PIEMONTE REGION

INDIVIDUAL REGIONAL BASELINE REPORT

ON LOW CARBON INVESTMENTS FUNDING

Preface

Present PIEMONTE REGION Individual Regional Baseline Report on Low Carbon Investments Funding is to be delivered under the Project entitled "PROmoting regional Sustainable Policies on Energy and Climate change mitigation Towards 2030" funded by the Interreg CENTRAL EUROPE Programme

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Appendix 1.: Fact sheet(s) to decentralised regional operative programmes
Appendix 2.: Fact sheet(s) to other EU low-carbon initiatives

1 Background

The Data Collection and Reporting Guide (D.T1.1.1) is the initial task foreseen under the Work Package "T1 Assessment of availability and use of public funds supporting climate change mitigation" of the PROSPECT2030 Project. The aim of T1 is to assess the use of public funds dedicated to climate change mitigation in the 2014-20 period with particular focus on development of RES. The overall objective of T1 is to deliver policy recommendations targeting mainly the regional, national and macro-regional strategies (EUSDR, EUSAIR, EUSBSR, EUSALP) developed in CE.

The starting point of T1 is a baseline assessment of the use of available funding for low-carbon investments in the participating regions from 2014 onwards. The funding schemes to oversee include the followings in particular:

- Decentralised funds made available from the ESI Funds through the Partnership Agreements (national, sectoral or regional operative programmes);
- EU low-carbon initiatives (H2020, LIFE, EFSI, ELENA, Jessica, SEFF schemes);
- National/federal funding schemes (grants, subsidized loans, feed in tariffs, building integrated RES schemes); and Cooperation with private stakeholders (EPC, ESCO schemes, crowdfunding, venture capital, etc.).

The analysis, carried out by all Project Partners (PP) in the coordination of PP8, will assess the appropriateness of funding policies, administrative procedures, planning and implementation structures, dedicated resources and impacts in environmental and economical terms. Where relevant, the environmental impacts will address the whole lifecycle of the supported RES projects. The economic analysis should particularly focus on the cost-effectiveness of the use grants and exploring best practices concerning innovative low-carbon financing solution leveraging to maximum extent private financial resources.

The participating regions and the PP responsible for the elaboration of the reports are given in the table below.

ion	PP	Abbreviated name of PP	eliverable ID
monte Region	LP	REGPIE	D.T2.2.1
li Energy	PP6	RAFVG	D.T2.2.2
Energyland	PP7	EEE	D.T2.2.3
ony-Anhalt	PP9	HSDM	D.T2.2.4
t and Dalmatia County	PP4	EIHP	D.T2.2.5
ovia Region	PP3	MAE	D.T2.2.6
thern Great Plain Region	PP8	AACM	D.T2.2.7

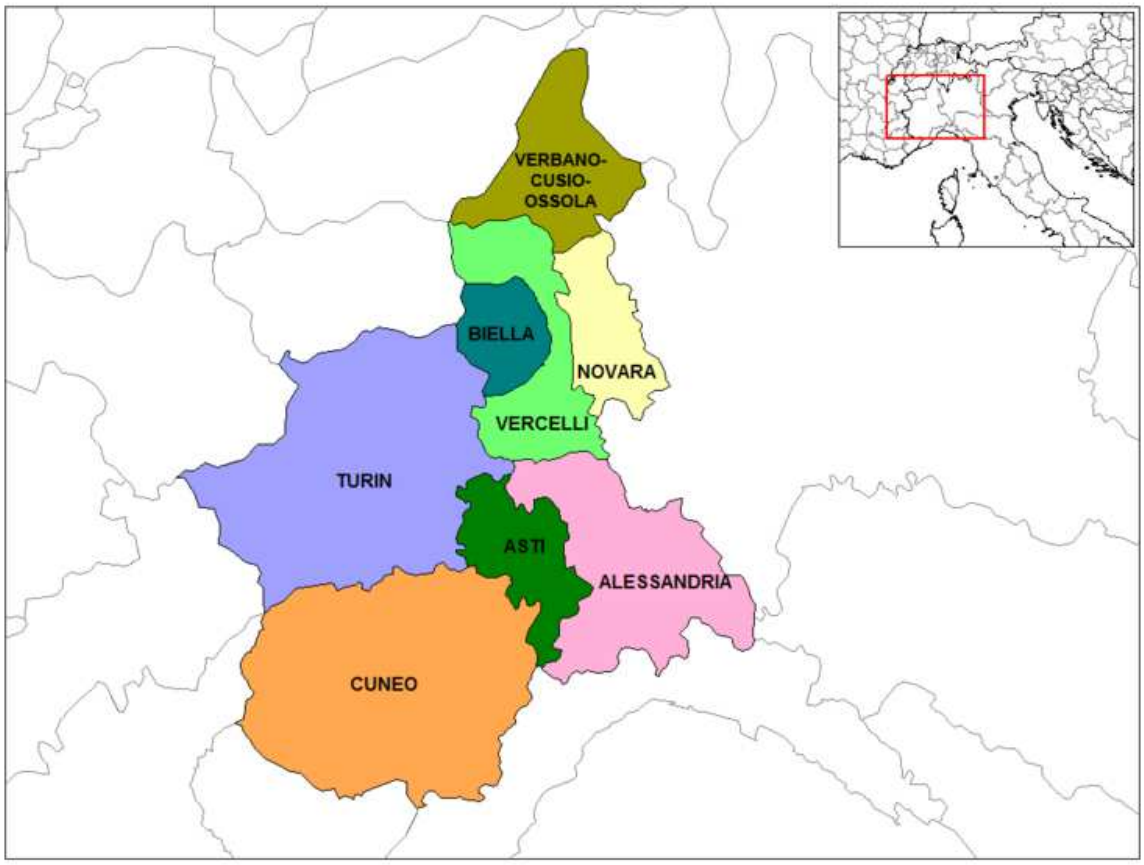
The data collection for the individual regional baseline reports will base on publicly available data and targeted interviews. Compliance with the GDPR rules will remain the responsibility of each Project Partner involved. As an initial assistance for the fact finding present Guide

provides a number of relevant basic internet addresses which cannot be considered to be exhaustive with regard to the collection of the required data.

2 Presentation of the target region

2.1 General presentation of the target region

Piedmont is a region with 4 356 406 inhabitants of north-western Italy, with as administrative capital - as well as historical capital - the city of Turin. It is bordered to the west by France (Auvergne-Rhône-Alpes and Provence-Alpes-Côte d'Azur regions), to the north-west by the Valle d'Aosta, to the north by Switzerland (cantons Vallese and Ticino), to the east by Lombardy, to the south-east with Emilia-Romagna and to the south with Liguria.



Piemont is the second Italian region by area, sixth by number of inhabitants, second by greatest number of municipalities and it is part of the Alpine Macroregion. It is also the fourth region for exports, with a 10% share of the national total, and fifth by value of the gross domestic product (GDP), with about 143 billion euros total. Per capita income is higher than the Italian average.

Most of the population lives in the plains, especially in the City of Turin and in the neighboring municipalities, where industrial activity is concentrated.

In the provinces of Vercelli and Novara, the economy is based on the cultivation of rice, of which the region is the leading Italian producer. Other agriculture products are: cereals, potatoes, vegetables, fruit and forage. On the hills, vineyards for the production of well known wines are widespread. Piemonte has a long tradition of mechanical industry and it has been the leading Region for car production. Nowadays the sector is declining and the

economics is mainly based on services. Food industry and tourism is also increasing their importance in the regional economics.

2.2 Potentials for low-carbon sector development

Piemont has a long lasting tradition of renewable production from hydropower. In the last ten years different RES have been promoted more and more and nowadays, biomass and solar energy are playing a key role. In the Region a lot of electricity is generated and recently Piemont, despite being a border region, became self sufficient in terms of electricity. A large part of that energy is generated by RES, but the most of it is based on natural gas power plants combined heat and power. One of the largest heating network all over Europe is installed in Torino and neighbouring cities.

2.2.1 Energy efficiency

The final energy consumption in Piedmont remains substantially constant over the last six years with values close to 10.5 Mtep. Natural gas and oil products still make up more than 60% of total consumption and, considering the way in which electricity and heat are produced, dependence on fossil fuels is still particularly high, albeit on a downward trend. The contribution of renewable sources, just under 2 Mtoe, is 18.5%.
Almost half of energy consumptions are concentrated in the building sector (private households and services - hereafter mentioned as civil sector).
Over the period 2005-2014, there has been a significant decline for the industrial sector and an increase for the others: transport, civil and agriculture and fisheries. It is evident that, as from 2007, the regional economy has suffered an abrupt halt, essentially due to a severe crisis in the industrial sector (mainly concentrated in the heavy industry and the manufacturing).
In 2005 the consumption of both the civil sector and the industrial one were quite in line (4.294 against 4.603 Ktep). As of 2014, the scenario is radically changed: the energy consumption of the civil Sector had a slight increase (+305 Ktoe between 2005 and 2014), while those in the Industrial Sector suffered a drastic contraction (-2,529 Koe). The industrial sector in 2014, therefore, became the third sector in final consumption (while it was the first in 2005), with a share of the total of around 21%. Similarly to what noted for the civil sector, the transport sector slightly increased in the timeframe, coming to represent almost a third of total final consumption. The agricultural sector is
representing a marginal share of total consumption (about 2%).

2.2.2 Renewables

The percentage of renewable energy sources peaked in 2017, when it was 18.5%. The overall contribution of renewables has increased by around 15% since 2012, which counts for an increase of around 288 ktoe from 2012 and 55 ktep from 2015. The growth rate of renewables is, thus, slowing a bit, mainly in the generation of electricity. The percentage increase was favored by the combined increase, with different rates, for renewable production and for gross final consumption (the latter, less than + 2% from 2012). That said, a reflection must be made on the trend of the last few years, which is certainly less promising than the previous ones, especially with regard to the more mature technologies (hydroelectric and biomass), close to saturation in terms of potential and restricted by their environmental impact on a local scale.
Most of renewable production comes from hydropower and biomass, with solar energy increasing more and more its role. In the following tables, the detailed breakdown for RES either in term of thermal or electrical production (data is in ktoe).

Thermal RES	2012	2013	2014	2015	2016	2017
Geothermal	2	2	2	2	2	1
Thermal Solar	11	15	17	17	18	21
Bio waste	12	13	7	6	10	2
Biomass (direct use)	650	687	608	642	693	683
Heat pumps	159	166	170	170	172	175
Derived Heat	43	116	130	127	137	137
Total	***865***	***986***	***927***	***958***	***1.021***	***1.017***

Electrical RES	2012	2013	2014	2015	2016	2017
Hydropower	584	600	606	614	613	607
Wind	2	2	2	2	3	2
Solar PV	123	137	142	149	145	156
Geothermal	0	0	0	0	0	0
Solid biomass	22	29	46	60	62	64
Biogas	54	82	87	90	89	88
Biofuel	3	10	15	14	10	7
Total	**788**	**860**	**898**	**930**	**921**	**925**

Piemont Region is the third Italian region, behind Lombardy and Veneto, for energy production from renewable sources. In terms of the contribution of the RES compared to the regional gross final consumption, the percentage of Piedmont is in line with all the main populous regions.

2.3 Regional low-carbon policies, institutional framework and policy

The Piedmont Region has adopted the Regional Environmental Energy Plan Proposal, at the conclusion of the review process aimed at enhancing the observations expressed during the consultation and Strategic Environmental Assessment process of the Proposal. This review was conducted in coordination and strategic connection with other regional planning and programming.

The planning document is proposing short-term targets (2020), but also mid-term ones (2030), in line with the objectives proposed at European level with the approval of the so-called Clean Energy Package.
The Plan Proposal selects as "main objectives" of the new regional energy planning cycle, the reduction of consumption and the gradual transition from natural gas to renewable sources. The main strategy sets out in order to achieve the above targets, aims at reducing final energy consumption in the building and transport sector, as well as promoting the production from RES with attention paid to the environmental impact. The priority is, thus, given to RESs that do not require a combustion process, and consequently that have zero emissions, either for greenhouses gases and for local pollutants.
The following strategic objectives have been defined:

1. increase of energy production from renewable sources for additional 494 Ktoe in 2030 (from the 2015 baseline) for a total production of 2,382 ktoe;
2. reduction of gross final energy consumption by approximately 1.960 ktoe with a target value of 8.645 ktoe in 2030. This target would be achieved with an expected reduction of about 30% in respect of the business as usual trend;
3. achievement by 2030 of a share of 27.6% of final energy consumptions produced by RES.

Back to back with the Regional planning activity, where PROSPECT2030 is expected to provide a valuable contribution, several important laws have been recently endorsed by the Regional Council, such as:

- the regional law updating a previous one about light pollution. This law introduces high standards, technical requirements for reducing light either pollution and the consumption of energy resources;
- the law for the promotion of the Energy Communities. These are non-profit organizations, to which public and private entities can participate, established to promote the process of decarbonisation of the economy and to facilitate the production, exchange and consumption of energy generated mainly from renewable sources , as well as promoting energy efficiency. Piemont Region has been the first to approve such a kind of law in order to accelerate the creation of Energy Communities that in any cases require the removal of legal obstacles still present today at National level.

3 Decentralised funds made available from the ESI Funds through the Partnership Agreements

This Chapter is dedicated to the assessment of the relevant decentralized components of EU funding between 2014 and 2020 that is committed and disbursed within the competence of the Member States.

The programming and implementation of the EU Structural and Investment Funds (ESIFs) is conducted within a multi-annual framework covering the period of 2014-2020. Regulation (EU) N°1303/2013 lays down common provisions applicable to the European Regional Development Fund (ERDF), the European Social Fund (ESF), the Cohesion Fund (CF), the European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF). These Funds operate under a common framework known as the European Structural and Investment Funds. The Regulation also sets out the provisions necessary to ensure the effectiveness of the ESIF and their coordination with one another and with other EU instruments.

ESIFs include both program elements decentralised on to the EU Member States and program elements managed centrally by the European Commission or its executive bodies in accordance with the principle of subsidiary. However, the major part of ESIFs (approximately 75%) is utilised by the Member States within a decentralised implementation system.

Each Member State has concluded a Partnership Agreements with the European Commission. The Partnership Agreements uniformly provide funding for eleven Thematic Objectives defined by the European Commission. The Thematic Objectives include:

TO1 - Strengthening research, technological development and innovation;
TO2 - Enhancing access to, and use and quality of ICT;
TO3 - Enhancing the competitiveness of SMEs, of the agricultural sector (for EAFRD), and ofthe fishery and aquaculture sector (for EMFF);
TO4 - Supporting the shift towards a low-carbon economy in all sectors;
TO5 - Promoting climate change adaptation, risk prevention and management;
TO6 - Preserving and protecting the environment and promoting resource efficiency;
TO7 - Promoting sustainable transport and removing bottlenecks in key network infrastructures;
TO8 - Promoting sustainable and quality employment and supporting labour mobility;
TO9 - Promoting social inclusion, combating poverty and any discrimination;
TO10 - Investing in education, training and vocational training for skills and lifelong learning;
TO11 - Enhancing institutional capacity of public authorities and stakeholders and efficient public administration

All Partnership Agreements provide a matrix of the above Thematic Objectives (TOs) versus the structural instruments (ERDF, ESF, CF, EAFRD, EMFF; regional development, social inclusion, cohesion, agricultural & rural development and fishery funds).

The Member States are responsible to define national, sectoral or regional Operational Programmes (OPs) and ensure the translation of the Thematic Objectives onto OPs. TOs are translated into Operational Programmes (OPs) by each country in a different way. The low-carbon sector related activities may be addressed through several OPs. The OPs are typically broken down into Priority Axes (PAs) and measures within the specific PAs.

3.1 National/federal horizontal (sectoral) operative programmes

The National operational programme (NOP) "Metropolitan cities 2014 – 2020" was adopted by the European Commission in Decision C (2015) no. 4998 dated 14th July and has a financial allocation amounting to over 858,9 million Euro, of which 650,2 million from the Regional Development Fund (ERDF) and 208,7 from the European Social Fund (ESF).
The Programme, run by the Italian Territorial Cohesion Agency, supports the priorities of the National urban agenda. Within the framework of the sustainable urban development strategies outlined in the Partnership Agreement for programming period 2014-2020, it is in line with the goals and strategies of the European Urban Agenda which identifies urban areas as the key territories to take up the challenges of smart, inclusive and sustainable growth set in the Europe 2020 Strategy.
The metropolitan cities concerned are 14: Turin, Genoa, Milan, Bologna, Venice, Florence, Rome, Bari, Naples, Reggio Calabria, Cagliari, Catania, Messina and Palermo.
Within each Axes the City of Turin has defined its own priorities, as follows:

- guarantee greater accessibility to digital services, improving access to information and communication technologies (Axis 1);
- improve private, public and public transport mobility through the introduction of intelligent IT systems (Axis 2);
- expand and improve "slow" mobility, through the creation of new cycle paths (Axis 2);
- making public buildings more energy efficient, through restructuring and energy conversion (Axis 2);
- countering the various forms of marginality and hardship, promoting social inclusion (Axis 3);
- reduce the number of individuals exposed to housing problems, through the conversion of municipal buildings into homes with subsidized housing (Axis 4).

An amount of 37.7M€ has been assigned to the City of Torino with low carbon counting for more than one third of the overall budget. Nearly 8 M€ has been assigned to the energy renovation of public buildings, as detailed in the table below.

Type of action	Budget	Percentage
Digital Agenda	7.493.949	19,8%
Energy	7.900.000	20,9%
Infrastructures for social inclusion	4.466.266	11,8%
Mobility	7.029.396	18,6%
Services for social inclusion	9.830.384	26,0%
Technical assistance	1.050.000	2,8%
Total	**37.769.995**	**100,0%**

3.2 Decentralised regional operative programmes

In Piedmont Region the Funds of the ROP ERDF belonging to TO4 - Supporting the shift towards a low-carbon economy in all sectors, are divided into seven Axis; in particular Axis IV (Sustainable energy and quality of life) is aimed, on the one hand, at reducing primary energy consumption by promoting actions on the heritage of public buildings and, on the other, at spreading innovations in the production system that lead to the adoption of technical solutions for a more rational use energy and increase the use of energy from renewable sources. The achievement of the Axis objectives is also measured in terms of greenhouse gas (CO2) reduction.
Piedmont Region is directly involved through its own functions in the implementation of the measures and in the allocation of funds.
The allocation of public resources amounts to 193 million euros, divided almost equally between public entities and companies.
In general, the Axis has shown excellent performance. The interventions carried out allowed the wide overcoming of the performance framework (198% compared to the forecasts regarding the number of companies and 130% as regards the expenditure certified in 2018).

