EUCF

European City Facility

3rd Call Investors Report August 2022

3rd Call EUCF: Investor report

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What is the European City Facility?

The European City Facility (EUCF) is a funding facility set up under the Horizon programme for Research and Innovation of the European Union. It provides tailor made and simplified financial support (grants of EUR 60 000) and capacity building services to municipalities and local authorities in European Union. The objective is that these entities develop sound investment concepts and mobilise finance in the field of sustainable energy.

The EUCF provides support for investment projects within the field of sustainable energy, including all investments on the energy demand side, which contribute to the improvement of energy performance and the achievement of energy savings.

The EUCF 3rd Call was open from the 15th of October to the 17th December 2021. Amongst 166 applications from all over Europe, 67 beneficiaries received the EUCF grant to create their investment concepts in this call.

The 67 local authorities that are beneficiaries from the 3rd EUCF Call are divided into three regions: Central and Eastern Europe (CEE), Nordic countries & Western Europe (NC&WE) and Southern Europe (SE).

Are you an investor?

If the answer is yes, we invite you to quickly register to the EUCF investors network https://www.eucityfacility.eu/support/registration.html.

We will ensure that you are the first to know more about the Investment Concepts developed by our beneficiaries. With our 4th call closing soon, you will eventually have access to more than 200 investment concepts, providing a unique opportunity to enlarge your investment portfolio and engage with EU City Facility stakeholders all over Europe.

Registering will also help you stay tuned about upcoming on-line and in-person matchmaking activities! As of November 2022, we are organising a series of events for EUCF beneficiaries to meet investors and present their investment concepts. Because the objective of the EUCF is to ensure that all investment concepts evolve into concrete projects. You can also follow us on Twitter, but the key action point is to join our Investor's network!

https://twitter.com/eucityfacility

3rd Call EUCF: Investment size per region

€ INVESTMENT SIZE	EXPECTED ENERGY SAVINGS	EXPECTED RENEWABLE ENERGIES	NUMBER OF BENEFICIARIES
CENTRAL & EASTERN EUROPE (CEE)			
1494 MILLION €	**891** GWh/y	**742.9** GWh/y	**26**
NORDIC COUNTRIES & WESTERN EUROPE (NC&WE)			
2191 MILLION €	**1415.9** GWh/y	**956.3** GWh/y	**22**
SOUTHERN EUROPE (SE)			
1706 MILLION €	**735.5** GWh/y	**748.7** GWh/y	**19**
TOTAL			
5392 **MILLION €**	**3044** **GWh/y**	**2447.9** **GWh/y**	**67**

3rd Call EUCF: Map of Beneficiaries

NETHERLANDS
- Groningen
- Haarlemmermeer
- Uithoorn
- Beemster
- Gemeente Ede
- Zeist
- Smallingerland

CZECHIA
- Tabòr

NORWAY
- Asker

SWEDEN
- Uddevalla
- Skövde
- Lund

FINLAND
- Vaasa
- Mikkeli

LITHUANIA
- Elektrenai

POLAND
- Bydgoszcz
- Krosno
- Bytom
- Świdnica
- Lubartow
- Nowy Targ
- Czechowice-Dziedzice
- Radłów

LATVIA
- Adazi
- Tukums
- Jurmala Council

UNITED KINGDOM
- Northumberland

DENMARK
- Mikkeli
- Hjørring

HUNGARY
- Municipality of the City of Szombathely
- Pécs
- Szekszárd
- Kecskemet
- 7th District Erzsébetváros - Budapest

IRELAND
- Donegal County Council
- South Dublin

BELGIUM
- Vallée Haute-Meuse group
- Intercommunale Leiedal
- Ranst

ROMANIA
- Onesti
- Sfantu Gheorghe

FRANCE
- Roannais Agglomération

BULGARIA
- Ruse
- Razgrad
- Cherven Bryag

PORTUGAL
- Bragança and other municipalities of the Terra Fria
- Maia
- Ovar
- Oeiras
- Arcos de Valdevez
- São João da Madeira

CYPRUS
- Pano Platres community council

SPAIN
- Montilla
- Consell Comarcal del Moianès
- Rubí

ITALY
- Berceto
- Valbelluna Community
- Borgo San Dalmazzo
- Unione della Romagna Faentina (URF)
- Unione dei Comuni Valli del Reno, Lavino e Samoggia
- Milan Municipality

SLOVENIA
- Grosuplje

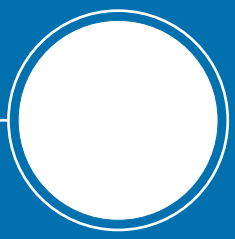
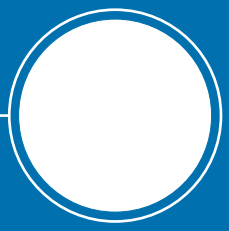
CROATIA
- City of Kastav and Municipality of Matulji
- Pregrada, Zabok and Krapinske Toplice

GREECE
- Xylokastro-Evrostini
- Edessa
- Vrilissia

BENEFICIARIES BY INVESTMENT SECTOR

SECTOR	BENEFICIARY
25% DISTRICT HEATING	Elektrenai (LT) Adazi (LV) Intercommunale Leiedal (BE), Ranst (BE) Groningen (NL), Beemster(NL), Uithoorn (NL) Mikkeli (DK), Hjørring (DK) Mikkeli (FI) Municipality of the City of Szombathely (HU), Szekszárd (HU), South Dublin (IE) Bytom (PL) Czechowice-Dziedzice (PL)
RESIDENTIAL BUILDINGS INNOVATIVE ENERGY INFRASTRUCTURE **19%**	7th District Erzsébetváros - Budapest (HU), Zeist(NL), Smallingerland (NL) Donegal County Council (IE) Unione dei Comuni Valli del Reno (IT), Lavino e Samoggia (IT), Nowy Targ (PL), Radłów (PL), Krosno (PL) Bragança and other municipalities of the Terra Fria (PT) Rubí (ES) Skövde (SE) Northumberland (UK)
INNOVATIVE ENERGY INFRASTRUCTURE **16%**	Vallée Haute-Meuse (BE), Razgrad(BG), Cherven Bryag (BG) Roannais Agglomération (FR) Vaasa (FN) Vrilissia (EL) Kecskemet (HU) Jurmala Council (LV) Bydgoszcz (PL) Arcos de Valdevez (PT) Uddevalla (SE)

BENEFICIARIES BY INVESTMENT SECTOR

SECTOR	BENEFICIARY
PUBLIC BUILDINGS **13%** 	Tábor (CZ) Xylokastro-Evrostini (EL) Milan Municipality (IT), Unione della Romagna Faentina (IT) Tukums (LV) Maia (PT), Oeiras (PT), Ovar (PT) Onesti (RO) Grosuplje (SL)
SUSTAINABLE URBAN MOBILITY **9%** 	Ruse (BG) City of Kastav and Municipality of Matulji (HR) Pregrada, Zabok and Krapinske Toplice Pano Platres community council (CY) Pécs (HU) Borgo San Dalmazzo (IT)
OTHERS SECTORS **10%** 	Valbelluna Community (IT), Berceto (IT) Edessa (EL) Geemente Ede (NL), Haarlemmermeer(NL) Consell Comarcal del Moianès (ES) Lund (SE)
BUILDING INTERGATED RENEWABLES **7%** 	Asker (NO) Lubartow (PL), Świdnica (PL) São João da Madeira (PT) Montilla (ES)
SMART GRIDS **1%** 	Arcos de Valdevez (PT)

Intended Measures by Country: Detailed Overview

Belgium

MUNICIPALITY

Vallée Haute-Meuse (Grouping)

INVESTMENT SIZE
6.9
MILLION €

RENEWABLE ENERGIES
5.1
GWh/y

ENERGY SAVINGS
0
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The objective is to finance the creation of solar-power electricity production sites, by way of photovoltaic panels. The precise technology used may vary depending on technical studies for each site. Depending on technical data, the electricity produced could be self-consumed, injected into the network or stocked in batteries. Where applicable, higher panel structures might be needed (above roads, parking lots …). Some sites might be used directly to provide power for electrical vehicle charging stations.

TARGETED SECTORS

Innovative energy infrastructure

MUNICIPALITY

Intercommunale Leiedal (Public entity)

INVESTMENT SIZE
7.2
MILLION €

RENEWABLE ENERGIES
0
GWh/y

ENERGY SAVINGS
11.3
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The project is about 5th generation, low-temperature district heating & cooling (5GDHC), fed with heat from riothermia (the process of recovering heat from sewage waters). The project foresees the development of district heating pipes from the sewage water plant to the city of Menen and, within the city, a 2-pipe system with insulated pipes and delta T of 20°C due to upgrading the temperature at the sewage water plant with a central heat pump. It also foresees heat pump systems to upgrade from very low temperature to useable heat (regime of 65/45°C).

