



PINEROLO Investment Project

energy efficiency first in Pinerolo territory!

EUCF 2° call – Webinar Italia

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Stefano Dotta
25/03/2021





Coordinatore del progetto:

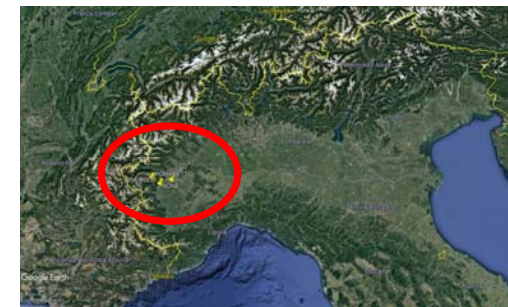
Comune di Pinerolo – 35.970 (ab.) - PAESC (2020-09-23) – Piano Urbano Mobilità Sostenibile (PUMS)

Partner:

Comune di None – 8.009 (ab.) – PAES (2012-11-26)

Comune di Pomaretto – 998 (ab.) – PAES (2012-09-24 / 2015-11-25)

Dal 2019 i tre Comuni hanno aderito alla prima OIL FREE ZONE italiana



I principali obiettivi dell'Investment Project sono di sviluppare un Investment Concept finalizzato a:

Efficienza energetica di edifici pubblici e illuminazione stradale pubblica

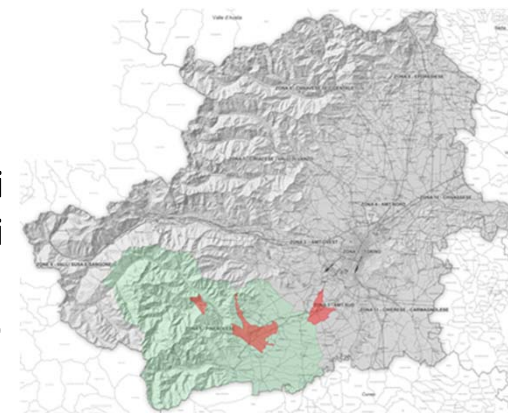
- Riqualificazione energetica (ottimizzazioni e sostituzioni component e impianti) di 48 edifici pubblici (38 Pinerolo – 10 None) mobilitando investimenti privati attraverso l'implementazione di contratti EPC – raggruppando l'offerta
- Sostituzione di punti luce obsoleti con nuovi efficienti (475 None) mobilitando investimenti privati e/o pubblici

Impianti di produzione di energia da fonti rinnovabili

- Nuovi impianti FV integrati in edifici pubblici (450 kWp Pinerolo – 60kWp None)
- Nuovi impianti idroelettrici installati nella rete dell'acquedotto comunale (21 kWp Pomaretto)

Mobilità urbana sostenibile

- Conversione e sostituzione di veicoli del trasporto pubblico urbano, da diesel a elettrico, installazione di stazioni di ricarica per veicoli elettrici, incremento della rete di piste ciclabili (nuove realizzazione e ottimizzazione dell'esistente)



Impatti attesi dell'investment project

Investimenti	Produzione di energia rinnovabile (GWh/y)	Risparmio energetico (GWh/y)	Costi (M€)
Riqualificazione energetica edifici		3.23	8.500
Riqualificazione energetica Illuminazione edifici		0.67	
FV integrato in edifici pubblici	0.64		0.765
Centraline idroelettriche su acquedotto	0.18		0.400
Riqualificazione energetica IP		0.14	0.119
Mobilità Urbana sostenibile		4.56	4.500
Totale	0.82	8.60	14.284
		9.42	

Attività in Corso finanziate direttamente dal Comune di Pinerolo

- **Energy Management**
 - Monitoraggio dei consumi energetici
 - Monitoraggio della produzione da FER
 - Monitoraggio del servizio di O&M
 - Monitoraggio dei costi energetici e di O&M

