonstrators at local scale

With regard to the regulatory aspects related to the creation of energy communities, it is necessary to highlight how the framework is currently uncertain; however, an amendment to Legislative Decree no. 162 of December 30, 2019, coordinated with conversion law no. 8 of February 28, 2020 (*Decreto Milleproroghe*), makes it possible, on an entirely experimental basis, to create energy communities for plants with power below 200 kW.

ACHIEVABLE RESULTS, ENERGY SAVING AND EMISSION REDUCTION

CO₂ reductions related to the installation of plants within the energy community that may be realised in the municipality are not counted in this sheet in order not to overlap the effects with other actions of the Plan relating to the production of energy from renewable sources by private individuals.

In addition to CO₂ reduction, energy communities promoted primarily by enhancing the existing electricity grid will also:

- play an important role in terms of local consensus for the authorisation and construction of plants and infrastructure;
- be an additional tool to support families in conditions of energy poverty, especially where direct intervention (e.g. with self-consumption plants) is not technically possible;
- contribute to the construction of an energy system resilient to climate change;
- contribute to reducing the management costs of distribution and transmission networks, which today have to deal with imbalance phenomena and represent an extra cost for users, by virtue of the fact that the energy produced by energy communities is self-consumed in the immediate vicinity of the plant, rather than being conveyed into the larger networks.

4.3.3 DeMEPA

A detailed set of measures supporting the energy community to be included in the Lombardy Regional Plan Energy, Environment and Climate have not yet been defined for the reasons above explained. Thus, an assessment of the possible impact on the expected results of the Plan cannot be considered.

However, based on the results of the feasibility study on the renewable energy community located in Terranova dei Passerini, a small Lombardy town with about 900 inhabitants, some preliminary indications can be given.

The renewable energy community, involving the City Hall, 110 households, a commercial shop and a SME, through a 200 kW PV plant is able to generate about 50% of the electricity consumption amounting to 412 MWh/year. Considering a fiscal benefit for the community equal to 50% of the investment and assuming that the 'shared energy' (the amount of electricity to which are related the incentives recognized by the current national regulations) is equal to 80% of the locally generated electricity, the return on investment is evaluated in 8,5 years compared to a useful life of the PV plant not less than 20 years.

The avoided losses in the upstream transmission and distribution networks amounts to 6,6 MWh/year. The carbon reduction has been estimated in about 150 t/year.

Similar results obtained for representative cases of the regional context coupled with an assessment of their potential replicability in the period 2022-2030 will provide a full response to the potential impact of the considered measures and it would also enable a prioritisation of the different measures.

4.3.4 Impact quantification

4.3.4.1 Udine

Promotion of the use of energy from photovoltaic systems in private sectors					
Action n°	1.1				
Emission factor	Ipcc				
Data source	IME 2019 – Inventory Monitoring Emission (SECAP)				
BASELINE YEAR: 2019	EXPECTED RESULTS				
Final energy consumption	298,533 ¹	MWh	Energy saved		MWh
Energy production	15,165 ²	MWh	Increased energy production	37,914	MWh
Estimated emissions	82,395 ³	tCO ₂	Emissions avoided	6,802	tCO ₂
INFORMATION			<input type="checkbox"/> Benchmark of excellence		
Responsible sector (Municipality)	Municipality of Udine - Private and urban planning service; Environment Organizational Unit; Energy Organizational Unit				
Stakeholder(s) involved/engaged	Udine Energy Desk				
Timeline	<input type="checkbox"/> Expected		<input checked="" type="checkbox"/> Ongoing		<input type="checkbox"/> Implemented
	Duration: 10 years		Expected start (year): 2021		Expected end (year): 2030
Costs and financing	Costs: 62.000.000 €				
Financing according to the municipal budget	<input checked="" type="checkbox"/> Not financed		<input type="checkbox"/> Scheduled		<input type="checkbox"/> Foreseen in the budget
	<input checked="" type="checkbox"/> Municipal funds		Amount: 6.000€		
	<input checked="" type="checkbox"/> External funds (third party financing)		Amount: 61.994.000€		Third party financing: Private citizens, companies and investors

