Interreg CENTRAL EUROPE
PROSPECT2030
European Union
European Regional
Development Fund

The sustainable energy transition in Piedmont

Good practices co-financed with the European Regional Development Fund 2014/2020

REGIONE PIEMONTE

POR Piemonte FESR 2014/2020

Index

Project PROSPECT2030

How to achieve the European 2030 energy goals?

With more effective use of available public funds and more careful energy planning, the goal is to reduce climate-changing emissions by 55% and achieve energy production from renewable sources of at least 32%.
PROSPECT2030 focused on good energy governance practices as fundamental actions to reduce CO_2 emissions and address the energy transition towards a low-carbon economy.
Dialogue between the Region and local public administrations is essential: we need to raise awareness that urgent measures must be taken to combat climate change.

What has been done in the Piedmont Region?

Use of European funds

Thanks to the use of funds from the POR FESR, the project allowed the analysis of the regional context and the energy efficiency measures carried out in the 2014-2020 programming period. A necessary starting point for reshaping the funding policies for the next period and increasing their effectiveness.

The goal is to achieve a high level of energy sustainability in Piedmont, through the increase of investments in energy efficiency and through the use of renewable energy.

The Energy Action Plan

The project made it possible to enrich the analyzes and assessments necessary to improve the regional energy planning process in progress, focusing on the priorities to be pursued for the energy transition, the technical and economic actions to be implemented to achieve the objectives and reference time period. From this aspects, it follows the development of energy scenarios in the short, medium and long term, in line with the recent indications which foresee the goal of a zero-carbon Europe between now and 2050.

PROSPECT2030 is a project co-financed by the Interreg Central Europe Program.

#climatechange
#energyplanning2030
#sustainablepresent #zeroemissions

Good practices of Sustainable Energy Transition co-financed with the European Regional Development Fund 2014/2020

Regional context

The dramatic impact of man-made climate change has never been so concrete. There is a significant increase in average temperatures of about 1.5 ° C in Piedmont. Furthermore, due to the current change, extreme weather events are increasingly frequent and impacting.

In this context and in compliance with EU directives, the Piedmont Region has started a process aimed at significantly reducing its emissions of climate-changing gases by 2030, through a 30% reduction in energy consumption and an increase to 27.6% of the consumption of energy from renewable sources.

Piedmont largely depends on extra-regional energy supplies, in particular from fossil energy sources. According to the latest available data, renewable sources contribute about 19% of final energy consumption, which for 33% depends on the use of natural gas. The field in which the most energy is consumed is the construction sector (residential and tertiary), responsible for more than 48%, followed by the transportation (27%) and industry (22%). Compared to 1990, it can be extimated a reduction of more than 20% in carbon dioxide emissions.

These data explain how the transition process is underway but an acceleration is needed to guide the Region towards the challenging objectives defined in the European context, aimed at combating climate change.

An action on the assets of public buildings, starting with the most energy-intensive and degraded ones, can lead to a benefit for the environment and for the citizens who use them.

#climaticchange #energyconsumption #publicbuildings #benefitsforcitizens #renewableenergy

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From goals to results

Goals

- **Strengthen the green trajectory pursued by the Region**
- **Promote the reduction of emissions climate-altering**
- **Increase energy efficiency and the use of renewable sources in public, residential and non-residential buildings**
- **Disseminating good practices for favor replicability in similar contexts**

Actions

To implement measures aimed at achieving these objectives, the Piedmont Region has chosen to activate funding lines dedicated to local authorities, social housing managed by the Territorial Housing Agencies and hospitals.

