

Workshop District Renovation towards #nZEB Taller Rehabilitación de Distritos #EECN

27 de marzo

Laboratorio de Control de Calidad en la Edificación
Gobierno Vasco

Project IEA EBC Annex 75 - Cost-effective Building Renovation
at District Level Combining Energy Efficiency & Renewables

Organización:



ENEDI UPV/EHU
Research Group on Energy in Buildings
Grupo de Energética en Edificación



Energy in Buildings and
Communities Programme



Universidad
del País Vasco Euskal Herriko
Unibertsitatea



Workshop on district renovation towards nZEB

Project IEA EBC Annex 75 - Cost-effective Building Renovation at District Level Combining Energy Efficiency & Renewables

A chance to share district renovation experiences and discuss the most important barriers and policy instruments for a future nZEB renovation at district scale.

9:30 **Welcome by the organizers and workshop goals**

9:45 **Presentation of ANNEX 75 project**

10:00 **Round table 1: Administration role in building renovation at district scale**

Basque government's Department of Housing: building renovation strategy

Ainara Sertutxa, Head of Projects, Constructions and Supervisions, Department of Housing, Basque Government.

Basque social housing company - ALOKABIDE: social housing building management and 2050 renovation Plan for 7700 dwellings

Carlos Orbea, Technical Manager of ALOKABIDE

Building administrator association of Bizkaia: The perspective from building management professionals

Raquel Varona, member of the board of governors of Colegio de Administradores de Bizkaia

Architect's association: The perspective from design professionals

Arantxa García, member of the board of governors of Delegación de Gipuzkoa del Colegio de Arquitectos Vasco Navarro.

11:00 **Coffee break**

11:30 **Round table 2: District renovation case studies analysis and best facilitation tools**

SmartEnCity project - Vitoria-Gasteiz: new biomass DH in Coronación

Savid Grisaleña, Innovation and sustainability department of VISESA

Alberto Ortíz de Elgea, Head of Innovation, sustainability and energy services of VISESA

CITYFIED project – Valladolid, new biomass DH in Torrelago

Ana Quijano, Researcher at Energy Department – Foundation CARTIF

ZenN project – Eibar, social housing district renovation in Mogel

Esther Zarrabeitia, Head of Urban planning and rehabilitation of DEGEBESA

Review of ANNEX 75 success stories

3% plus Road map for EE renovation for local districts. Uta Lynar, B.&S.U. mbH

12:45 **Conclusions of the workshop**

13:00 **Closure**

Workshop sobre rehabilitación de distritos nZEB

Project IEA EBC Annex 75 - Cost-effective Building Renovation at District Level Combining Energy Efficiency & Renewables

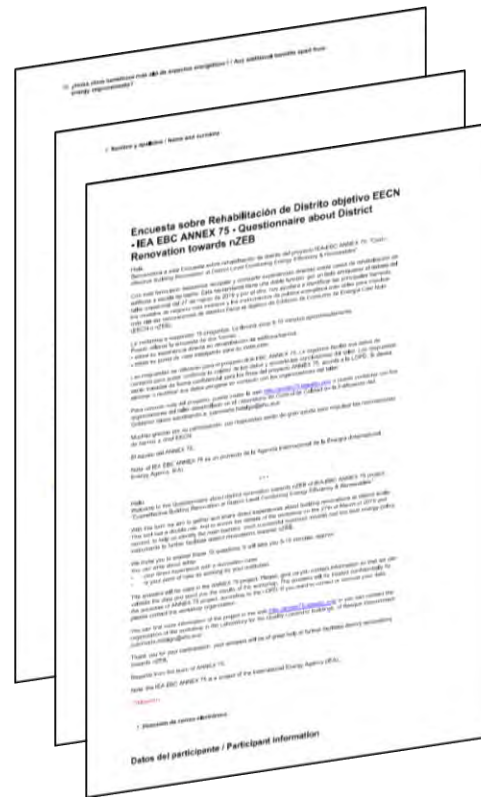
Un encuentro para compartir experiencias de rehabilitaciones de distrito y analizar las principales barreras e instrumentos de política energética para conseguir renovación de distrito nZEB exitosa.