¹ Electricity consumption in Residential, Tertiary (L.A. excluded) and Industrial sectors

² Local PV plants energy production

³ Electricity emissions in Residential, Tertiary (L.A. excluded) and Industrial sectors

Promotion and development of Renewable Energy Communities						
Action n°	1.2					
Emission factor	Ipcc					
Data source	IME 2019 – Inventory Monitoring Emission (SECAP)					
BASELINE YEAR: 2019	EXPECTED RESULTS					
Final energy consumption	298,533 ⁴	MWh	Energy saved		MWh	
Energy production	15,165 ⁵	MWh	Increased energy production		MWh	
Estimated emissions	82,395 ⁶	tCO ₂	Emissions avoided	1,570	tCO ₂	
INFORMATION			<input checked="" type="checkbox"/> Benchmark of excellence			
Responsible sector (Municipality)	Municipality of Udine - EU Funding and Equity Investments Office					
Stakeholder(s) involved/engaged	Udine Energy Desk					
Timeline	<input type="checkbox"/> Expected		<input checked="" type="checkbox"/> Ongoing		<input type="checkbox"/> Implemented	
	Duration: 10 years		Expected start (year): 2021	Expected end (year): 2030		
Costs and financing	Costs: 181.757 ⁷ €					
Financing according to the municipal budget	<input type="checkbox"/> Not financed		<input type="checkbox"/> Scheduled		<input type="checkbox"/> Foreseen in the budget	
	<input type="checkbox"/> Municipal funds		Amount: €			
	<input checked="" type="checkbox"/> External funds (third party financing)		Amount: 181.757€	Third party financing: 85% European funds; 15% National revolving fund		

⁴ Electricity consumption in Residential, Tertiary (L.A. excluded) and Industrial sectors

⁵ Local PV plants energy production

⁶ Electricity emissions in Residential, Tertiary (L.A. excluded) and Industrial sectors

⁷ Alpgriids Project co-financing + National revolving fund

⁸ Alpgriids Project activities

Renewable Energy Communities Pilot Project - Alpgriids Project					
Action n°	1.3				
Emission factor	Ipcc				
Data source	Energy Monitoring System Alpgriids 2020				
BASELINE YEAR: 2019	EXPECTED RESULTS				
Final energy consumption	346.1	MWh	Energy saved	68.88	MWh
Energy production	0	MWh	Increased energy production	0	MWh
Estimated emissions	77.05	tCO ₂	Emissions avoided	27.64	tCO ₂
INFORMATION			<input checked="" type="checkbox"/> Benchmark of excellence		
Responsible sector (Municipality)	Municipality of Udine - EU Funding and Equity Investments Office				
Stakeholder(s) involved/engaged	DeMEPA				
Timeline	<input type="checkbox"/> Expected		<input checked="" type="checkbox"/> Ongoing		<input type="checkbox"/> Implemented
	Duration: 4 years		Expected start (year): 2021	Expected end (year): 2024	
Costs and financing	Costs: €				
Financing according to the municipal budget	<input type="checkbox"/> Not financed		<input checked="" type="checkbox"/> Scheduled		<input type="checkbox"/> Foreseen in the budget
	<input checked="" type="checkbox"/> Municipal funds		Amount: 854.150 €		
	<input type="checkbox"/> External funds (third party financing)		Amount: €	Third party financing: Municipal and National funds for RECs: ATER Udine	

Investments for the production of energy from municipal photovoltaic systems					
Action n°	1.4				
Emission factor	Ipcc				
Data source	Inventory Monitoring Emission 2019 (SECAP)				
BASELINE YEAR: 2019	EXPECTED RESULTS				
Final energy consumption	20,642 ⁹	MWh	Energy saved	360	MWh
Energy production	114 ¹⁰	MWh	Increased energy production	360	MWh
Estimated emissions	4,554 ¹¹	tCO ₂	Emissions avoided	77.7	tCO ₂
INFORMATION				<input type="checkbox"/> Benchmark of excellence	
Responsible sector (Municipality)	Municipality of Udine - Org Unit. Power; Infrastructure Service 3				
Stakeholder(s) involved/engaged	Udine Energy Desk				
Timeline	<input checked="" type="checkbox"/> Expected		<input type="checkbox"/> Ongoing		<input type="checkbox"/> Implemented
	Duration: 10 years		Expected start (year): 2021	Expected end (year): 2030	
Costs and financing	Costs: 680.000€				