There will be a heat exchanger to extract heat from effluent water and adapted heating systems of end-users, including individual heating concepts and systems of the end-users (buildings), to connect to 5GDHC, including booster heat pumps in buildings. Key elements are also energy efficiency measures in the buildings of end-users, to reduce heat demand and peak demand by 20%. The engagement of ESCO is also planned to unburden the end-users.

TARGETED SECTORS

District heating

Belgium

MUNICIPALITY

Ranst

INVESTMENT SIZE
26.7
MILLION €

RENEWABLE ENERGIES
0
GWh/y

ENERGY SAVINGS
67.5
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The municipality of Ranst wants to lower its CO2 emissions by replacing the current heat source (natural gas) with a sustainable alternative: a citizen-owned district heating network based on aqua thermal and waste energy.
The project area consists of the centre of Oelegem (sub municipality of Ranst) and the business park Ter Straten. Two separate networks will be installed: the North network, delivering heat to the centre of Oelegem, and South Network, delivering heat to the business park.

The North Network consists of 900 meters of piping and can deliver heat to 120 buildings, of which the majority are individual houses. The source of heating will be a large-scale heat pump using surface water from the canal as its heat source.
The South Network consists of a 2000-meter network and can deliver heat to 30 industrial buildings. The source of heating will be either a large-scale aqua thermal heat pump or waste energy from a large chemical plant in the business park or a combination of both.

TARGETED SECTORS

District heating

Bulgaria

MUNICIPALITY

Ruse

INVESTMENT SIZE
56.3
MILLION €

RENEWABLE ENERGIES
2.8
GWh/y

ENERGY SAVINGS
46
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The Investment Concept aims at enhancing a four-component investment project.
In the first place, there is the acquisition of 20 hydrogen-powered buses and a hydrogen refuelling station. Secondly, they will build a solar PV plant for the production of “green” hydrogen involving the following components: i) solar PV panels; ii) solar inverters; iii) mounting structure and, iv) complementary PV system equipment such as combiner boxes, surge arresters, monitoring equipment, cables, etc.

In third place, there will be a renovation of the envelope of 50 residential buildings with the financial support of the National EE program or RRF, including the thermal insulation of walls, floors and ceilings and the replacement of windows. It is also planned to renovate over 26,000 sq.m. of public buildings (schools and kindergartens). Measures will include: i) improvement of heating systems; ii) thermal insulation of walls, floors and ceilings; iii) replacement of windows and iv) improvement of the building lighting systems.

TARGETED SECTORS

Sustainable urban mobility

Bulgaria

MUNICIPALITY

Razgrad

INVESTMENT SIZE
34.5
MILLION €

RENEWABLE ENERGIES
32.5
GWh/y

ENERGY SAVINGS
0
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The intended investment includes the construction and exploitation of a 25MW solar park for municipal needs (to replace 3250MWh/a from the grid) and industrial zone needs and clean H2 production for the industrial zone. In addition, there will be a 5MW solar park for municipal needs (to replace 3250MWh/a from the grid) and industrial zone needs and clean H2 production for the industrial zone.

Upon negotiations with a local gas supplier, there will be an inspection and renovation of existing pipelines to inject H2 to partially substitute gas for the industrial zone and H2 will be supplied in trailers for other industry needs. Industrial zone businesses will be consulted on needs and investment readiness at the beginning to make a business case and secure the market.

TARGETED SECTORS

Innovative energy infrastructure

MUNICIPALITY

Cherven Bryag

INVESTMENT SIZE
19.7
MILLION €

RENEWABLE ENERGIES
25
GWh/y

ENERGY SAVINGS
0.8
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The investment concept project includes three strands with technology measures.

The first strand refers to the integration of on-site hydrogen fuel-producing electrolyser systems into the heating systems of at least 10 public buildings. The Municipality of Cherven Bryag already has one pilot integration of a hydrogen-fuel-producing electrolyser system to the heating system of the public school “Dr Petar Beron”.

The second strand is the construction and putting in exploitation 20MW solar park to substitute the grid with renewable electricity used by the municipality, power H2 production, and for sale. Thirdly, there will be the construction and putting in exploitation of an H2 production facility powered by the solar park, which will produce clean hydrogen (zero emissions) to be compressed and bottled for sale or/and municipal use.

TARGETED SECTORS

Innovative energy infrastructure

Croatia

MUNICIPALITY

City of Kastav and Municipality of Matulji (Grouping)

INVESTMENT SIZE
291.8
MILLION €

RENEWABLE ENERGIES
37.3
GWh/y

ENERGY SAVINGS
117.5
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The innovative transport system, in interaction with internal subsystems and connections to the wider area, will enable a paradigm shift in mobility from ownership to a sharing economy rather than mere electrification. There will be a technology showcase space in a multimodal green hub, electric vehicles fleets as smart charging mobile storage to support RES penetration, efficient on-demand public transport complementary to sharing systems to optimize resources, park&ride services, zero-emission last mile solutions, etc.

All of this will result in energy optimization, emission reduction, reducing traffic congestion and financial savings. Innovative infrastructure in private and public locations will be a focal point for the synergy between the transport and energy systems, enabling the operation of the Microgrids and Smart Grid.

TARGETED SECTORS

Sustainable urban mobility

MUNICIPALITY

Pregrada, Zabok and Krapinske Toplice (Grouping)

INVESTMENT SIZE
12.3
MILLION €

RENEWABLE ENERGIES
0.7
GWh/y

ENERGY SAVINGS
10.7
GWh/y

MEASURES TO BE FINANCED AND SECTORS

With a larger accent on e-mobility, this project is heading closer to sustainable and more efficient transport. Urban mobility measures which are planned for analysis in the Integrated urban mobility plan for all three municipalities will be detailed in continuation.

A public bus line will be introduced to cover the Pregrada-Zabok route, with electric buses and the introduction of special transport for people with special needs and people with disabilities. Bicycle routes will be constructed, together with pedestrian paths and interventions in road infrastructure to address critical points in traffic.

There will be an implementation of the Park & Ride and Bike & Ride systems, a Bike Share system, and also the infrastructure for charging electric passenger cars at multiple locations. Finally, there will be the implementation of the Car Share system and the development of a traffic tracking application for web and mobile devices, synchronization of transport systems and implementation and integration of info points with timetables and other information.

TARGETED SECTORS

Sustainable urban mobility

Cyprus

MUNICIPALITY

Pano Platres community council (Grouping)

INVESTMENT SIZE
51
MILLION €

RENEWABLE ENERGIES
25.3
GWh/y

ENERGY SAVINGS
0.7
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The project for the Communities in Troodos includes the following measures, all aligned with the EIB energy lending policy: There will be a plan to unlock the potential of Energy Efficiency for public buildings including community centres, universities, schools, elderly care centres and sports centres.

There are plans to decarbonise Energy Supply using solar PV and/or micro hydro, green hydrogen production and storage. The council wishes to support innovative technologies and new types of energy infrastructure (solar integrated with electric vehicle charging, micro hydro with electric charging, battery storage/demand response, decentralised energy distribution). Lastly, there are plans to secure the enabling infrastructure through distributed energy, integration with renewables and the decarbonisation of heat in public buildings.

TARGETED SECTORS

Sustainable urban mobility

Czech Republic

MUNICIPALITY

Tábor

INVESTMENT SIZE
40.3
MILLION €

RENEWABLE ENERGIES
2.4
GWh/y

ENERGY SAVINGS
46.2
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The project has five pillars of technological measures. One measure refers to the production of solar electricity on the roofs of city buildings for their direct use in the buildings. There will also be a replacement of inefficient lighting sources with LED in public buildings (schools, offices and others). They foresee the thermo-insulation of public and residential buildings incl. other measures on the building envelope.

They also plan to replace old heat distribution routes (high energy losses) with new efficient district heating routes. These are the backbone distribution routes, placed about 10 km across the city of Tábor. Another part of the plan is to change the fuel base of the central heat source for district heating. They wish to reduce the share of coal by 100%, in favour of wood chips (89%) and natural gas (11%). The result is a very significant reduction in the share of fuels, with a high emission factor and a reduction in the cost of emission allowances.

TARGETED SECTORS

District heating

Denmark

MUNICIPALITY

Mikkeli (Grouping)

INVESTMENT SIZE

96

MILLION €

RENEWABLE ENERGIES

0

GWh/y

ENERGY SAVINGS

230

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The TERMUN (Termonet in MUNicipalities) investment concept (IC) aims to accelerate the transition from fossil heating to heat pumps but will not consist of one technical solution.

