

INNOVATIVE FINANCING INSTRUMENTS: CASE STUDIES

ENERGY PERFORMANCE CONTRACTING (ESCO), SOFT LOANS, CITIZEN FINANCE, BLENDED FINANCE



AUSTRIA
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SPAIN
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ITALY
Marco Costa

MODERATION: SYLWIA SLOMIK, EUROCITIES

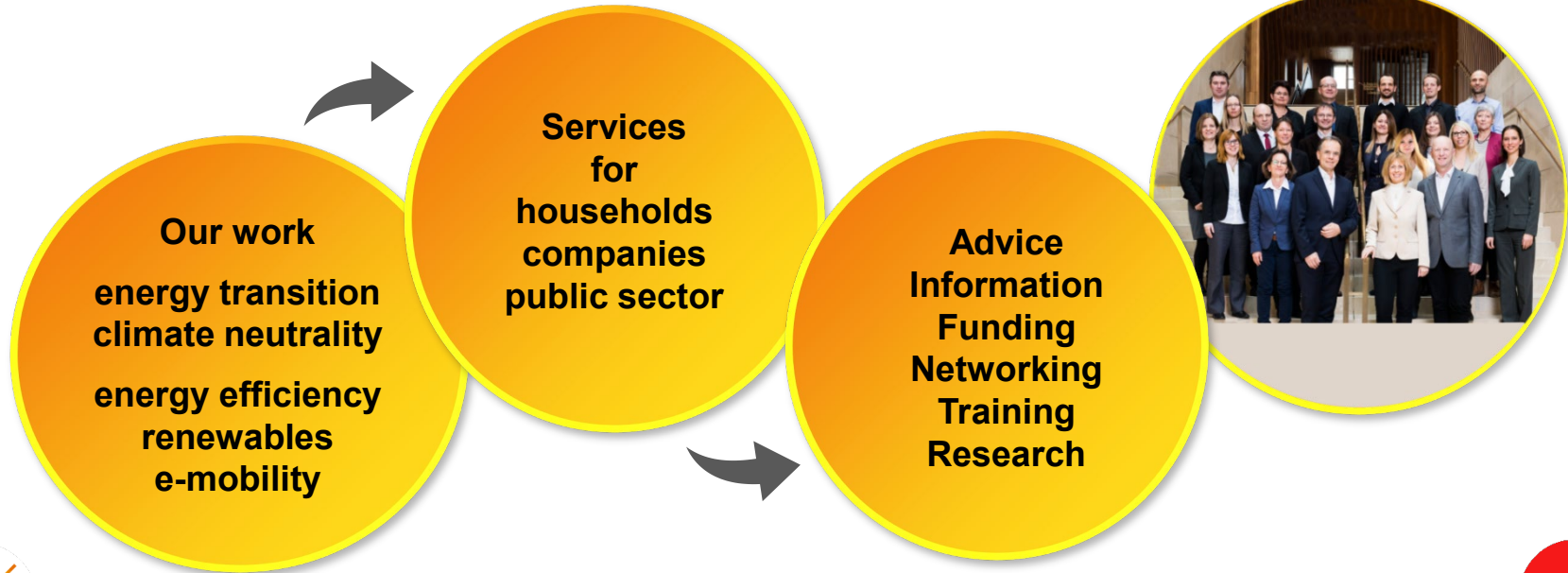
Energy Performance Contracting (EPC)

– Experience from over 300 projects in Upper Austria –

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OÖ Energiesparverband (ESV): Regional Energy Agency of Upper Austria

Central institution in the field of sustainable energy in Upper Austria (founded in 1991)



The region of Upper Austria - Oberösterreich



Capital: Linz
Population: 1.5 million
440 municipalities



Industrial & rural:
25% of Austrian industrial exports
50% live in small municipalities

The EPC facilitation in Upper Austria

- The regional government started its first **programme for EPC market development** in 1998
- Two-fold approach:
 - **financial support** for contracting projects
 - **facilitation service** by the regional energy agency
- **300+ contracting projects** supported (about half in municipalities, half in companies & institutions)
- areas: street lighting, EPC in buildings and industry, renewable heat contracting
-> **more than 100 million Euro investment triggered**
- **30+ ESCOs** offer services in the region
- the first years were challenging, the programme started slowly
- today, EPC has found its place in the portfolio of sustainable energy solutions in Upper Austria



What is Energy Performance Contracting?

- **a contractual arrangement between a client** (e.g. a municipality, a company) **and a service provider**, a so-called "Energy Service Company" (ESCO)
- Typically, the ESCO **finances and implements** energy investments. (However, a variety of different financing types exist.)
- **The ESCO guarantees the energy savings** in the **contract**.
- The investment and capital costs (or part of them) are covered by the annual costs savings.
- Typically, it is especially interesting for projects with high energy savings potentials and shorter payback times.
- **Contracting is a financing & operator model** (no pure financing model)

Types of energy contracting

There are two main **types** of energy contracting models :

"Energy performance contracting"

The ESCO implements energy saving measures (i.e. street lighting refurbishment or thermal insulation of a building) which lead to lower energy costs. The investment costs are refinanced through the savings achieved.

"Energy supply contracting"

The ESCO typically erects, finances and operates energy installations for the client. The ESCO then supplies the client with, for example, electricity or heat at a fixed price.

How is EPC different from other financial instruments?

1. Contractually guaranteed savings

2. Guarantee mechanism (financial consequences if savings are not achieved), e.g.:

- withholding/reducing payment to the ESCO
- bank guarantee from ESCO which can be drawn by the client if savings are not achieved
(- ESCO must adjust/replace the equipment until savings are achieved)

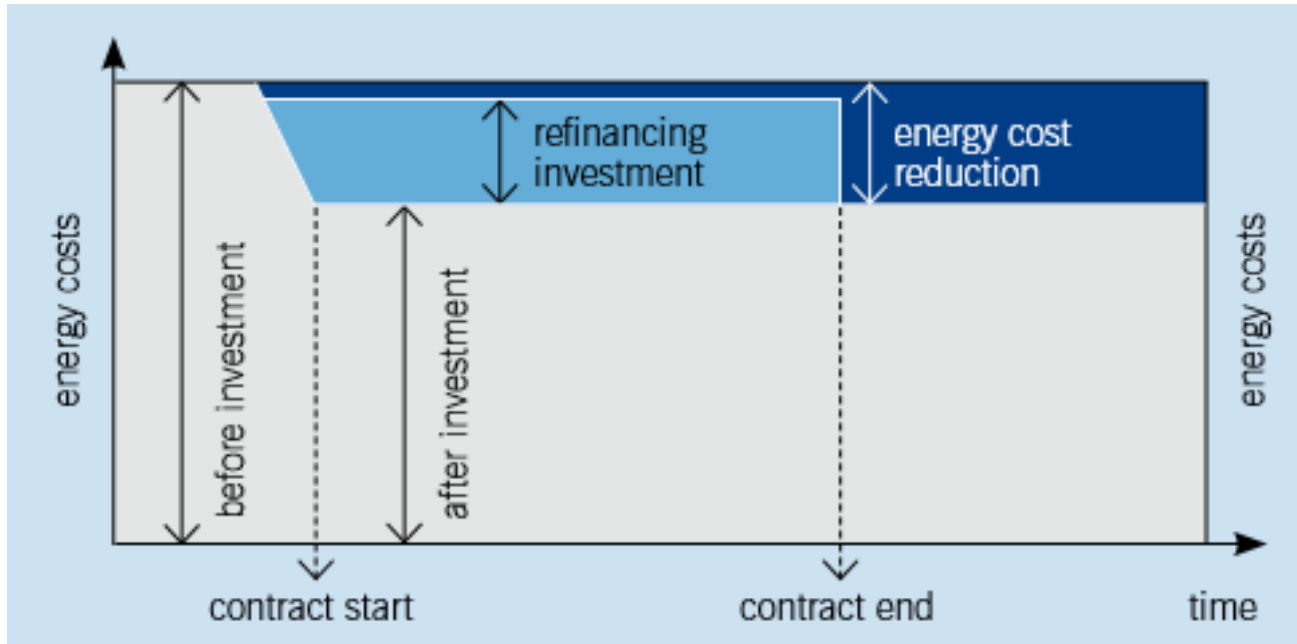
Other than that, EPC can take many forms

(depending on the legal, economic and social contexts of each region and project)

A variety of EPC models

- who finances
- who performs audit
- who designs system
- who does refurbishment work
- who does maintenance
- project size
- project completely or partly financed by EPC
- maintenance cost savings included in the contract or not
- calculation of ESCO fee & billing schedule
- how changes in energy prices are taken into account
- who benefits from "extra" energy savings
- duration of contract
- reporting requirements (ESCO to client)
- access during the contract, ownership and equipment condition after end of contract
- provisions in case of bankruptcy of ESCO or client
- etc.

How Energy Performance Contracting works



Steps of an energy contracting project

Step 1 **Internal preparation phase**
Internal coordination, overview of data, first discussions with ESCOs

Step 2 **Rough analysis**
2-3 rough analyses (usually free of charge), possibly tender
Decision in favour/against the project

Step 3 **Selection of the ESCO**

Step 4 **Detailed analysis**
ESCO develops a detailed analysis (technical planning of project)

Step 5 **Contract preparation**
Discussions about contract details, decisions of the contract content,
signing of the contract

Step 6 **Implementation of the measures**

Step 7 **Contracting rate**
Payment of contracting rate and annual billing

The ESCO's qualifications

A qualified ESCO....

- has all respective qualifications for the project at hand
- involves staff of the client (should you want that)
- prepares the project well
- develops a detailed analysis including energy efficiency measures and provides a clear cost-/benefits analysis
- proposes a clearly structured contract which also includes provisions for "difficult" situations (e.g. bankruptcy, changes of ownership)
- proposes a clear division of tasks and responsibilities between ESCO and client
- is able to provide proof of its financial standing/credit rating
- has a list of reference projects

Learnings from ESV facilitation service



Key success factors – CLIENT's side:

- Proper internal preparation
- Advice & support by third party which is independent from ESCO
- Exact definition of specifications & requirements (what exactly do you expect from the project, ex: quality standards, room temperature, involve own staff...)
- Compare ESCOs (more than one offer)
- Selection of the "right" ESCO
- Understand the contract, develop it in cooperation with the ESCO (no standard contract for all projects)
- Training, information & awareness raising of operators and users is very helpful

Examples of EPC projects

Street lighting refurbishment – Bad Schallerbach

- Well-known health resort, committed to climate protection
- Comprehensive refurbishment of the public lighting system (790 lighting points) to LED
- Reduction of the installed capacity from 55 kW to 23 kW
- **Investment:** 354,600 €
- **Annual savings:**
 - Electricity: 130,900 kWh (58 %)
 - Electricity costs: 19,500 €
 - Maintenance costs: 20,000 €
 - CO₂: 60 tons
- **Contract duration:** 10 years
- **ESCO:** Elektro Kliemstein (local electrician, first EPC project)



Building refurbishment – Red Cross in Wels

- Building in need of deep renovation, high energy costs
- Thermal insulation (exterior wall: 16 cm, basement ceiling: 10 cm, top floor ceiling: 30 cm), replacement of windows, installation of sun shading, connection to district heating
- **Investment:** 518,000 €
- **Annual savings:**
 - Electricity: 214,500 kWh
 - Electricity costs: 14,700 €
 - CO₂: 54 tons CO₂
- **Contract duration:** 15 years (2014 - 2029)
- **ESCO:** eww (local utility and energy provider)
- The building stayed operational during the entire project!



Public buildings of the regional government

- "Low-picking fruits" first, EPC second
- 15 EPC projects, refurbishment of 40 buildings (administrative buildings, road maintenance buildings, vocational schools, care facilities, museums, etc.)
- Mix of implemented measures, i.e. optimisation of heating systems, thermal insulation, conversion to renewable energy
- **Total investment:** approx. 4,850,000 € (60,000 to 1,100,000 €/project)
- **Annual savings:** (total of all 15 projects)
 - Electricity: 4,500,000 kWh
 - Electricity costs: 340,000 €
 - CO₂: 1,450 tons
- **ESCOs:** Cofely Gebäudetechnik, Siemens



Biomass heating for 2 cinema buildings in Steyr and Wels

- Biomass supply contracting
- 200 kW biomass heating systems for the Star Movie Cinemas
- Wood chips supplied by regional farmers
- **Investment:**
 - Wels: around 120,000 €
 - Steyr: around 100,000 €
- **Savings:**
 - Wels: 47 tons CO₂/a
 - Steyr: 45 tons CO₂/a
- **Contract duration:** 15 years
- **ESCO:** OÖ. Maschinenring-Service
- Permits heating with regional and CO₂-neutral bioenergy, hassle free!



Main take-aways

- EPC is just one of a range of possible financing models (and it's not appropriate for all projects and situations)
- Contracting is a long-time partnership, trust between partners is essential
- EPC is flexible and can be adapted to your context/needs/requirements
- To get the most benefits from EPC, clients need to understand it well
- Investing the necessary time for proper project development pays off in the end
- "Small is (also) beautiful": few, smaller, but good quality projects can be a good place to start

Thank you!

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PROSPECT+ REPLICATION WORKSHOP

REMO URBAN PROJECT: VALLADOLID

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Innovation consultant and Associate Professor



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 646511



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REMOURBAN project



Total REMOURBAN budget: **32.5M€** (21,5M€ EU funded)
 Total investment in REMOURBAN actions: **22.9M€** (80% public)
 Energy savings: **6,858,735 MWh/yr**
 CO₂ emissions avoided: **2,841 TnCO₂/yr**
 Citizens directly involved in demos: **19,800**
 Direct job creation: **187**
 Consortium: **22** partners (5 municipalities, 3 RTD, 5 industries, 9 SMEs)
 Nationalities: **7** (Spain, UK, Turkey, Belgium, Hungary, Germany, Italy)

acciona Infraestructuras
 ANADOLU ÜNİVERSİTESİ
 AREBS
 Ayuntamiento de Valladolid
 CARTIF
 DemirEnerji
 ENERGO ENERGY EFFICIENCY CONSULTANCY
 gmv INNOVATING SOLUTIONS
 IBERDROLA Ingeniería y Construcción
 INFOHUB Ltd.
 MISKOLC HOLDING ÖNGÖR HANTZATI VÁRDIYONÉSZÉLD ZRT.
 Nottingham City Council
 nep nottingham energy partnership
 NOTTINGHAM TRENT UNIVERSITY
 ovardi energy | investments UniCredit wrr
 ÖLCSAN "kalitenin ölçüsü"
 sasie
 STEINBEIS-EUROPA-ZENTRUM
 ESKİŞEHİR TEPEBAŞI MUNICIPALITY
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 REMOURBAN

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Source: Jason Hawkes. Valladolid: Cúpula del Milenio

the goal is providing a
model to make cities

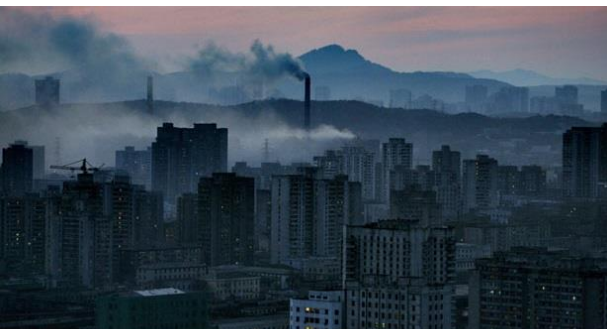
smarter
and more
sustainable





REMOURBAN key objective

- Develop and validate an **Urban Regeneration Model** – highly replicable and based on the joint transformation of:
 - Buildings/districts towards **Low Energy Districts**
 - City transportation towards a **Sustainable Urban Mobility**
 - Integrate existing city infrastructures through **ICTs**



Source: PETER PARKS/AFP/Getty Images



Source: theskyisbig.blogspot.com



Source: Stephen Thomas-Patel





Urban Regeneration Model

IMPLEMENTATION – LIGHTHOUSE CITIES

VALLADOLID



NOTTINGHAM



TEPEBASI



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Urban Regeneration Model

REPLICABILITY – FOLLOWER CITIES



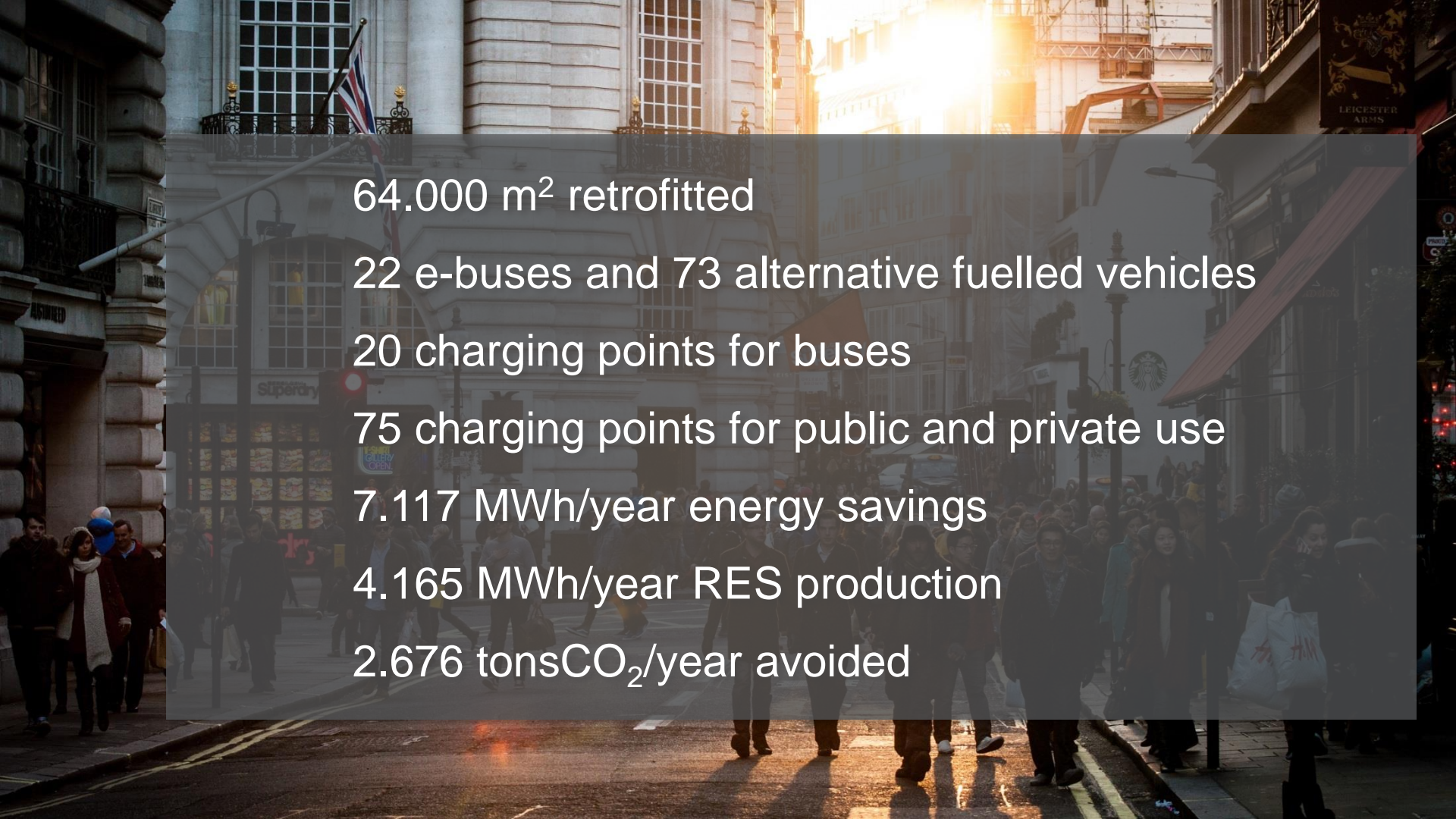
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A photograph of a busy city street at sunset. The sun is low in the sky, creating a warm, golden glow. Pedestrians are walking on the sidewalks, and a few vehicles are visible in the distance. A semi-transparent dark grey box is overlaid on the center of the image, containing white text. The text lists various metrics related to energy efficiency and emissions reduction.