⁹ Total electricity consumption Udine Municipality building assets

¹⁰ Annual electricity production by PV plants installed on municipal buildings

¹¹ Total CO₂ emission from electricity consumption Udine Municipality building assets

Strengthening of the Energy Desk					
Action n°	1.5				
Emission factor	Ipcc				
Data source	Inventory Monitoring Emission 2019 (SECAP)				
BASELINE YEAR: 2019	EXPECTED RESULTS				
Final energy consumption	2,100,893 ¹²	MWh	Energy saved		MWh
Energy production		MWh	Increased energy production		MWh
Estimated emissions	499,920 ¹³	tCO ₂	Emissions avoided		tCO ₂
INFORMATION			<input checked="" type="checkbox"/> Benchmark of excellence		
Responsible sector (Municipality)	Municipality of Udine - Environment Org Unit.				
Stakeholder(s) involved/engaged	Udine Energy Desk – APE FVG Energy Agency				
Timeline	<input type="checkbox"/> Expected		<input checked="" type="checkbox"/> Ongoing		<input type="checkbox"/> Implemented
	Duration: 10 years	Expected start (year): 2021		Expected end (year): 2030	
Costs and financing	Costs: N.D.€				

¹² Total energy consumption of the whole territory of Udine City

¹³ Total emissions of the whole territory of Udine City

Creation of the One Stop Shop					
Action n°	1.6				
Emission factor	Ipcc				
Data source	Inventory Monitoring Emission 2019 (SECAP)				
BASELINE YEAR: 2019	EXPECTED RESULTS				
Final energy consumption	2,100,893 ¹⁴	MWh	Energy saved		MWh
Energy production		MWh	Increased energy production		MWh
Estimated emissions	499,920 ¹⁵	tCO ₂	Emissions avoided		tCO ₂
INFORMATION			<input checked="" type="checkbox"/> Benchmark of excellence		
Responsible sector (Municipality)	Municipality of Udine - Environment Org Unit.				
Stakeholder(s) involved/engaged	Udine Energy Desk – APE FVG Energy Agency				
Timeline	<input checked="" type="checkbox"/> Expected		<input type="checkbox"/> Ongoing		<input type="checkbox"/> Implemented
	Duration: 10 years	Expected start (year): 2021		Expected end (year): 2030	
Costs and financing	Costs: N.D.€				

¹⁴ Total energy consumption of the whole territory of Udine City

¹⁵ Total emissions of the whole territory of Udine City

4.3.4.2 IRE Liguria

Not available

4.3.4.3 DeMEPA

Not available

4.3.5 Economical benefits

4.3.5.1 Udine

The following table shows the overall picture of the investments that each of the 6 identified Actions will generate in the area:

Action	Investments planned/expected
A1.1	62,000,000€
A1.2	181,757€
A1.3	854,150€
A1.4	680,000€
A1.5	-
A1.6	-
Total	63,715,907€

4.3.5.2 IRE Liguria

Not available

4.3.5.3 DeMEPA

Not available

4.3.5.4 Environmental benefits

4.3.5.5 Udine

Overall, the measures identified will contribute in environmental terms to the abatement of 8,477 tCO₂e and represent 6.7% of the emission reduction target of the entire SECAP Actions package.