Requirements

- Publicly owned buildings
- Energy requalification interventions on structures and systems
- Preliminary energy diagnosis
- Compliance with sustainability criteria environmental energy Ithaca-Protocol

Priority

- Nearly Zero Energy Buildings (nZEB)*
- Percentage of reduction in energy consumption
- Accession to the Covenant of Mayors
- Exemplarity and replicability of the project

Results

60 M€
loans disbursed on

161 public buildings
redeveloped of which:

58 Schools
44 Town halls
20 Sport facilities
10 Social housing residential buildings
5 Hospitals
24 Multifunctional buildings

70%
Average energy savings achieved

12.300 ton/year
CO_2 emissions avoided

* **nZEB**: Nearly Zero Energy Building

The participation of the territory

The success of the initiative is due to the propensity of the Piedmontese administrations to carry out "quality" energy requalification interventions on their buildings with poor performance.

Through the POR FESR 2014/2020, the Region financed two other measures for the reduction of energy consumption that affected public lighting systems and businesses.

#energytransition #energyefficiency #publicbuildingredevelopment #benefitsforcitizen #dissemination # replicability #goodpractices

Energy requalification of the buildings of small local authorities

Beneficiaries
Municipalities and Unions of Piedmontese Municipalities up to 5,000 inhabitants

18 million Euros
of total incentives and up to 90% of the investment

75 funded applications and 118 redeveloped buildings between schools, town halls, sports facilities, multifunctional buildings

Overall interventions
in **96%** of cases the thermal insulation of walls, roofs and floors was envisaged and in **88%** the replacement of external doors and windows.
The consumption of energy from fossil sources has reduced on average by **60%**, reaching **80%** in buildings with almost zero energy (nZEB).

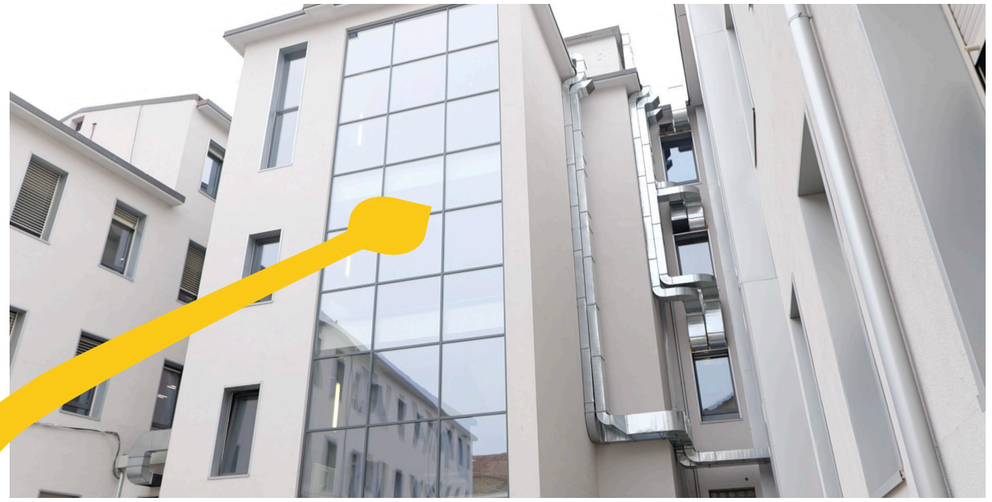
Energy requalification of buildings of local authorities with over 5,000 inhabitants

Beneficiaries
Municipalities and Unions of Piedmontese Municipalities over 5,000 inhabitants

22 million Euros
of total incentives and up to 90% of the investment

18 funded applications and **28 redeveloped buildings** between schools, town halls, sports facilities, multifunctional buildings

Overall interventions
in **100%** of cases the thermal insulation of walls, roofs and floors was envisaged and in **96%** the replacement of external doors and windows.
The consumption of energy from fossil sources has been reduced on average by **76%** to reach **87%** in nearly zero energy buildings (nZEB).