64.000 m² retrofitted

22 e-buses and 73 alternative fuelled vehicles

20 charging points for buses

75 charging points for public and private use

7.117 MWh/year energy savings

4.165 MWh/year RES production

2.676 tonsCO₂/year avoided

A nighttime aerial view of a city with many lights, serving as the background for the text.

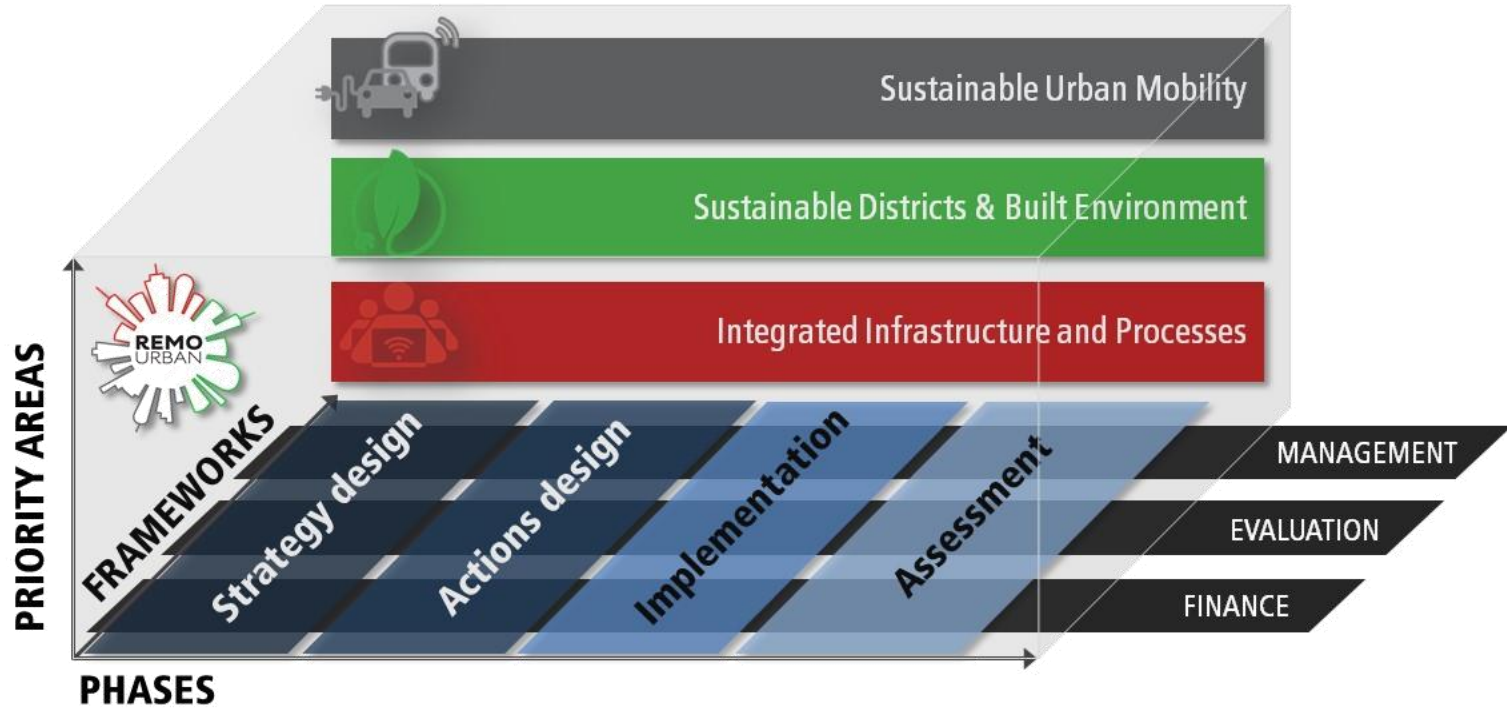
20.000 citizens directly involved in our actions

Relevant contribution to scientific dissemination

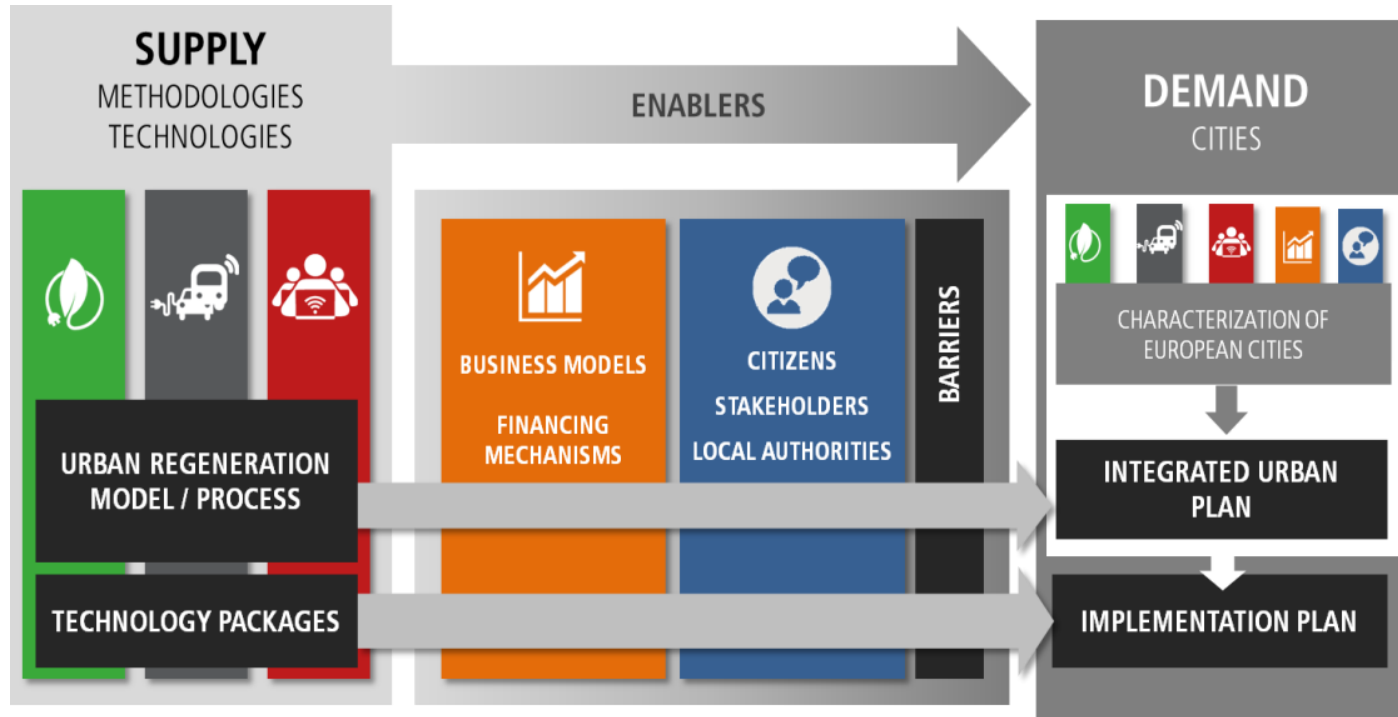
Strong contribution and cooperation to existing initiatives (CITYKeys, EIP-SCC, SCIS, etc.)

Contributed to the creation and sustainment of the Lighthouse Projects Collaboration

Urban Regeneration Model

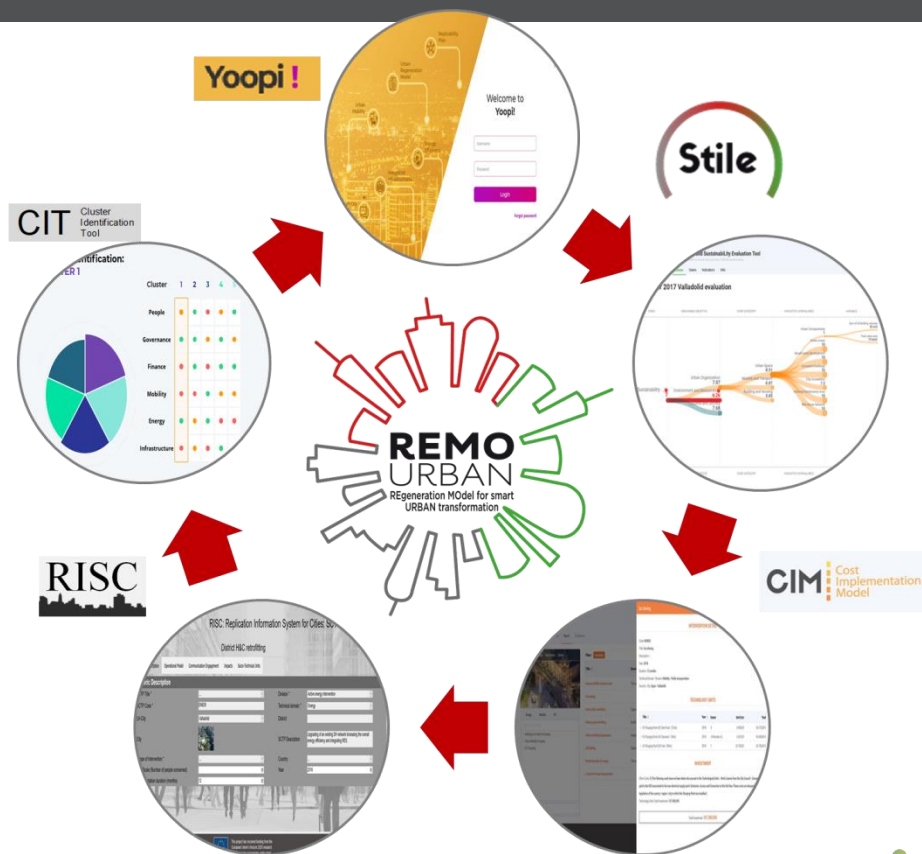


Our objective: replication





Supporting tools



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Supporting tools: Yoopi! and CIT

Yoopi! Evaluations Users Welcome admin

Phase 1 Phase 2

Cluster Identification Tool Questionnaire SWOT Impacts

Evaluation for Leon city

General **City Information**

ICT

What are the needs not yet covered by the existing ICT infrastructures? What are the needs of citizens and/or civil servants in terms of urban digital platform?

- The energy management in public buildings
- More public urban services
- Management platform for Smart Cities
- APIs development for municipal services
- Free public access to wifi

What are the barriers to existing ICT platforms, if any?

- To put in place new technologies and working methods
- The sources of financing available
- The lack of widespread use
- The bureaucratic obstacles
- The lack of data accessibility

For what services have ICT platforms already been set up?

- For a Trade promotion ICT Platform
- For a management platform of the consumption of electric cars
- For a smart phone application to ensure registering of events
- For a monitoring system of the vehicles belonging to public institutions

What are the data available that the city could make use of?

- Data on energy consumption
- Data from the master social plan
- Documents which should land register
- Application plans and points of interest data
- Weather data
- No available data

If you have one or more ICT platforms, what is the main use of them by civil servants and/or citizens?

- Only use of the platform for the management of electric cars
- Consult of municipality data
- Data (base maps and street constants) updated and
- It is used by citizens more than other municipality's systems

Cluster identification: **CLUSTER 5**

Welcome admin

New evaluation

Find evaluations...

Phase 2 Step 3 = Step 4

Biomass, biogas and waste use

SCTP_1

SCTP_2

SCTP_3

SCTP_4

SCTP_5

for ICT Improvements

Yoopi! Evaluations Users Welcome admin

Phase 1 Phase 2

Cluster Identification Tool Questionnaire **SWOT** Impacts

SWOT & Impacts

SWOT Impacts

Strengths

- Improve data availability
- Improved decision making for citizens
- Improved decision making for city management
- Improved community ownership of smart city projects
- Instant access to state
- Central hub for all smart city statistics
- Visualization of monitored parameters in both real-time and historical approaches
- Including performance based evaluation
- Enabling automatic control of utilities based on real-time sensing and feedback
- Integrating ICT infrastructures for smart municipality and government

Weaknesses

- Need for training/learning period
- Awareness of the tool
- Technical complexity
- Costs to keep updated and supply/training new technicians
- Requiring dedication on system maintenance, especially for the distributed sensors and actuators
- Compatibility among various sensing and transmission protocols
- Lack of continuity for certain applied devices
- Requiring analytical skills of platform users to maximising the benefits of integrated ICT infrastructures

Opportunities

- Provides a platform for personalized apps/Developers
- Development of new sensor technologies
- Research Opportunities
- Positively enhancing the sensor, actuator and ICT industry through the smart city momentum
- Encouraging the joint effort among device manufacturer, system integrator and developer, and academic researchers
- Opportunities of establishing robust database based on the network coverage of "everything connected"
- Backing the true smartness based on big data infrastructure and strong analytical skills

Threats

- Conflicts with GDPR Regulations
- Lack of updates
- Competition with individual suppliers management tools
- Risks of system hacking that threatens the public security
- System tempering in uncontrollable situations that require extra repairing and maintenance
- Unperceived disconnection due to unresponsive end users, especially in the smart home sensors when device maintenance requires access to individual homes
- Information security and risk control

INFORMATION

Evaluation name

Evaluation for Leon city

Evaluation description

Assessment of initial resources and needs in Leon in order to achieve improvements within the ambit of urban mobility and energy

Strategy name

Management platforms and networks for Smart Cities (re)

Assessment name

Initial assessment for ICT improvements



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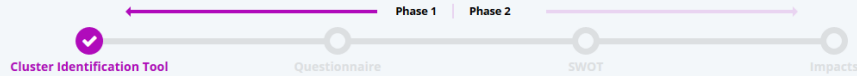


Supporting tools: Yoopi! and CIT

Yoopi!

Evaluations Users

Welcome admin



PHYSICAL CHARACTERISTICS

Population Density

Inhabitants / km2

500

City population

Inhabitants

150000

City area

Kilometers Squared

16

City elevation

Meters

800

INFORMATION

Name

Evaluation for Leon city

Description

Assessment of initial resources and needs in Leon in order to achieve improvements within the ambit of urban mobility and energy

PEOPLE

Population Dependency ratio

Percentage %

30

Annual Population Change

Inhabitants

5

Foreigners as a proportion of population

Percentage %

5

Students in Higher Education

Inhabitants

10

Youth Unemployment

Percentage %

20

Public Libraries

Number/10,000 inh

4

Median Population Age

Years

40

Voter Turnout Ratio

Percentage %

60

Recycling

Percentage %

80

PREVIOUS EXPERIENCES

Existence of local sustainability plans

Yes = 1 / No = 0

0

Existence of Smart Cities strategies

Yes = 1 / No = 0

0

Existence of an Agenda 21

Yes = 1 / No = 0

1

Signature of Covenant of Mayors

Mobility plan

ICT citizen oriented platforms



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Supporting tools: CIM

CIM Cost Implementation Model

Search Comparison

District Scale Retrofitting

CODE EN01
YEAR 2001
CITY-COUNTRY Valladolid-Spain
ENTITY Building and District Grouping
TITLE Passive energy intervention - Energy
DESCRIPTION Clean logistics and last mile delivery Clean logistics and la... ▾

District Scale Retrofitting

CODE EN01
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District Scale Retrofitting

CODE EN01
YEAR 2001
CITY-COUNTRY Valladolid-Spain
ENTITY Building and District Grouping
TITLE Passive energy intervention - Energy
DESCRIPTION Clean logistics and last mile delivery

Interventions investment

20.182,55 €

Investment breakdown

12.000 €
170.000 €
20.000.550 €

District Scale Retrofitting

LED 20.648,89

Technology Unit Total Investment 648,000 €

Make List 648,000 €

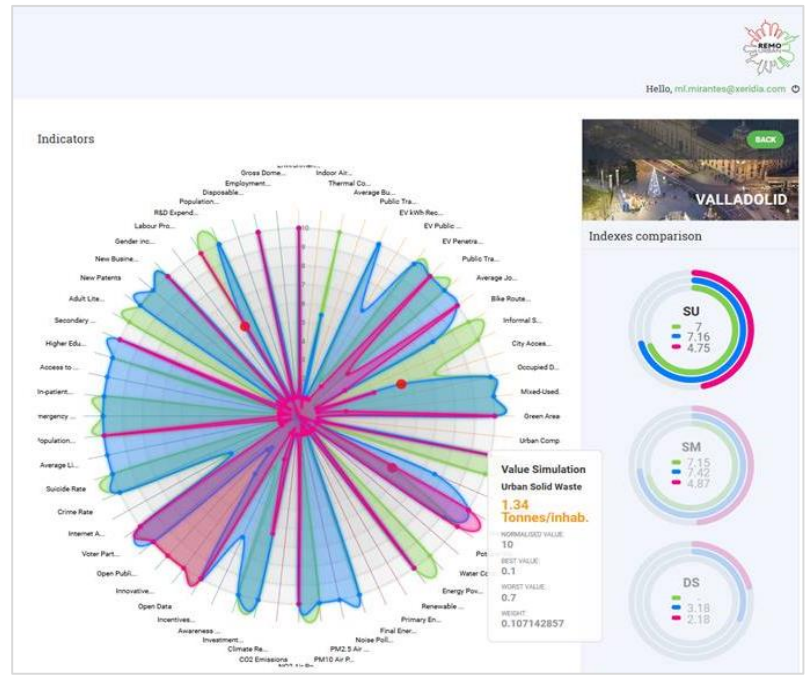
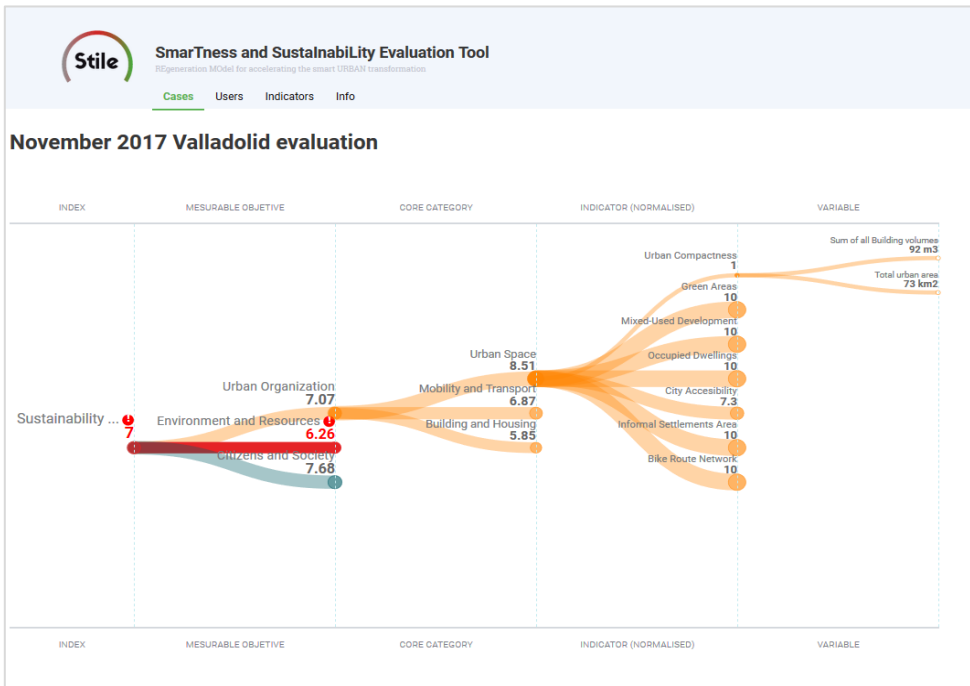
Review 648,000 €