- 9:30 **Bienvenida por la organización y objetivos del taller**
- 9:45 **Presentación del proyecto IEA-EBC ANNEX 75**
- 10:00 **Mesa Redonda 1: El rol de la administración en las rehabilitaciones de distrito**
- Dirección de Vivienda y Arquitectura del Gobierno Vasco: estrategia de rehabilitación de edificios en la CAPV**
Ainara Sertutxa, Responsable de Proyectos, Obras y Supervisiones de la Dirección de Vivienda y Arquitectura, Gobierno Vasco
- Sociedad pública de Alquiler de Vivienda - ALOKABIDE: plan de rehabilitación del parque la vivienda pública de alquiler social en Euskadi, 7700 viviendas**
Carlos Orbea, Director Técnico de ALOKABIDE
- Asociación de administradores de fincas de Alava: La perspectiva desde la gestión de comunidades de vecinos**
Raquel Varona, vocal de la junta de gobierno del Colegio de Administradores de Bizkaia
- Colegio Oficial de Arquitectos Vasco Navarro - COAVN: La situación del proyectista en los procesos de rehabilitación**
Arantxa García, vocal de la Delegación de Gipuzkoa del Colegio de Arquitectos Vasco Navarro.
- 11:00 **Pausa café**
- 11:30 **Mesa Redonda 2: Casos de estudio de rehabilitación a escala de barrio, análisis y mejores herramientas de impulso de la rehabilitación**
- Proyecto SmartEnCity - Vitoria-Gasteiz, central de biomasa DH en Coronación**
David Grisaleña, Técnico de Innovación y Sostenibilidad de VISESA
Alberto Ortiz de Elgea, Responsable de Innovación, Sostenibilidad y Servicios Energéticos
- Proyecto CITYFIED – Valladolid, central de biomasa DH en Torrelago**
Ana Quijano, Investigadora del área de Energías – Fundación CARTIF
- Proyecto ZenN – Eibar, renovación de vivienda social en Mogel**
Esther Zarrabeitia, Responsable del Dpto. Urbanismo y Rehabilitación
- Repaso de casos de éxito del ANNEX 75**
3% plus Road map for EE renovation for local districts. *Uta Lynar, B.&S.U. mbH*
- 12:45 **Conclusiones del workshop**
- 13:00 **Cierre**

Workshop sobre rehabilitación de distritos nZEB

Project IEA EBC Annex 75 - Cost-effective Building Renovation at District Level Combining Energy Efficiency & Renewables

Un encuentro para compartir experiencias de rehabilitaciones de distrito y analizar las principales barreras e instrumentos de política energética para conseguir renovación de distrito nZEB exitosa.



Workshop District Renovation towards #nZEB Taller Rehabilitación de Distritos #EECN

27 de marzo. Laboratorio de Control de Calidad en la Edificación, Gobierno Vasco

Project IEA EBC Annex 75 - Cost-effective Building Renovation
at District Level Combining Energy Efficiency & Renewables

ESKERRIK ASKO!

Grupo de Investigación de Energética en la Edificación, **ENEDI Group UPV/EHU**
Área Térmica del Laboratorio Control de Calidad de la Edificación de la Dirección de Vivienda y Arquitectura
(Gobierno Vasco)



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ENEDI UPV/EHU
Research Group on Energy in Buildings
Grupo de Energética en Edificación



Energy in Buildings and
Communities Programme



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Unibertsitatea



EUSKO JAURLARITZA
GOBIERNO VASCO

INGURUMEN, LURRALDE PLANGINTZA
ETA ETXEBIZITZA SAILA
DEPARTAMENTO DE MEDIO AMBIENTE,
PLANIFICACION TERRITORIAL Y VIVIENDA

IEA EBC Annex 75

Cost-Effective Building Renovation at District Level Combining Energy Efficiency & Renewables

13 countries are involved in the project:
AT, BE, CH, CN, CZ, DK, ES, GE, IT, NL,
NO, PT, SE

January 2018 – June 2022

Manuela Almeida (Operating Agent)
University of Minho
Portugal



Workshop on district renovation towards nZEB

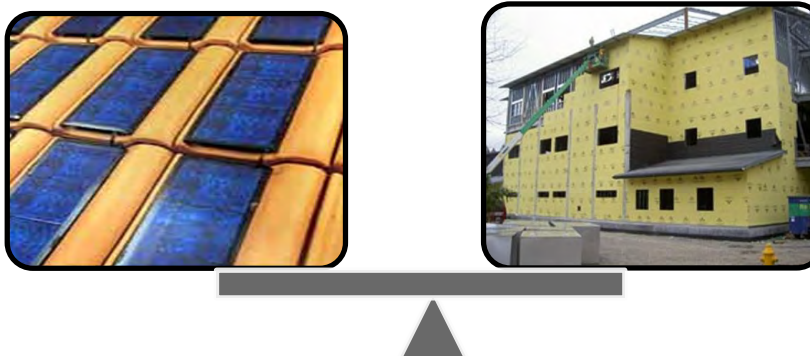
Vitoria-Gasteiz
27th March 2019

1. Project Background

IEA EBC Annex 75 | Background

In existing buildings, **the most cost-effective renovation solution** is often a **combination of energy efficiency measures and carbon emissions reduction measures**.

So, it is relevant to investigate **where is the balance point** between these two types of measures in a cost/benefit perspective.



Questions?

- How to achieve the best performance with minimal effort?
- How far is possible to go with energy efficiency measures (initially often less expensive measures)
- From which point the carbon emissions reduction measures become more economical

2. Project Idea

Key question: Where is the balance point between energy efficiency measures and measures that promote the use of renewable energy?