Attività pianificate per lo sviluppo dell'IC

- **Audit Energetici di edifici pubblici e IP finalizzati a definire:**
 - Potenziale di efficientamento energetico
 - Misure di efficientamento energetico
 - Produzione da FER
- **Analisi economiche finalizzate a definire:**
 - Investimenti
 - Incentivi
 - Entrate e Costi
 - Indicatori economici (TR, VAN, TIR, DSCR, ecc.)
 - Durata dell'EPC, Valore del canone, risparmi economici
- **Analisi legali necessari alla definizione delle procedure pubbliche di appalto più idonee all'implementazione di contratti EPC ed alla selezione delle ESCo**
- **Incontri e meeting con:**
 - Operatori di mercato (Imprese di costruzione, ESCos, Utilities) con l'obiettivo di verificare l'interesse del mercato
 - Cittadini con l'obiettivo di definire investimenti in EE e FER che possano aiutare a migliorare il funzionamento dei servizi pubblici e implementare CER
 - Banche e istituti finanziari locali

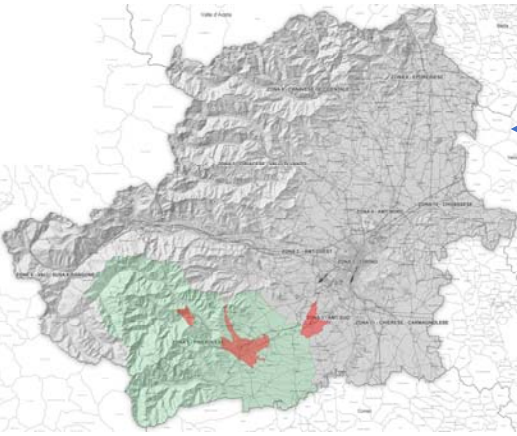
Contributo EUCF

Esperti esterni in Project Development Assistance (PDA)

Esperti legali in Energy Performance Contract, Public Private Partnership and Public Procurement



Governance



Collegato a

CITTÀ di PINEROLO
Settore lavori pubblici
3 esperti, 1 di loro è il coordinatore dell'investment project
(Arch. Fabrizio Cagno)

COMUNE DI NONE **COMUNE DI POMARETTO**

Supportato da



Relaziona a

Working Group (WG)
Coordinatore (Arch. Fabrizio Cagno)
Internal expert
External expert
Energy Manager di Pinerolo
Esperto Regione Piemonte

Technical Committee (TC)
Tecnici ed esperti comunali

CITTÀ di PINEROLO **COMUNE DI POMARETTO** **COMUNE DI NONE**

Relaziona a

Advisory Committee (TC)
Sindaci

CITTÀ di PINEROLO **COMUNE DI POMARETTO** **COMUNE DI NONE**

effetto moltiplicatore

INVESTMENT CONCEPT

Pinerolese
Area territoriale omogenea della Città Metropolitana di Torino costituita da 45 comuni guidati da Pinerolo
28 di loro sono parte della OIL FREE ZONE
6 di loro sono parte della comunità energetica territoriale guidata da Scalenghe

Primi passi per la realizzazione dell'Investment Concept

1) Firma del Grant Agreement

Primo mese

1) Affidamento incarico esperti esterni

2) Coinvolgimento della regione Piemonte e costituzione dei Working Group (WG), Technical Committee (TC), Advisory Committee (TC)

Secondo mese

Energy Audit....

Fonti di finanziamento previste per l'attuazione dell'IC

Investimenti Pubblici e/o Privati che si ritiene di poter attivare grazie a precedenti esperienze

- Tutti e tre i Comuni hanno esperienze nell'utilizzo di risorse pubbliche (POR-FESR della Regione Piemonte, "Conto termico", ecc.)
- PPP per l'efficienza energetica di illuminazione pubblica (Pinerolo)
- EPC per edifici pubblici e IP (Regione Piemonte – PDA project «2020Together», «Stepping»)

Procedura di affidamento EPC per edifici pubblici (baseline cost 1,3 M€/y Pinerolo + None)

PPP/EPC o fondi pubblici POR FESR per l'IP

Incentivi nazionali per FER e CER

PPP per la realizzazione di reti di stazioni di ricarica per veicoli elettrici



Grazie!

Fabrizio Cugno
Stefano Dotta



EUROPEAN CITY FACILITY – EUCF
“ENERGY EFFICIENCY FIRST IN PINEROLO TERRITORY”

- Identification of the application

Application ID: 01IT000074X

Title of proposed investment concept: Energy Efficiency First in Pinerolo territory!