District Scale Retrofitting +

District Scale Retrofitting +



Supporting tools: STILE





Infopacks



Info-package 2
Urban Regeneration Model

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 101017111



Info-package 2
Energiesprong 2050 Project



Info-package 2
Building-integrated photovoltaics (BIPV), energy storage and smart grid management



Info-package 2
Optimisation of existing District Heating and Cooling



Info-package 2
District retrofitting



Info-package 2
Management device for optimisation of local charging



Info-package 2
Enterprise Electric Car Club



Info-package 2
Clean logistics and last mile delivery



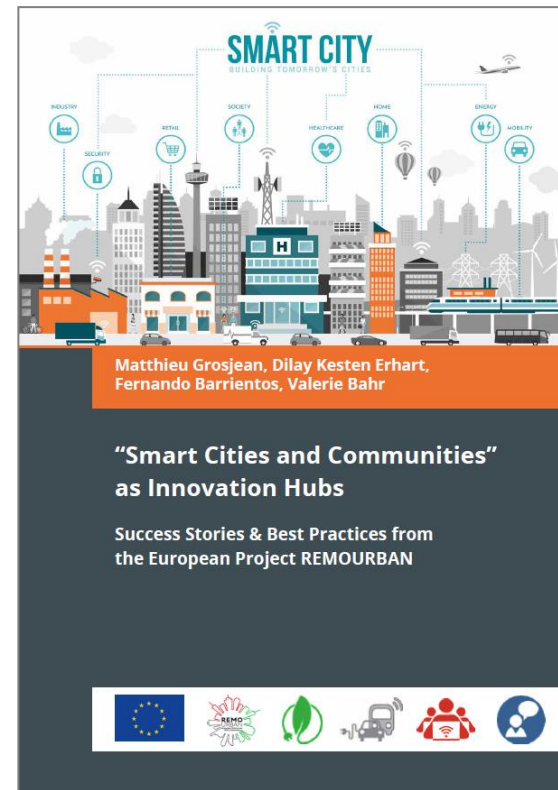
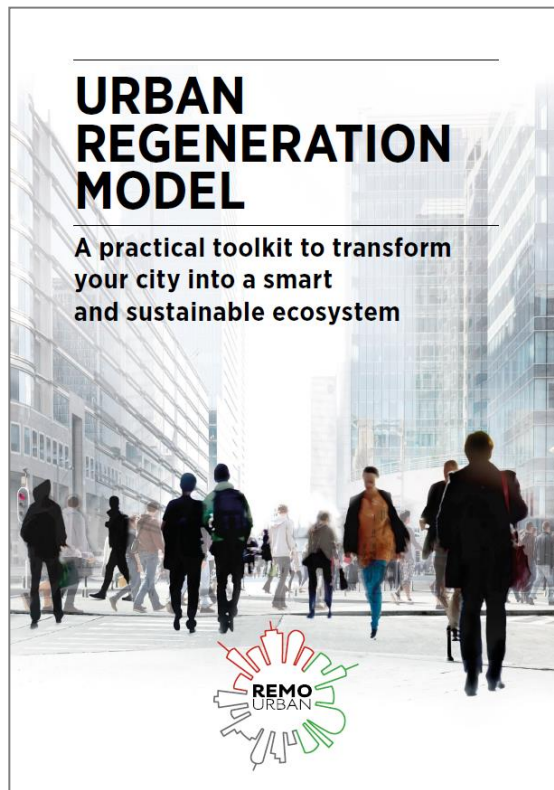
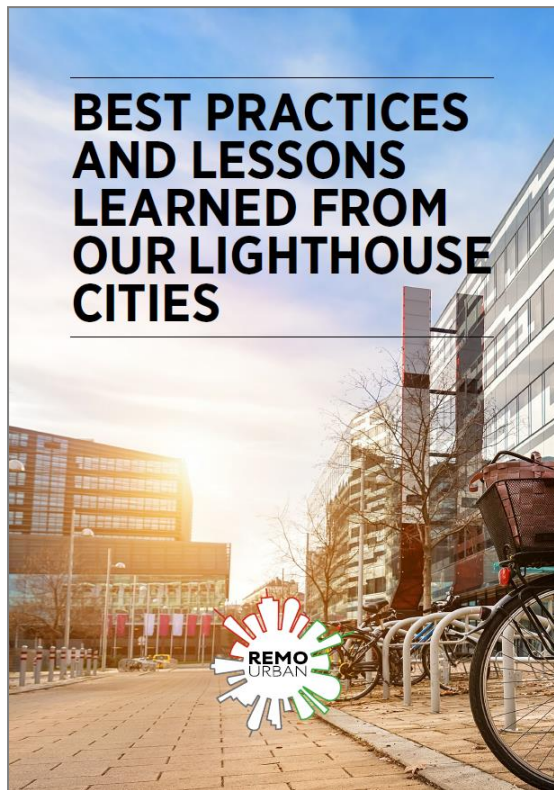
Info-package 2
City Information Platform



Info-package 2
Energy maps in real-time for citizens



Best Practices Books



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Valladolid lighthouse city



Energy retrofitting – FASA residential district



- Built in the '60s
- 24,700 m² of conditioned area
- 398 dwellings
- 1181 residents
- 19 blocks (342 dwellings) + 1 tower (56 dwellings)



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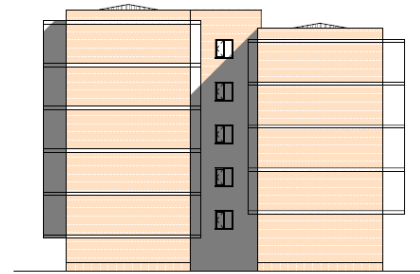


Energy retrofitting – FASA residential district

Blocks (5 + 1 floors, 18 dwellings, 1090 m²)



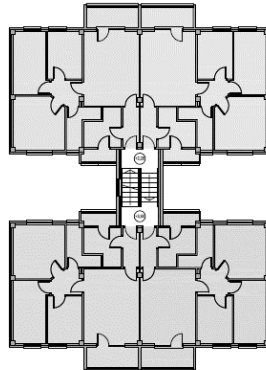
Alzado sur



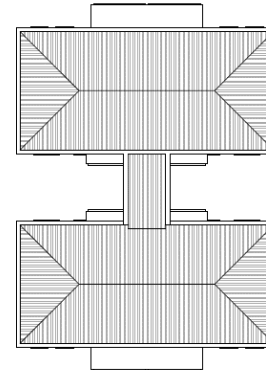
Alzado oeste



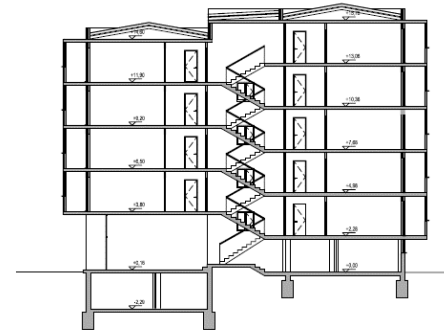
Sección transversal



Planta tipo



Planta cubierta



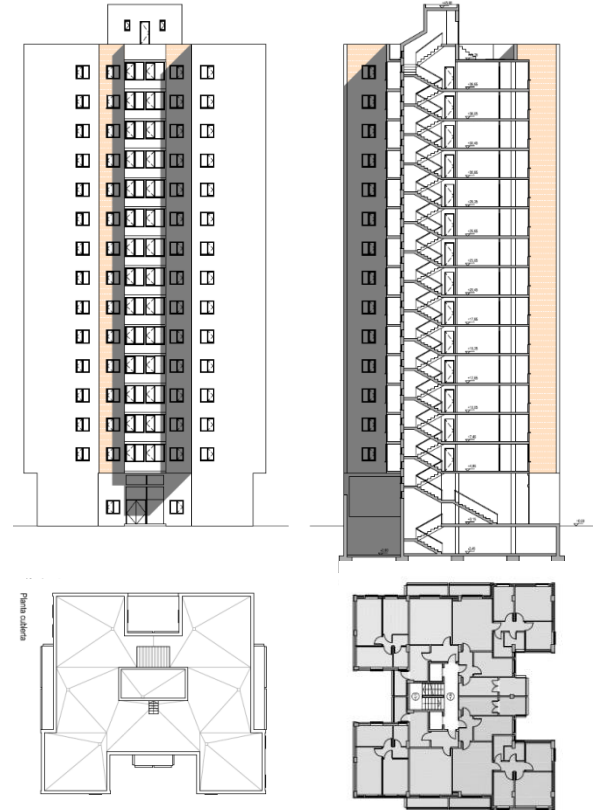
Sección longitudinal





Energy retrofitting – FASA residential district

Tower (14+1 floors, 56 dwellings, 3900 m²)



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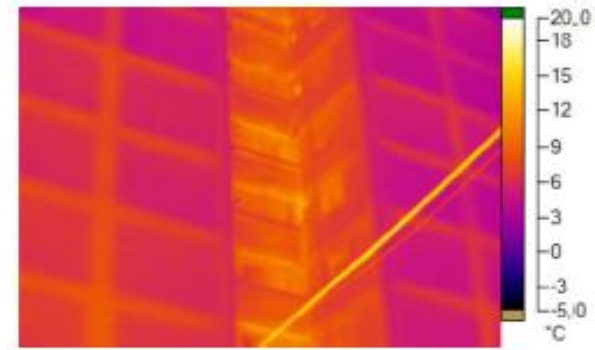
Partia Igo
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Energy retrofitting – FASA residential district

- Low energy efficiency (construction characteristics)
- High heating demand
- Thermal losses through thermal bridges (thermographs)





Energy retrofitting – FASA residential district

↓ REDUCTION OF ENERGY DEMAND

Building envelope insulation:

- Façades
- Balconies
- Roofs

↓ REDUCTION OF ENERGY CONSUMPTION

- District heating renovation
- Reduction of lighting consumption

RENEWABLE ENERGY CONTRIBUTION

- Biomass
- Solar energy





Energy retrofitting – FASA residential district

↓ REDUCTION OF ENERGY DEMAND

Façades and Balconies Insulation

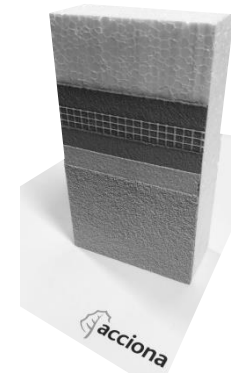
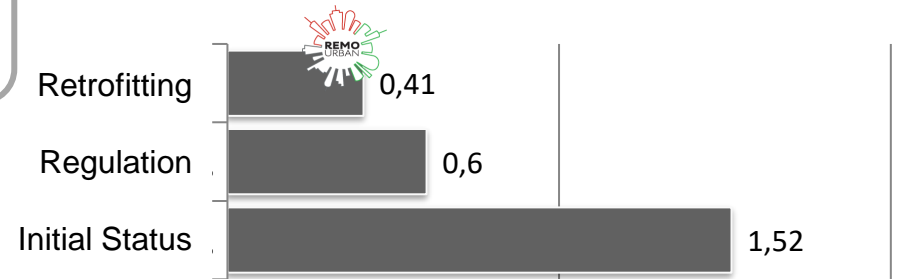
Objectives

- Improve the thermal performance of the building envelope
- Elimination of thermal bridges
- Improve thermal comfort

Technical Solution Implemented

- Façade: Exterior Thermal Insulation System (60mm EPS)
- Balconies: Sandwich panel (60mm EPS)

Transmittance [W/m² K]





Energy retrofitting – FASA residential district

↓ REDUCTION OF ENERGY DEMAND

Façades and Balconies Insulation



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Energy retrofitting – FASA residential district

↓ REDUCTION OF ENERGY DEMAND

Façades and Balconies Insulation



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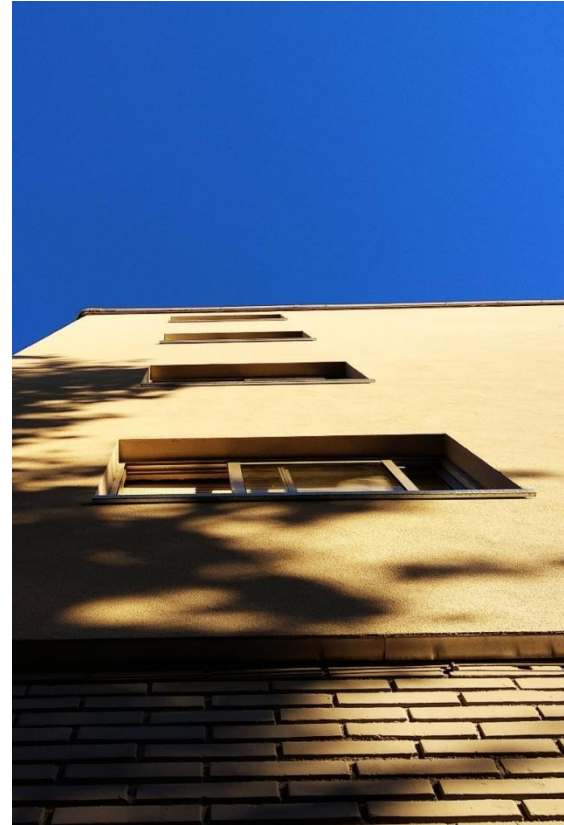




Energy retrofitting – FASA residential district

↓ REDUCTION OF
ENERGY DEMAND

Façades and
Balconies
Insulation



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Energy retrofitting – FASA residential district

↓ REDUCTION OF ENERGY DEMAND

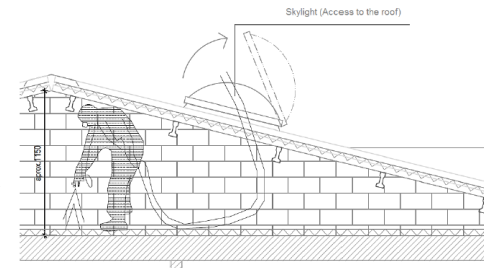
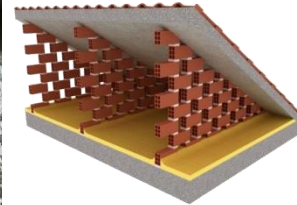
Roof Insulation Blocks

Objectives

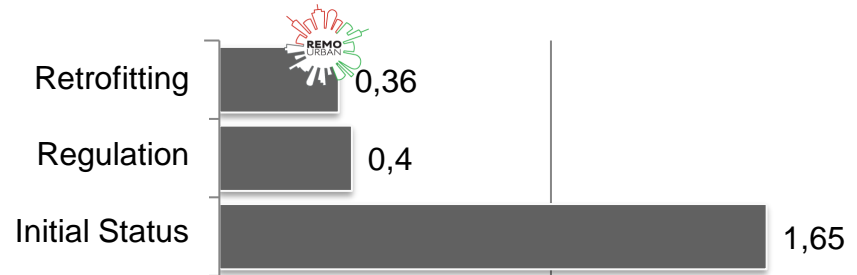
- Improve the thermal performance of the building envelope
- Elimination of thermal bridges
- Improve thermal comfort

Technical Solution Implemented

- Pitched roof (blocks): polyurethane foam (60mm)



Transmittance [$W/m^2 K$]



PROSPECT+ MEETING | July 5th 2024

Miguel Á. García-Fuentes | Innovation Consultant and Associate Professor



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Energy retrofitting – FASA residential district

↓ REDUCTION OF ENERGY DEMAND

Roof Insulation Tower

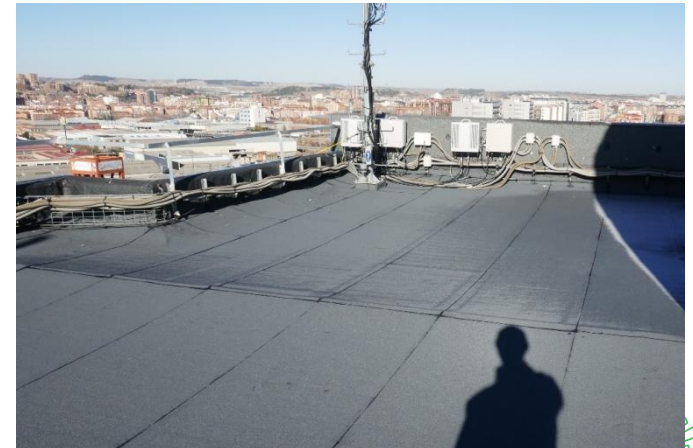
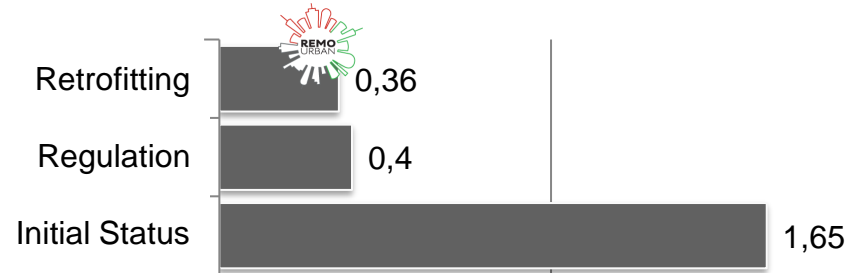
Objectives

- Improve the thermal performance of the building envelope
- Elimination of thermal bridges
- Improve thermal comfort

Technical Solution Implemented

- Flat roof (tower): rock wool (2x40mm) + waterproofing

Transmittance [$\text{W/m}^2 \text{K}$]

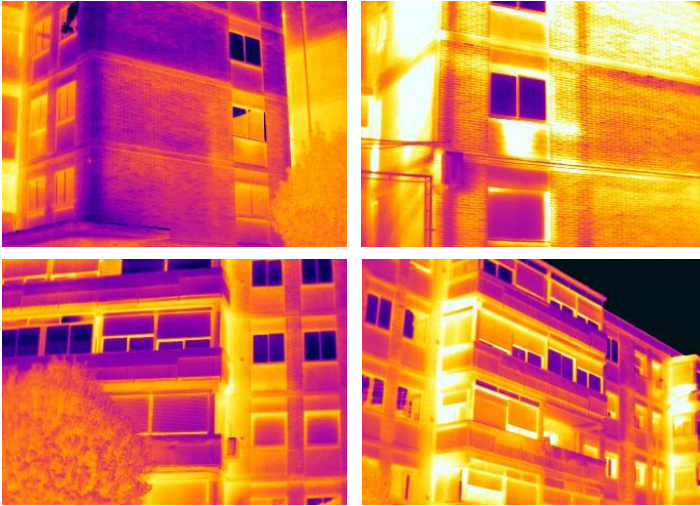




Energy retrofitting – FASA residential district

↓ REDUCTION OF ENERGY DEMAND

Elimination of thermal bridges thanks to the thermal insulation





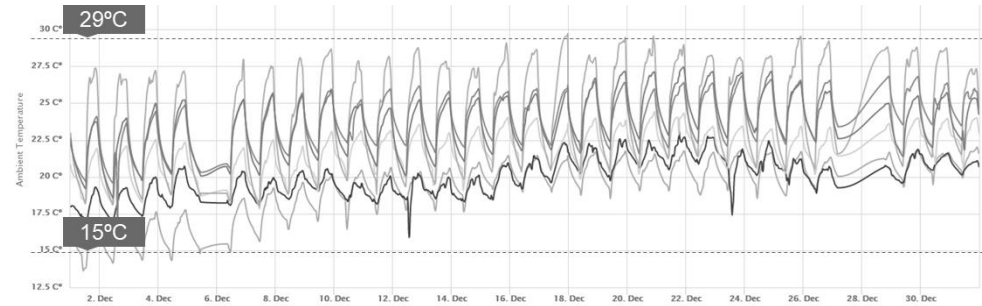
Energy retrofitting – FASA residential district