3.2.1 Measures activated for companies

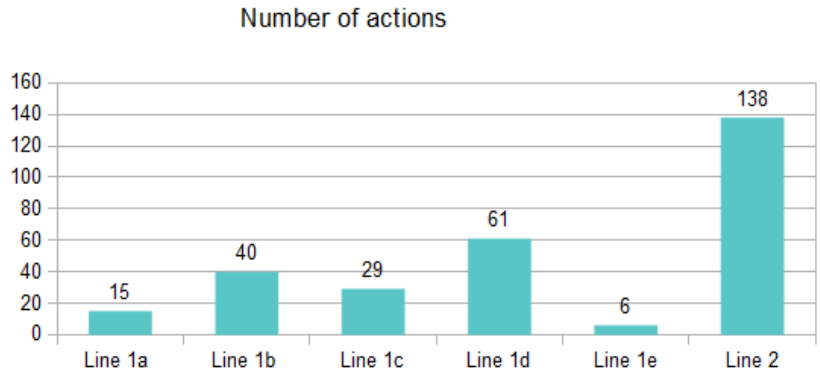
Regarding the measure activated for companies, with allocated resources amounting at 97 M€, there are two performance indicators at 2023:

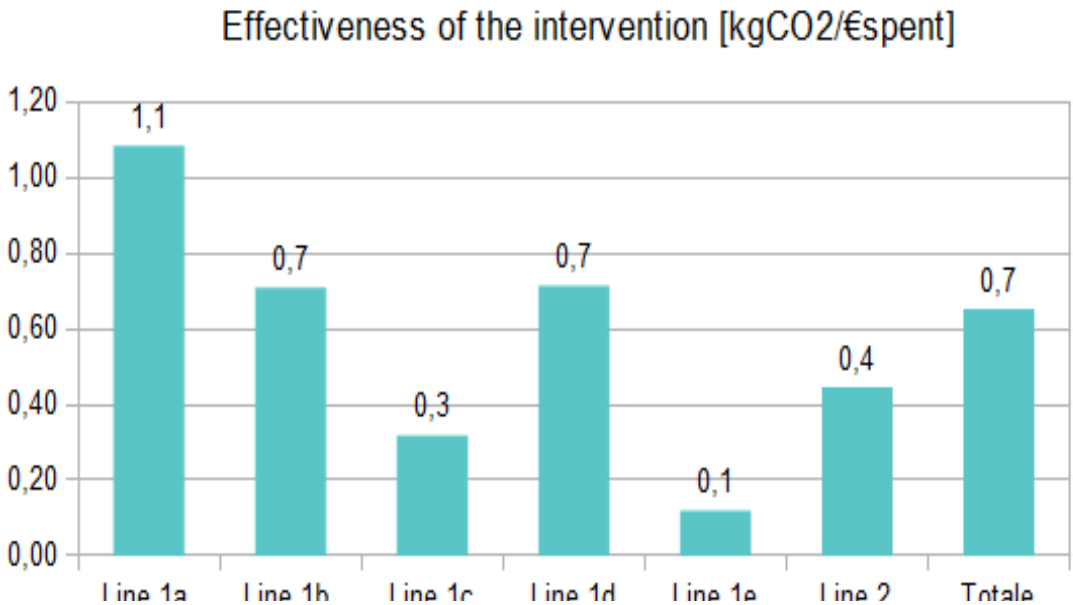
- number of companies receiving support: the target is estimated in 234 companies;
- annual greenhouse gas decrease: the target is estimated in 81.647.197 kgCO2.

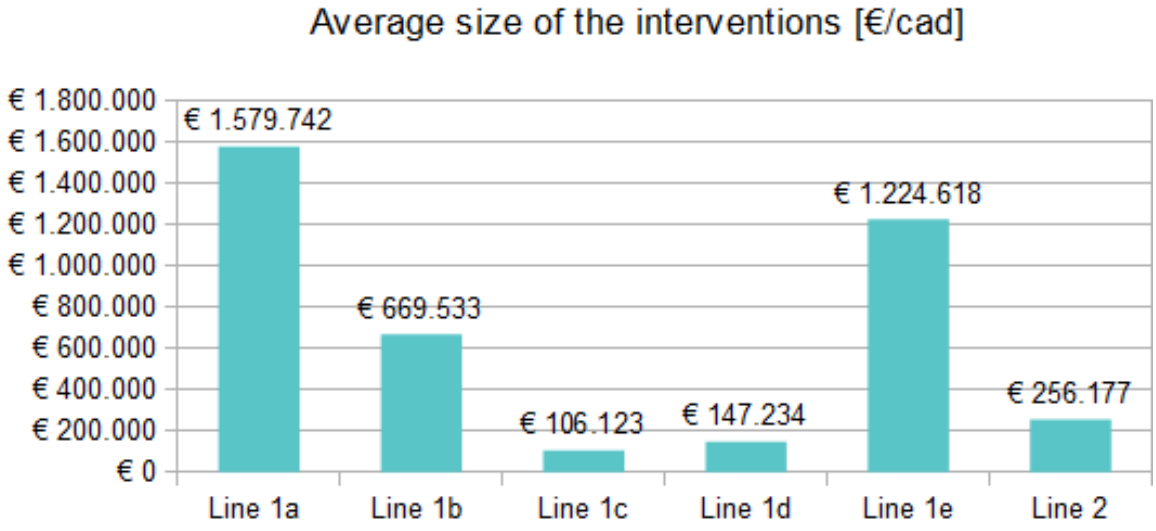
The incentives, partly with non-refundable funds (20%) and partly as subsidized credit (80%), finance:

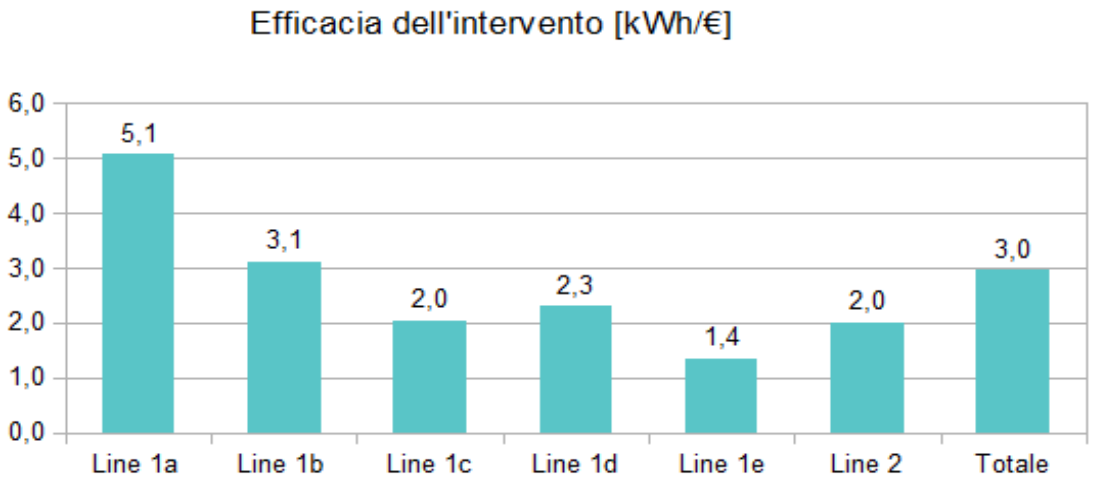
- high-efficiency cogeneration plants (Line 1a),
- measures to increase the energy efficiency of production processes (Line 1b) and buildings (Line 1c),
- the replacement of low efficiency systems and components with more efficient ones (Line 1d),
- the installation of new high efficiency production lines (Line 1e)
- the installation of plants for the production of energy from renewable sources (Line 2).

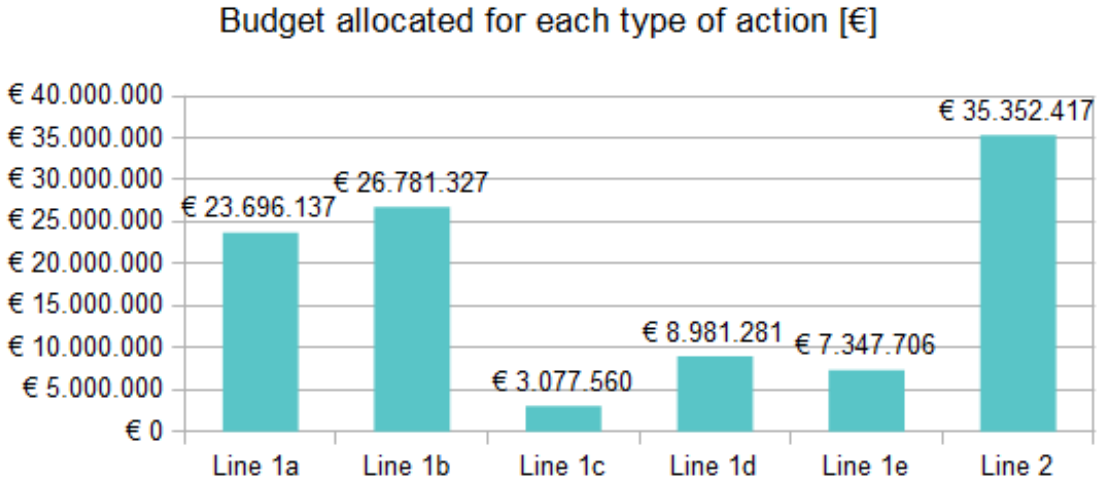
Graphs below show the number of interventions and the budget allocated divided by lines: one of the most interesting thing to notice is that, even if the installation of CHP represent only the 8% of the number of the actions, they absorbs a big part of the budget, because they are very important in terms of costs (on average 1.6 M€/each, look at the graph "Average size of the intervention") but also of effectiveness of the intervention (look at the graph "Effectiveness of the intervention (kgCO2/€spent)").




Effectiveness of the intervention [kgCO2/€spent]
1,20
1,00
0,80
0,60
0,40
0,20
0,00
1,1
0,7
0,3
0,7
0,1
0,4
0,7
Line 1a
Line 1b
Line 1c
Line 1d
Line 1e
Line 2
Totale


Average size of the interventions [€/cad]
€ 1.800.000
€ 1.600.000
€ 1.400.000
€ 1.200.000
€ 1.000.000
€ 800.000
€ 600.000
€ 400.000
€ 200.000
€ 0
€ 1.579.742
€ 669.533
€ 106.123
€ 147.234
€ 1.224.618
€ 256.177
Line 1a
Line 1b
Line 1c
Line 1d
Line 1e
Line 2





From the beginning of 2018 it is worth noting that the interest of the companies has been gradually decreasing (currently the monthly average is 4 applications for an average request for facilitation for each request of around 140,000 €). For this reason, the Management Structure has ordered the temporary closure of the call for tenders starting from 31 July 2019 with the aim of operating a "restyling", without distorting the purpose of the measure.

After a consultation process implemented with the main trade associations, some sectors originally excluded, based on a regional choice in 2016, have been included in the eligibility criteria (trade, packaging, industrial laundries, etc.).

At the moment results at the 31 December 2019 are available as shown in the table below:

Indicators	Results at 31th December '19	Target	Percentage
number financed companies	205	234	88%

saved tonCO2	70.254	81.647	87%

For details, see the information sheet in Appendix 2 or:

https://www.finpiemonte.it/bandi/dettaglio-bando/por-fesr-14-20-efficienza-energetica-energia-rinnovabile-nelle-imprese

3.2.2 Measures activated for public buildings and street lighting

The promotion of eco-efficiency in public buildings was implemented through five calls, which financed at least the 80% of the value proposed (adding a further 10% as a reward in the case of transformation buildings in Nzeb), in support of:

1. interventions in the health-hospital area, allocated resources 16 M€;
2. interventions on the real estate assets of the Piedmont Region, allocated resources 4 M€;
3. interventions of local authorities (municipalities, metropolitan cities, provinces and unions of municipalities), allocated resources 24 M€ (>5000 inhabitants) + 20 M€ (<5000);
4. interventions in the field of social housing, allocated resources 10 M€;
5. interventions to improve the efficiency of the municipal public lighting network, allocated resources 20 M€.

The interventions allow buildings (schools, municipal offices, sports facilities) and lighting systems reduction in energy requirements ranging from 20% to 80%, in relation to the different areas of intervention, with significant reductions in costs and CO2 emissions for the administrations concerned.

There are four perfomance indicators at 2023:

- additional capacity for renewable energy production: the target is estimated in 7.3 MWp;
- reduction of annual primary energy consumption in public buildings: the target is estimated in 54.932,7 MWh/y;
- reduction of the annual emission of greenhouse gases: the target is estimated in 11.096 tCO2;
- light points subject of the intervention: the target is estimated in 3.333 units.

The notices published have yielded quite differentiated outcomes for multiple reasons that would be worth investigating further: shortage of public resources co-financed by the actions, difficulties in the application of the procurement law, application constraints which also slow down the payment of contributions by the Region to the beneficiaries. All those factors are bottlenecks that prevent the beneficiaries to implement the actions in the foreseen time. This would require the need of prolongation to complete the projects and could lead to the withdrawal of the grant in the future. In particular, it is necessary to underline that the co-financing is essential to cover over 20% of the amount, plus those expenses that are not eligible, but are essential and considered as "enabling interventions" (i.e. seismic adjustment, removal of architectural barriers, asbestos, etc.).

Regarding the targets at the 31 December 2019, following partial results are available:

Indicators	Results at 31th December '19	Target	Percentage
additional capacity for renewable energy production [MWp]	4,5	7,3	61 %
reduction of annual primary energy consumption in public buildings [MWh/y]	39.143	54.933	71,2 %
reduction of the annual emission of greenhouse gases [tonCO2]	7.599	11.096	68,5 %
light points subject of the intervention [n]	36.020	3.333	>1000 %

For details, see the information sheet in Appendix 2 or:

http://www.regione.piemonte.it/bandipiemonte/cms/home?tid=109&field_stato_value=All

Measures about health-hospital area, real estate assets of the Piedmont Region and social housing are in course of definition; results could be available at the end of 2020.

Final results of every measures implemented by Piedmont Region will be defined at the end of 2023.

3.2.3 Some initial technical and economic analysis of the results of the regional calls for the energy efficiency in local authorities

It is possible to make some initial technical and economic analysis of the results of the regional calls for the energy efficiency of buildings in local authorities and for the energy refurbishment of public lighting networks, for which the works have already been completed or are going to be completed soon.

First of all, it's necessary to briefly explain the italian legislative framework.

The Ministerial Decree 26.06.2015 has recepted EU Directive 201/31/EU (Energy Performance Buildings Directive, EPBD recast), which entered into force 1st October 2015 and identifies four type of intervention of energetic retrofit:

1. **energy retrofit**: only interventions on the external envelope for less than 25% of the gross dispersion surface;
2. **energy refurbishment**: interventions on the external envelope for more than 25% of the gross dispersion surface and may be on the heating or cooling system;
3. **deep energy refurbishment**: interventions on the external envelope for more than 50% of the gross dispersion surface and on the heating or cooling system;

4. **transformation into NZEB (near zero energy building)**: after the refurbishment the building respects all the requirements to be defined "NZEB", among which integration of renewable sources.

Municipalities with a population of less than 5,000 inhabitants, as well as the Unions and the temporary groupings of the same.

The call has two lines of intervention. Line A: interventions to reduce the energy demand of the building with medium or low building winter energy quality on the basis of the Energy Performance Certificate, such as thermal insulation, replacement of windows, solar shading, improvement of the efficiency of heating systems. Line B: installation of renewable source systems such as heat pump systems, solar thermal and photovoltaic systems, biomass systems where possible. Line B must be compulsory associated with Line A or realized on buildings with an existing high energy performance. The call required the achievement of a ratio between non-renewable global primary energy savings and the amount of the benefit greater than 0.4 kWh/€spent (in order to reward interventions capable of generating greater savings for the same investment) and compliance of the minimum energy requirements defined for the year 2019 by national legislation.

At the end of the Call (2018), 75 applications were approved for granting, which corresponds to a regional subsidy amount of around 20 million Euros (double the initial allocation). The excellent success of the initiative has shown the willingness of small local administrations to propose "quality" energy efficiency measures on their buildings, despite the "challenging" design approach required by the Call. Indeed, it was challenging the required post-intervention energy performance and the related need to verify the seismic characteristics of existing buildings. This obliged to implement, in many cases, improvement interventions also from a structural point of view.

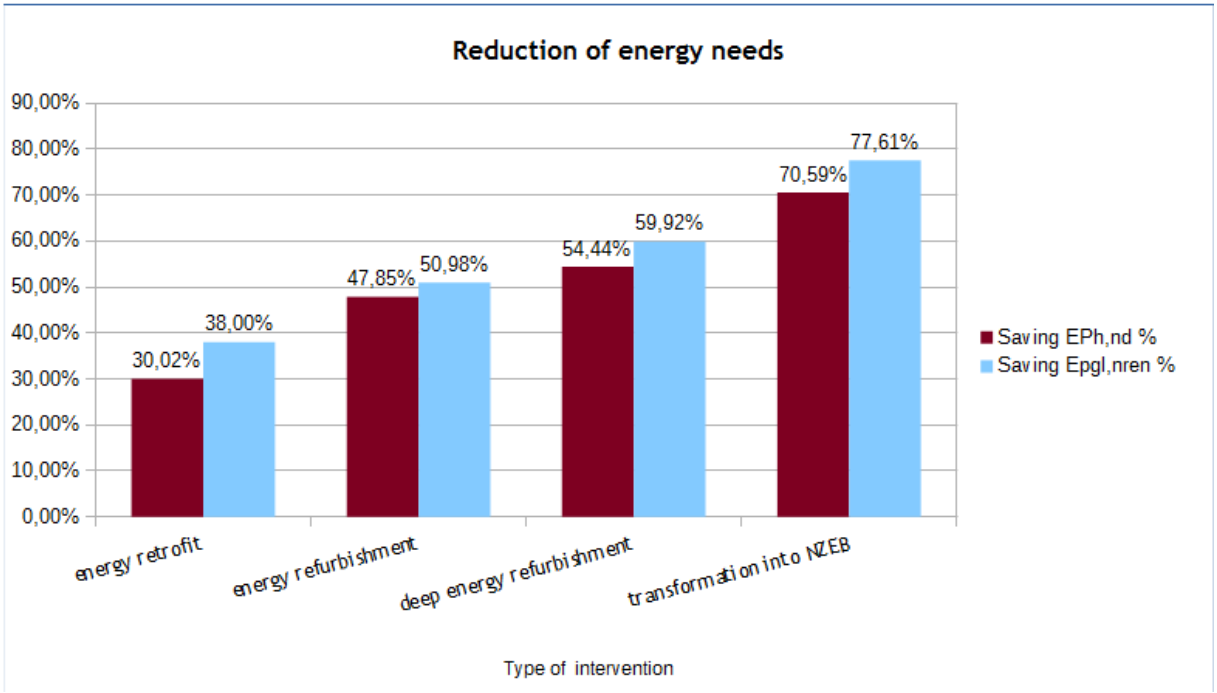
Regarding types of interventions and works proposed, the following tables and graphs show that almost all the interventions (96%) included the insulation of the opaque elements (thermal insulation, external insulation) and the replacement of the external windows (88%). About 60% of the interventions involved the replacement of the heat generator, with the installation of a condensing boiler in 32% of cases and a heat pump (mainly air-water powered) in 27% of cases. In 39% of cases, the installation of a photovoltaic solar system was included, with an average power of the system equal to 19 kWp, often coupled to a new electric heat pump.