- Identification of the applicant

Name of the leading city/municipality or its grouping: Pinerolo Area

Population size: 44.977

Organization (legal entity): Comune di Pinerolo

Department: Settore Lavori Pubblici

Street, No.: Piazza Vittorio Veneto 1

Postal Code, City: 10064

Country: Italy

Contact person: Fabrizio Cogno

Telephone +390121361394

e-mail: Fabrizio.cogno@comune.pinerolo.to.it

LAU and NUTS 3 code of the municipality/local authority or of each municipality/local authority in case of a grouping

Lead applicant

Country Italy, *NUTS 3* Torino, *Municipality* Pinerolo, *LAU Code* 001191

Group

Country Italy, *NUTS 3* Torino, *Municipality* None, *LAU Code* 001168

Country Italy, *NUTS 3* Torino, *Municipality* Pomaretto, *LAU Code* 001198

- Development of the investment concept

Allocation of grant amount

Please indicate how the grant resources will be allocated for the development of the investment concept (note: more than one answer is possible)

1. **In house staff**
2. **External experts/sub- contractors**
3. Others- specify below (max 250 characters, including spaces)

Activities funded by grant amount

Please indicate the missing component(s) for the development of the intended investment concept and explain how the EUCF grant can fill this gap. Briefly state the activities for which the EUCF grant is needed (e.g. engineering analysis, legal analysis, social study, market study, financial analysis, etc)

Max 1000 characters, including spaces. For monitoring purposes only. This requirement will not evaluate

Starting from SECAP and SEAPs, the group led by Pinerolo, will develop an investment concept (IC) aimed mainly at the energy efficiency of public buildings in order to mobilize investments through the implementation of EPC, but also other investment will define on the field of RES, street lighting, smart mobilities and energy communities. Thanks to the results obtained by some EU project, coordinated by the Piedmont Region (2020Together, Stepping) it is possible identify experts and technical activities needed to define a bundling IC for EPC. The activities will be: energy audit to define energy saving potential and energy efficiency measures, economic analysis to define investments, subsidy, revenues, economic indicators such as SPT, NPV, IRR, DSCR. Duration of EPC, value of the fee, and economic savings for the municipality will be also define. Legal analysis in order to define the most effective public procurement procedure necessary to select the ESCo. Bundling coordination

Governance for investment concept development

Please describe the internal organisational structure (roles and responsibilities of the people involved) and decision-making process for the development of the investment concept, indicating also if internal capacities are sufficient or if external expert should be involved and how they can provide a value added (e.g areas with need for capacity building).

Max 1500 characters, including spaces

The development of the Investment Concept (IC) will be led by Pinerolo, which has more technical and administrative staff. Pinerolo will provide 3 people from its public works sector: the head manager and 2 technicians (an environmental expert, and an O&M expert of public buildings) one of them will be the coordinator. The grouping includes 3 municipalities that are members of the CoM and will be supported by Piedmont Region (PReg). All 3 municipalities involved have joined 25 others in a local oil free zone, 6 of them have formed an energy community. The coordinator will be responsible for the technical activities carried out by Working Group (WG) and will report to a Technical Committee (TC) on the progress. Internal and external experts for technical, economic and legal analysis will be part of the WG. Technicians of the municipalities will be part of the TC and it will meet at least 4 times during the activities. The TC will have the task to report on the development of the IC to an Advisory Committee (AC) of which the Mayors will be part. PReg experts will be involved in both the WG and the TC in order to support in the development of the IC. As internal expertise will not be sufficient, the involvement of external experts in the WG is foreseen. They will be responsible for energy audits and economic and legal analyses, and could be the external energy managers currently involved in municipalities or other selected according to the national public procurement rules

Engagement of stakeholders and citizens

Please briefly highlight important stakeholders (e.g. civil society, economic actors) and their needs and expectations towards the envisaged investment project. Please explain how are planned to be involved in the process of the investment concept development (e.g. engagement activities and communication instruments with corresponding timings and objectives)