↓ REDUCTION OF ENERGY DEMAND

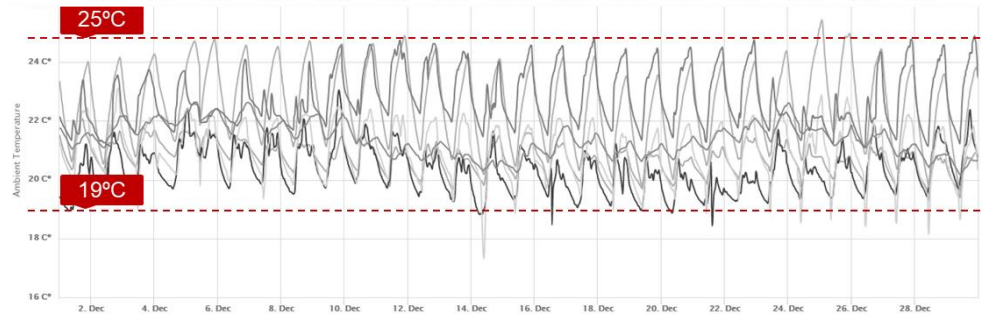
Comfort Temperature Range Improvement



Before



After



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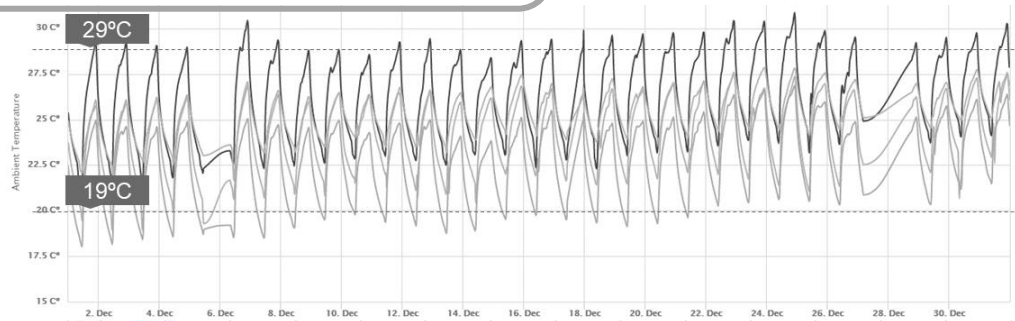
Energy retrofitting – FASA residential district

↓ REDUCTION OF ENERGY DEMAND

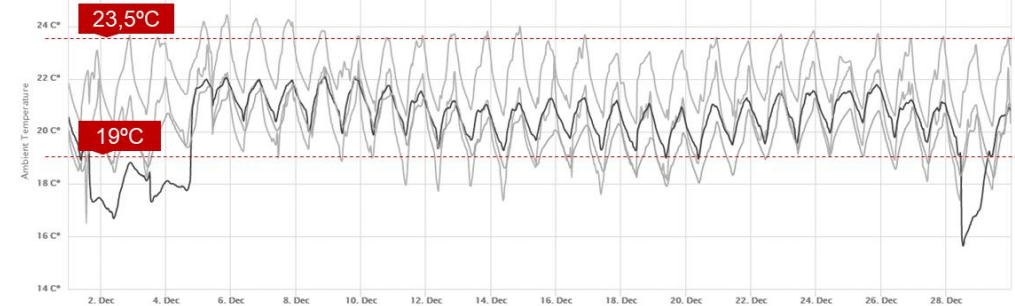
Comfort
Temperature Range Improvement



Before



After



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Energy retrofitting – FASA residential district

↓ REDUCTION OF
ENERGY
CONSUMPTION

Reduction of
lighting
consumption

Objectives

- Reduction of lighting consumption in common areas

Technical solution implemented

- LEDs in common areas
- Presence detector (tower)

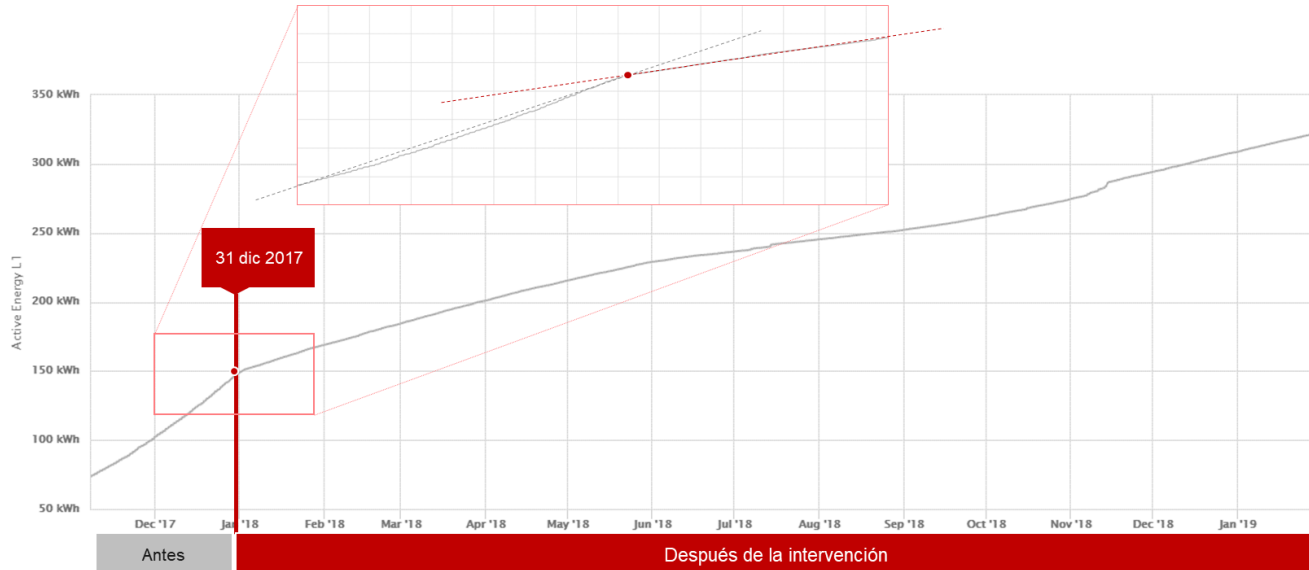




Retrofitting of FASA residential district

↓ REDUCTION OF ENERGY CONSUMPTION

Consumption reduction: More than 50%



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Retrofitting of FASA residential district

↓ REDUCTION OF
ENERGY
CONSUMPTION

Renovated
boilers room



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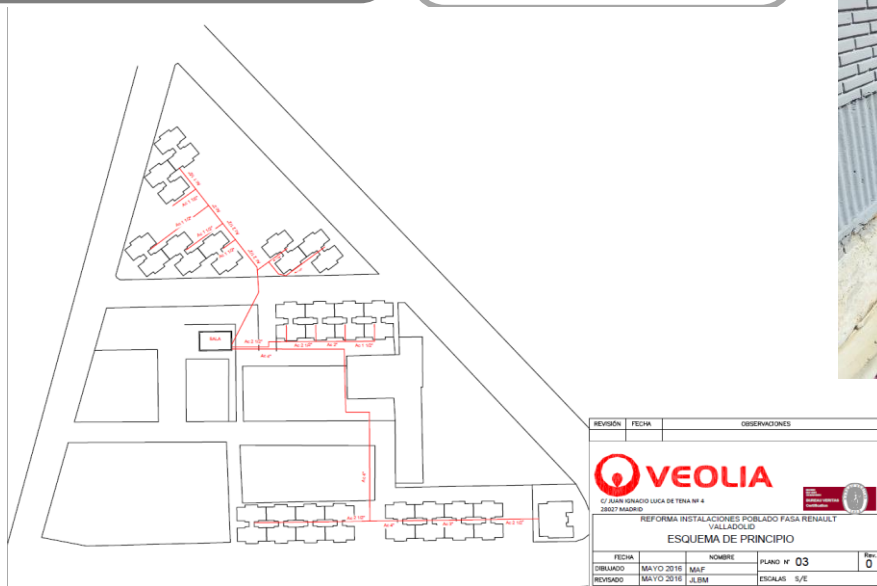
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Retrofitting of FASA residential district

↓ REDUCTION OF ENERGY CONSUMPTION

New district heating network



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Retrofitting of FASA residential district

↓ REDUCTION OF
ENERGY
CONSUMPTION

Centralized
DHW



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Retrofitting of FASA residential district

↓ REDUCTION OF
ENERGY
CONSUMPTION

Energy
monitoring



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Retrofitting of FASA residential district

↓ REDUCTION OF ENERGY CONSUMPTION

Heating savings

Baseline

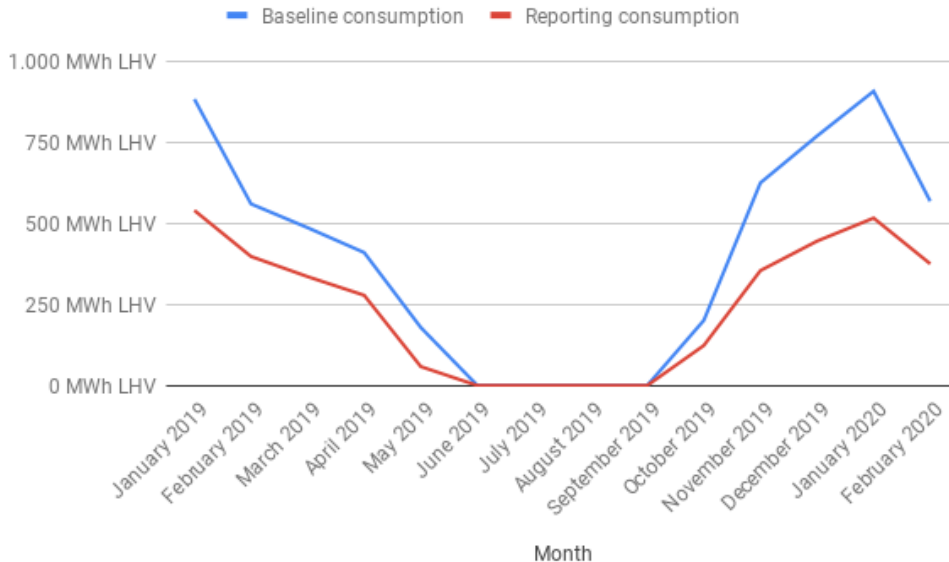
5,592 MWh LHV

Reporting

3,426 MWh LHV

Heating savings

39 %



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Retrofitting of FASA residential district

RENEWABLE ENERGY
CONTRIBUTION

Biomass



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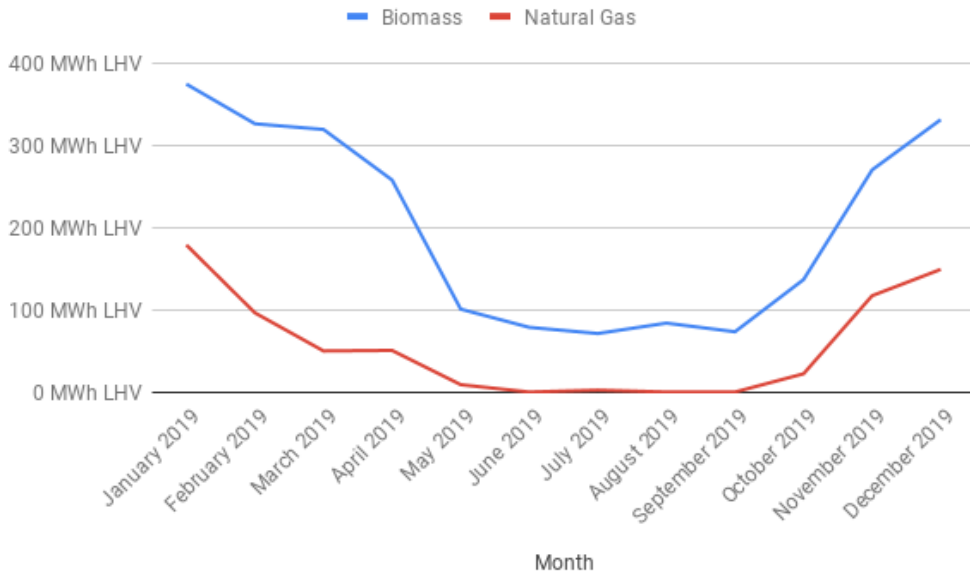




Retrofitting of FASA residential district

RENEWABLE ENERGY CONTRIBUTION

Biomass



Biomass
2,425 MWh LHV

Natural Gas
676 MWh LHV

RES contribution
78 %





Retrofitting of FASA residential district

RENEWABLE ENERGY CONTRIBUTION

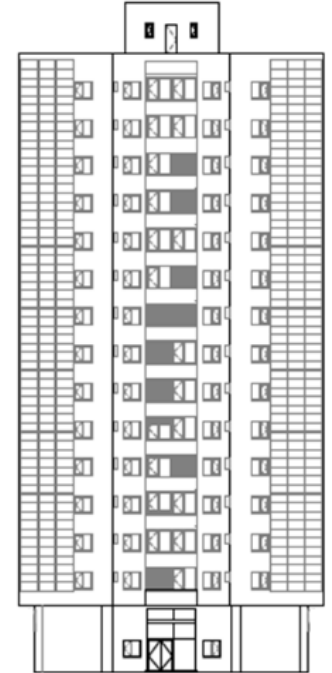
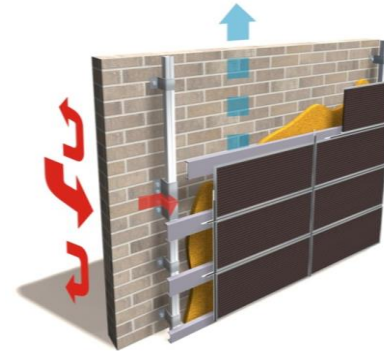
Solar Energy

Objectives

- Production of renewable energy

Technical solution implemented

- Ventilated facade system (60mm rock wool)
- Isolated photovoltaics system
- Energy contribution to the district heating (heating and DHW)
- 354 CdTe modules (255 m²)
- Installed power 27.43 KWp
- Production 24,800 kWh per year

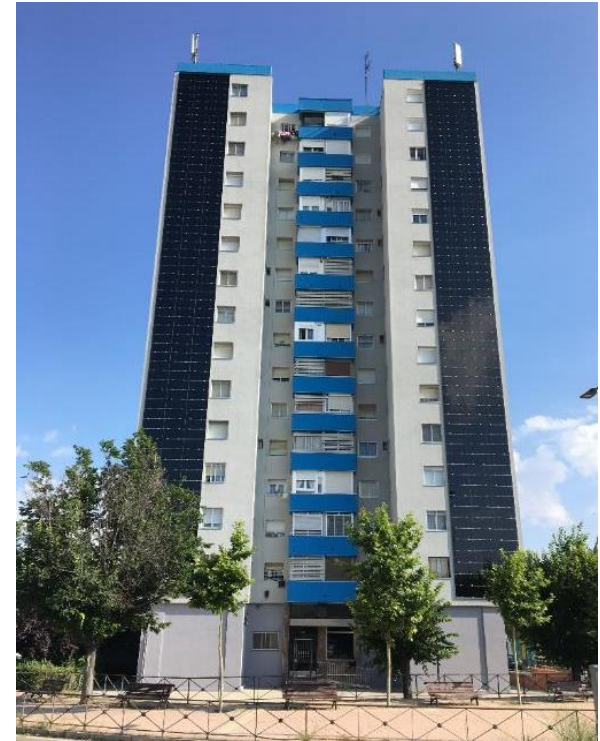




Retrofitting of FASA residential district

RENEWABLE ENERGY
CONTRIBUTION

Solar Energy



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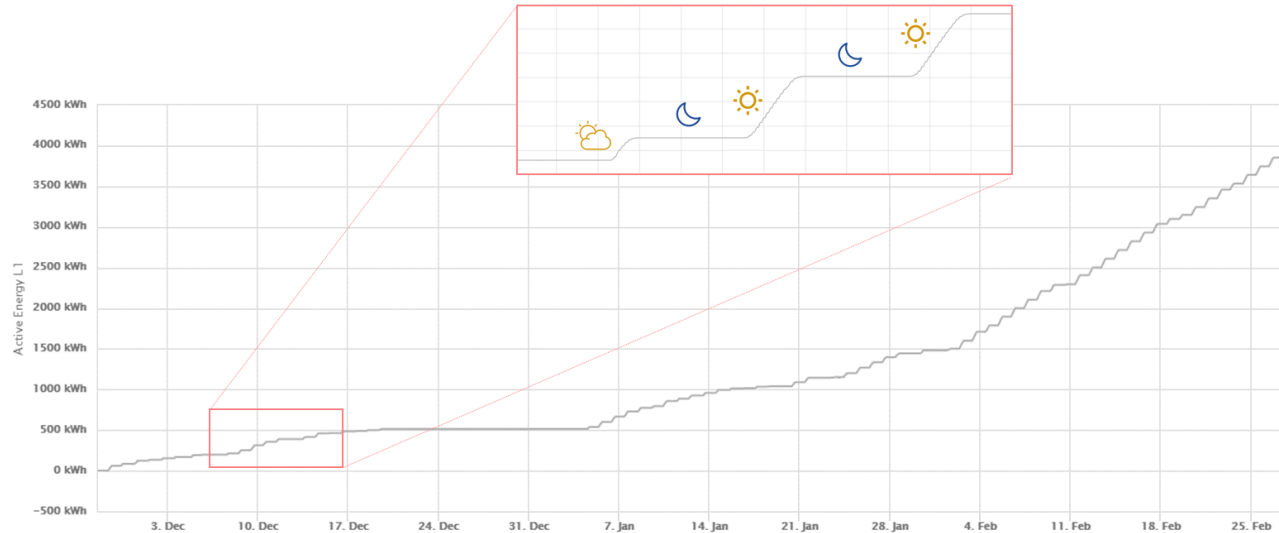




Retrofitting of FASA residential district

RENEWABLE ENERGY
CONTRIBUTION

PV Production



Después de la intervención



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Retrofitting of FASA residential district

VA! Ayto. de Valladolid
@AyuntamientoVLL

Siguiendo

#ConcejalUrbanismo @manuel_saravia en reunión con vecinos del #PolígonoFASA, abordando el Proyecto @Remourban_EU



Luis Vélez @velezpoe · 5 abr. 2016

Hoy en la #AsambleaVecinal #PoligonoFASA sobre proyecto @Remourban_EU con @manuel_saravia @herreroapedro



i+D Valladolid @INNOLID · 24 ago. 2016
Avanzando en proyectos #smartValladolid #Remourban S2CITY #smartcities #Valladolid



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Retrofitting of FASA residential district



Leaflet

Fundación CARTIF
Cristina de Torre: critor@cartif.es - Teléfono: 983 54 89 11
Ayuntamiento de Valladolid / Agencia de Innovación y Desarrollo Económico de Valladolid
Ángela Rivada: arivada@via.es - Teléfono: 983 24 74 01
<http://es.remourban.eu>

tas

la durante las obras?
balizaremos en el interior de su vivienda es el agua caliente sanitaria, donde conectaremos colocado su actual sistema (caldera o termo por un sistema con contador individual.

vecinos de Torrelago, en Laguna de Duero, han edificios con medidas similares a las planteadas

antados con la reducción de su consumo en de sus viviendas. Si tiene oportunidad, ¡no

Si tiene alguna más...