TERMUN IC works across the different solutions possible for establishing solutions. A 'thermometer' is a supply network that transports thermal energy from different types of energy sources. The network runs across many homes/buildings with a typical temperature of between 0 and 10 degrees. The investment needed to build a solution contains but is not limited to tendering and analysis of potential, foreseeing pipes and pumps in a horizontal or vertical system for the brine system, installing heat pumps in private houses and creating Service and billing systems.

TARGETED SECTORS

District heating

MUNICIPALITY

Hjørring

INVESTMENT SIZE

4.1

MILLION €

RENEWABLE ENERGIES

18.1

GWh/y

ENERGY SAVINGS

0

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The expansion of the district heating grid and utilization of surplus can be accomplished with existing technology. The planned new expansion of the Port of Hirtshals however, is planned to include a Power-to-X plant that will utilize electricity produced by local wind turbines and convert this into hydrogen fuel for large ferries.

The investment case aims at enabling energy decarbonisation through low or zero carbon technology while increasing financing for decentralized energy production at the port. The Municipality of Hjørring wants to make sure that sufficient grid investment will take place since it is essential for new, intermittent energy sources like wind and solar. Danish taxation system provides a unique opportunity to install solar panels on all existing buildings on the port, as these can be considered one block while being leased to individual companies. Under Danish law, this makes it favourable to produce and sell electricity via solar panels.

TARGETED SECTORS

District heating

Finland

MUNICIPALITY

Vaasa

INVESTMENT SIZE
52
MILLION €

RENEWABLE ENERGIES
0
GWh/y

ENERGY SAVINGS
53
GWh/y

MEASURES TO BE FINANCED AND SECTORS

Currently, there is a huge battery manufacturing ground being developed near the Vaasa airport, called GigaVaasa (https://www.gigavaasa.fi).

The total acreage reserved for the two first actors is about 140 hectares, which would be good for about 100.000 battery units for electric vehicles annually.
The plan is to use a quarry that is no longer in use as combined heat storage and process water pit.

The quarry is about 3 kilometres away from the actual area that is producing and further using, most of the stored heat. The quarry is to be covered in its entirety with a floating, isolated cover that allows expansion and minimises aeration. The storage volume of the quarry pit altogether would be 1,2 million cubic meters. By utilising this volume and one cycle per year, the actors of the city of Vaasa would avoid annually the production of about 53 GWh which would further equal a reduction of 42.870 tons of CO2 equivalent.

TARGETED SECTORS

Innovative energy infrastructure

MUNICIPALITY

Mikkeli

INVESTMENT SIZE
13
MILLION €

RENEWABLE ENERGIES
320
GWh/y

ENERGY SAVINGS
0
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The planned investment will include a heat pump plant and an increase in the capacity of the existing district heating network. The heat pump plant receives waste heat from a data centre and converts it into district heat. The capacity increase of the existing district heating network allows the transferring of heat from a data centre to the city centre.

The intended measures include a pre-feasibility study and development of an investment plan (engineering consultancy company, sourced via public tendering process) and a pre-feasibility study on a heat pump plant. There will be the required revisions to the existing district heating network to receive waste heat from a data centre. The technical solutions studied will represent BAT technology. In addition, there will be activities such as project coordination, reporting and communication activities, relations to project partners and stakeholders and tendering and management of purchasing services procurement.

TARGETED SECTORS

District heating

France

MUNICIPALITY

Roannais Agglomération (Public entity)

INVESTMENT SIZE

48

MILLION €

RENEWABLE ENERGIES

85

GWh/y

ENERGY SAVINGS

0

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The public entity wants to develop deep geothermal energy to produce renewable heat and electricity. Geophysical and geotechnical studies need to be conducted, including measurement campaigns and data treatment.

Once these studies are done, it will be possible to define more precisely where to drill, and the drilling depth and the applicant will have a better idea of the amount of heat and electricity it will be able to produce. It will then proceed with drilling and the construction of the geothermal power station and the associated heating network.

TARGETED SECTORS

Innovative energy infrastructure

Greece

MUNICIPALITY

Xylokastro-Evrostini

INVESTMENT SIZE

19.1

MILLION €

RENEWABLE ENERGIES

8.9

GWh/y

ENERGY SAVINGS

4.3

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The investment concept focuses on the energy upgrade of buildings and public lighting, the installation of building-scale renewables as well as the electrification of the municipal fleet.

The following interventions will be considered.
In buildings, there will be thermal insulation of the envelope of the buildings (walls, roof, windows) and the energy upgrade of HVAC systems and lighting systems. Overall, there will be the installation of building-integrated renewables to meet the remaining energy demand with non-fossil fuel energy.

They also plan the electrification of the municipal fleet; an upgrade of public lighting from conventional lamps to LEDs and the development of local “Green” Recycle Corners in each district across the entire municipal geographical boundaries.

TARGETED SECTORS

Public Buildings

Greece

MUNICIPALITY

Edessa

INVESTMENT SIZE

71.2

MILLION €

RENEWABLE ENERGIES

18.4

GWh/y

ENERGY SAVINGS

34.2

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The investment project will promote energy efficiency and RES with the most cost-effective projects.Firstly, 95 public buildings (40 offices and 55 schools), 100 private offices and 1,000 buildings in the residential sector constructed before 2000 will be renovated. The combination of the interventions will include the insulation of the building envelope (external walls, roof and windows with double glazes), the installation of heat pumps, the installation of energy-efficient lighting systems and the production of electricity from photovoltaics.

Secondly, 7 MW of RES stations will be installed (5 MW photovoltaic, 1 MW biomass and 1 MW small hydro stations) through the energy community. The energy for waste-water treatment and irrigation will be reduced,e-mobility will be promoted (520 vehicles) and in 1000 households energy poverty will be combated.

TARGETED SECTORS

Others

MUNICIPALITY

Vrilissia (Grouping)

INVESTMENT SIZE

63

MILLION €

RENEWABLE ENERGIES

0

GWh/y

ENERGY SAVINGS

93.9

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The proposed system consists of a hydrogen production unit combined with a PV (800 kW) unit (local and virtual net metering). The hydrogen (consumed directly or stored in a pressurized tank) will be produced by an electrolyser fed solely by PV electricity. The system will be connected with one H2 refuelling station, equipped with Fuel Cells and a Hydrogen (FCH) storage system to provide stability in supply. Four such systems will be deployed (one in each municipality).

The produced H2 in the refuelling stations will be fed into the new FCH municipal fleet (sweepers, bikes, mini-buses, garbage trucks, etc.), as well as the private vehicles with FCH technology. The new FCH municipal vehicles will cover both the authority's and the citizens' mobility and transportation needs. The private FCH vehicles are also a market segment targeted by the stations for refuelling services. One FCH train is also expected to be deployed by Agioi Anargyroi-Kamatero municipality, for intra-municipal mobility needs.

TARGETED SECTORS

Innovative energy infrastructure

Hungary

MUNICIPALITY

Municipality of the City of Szombathely

INVESTMENT SIZE
128.4
MILLION €

RENEWABLE ENERGIES
76.2
GWh/y

ENERGY SAVINGS
118
GWh/y

MEASURES TO BE FINANCED AND SECTORS

One-third of Szombathely's apartments are provided with heat energy and hot water by the municipal district heating company. The goal is to have the district heating's carbon emission decreased to half. For this, they will increase the efficiency of the district heating line system, combine the independent district divisions and increase to 50% the renewables from 9%.

In the case of public buildings, they will develop energy monitoring smart grid systems and make the city's public building energy deep renovation complete. The aim is that public buildings generate for themselves 20-50% of their energy demand with the locally available renewables, and with the installation of solar panels and heat pumps.

In the case of transport, the plan is to increase the ratio of bicycles, exchange the city's bus fleet for electrical and establish the necessary storage and solar power plant for the capacity needed for charging.

TARGETED SECTORS

District heating

MUNICIPALITY

Pécs

INVESTMENT SIZE
103.7
MILLION €

RENEWABLE ENERGIES
17
GWh/y

ENERGY SAVINGS
16.7
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The overall goal is the electrification of the local public transport. They aim toward the replacement of diesel buses with 140 e-buses and the reconstruction of a central site and repair station, which will include the installation of a solar park and electric charging infrastructure for 140 e-buses. Before the project, they will prepare the feasibility study based on EU templates. This document will contain a situation analysis, forward analysis, strategic and operative objectives, detailed scenarios, planned activities and (public) procurements, and a project schedule.

The feasibility study will be prepared by an external expert. Then, there will be a cost-benefit analysis (CBA): This document will be prepared based on EU templates just like the feasibility study. Taking into account that the CBA template contains very special financial details and information, the document will be prepared by an external financial expert. One of the most important documents is the decarbonisation plan, which will be prepared within the project because it contains the bus fleet replacement's expected impacts, the replacement schedule and also the expected impacts and results of CO2 emissions reduction.