Annex 56: At the building level

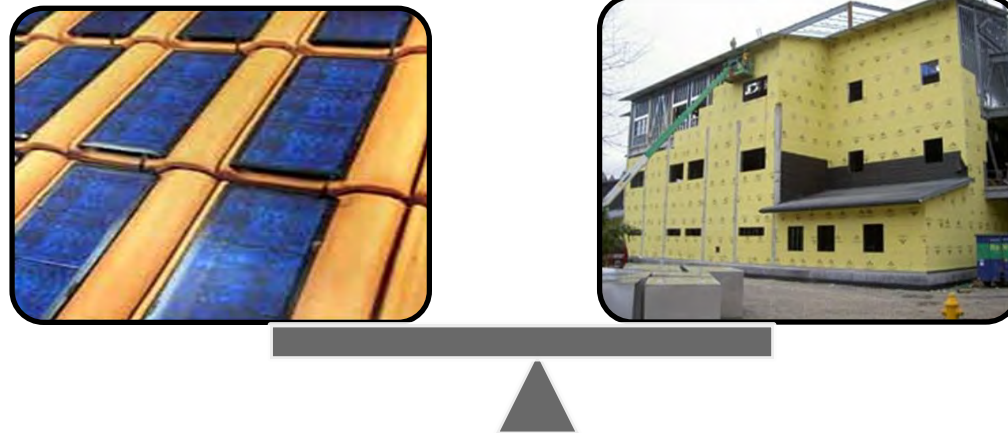
Annex 75: At the level of groups of buildings / urban districts



The Goal: reach cost-effective energy and carbon emission optimization in building renovation at an urban district scale

2. Project Idea

- At **district level** there are **specific opportunities** as well as **specific challenges** when compared to building level
- **Finding the balance** between renewable energy supplies and energy efficiency measures for the renovation of the existing stock **is more complex at district level** than for individual buildings, but **may also bring larger benefits**



2. Project Idea

There are **several options available** that need to be explored:

Exemples:

- We can benefit from significant **economies of scale for energy efficiency measures due to aggregated demands and synergies** in construction procurement, processes and planning;
The provision of low-temperature district heating systems to groups of buildings may benefit from synergies when combined with energy efficiency measures applied to the buildings envelopes.
- There is also an opportunity to **benefit from centralized renewable energy approaches**;
The availability of heat storage facilities that in a single building intervention is limited to the building floor space, at district level the options are wider

2. Project Idea

However, **there are** also some **challenges**:

- At the **level of individual buildings**, **synergies** between energy efficiency measures and installation of renewable energy systems **can be easily achieved** but, **at district level** such **synergies are not necessarily available** as they depend on the existing heating systems and on the synchronization of the buildings' renovation cycles

In this context, it is important **to explore the potential of cost-effective renovation interventions at district level** to accelerate the necessary transition towards low-emissions and low-energy districts

3. Annex 75 Objectives

The main objectives in Annex 75 are:

- To define a **flexible methodology, supported by efficient tools**, that **identifies cost-effective strategies** for **renovating urban districts** that significantly reduce carbon emissions and energy use
- To identify and document **good practice examples**, supplementing the methodology, by **showing strategies** for transforming existing urban districts into low-energy and low-emissions districts
- To develop **Guidelines for policy makers and energy-related companies** showing on how to **encourage the market uptake** of cost-effective strategies combining energy efficiency measures and renewable energy measures
- To develop **Guidelines for building owners and investors** about **cost-effective district-level solutions**

<http://annex75.iea-ebc.org/>

4. Annex 75 Scope

Annex 75 Scope:

- **Residential buildings**
Single-family houses and multi-family buildings
- **Non residential buildings**
without complex technical systems



5. Research Structure

Annex 75 Structure:

The project is organized in four Subtasks as follows:

- **Subtask A: Technology Overview**
- **Subtask B: Optimization Methodology and Strategy Development**
- **Subtask C: Case Studies**
- **Subtask D: Policy Instruments, Business Models, Stakeholder Dialogue, and Dissemination**

6. Annex 75 Reports

- **Report on Technology Overview**
- **Methodology Report** on cost-efficient building renovation at district level
- **Assessment tools**
- Report on the application of the methodology in generic districts
- Report on strategy development
- Report on parametric assessments of case studies
- Online documentation of **good practice examples**
- Report on **enabling factors and obstacles to replicate successful case studies**
- Good practice guidance: Guidance for transforming existing districts into low-energy and low-emission districts
- Report on **policy instruments, including recommendations for subsidy programmes and for encouraging market take-up**
- Report on **business models and models for stakeholder dialogue**
- **Guidelines** for policy makers and energy related companies on how to encourage the market take-up of cost-effective strategies combining energy efficiency measures and renewable energy measures
- **Guidelines** for building owners/investors about cost-effective renovation strategies, including district-based solutions

Technology Overview

EBC

IEA EBC ANNEX 75

WORK IN PROGRESS: November 2018

Technology Overview

Subtask A – Work Package A1

Summary

The objective of Work Package A1 is the identification of existing and emerging technology options (both envelope and systems and at both building and urban scale). The document reports on work developed through collection of technologies with the potential to be included in the methodology for the participants of the research project.

Work in Progress consists of a series of documents presenting on-going work being developed in the context of the Annex 75 research project.