Max. 1500 characters, including spaces

As soon as a first draft of the IC will be set up, stakeholders will be involved by the Working Group (WG) in specific workshops, in order to make the final implementation of the IC close to the local market, financial conditions, citizens' interests as well as replicable in other municipalities. The Stakeholders that will be involved by the WG are: Municipalities belonging to the Pinerolo Oil Free Zone with the aim of creating opportunities for the replication of the IC. Local investors such as enterprises, ESCo and Utilities with the aim of assessing the interest of the market, in order to increase the future probability of realization of the investments. Citizens with the objective of implementing a participatory process to define which investments in energy efficiency and renewable energies could be useful to improve the functioning of public services such as schools, municipal offices, gyms etc. Local energy consumers and producers and municipalities currently involved in the Pinerolo Energy Community (PEC) in order to verify the synergies between the IC and the development of their PEC. Banks and local financial institutions will be consulted during the development of IC, in particular during the economic analysis. In addition, they will be involved in the delicate phase of the analysis of the legal framework and in the definition of the public procurement procedures necessary to mobilise private investment and verify the financial capacity of private access to credit

- Implementation of the investment

Investment sector(s) targeted

Please indicate the sector(s) targeted by the investment project:

1. Public buildings
2. Buildings integrated renewables
3. Residential buildings
4. District heating
5. Sustainable urban mobility
6. Innovative energy infrastructure
7. Smart grids
8. Others – please specify below (max 250 characters, including spaces)

The investment concept will target other two sectors: energy efficiency of public street lighting in None and renewable energy systems different by PV notably hydroelectric power plant integrated in public aqueduct

Intended measure

Please state the intended technology measure(s) to be financed. Non eligible technology measures under the EUCF are aligned with the new [European Investment bank \(BEI\) energy lending policy](#), adopted on 14 November 2018

Max 1000 characters, including spaces

The technology measures that will be considered are completely aligned with European Investment bank energy lending policy and contribute to achieve the 2030 EU target. According to the energy efficiency first principle the technology measures will be related to energy efficiency improvement to the building envelope and building system, a wide portfolio of energy technologies with high performance and low cost will be considered, notably insulation systems for

external walls, roof and ceiling, new windows, new heat generator, gas-fired small boilers, smart meters, building automation etc. Integrated renewable power plants (PV) on public buildings and connected with storages and smart grid, led technologies, replacement of public bus with new electric or hydrogen, electric recharging grid, new bicycle lanes will be also considered in order to reduce the GHG emission, boost the development of the local energy communities and electromobility, increasing the power system smartness

Expected size of investment

Please indicate the expected investment size (approximate amount) and attach the corresponding supporting documents and/or calculation log.: 14.283.750€

Expected Impacts

Please indicate the expected energy savings generated by the project (approximate amount) and attach the corresponding calculation log.: 9,419 GWh/y)

Potential for replication and/or upscaling

Please explain how the investment project could potentially be replicated in other contexts and/or up-scaled (in the region), if known at this stage.

Max. 1,000 characters, including spaces

Pinerolo is the municipality most important and populous of a homogeneous territorial area called Pinerolese. This area is part of the Piedmont Region and includes 45 small and medium municipalities. 3 of them, are involved in this IC proposal. It is possible to foresee a first up-scale of the IC thanks to the other 25 municipalities belonging to the OIL FREE ZONE (OFZ), these have characteristics and public buildings similar and need similar investments to achieve their CO2 emissions reduction targets. It is planned to present the IC to the OFZ members once finalised and it will represent a best practice for them. The Piedmont Region expert's participation in WG and TC will guarantee the results dissemination in other homogeneous areas of its Provinces. Moreover, the 6 municipalities led by Scalenghe join to the local Energy Community will develop an IC useful for the Community itself allowing its members (producers, consumers, utilities and citizens) to mobilize further investments

ESTIMATION OF THE AVOIDED CO₂ EMISSIONS

The calculation of CO₂ emissions reduction achieved by the investment projects have been implemented within the template Annex D, by providing the proper Emission Factor for each energy source.

The emission factors have been taken from the IPCC Report for electricity, gas natural and diesel and from local reports for what concern the local generation plants.

In the following table the values and the sources of emission factor have been reported.