Type of intervention	% project that included the intervention	Surfaces subject to intervention (m^2)	Power of installed systems (kW)	Average intervention cost (€/m^2)	Average intervention cost (€/kW)
Insulation of opaque elements	95%	118.913		109	
Window replacement	88%	12.398		591	

Solar screens	31%	2.827		304	
LED lighting	25%				
Condensing boiler	32%		3.899		434
Heat pump	27%		1.244		1.579
Solar PV	39%		585		2.410
Solar thermal	7%	95		1.625	

As regards the energy savings achieved by the interventions, the assessment of the projects highlighted the following:

- with regard to the thermal energy performance index (EP_{Hnd}, as the energy performance of the building envelope), the average post-intervention value is approximately 120 kWh/m2. This means a reduction of more than 50% of the building's winter energy demand, that before the renovation works was approximately 250 kWh/m2, as confirmed by the average value for the national building stock;
- with regard to the global non-renewable energy performance index (EPgl, nren), which considers the energy performance, in terms of non-renewable primary energy, of the building-plant system (therefore including technical systems), there is an average ante performance intervention equal to approximately 400 kWh/m2 and an average post-intervention performance equal to approximately 157 kWh/m2, with an important percentage decrease in primary energy consumption, quite near to 60%. This reduction is also highly differentiated according to the type of intervention proposed. In particular, in *deep energy refurbishment* and in the *transformation into nZEB*, much higher percentage savings are achieved due to the relevance and extension of the interventions and compliance with the obligations to use renewable energy sources set out in Legislative Decree n. 28/2011.



The analysis of the ratio between the primary energy saved and the amount of the subsidy (whose minimum value of 0.4 kWh/€spent constituted, as mentioned, a requirement of eligibility of the applications) the following average values have been achieved:

- *energy retrofit* and *energy refurbishment*: 0.68-0.62 kWh/€spent;
- *deep energy refurbishment*: 0.81 kWh/€spent;
- for the transformation of existing buildings into nZEB buildings, the average values are similar to those found for *deep energy refurbishment*. This result demonstrate that with careful planning of the interventions, the overcharge for achieving the nZEB qualification for this type of building it is not that much compared to a deep renovation approach.

Municipalities with a population of more than 5,000 inhabitants, as well as the Unions and the temporary groupings of the same.

The lines of intervention foreseen by the call (Line A and Line B) are the same as those set out in the Call for local authorities with a population of less than 5,000 inhabitants. Also in this case, the call required the achievement of a ratio between non-renewable global primary energy savings and the amount of the benefit greater than 0.4 kWh / € and the compliance with the minimum energy requirements defined for the year 2019 by the legislation national.

At the end of the Call (2018), 20 applications (for a total of 28 buildings) were eligible for financing, with and overall amount of € 26.4 million of ERDF (slightly less than the Call budget). The lower success compared to the "parallel" call for smaller local authorities is due, mainly, to the fact that the combination of soft loan and grant was not very attractive as the administrations have, nowadays, limited debt capacity.

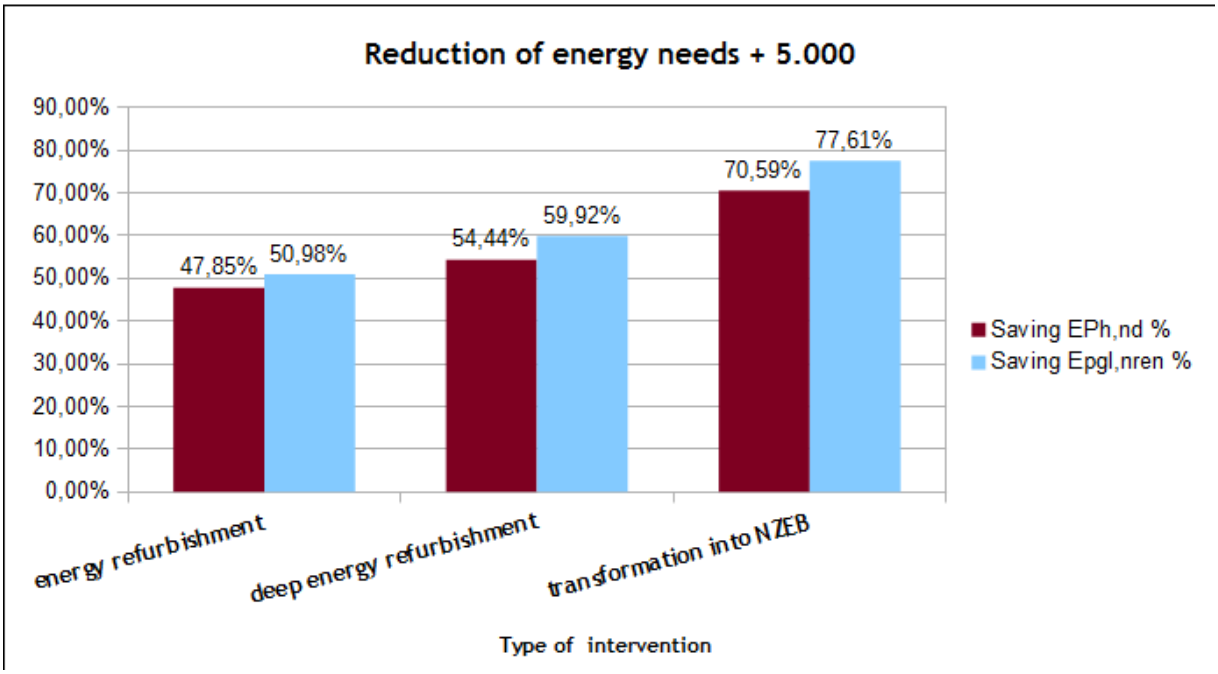
Some results, as previously illustrated for the call for local authorities with a population of less than 5,000 inhabitants, are reported in the table below.

Type of intervention	% project that included the intervention	Surfaces subject to intervention (m^2)	Power of installed systems (kW)	Average intervention cost (€/m^2)	Average intervention cost (€/kW)
Insulation of opaque elements	100%	118.249		133	
Window replacement	96%	15.601		559	
Solar screens	43%	4.604		302	
LED lighting	79%				
Condensing boiler	21%		1.527		344
Heat pump	43%		2.042		2.037
Solar PV	61%		682		2.652
Solar thermal	25%	172		2.090	

As regards the energy savings achieved by the interventions, the assessment of the projects applications highlighted the following:

• with regard to the thermal performance index for heating (EP_{Hnd}), there is an average pre-intervention performance of approximately 250 kWh/m2 (which is in line with the "small municipalities" call). The average post-intervention performance is approximately 97 kWh/m2, with a decrease of the building's winter demand for energy, exceeding 60%. This reduction is clearly very different on the basis of the type of intervention proposed, as shows the picture below;

• with regard to the non-renewable global energy performance index ($EP_{gl,\ nren}$), there is an average pre-intervention performance of approximately 428 kWh/m2 and an average post-intervention performance of approximately 100 kWh/m2, with a reduction of about 63%. Even in this case the reduction is very different according to the type of intervention proposed. In particular, in the *deep energy refurbishment* and in the *transformation into nZEB*, the reduction is much higher and range from 60% to 77%.



The average investment cost per unit of useful surface of the granted applications amounts to about 291 €/m2. The unit cost is lower for *deep energy refurbishment* and *energy refurbishment* interventions (approximately € 270/m2) and increases as the extent and complexity of the intervention increases. The average unit cost for the *transformation into nZEB* has been approximately € 541/m2.

Comparing the two calls for public buildings, the following is observed:

- the average useful area of the building is generally greater for the "large municipalities" call (approximately 3,470 m2 for each building) than for the "small municipalities" call (approximately 810 m2 for each building);
- the average specific primary energy savings per square meter of usable area is practically the same for the both calls and stands at about 213 kWh/m2;
- the average costs allowed per square meter of usable area are comparable (312 €/m2 for "small municipalities" and 301 €/m2 for "large municipalities");
- as far as the distribution of budget granted between Line A and Line B is concerned, the values are almost equal for both calls, settling at 91% for Line A and 9% for Line B.

The average primary energy savings per Euro invested is 0.86 kWh/€ (respectively 0.78 kWh/€ for the "large municipalities" call and 0.98 kWh/€ for the "small municipalities" call), while the CO2 emissions per Euro invested are equal to 0.14 kgCO2/Euro for the "large municipalities" call and 0.24 kgCO2/Euro for the "large municipalities" call, with an overall average figure for the two calls equal to 0.18 kgCO2/€.

3.2.4 Measures activated for public lighting systems

The call, launched in 2018 with an initial allocation of 10 million Euros, provided for a capital grant equal to 80% of the eligible costs. The beneficiaries are all Municipalities belonging to Piemonte region with the exception of the provincial capitals.
There are two lines of intervention. Line A: for energy redevelopment interventions such as the replacement of sources / fixtures, LED retrofitting, remote control / remote management

systems. Line B: for integrated technological services connected to the public lighting infrastructure such as systems for traffic control / video surveillance, weather or air pollution monitoring, smart parking, information panels, wi-fi services.
The call required a minimum energy saving of 40% and the compliance with the environmental and technological requirements recently introduced by of the national and regional laws.
After the deadline (May 2019), 133 applications have been granted, for a total request of resources of nearly € 20 million (double the initial budget). The considerable success of the initiative is probably due to a mix of factors, among which we can identify the size of the stock of lighting systems with poor efficiency, the possibility of having important capital contributions, the availability - especially in certain geographic areas - of energy audits already carried out on the municipal street-lighting stock, the immediate positive impact in terms of service provided to the community and the level of savings in expenditure for municipal budget, the availability of mature technologies for the retrofit of light points.
The projects eligible for subsidies concerned a total of 36.020 lighting points, therefore going to act on 37% of the lighting points present in the territories of the beneficiary Municipalities. The 133 projects funded are triggering investments for € 25,354,344, supported by a grant provided by the Piedmont Region equal to € 19,937,795. The average expenditure per Municipality was € 190,634 while the average investment for the renovation of a lighting point was € 704. All projects used LED, as the technology for the relamping intervention.

Each euro invested as a subsidy on the POR FESR 2014-2020 led to a saving of about 0.67 kWh of electricity, or 1.45 kWh of primary energy, while the savings in the CO2 emissions per Euro invested are equal to 0.32 kgCO2/€spent. All these data are significantly higher than the corresponding values obtained for the calls for the refurbishment of buildings of the local authorities, even though with an reduced lifespan duration.

The proposed interventions provided the achievement (based on a standardized calculation methodology defined by the Call) of average energy savings of 60%, much more than the minimum requirement of 40%. This shows a high savings potential in street light, mainly related to the availability of highly efficient and manageable light sources and fixtures in centralized and intelligent mode through remote control / remote management systems.

The overall energy savings achieved by the measure is approximately 12,094 MWh/year which equates to a primary energy saving of 29,267 MWh/year, or 2.5 ktep.

4 Other EU low-carbon initiatives

The purpose of this Chapter is to identify and assess individual EE and/or RES projects in which at least one project partner from your region plays a dominant role and/or the implementation partly or wholly realized in your region. Project of interest are those that have been funded from 2014 onwards. The projects are to be identified from public sources or via interviews.
Please populate the layout in Appendix 3. for each project in each section of in Chapter 4.!

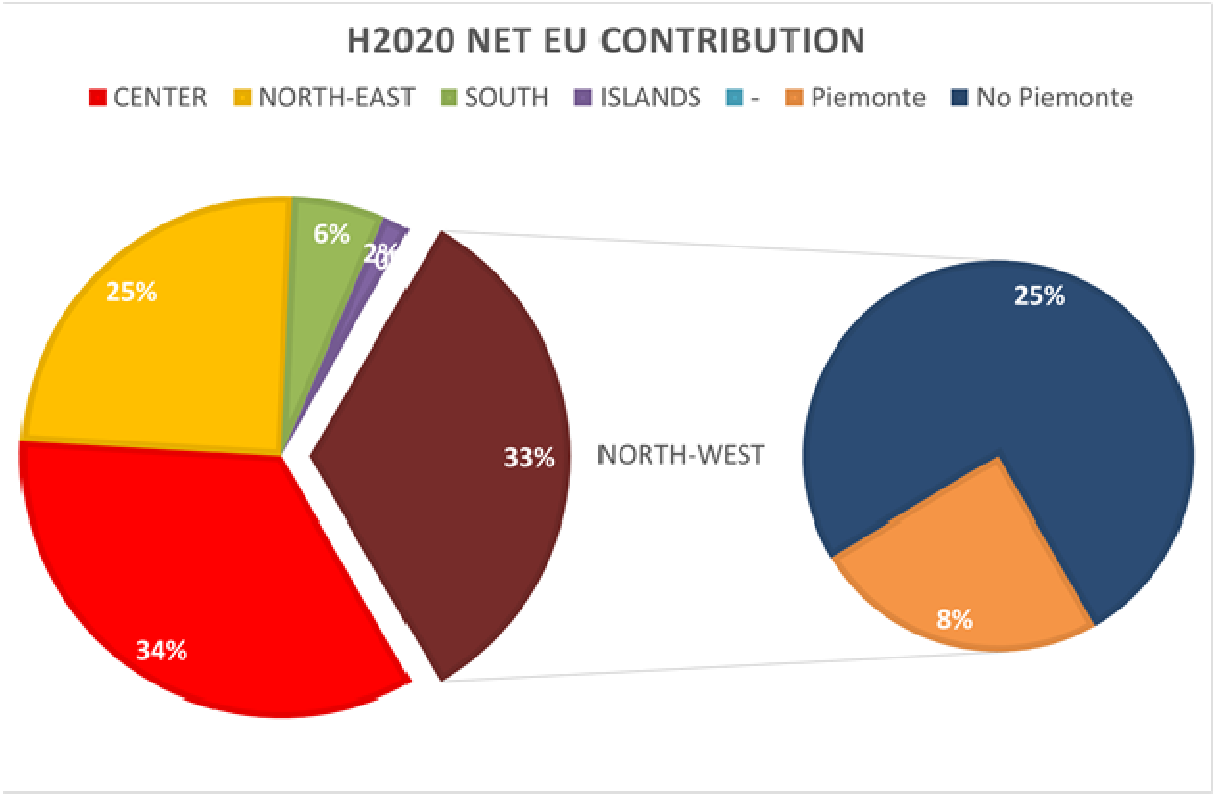
4.1 EU initiatives managed by the European Commission

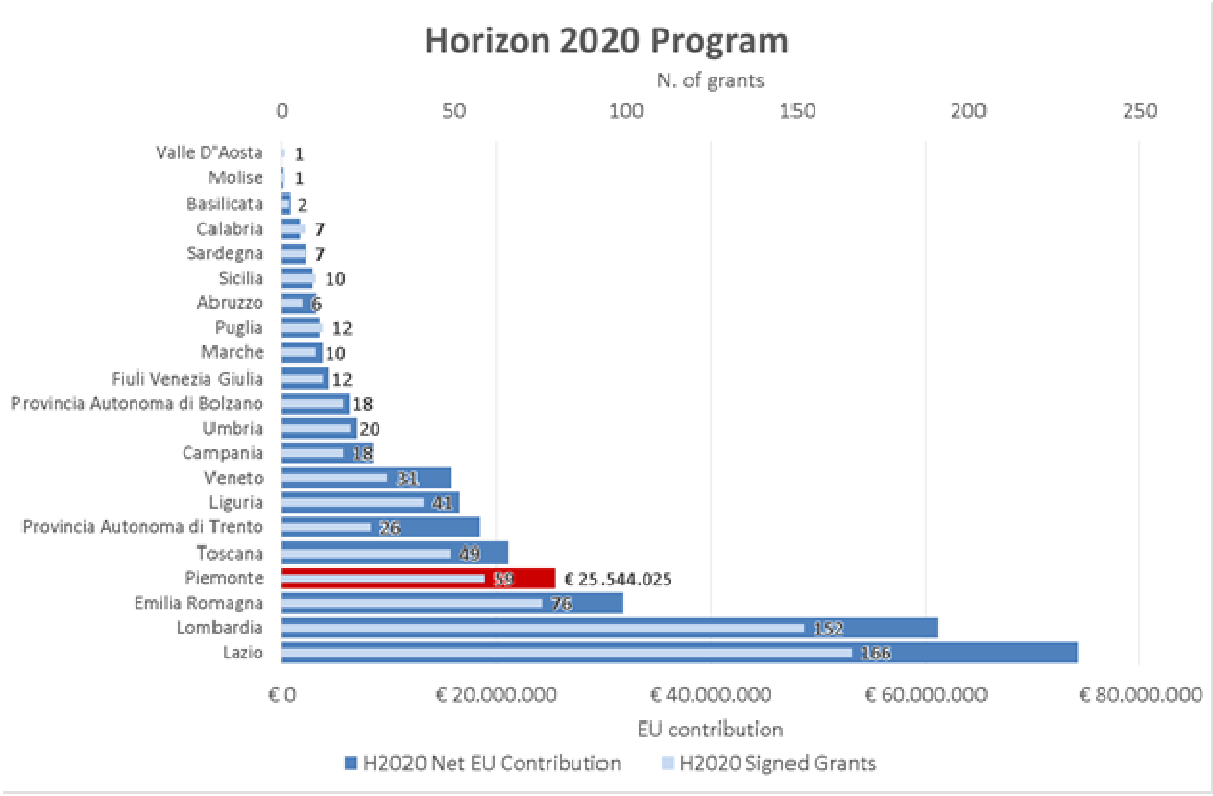
4.1.1 Horizon 2020Programme

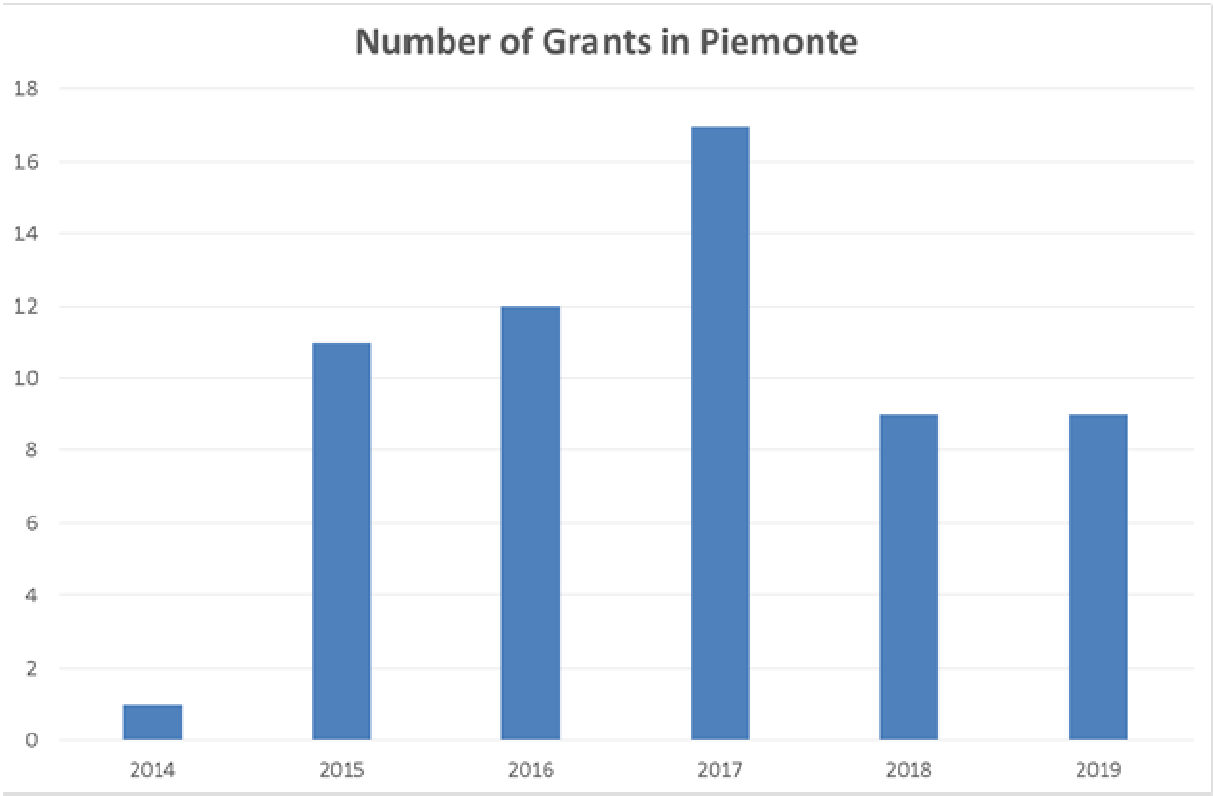
Horizon 2020 is the biggest research and innovation programme with nearly €80 billion of funding available over 7 years (2014 to 2020). Work Programmes '10. Secure, clean and efficient energy' addressees