Prepared by ~~Jørgen~~ Jørgen Rose, Kirsten Egekvist, Thomsen, Ove C. Marck

EBC

Energy system - Storage

Solar district heating

Jørgen Rose, jo@ablau.dk, Denmark

Description

Large-scale solar panel arrays connected to an insulated water basin. During summer, the solar panels heat the water in the basin to approximately 90 °C and during winter, the stored energy supplies the district heating. Systems will have additional heat generating capacity to ensure that all of the consumers' heating needs are met, when there is insufficient sunshine.



Figure 16 - Tofthund District Heating. 27,000 m² solar panels and 70,000 m³ water. The facility will cover approximately 45 % of the total heating needs of the 1,033 individual customers.

Main characteristics

Solar collectors combined with a large water storage basin.

Power range

N/A

Technology interdependencies

If solar heat is used in combination with combined heat and power production (CHP), the flexibility value of the storage for electricity production in a system dominated by wind power could be included.

Advantages and disadvantages

The solution is relevant in climates dominated by heating with a seasonal variation in sunshine levels and temperatures.

References

"Solar Water Heating Project Analysis", RETScreen International (www.retscreen.net), 2004.

EBC




Figure 15 - A 50 kW LT-PEMFC CHP hydrogen unit from Dantherm Power.

Main characteristics

PEM fuel cells can usually work as both a fuel cell and a water electrolysis cell, i.e. converting hydrogen into electricity and heat in one process and converting water and electricity into hydrogen in the reverse process. This means that the fuel cell can store excess electricity as hydrogen when production from e.g. wind turbines is high and use this hydrogen as fuel when production is low.

Power range

The larger FC-CHP units are typically around 20 to 1,000 kW of electrical power.

Technology interdependencies

Combining PEM-FC with electricity based on renewable energy sources like wind turbines or photovoltaics means that it is possible to store excess production as hydrogen which can be used as fuel in the PEM-FC at a time where there is a shortage of electricity production. Stored hydrogen could also be used for transportation purposes in e.g. cars.

The fuel cells produce both electricity and heat and in order to obtain maximum efficiency the heat should be utilized as well, e.g. by heat pumps connected to a district heating system.

Advantages and disadvantages

The main advantages include:

- The PEM-FC utilizes the scalability of the fuel cell technology to produce electricity locally with efficiencies equal to or higher than for conventional power plants.
- Larger FC-CHP units in the grid can support the grid companies in balancing the grid.
- The grid balancing property of the PEM-FC contributes to reduced additional investments in infrastructure e.g. cables.
- Hydrogen produced from excess electricity based on renewable sources can be stored in hydrogen storages and used in the PEM-FC in situations, where wind turbines, solar PV and other renewable technologies are not available.

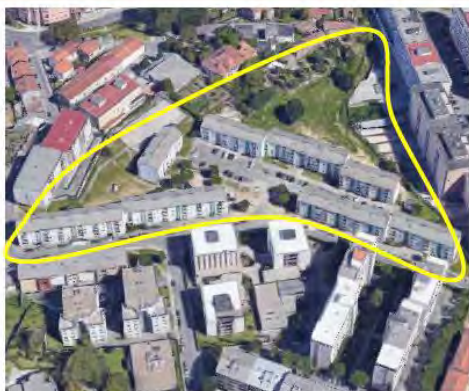
The main disadvantages include:

- Relatively high production costs today due to expensive materials (platinum).
- The lifetime of the current technology needs to be improved.

6. Work Developed

Cases Studies and Success Stories

Case Study - Santa Tecla neighbourhood, Braga



- no. of buildings: 8
- total heated floor area: 3925 m²

- building typology:

- year:



before 19

- reno
- no
- impl

Furuset, Oslo



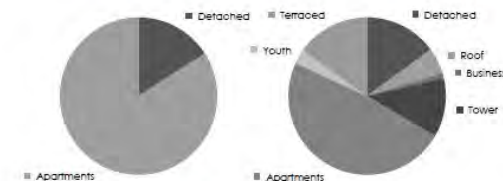
- building typology:

■ other

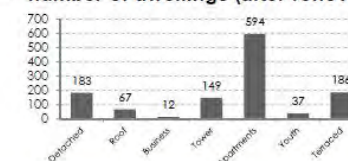
Kildeparken, Aalborg



- building typology (no. of dwellings):



- number of dwellings (after renovation):



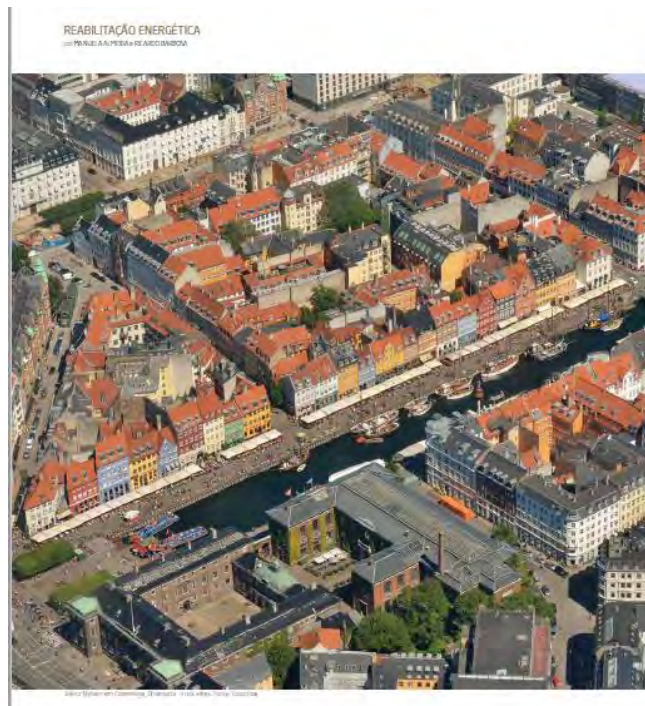
Before After

- no. of dwellings [-] **942** **1,228**
- total heated floor area [m²] **96,000** **120,000**