Energy source	Emission factor [tCO _{2eq} /GWh]	Source of Emission Factor
Natural gas	237	CO ₂ -equivalent LCA emission factors (from ELCD)
Heat/cold (Pinerolo)	337	CO ₂ -equivalent emission factors (from Sustainability Report of Energy Distributor)
Heat/cold (None)	217	LCA conducted on similar power plant at national level
Diesel	305	CO ₂ -equivalent LCA emission factors (from ELCD)
Electricity	708	CO ₂ -equivalent LCA emission factors (from ELCD)

In the following table the results of the energy and CO₂ emission savings achieved by the investment project are summarized.

Energy source	Energy savings [GWh/year]	Avoided CO ₂ emissions [tCO _{2eq} /year]
Natural gas	1,88	445,6
Heat/cold (Pinerolo)	0,49	165
Heat/cold (None)	0,85	184
Diesel	4,56	1391
Electricity	0,81	573,5

ESTIMATION OF THE ANNUAL PRODUCTION OF ENERGY FROM HYDROELECTRIC POWER PLANT

In the following lines the data referred to hydroelectric power plants under development in Pomaretto are reported.

Hydroelectric power plant "LOU CVALET"

Hydraulic head: 370 m

Peak power: 17 kW_p

Annual potential energy production: 142800 kWh

Hydroelectric power plant "GILLI"

Hydraulic head: 70 m

Peak power: 4 kW_p

Annual potential energy production: 33600 kWh

ESTIMATION OF THE ANNUAL PRODUCTION OF ENERGY FROM PHOTOVOLTAIC SYSTEMS

An analysis of the producibility of energy from photovoltaic systems has been implemented on public buildings in the city of Pinerolo. First of all, the available roofing surfaces were calculated with adequate orientation to accommodate the installation of photovoltaic systems. We then proceeded to estimate the number of modules potentially installable and then the sizing of the system. The total peak power that could be installed was about 450 kW_p, whose manufacturability was evaluated using PVGIS software taking into account the irradiation values of a typical building in the City of Pinerolo.

Building	Roof surface [m ²]
Scuola dell'infanzia ANDERSEN	429
Scuola primaria COLLODI	493
CTU SERENA (PARRI, POLLICINO, suc. POET)	2.344
CTU ABBADIA ALPINA(ex LAURO, RODARI,PUCCINI)	795
CTU SERAFINO(GIOVANNI XXII, A.FRANK)	1.850
CTU MONTEGRAPPA (BATTISTI, AGAZZI)	1.318
Scuola secondaria di I grado BRIGNONE	778
Scuola primaria NINO COSTA	14
CTU COSTA (ex N. COSTA + ASS.SPORTIVE)	277
CTU RIVA (infanzia e materna RIVA, Centro Sociale)	82
Asilo nido TABONA	14
CENTRO SOCIALE Via Lequio	200
Scuola infanzia MONTESSORI	90
MUNICIPIO	300
SPOGLIATOIO NECROFORI CIMITERO PRINCIPALE	82
CENTRI SOCIALI - FABB ERP PIAZZA FORO BOARIO	100
Total available roof surface for PV system [m²]	Number of installable PV modules [-]
4582	1527
Total PV peak power [kW]	Annual potential energy production from PV modules [kWh]
458	580.225

The PVGIS evaluation is reported in the following page.

Rendimento FV connesso in rete

PVGIS-5 stima del rendimento energetico FV:

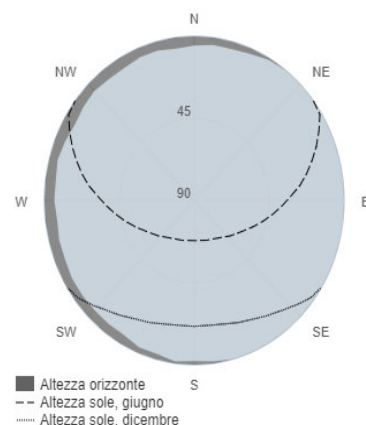
Valori inseriti:

Lat./Long.: 44.885, 7.332
 Orizzonte: Calcolato
 Database solare: PVGIS-SARAH
 Tecnologia FV: Silicio cristallino
 FV installato: 450 kWp
 Perdite di sistema: 14 %