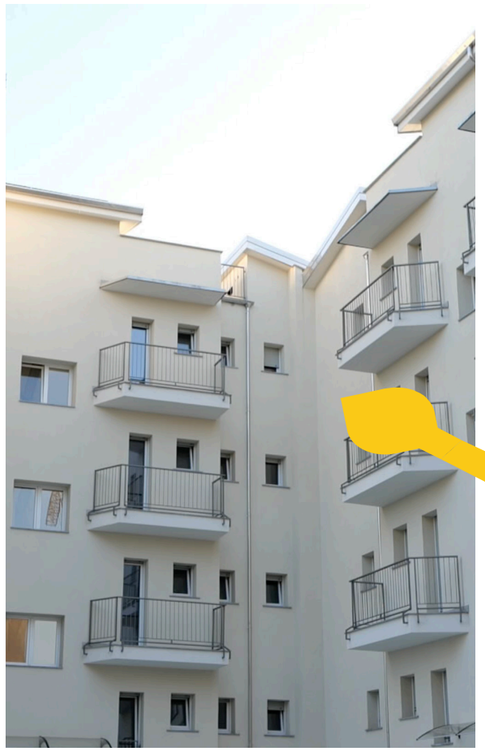


Energy requalification of hospitals

Beneficiaries
Regional Health Authorities

13 million Euros
of total incentives and up to 90% of the admissible amount

5 funded applications and **5 redeveloped buildings**
The consumption of energy from fossil sources has decreased on average by 34%.



Nearly Zero Energy Social Housing Buildings (nZEB)

Beneficiaries
Territorial Agencies for the Piedmont Social Housing

7 million Euros
of total incentives and equal to 90% of the investment

7 funded applications and **10 residential buildings** transformed to **almost zero energy**

The consumption of energy from fossil sources fell by more than 90%.

The interventions are dedicated to disadvantaged users with the aim of **increasing living comfort and reducing energy poverty.**

Mandela Palace in Asti

Thanks to an overall energy efficiency intervention, the Municipality of Asti has succeeded in transforming the municipal offices of Palazzo Mandela, dating back to 1964, into a very high energy performance building (nZEB), which achieves near-energy self-sufficiency and the from fossil and polluting energy sources.

Interventions carried out

External thermal insulation, replacement of windows, heating and cooling with heat pump, installation of screens, LED lighting system, photovoltaic system (151 KW)

24.026 m³ Volume

5.184 m² Surface

1964 Year of construction

2.370.511 € Total investment

1.368.095 € POR FESR Facilitation

202 kWh/m² Non-renewable energy performance index before intervention

2,5 kWh/ m² Non-renewable energy performance index after intervention

98% Saving of energy from fossil sources

184 tonCO_2eq/a Estimation of avoided CO_2 emissions

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Before intervention

After intervention

Before intervention

After intervention

Giolitti School of Turin

The intervention on the building of the Giolitti school in Turin, represents a good example of energy redevelopment, even if partially finished. It shows the enhancement of a building of cultural interest, evidence of industrial archeology. In 2011 it was subjected to a monumental constraint by the Superintendence of Archeology, Fine Arts and Landscape of Turin. The project also includes an action to raise awareness and approach the issue of energy saving towards students and all other users of the building.

Interventions carried out

Internal thermal insulation, replacement of windows, insulation of the attic, upgrade of the remote control system

48.778 m^3 Volume

12.004 m^2 Surface

1954 Year of construction

2.550.000 € Total investment

2.295.00 € POR FESR Facilitation

190 kWh/m^2 Non-renewable energy performance index before intervention

110 kWh/ m^2 Non-renewable energy performance index after intervention

42% Saving of energy from fossil sources

375 tonCO_2eq/a Estimation of avoided CO_2 emissions

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Gianni Rodari school of Cuneo

The "Gianni Rodari" primary school in Cuneo, built in the 1970s, is one of the most important and strategic school buildings in the city. Subjected to an overall redevelopment of both the building and the systems, it helps to highlight the exemplary role of the public administration towards citizens in terms of reducing consumption and climate-altering gas emissions.