- renovation measures already carried out: **renovation in progress**
- implementation period: **2014 - 2020**

6. Work Developed

Dissemination



O potencial das intervenções de renovação a nível urbano para edifícios nZEB - IEA EBC Annex 75

Num nível urbano, o equilíbrio entre a aplicação de medidas de eficiência energética e o uso da energia renovável para a renovação dos edifícios existentes com o objetivo nZEB é mais complexo do que ao nível dos edifícios individuais, mas pode tirar partido de potenciais vantagens inerentes à economia da escala que se podem conseguir através sinérgias entre medidas a aplicar:

Os edifícios são responsáveis por uma percentagem significativa das emissões de carbono associadas com o uso de energia. Promover a sua renovação, bem como a das emissões associadas, é particularmente desafiante no que toca ao edifício existente, devido à variedade de diferentes benévolos arquitetónicas e técnicas [1]. No entanto, a reabilitação energética destes edifícios é absolutamente necessária para que a União Europeia consiga cumprir os objetivos definidos para 2020 e 2030. Como parte da solução, os edifícios de necessidades energéticas quase nulas (nZEB) têm ganho destaque. O conceito foi introduzido na União Europeia para o Desempenho Energético de Edifícios de 2010 (EPBD recast) [2] e centra-se na necessidade de os edifícios possuírem uma eficiência energética muito elevada, e nos quais a energia fornecida deverá ser proveniente essencialmente de fontes renováveis, situadas no próprio edifício ou nos proximidades. Um requisito, esse conceito foi transposto através do Regulamento de Desempenho Energético dos Edifícios de Habitação, definindo os como os edifícios que são capazes de atingir o nível de eficiência energética calculada. No caso de renovação de edifícios existentes com o objetivo nZEB, a questão prende-se com a determinação da redução das necessidades energéticas e das emissões de carbono, encontrando o equilíbrio entre a aplicação de

medidas de eficiência energética e de fornecimento de energia renovável. Esta situação não é do tipo de pensamento usado por mais renovação, de que as medidas de redução das emissões de carbono podem ser tão eficazes quanto as medidas de conservação de energia ou de eficiência energética. É, no entanto, necessário identificar qual é a relação ótima entre a minimização da procura de energia e o uso de energia renovável, numa perspetiva de otimização da relação custo-benefício (figura 1). A otimização desta relação permitirá entender qual longe é possível ir com cada tipo de medidas e a par de que ponto as medidas de redução das emissões de carbono se tornam economicamente mais atrativas do que as medidas de eficiência energética, nomeadamente no caso dos edifícios existentes e aquelas que dizem respeito a intervenções no envolvente. Esta relação permite também identificar as opções que apresentam um retorno custo/eficácia mais vantajoso, considerando todo o ciclo de vida do edifício [3]. Estas opções de reabilitação energética com carácter rentável estão associadas a reduções significativas das necessidades energéticas nos edifícios e, em, dados as suas características, um elemento potencial de adoção por parte dos principais atores envolvidos nas decisões relativas à renovação dos edifícios. Por ser significativa, esta questão tem vindo a ser estudada ao nível do edifício [4], mas existem agora cada vez mais evidências de que há oportunidades que devem ser exploradas relativamente à procura de soluções rentáveis à escala urbana [5]. Estas soluções podem tirar partido de intervenções/ações não disponíveis nos renovações à escala

As renovações do edifício a nível urbano apresentam grandes desafios, mas também expressivas oportunidades quando comparadas com as intervenções nos edifícios a nível individual.

Published articles

Annex 75 Newsletter
November 2018

Work in Progress: Technology Overview for Efficient Districts

In the scope of the research project, a diverse number of technologies, regarding both the building envelope and systems, were identified as significant contributors to the improvement of energy efficiency at the district scale. Such technologies include established measures such as the implementation of External Thermal Insulation Composite Systems (ETICS) and use of low temperature thermal grids, but also innovative solutions such as compressed activation and quadruple-glazed windows. See more [here](#).

University of Minho has published an article in the national journal "Edifícios e Energia" regarding the potential of intervening in a district scale renovation towards nZEB targets. See the full article in portuguese [here](#).

The second meeting of the work phase of the Annex 75 research project was held at the Francisco Balsemão in the beautiful city of Guimarães.