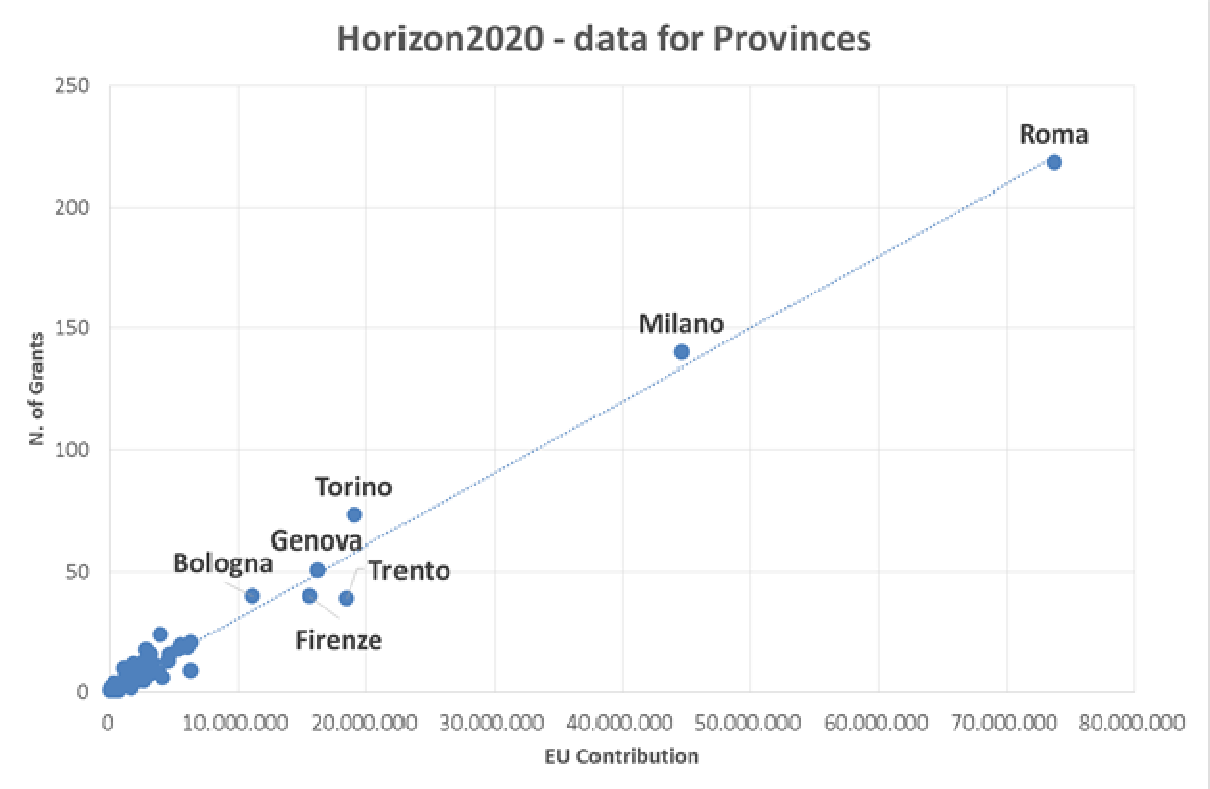
- Energy efficiency focusing on buildings, industry, heating and cooling, SMEs and energy-related products and services, integration of ICT and cooperation with the telecom sector;
- Low carbon technologies covering: photovoltaics, concentrated solar power, wind energy, ocean energy, hydro power, geothermal energy, renewable heating and cooling, energy storage, biofuels and alternative fuels, carbon capture and storage; and
- Smart cities and communities supporting the sustainable development of urban areas in particular in the areas of energy, transport and ICT.

Thanks to Horizon 2020 projects, in Piemonte more than 25M€ have been used in Innovation Actions or coordination and support actions (59 grants signed). The amount stands for more than 8% of the overall budget allocated in Italy. Piemonte is the forth Region in the ranking of Italy, following Lazio, Lombardy and Emilia. An average of 12 grants have been signed between 2015 and 2019, with a peak in 2017 with 17. If we have a deeper look at NUTS3 level, the Torino province stands out as the third Italian province for number of Horizon2020 participations.




Horizon 2020 Program
N. of grants
0
50
100
150
200
250
Valle D"Aosta 1
Molise 1
Basilicata 2
Calabria 7
Sardegna 7
Sicilia 10
Abruzzo 6
Puglia 12
Marche 10
Friuli Venezia Giulia 12
Provincia Autonoma di Bolzano 18
Umbria 20
Campania 18
Veneto 31
Liguria 41
Provincia Autonoma di Trento 26
Toscana 49
Piemonte 19
€ 25.544.025
Emilia Romagna 76
Lombardia 152
Lazio 166
€ 0
€ 20.000.000
€ 40.000.000
€ 60.000.000
€ 80.000.000
EU contribution
H2020 Net EU Contribution
H2020 Signed Grants


Number of Grants in Piemonte
18
16
14
12
10
8
6
4
2
0
2014
2015
2016
2017
2018
2019



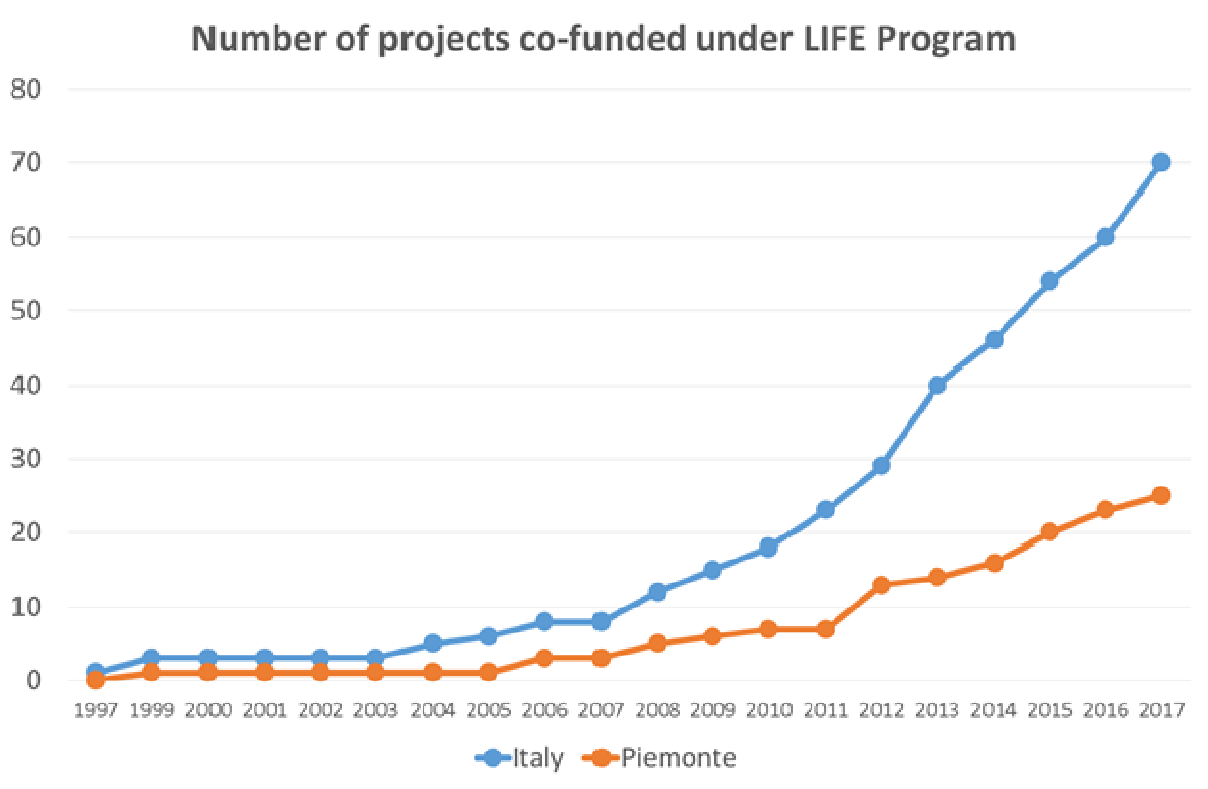
4.1.2 LIFE Programme

The LIFE programme is the EU's funding instrument for the environment and climate action created in 1992. The current funding period 2014-2020 has a budget of €3.4 billion.The LIFE programme is divided in two sub-programmes, one for environment (representing 75% of the overall financial envelope) and one for climate change (representing 25% of the envelope). Under LIFE Program from late 90s to 2017, it is possible to count for 25 projects where a Partner is settled in Piemonte Region and which are broadly related to the promotion of low carbon economy. These 25 projects are 36% of the overall funded projects with Italian partners.

Is is not really easy to select the right projects as, the priorities touched by LIFE Program are not very fitting with PROSPECT2030 propject. The selection has been implemented taking into consideration Climate Change Mitigation and the following keywords:

- Covenant of mayor
- Renewable energy
- Energy efficiency
- Energy savings
- Energy supply

It is possible that few interesting projects have not been selected in the above search, on the other hand it is very likely that some projects included in the search are not very much in line with PROSPECT2030 propject priorities. Nevertheless this sample of projects can be considered valuable to provide a picture of the capacity of the regional system to attract fundings from LIFE Program in comparison with the rest of Italy.



4.1.3 INTERREG and other EU initiatives

Piemonte Region is involved in several Interreg Programs, thanks to its geographical proximity to several very different EU areas. It is part of:

- Alpine Space (https://www.alpine-space.eu/),
- Central Europe (https://www.interreg-central.eu) and
- MED (https://interreg-med.eu/) and of course
- Interreg Europe (https://www.interregeurope.eu/).

In order to ease the assessment, all "low carbon priorities" have been included. By consequence, event sustainable mobility, which is not very fitting with PROSPECT2030 is included.
Hereafter, a detailed analysis of the projects implemented or under implementation with partners coming from the Region is provided.
Generally speaking, it is worth noting that Piemonte is well represented in all Interreg Programs with a presence in key projects.
All the Programs assigned to the low carbon priority 200 M€ and financed 128 projects. The budget allocated to Piemonte PP is about 5.6€, equal to 3% of the overall Program budget. 17 out of 128 projects (13%) involved PP coming from Piemonte. The assessment included the overall "low carbon" priority, which is generally splitted among mobility and energy. For sure, Piemonte Region concentrated its own efforts in energy priority. This is to say that Piemonte stands out among EU Regions in attracting such kind of funds.

	Funds	Projects

Interreg Programs	Amount k€	%	N.	%
Alpine Space	3.300	10,5%	9	64,0%
Central Europe	659	1,53%	3	13,0%
MED	1.300	2,7%	3	12,0%
Interreg Europe	413	0,5%	2	3,0%
Total	**5.672**	**2,9%**	**17**	**13,3%**

Alpine Space Program

In the period 2014 - 2020 the Alpine Space program funded the following projects with the presence (as LP or PP) of Piemonte partners.

PROJECT	TIMEFRAME	PARTNER	LP/PP	BUDGET TOT. PROJECT	BUDGET FESR - PIEMONTE	WEBSITE
PEACE_Alps	12/2015 12/2018	Piemonte Region	LP	2.148.881	307.570	https://www.alpine-space.eu/projects/peace_alps/en/home
Objectives: PEACE-ALPS tackled the problems related to the implementation of Sustainable Energy Action Plans (SEAPs) or any other Energy concepts already endorsed by LAs in Alpine Space Area by supporting them in developing concrete actions with an inter-municipal approach **Results**: The project partners have set up centralised services for 240 municipalities, 800 public buildings, 15.000 light spots. Partners tested them in a transnational mutual learning process among themselves and with the involved local authorities.						
CESBA Alps	16/12/2015 15/06/2019	Piemonte Region iiSBE Italia	LP PP	2.818739	624.792	https://www.alpine-space.eu/projects/cesba-alps/en/home
Objectives: The goal of CESBA is to facilitate the diffusion and adoption of sustainable built environment principles among all the stakeholders through the use of harmonized assessment systems in the whole life cycle of the built environment. **Results:** The project developed a common transnational KPIs and assessment methods that any region in Europe and in the Alpine Space can take, contextualize and use. CESBA Alps also developed the first tool for sustainable assessment of territories.						
THE4BEES	16/12/2015 15/12/2018	CSI Piemonte Piemonte Region	LP PP PP	2.901.412	616.658	https://www.alpine-space.eu/projects/the4urbees/en/home

		CSP				
Objectives: THE4BEES builds on the hypothesis: Energy is consumed by people rather than by buildings. THE4BEES focused on the behavioural changes of users in public buildings needed to achieve reduction of energy consumption. **Results:** During the project, a user-building interface was created. The tool provides occupants on their electricity/heating consumption, comfort indicators, lightcontrol and hint and tips on how to improve their behavior						
IMEAS	01/11/2016 31/12/2019	ENEA Vercelli Foundation for the Environment T. Fenoglio	LP PP	2.147410	422.022	https://www.alpine-space.eu/projects/imeas/en/home
Objectives: The goal of IMEAS is to develop a consistent methodology and practical guidance for the creation and integration of roadmaps based on multi-level approaches to climate change mitigation, energy innovation potentials, economic structures and control of energy plans. **Results:** IMEAS developed a web Platform, a community of people and institutions that share tools and experience to support successful low-carbon energy transition strategies. https://www.imeas.eu/						
GRETA	16/12/2015 15/12/2018	Polytechnic of Torino	PP	2.962.952	253.000	https://www.alpine-space.eu/projects/greta/en/home
Objectives: GRETA aims to demonstrate the potential of NSGE in the Alpine Space and to share its knowledge to foster the integration of this technology into future energy plans in the area at different administrative levels. **Results:** The main results of the project are decision support tools (geothermal potential maps, guidelines for energy planning), legal and technical guidelines for the utilization of NSGE, based on an exchange of best practices.						
e-MOTICON	01/11/2016 30/06/2019	Piemonte Region	PP	2117442	68.000	https://www.alpine-space.eu/projects/e-moticon/en/home
Objectives: e-MOTICON aims to support Public Administrations in ensuring homogeneous development of electric mobility. deploying an innovative transnational strategy of integration among different instruments and policicies **Results:** e-MOTICON delivered a White book on innovative E-CS planning to respect e-mobility requirements in Alpine Space transnational strategy and Regional Action Plans. It also provided a toolset to anticipate E-CS network requirements and test it in 3 joint pilot actions. The project developed a networking platform: https://www.e-moticon.eu/how_to_use.html						
ASTUS	01/11/2016 31/10/2019	UNCEM Piemonte	PP	2.395.951	103.275	https://www.alpine-space.eu/projects/astus/en/home
Objectives: to reduce in a long term perspective the carbon impacts linked to daily trips in the Alps. Several major results will be reached within the project to assist alpine local authorities in identifying and adopting an adequate local low carbon strategy and action plan, in order to foster long term low carbon options. **Results:** a comparative, transnational typology of alpine territories; transferable instruments and decision making tools assessing the impacts of potential alternative mobility solutions for any alpine regions willing to improve its CO2 footprint in the field of mobility; generate a transnational methodology for producing						

low CO2 scenarios and local action plans; produce final/concluding report with recommendations for reuse of project.						
SAMBA	17/04/2018 16/04/2021	Piemonte Region SiTI Torino Chieri municipality	LP PP PP	2.021.192	475.082	https://www.alpine-space.eu/projects/samba/en/home
Objectives: Increasing awareness about the potential of mobility behaviour change policies; improving behaviour change policies to promote sustainable and low carbon mobility; Fostering behaviour change towards sustainable mobility in the pilot cases. **Results:** the project is still ongoing. Project partners are developing a tool which supports public authorities in the design of pricing schemes in mobility for the impact on behaviour and their potential to trigger changes.						
CaSCo	01/11/2016 31/10/2019	Environment Park Unione montana Valsesia ARPA Piemonte	PP PP PP	2.291.187	427.121	https://www.alpine-space.eu/projects/casco/en/home
Objectives: development and implementation of transnational low carbon policy instruments for the procurement of significantly low carbon timber products and closing loops of regional added value and capitalizing of low carbon timber products by fostering their utilisation in politics, public bodies and key actors as e.g. architects. **Results:** developed political framework for integrating low carbon timber products in procurement of public bodies; implementation of those policies in various communities in the programme region; improved trans national operating framework and support tools for low carbon policies; empowered SME value chains and improved deliverance of low carbon timber to meet the raised public demands.						

The Program assigned to the low carbon priority 31,4 M€ and financed 14 projects. The budget allocated to Piemonte PP is nearly 3,3 M€, equal to 10,5% of the overall Program budget. 9 out of 14 projects (64%) involved PP coming from Piemonte.

Central Europe Program

In the period 2014 - 2020 the Central Europe program funded the following projects with the presence (as LP or PP) of Piemonte partners.

PROSPECT2030	01/04/2019 30/09/2021	Piemonte Region	LP	1.919.596	212.214	https://www.interreg-central.eu/Content.Node/PROSPECT2030.html
Objectives: project focuses on good governance as the fundamental action to reduce CO2 emissions, boosting the energy transition towards a low-carbon economy. It will foster a better use of public funds and a more efficient energy planning **Results:** the project just started.						
	01/06/2016 31/07/2019	City of Torino	PP	2.095.460	176.000	https://www.interreg-central.eu/Content.Node/SOLEZ.html

SOLEZ						
Objectives: The Solez project brings together cities which endeavour to implement measures to support low emission zones (LEZ) or other low-carbon mobility policies. **Results:** SOLEZ increased partners' knowledge and experience on effective LEZ implementation approaches; increased private stakeholders and civil society engagement in low-carbon mobility initiatives and LEZ-related decisions; developed and tested a set of different ICT-enhanced solutions.						
STORE4HUC	April 2019 March 2022	Municipality of Cuneo Envipark	PP PP	1.774.380	271.130	https://www.interreg-central.eu/Content.Node/store4HUC.html
Objectives: The project aims to improve territorially based low-carbon energy planning strategies. It will enrich policies that support climate change mitigation in historical city centres by focusing on improved urban and spatial planning for integrating energy storage systems to enhance the public institutional and utility capabilities. **Results:** the project just started.						