Interventions carried out

External thermal insulation, replacement of windows, installation of condensing boiler

12.081 m^3 Volume

2.947 m^2 Surface

1978 Year of construction

1.098.685 € Total investment

988.817 € POR FESR Facilitation

324 kWh/m^2 Non-renewable energy performance index before intervention

78 kWh/m^2 Non-renewable energy performance index after intervention

76% Saving of energy from fossil sources

141 tonCO_2eq/a Estimation of avoided CO_2 emissions

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Before intervention

After intervention

Before intervention

After intervention

Municipal offices of Formazza

The redevelopment work carried out by the small Municipality of Formazza has made it possible to significantly increase the energy performance of a building that dates back to the 1950s and which houses the municipal offices, archives, the library and a conference room. Due to its importance in the area and thanks to the interventions, it will provide greater comfort not only to the people who work there, but also for all the citizens of the area.

Interventions carried out

External thermal insulation, installation of condensing boiler for heating and heat pump for hot water production, installation of photovoltaic system

3.218 m^3 Volume

717 m^2 Surface

1958 Year of construction

395.589 € Total investment

316.471 € POR FESR Facilitation

559 kWh/m^2 Non-renewable energy performance index before intervention

151 kWh/m^2 Non-renewable energy performance index after intervention

73% Saving of energy from fossil sources

45 tonCO_2eq/a Estimation of avoided CO_2 emissions

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District heating network in Frassinetto

The energy requalification intervention in Municipality of Frassinetto concerns two buildings of Municipality dedicated to services to citizens and tourists. Thanks to the project, a small internal district heating network was developed with a biomass power plant, that favors the local wood supply chain.

Interventions carried out

Biomass thermal power plant, local district heating network for several buildings in the Municipality, energy requalification of municipal buildings, installation of a solar thermal system

3.946 m^3 Volume

807 m^2 Surface

1900 and 1964 Year of construction

444.680 € Total investment

355.744 € POR FESR Facilitation

927 kWh/m^2 Non-renewable energy performance index before intervention

284 kWh/m^2 Non-renewable energy performance index after intervention

69% Saving of energy from fossil sources

174 tonCO_2eq/a SEstimation of avoided CO_2 emissions

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Before intervention

After intervention

Before intervention

After intervention

Mondovì swimming pool

The municipal swimming pool of Mondovì, built in the 70s, with high consumption, has been the subject of an important energy, structural and aesthetic requalification work, which has made it possible to transform it in a building with almost zero energy consumption from fossil sources (nZEB) and to give it a more modern aspect much appreciated by the citizens.

Interventions carried out

External thermal insulation, replacement of windows, interventions on thermal, electrical and lighting systems, installation of photovoltaic and solar thermal systems

15.280 m^3 Volume

2.370 m^2 Surface

1981 Year of construction

1.463.280 € Total investment

1.316.952 € POR FESR Facilitation

954 kWh/m^2 Non-renewable energy performance index before intervention

49 kWh/m^2 Non-renewable energy performance index after intervention

95% Saving of energy from fossil sources

393 tonCO_2eq/a Estimation of avoided CO_2 emissions

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Montà gym

The Municipality of Montà has chosen to carry out an overall energy requalification of the municipal gym, a building from the 1980s with high energy consumption. A project that, in addition to generating a positive impact from an energy and economic point of view for the Municipality, also has an important social impact in consideration of the intended use of the structure.

Interventions carried out

External thermal insulation, replacement of windows, internal automatic air exchange, LED lighting system

13,317 m^3 Volume

1,921 m^2 Surface area

1986 Year of construction

€ 499,982 Total investment

399.985 € POR FESR subsidy

309 kWh / m^2 Non-renewable energy performance index before intervention

105 kWh / m^2 Non-renewable energy performance index after intervention

66% Energy saving from fossil sources

75 tonCO_2eq/a Estimation of avoided CO_2 emissions

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Before intervention

After intervention

Before intervention

After intervention

Town Hall of Igliano

The energy efficiency intervention involved a building that dates back to the 1920s and is subjected to cultural heritage restrictions. This initiative demonstrates that even in one of the smallest municipalities in Piedmont it is possible to carry out demonstration interventions in terms of energy sustainability that can be easily replicated in other territories.