Our project partner from the Netherlands - TU Delft - organized a conference entitled "Sustainable Urban Energy Systems Conference" from 6 to 8 November 2018, where technological prospects, citizen involvement and governance arrangements were discussed. For more information check the [link](#).

Commissão de Inovação do Ambiente - [link](#)

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Periodical Annex 75 Newsletters

6. Work Developed

Dissemination

<http://annex75.iea-ebc.org/>



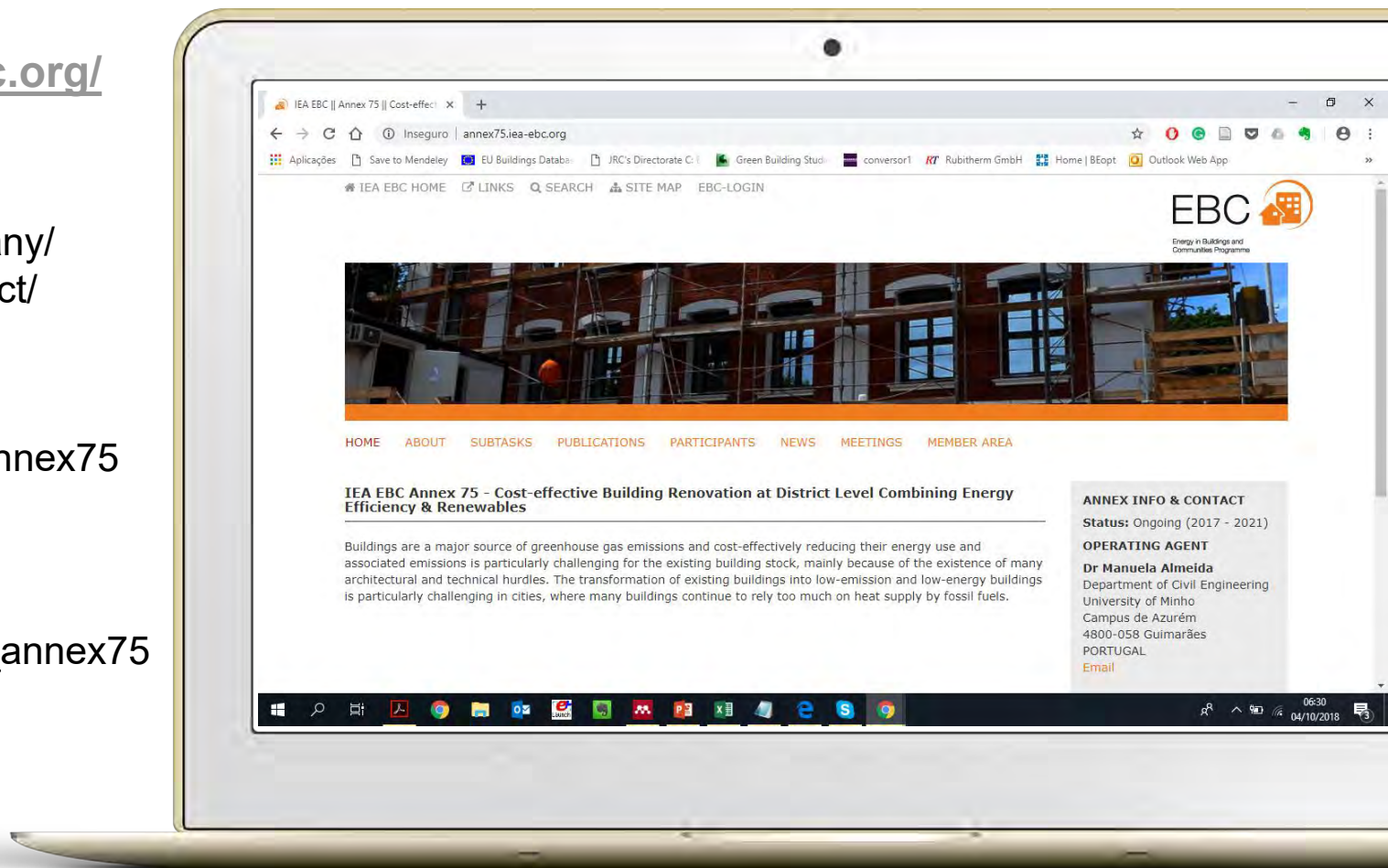
[linkedin.com/company/iea-ebc-annex-75-project/](https://www.linkedin.com/company/iea-ebc-annex-75-project/)



[facebook.com/ebcannex75](https://www.facebook.com/ebcannex75)



twitter.com/iea_ebc_annex75



Thank you for your attention!

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University of Minho, Civil Engineering Department, Portugal



Workshop District #Renovation towards #nZEB

27th of March

WORKSHOP ON DISTRICT RENOVATION TOWARDS NZEB

Round table 1:

Administration role in building renovation at district scale

Project IEA EBC Annex 75 - Cost-effective Building Renovation
at District Level Combining Energy Efficiency & Renovation

Speaker / Ponente

ARANTXA GARCÍA FERMÍN

Colegio Oficial de Arquitectos Vasco-Navarro, Delegación de Gipuzkoa



REFURBISHMENT OF EXISTING BUILDINGS PROJECTS

BUILDINGS

Common projects

Including those involved in district renovation projects.