TARGETED SECTORS

Sustainable urban mobility

Hungary

MUNICIPALITY

Szekszárd

INVESTMENT SIZE
38
MILLION €

RENEWABLE ENERGIES
72
GWh/y

ENERGY SAVINGS
0
GWh/y

MEASURES TO BE FINANCED AND SECTORS

It is necessary to prepare a development strategy and plan, based on which the district heating supply in Szekszárd can be improved. The aim is to promote the long-term competitiveness of district heating services, the economical operation of existing systems, environmental protection and energy management. All the heat sources in the district heating system in Szekszárd are currently based on natural gas, so it is necessary to reduce the dependence on fossil fuels and promote renewable energy supply to increase carbon neutrality.

For that reason a study design-level research on three basic developments required: the geothermal-based heat source, woodchip biomass boiler plant and the installation of several solar parks. The geothermal power plant and the biomass boiler plant could be connected to the Southern Heating Plant. The solar plant may be built from 2 to 6 solar parks with a capacity of less than 500 kVA.

TARGETED SECTORS

District heating

MUNICIPALITY

Kecskemet

INVESTMENT SIZE
92
MILLION €

RENEWABLE ENERGIES
89.3
GWh/y

ENERGY SAVINGS
33.7
GWh/y

MEASURES TO BE FINANCED AND SECTORS

One of the intended technology measures is to develop renewable energy production from solar systems installed on the roofs of urban buildings and other areas. They also plan to develop and implement a complex electromobility infrastructure, which will use the produced renewable energy.

There will also be a bus fleet with battery-powered buses and the installation of an electrical charging network. They wish to expand the photovoltaic production capacity with new installations, create hybrid energy management units with a management system and upgrade the district heating system with a geothermal power plant development by installing an electric boiler involved in tertiary control. The overall long-term plan of the city is to prepare an ELENA application and therefore, the Investment Concept is the first step and the basis of the planned ELENA project.

TARGETED SECTORS

Innovative energy infrastructure

Hungary

MUNICIPALITY

Erzsébetváros - Budapest

INVESTMENT SIZE

73

MILLION €

RENEWABLE ENERGIES

22

GWh/y

ENERGY SAVINGS

35.7

GWh/y

MEASURES TO BE FINANCED AND SECTORS

A prerequisite for achieving the district's energy targets is the renewal of the apartment house building stock, of which 90% were built before 1945 and are privately owned. The energy performance of these buildings heated almost exclusively with natural gas is very poor. Spearheading this change, the Municipality intends to renovate 31 buildings. The planned measures include thermal insulation, replacing windows and doors, installing solar panels on roofs and upgrading the grid (smart grid). Innovative solutions for thermal insulation in inner-city apartment buildings are needed to protect the cityscape.

In addition, Erzsébetváros aims to include around 300 privately owned buildings in the longer term. As part of the financing strategy of the investment concept, a revolving building renovation fund model will be developed. That fund could accelerate the renewal of properties and allow owners to finance the costs from their energy efficiency savings.

TARGETED SECTORS

Residential buildings

Ireland

MUNICIPALITY

Donegal County Council (Grouping)

INVESTMENT SIZE

21.5

MILLION €

RENEWABLE ENERGIES

44.8

GWh/y

ENERGY SAVINGS

2.13

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Before the year2030, the Council wishes to implement a deep retrofit of 33,000 dwellings to achieve a Band B2 BER/ EPC, thermal insulation and replace 26,000 oil-fired burners with renewable energy sources. There will be a solar PV Installation in Public, Commercial and Domestic Buildings totalling c. €106.8m.

They also foresee the replacement of 53,000 passenger vehicles with EVs, and the installation of Fast chargers to facilitate 53,000 electric vehicles. They will investigate opportunities to build & operate microgrids. In 9,000 Commercial buildings, they plan to install solar PV and LED lighting, in 10% and 20% respectively. There will also be heat pumps and thermal insulation in commercial buildings. In Public buildings, there will be LED lighting upgrades, heating system upgrades to renewable sources and thermal insulation. Finally, there will be 38 zero-emission battery electric buses by 2023.

TARGETED SECTORS

Residential buildings

Ireland

MUNICIPALITY

South Dublin (Public entity)

INVESTMENT SIZE

7.5

MILLION €

RENEWABLE ENERGIES

0

GWh/y

ENERGY SAVINGS

11.4

GWh/y

MEASURES TO BE FINANCED AND SECTORS

This project suggests the utilization of a local heat resource through the local District Heating Network (DHN). Expansion of the DHN based on the waste heat from a data centre connecting both existing buildings and planned new buildings are foreseen (both public and apartment buildings).

The local hospital has made an agreement on investing in a local CHP plant using natural gas and, in this project, they will analyse options of using this plant as a back-up to the waste heat-based system and therefore potentially linking the hospital DHN with the new DHN for Tallaght.

TARGETED SECTORS

District heating

Italy

MUNICIPALITY

Berceto

INVESTMENT SIZE

22.6

MILLION €

RENEWABLE ENERGIES

4.6

GWh/y

ENERGY SAVINGS

8.8

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The Investment Concept in Berceto will include the creation of two mixed public/private Renewable Energy Communities (RECs), which will be open to the whole territory. They will purchase machinery and equipment for forest maintenance. In addition, they will design, install and operate three biomass gasification plants of around 100 kW each.

The electricity produced will be consumed by all of the associated parties, whilst the thermal energy will be used to power an artisanal area. There will be the assessment and feasibility studies for other RES sources (mini-hydro in old mills). They foresee the redevelopment of the public lighting network (876 lighting points) and the replacement of LPG boilers with Heat Pumps in residential buildings (678).

TARGETED SECTORS

Others

Italy

MUNICIPALITY

Valbelluna Community (Grouping)

INVESTMENT SIZE

762

MILLION €

RENEWABLE ENERGIES

51.5

GWh/y

ENERGY SAVINGS

236

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Given the broad approach of the IC, several RES technologies and EE measures will be considered at different scales and in different sectors, depending on the needs brought by the users to the existing one-stop shop. Regarding renewables, the priority solutions will be photovoltaic, solar thermal and biomass boilers. As for energy efficiency, building integrated renovation measures (window frames, insulations, plant renovation and revamping) will be included.

Despite this wide approach, some segments will be most likely addressed, namely the residential and the tertiary private sectors, also because of their relevance in the SEAPs and their higher potential for reducing energy consumption and CO2 emissions. This prioritization is also reflected in the way the size of investment and the expected impacts were calculated since higher shares were assigned to these two sectors.

TARGETED SECTORS

Others

Italy

MUNICIPALITY

Borgo San Dalmazzo (Grouping)

INVESTMENT SIZE

44.2

MILLION €

RENEWABLE ENERGIES

26.7

GWh/y

ENERGY SAVINGS

0.5

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The measures that will be considered are completely aligned with the EIB energy lending policy and contribute to achieving the 2030 EU target.

There are plans for integrated renewable power plants (PV or hydroelectric) on public/private buildings or aqueduct networks connected with recharging networks for e-vehicles (EV) within Renewable Energy Communities (RECs). They will also develop storage, bidirectional EV chargers, and the replacement of bus and municipality vehicles with new EV or hydrogen vehicles (HV).

There will be a new sustainable goods transport for urban city centre as EV or sloping elevator (mainly in Cuneo), new EV or HV for goods transport from production site to intermodal centres. Finally, there is a plan to create green hydrogen production systems and refuelling stations for HV.

All these measures will be included in new mobility services to be defined within the IC and co-designed with local companies. The services will concern, for example, shared and sustainable mobility for employees and tourists and goods to and from the mountain valleys and historical centres.

TARGETED SECTORS

Sustainable urban mobility

Italy

MUNICIPALITY

Unione della Romagna Faentina (URF)

(Public entity)

INVESTMENT SIZE

41.8

MILLION €

RENEWABLE ENERGIES

1

GWh/y

ENERGY SAVINGS

31

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The project foresees the implementation of actions in six cities of the URF to promote a deep retrofit in 56 public buildings and 20 private condominiums, and the installation of renewable generation systems based on collective energy schemes, considering Renewable Energy Communities (REC) and Collective Self-Consumption (CSC) legal forms.

The project will include feasibility studies to support the implementation of deep energy retrofits and those that support the installation of photovoltaic panels, battery storage with EV charging sockets and smart devices. These devices can monitor the energy production and consumption in real-time and allow a smooth renewable energy installation, based on collective energy schemes (REC and CSC) There will also be a business model development to perform the retrofit interventions and system deployment and accompanying communication activities. The technology measures launched with technical assistance are designed according to the new European Investment Bank (EIB) energy lending policy.