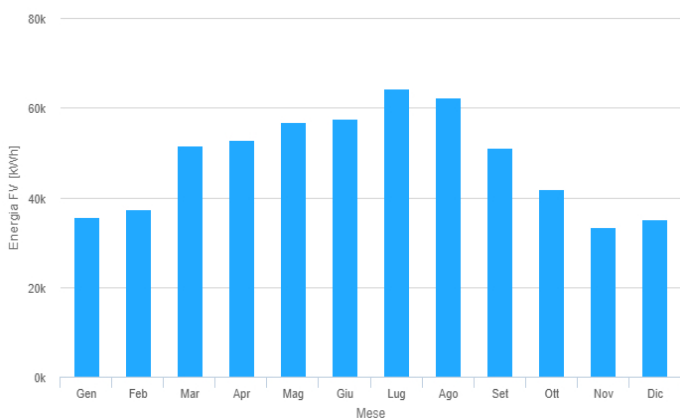
Output del calcolo

Angolo inclinazione: 35 °
 Angolo orientamento: 0 °
 Produzione annuale FV: 580225.08 kWh
 Irraggiamento annuale: 1727.43 kWh/m²
 Variazione interannuale: 44174.20 kWh
 Variazione di produzione a causa di:
 Angolo d'incidenza: -2.64 %
 Effetti spettrali: 1.06 %
 Temperatura e irradianza bassa: -11.79 %
 Perdite totali: -25.36 %

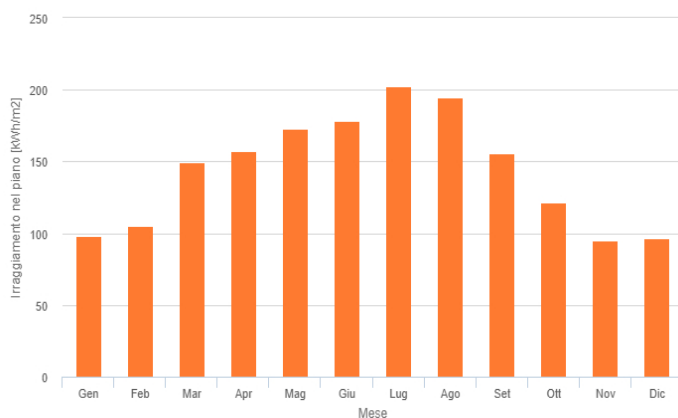
Grafico dell'orizzonte:



Energia prodotta dal sistema FV fisso fisso:



Irraggiamento mensile sul piano fisso:



Energia FV ed irraggiamento mensile

Mese	E _m	H(i) _m	SD _m
Gennaio	35574.998.1	10160.6	
Febbraio	37373.9105.5	9457.8	
Marzo	51626.8149.4	8862.6	
Aprile	52772.3157.3	8284.4	
Maggio	56943.6173.0	4869.9	
Giugno	57653.5178.2	6157.0	
Luglio	64387.8202.5	4731.7	
Agosto	62181.9194.4	4016.8	
Settembre	51083.9155.8	5137.1	
Ottobre	41920.8121.6	6856.3	
Novembre	33491.694.8	8095.2	
Dicembre	35214.196.9	6530.1	

E_m: Media mensile del rendimento energetico dal sistema scelto [kWh].

H(i)_m: Media mensile di irraggiamento al metro quadro sui moduli del sistem scelto [kWh/m²].

SD_m: Variazione standard del rendimento mensile di anno in anno [kWh].

La Commissione europea gestisce questo sito per offrire al pubblico un più ampio accesso alle informazioni sulle sue iniziative e le politiche dell'Unione europea in generale. L'obiettivo è quello di fornire informazioni esatte e aggiornate. Qualsiasi errore portato alla nostra attenzione sarà prontamente corretto.

La Commissione declina, tuttavia, qualsiasi responsabilità per quanto riguarda le informazioni ottenute consultando questo sito, tali informazioni:

i) sono esclusivamente di carattere generale e non intendono fare riferimento a circostanze specifiche relative ad alcun individuo o entità,

ii) non sono necessariamente esaurienti, complete, corrette o aggiornate,

iii) sono talvolta legate a siti esterni sui quali i servizi della Commissione non hanno alcun controllo e per le quali la Commissione non si assume alcuna responsabilità,

iv) non costituiscono un parere di tipo professionale o legale (per una consulenza specifica, è sempre necessario rivolgersi ad un professionista qualificato).