DISTRICT RENOVATION PROJECTS

DISTRICTS

Model projects.

Specific ones.

BUILDINGS

REFURBISHMENT OF EXISTING BUILDINGS PROJECTS



WHO IS PROMOTING THEM?

Communities (private people).

WHICH IS THE CURRENT SITUATION?

- Building problems (condensation)
- Limited economic resources

BUILDINGS

REFURBISHMENT OF EXISTING BUILDINGS PROJECTS

WHO IS PROMOTING THEM?

Communities (private people).

WHICH IS THE CURRENT SITUATION?

- Building problems (condensation)
- Limited economic resources
- **People worries and fears:**

Will we choose the right

Architect

construction company?

Will all the problems be solved?

How much will this cost?





DISTRICT RENOVATION PROJECTS

WHO IS PROMOTING THEM?

Public institutions

WHO DEVELOPS THEM?

Research centres.

Technology companies.

POSITIVE ASPECTS

- It provides a comprehensive overview.
- It includes different topics: energy, social, cultural,...
- It involves a huge investment of money (European projects such as: ZenN, Replicate, etc...).





DISTRICT RENOVATION PROJECTS



REFURBISHMENT OF EXISTING BUILDINGS PROJECTS

SCALING

The final part requires **contruction projects** (planning permission, procedures,...).



There is a big step between the overall vision and the specific one.

LINEAR PROCESS, NO CIRCULAR

EXAMPLE

- **1½ month** to design the projects
(Buildings refurbishment: thermal envelope).
- 5 residential buildings (**97 dwellings**)

After some meetings with the neighbours (choosing the construction companies,...)



The construction started at the end of 2018, and it is expected to be finished at the end of June 2019.

<https://replicate-project.eu/>

<http://www.agmarquitectos.com/es/noticias/0319-agm-participa-en-el-programa-europeo-replicate>

agm arquitectos slp



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691735

The goal: district renovation towards NZEB.

Public institutions
should
take the lead.

For their own benefit:

- CO2 reduction.
- Recover vulnerable districts. Recover city.

How?

Replicating the methodology towards the city.

PGOU → **PGRU**

Plan **G**eneral de **R**egeneración **U**rbana.

Urban planning



ROAD MAP

The goal: district renovation towards NZEB.



CIRCULAR PROCESS

Examples of outreach campaigns

ENERGY FAIR



ENERGIA FERIA FERIA DE LA ENERGÍA

EKAINA JUNIO 8 > 16:00-20:00 | **BOULEVARD DONOSTIA / SAN SEBASTIÁN**
9 > 10:00-14:00

ENERGIA FAKTURARI, AURREZKIARI ETA ERAGINKORTASUNARI BURUZKO AHOZKULARITZA PUNTUA
PUNTO DE ASESORAMIENTO SOBRE LA FACTURA, EL AHORRO Y LA EFICIENCIA ENERGÉTICA

Energia gutxiago nota kontsumitu jakin nahi baduzu, eskatu zure gidai!
Si quieres saber cómo consumir menos energía, ¡pide tu guía!

Sartu eta egin eguzki plaka batekin argitzen den etxeko poli bat!
Haurrentzako txokoa Espacio infantil
(¡Entra y haz una bonita casa que se ilumina con una pizarra solar!)

Organizazioa: Euzko Alkartasuna, Euzko Legebiltzaria, Euzko Foru Erkidegoa

COAVN INGURUMENA



PONENTE/ SPEAKER:
Arantxa García Fermín

WORKSHOP ON DISTRICT RENOVATION TOWARDS NZEB

Vitoria Gasteiz March 27, 2019

Examples of outreach campaigns

GOOD PRACTICE GUIDE: HOW TO DO IT? (a guide for homeowners and communities)



<http://www.guia-adi.com/>

- **Is it enough?** ETICs + WINDOWS + ROOF

and...¿tightness?...¿ventilation?

- Can we continue depending on **subventions/ funds/...**

How should we finance these kind of projects?

- When it is **compulsory to renovate** as nZEBs

Will we continue promoting these projects?



Colegio Oficial de Arquitectos Vasco-Navarro,
Delegación de Gipuzkoa

**Board of governors of Delegación de Gipuzkoa
del Colegio de Arquitectos Vasco Navarro**

[@coavnss](https://twitter.com/coavnss)



**ARANTXA GARCÍA
OIHANA OLLOQUIEGUI**

[@go2_arkitektura](https://twitter.com/go2_arkitektura)



PONENTE/ SPEAKER:
Arantxa García Fermín

WORKSHOP ON DISTRICT RENOVATION TOWARDS NZEB

Vitoria Gasteiz **March 27, 2019**

WORKSHOP ON DISTRICT RENOVATION TOWARDS nZEB

Round table 1:

Administration role in building renovation at district scale

Ainara Sertutxa, Head of Projects, Constructions and Supervisions
DEPARTMENT OF HOUSING, BASQUE GOVERNMENT