The Program assigned to the low carbon priority 43 M€ and financed 23 projects. The budget allocated to Piemonte PP is about 659.300 €, equal to 1,5% of the overall Program budget. 3 out of 23 projects (13%) involved PP coming from Piemonte.

Interreg Europe Program

In the period 2014 - 2020 the Interreg Europe program funded the following projects with the presence (as LP or PP) of Piemonte partners.

SHREC	01/08/2019 31/07/2023	Piemonte Region	PP	1.844.165	176.468	https://www.interregeurope.eu/shrec/
Objectives: The project overall objective is to improve regional and national policies increasing the share of energy from renewable sources in the overall energy mix and encouraging and facilitating the production and use of renewables by businesses, communities and households aiming at less carbon intensive energy future. **Results:** the project just started.						
MOLOOC	01/01/2017 31/12/2021	City of Torino	PP	1.445.737	236.300	https://www.interregeurope.eu/moloc/
Objectives: MOLOC aims to develop a new city building approach, associating quality of life and energy efficiency. MOLOC stands for MOrphologies Low Carbon and will explore the brakes that limit the impact of local policies and actions in their ambitions to change current urban morphologies in the light of sustainable urban development. **Results:** the project is ongoing						

The Program assigned to the Priority Axis 3 (low carbon economy - 4 calls) 76,7 M€ and financed 60 projects. The budget allocated to Piemonte PP is about 413.000 €, equal to 0,5% of the overall Program budget. 2 out of 60 projects (3,3%) involved PP coming from Piemonte.

Interreg MED Program
In the period 2014 - 2020 the Interreg MED Program funded the following projects with the presence (as LP or PP) of Piemonte partners.

STEPPING	01/11/2016 31/10/2019	PIEMONTE REGION ENVIPARK	LP PP	1.943.112,50	447.343,40	https://stepping.interreg-med.eu/
Objectives:The project aims to test a new approach of application of EPC scheme in the design and awarding of energy efficiency intervention for public building stock in order to develop validated guidelines on MED EPC to be transferred and Disseminated to MED Public institutions. **Results:** 16 Investment Plans implemented involving more than 60 municipalities and about 200 public buildings. 2 EPC tender launched. 32 training events organized. Policy Recommendation and EPC MED Guidelines implemented.						
CESBA MED	01/11/2016 31/10/2019	City of Torino iiSBE Torino	LP PP	3.190.375	650.292,50	https://cesba-med.interreg-med.eu/
Objectives: CESBA MED intends to find the most affordable and operational solutions for the development of energy efficiency plans at neighbourhood scale. **Results:** CESBA SNTools: 8 contextualized assessment tools (CESBA SNTools) were developed together with an application methodology. The tools are intended to support decision makers and the managers of publi building stocks in the implementatiton of more efficient energy retrofitting plans combining the building and the urban scale. CESBA MED Passport : A set of common criteria, indicators and metrics to allow the comparison of the performance reached by public buildings and urban areas in the different MED regions and a common way to display the results will be developed. These elements will form the CESBA MED Passport.						
GREEN CAP	01/11/2016 31/10/2019	ENVIPARK	PP	1.223.000,03	212.500	https://renewable-energies.interreg-med.eu/

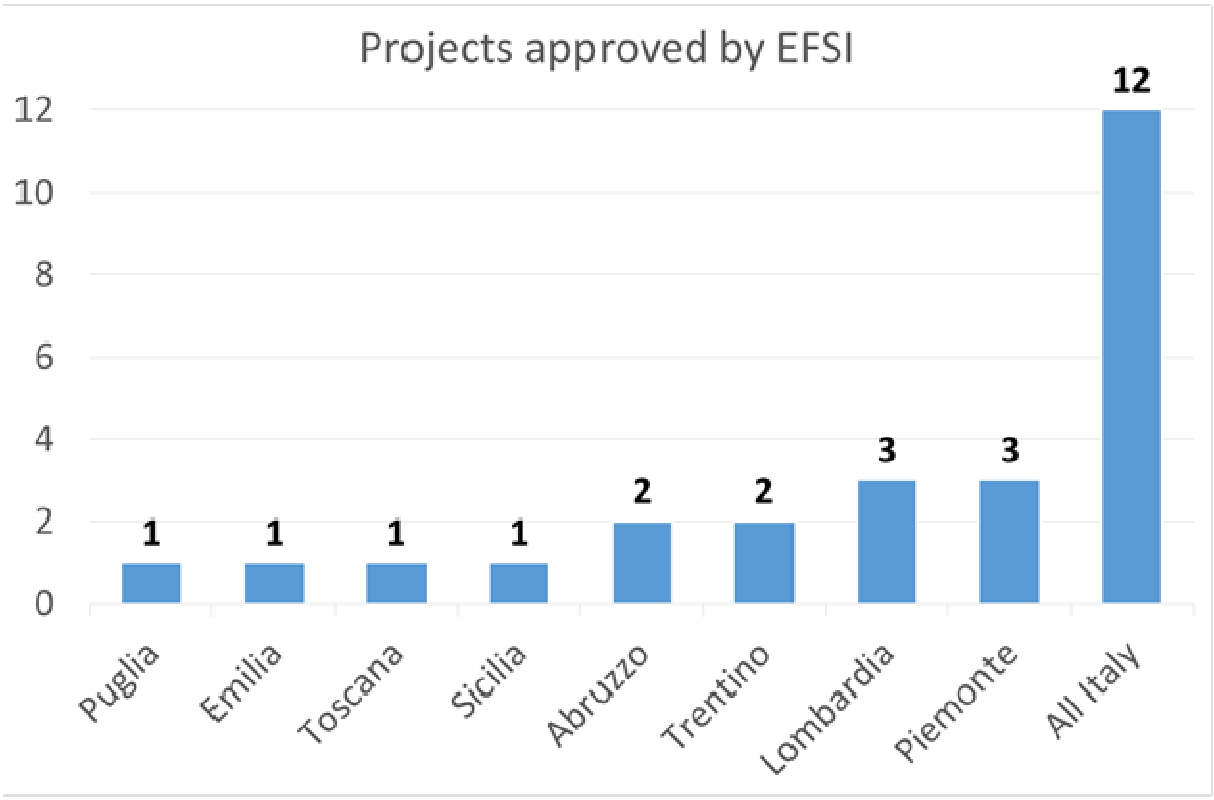
The Program assigned to the Priority Axis 2 (Energy Efficient Building, Renewable Energy, Urban Transport) 46,8 M€ and financed 25 projects. The budget allocated to Piemonte PP is about 1.310.136 M€, equal to 2,7% of the overall Program budget. 3 out of 25 projects (12%) involved PP coming from Piemonte.

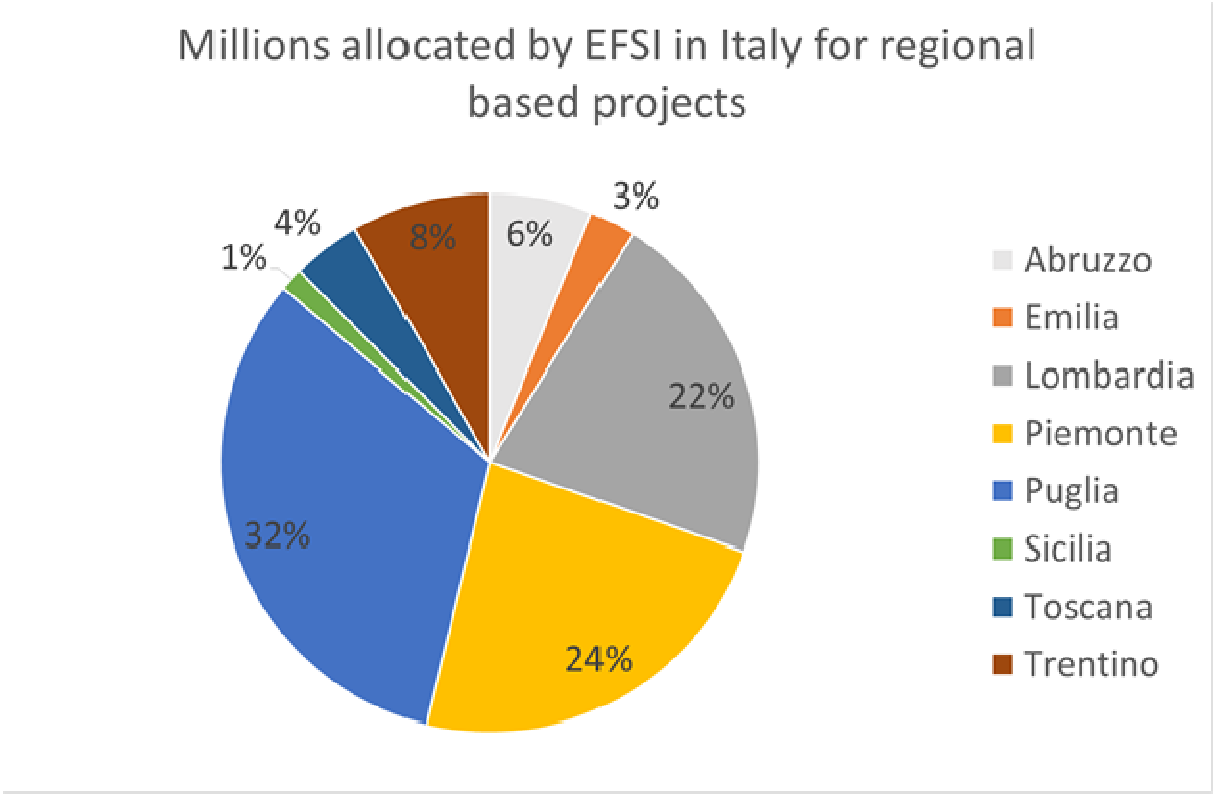
4.2 Joint initiatives of the EU with International Financial Institutions

4.2.1 European Fund for Strategic Investments (EFSI)

EFSI is one of the three pillars of the Investment Plan for Europe, the so-called Juncker Plan, and aims to overcome current market failures by addressing market gaps and mobilising private investment. It helps to finance strategic investments with higher risk profile in key

areas such as infrastructure, research and innovation, education, renewable energy and energy efficiency as well as risk finance for small and medium-sized enterprises (SMEs).
In Italy the EFSI supported 24 projects in energy sector. Half of them are prepared in partnership with other countries for developing Funding schemes or have a national relevance (such as those implemented by Cassa Depositi e Prestiti). Three projects, on the contrary, have been submitted by applicants settled in Piemonte.The total amount provided is above 500 M€. Only Lombardia Region have such a number of approved projects. In terms of financial resources allocated, not considering the projects with a national fallout, Piemonte is a frontrunner, collecting about 24%of the allocated budget.





4.2.2 European Local Energy Assistance (ELENA)

- No Elena projects have been implemented in Piemonte so far. On the contrary, it is worth noting that one of the first PDA (MLEI - IEE) project has been successfully implemented in Piemonte Region with the involvement of the metropolitan City of Torino, Environment Park, the Region itself and several beneficiaries (small and medium municipalities). Thanks to the project more than 12 M€ of investment in energy efficiency have been realized in public buildings and street light, using the EPC scheme, with a leverage factor of about 25. The project will be described in a specific attached sheet.

4.2.3 Joint European Support for Sustainable Investment in City Areas (Jessica)

- No Jessica projects have been implemented in Piemonte so far.

5 National/federal funding schemes

In Italy, nowadays there are several supporting schemes for renewables and energy efficiency. Most of them are managed by the GSE, a public company in charge of the task from institutional point of view. The GSE manages more than ten incentive mechanisms aimed at promoting electricity generated from renewable sources and pursue energy efficiency utilizing a series of market tools and mechanisms, such as white certificates and the renewable energy for heating and cooling support scheme. Another important scheme supporting energy efficiency and RES for private households is the tax deduction system, which allows to receive back on the taxes to be paid the following years an important share of the capital cost beard. Finally, additional forms of incentives are coming out recently and managed at Ministerial level.
In this chapter a description of the package of incentives managed by GSE is provided at the beginning, then the tax deduction system and finally additional information about the most

recent subsidies implemented. For the most important schemes a benchmarking analysis is performed.

5.1 Supporting schemes for RES by GSE

QUALIFICATION OF PLANTS AND ELECTRICITY

One of our most important activities implemented by GSE is the qualification of plants. It is a fundamental process to identify the plants that meet the requirements provided for by law in order to access incentive mechanisms. This is performed in the following ways.

QUALIFICATION OF PLANTS POWERED BY RENEWABLE SOURCES (RES-E):The RES-E qualification, issued by GSE, is a technical pre-requisite necessary to be admitted to green certificates (afterwards described) or the all-inclusive feed-in tariff, depending on the net electricity produced and fed into the grid.

QUALIFICATION OF ELECTRICITY – GUARANTEE OF ORIGIN (GO): GSE issues the Guarantee of Origin (GO) to plants that, upon requesting the qualification, obtain it by giving evidence of electricity generation from renewable sources. This tool represents the only guarantee of origin of the electricity generated from these sources. The operators that sell energy to the final market are obliged to purchase GOs for an amount equal to that of the electricity sold as renewable.

INCENTIVE MECHANISMS

GSE supports the production of electricity from renewable sources through various incentive mechanisms, at disposal of private subjects, companies and public administrations. They are briefly described in the following bullet points.

- FEED-IN SCHEME: This mechanism used to allocate incentives to private subjects, companies and public administrations that would install a photovoltaic solar plant connected to the electricity grid, proportioned to the electricity produced. As of 6 July 2013 the reductions provided for by the Feed-in scheme are no longer accessible.
- GRIN: The Green Certificate mechanism, provided for by Ministerial Decree of 6 July 2012, has been substituted by a new form of incentive as of year 2016. The subjects that have already been recognised a Green Certificate (holders of plants with RES-E qualification) will maintain the benefit for the remaining concessional period, but in a different form. In fact, according to the new mechanism, GSE pays a tariff in Euros on the net production of electricity additional to the revenues deriving from the increase in value of electricity (which can take place through the Simplified Purchase &Resale Arrangements or through the operator's recourse to the Free Market). In order to pass on to the new incentive mechanism, the holders of RES-E plants, that have already been recognized a Green Certificate, must sign an Agreement with GSE entitling them to benefit from the incentive tariff for the remaining period. The Agreement must be entered into through an IT application: GRIN - Gestione Riconoscimento INcentivo (Management of the Incentive Recognition).
- ALL-INCLUSIVE FEED-IN TARIFF: This mechanism represents an alternative to the green certificates. It consists in tariffs for the electricity fed into the grid whose value includes both the incentive component and the increase in value component of the electricity fed into the grid.
- CIP 6: This incentive mechanism for electricity produced by renewable sources and similar was introduced by the Inter-ministerial Committee's resolution 6/92. It was a form of remuneration through a tariff whose value was periodically updated. Currently, it is no longer possible to access this incentive mechanism.

- INCENTIVES AS PER M.D. OF 23 JUNE 2016 AND AS PER M.D. OF 6 JULY 2012: These are incentives for electricity generation from RES-E plants, other than photovoltaic solar ones, with a capacity of at least 1 kW.
- SIMPLIFIED PURCHASE AND RESELL ARRANGEMENTS: This tool allows GSE to purchase and resell the electricity to be fed into the grid paying producers a minimum guaranteed price for every kWh purchased. Producers with small-sized plants and a nominal electrical capacity up to 1 MW, benefit from GSE's guaranteed minimum prices for the first 2 million kWh per year fed into the grid, without prejudicing the possibility to receive more if the hourly zonal prices prove to be more advantageous.
- NET-METERING: Through this mechanism, those who generate electricity from renewable sources feeding it into the grid and at the same time purchase electricity from the grid for personal consumption, benefit from the compensation of the economic value of what produced and fed into the grid with the economic value of what purchased and consumed in a period differing from that of production.

SUPPORTING SCHEMES FOR ENERGY EFFICIENCY BY GSE

In addition to promoting renewable sources through incentives, GSE manages as well incentives for the efficient management of energy resources. They are briefly described in the following bullet points.

- WHITE CERTIFICATES: White certificates, also known as "Energy Efficiency Certificates", give proof of end-use energy savings achieved through projects aimed at increasing energy efficiency in the final uses of energy.
- RENEWABLE ENERGY FOR HEATING AND COOLING SUPPORT SCHEME (CT): The scheme aims at supporting the production of thermal energy from renewables, as well as small-scale interventions of energy efficiency for private organizations and the Public Administration. The CT finances up to 65% of energy retrofit of the building envelope and on thermal plants that increase energy efficiency. For the transformation of existing buildings into almost zero energy buildings (nZeb), the contribution reaches 65% also for any demolition and seismic adjustment costs. In any case, the mechanism covers 100% of the costs of the Energy Diagnosis performed to determine the interventions to be performed and can be combined with other public (including state) financing, provided that the sum of the public contributions does not exceed 100% of the cost of the interventions.
  The CT can be accessed via two different methods:
  1. direct access: following the conclusion of the interventions, the Responsible Person transmits to the GSE, through the special section of an IT tool a specific application for the granting of incentives;
  2. reservation: the Public Administration, and the ESCos that operate on behalf of the PA, can present to the GSE, for the reservation of the incentive, a request form.
- BIOFUELS – SUSTAINABLE BIOFUEL BLENDING CERTIFICATE: Italy has established that within 2020 the renewable biofuels used in transport must be equal to 10%. In 2015 fossil fuel suppliers blended a 5% share of biofuels, complying with the minimum goal envisaged for that same year. This obligation is useful for a greater diffusion of biofuels in the sector and for a reduced impact of CO2 emissions. GSE manages the sustainable biofuel blending certificate in order to recognise to suppliers that blend their share of biofuels and,doing so they can freely exchange the fuel in the market.
- HIGH PERFORMANCE COGENERATION: The recognised high performance cogeneration units are allowed access to the Energy Efficiency Certificates (EEC) or white certificates, depending on the conditions and procedures provided for by the Ministerial Decree of 5 September 2011. GSE issues a high performance cogeneration certificate to the applicant

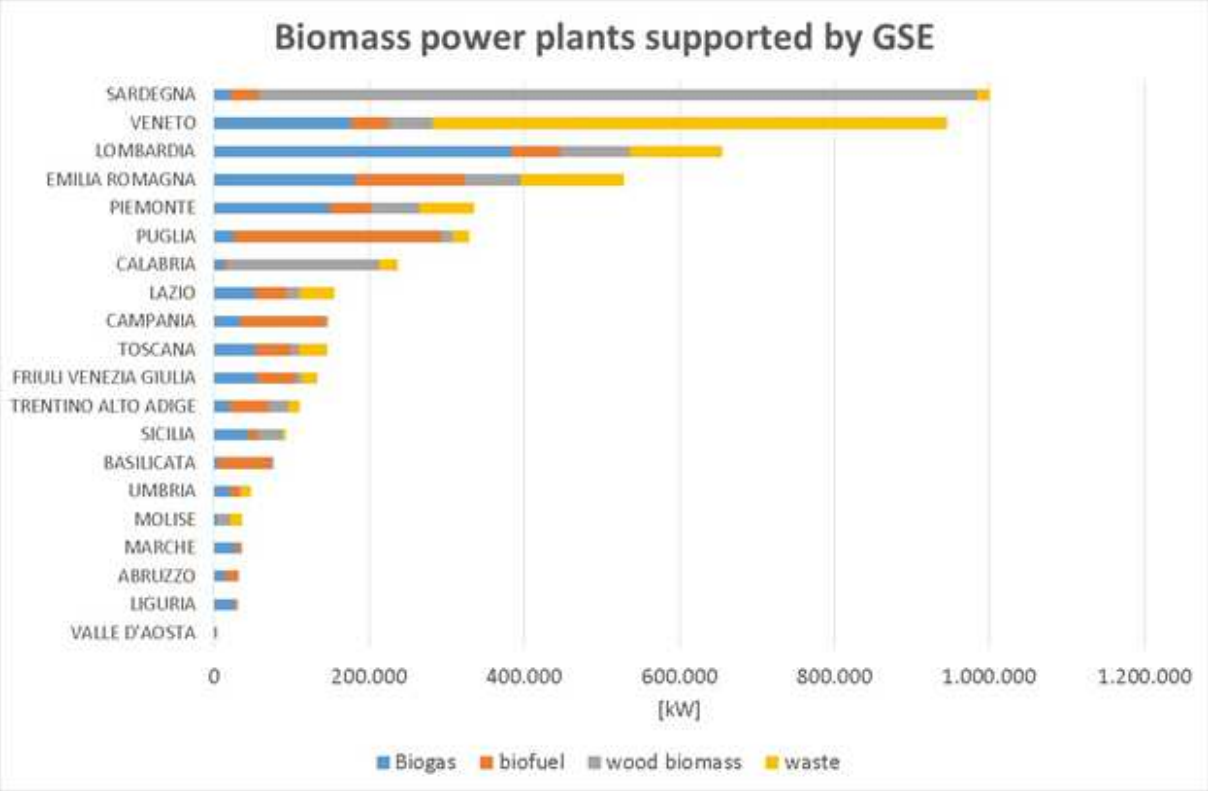
units and fosters those who invest in this type of technology, providing market benefits, cost reductions or technical benefits.