TARGETED SECTORS

Public Buildings

Italy

MUNICIPALITY

Unione dei Comuni Valli del Reno, Lavino e Samoggia (Public entity)

INVESTMENT SIZE

15.8

MILLION €

RENEWABLE ENERGIES

7.7

GWh/y

ENERGY SAVINGS

3

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Firstly, renewable energy sources will be integrated into buildings. Based on the regulatory framework, a maximum of 200 kWp PV (with related storage and energy boxes and energy management) will be installed in each city, grouping 3 condos and 1 public building each, for a total of 15 residential buildings and 5 public buildings.

They also plan to develop five Energy Parks with 1MWp of PV in each city. In terms of energy efficiency of residential and public buildings, they will perform retrofitting interventions such as thermal insulation, windows replacement, heating system/HVAC revamping and internal lighting substitution on the aforementioned 20 buildings (15 residential buildings and 5 public buildings). Finally, as concerns sustainable urban mobility, they will install 2 e-shelters charging stations across five parking lots (one in each municipality), 10 overall, fed by 5 PV plants of 40 kW plus storage each, for EV charging.

TARGETED SECTORS

Residential Buildings

MUNICIPALITY

Milan Municipality

INVESTMENT SIZE

82.8

MILLION €

RENEWABLE ENERGIES

12.5

GWh/y

ENERGY SAVINGS

33.1

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Technology measures have been estimated based on a real case, the Natural History Museum (200 years old; 77.000 m3), scaled up to its museum district and then to all four cultural districts in Milan (approx. 880.000 m3), concerning public buildings.

The measures that will be performed are, in the first place, the thermal insulation of the building shell: new windows (same style) and the insulation of the roof and a portion of walls (internal insulation – external being unauthorized). There are also plans to instal photovoltaic panels on the roof.

There will be a retrofit of the HVAC system, in terms of existing fossil fuel (e.g. diesel) heating system that will be with reversible electric water heat pumps. Ventilation units will be retrofitted as well, possibly with heat recovery, including radiators. A new interior lighting system will be installed with LED – BEMS, with automatic control and modulation of lighting and HVAC systems (based on occupancy as well as hygrometric levels to be observed due to existing natural materials within the museum).

TARGETED SECTORS

Public Buildings

Latvia

MUNICIPALITY

Adazi

INVESTMENT SIZE

14.6

MILLION €

RENEWABLE ENERGIES

12.9

GWh/y

ENERGY SAVINGS

1.1

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The project involves a study, assessing the feasibility of several measures related to RES throughout the Adazi district. One of the issues is the deployment of RES in Carnikava parish, with the current 14 gas boiler houses to be replaced with a centralized system using RES. In the village of Kadaga, (population of around 2200), the aim is to justify the introduction of RES in the already existing district heating system.

The measure "Promotion of the use of renewable energy resources in district heating" will be the subject of an application for credit from the European Investment Bank. Both the municipality and heating operators and the population will be able to obtain an economic justification for the efficiency and benefits of the deployment of RES.

TARGETED SECTORS

District heating

MUNICIPALITY

Tukums

INVESTMENT SIZE

52.9

MILLION €

RENEWABLE ENERGIES

0.3

GWh/y

ENERGY SAVINGS

12.1

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Tukums intends to reduce heat energy consumption by 40% and electricity by 30% in 10 buildings. It is planned to ensure comprehensive reconstruction of the selected public municipal buildings, which will ensure a significant reduction of energy usage in the buildings. These measures usually include insulation of the building facade, refurbishment of the heating and hot water systems, change of windows, insulation of roof and basement, installation of solar PV panels and other measures.

In the case of the Ice Hall, technical measures would be the installation of a new freezing system and heat recovery system, replacement of the lighting, installation of solar PV panels, construction of a snow melting pit, installation of a new ventilation system and renovation of the building.

These measures are crucial as these buildings consume a lot of energy and have not been refurbished since their construction (20-30 years).

TARGETED SECTORS

Public Buildings

Latvia

MUNICIPALITY

Jurmala Council

INVESTMENT SIZE

19.9

MILLION €

RENEWABLE ENERGIES

1.9

GWh/y

ENERGY SAVINGS

23.6

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Measures foreseen are the deep retrofit of public buildings such as insulation, replacement of the ventilation system, replacement of doors and windows, replacement of the heating supply system and LED lighting.

In addition, the aim is to also develop a solar park, with 5400 new PV panels, reconversion of DH boilers from natural gas to wood chip and the replacement of more than 8 000 public street lights from mercury vapour and high-pressure sodium-vapour technology to LED.

TARGETED SECTORS

Innovative energy infrastructure

Lithuania

MUNICIPALITY

Elektrenai

INVESTMENT SIZE

13.2

MILLION €

RENEWABLE ENERGIES

0

GWh/y

ENERGY SAVINGS

13.8

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Essentially there are two measures foreseen: In the first place, district heating relies on the use of biomass (primarily wood pellets) for central heating of buildings and offers significantly lower air pollution and carbon emissions than using natural gas as a fuel.
In the second place, the measure will refer to compressed natural gas (CNG) powered public transport. The aim is to replace public transport vehicles (buses) which use diesel fuel with compressed natural gas (CNG) powered vehicles to reduce carbon emissions.

Furthermore, the measure is feasible and consistent because the city of Elektrenai at the time of the EUCF application already has a CNG fueling station eliminating the need for additional investments in equipment to fuel the vehicles.

TARGETED SECTORS

District heating

Netherlands

MUNICIPALITY

Groningen

INVESTMENT SIZE

280

MILLION €

RENEWABLE ENERGIES

100

GWh/y

ENERGY SAVINGS

121

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The project will proceed in many phases. For phase 1, residual heat from two data centres on the nearby Zernike Campus will be used as heat sources. Solar heating collectors (Dorkwerd) will also provide heat.

For the next phases, residual heat from Solidus (the company producing fibre-based packaging) and Cosun Beet Company (sugar beet processor), located in Hoogkerk, are studied as heat sources. On a regional scale, more potential residual heat sources are available from the industry in Delfzijl/Eemshaven. The feasibility of these potential heat sources is also currently studied.

The city will continue to monitor developments of other potential future heat sources, including low local temperature sources, such as aqua thermal or ground source heat/residual heat from local businesses, as well as geothermal energy.

The market for heat sources is dynamic. This requires maximum flexibility. In phase 1, the decision is to construct a network that can handle high temperatures (90 °C). This reduces the costs and disruption in case a change of heat source is made in the future.

TARGETED SECTORS

District heating

MUNICIPALITY

Haarlemmermeer

INVESTMENT SIZE

72.6

MILLION €

RENEWABLE ENERGIES

58

GWh/y

ENERGY SAVINGS

0

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The focus of this project is PV technologies. Regular large-scale PV systems require roof reinforcement measures to strengthen the bearing capacity. This problem mainly concerns large utility buildings. Because of the additional costs, the business case becomes less profitable, and the PVs are not purchased. Therefore, this investment concept promotes the use of innovative lightweight solar panels. Since the panels are lighter, reinforcement is not necessary. Hence, the technical feasibility study.

In the solar park projects, they endorse PV systems that benefit landscape integration and soil quality. For example, regular PV lets less light through, which in turn causes soil degradation. New bi-facial PV panels overcome this problem by not having a dark back panel on which the solar cells are placed. Instead, it contains glass on both sides and captures the light that passes through the back panel. As a result, the power output is significantly higher, and the soil quality is maintained.

TARGETED SECTORS

Others

Netherlands

MUNICIPALITY

Uithoorn (Grouping)

INVESTMENT SIZE

60.5

MILLION €

RENEWABLE ENERGIES

0

GWh/y

ENERGY SAVINGS

400

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Intended measures comprise the establishment of a heating grid of approximately 30 km between the greenhouse clusters in Greenport Aalsmeer, including 'T' sections where local heat sources and residential neighbourhoods and business parks can collectively connect to the grid.

The technical scope includes a 30 km heating grid including T-sections. In addition, there will be a connection to the Greenhouse heating system of up to 300 hectares of greenhouses, including heat exchanger units. They also plan a connection to geothermal heating projects in the greenhouse area's PrimA4a and De Kwakel-Kudelstaar. They also foresee, within the investment, monitoring and control systems, installation and commissioning and development costs such as engineering, contracting and permits. The development of geothermal wells (PrimA4a and Kudelstaart) is expected in the area but is not included in the scope of this investment concept.

TARGETED SECTORS

District heating

MUNICIPALITY

Beemster

INVESTMENT SIZE

13.1

MILLION €

RENEWABLE ENERGIES

11.1

GWh/y

ENERGY SAVINGS

1.4

GWh/y

MEASURES TO BE FINANCED AND SECTORS

After making an inventory of the (needed) adjustments and engineering analysis, an investment plan is drawn up. This creates clarity regarding the financial feasibility of switching from individual central heating boilers in residential buildings to sustainable district heating.