Interventions carried out

External thermal insulation, windows replacement, heat remote control system, photovoltaic system installation

1.102 m^3 Volume

223 m^2 Surface area

1920 Year of construction

166.523 € Total investment

133.218 € POR FESR subsidy

431 kWh/m^2 Non-renewable energy performance index before intervention

85 kWh/m^2 Non-renewable energy performance index after intervention

80% Saving of energy from fossil sources

17 tonCO_2eq/a Estimation of avoided CO_2 emissions

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San Giovanni Residence in Niella Belbo

The San Giovanni Residence for persons with disabilities was the subject of combined building and plant interventions, with particular attention to the walls and floors of the building, insulated with a high thickness sustainable material.

Considering the intended use of the building, it represents a very important social impact and allows a considerable improvement in internal comfort.

Interventions carried out

External thermal insulation, window replacement, attic insulation, heating system, LED lighting, photovoltaic system installation, automatic control and regulation systems

4.371 m^3 Volume

1.124 m^2 Surface area

1992 Year of construction

300.570 € Total investment

240.456 € POR FESR subsidy

276 kWh/m^2 Non-renewable energy performance index before intervention

59 kWh/m^2 Non-renewable energy performance index after intervention

78% Saving of energy from fossil sources

54 tonCO_2eq/a Estimation of avoided CO_2 emissions

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Before intervention

After intervention

Before intervention

After intervention

Municipal building of Pianfei

The Pianfei Town Hall building dates back to the 1970s and had a very poor energy performance. The interventions carried out were significant and generated a positive impact for the Municipality from an energy and economic point of view with important repercussions for the internal staff and for the citizens who use the services.

Interventions carried out

External thermal insulation, replacement of windows, installation of a condensing boiler, installation of an automatic regulation and control system

3.923 m^3 Volume

987 m^2 Surface area

1970 Year of construction

242.000 € Total investment

193.602 € POR FESR subsidy

253 kWh/m^2 Non-renewable energy performance index before intervention

83 kWh/m^2 Non-renewable energy performance index after intervention

67% Saving of energy from fossil sources

41 tonCO_2eq/a Estimation of avoided CO_2 emissions

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Municipal theater of Rivara

The energy redevelopment project proposed by the municipality of Rivara is particularly interesting because it concerns the town's theater which dates back to 1875. Due to its qualities, the building is subjected to historical and architectural constraints. As a result of its characteristics, some difficulties emerged during the construction phase that slowing down the work.

Interventions carried out

Partial thermal insulation of the building, replacement of windows, installation of heat pump systems, heat pump for heating and hot water production, LED lighting system

1.523 m^3 Volume

200 m^2 Surface area

1875 Year of construction

202.901 € Total investment

162.321 € POR FESR subsidy

799 kWh/m^2 Non-renewable energy performance index before intervention

126 kWh/m^2 Non-renewable energy performance index after intervention

84% Saving of energy from fossil sources

58 tonCO_2eq/a Estimation of avoided CO_2 emissions

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Before intervention

Work in progress

Before intervention

After intervention

Multifunctional building of San Nazzaro Sesia

The Municipality of San Nazzaro Sesia has totally redeveloped the building of the former elementary schools which dates back to the 1950s and is used as a multifunctional structure.

The project involved the installation of special automatic control systems for the plants that allows to program their use according to the necessities.

Interventions carried out

External thermal insulation, replacement of windows, installation of solar shading, replacement of the heating and cooling system and use of renewable sources

2.615 m^3 Volume

456 m^2 Surface area

1954 Year of construction

245.000 € Total investment

196.000 € POR FESR subsidy

554 kWh/m^2 Non-renewable energy performance index before intervention

129 kWh/m^2 Non-renewable energy performance index after intervention

77% Saving of energy from fossil sources

37 $tonCO_2eq/a$ Estimation of avoided CO_2 emissions

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Comprehensive Institute Gaudenzio Ferrari of Vercelli

The City of Vercelli has focused on the overall energy requalification of the comprehensive "Gaudenzio Ferrari" Institute. The students of the school were involved during the realization of the project in order to raise awareness on the issues of energy saving and environmental sustainability that play a key role for their future.