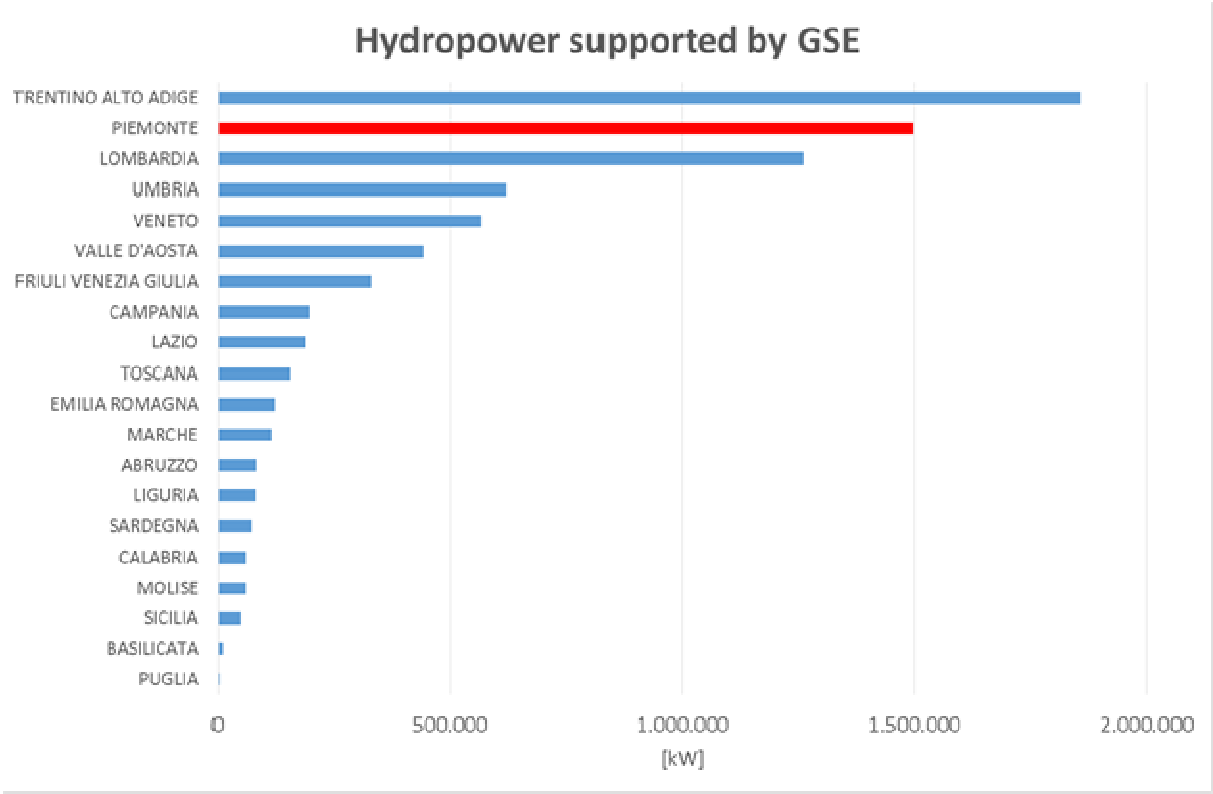
An assessment of the whole package of incentives managed by GSE has been implemented by analyzing the data that can be downloaded from the IT platform "Atlaimpianti" (https://bit.ly/2gFcI9F), where all main information of granted plants and interventions are provided as open data.

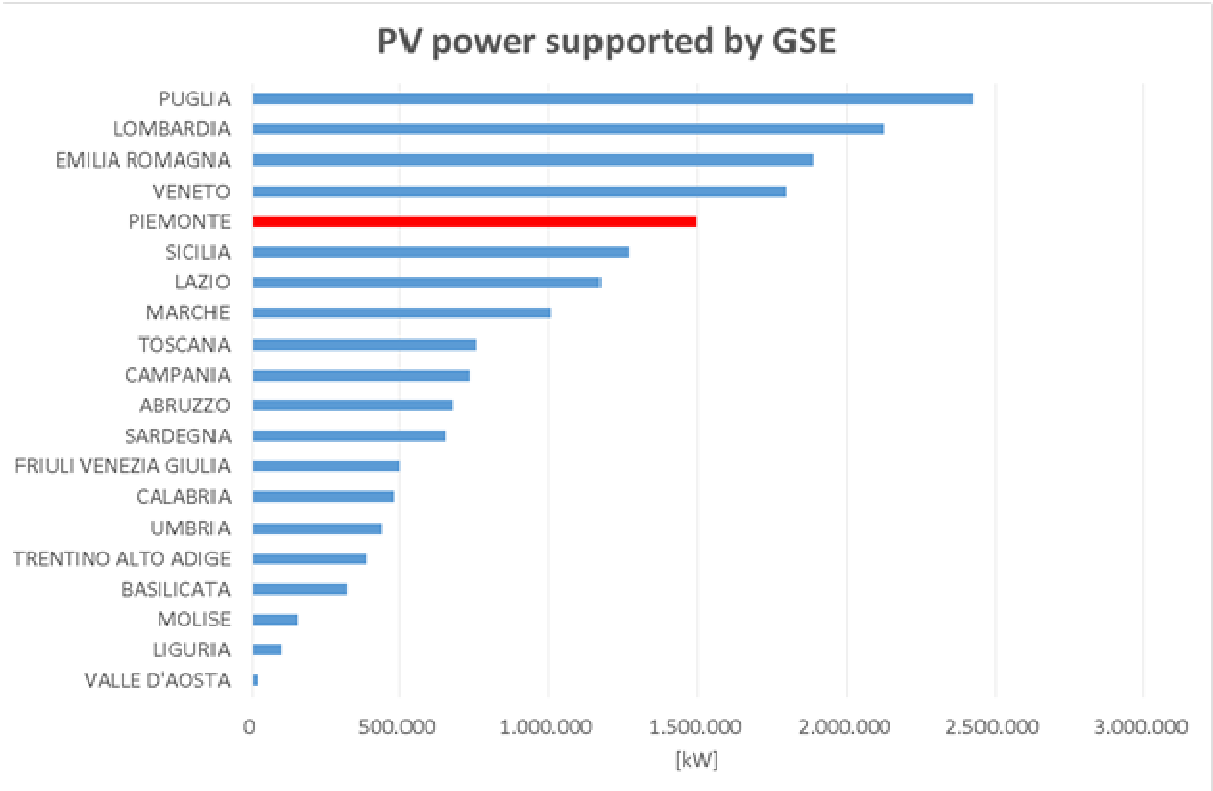
For the analysis of it, a benchmarking assessment has been performed, raking Piemonte Region among the other Italian Regions. In this way it was possible to calculate for each technology (or supported action), the following data:

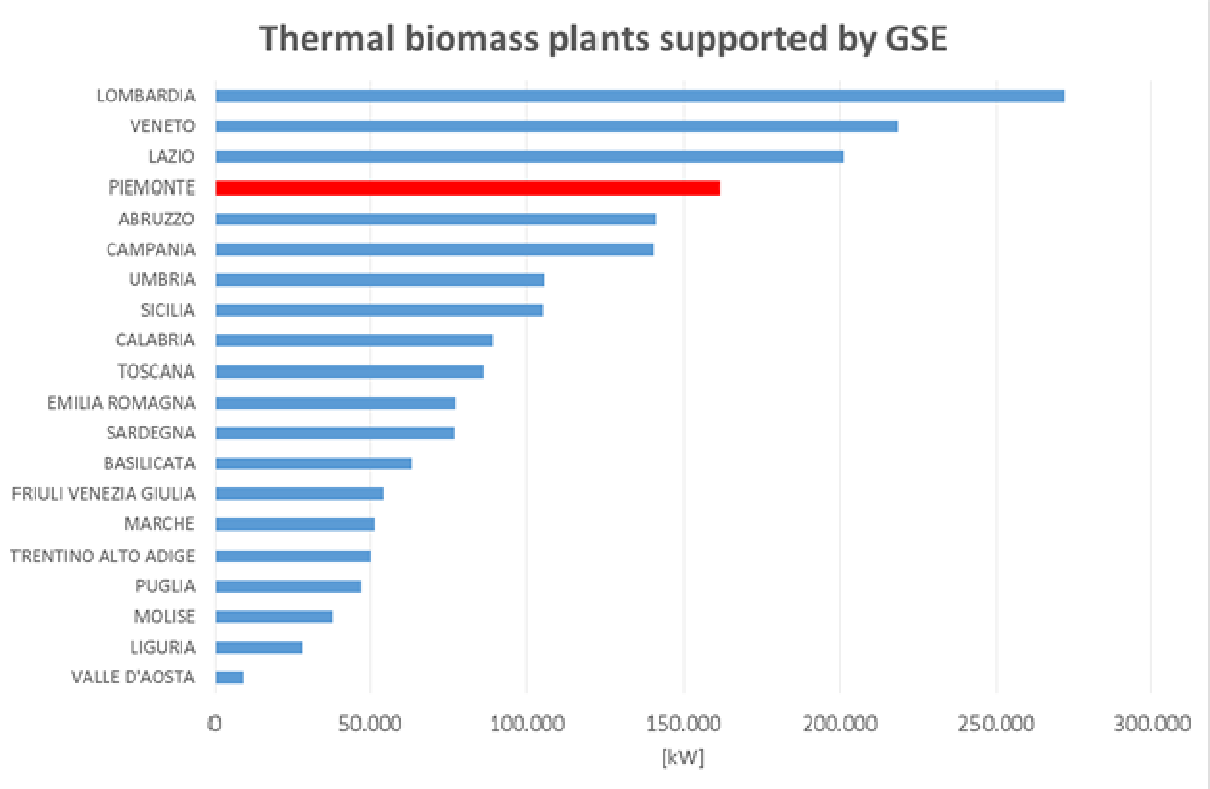
- position of Piemonte in the raking list of Regions
- share of the market (generally on power installed) owned by the Piemonte Region in comparison to the overall Italian installations of the concerned technologies thanks to the supporting scheme under assessment.

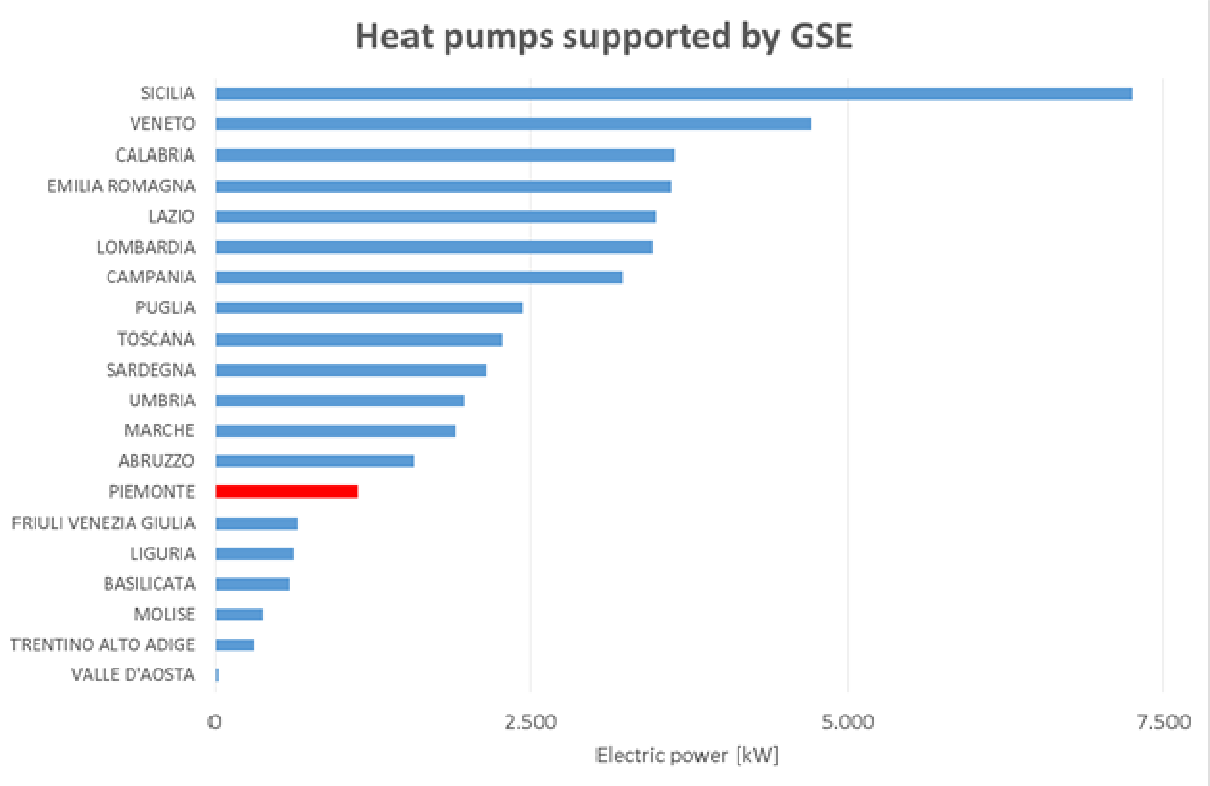
In the following charts, the results of main benchmarking assessment is provided. The first three charts are related to power plants, whereas the followings are related to thermal plants.

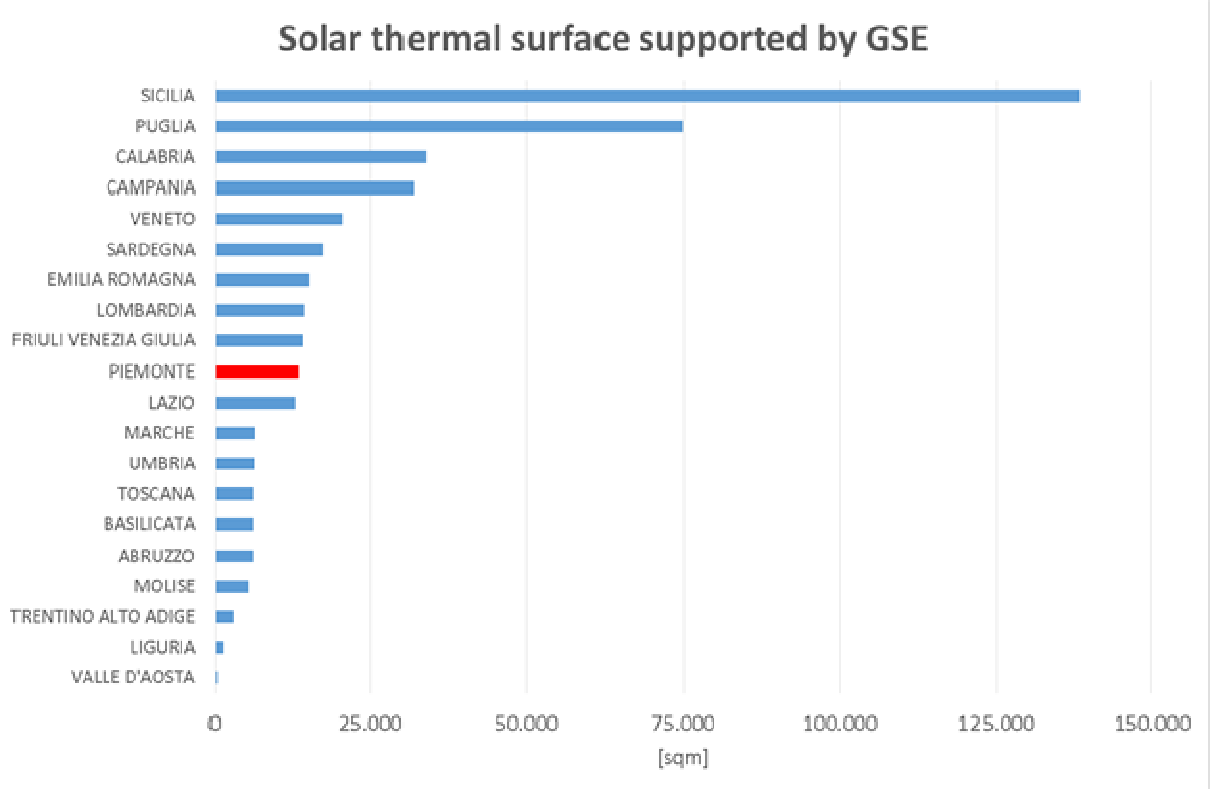



Hydropower supported by GSE
TRENTINO ALTO ADIGE
PIEMONTE
LOMBARDIA
UMBRIA
VENETO
VALLE D'AOSTA
FRIULI VENEZIA GIULIA
CAMPANIA
LAZIO
TOSCANA
EMILIA ROMAGNA
MARCHE
ABRUZZO
LIGURIA
SARDEGNA
CALABRIA
MOLISE
SICILIA
BASILICATA
PUGLIA
0
500.000
1.000.000
1.500.000
2.000.000
[kW]