To achieve this, adjustments to the public space (infrastructure) and adjustments to the residential buildings will be made. The latter will be done through consultation with the owners/citizens. The residential buildings are located in two different districts in the municipality of Purmerend and Beemster. In Middenbeemster (municipality of Beemster), approximately 600 houses need to be inspected to draw up an investment plan. Before this, 470 houses need to be inspected in the second district, Overwhere- Zuid (municipality Purmerend).

TARGETED SECTORS

District heating

Netherlands

MUNICIPALITY

Gemeente Ede

INVESTMENT SIZE

250

MILLION €

RENEWABLE ENERGIES

238

GWh/y

ENERGY SAVINGS

0

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Creation of a regional development fund for a local and regional production of sustainable energy (wind and solar) that will have a 50% of local ownership and management by citizens.

International cooperation with partners in the Global South with programmes on climate mitigation and adaptation will be explored. The fund will be created by putting a levy on electricity and natural gas consumption by all actors providing public services in the municipalities of the region involved, which represent 9-10% of the energy consumption of the region. The levies will replace the currently Guarantees of Origin and CO2 offsetting. The Development Fund aims to target the public service sector with near 100% sustainable energy coverage by 2030/2035.

TARGETED SECTORS

Others

MUNICIPALITY

Zeist

INVESTMENT SIZE

280.6

MILLION €

RENEWABLE ENERGIES

4.3

GWh/y

ENERGY SAVINGS

104

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The focus of the ESCo is to reduce energy consumption and, if convenient, implement heat and renewable energy solutions. The project focuses on the renovation of housing to a higher energy standard: insulation, and restoration, and it may include integrating renewables (e.g. solar panels) and the heating system as an integral part of the energy system of residential buildings, or buildings for small businesses.

The research mainly focuses on the needs and demands of the dwellers, as they may differ per area or house. An ESCo should be accepted as a solution by residents and therefore be able to meet their needs. Increasing energy standards coincides with an increase in comfort, healthy living programmes, poverty reduction and generation-proof housing, making business cases viable. In Austerlitz (a village in Zeist) as a pilot, a particular focus is on generation-proof housing, as many of the residents are elderly people.

TARGETED SECTORS

Residential buildings

Netherlands

MUNICIPALITY

Smallingerland

INVESTMENT SIZE

603.0

MILLION €

RENEWABLE ENERGIES

0

GWh/y

ENERGY SAVINGS

286.9

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Several analyses in 2021 (for the Transitievisie Warmte) have shown that for the township, heat pump systems are the best option for 84% of the (existing) houses (ca. 21,000 houses) towards fossil-free heating.

In the 'Transitievisie Warmte', three scenarios of heating were calculated for three different types of houses. This is the first indication of the needed measures and costs. On average, it can be said that the following measures are needed towards making households fossil-free: insulation, heat pumps, radiators (or underfloor heating), induction cookers and ventilation.

TARGETED SECTORS

Residential buildings

Norway

MUNICIPALITY

Asker

INVESTMENT SIZE

7.5

MILLION €

RENEWABLE ENERGIES

5.4

GWh/y

ENERGY SAVINGS

3.1

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The analysis will advise whether Asker should maintain and modernize the bioenergy district heating plant or replace it with other innovative and sustainable energy solutions, e.g. thermal energy from geothermal heat wells, potentially in combination with solar collectors and solar panels.

Analyzing opportunities, risks and costs is necessary to advance a political process for determining which investments Asker should approach to become self-sufficient with zero-emission energy for its buildings and facilities in the area.

Perspectives for the analysis: cost and energy-effective emission-reducing alternatives.

Environmental elements: emissions, production, transport & logistics. Financing/investment, societal perspectives/ responsibilities in energy supply to other actors (public and private residents), and timeline calculations for prospect systems. Grid electricity is zero emission hydropower.

TARGETED SECTORS

Building integrated renewables

Poland

MUNICIPALITY

Bydgoszcz

INVESTMENT SIZE

31.2

MILLION €

RENEWABLE ENERGIES

38.9

GWh/y

ENERGY SAVINGS

0

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The project consists of the construction of PV farms with demonstration hydrogen storage on the brownfields: unused land and landfill. The planned farms are maintenance-free installations. The operation of the PV farm consists of the production of electricity from generators, photovoltaics and conversion to alternating power through inverters. The basic element is the solar panel. The panels will be attached to a steel structure, anchored directly in the ground. Approximately 1600 panels with a peak power of 0.4 kW each are estimated.

The farm will consist of the following: PV panels, internal roads, above-ground and underground infrastructure, energy-fibre cable lines, power connections, inverters, other necessary elements and monitoring.
The surplus energy will be stored in a demonstration H2 storage. The stored H2 will be converted back into electricity and sold at a time of higher price or to power the City during the night valley periods.

TARGETED SECTORS

Innovative energy infrastructure

MUNICIPALITY

Krosno

INVESTMENT SIZE

160.6

MILLION €

RENEWABLE ENERGIES

65.2

GWh/y

ENERGY SAVINGS

164.5

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Krosno intends to implement the Green Deal and achieve climate neutrality by 2050. The town works around a development map for carbon neutrality. Bearing in mind these plans, two stages are planned: 2021-2030 and 2030-2040.

Phase 1 will be carried out to simultaneously create components that complement each other within phase 1, but phase 2 will also be built complementarily. Investments will be implemented on public, private, and housing resources, taking into account preparatory and analytical works. They will require appropriate financial outlays as well as the involvement and consent of stakeholders.
Both phases take into account the development of RES and “green” energy islands, hydrogen technologies, or local low-temperature heating networks and the concept of distributed and civic energy. All of these are aligned with the EIB energy lending policy.

TARGETED SECTORS

Residential buildings

Poland

MUNICIPALITY

Bytom

INVESTMENT SIZE
36.7
MILLION €

RENEWABLE ENERGIES
77
GWh/y

ENERGY SAVINGS
67.7
GWh/y

TARGETED SECTORS

District heating

The mplementation of the investment concept will allow the transformation of a district heating plant, producing district heat exclusively based on fine coal, into a combined heat and power plant that will produce heat and electricity based on RES sources and low-emission technologies.

The implementation of the investment measures will make it possible to achieve approx. 10.5 MWt and 3.5 MWe - power obtained from the Thermal Waste Processing Installation. The estimated amount of biogas produced is 2.8 million m3/year of biogas. There will also be 1.6 mln m3/year of landfill gas obtained.

The amount of clean energy obtained from co-firing biogas and biomethane in a gas engine (and also hydrogen in the long term) will be 75,000 GJ/year and 27,600 MWh/year and1.6 mln m3/year of landfill gas will be obtained. Lastly, approximately 25,000 Mg/year is the amount that will be obtained, hydrated, and digestated to be reused in the Waste Incineration Plant Instalacja Termicznego Przekształcania Odpadów (ITPO) installation.

MUNICIPALITY

Świdnica

INVESTMENT SIZE
12.8
MILLION €

RENEWABLE ENERGIES
4.9
GWh/y

ENERGY SAVINGS
6.8
GWh/y

MEASURES TO BE FINANCED AND SECTORS

Some of the measures foreseen include thermal insulation of building partitions (15 public and 16 residential buildings) and mechanical ventilation with recuperation (23 public and 16 residential buildings).

In terms of renewable energy sources, on both public buildings and residential buildings there will be photovoltaic installations on roofs, wind microturbines, removal of fossil fuel sources, heat pumps with internal installations of the building and Energy management system in buildings.

Lastly, as refers to smart grids, software and hardware for the municipal decentralized intelligent energy management system (VMES) will also be part of the measures.

TARGETED SECTORS

Building integrated renewables

Poland

MUNICIPALITY

Lubartow

INVESTMENT SIZE

46.6

MILLION €

RENEWABLE ENERGIES

80

GWh/y

ENERGY SAVINGS

19.4

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The concept of the city's energy balance is based on several pillars. They will be implemented by the city and municipal companies, depending on the component. The municipal waterworks and sewage system company will implement a part with photovoltaic farm and energy storage, public transport and the re-use of renewed water per Regulation (EU) 2020/741 of the European Parliament and the Council on minimum requirements for water reuse.

Another component, based on cogeneration of heat and energy and its distribution to end users, will be implemented by the municipal heating company. The companies will also provide a financial own contribution at the stage of project implementation. The component related to the construction of photovoltaic installations in public buildings and residents' homes will be implemented by the City of Lubartow, and the financial contribution will come from the city budget and the participants of the task.