Abril y el 29 de Abril pasaremos por su vivienda lo lo prefiere, también puede contactarnos en:

REGENERATION MODEL for accelerating the smart URBAN transformation

El Proyecto Noticias Recursos Contacto

Home - Recursos

Preguntas Frecuentes

Preguntas frecuentes sobre el Distrito Grupo de Viviendas FASA-Renault

01 ¿Cuánto tiempo durarán las obras?

Esta previsto que las obras duren aproximadamente un año y medio. Las intervenciones en fachadas y cubierta comenzarán en verano de 2016, y se prolongarán hasta verano de 2017 (aproximadamente 12 meses). Durante este periodo se rehabilitarán los edificios por fases, es decir no habrá andamios en todos los edificios durante los 12 meses

Debido a que las intervenciones en la central térmica sólo se pueden hacer en periodos de verano, para no cortar el suministro de calefacción durante el invierno, en verano de 2016 se modificarán las calderas, las subcentrales de cada portal y la red de distribución (las tuberías desde la central térmica hasta cada uno de los portales). La instalación de la red de agua caliente sanitaria así como las instalaciones individuales de los repartidores de costes se realizarán a partir de la primavera de 2017. Estas obras durarán aproximadamente 7 meses, comenzando en verano de 2016 y finalizando tras el verano de 2017, sin hacer nada durante el invierno.

02 ¿Nos proporcionarán la información por escrito?

Por supuesto, en las visitas a cada portal les llevaremos la documentación de los costes y el detalle de las intervenciones. Si agrueban el proyecto, a partir de entonces tendrán que firmar un contrato con las empresas Acciona Infraestructuras (para la rehabilitación de fachadas) y con VEDLIA Servicios (rehabilitación de instalaciones térmicas y contrato de energía y servicios), donde ustedes podrán revisar los términos del contrato por escrito.

En cualquier caso, cuentan con los teléfonos de contacto de todas las empresas implicadas en la rehabilitación de su barrio por

Spanish Web /FAQ

REMO URBAN

8

8:26 / 14:52

8

8:17 / 14:52

Local TV



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Retrofitting of FASA residential district

Consulting Office in the district



More than 50 meetings

Multiple doubts resolved



Periodic communications

Follow-up Commission





Retrofitting of FASA residential district

ENERGY PERFORMANCE

Commitments on energy savings

SECURE ENERGY SUPPLY

Commitments on plant efficiency

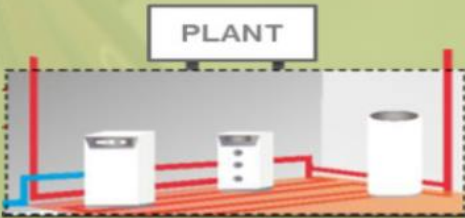
RELIABLE ENERGY O&M

Commitments on **availability, quality** and costs

Services

- Energy supply
 - Performance
 - RES
- Operations and Maintenance
- Total Guarantee (Corrective Maintenance)

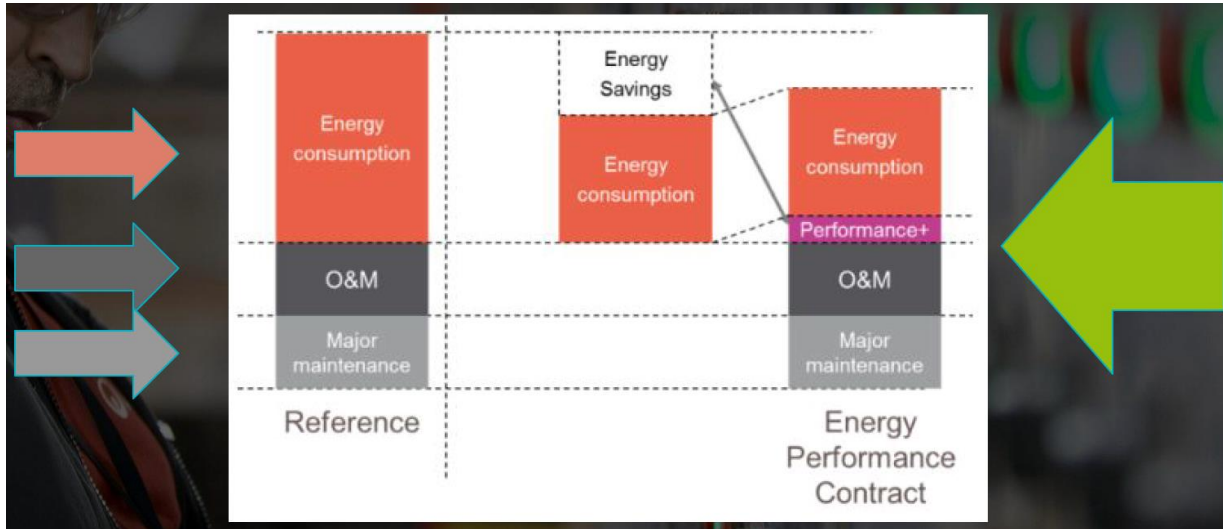
- Financial (ECM)





Retrofitting of FASA residential district

- The key factor in EPC is ***Risk Assumption***: technical, operational and financial.





Retrofitting of FASA residential district

How does it work?

The contract is guaranteed by energy performance:

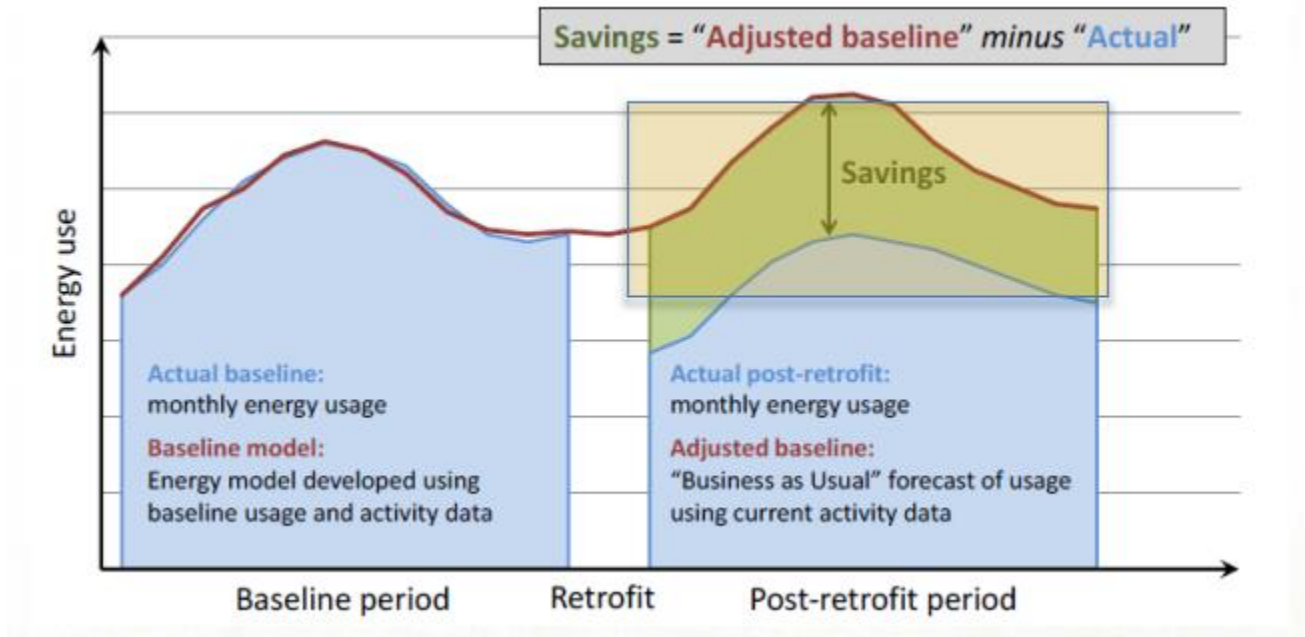
- the ESCo must guarantee effective energy savings.
- The earnings depend on the savings.
- The ESCo can use internal or external resources, in order to fulfil its role in the contract.
- ESCo can finance the initiative with equity and debt (TPF).



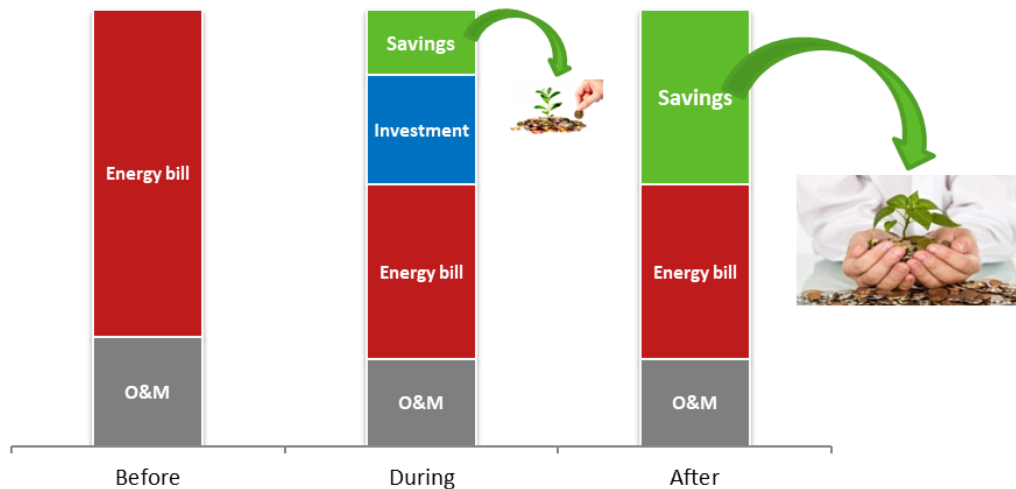
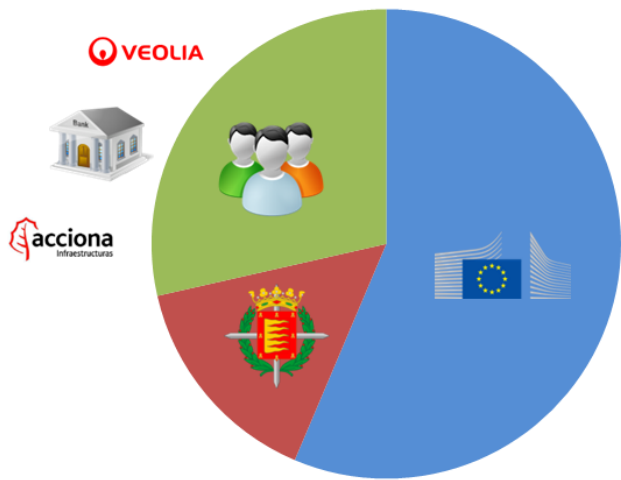


Retrofitting of FASA residential district

- IPMVP:
 - Provides reliability
 - Need for accurate data



Retrofitting of FASA residential district



- **Combining Instruments:** The success of the program is largely due to its combination of grants, EPC and soft loan, which make it accessible to households that may not have been able to afford renovations otherwise.
- **Community Involvement:** The municipality, the ESCO and the construction company worked closely with the neighbourhood association to ensure broad participation and engagement.





Stay tuned:
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REMOURBAN on Twitter
@Remourban_EU
follow us!



Regenerate your city with
REMOURBAN!

Thank you for your attention!



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 646511



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5 DECEMBER 2024, 10:00-12:00 CET

INNOVATIVE FINANCING INSTRUMENTS: CASE STUDIES

**ENERGY PERFORMANCE CONTRACTING (ESCO),
SOFT LOANS, CITIZEN FINANCE, BLENDED FINANCE**

Setting-up Renewable Energy Communities: the case of San Lazzaro di Savena

**Sharing experiences in supporting public institutions
in the energy transition in Italy**

Marco Costa

Energy Engineer and
Renewable Energy Communities Team Lead



EU Legislation and transposition path for Italy

DEC-2018

Renewable Energy Directive (RED II) and Electricity Market Directive

- Strengthening the role of renewables self-consumers
- Possibility to establish Renewable Energy Communities

DEC-2019
FEB-2020

D.L. n. 162/2019
Law n. 8/2020
Kick start of the trial phase

- Partial transposition of RED II directive allowing for:
- Collective self-consumers
 - Renewable Energy Communities

DEC-2021

D.L. n.199/2021
Full transposition of RED II Directive

Expansion of REC perimeter and installed capacity allowance

FEB- 2024

Legislative Decree and Technical regulation by GSE

Full regulation of RECs and registration portal activation from 8° of April

What's an Energy Community in Italy?



A group of energy prosumers that collectively «share» energy locally produced and consumed

Shared Energy definition

Shared Energy

=

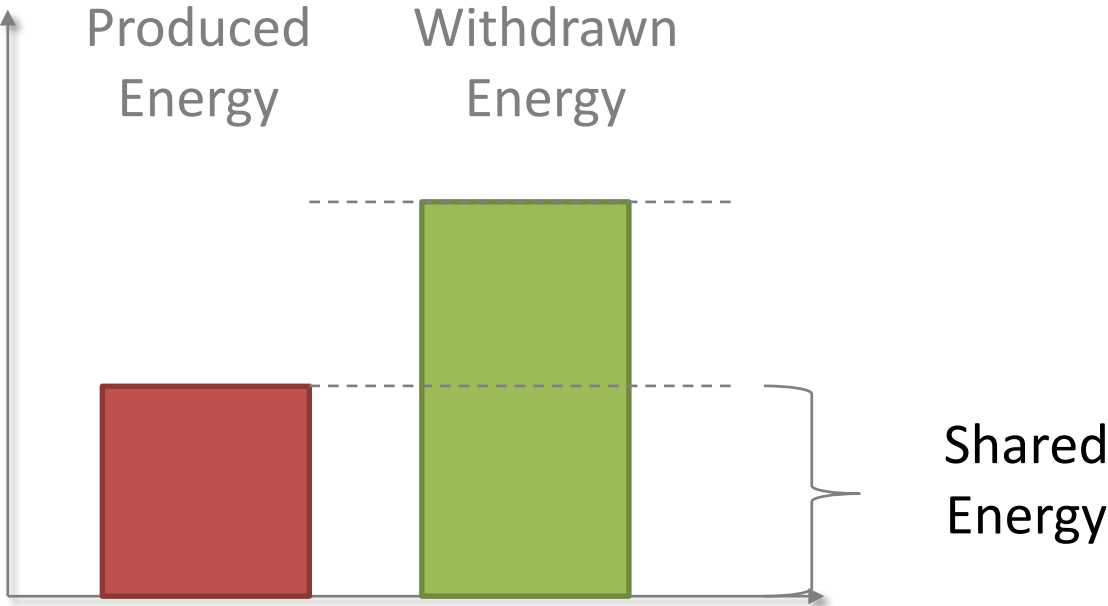
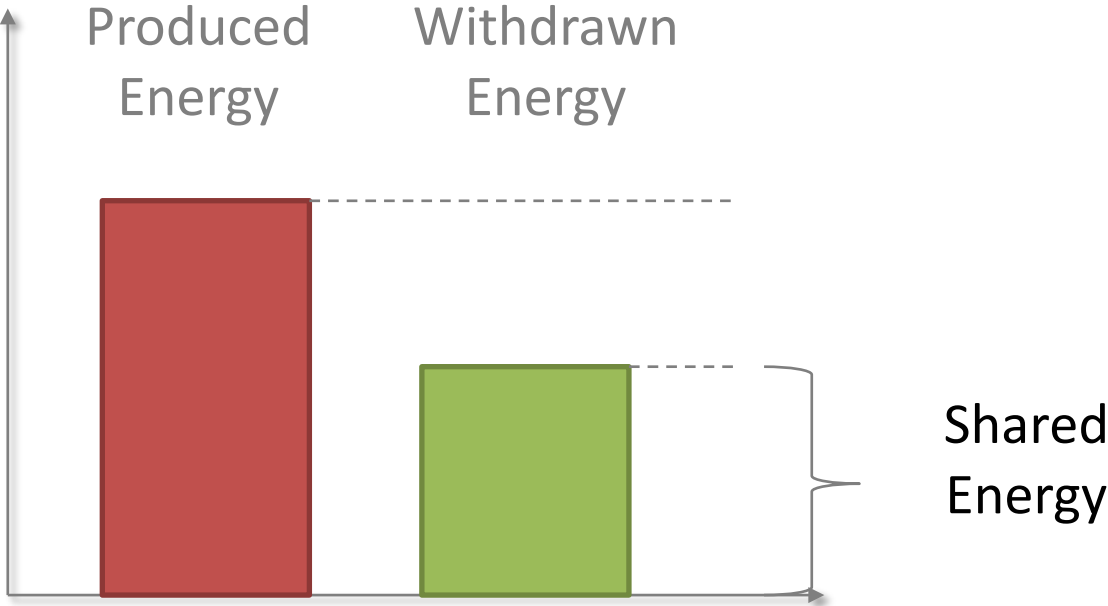
The minimum, in a given time frame, of:

Renewable energy produced

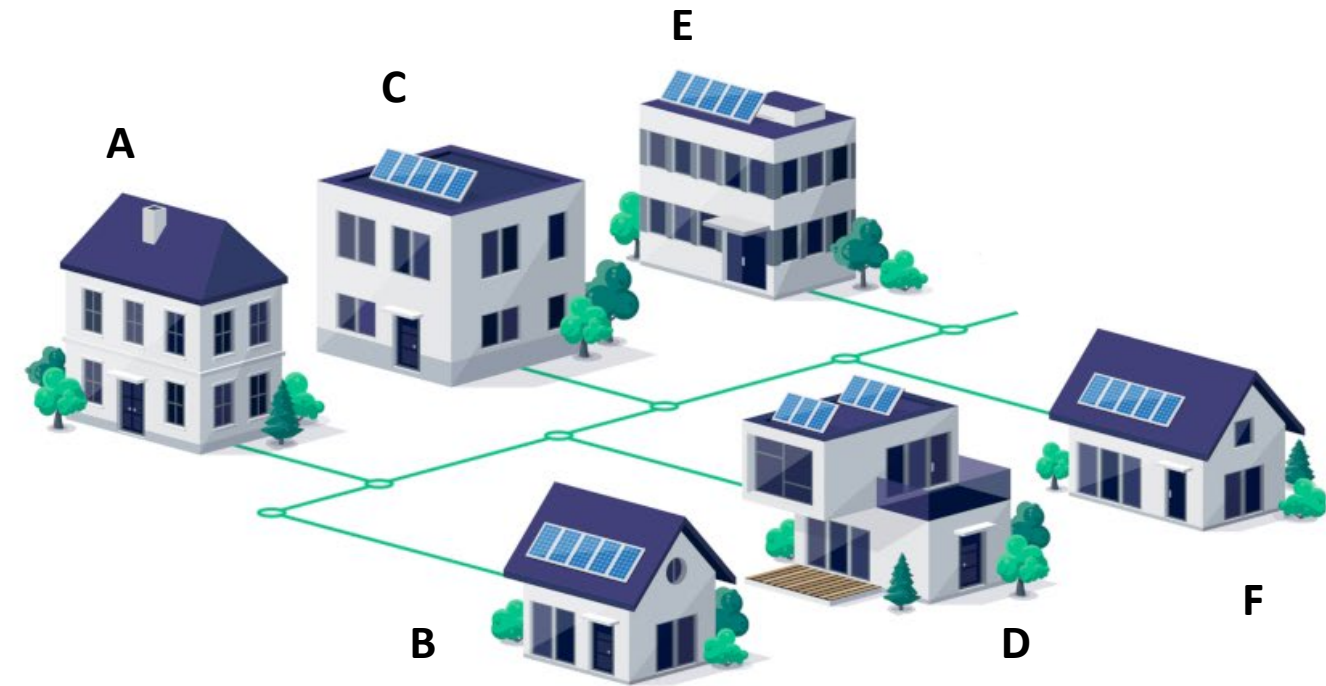
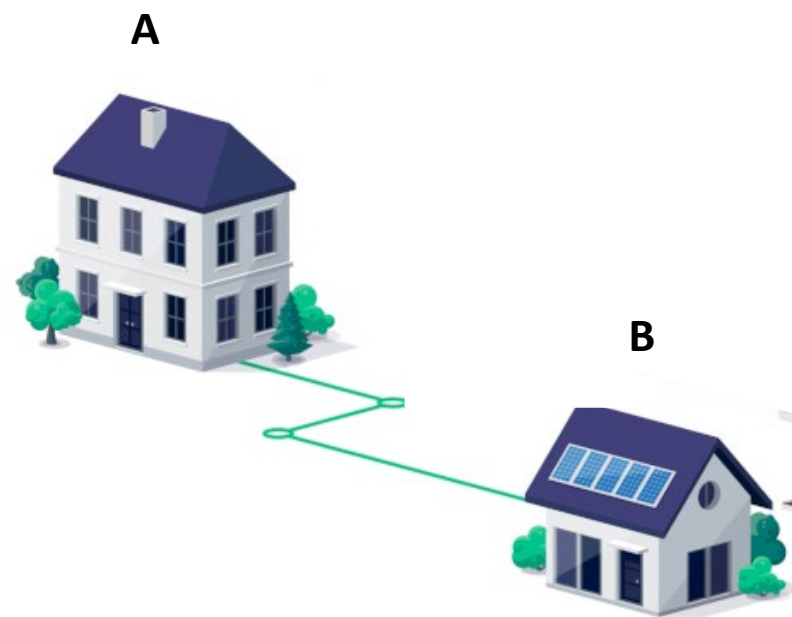
AND

Energy withdrawn from the grid

It's a virtual concept, not a direct sharing of energy among members



Shared Energy definition



Within the same hour:

- User A withdraw 10 kWh from the grid
- Prosumer B feed 3 kWh to the grid



Shared : 3 kWh

Within the same hour:

- User A withdraw 10 kWh from the grid
- Prosumer B feed 20 kWh to the grid



Shared : 10 kWh

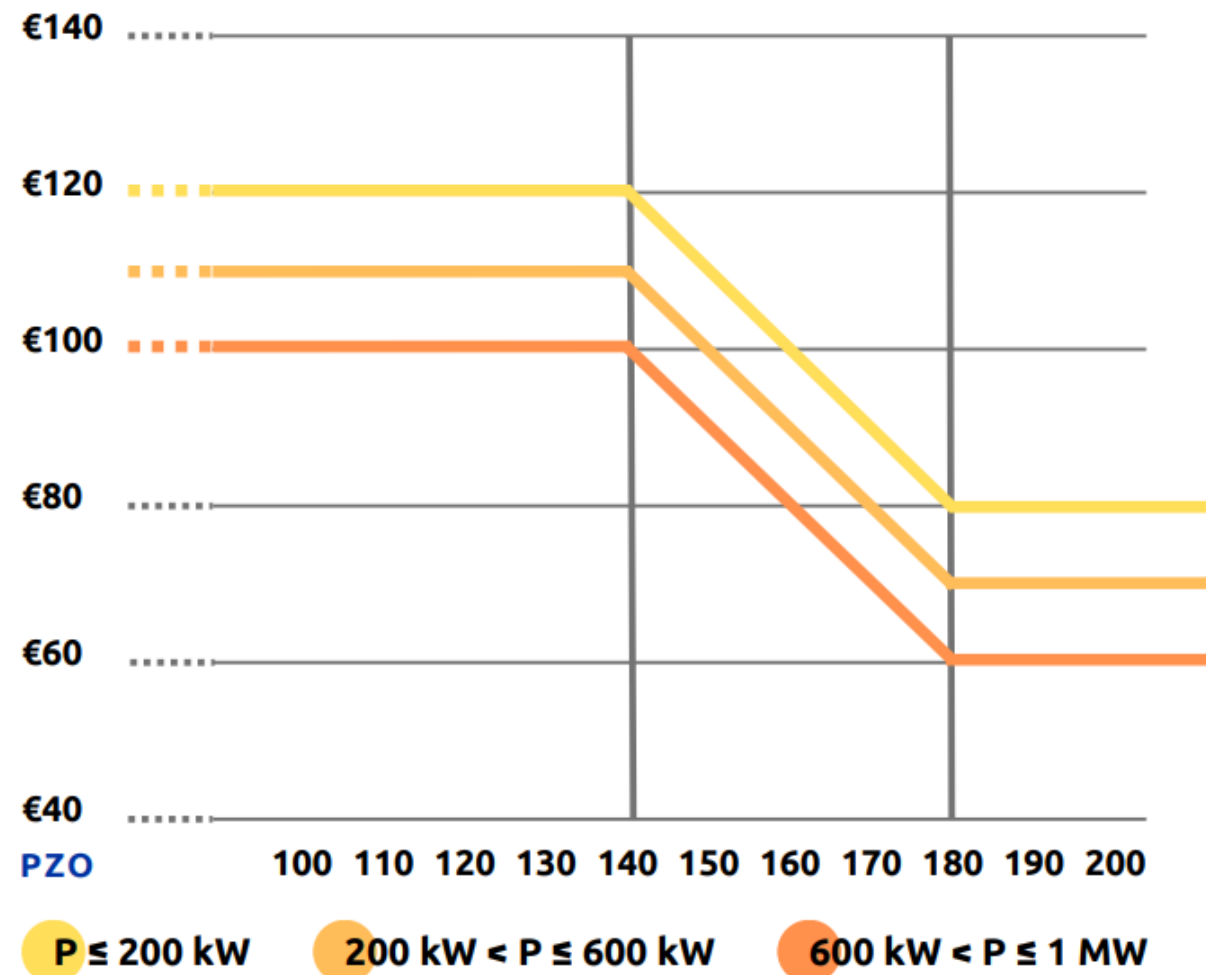
Energy Community basics

Main goal: “to provide environmental, economic or social community benefits for its shareholders and members or for the local areas where it operates, rather than financial profits”

Need for a dedicated legal entity:

- *Criteria based approach: any legal form allowed in the EU*
- *Allowed stakeholders: citizens, NGO, SME, ESCo, cooperatives, public entities, etc.*
- *Not allowed: Energy related companies and REC management cannot be the primary business activity for an enterprise*
- Any stakeholder can join and withdraw from the REC freely any time

REC's incentive scheme



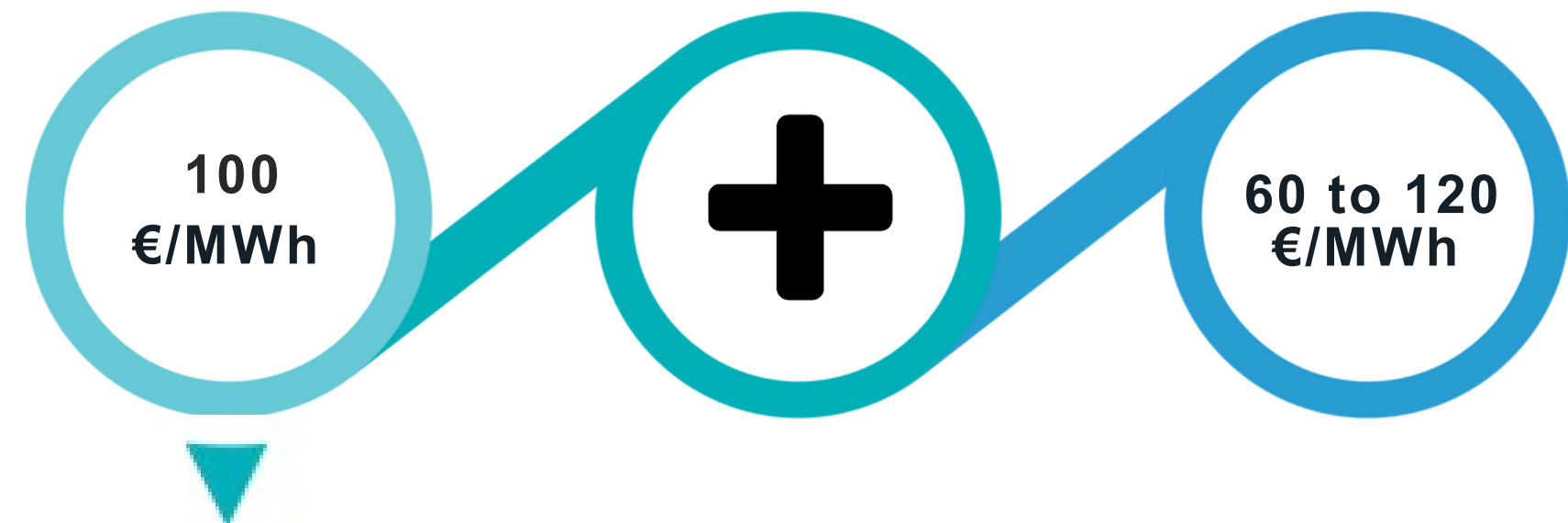
FOR THE ENERGY SHARED

Incentive scheme depends on:

- Renewable Energy System size
- Zonal energy price

+

ARERA CONTRIBUTION: 10€/MWh

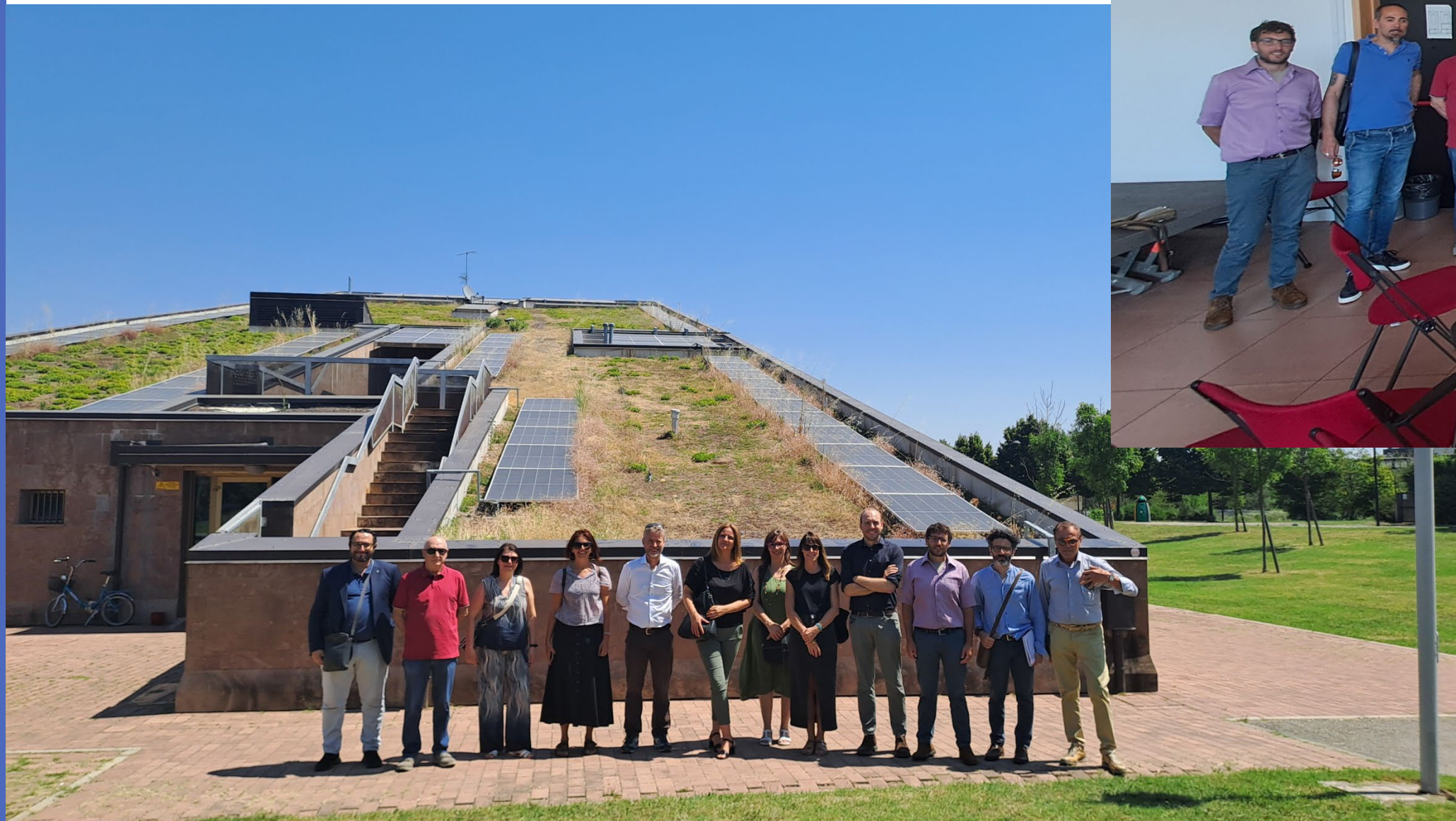


Feed in tariff: currently 100 €/MWh

FOR THE ENERGY FED INTO THE GRID

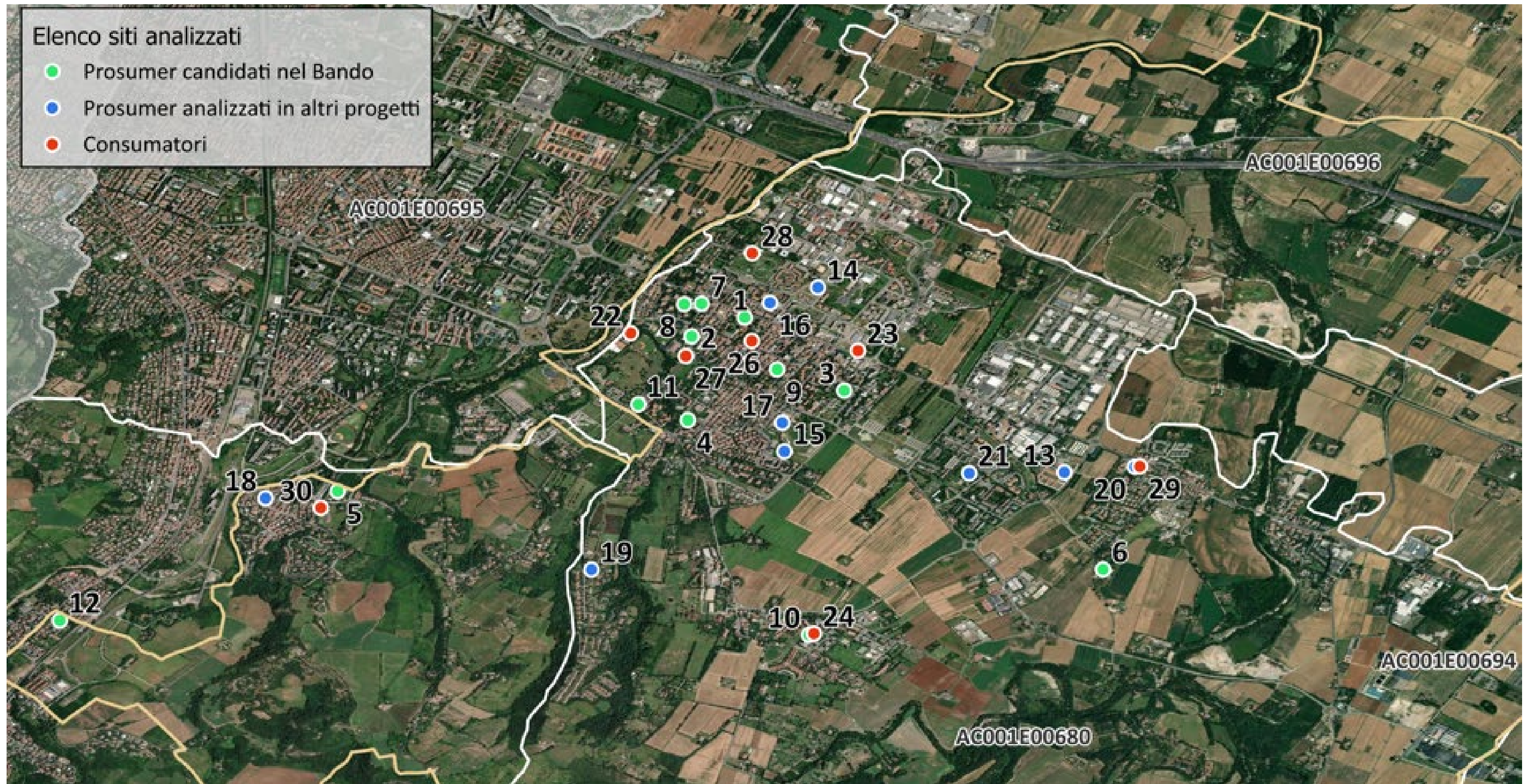
THE CASE OF SAN LAZZARO DI SAVENA (BO)

8 funding members:
municipality, social associations and
other institutional partners



Chosen legal entity:
Accredited Association

THE CASE OF SAN LAZZARO DI SAVENA (BO)



FEASIBILITY STUDY

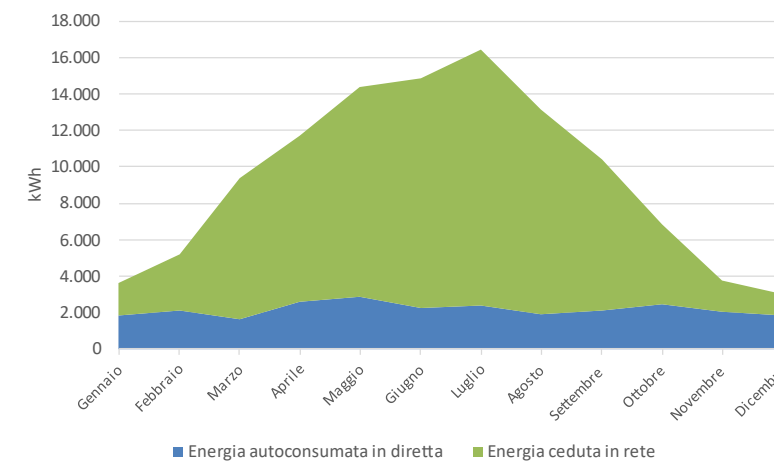
Sites inspection and 3D modelling of the 11 buildings under analysis, for almost 530 kWp