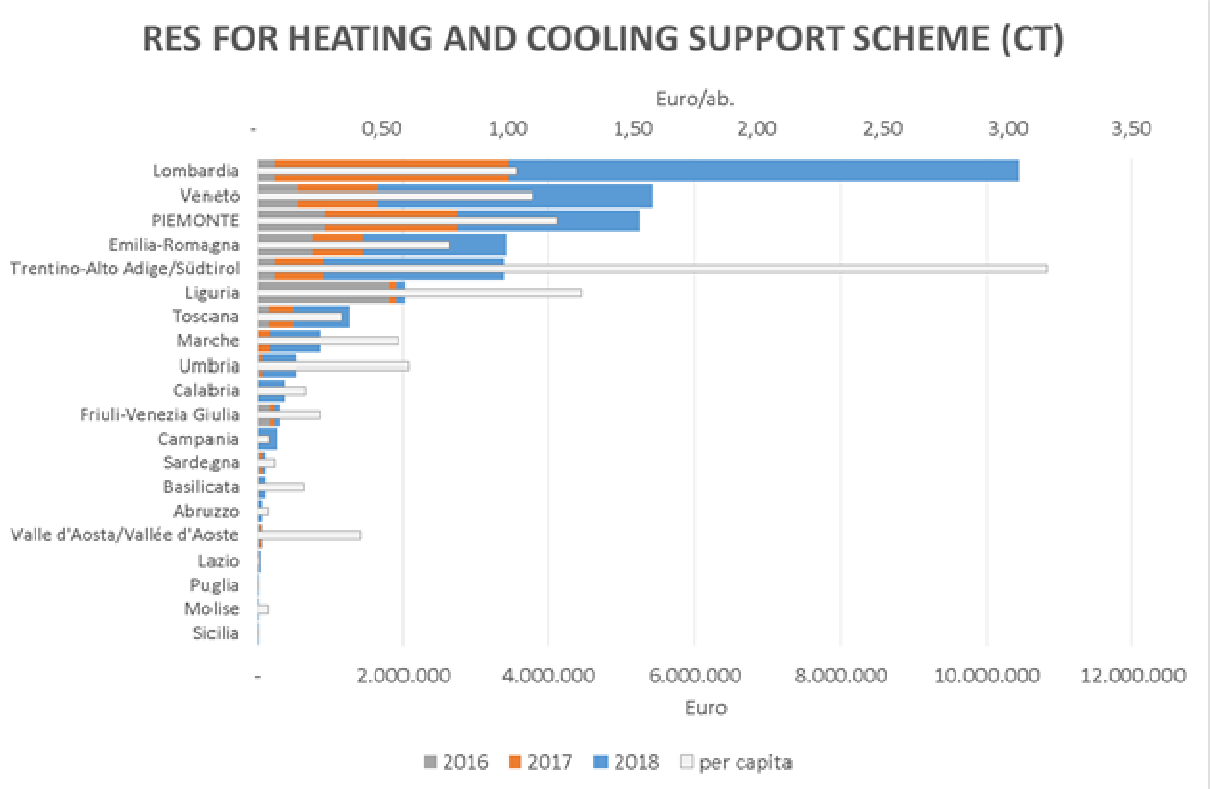

PV power supported by GSE
PUGLIA
LOMBARDIA
EMILIA ROMAGNA
VENETO
PIEMONTE
SICILIA
LAZIO
MARCHE
TOSCANA
CAMPANIA
ABRUZZO
SARDEGNA
FRIULI VENEZIA GIULIA
CALABRIA
UMBRIA
TRENTINO ALTO ADIGE
BASILICATA
MOLISE
LIGURIA
VALLE D'AOSTA
0
500.000
1.000.000
1.500.000
2.000.000
2.500.000
3.000.000
[kW]


Thermal biomass plants supported by GSE
LOMBARDIA
VENETO
LAZIO
PIEMONTE
ABRUZZO
CAMPANIA
UMBRIA
SICILIA
CALABRIA
TOSCANA
EMILIA ROMAGNA
SARDEGNA
BASILICATA
FRIULI VENEZIA GIULIA
MARCHE
TRENTINO ALTO ADIGE
PUGLIA
MOLISE
LIGURIA
VALLE D'AOSTA
0
50.000
100.000
150.000
200.000
250.000
300.000
[kW]

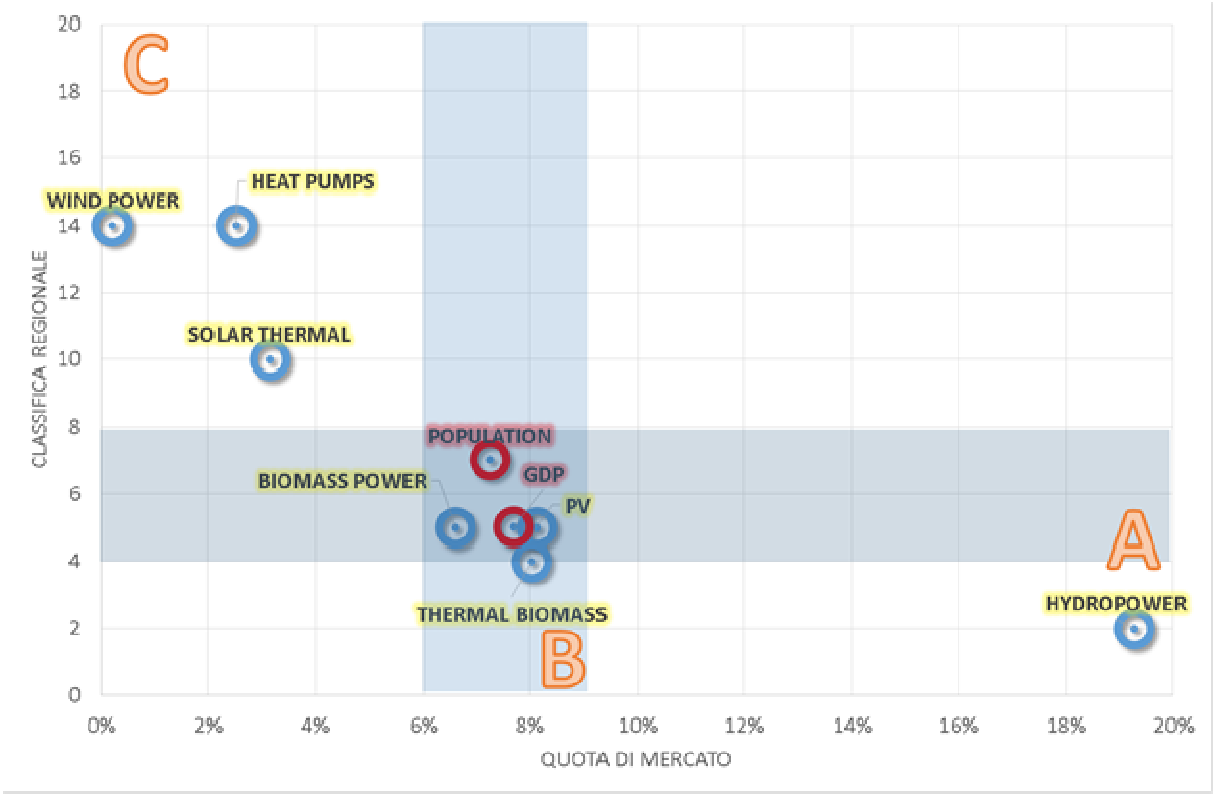

Heat pumps supported by GSE
SICILIA
VENETO
CALABRIA
EMILIA ROMAGNA
LAZIO
LOMBARDIA
CAMPANIA
PUGLIA
TOSCANA
SARDEGNA
UMBRIA
MARCHE
ABRUZZO
PIEMONTE
FRIULI VENEZIA GIULIA
LIGURIA
BASILICATA
MOLISE
TRENTINO ALTO ADIGE
VALLE D'AOSTA
0
2.500
5.000
7.500
Electric power [kW]



Even more interesting is the specific assessment of the supporting scheme for RES for heating and cooling (CT), as this incentive is the key one for energy efficiency and it is essential for driving the energy transition. In the following table, limited to public beneficiaries, it is possible to highlight as Piemonte Region has been the third Region in Italy for the access to these incentives, very close to the second position. More than 5.2M€ have been allocated in Piemonte, out of a total value of 33M€ with a per capita value (more than 1 euro) which is double than the Italian average.



In order to understand if the performance of the Piemonte Region is valuable or not, the above data have been compared to some key performance indicators that can be considered as driving forces, such as the GDP, the population. in this way it was possible to highlight the technologies where Piemonte can be considered a better attractor of fundings, rather than other where results are worse than expectations. This is presented in the following map chart.



As could have been figured out, the data do distribute on a line (the greater the market share and the higher the ranking position - bottom right). It is possible, thus, to notice those renewable sources in which Piemonte stands out, confirms expectations or highlights situations of delay. In the chart there are therefore three more significant areas. That denominated with the letter A, in which both the market share and the ranking is significantly better than the demographic and economic characteristics. The area B in which it is in line with the latter is that C in which there is a situation of backwardness. Obviously, in addition to the ability of the regional system to attract investments the results are primarily influenced by the climatic, territorial and urban characteristics of the region. Unsurprisingly, therefore, the leadership on hydroelectric power or the potential not fully exploited on wind power, is fully justified by the geomorphological and natural characteristics of the region. It was less predictable the level of installations of solar thermal energy, which is below expectations. This can be explained having a look at the same analysis performed with another important incentive scheme: the tax deductions for energy efficiency.

5.2 The tax deduction system

The legislative reference of the tax deductions is constituted by the law 296/2006 for the energy retrofit of the buildings heritage (Ecobonus) and the so called Home Bonus for general building retrofit. Both measures have been integrated over the last few years, compared to the initial formulation. In 2018 the deadline for such measures has been extended until 2019 (with further prolongation expected for the upcoming years)with the possibility to receive a 50% deduction (in 10 yearly rates) with the maximum expenditure of 96,000.00 euros for each unit real estate for building renovation. Among those interventions some of them have an impact of the energy performance of the building (i.e. PV installations), so that an analysis is made on the available data. With the ecobonus, the tax deduction share of the borne costs increases at 65% and in some special cases even more (85%). To facilitate the use of tax

deductions for energy renovation, the credit transfer mechanism has been recently introduced. This is also valid for the interventions of
energy requalification of the common parts of the building envelope of the condominium buildings when the affected area is greater than 25% of the dispersing surface. By entering into an energy service contract, as defined by law, or an energy performance contract paying an annual fee to an ESCO and making use of the credit transfer, the energy renovation of the building can be implemented without particular economic impact on condominiums.
In the following table, the results of the investments implemented tranks to the tax deduction scheme for energy efficiency (Ecobonus) between 2014 and 2018, is provided. As highlighted,Piemonte is the second Italia Region with more than 2 billion of euro spent in home renovation measures, tending to 1 TWh of energy savings. In terms of typology of measures, the replacement of windows and the installation of condensing boilers with thermostatic valves are the main measures implemented, followed by the envelope insulations.

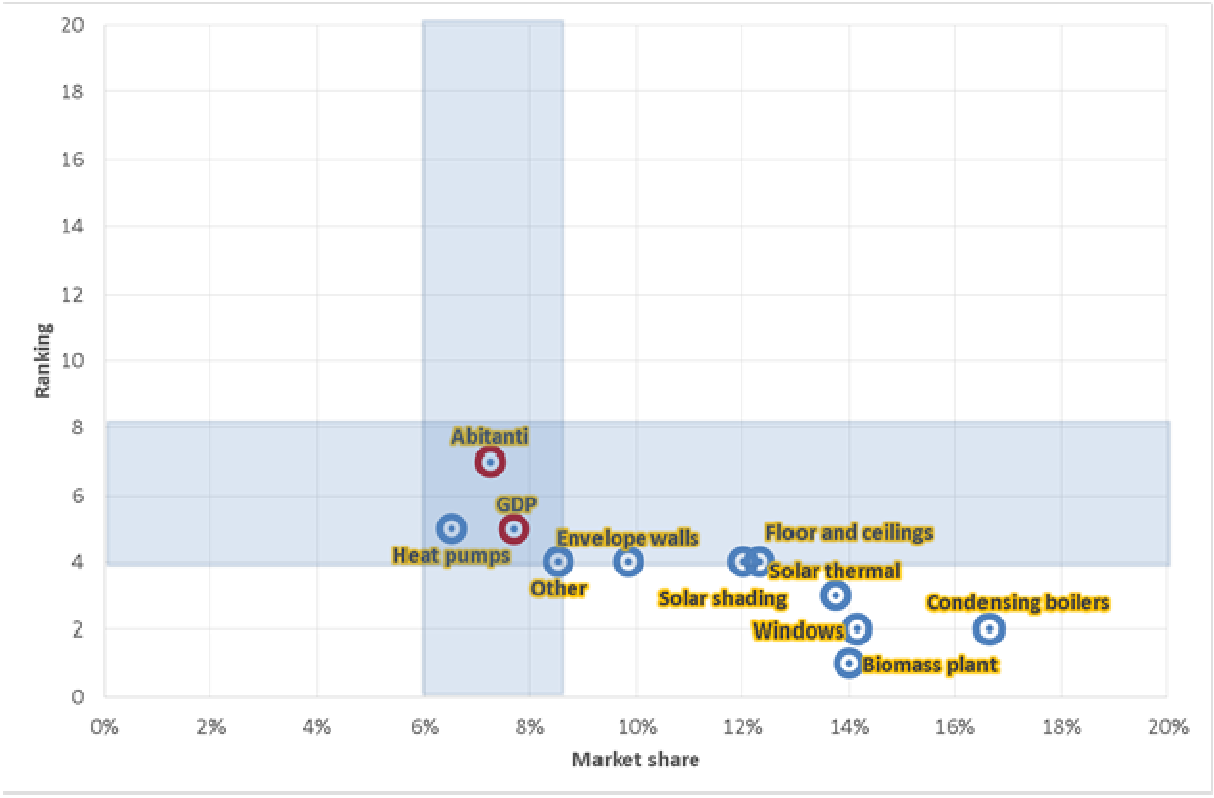
REGIONE	Investments	Savings
	(M€)	(GWh/y)
LOMBARDIA	4.009,0	1.440,0
PIEMONTE	**2.185,0**	**846,9**
VENETO	2.070,2	740,3
EMILIAROMAGNA	1.937,5	726,1
TOSCANA	929,7	304,1
LAZIO	888,0	276,1
TRENTINO	745,4	237,7
FRIULI	566,8	192,3
LIGURIA	639,3	178,1
MARCHE	413,9	138,6
PUGLIA	429,6	123,2
CAMPANIA	391,3	111,7
SICILIA	327,0	95,6
ABRUZZO	216,2	72,8

SARDEGNA	198,9	61,7
UMBRIA	163,4	57,9
CALABRIA	133,7	44,3
VALLEAOSTA	85,7	34,6
BASILICATA	92,0	32,8
MOLISE	43,4	15,3
Italy	**16.466,0**	**5.730,1**

Periods	**2014-2017**			**2018**		
Typology	**N. of measures**	**Investments (M€)**	**Savings (GWh/y)**	**N. of measures**	**Investments (M€)**	**Savings (GWh/y)**
Envelope walls insulation	6.393	137,8	52,4	1.354	57	20,7
Insulation of ceilings and floor	8.269	266,7	106,7	1.429	57,6	21,4
Windows	118.734	858,1	351	23.308	179,9	75,1
Solar Thermal	5.477	38,1	24,6	782	4,5	3,2
Solar shading	24.191	52	7	9.062	15,5	1,6
Condensing Boilers	33.848	335,5	111	9.167	98,4	42,8
Heat Pumps	3.262	29	12,3	1.036	20,6	4,2
Biomass boilers	1.284	12,3	3,8	630	6,5	3,8
Building Automation	239	3,4	1,8	203	2,9	1,3
Other	1.029	4,9	1,4	284	4,3	0,8

Total	**202.791**	**1.739,70**	**672,6**	**47.255**	**447,2**	**174,9**

Proponing once again the chart which maps the ranking of the Region and the share of the overall national market, it is worth noting that Piemonte stands out for all types of interventions, but, in particular, for condensing boilers, biomass, solar thermal collectors, windows and solar shading. On the other hand, it is slightly set back on the installation of heat pumps. This kind of incentives is, thus, much exploited at regional level and for solar thermal plants it seems to suite better to the regional context than the one set by GSE.



5.3 European Investment Loan

The "European Funds Investment Loan" is managed by the public bank Cassa Depositi e Prestiti. The funding is addressed to those Public Administrations that have successfully applied for investments financed by the European Regional Development Fund and the European Agricultural Fund for Rural Development.

With the European Funds Investment Loan, financial coverage is provided for any share borne by the beneficiary for the realization of a public investments, allowing the launch and rapid completion of the same. The sums paid must be repaid at the time of payment of the Contribution, without any additional charge. The amortization period can be anticipated if the investment has been fully realized. The residual amount payable by the beneficiary will be reimbursed in maximum 40 six-monthly installments.

More information on: https://bit.ly/31iiQWO

5.4 National Fund for Energy Efficiency

in 2019 a National Fund for energy efficiency has been established at the Ministry of Economic Development. It supports energy efficiency measures implemented by companies, including ESCOs, and by the Public Administration, on buildings, plants and production processes. Specifically, the interventions supported must concern the reduction of energy consumption in industrial processes, the construction and expansion of district heating networks, the improvement of public services and infrastructures, including public lighting and energy upgrading of buildings.

The Fund has a revolving nature and is divided into two sections that operate by:

- the granting of guarantees on individual financing operations, for which 30% of the resources that annually flow into the Fund are allocated;
- the provision of soft loans at a rate of 70% of the resources that flow into the Fund annually. 20% of the resources allocated for the granting of loans is reserved for the PA.

More information on: https://bit.ly/35DkGoC

6 Cooperation with private stakeholders

Energy Performance Contracts (EPC) have been implemented in several different projects in the last few years in Piemonte Region. Some of the most outstanding examples have been coordinated and promoted by the Region itselfs in the framework of EU projects. In the following table, the list of implemented or promising projects is provided. All these initiatives have in common the the bundling and pooling approach as a way to achieve economy of scales and put on the market a pipeline of investments that can be faily accepted by ESCOs. The EPCs are based on a guaranteed level of savings and with a sharing extrasavings in case of overperformance. The contracts have a duration that can range from 13 to 15 years. A Measurement and Verification Plan, inline with IPMVP standard, is also presented in the tendering document and is an annex of the EPC.
No specific financial tool has been offered to ESCOs, on the contrary the tender procedure allocated all the financing risk on the ESCO that must collect the financing provisions on the market or with own equity, getting direct access to available grants or incentives.

Type of action	Investments	Status	Project
18 public buildings (5 Municipalities)	2.5 M€	Implemented and under management	2020Together
3.000 street light points (6 Municipalities)	2.4 M€	Implemented and under construction	2020Together
6 public buildings (2 Municipalities)	0.5 M€	Ongoing	STEPPING
7 public buildings (1 Research Institute)	1.5 M€	Ongoing	STEPPING
17 public buildings (10 Municipalities)	0.7 M€	Ongoing	STEPPING

48 public buildings 3.000 street light points 24 Public Administrations	**8 M€**		

Besides of that, in the province of Cuneo a project based on the scheme of PDA (Elena like)is under implementation and involving 11 Municipalities and 32 buildings. The idea was born thanks to the support of the Cassa di Risparmio di Cuneo Foundation. To achieve energy efficiency renovation of the bundling created goals, the Foundation, in agreement with the Municipalities involved, managed a pilot project based on the activation of important investments, thanks to the selection of an Esco (Energy Service Company). The project is still ongoing and the Municipalities will stipulate with the selected Esco an EPC with guaranteed savings.