TARGETED SECTORS

Building integrated renewabless

MUNICIPALITY

Nowy Targ

INVESTMENT SIZE

46.2

MILLION €

RENEWABLE ENERGIES

16.3

GWh/y

ENERGY SAVINGS

62.5

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Implementation of projects related to the improvement of energy efficiency of public buildings and private buildings and the increase in the use of renewable energy sources in the city of Nowy Targ. Among intended measures are photovoltaic installations with a total power of 210 kW on 4 public buildings together with the installation of renewable energy in the form of heat pumps for domestic hot water and central heating for 10 public buildings.

Implementation of energy management systems in public buildings is foreseen with the thermomodernisation of four public buildings. For the residential sector, it is planned to install 1 190 renewable energy installations - photovoltaics and further also heat pumps and biomass boilers. Thermomodernisation of 1430 residential buildings is foreseen and it is also planned to develop and modernize the heating network in the city centre, and the expansion of the heating network in the light of the streets located in the southern part of the city.

TARGETED SECTORS

Residential buildings

Poland

MUNICIPALITY

Czechowice-Dziedzice

INVESTMENT SIZE

26.2

MILLION €

RENEWABLE ENERGIES

15.5

GWh/y

ENERGY SAVINGS

12.5

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The amount needed to prepare the feasibility study for the construction of an energy complex in Czechowice-Dziedzice may exceed the grant amount.

Since the energy complex is at a preliminary stage, the Commune cannot define the source and amount of financing. One of the essential parts of the feasibility study is the financial analysis of the project, which can indicate the possible activities and financial resources to be involved.

The development of the feasibility study for the energy complex will allow to set directions for action and indicate the activities needed to complete the investment.

TARGETED SECTORS

District heating

MUNICIPALITY

Radłów

INVESTMENT SIZE

23.1

MILLION €

RENEWABLE ENERGIES

8.9

GWh/y

ENERGY SAVINGS

37.7

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The project will aim to develop a coherent concept for the implementation of projects related to the improvement of energy efficiency of public buildings and private buildings and the increase in the use of renewable energy sources in the City and Commune of Radłów.

As part of the action, photovoltaic installations with a total power of 300 kW on four public buildings and heat pump installations for domestic hot water and central heating for 14 public buildings are planned. The project will focus on the thermomodernisation of 15 public buildings and 750 private buildings. The project foresees implementation of energy-saving street lighting in which the modernisation consists of the replacement of sodium lamps with LED lighting (700 light points are planned).

TARGETED SECTORS

Residential buildings

Portugal

MUNICIPALITY

Bragança and other municipalities of the Terra Fria (Grouping)

INVESTMENT SIZE

85.1

MILLION €

RENEWABLE ENERGIES

150

GWh/y

ENERGY SAVINGS

199

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The intended measures of this investment concept are the deployment of a wind farm in combination with a smart grid for its management and heat pump installation for heating and cooling. These measures shall be applied to the five municipalities of Terra Fria.

The Wind Farm shall have an installed capacity of 57MW that will produce renewable energy for powering with the heating pumps and generating heat and cooling for buildings, and for powering the municipalities' electricity grids with local green energy. There will also be its use for injecting power into the grid.

The heat pumps allow not only increase efficiency in the heating and cooling systems but also replace old wood, heating oil and gas combustion and plug-in electric heaters in buildings that have very low efficiency. In addition, the heat pumps can replace fans and other non-efficient cooling methods during warmer seasons.

TARGETED SECTORS

Residential buildings

MUNICIPALITY

Maia

INVESTMENT SIZE

89.3

MILLION €

RENEWABLE ENERGIES

127.5

GWh/y

ENERGY SAVINGS

21.4

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Maia, within its SEAP 2030 and Living Lab vision, identified several key measures related to public and residential buildings, solar power, renewable energy communities and more. In terms of public buildings renovation, the central theme is Energy efficiency in public buildings and facilities (143 buildings), such as lighting and HVAC systems renovation.

For residential buildings, the focus is on social housing renovation: energy efficiency in buildings that will reduce energy poverty (2 447 dwellings), with measures such as thermal insulation of facades and roofs and solar panels for domestic hot water production. They also plan the implementation of an additional 470 kWp of self-consumption PV system in municipal buildings.

They also aim the creation of renewable energy communities in 45 social housing districts (2 MW). They wish to install a remote management system in the city (24 476 LED) to improve street lighting. As to district heating: residual thermal energy recovery in the Waste Management plant is planned to support neighbourhood heating needs (airport and industrial facilities).

TARGETED SECTORS

Public Buildings

Portugal

MUNICIPALITY

Ovar

INVESTMENT SIZE

28.3

MILLION €

RENEWABLE ENERGIES

30

GWh/y

ENERGY SAVINGS

15.2

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The Energy Community of Ovar (ECO) will serve as the territory's framework for widespread investment in energy efficiency and renewable energy solutions aiming to reach municipal carbon neutrality in 2030. Collective procurement measures will be done for energy efficiency and building renovation actions.

They plan the installation of 20 MW of solar PV, 10 electric chargers, e-bikes and related systems, and 5000 m2 of solar hot water panels. There will be energy management within the community, with particular emphasis on electricity, allowing citizens to sell potential electricity production surplus to other members of the community and fostering the provision of flexibility by building users.

Lastly, they plan to enable community members to convert credits obtained from the sale of energy surpluses into goods and services provided within the community (e.g. local grocery shops or markets, public transportation), which will promote local businesses.

TARGETED SECTORS

Public Buildings

MUNICIPALITY

Oeiras

INVESTMENT SIZE

148.9

MILLION €

RENEWABLE ENERGIES

87.9

GWh/y

ENERGY SAVINGS

19.4

GWh/y

MEASURES TO BE FINANCED AND SECTORS

There is a case study for schools in the Oeiras municipality that is intended to be replicated in other public facilities and industry and business parks, which includes measures that will bring significant energy savings and emission reductions. The measures include the replacement of wall and roof insulation and windows.

They plan to install systems that monitor consumption levels. They will substitute the interior and exterior lighting. They will also replace all-electric radiators with direct expansion split-type units and install a new solar rooftop PV for self-consumption.

TARGETED SECTORS

Public Buildings

Portugal

MUNICIPALITY

Arcos de Valdevez

INVESTMENT SIZE

40.1

MILLION €

RENEWABLE ENERGIES

66

GWh/y

ENERGY SAVINGS

0

GWh/y

MEASURES TO BE FINANCED AND SECTORS

Firstly, the project is about collecting aerial image data for calculation of biomass potential, considering factors such as susceptible areas, vegetation species, fauna and history of forest fires.

The idea is to obtain spectral data of the municipality biome and process RGB (Red, Green, and Blue colour composites) images to calculate the vegetation index. Then, they will make a sampling network in various parts of the municipality, and thus complement with concrete results the measurement of biomass through laboratory analysis.

With the combination of aerial image data and laboratory analyses, a map will be created to easily assess the most appropriate locations to make the collection of biomass, as well as a database with all the values measured. They will carry out a viability study for the implementation of a biomass central and its energy efficiency, considering the quantities estimated to be available as fuel in the municipality and other close biomass providers.

TARGETED SECTORS

Innovative energy infrastructure

Portugal

MUNICIPALITY

São João da Madeira (Grouping)

INVESTMENT SIZE
27.1
MILLION €

RENEWABLE ENERGIES
21.8
GWh/y

ENERGY SAVINGS
9.7
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The investment concept will focus on three main areas: Public Lighting, Renewable Energies and Energy Poverty. The objective of the first is to substitute inefficient lighting with LED and incorporate a smart management system.

For this to be possible, the municipalities will need to obtain the grid management, a possibility foreseen in the future legislation to be released. Having this in mind, a Smart-City approach will then be possible to develop along with electrical vehicle charging systems supported in the public lighting grid, along with other strategies for financing purposes (publicity, city internet, etc.).

The second investment area will focus on renewable energy communities supported by photovoltaic systems. This is being implemented in municipal or private buildings. The third and last investment area will focus on the needs of a specific population to tackle energy poverty, focusing on building envelop improvement and PV integration.

TARGETED SECTORS

Building integrated renewables

Romania

MUNICIPALITY

Onesti

INVESTMENT SIZE
57.2
MILLION €

RENEWABLE ENERGIES
27.1
GWh/y

ENERGY SAVINGS
31
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The investment concept targets three main measures to increase energy efficiency, enhance renewable energy production and reduce GHG emissions. In the first place, there is the creation of a green hydrogen ecosystem by building a heavy & light duty traffic Hydrogen Refuelling Station (HRS), a green H2 production unit connected to a mixed solar and wind power generation system, and an H2 compression and storage facility.