Action	tCO ₂ e avoided
A1.1	6,802
A1.2	1,570
A1.3	27.64
A1.4	77.7
A1.5	-
A1.6	-
Total	8,477

4.3.5.6 IRE Liguria

Not available

4.3.5.7 DeMEPA

Not available

4.3.6 Social benefits

4.3.6.1 Udine

Since SECAP is a recently approved Plan, it is currently difficult to estimate the social benefits of the envisaged measures. However, since these are Actions that envisage significant investments, even partially supported by national incentive systems, it is likely that these will have a significant impact both in terms of jobs created and in terms of families and people in a situation of energy poverty supported by the measures.

4.3.6.2 IRE Liguria

Energy communities represent a significant opportunity for the territories in consideration of the potential economic, environmental and social repercussions. They can in fact generate induced activities for the construction sector and for example, the supply of technological components. They can provide an important contribution to the European goal of climate neutrality by 2050, thanks to an increase in generation of power from renewable sources and the consequent reduction of emissions. They also constitute an important instrument for the fight against energy poverty that affects 8.8% of the Italian population according to the latest Report OIPE (Italian Observatory of Energy Poverty).

4.3.6.3 DeMEPA

The ambitious objectives of the Lombardy Regional Plan Energy, Environment and Climate, from a huge reduction of energy consumption to the strong penetration of renewable energy sources with its related reduction of carbon emissions, in addition to an effective planning it requires an increasing public awareness on the ability to efficiently consume the energy and on the opportunity to produce renewable energy on its own.

The energy communities asking the participating end users to define and share all choices regarding the constitution of the community and its subsequent operation, from the investment related to local generation capacity until the sharing of the economic benefits granted to the community, encourage this growth of awareness that is essential in the current processes of energy transition.

It is expected a "learning curve" by citizens, starting from collective self-consumption schemes in condominium buildings of the highly urbanized contexts, while energy communities will likely more developed in small municipalities where the local public administration and/or the presence of a small-medium-sized enterprise will play the role of initial aggregation.

4.3.7 Measure template

4.3.7.1 Udine

The Action Sheet template is a tool specially created by SOGESCA for the Udine SECAP capable of reporting all the essential and useful information regarding projects, initiatives and programs to address the three pillars of the Covenant of Mayors initiative and achieve quantitative and qualitative results SECAP. The Action Sheet template is designed to report in a single model both adaptation and mitigation actions as well as mixed actions (adaptation + mitigation) and information relating to the topic of Energy Poverty. All the fields shown in the template comply with the requirements of the Covenant of Mayors initiative and slavishly retrace the information requested from the Municipalities for uploading the SEAP Actions on the Covenant of Mayors Platform.

Action Title					
Action n°					
Sector					
Energy poverty related	<input type="checkbox"/>				
Action type					
Emission factor	Ipcc				
Data source					
BASELINE YEAR: 2019					
Final energy consumption		MWh	Energy saved		MWh
Energy production		MWh	Increased energy production		MWh
Estimated emissions		tCO ₂	Emissions avoided		tCO ₂
INFORMATION					<input type="checkbox"/> Benchmark of excellence
Responsible sector (Municipality)					
Stakeholder(s) involved/engaged					
Timeline	<input type="checkbox"/> Expected		<input type="checkbox"/> Ongoing		<input type="checkbox"/> Implemented
	Duration: years		Expected start (year):		Expected end (year):
Costs and financing	Costs: €				
Financing according to the municipal budget	<input type="checkbox"/> Not financed		<input type="checkbox"/> Scheduled		<input type="checkbox"/> Foreseen in the budget
	<input type="checkbox"/> Municipal funds		Amount: €		
	<input type="checkbox"/> External funds (third party financing)		Amount: €		Third party financing:
INDICATORS (KPIs)					
KPI (1)					
KPI (2)					
DESCRIPTION					
Action					

Expected results	
References	
Action Web Page	
Cartography	<input type="checkbox"/> Cartography / supporting images attached
Area where the action is located	
Web references	

4.3.7.2 IRE Liguria
 Not available
 4.3.7.3 DeMEPA
 Not available

5 INTRODUCTION OF LOCAL ENERGY COMMUNITIES

5.1 Recommendations for the measure implementation

5.1.1 Udine

For the purposes of the implementation of the Actions identified in support of the LECs, the Municipality will have to make a significant commitment to the launch of initiatives aimed at the development of LECs at the local level. The involvement of citizens and sector stakeholders represents a crucial step for the implementation of these measures. Since their conception, the Actions have been shared with the stakeholders identified during the Alpgriids Project. At the same time, the Municipality will enhance the existing tools for the launch of the Actions (Sportello Energia), enhancing their capacities and planning new support services (One-Stop-Shop) in collaboration with institutional actors (APE FVG and the Friuli Venezia Giulia Region). and private actors.