7 Evaluation

The evaluation of the above financial facilities/schemes is expected to base on the following criteria:

Setting priorities and objectives for low-carbon funding:

- EU priorities and objectives provide the overall framework in which the national ones are defined. According to the national legislative rules, Regions have the possibility to define their own objectives and targets in the energy issues. There is an overall and positive overlap of the objectives and priorities at the different level of governance. This is true also for Piemonte, where priorities and targets are being set in a Regional Plan under approval in the regional council.

Institutional framework:

- The Energy Plan approval procedure comes after a consultation process and an environmental impact assessment procedure where all relevant stakeholders had the possibility to make proposals and comments about. As soon as the Plan will be adopted, the Action plan will be drafted. This phase is where PROSPECT2030 will provide its main support. Additional stakeholders consultation phases will be organized in form of official Forum or participative meetings/workshops.
- A participation procedure is also foreseen for the management of regional structural funds, where the measures are presented to stakeholders boards beforehand of the formal approval. In the current programming period, this was particularly true for funds established for public authorities.

Eligibility and application conditions:

- Funds managed by the Region are granted to beneficiaries on the basis of calls for tender where assessment criteria are explicitly defined. The timing for the assessment are set and fixed with deadlines.

Administrative procedures:

- The procedure is transparent at maximum level. There might be delays in payments due to balance sheet constraints, mainly during specific periods of the year.

Financial burdens:

- The preparation of projects for receiving grants is generally time-consuming and it is an activity which requires a certain level of technical expertise. Generally speaking beneficiaries (either public or private) are supported during the application procedure by consultants or agencies.
- The cash flow is in most cases a problem, mainly for the public sector when local authorities are facing budgetary shortage or are not able to upfront investment cost waiting for the reimbursement.

Efficiency of use of funding dedicated to sustainable energies:

- Funds managed at regional level are, as previously highlighted, granted covering the most of the investment costs so there is space for private financing. The main issue is to make this being fairly balanced between the public and private interest.
- The use of public funds for project development assistance in combination with a financial instrument blending grants and commercial financing can be a solution which has been only partially explored.

8 Conclusions and recommendations

Please group your conclusions and recommendations under the following headings:

Conclusions and recommendations at the level of the target region

- Reduce the administrative burden for the application procedure for beneficiaries.
- Set up project development assistance services that could promote the aggregation of projects and the standardization of the technical assessment. This activity shall be in line with the provision of the DIRECTIVE (EU) 2018/844 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL promoting the access to appropriate mechanisms for accessible and transparent advisory tools, such as one-stop-shops for consumers and energy advisory services, on relevant energy efficiency renovations and financing instruments.

Conclusions and recommendations at national level

- To keep the supporting schemes for energy efficiency stable in the future
- to introduce corrective measures for renewables so that they are promoted taking also into consideration the local impact associated to their installation.

Conclusions and recommendations at macro-regional (EUSDR, EUSAIR, EUSBSR, EUSALP)

- Encourage share of knowledge and experiences/best practices among Regions.
- Organize workshops and webinars on specific common issues
- Develop project proposals promoting the cooperation of Regions

Appendix 1. Fact sheet to decentralised regional operative programmes

Title of OP	Regional Operational Programme for Piemont Region		
Priority axis 4: Sustainable Energy and quality of life			
Specific objectives:	**Reduction energetic consumptions and greenhouse emissions for companies and integration with renewable sources**		
Competent implementation body/bodies:	Piemont Region – Direction Competitivity of regional sistem		
Final beneficiaries:	Companies		
Available budget:	Total budget:	97.000.000 €	
	EU funding:	50% EU	
	Ratio of national contribution:	35% Italy 15% Piedmont Region	
Description of measures (with budget breakdown):	The call describes two interventions lines: Line 1- Energy efficiency measures: a) installation of high-efficiency cogeneration plants; b) interventions aimed at increasing energy efficiency in production processes; c) interventions aimed at increasing the energy efficiency of buildings; d) punctual replacement of low efficiency systems and components with higher efficiency ones; e) installation of new production lines with high efficiency. Line 2 - Installation of renewable energy plants, whose renewable energy is entirely destined for self-consumption. The incentives, partly with non-refundable funds (20%) and partly as subsidized credit (80%), finance high-efficiency cogeneration plants, measures to increase the energy efficiency of production processes and buildings, and the replacement of low efficiency systems and components with more efficient ones, the installation of new high efficiency production lines. https://www.regione.piemonte.it/web/temi/fondi-progetti-europei/fondo-europeo-sviluppo-regionale-fesr/energia-sostenibile/efficienza-energetica-fonti-rinnovabili-nelle-imprese		
Main expected results:	Number of Companies funded: 234 Greenhouse emission reduction: 81.647.197 kgCO2eq/year		
Implementation status:	70,8% of budget available is spent Number of Companies funded: 205/234, 88% Greenhouse emission reduction: 70.253.674.8/81.647.197 kgCO2eq/year, 87%		
Other key information:	Other results at 31.07.2019: Energy saved = 351 GWh/y; 3,3 kWh/€spent Greenhouse emission reduction / €spent: 0,7 kgCO2eq/€spent		

Title of OP	Regional Operational Programme for Piemont Region		
Priority axis 4: Sustainable Energy and quality of life			
Specific objectives:	**Reduction of energy consumption in public buildings or public facilities, residential and non-residential and source integration, source integration renewable**		
Competent implementation body/bodies:	Piemont Region – Direction Competitivity of regional sistem		
Final beneficiaries:	Public bodies		
Available budget:	Total budget:	76.000.000 €	
	EU funding:	50% EU	
	Ratio of national contribution:	35% Italy 15% Piedmont Region	
Description of measures (with budget breakdown):	The calls describe two interventions lines: Line A: Interventions to reduce the energy demand of the building that presents an indicator of the winter energy performance of the quality building "MEDIA" or "LOW" as reported on the Energy Performance Certificate (APE), review of fossil fuel plants, with increase in efficiency, also through the use of technological mixes and systems of remote management and remote control. The following interventions are eligible: - thermal insulation of opaque surfaces delimiting the air-conditioned volume; - replacement of transparent closures; - Installation of shielding systems and / or shading of transparent closures with exposure from ESE to O; - efficiency / replacement of air conditioning systems, efficiency / replacement or new installation of ventilation systems; - replacement of internal lighting systems and existing external fixtures with systems efficient lighting; - streamlining / replacing domestic hot water (DHW) production systems; - installation of high-efficiency cogeneration plants to be used for self-consumption for room climate control and DHW production; - installation of management technologies and automatic control of thermal and electrical systems including the installation of heat regulation and heat accounting systems. Line B: Installation of energy production systems from renewable sources to be used for self-consumption. They are eligible: - installation of renewable energy plants to be used for self-consumption (solar thermal, pumps of heat, photovoltaic, biomass generators, etc.); - monitoring, control and regulation systems.		
Main expected results:	Performance indicators at 2023: additional capacity for renewable energy production: 7.3 MWp; reduction of annual primary energy consumption in public buildings: 54.932,7 MWh/y; reduction of the annual emission of greenhouse gases: 11.096 tCO2; light points subject of the intervention: 3.333 units.		
Implementation status:	50% of budget available is assigned additional capacity for renewable energy production: 61%; reduction of annual primary energy consumption in public buildings: 71,2%; reduction of the annual emission of greenhouse gases: 68,5%.		
Other key information:	Energy saved = 39.143 MWh/y; 0.86 kWh/€spent Greenhouse emission reduction / €spent: 0.18 kgCO2eq/€spent		

Title of OP	Regional Operational Programme for Piemont Region		
Priority axis 4: Sustainable Energy and quality of life			
Specific objectives:	**Reduction of energy consumption in public lighting**		
Competent implementation body/bodies:	Piemont Region – Direction Competitivity of regional sistem		
Final beneficiaries:	Public bodies		
Available budget:	Total budget:	20.000.000 €	
	EU funding:	50% EU	
	Ratio of national contribution:	35% Italy 15% Piedmont Region	
Description of measures (with budget breakdown):	The call for proposals included two lines of intervention: Line A: energy requalification interventions such as replacing sources / devices, LED retrofitting, remote control / remote management systems, mandatory as it is capable of generating the required energy savings; Line B: integrated technological services connected to the public lighting infrastructure such as traffic control / video surveillance systems, weather monitoring or atmospheric pollution, smart parking, information panels, wi-fi services. The notice required a minimum energy saving of 40%, the achievement of lighting fixtures performance improvements compared to the minimum levels set by legal obligations. At the end of the call for applications (2019) the admitted applications amounted to 133.		
Main expected results:	Light points subject of the intervention: 3.333 units.		
Implementation status:	100% of budget available is assigned over 32.500 light points subject of the intervention		
Other key information:	Other results at 31.07.2019: Energy saved = 12.094 MWh/y; primary energy saved 29.267MWh; 1,46 kWh/€spent Greenhouse emission reduction / €spent: 5.237 tonCO2eq,		

Appendix 2. Fact sheet to other EU low-carbon initiatives

Project Name	TOrino is GEtting THERe
Project Acronym	2020TOGETHER
Programme:	**Intelligent Energy Europe - IEE**
Objectives of the Call or Financial Facility:	Mobilising Local Energy Investment
Total budget	490.000 € all in Piemonte Region
General/specific objectives of the Project:	The Main purpose of the project was to respond to the needs of municipalities to overcome economic-financial concerns at local level and start energy efficiency refurbishment of public asset, buildings and street lighting, by using Energy Performance Contracts. The project was located in the area of the province of Torino
Participating organization(s) from the Region:	Regione Piemonte (Lead Partner), Metropolitan City of Torino (PP), City of Torino (PP) Environment park (technical PP)
Role in the project	**Piemonte Region:** Lead partner, ensuring that the conditions are met for long lasting replicable results **Metropolitan City of Torino**: Acting as contractor authority, and coordinator and aggregator of municipalities **City of Torino:** Experimenting an energy refurbishment model on a pilot case for large-scale replication in the future **Environment Park:** Technical partner performing energy audits and financial analysis
Project summary:	The **2020Together project**, financed through a **490 thousand Euros** European funding as part of the CIP - IEE, MLEI program, aim was to aggregate the needs of small and medium municipalities for energy refurbishment in public building and street lighting, with the purpose to: obtain a total investment capable to create interest among the ESCo's; apply a replicable model; realize economies of scale. The model provided by energy performance contracts that involve third-party financing could prove a valid contribution to overcome this stranglehold. At the early stages of the 2020Together project, the application of EPCs was still largely unheard of and little practised, in particular at the level of Municipalities, but also among small and medium-sized local companies. The process has always been based on constructive discussion aimed at bringing out needs, previous experience, critical issues, suggestions. The Municipalities were informed and engaged through a number of meetings with the purpose to disseminate the contents of the project. Moreover they have been directly involved, empowered and compelled by signing with the Metropolitan City a Formal Agreement, approved by Town Councils. The Agreement specifically identified those public buildings and street lighting that were involved in the tender and designates the Metropolitan City as the contracting authority, i.e. in charge with preparing tendering documents, calling the tender, awarding and signing a framework contract with the successful bidder. In this way a wide territory local authority, the **Metropolitan City of Torino**, acted as a **coordinator** and **contracting authority** by managing innovative contractual agreements – Energy Performance Contracts. Tenders of individual municipalities were grouped to form that critical mass required to make call for tenders appealing and obtain better contractual conditions. Each Municipality then signed its own performance contract with the ESCo. Still based on EPC, The City of Torino, on its part, has experimented an extensive revamping program for heating systems in public buildings. To increase the attractiveness of the tender, a preliminary technical analysis was performed to identify for each Municipality the buildings (or public lighting

	systems) mostly in need of efficiency retrofitting actions. A mandatory condition was the lack of any binding pre-existing contractual obligations in the management of the buildings. The designated buildings were then subjected to energy audit. **These were the main activities developed during the project:** 23 agreements signed with municipalities potentially interested in taking these measures. 52 energy audits carried out with the purpose to identify the most suitable buildings among those proposed by the municipalities. Training delivered to municipalities and companies on contractual terms of Energy Performance Contracting. Involvement of small and medium-size companies: discussion of the challenges posed by EPC. Production of tender documents and setting up of the coordination and contracting function of the Metropolitan City of Torino. Awarding of 1 EPC tender for energy refurbishment of 18 buildings in 5 metropolitan municipalities. Total investment of over 3 million Euros, average energy saving 60%, average cost saving 11%. Launch of 1 call for EPC tender for energy retrofitting in public street lighting involving at least 2054 spot lights in 6 metropolitan municipalities, to be awarded within 2017. Minimum investment as contract starting price 1.7 million Euro, minimum energy cost saving 22%-44%. REVAMPING2 Project: energy efficiency upgrading of heating boiler rooms in about 120 buildings of the City of Torino started with EPC. Total investment 7.7 million Euros, expected energy saving 30%. Communication of project activities to stakeholders and to the citizens. **These were the key achievements:** Total investment attained: about 12.5 million Euros with remarkable structural measures. Over 4,360 tons of CO2-eq emissions avoided, 22,050 MWh primary energy saving, 200 MWh of renewable energy products. Signature of EPC contracts for energy efficiency upgrading of building and public lighting. Production of repeatable EPC call for public tender document templates. Development of proficiency of local administrators and stakeholders on issues related to the new types of energy contracts. Dissemination of practical expertise resulting from project development thanks to the participation to national and international events and to the publication of the "Guide for drawing up EPC contracts - The 2020 Together experience". Networking with European projects with similar goals.
Project funding/financial scheme:	The financial scheme of 2020Together was based on Third-Party Financing, meaning that the ESCo should: make the capital available as equity, or be financed by a third party institution, or implement both solutions. By underwriting individual performance contracts with the Municipalities, the ESCo is committed to : . make investments in each of the buildings concerned . Provide the Municipalities with the guarantee that all their buildings - to a variable extent- will benefit from

	actual energy retrofitting measures, not only from cost savings resulting from improved energy management. . hire a professional, appointed by the Contracting Authority, to take part in the works of the Performance Monitoring and Verification Commission. Unlike the assessment of the investments made for each building, performance assessment is made globally for each Municipality . The Municipalities will pay to the ESCo a fee that is proportional to the actual achievement of performance goals. Tender documents included: 1. Call for tender 2. Tender specifications and relevant attachments for the preparation of technical-financial bids 3. Affidavit forms required to be admitted in the procedure 4. Contract templates (framework contract and performance contracts) 6. Tender service specifications templates 7. Performance monitoring and verification plan
Main information sources:	http://www.cittametropolitana.torino.it/cms/ambiente/risorse-energetiche/progetti-energia-sostenibile/2020together

Project Name	**Supporting The EPC Public Procurement IN Going beyond**
Project Acronym	**STEPPING**
Programme:	**Interreg MED Program**
Objectives of the Call or Financial Facility:	Energy Efficiency Building
General/specific objectives of the Project:	STEPPING general objective is to increase the adoption of EPC investment schemes in the elaboration of Energy Efficiency plans for public building in the MED area, raising the knowledge of MED institutions in designing, implementation and managing of energy efficiency plans for public buildings.
Total Budget	1.943.112 € - In Piemonte Region: 447.300 €
Participating organization(s) from the Region:	Regione Piemonte (Lead Partner), Environment park (technical PP)
Role in the project	**Piemonte Region:** Lead partner, ensuring that the conditions are met for long lasting replicable results **Environment Park:** Technical partner performing energy audits and financial analysis
Project summary:	STEPPING's partners past experience and results of MED projects developed under previous programmes, showed that it was necessary to adapt the EPC investment scheme to the conditions of the MED area, which are not comparable to those of northern and central EU countries. The project tested a new approach of application of EPC scheme in the design and awarding of energy efficiency intervention for public building stock in order to develop validated guidelines on MED EPC to be transferred and Disseminated to MED Public institutions. During the project implementation new approaches of EPC, elaborated from the sharing of own knowledge raised by partners past projects, have been tested through pilots

	activities in order to improve their adequateness to MED area. The needs of small and medium municipalities for energy refurbishment in public buildings were aggregated with the purpose to: obtain a total investment capable to create interest among the ESCo's; apply a replicable model; realize economies of scale. The application of EPCs in not equal in the involved regions, as some of them are already quite experienced, while others never applied EPC schemes. The process was based on constructive discussions with involved stakeholders aimed at bringing out needs, previous experience, critical issues, suggestions. The Municipalities were informed and engaged through a number of meetings with the purpose to disseminate the contents of the project. Moreover they have been directly involved by signing with the partners Formal Agreements. All Partner had to implement Investment Plans for the involved municipalities/buildings, while only 4 had to launch a tender. In any case the individual municipalities were grouped to form that critical mass required to make call for tenders appealing and obtain better contractual conditions. The designated buildings, selected on the basis of their need of efficiency retrofitting actions, were subjected to energy audit. **These were the main activities developed during the project:** More than 40 agreements signed with municipalities potentially interested in participating to the project. About 200 energy audits carried out with the purpose to identify the most suitable buildings among those proposed by the municipalities. Organization of nearly 30 regional events to present the project and recrute municipalities. 32 Training sessions delivered to municipalities, professionals and ESCOs on contractual terms of Energy Performance Contracting. Involvement of policy makers: interviews about the challenges posed by EPC. Production of Investment Plan and tender schemes. Communication of project activities to stakeholders and to the citizens. **These were the main key achievements:** 69 Municipalities involved in Investment Plans 170 Involved public buildings 16 Investment Plans Nearly 300 people trained Realization of the “EPC simulation Tool” to be used during trainings and available online Launch of 2 (another one expected before project end) EPC tender (in Italy) for energy refurbishment of 69 buildings in 9 municipalities. Total investment of over 7 million Euros. Other 2 tender are expected to be launched after the project end Production of repeatable schemes: Investment Plan and EPC tender document templates. Development of proficiency of local administrators and stakeholders on issues related to the EPC contracts. Production of a “MED EPC Policy Recommendations” document with a list of possible policies and regulation actions supporting a larger EPC implementation in MED Area Dissemination of practical expertise resulting from project development thanks to the publication of the “MED EPC Guidelines” and to the participation to national and international events and to the publication of Networking with European projects with similar goals.
Project funding/financial scheme:	

	The financial scheme of STEPPING was based on Third-Party Financing, meaning that the ESCo should: make the capital available as equity, or be financed by a third party institution, or implement both solutions. By underwriting individual performance contracts with the Municipalities, the ESCo is committed to : . make investments in each of the buildings concerned . Provide the Municipalities with the guarantee that all their buildings - to a variable extent- will benefit from actual energy retrofitting measures, not only from cost savings resulting from improved energy management. . hire a professional, appointed by the Contracting Authority, to take part in the works of the Performance Monitoring and Verification Commission. Unlike the assessment of the investments made for each building, performance assessment is made globally for each Municipality . The Municipalities will pay to the ESCo a fee that is proportional to the actual achievement of performance goals. Tender documents included: 1. Call for tender 2. Tender specifications and relevant attachments for the preparation of technical-financial bids 3. Affidavit forms required to be admitted in the procedure 4. Contract templates (framework contract and performance contracts) 6. Tender service specifications templates 7. Performance monitoring and verification plan
Main information sources:	https://stepping.interreg-med.eu/