Indice Di Performance

1.282 kWh/kWp

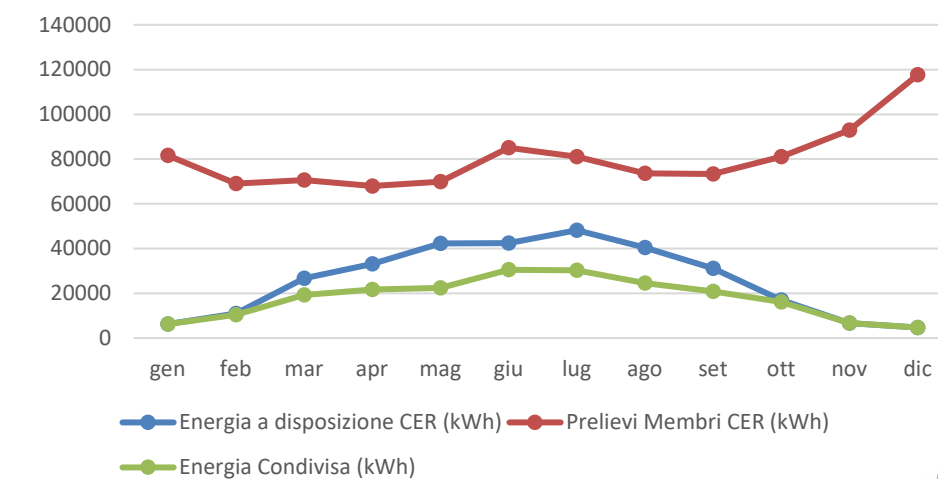
Consumption analysis from utility bills



Mese	Consumi Elettrici mensili [kWh]		
	Fascia F1	Fascia F2	Fascia F3
Gennaio	1.995	936	1.722
Febbraio	2.105	857	1.365
Marzo	1.208	837	1.442
Aprile	1.903	819	1.479
Maggio			

Analysis of self-consumed energy and fed into the grid

Andamento mensile dell'energia condivisa

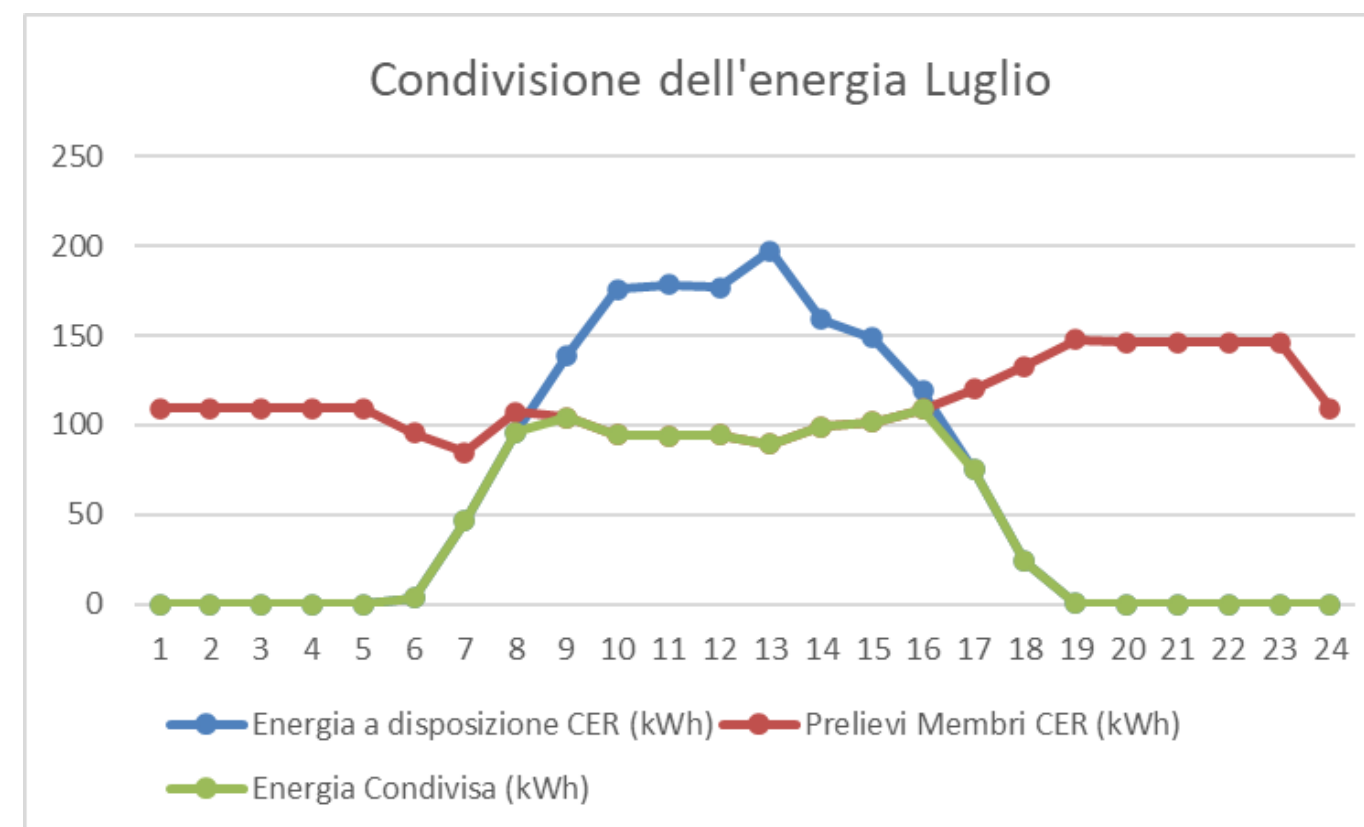
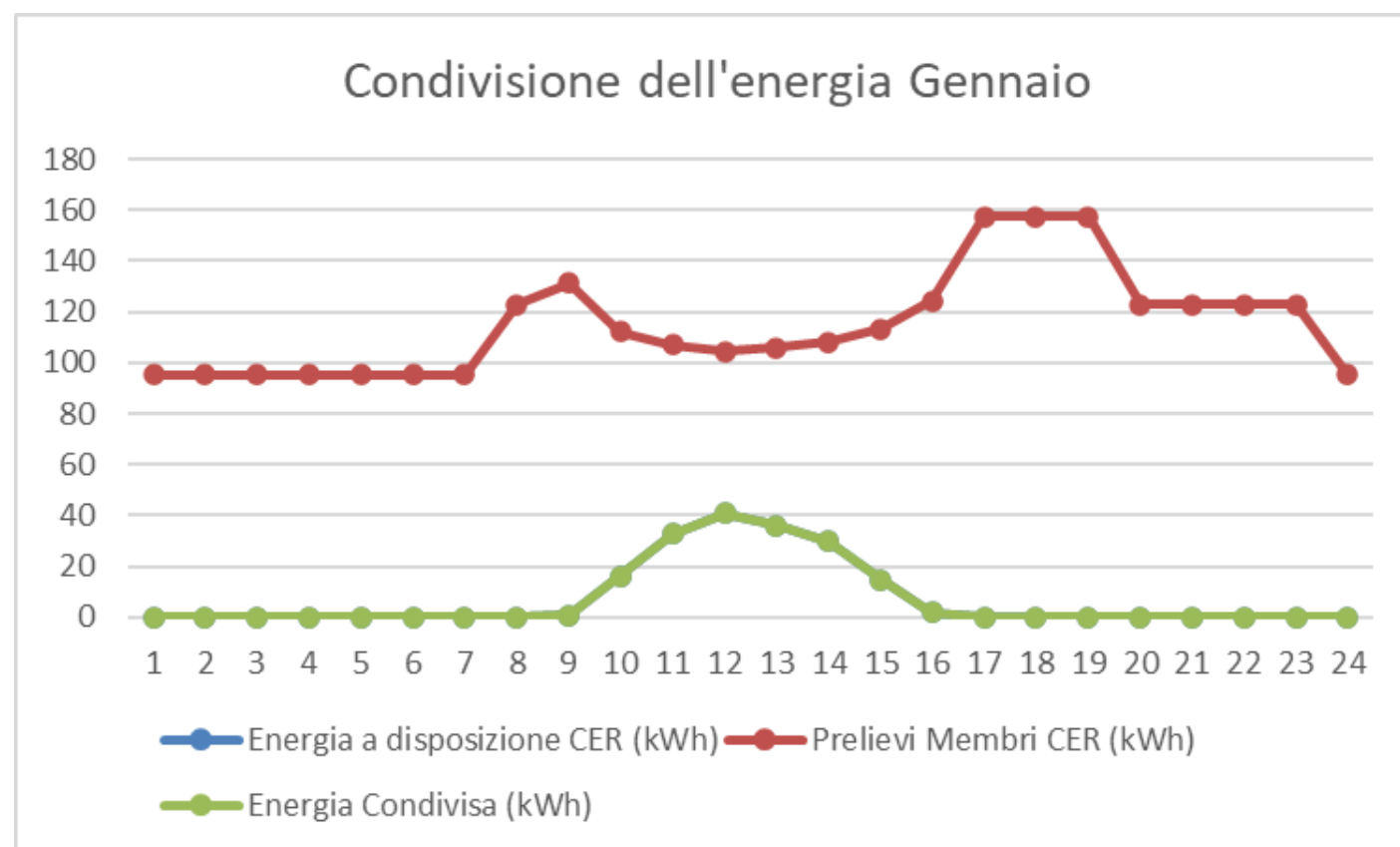


SHARED ENERGY

The total estimated energy produced is 606,310 kWh per year, of which 39 % is self-consumed live.
The energy made available to the grid is 371,727 kWh.

Evaluating for each hourly interval the minimum between energy produced and energy self-consumed, considering only the sites under analysis, the energy shared is equal to:

- TR HV/MV AC001E00679: 500 kWh (0.8 % of total available)
- TR HV/MV AC001E00680: 213,694 kWh (68.9 % of the total available)



MORE PV SYSTEMS AVAILABLE SOON...

The municipality has already installed or is planning to install approximately 647 kWp of photovoltaic systems on municipal buildings. They will increase the shareable energy by 251,197 kWh/year. These newly installed systems* will be part of the Energy Community.

... AND MORE CONSUMERS

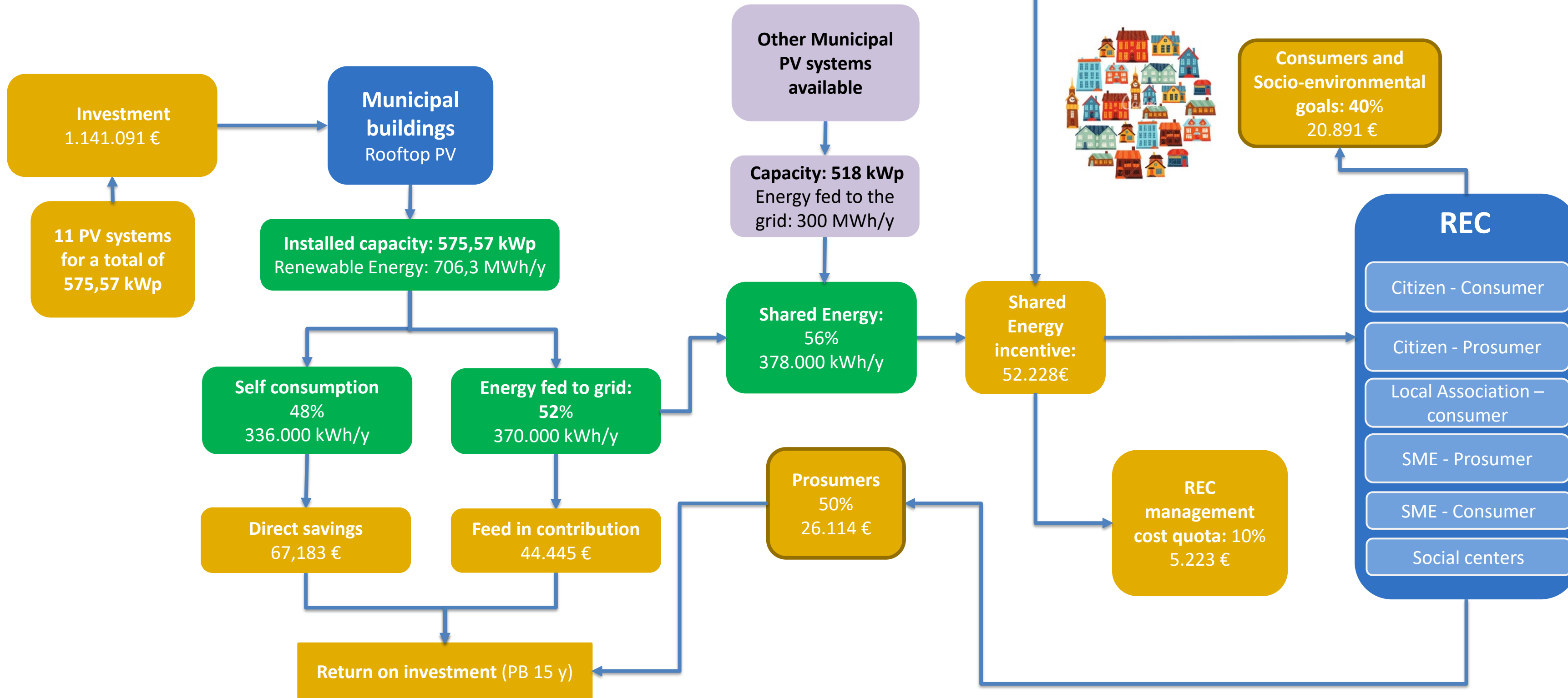
Some of these buildings have very high consumption, so at certain times of the day they will act as consumers. In addition, the municipality or other local associations will be able to use their PODs as consumers (e.g. La Terrazza social centre)

* Ai sensi del d.lgs. 414 12/2023



How does a small REC works?

REC incentive scheme



REC instrumental to the SECAP implementation

As indicated in the SECAP*, as of 2017, total electricity consumption in the municipal area was 107.75 GWh.

ENERGIA ELETTRICA [MWh]								
ANNO	Edifici comunali e attrezzature	Edifici terziari e attrezzature	Edifici residenziali	IP	Agricoltura	Industria	Trasporti (totali)	TOTALE
2017	1.791,65	44.480,72	36.422,11	2.381,64	2.129,76	19.516,14	1.031,70	107.753,71

Considering only municipal and residential building consumption, the total energy withdrawn is approximately 38.00 GWh, with 12.50 of this estimated during the production hours of the photovoltaic systems.

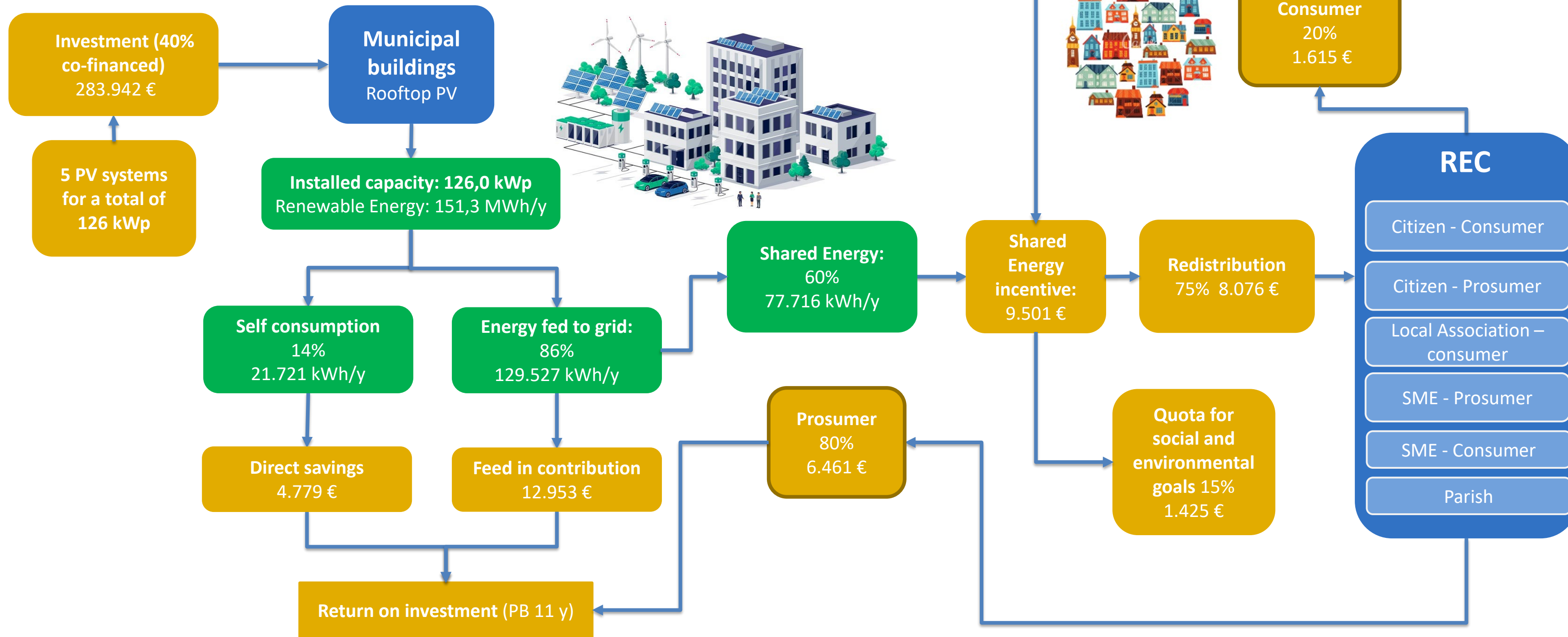
The minimum power to be installed in order to saturate this value is 10.4 MWp

* <https://www.comune.sanlazzaro.bo.it/novita/notizie/approvato-il-piano-d2019azione-per-l2019energia-sostenibile-e-il-clima-paesc>



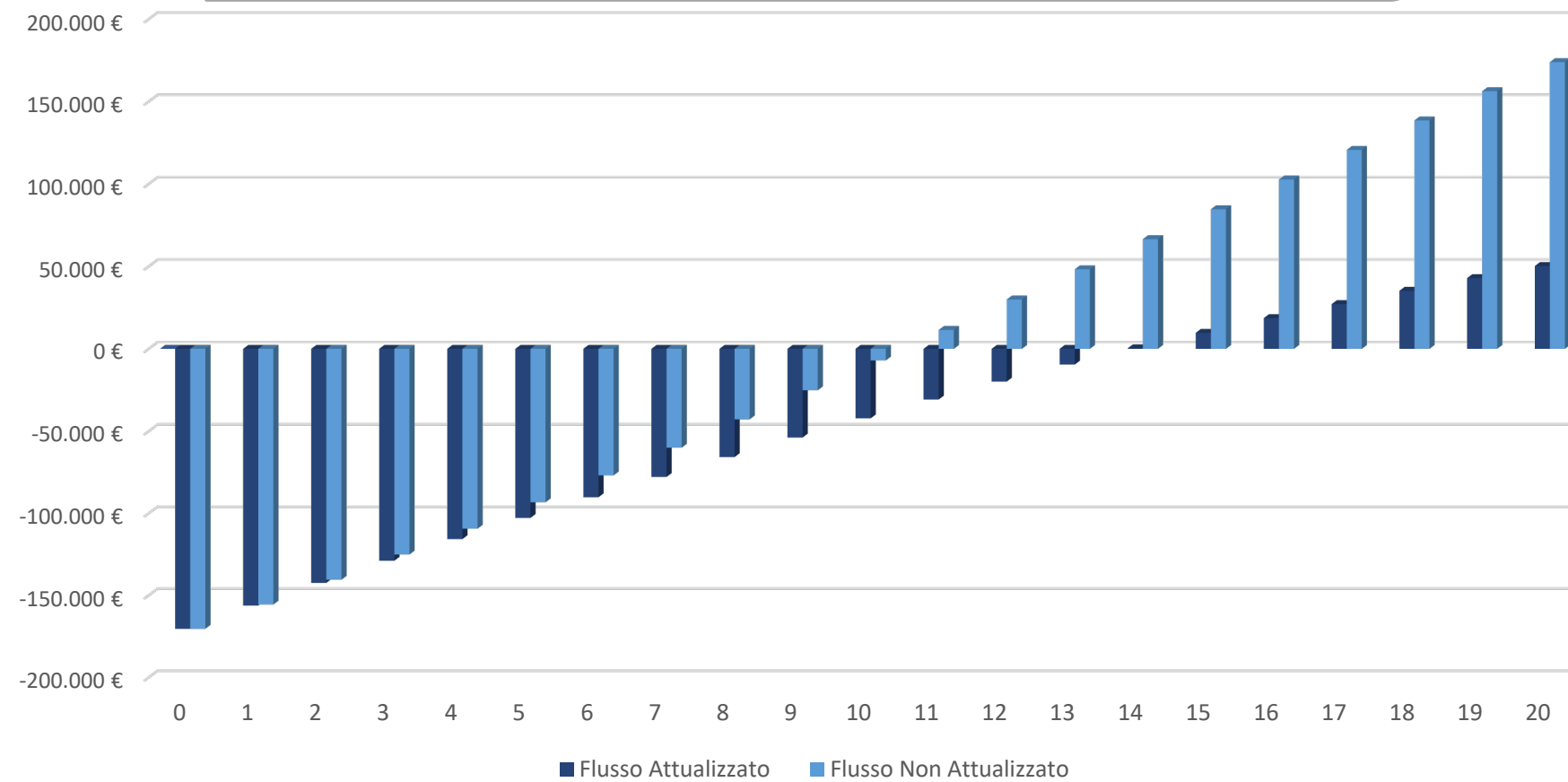
How does a small REC works?