Interventions carried out

Partially external and partly internal thermal insulation, replacement of windows, installation of heat pump system and solar thermal and photovoltaic systems

25.198 m^3 Volume

3.373 m^2 Surface area

1900 Year of construction

1.455.035 € Total investment

1.309.531 € POR FESR subsidy

382 kWh/m^2 Non-renewable energy performance index before intervention

98 kWh/m^2 Non-renewable energy performance index after intervention

74% Saving of energy from fossil sources

153 tonCO_2eq/a Estimation of avoided CO_2 emissions

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Before intervention

After intervention

Before intervention

Chivasso Hospital - New refrigeration units

Civil Hospital of Chivasso

The energy redevelopment of the Chivasso Hospital was very complex in the design and construction phase, also because the building is made up of several blocks of different construction periods, from the 1600s to the 1970s. The intervention on the heating and cooling systems has made it possible to optimize the distribution of the energy that is produced by a high-efficiency cogeneration power plant particularly suitable for hospitals.

Interventions carried out

Installation of a cogeneration system for the production of electricity and heat, new cooling system, LED lighting system

109.351 m^3 Volume

25.847 m^2 Surface area

Part of 1600 and part of 1970
Year of construction

4.968.014 € Total investment

3.200.000 € POR FESR subsidy

494 kWh/m^2 Non-renewable energy performance index before intervention

385 kWh/m^2 Non-renewable energy performance index after intervention

22% Saving of energy from fossil sources

738 tonCO_2eq/a Estimation of avoided CO_2 emissions

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Almost zero energy residential building in Asti

The Asti Territorial Housing Agency (ATC) identified a public social housing building from 1975 to develop an energy redevelopment pilot project that allowed the transformation into a building with almost zero energy consumption (nZEB). The project is an example of the great potential for energy saving also in residential contexts, with significant economic benefits for the occupants.

Interventions carried out

External thermal insulation, replacement of windows, replacement of gas boiler with electric heat pump for heating and hot water, automatic internal air exchange systems, photovoltaic system

9.656 m³ Volume

2.489 m² Surface area

1975 Year of construction

1.416.403 € Total investment

1.265.083 € POR FESR subsidy

227 kWh/m² Non-renewable energy performance index before intervention

18 kWh/ m² Non-renewable energy performance index after intervention

92% Saving of energy from fossil sources

105 tonCO_2eq/a Estimation of avoided CO_2 emissions

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Before intervention

After intervention

Before intervention

After intervention

Almost zero energy residential building in Novara

The project concerns the recovery of an unused building for which the redevelopment works had been interrupted. Thanks to the interventions, the Novara Territorial Housing Agency (ATC) has restored 16 new housing units to assign to users with special needs. Also in this case, the energy redevelopment has made it possible to transform the building to almost zero energy, thus making it an example of public housing.

Interventions carried out

External thermal insulation, replacement of windows, installation of solar shading, installation of electric heat pumps, LED lighting system, automatic control and regulation systems, photovoltaic and solar thermal systems, automatic internal air exchange systems

109.351 m^3 Volume

25.847 m^2 Surface area

1957 Year of construction

1.310.200 € Total investment

1.174.713 € POR FESR subsidy

399 kWh/m^2 Non-renewable energy performance index before intervention

16 kWh/m^2 Non-renewable energy performance index after intervention

96% Saving of energy from fossil sources

95 tonCO_2eq/a Estimation of avoided CO_2 emissions

Click here to watch the video interview

Publication carried out in November 2021 as part of the Interreg Central Europe Project **Prospect2030** by the Environment, Energy and Territory Directorate of the Piedmont Region.

The described interventions can be viewed on YouTube at the channel **Comunicazione Piemonte 2020** in the playlist **Prospect2030 - Buone pratiche efficienza energetica**.

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