The ecosystem is also created by replacing the current diesel buses and public cleaning & maintenance trucks (>20 years old) with hydrogen-fuelled vehicles (FCEV). Green H2 needs to be used for heating in the public buildings included in the renovation program. In the second place, there is a set of residential and public building retrofits (> 40 years old), incl. the representative municipal sports facilities, for increased energy efficiency including an integrated PV roof system & energy storage and installation of an H2 suitable heating system. Lastly, there is foreseen to install intelligent LED street lighting and traffic lights.

TARGETED SECTORS

Public Buildings

Romania

MUNICIPALITY

Sfantu Gheorghe

INVESTMENT SIZE

45.5

MILLION €

RENEWABLE ENERGIES

11.4

GWh/y

ENERGY SAVINGS

8.3

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The plan is to insulate public buildings insulation and build a Solar Car Park with 400 parking places. The solar roof will charge the electric vehicles and provide electrical energy to the grid. Solar capacities will be installed on five public buildings during the renovations.

They foresee the replacement of public lighting with LED panels. The city plans to introduce sensors in trash bins to optimize the collecting routes and reduce operational costs (waste management). They also wish to extend the E-bus fleet and purchase 12 new electric buses.

The current solar power plant will be extended by 6 hectares with 9600 panels. Finally, there is a plan to establish a biogas facility that uses agricultural waste and by-products.

TARGETED SECTORS

Smart Grids

Slovenia

MUNICIPALITY

Grosuplje (Grouping)

INVESTMENT SIZE

17.1

MILLION €

RENEWABLE ENERGIES

4.7

GWh/y

ENERGY SAVINGS

3.9

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The following measures are envisaged to increase energy efficiency in 37 public buildings: users' awareness raising of energy efficiency, thermal insulation of the building envelope (17,613 m2; 150 mm insulation thickness) and replacement of 14,090 m2 windows and doors (U-value 1,1). In terms of renewables, it is foreseen to install solar PV on 53 public buildings and a new solar roof-top PV installation of 2,814.4 kWp.

In addition, the replacement of old heating boilers with a RES system will be done in 20 public buildings:
Public lighting optimization will also be done through the replacement of 865 poles, 850 lamps (LED technology), replacement of 20 km cables and conversion of lighting stations to 40 pcs.

TARGETED SECTORS

Public Buildings

Spain

MUNICIPALITY

Montilla

INVESTMENT SIZE
24.1
MILLION €

RENEWABLE ENERGIES
27.1
GWh/y

ENERGY SAVINGS
1.4
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The following measures are foreseen to set up a local energy community (LEC) in the municipality to develop a set of actions to improve energy efficiency and reduce local energy demand. They foresee the installation of solar PV integrated with public and private buildings to reduce their demand and share with others.

Also, they will install solar PV in the municipal grid (or closest grids) to benefit the overall municipal RES production, reducing local energy demand, improving grid efficiency and supporting the smart city concept. These two PV installation measures are the basis for the Local Energy Community, including social and environmental benefits.

There is also the aim to renovate 10.000 m2 of public buildings to reduce their energy demand, an average of 50% energy savings reached and increase the Electric Vehicles fleet by 75 more vehicles in the municipality. They also plan to install 1.000 LED luminaries in streetlighting with sensors, aimed at reducing on average 60% of the electric demand.

TARGETED SECTORS

Building integrated renewables

MUNICIPALITY

Consell Comarcal del Moianès (Grouping)

INVESTMENT SIZE
39.7
MILLION €

RENEWABLE ENERGIES
75.1
GWh/y

ENERGY SAVINGS
20.3
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The purpose of the project is to transform the way citizens
The purpose of the project is to transform the way citizens
access energy, encouraging the production of renewable energy, electric mobility and efficient consumption.
It seeks to develop an investment concept for different energy efficiency actions.

For example, Smart Energy Communities will be created with photovoltaic installations (in municipal and private facilities) for collective self-consumption. The plan is to analyse the possibility of sustainable mobility (strategic charging points, change of municipal and private fleet), and district heating with 100% renewable models.

They also wish to look into a technical analysis of wind and biomass capacity in the region, among other measures to be considered.

TARGETED SECTORS

Others

Spain

MUNICIPALITY

Rubí

INVESTMENT SIZE

49.4

MILLION €

RENEWABLE ENERGIES

6.4

GWh/y

ENERGY SAVINGS

4.3

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The energy rehabilitation of residential buildings (detached and semi-detached houses, and apartment buildings) will comprise the improvement of the building skin insulation (Exterior Insulation and Finish System (EIFS), cellulose injection, double-glazed windows, thermally broken window frames, etc.).

The project will also look to increase the efficiency of the energy production systems (such as high-efficiency heat pumps) and the implementation of renewable energy systems (photovoltaic installations for individual or shared use). Furthermore, photovoltaic installations will be built on all municipal building roofs, when technically possible, to provide renewable energy for the municipality's consumption and share the energy surplus with residencies which lack enough surface to fulfil their demand for renewable energy.

TARGETED SECTORS

Residential buildings

Sweden

MUNICIPALITY

Uddevalla

INVESTMENT SIZE

68.4

MILLION €

RENEWABLE ENERGIES

47.8

GWh/y

ENERGY SAVINGS

1

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The emphasis is on the development of Uddevalla port through various sustainability measures, focusing on transport and energy. By providing fossil-free electricity to ships in the Port, the aim is to replace Marine Diesel Oil and contribute to fulfilling regulations/emission limits in the Skagerrak Sea.

An underlying objective is to reduce health effects when replacing Marine Diesel Oil used close to inhabitants. The organisers will manage structural challenges to transform the infrastructure into a sustainable port system. To do this, they will buy 55 trucks and machines (electrical and hydrogen/fuel cell vehicles) and install PV 14MWp, wind power 15 MW, and batteries 20MW. They also foresee hydrogen production, storage and filling station, the first out of five hydrogen filling stations in Uddevalla.

TARGETED SECTORS

Innovative energy infrastructure

Sweden

MUNICIPALITY

Skövde

INVESTMENT SIZE
58.8
MILLION €

RENEWABLE ENERGIES
1.9
GWh/y

ENERGY SAVINGS
69.4
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The project is about energy efficiency measures in public and residential buildings. Measures include insulation, windows, ventilation, lighting, heating etc. The methodology used is the BELOK Total Concept which includes a switch to energy-efficient street lighting and installation of weather and motion-activated automatic regulation.

The goal is to go from 30% LED to 100% LED with an estimated yearly energy use: 3 400 MWH.
They will also install solar PVs on appointed flat unshaded roofs in e.g. shopping areas. Battery storage solutions for peak shaving will also be investigated. They will develop charging infrastructure for electric vehicles with the installation of approximately 1900 charging posts for the tenants' vehicles at residential buildings owned by the local public real estate company and 600 charging posts (of which 60 fast-chargers) for public use.

TARGETED SECTORS

Residential buildings

MUNICIPALITY

Lund

INVESTMENT SIZE
192.5
MILLION €

RENEWABLE ENERGIES
3.6
GWh/y

ENERGY SAVINGS
52.7
GWh/y

MEASURES TO BE FINANCED AND SECTORS

The project is about a hydrogen production facility, including integration with the existing energy system. In addition, there will be a new bio-CCS and a new bio-char plant.

For the charge-as-you-drive electric road, there will be the road integration of charging rail, charging infrastructure at end-points, transformer stations, and heavy vehicle adaptation.

Small-scale district heating using geothermal heat and low-temperature technology is also foreseen.
Diversity of energy renovation measures in existing building stock will be provided, including new installation of PVs (hardware and software, to be decided depending on individual building status).

TARGETED SECTORS

Others

United Kingdom

MUNICIPALITY

Northumberland

INVESTMENT SIZE

19.7

MILLION €

RENEWABLE ENERGIES

13

GWh/y

ENERGY SAVINGS

0

GWh/y

MEASURES TO BE FINANCED AND SECTORS

The properties of Hydrotreated Vegetable Oil(HVO) are extremely similar to kerosene and diesel, and it is used as a drop in fuel in existing oil boilers. However, to support this some modifications are needed including changes to the spray nozzle, increasing fuel pressure and adjusting the air intake. The estimated conversion cost for making these changes is £500 per boiler which is relatively low when compared to the average cost of heat pump installation (£10,000).

Not only would the switch to HVO have an impact on residents in the area but also on local supply chains. This is one of the gap areas that would be analysed in the creation of an investment concept. Within Humshaugh, there is an oil buying group that operates in the area – it would be essential to understand how the pilot would affect their supply chain and if they could be involved in the distribution of HVO. Currently, there are no manufacturers of HVO in the UK - this project would explore manufacturing capabilities in Northumberland.

TARGETED SECTORS

Residential buildings

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