REC incentive scheme



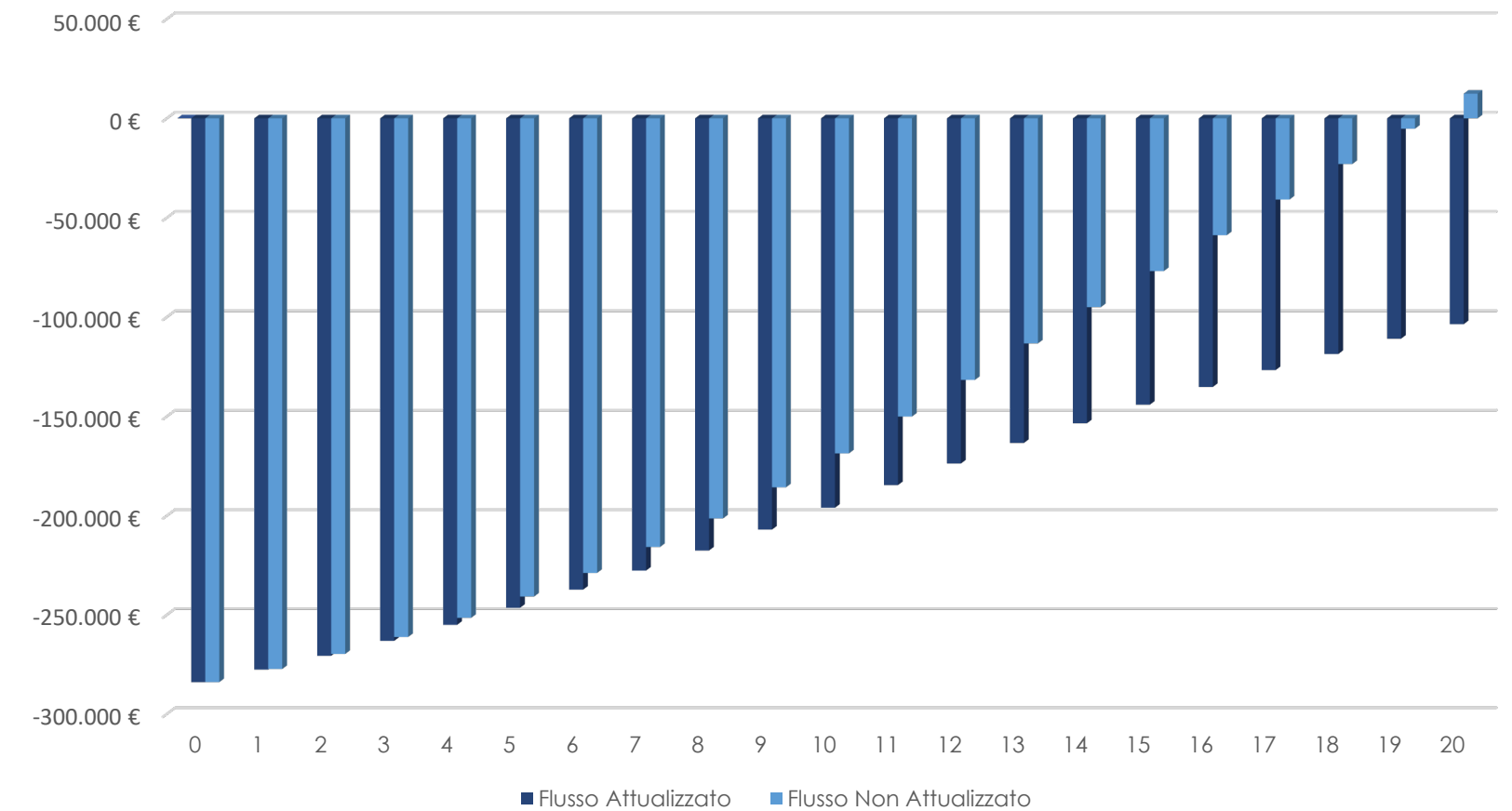
Economic results

40% co-financing support



Financials	
IRR @20y	7,55%
NPV @20y	50.221 €
SPB [y]	11
PB [y]	14

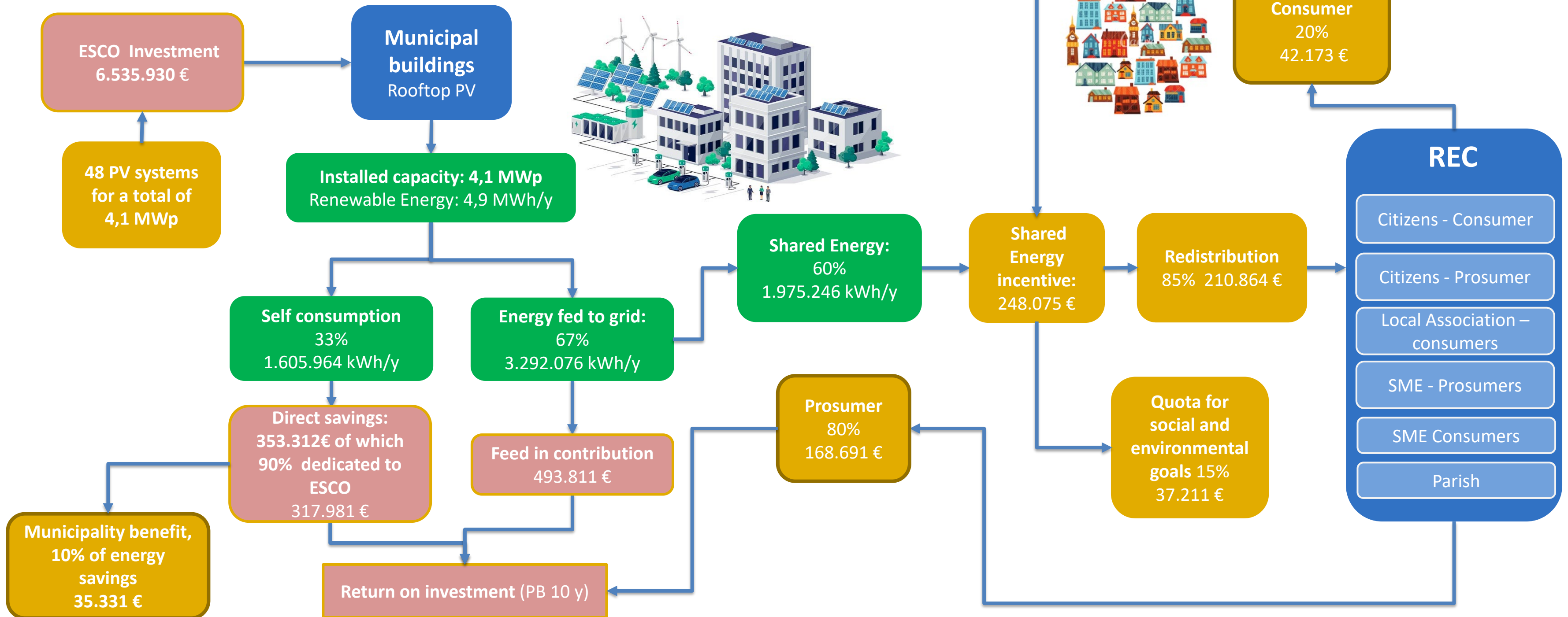
100% self funded



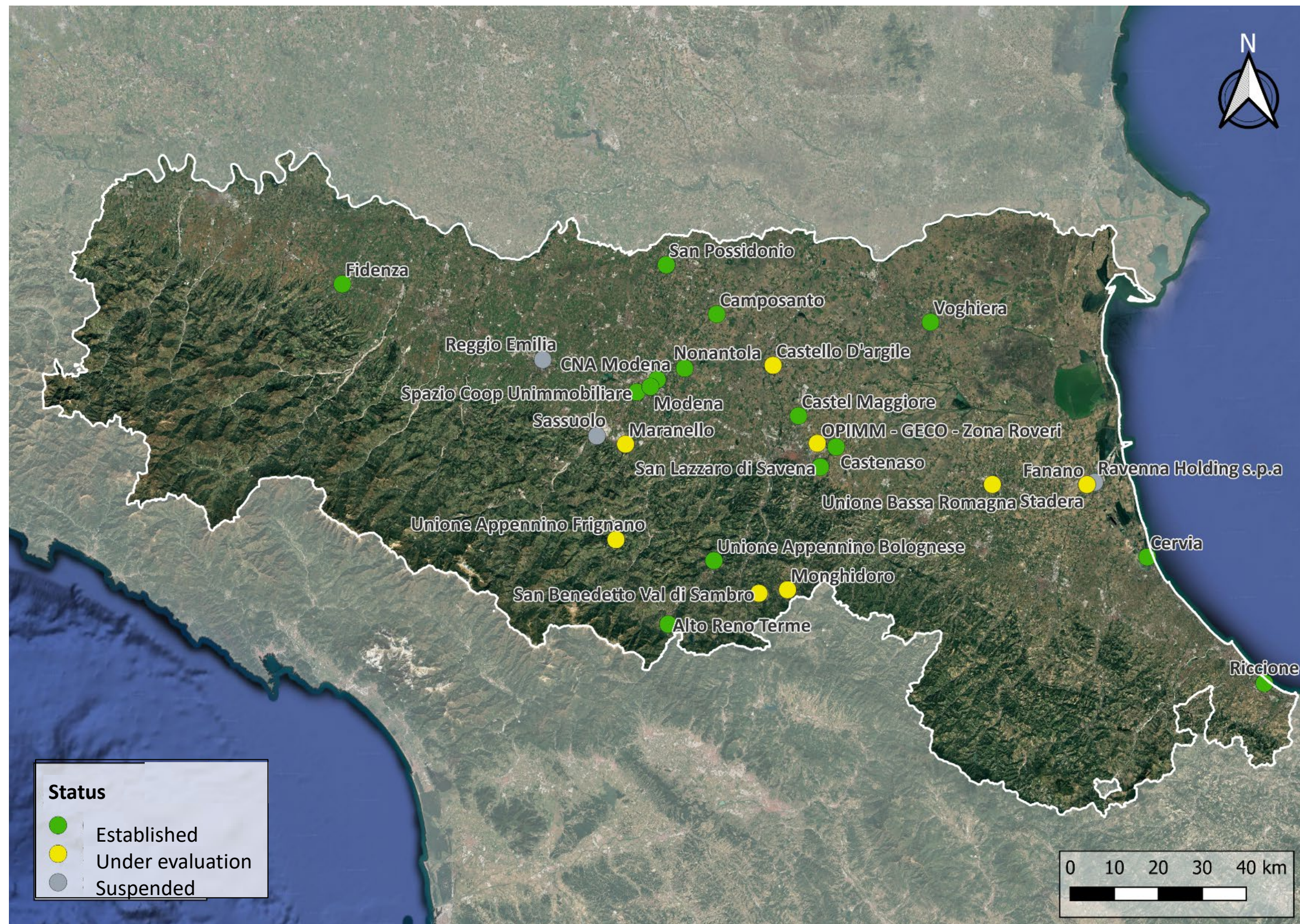
Financials	
IRR @20y	0,36%
NPV @20y	-103.563 €
SPB [y]	20
PB [y]	>20

How does a big REC works?

REC incentive scheme



REC Grant Emilia-Romagna Region - Results



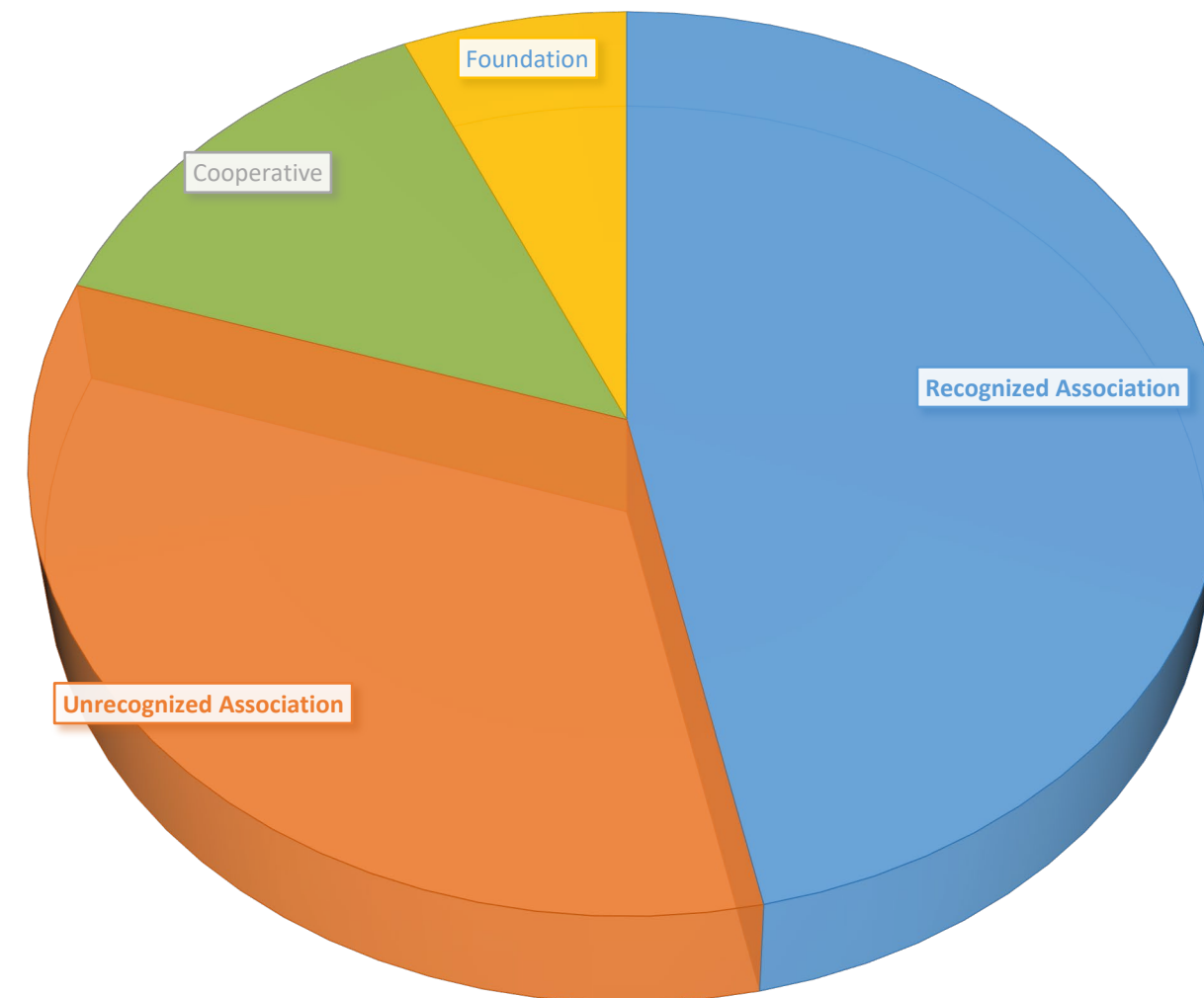
- **26 Applications** supported by AESS in 2023:
- **By now:**
 - 15 established Renewable Energy Communities
 - 8 projects under development
 - 3 suspended projects

REC Call Emilia-Romagna Region : chosen legal forms

Considering the 15 established RECs, the chosen legal entities are distributed as follows:

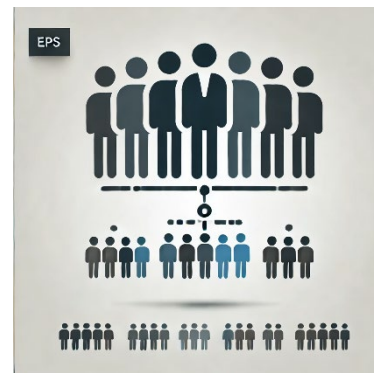
- **Accredited Association: 7**
- **Simple Association: 5**
- **Cooperative: 2**
- **Foundation: 1**

Excluding the 2 cooperatives, all other RECS are lead by or include municipalities

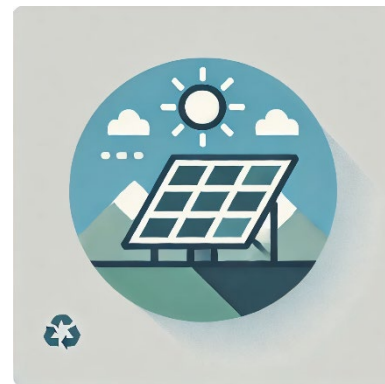


REC Call Emilia-Romagna Region : statistical results

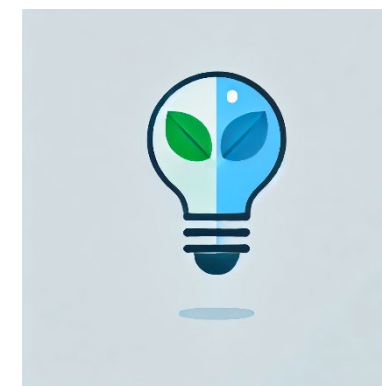
Summarizing the data of the configurations submitted for the regional REC grant:



a total of 84 founding members were involved



9,11 MW were analyzed....



...allowing for a production of 11,3 GWh/y of renewable energy



An average total shared energy rate of 49% is estimated



Approximately 2.960 tCO₂eq/year will be prevented from being emitted into the atmosphere



Technical analyses have estimated an average total self-consumption rate of 23%



A total REC incentive of € 409.763 is estimated in the first year

Challenges when setting up a REC in Italy

- **Members participation**
 - Buy-in
 - Long term engagement
- **Legal entity specifics:**
 - Incentive redistribution
 - Governance
 - Set up costs
- **Business Plan**
 - REC management costs
 - Financial stability
 - Access to credit
- **Direct Investment vs Third party investment**
- **Installation authorization and timing**
- **Administrative challenges for public entities**



Thank you for your attention



5 DECEMBER 2024, 10:00-12:00 CET

INNOVATIVE FINANCING INSTRUMENTS: CASE STUDIES

**ENERGY PERFORMANCE CONTRACTING (ESCO),
SOFT LOANS, CITIZEN FINANCE, BLENDED FINANCE**

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