5.1.2 IRE Liguria

Both the Municipality of Genoa and the Liguria Region undertake to support the spread of energy communities, with particular regard to the self-production of renewable energy, both in the industrial / commercial sphere, and as an expression of citizens' initiatives aimed at social and environmental purposes. The Region also undertakes to identify funding strands within the POR / ERDF funds.

5.1.3 DeMEPA

Lombardy Region through the Regional Plan Energy, Environment and Climate intends to promote the development of energy communities according to a differentiated penetration model for the different territorial areas in order to enhance local resources, as it appears from Tab. 13 of the Official Guidelines ("Atto di indirizzo") of the Plan, below reported.

Energy Communities	
Mountains areas	<ul style="list-style-type: none"> • Localised mountain areas with concentration of end-users • Integrated use of biomass, solar thermal and photovoltaic • To support the development of the forest-wood-energy supply chain
Foothill areas	<ul style="list-style-type: none"> • In more urbanised areas and densified industrial and tertiary districts • Networks of photovoltaic systems connected to energy networks including those of electric mobility
Metropolitan areas	<ul style="list-style-type: none"> • In the most densely populated areas and in the energy-intensive industrial and tertiary districts • Creation of production smart grids based on photovoltaic systems connected to electric mobility networks
Lowland areas	<ul style="list-style-type: none"> • Limited areas linked to agro-livestock holdings

The Region will make use of the existing "Regional Observatory for Energy Transition and the Circular Economy" involving business associations, representatives of municipalities, universities and environmental associations, as a stable operational sharing venue and for monitoring the actual implementation of the energy community development program.

5.2 Monitoring indicators and measure update

5.2.1 Udine

For each of the identified Actions, 2 Performance Indicators were selected for the purpose of monitoring the implementation status of the measures. The following are the KPIs identified for each Action:

Promotion of the use of energy from photovoltaic systems in private sectors

Action n°	1.1
INDICATORS (KPIs)	
KPI (1)	Number of PV systems installed (number)
KPI (2)	Total installed power / year (kWp)

Promotion and development of Renewable Energy Communities

Action n°	1.2
INDICATORS (KPIs)	
KPI (1)	Number of Renewable Energy Communities established (number)
KPI (2)	Total installed power / year (kWp)

Renewable Energy Communities Pilot Project - Alpgriids Project

Action n°	1.3
INDICATORS (KPIs)	
KPI (1)	Effective energy production of the plants
KPI (2)	Energy withdrawn from the REC network in buildings

Investments for the production of energy from municipal photovoltaic systems

Action n°	1.4
INDICATORS (KPIs)	
KPI (1)	Number of systems installed (number)
KPI (2)	Total installed power / year (kWp)

Strengthening of the Energy Desk

Action n°	1.5
INDICATORS (KPIs)	
KPI (1)	Number of cases handled
KPI (2)	Number of interventions promoted by the branch activity

Creation of the One Stop Shop

Action n°	1.6
INDICATORS (KPIs)	
KPI (1)	Launch of the One Stop Shop
KPI (2)	Number of interventions promoted and followed by the One Stop Shop

5.2.2 IRE Liguria

The Municipality of Genoa will monitor:

- Number of events
- number of accesses to dedicated web pages
- number of demonstrators,
- energy production of installed systems and related to CO2 not emitted into the atmosphere.

5.2.3 DeMEPA

Proper indicators for each of the main targets shall be defined in the Lombardy Regional Plan Energy, Environment and Climate whose drafting is still ongoing.