March, 27th of 2019

DEPARTMENT OF HOUSING OF THE BASQUE GOVERNMENT

BUILDING RENOVATION STRATEGY



FINANCIAL AIDS



(1)

BUILDING OWNERS



(2)

LOCAL ADMINISTRATIONS

Bilbao Viviendas
Etxebizitzak



DURANGO
Udala • Ayuntamiento

- 1 BACKGROUND AND CONTEXT
- 2 MAIN OBJECTIVES IN REFURBISHMENT AND REBUILDING POLICIES
- 3 PLAN RENOVE REHABILITACIÓN – FINANCIAL AID PROGRAMS

DEPARTMENT OF HOUSING OF THE BASQUE GOVERNMENT

BUILDING RENOVATION STRATEGY



INPUTS

LEY DE VIVIENDA 3/2015 (HOUSING LAW)

Building refurbishment and urban regeneration becomes a public action, in order to ensure the access to a decent and adequate housing

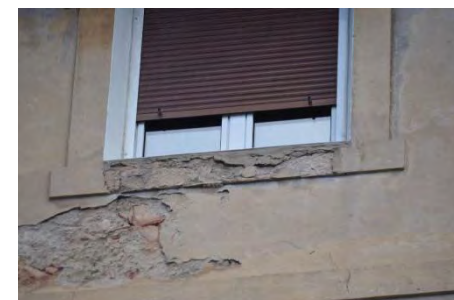
PUBLIC ADMINISTRATION MUST PROMOTE REFURBISHMENT AND RENOVATION PROCESSES



EXISTING HOUSING IN EUSKADI: SOME DATA

- ITEs up to 2016 (Building Technical Inspections)

**50% BUILDINGS NEEDED
REFURBISHMENT WORKS**
(To undertake in less than 1 year)



- “Inventory of housing and Diagnosis of the need of housing renovation in Euskadi”

> 60% BUILDINGS BUILT PRIOR TO 1980
(first regulation on thermal conditions in 1979)

> 30% BUILDINGS LACKS ELEVATOR
(street level accesibility not included)

DEPARTMENT OF HOUSING OF THE BASQUE GOVERNMENT

BUILDING RENOVATION STRATEGY



EVOLUTION IN REFURBISHMENT AND REBUILDING PROCESSES

NEW NEEDS

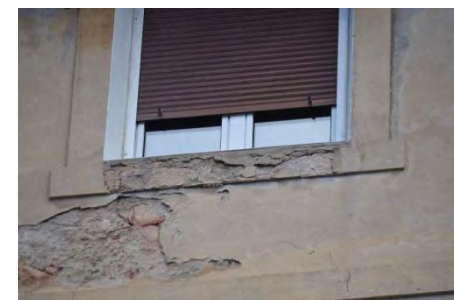
EXISTENT HOUSING IN EUSKADI:
SOME DATA

BUILDING CONSERVATION
ESSENTIAL



- ITEs up to 2016 (Building Technical Inspections)

**50% BUILDINGS NEEDED
REFURBISHMENT WORKS
(To undertake in less than 1
year)**



Population ageing
Laws regarding the rights of
persons with disabilities



**IMPROVE ACCESSIBILITY IN
BUILDINGS**

- “Inventory of housing and Diagnosis of the need
of housing renovation in Euskadi”

Europe strategy 2020
Support of ERDF to energy
efficiency



**IMPROVE ENERGY
EFFICIENCY IN BUILDINGS**

**67% BUILDINGS BUILT PRIOR TO 1980
(first regulation on thermal conditions in 1979)**

**30% BUILDINGS LACKS ELEVATOR
(street level accesibility not included)**

DEPARTMENT OF HOUSING OF THE BASQUE GOVERNMENT

BUILDING RENOVATION STRATEGY



PLAN RENOVE REHABILITACIÓN

PROGRAM 1:

Ayudas a la rehabilitación a particulares y comunidades

SCALE:

Isolated Buildings

BENEFICIARY:

Homeowners' associations + particular members (incomes)

REHABILITATION

CONSTRUCTION WORKS:

Building maintenance, conservation and adaptation works.

EE REQUIREMENTS:

- AT LEAST increase a letter grade the CEE
- ADDITIONAL aid if they increase two letters

PROGRAM 4:

Ayudas a la rehabilitación eficiente de viviendas

SCALE:

Building sets

BENEFICIARY:

Homeowners' associations

REHABILITATION

CONSTRUCTION WORKS:

Energy efficiency + accessibility to street level + accurate fire security systems

EE REQUIREMENTS:

- AT LEAST reach a C grade
- Reduce > 30% energy demand and energy consumption
- Monitor energy performance

PROGRAM 5:

Subvenciones para la regeneración urbana

SCALE:

Districts

BENEFICIARY:

Local administrations

REHABILITATION

CONSTRUCTION WORKS:

Similar to P4
Aids run directly by Local Administration

EE REQUIREMENTS:

- AT LEAST increase a letter grade the CEE
- ADDITIONAL aid if they increase two letters

ESKERRIK ASKO

zero plana

Strategic Initiative

INTELLIGENT BUILDING RENOVATION UNDER **NZEB** STANDARD



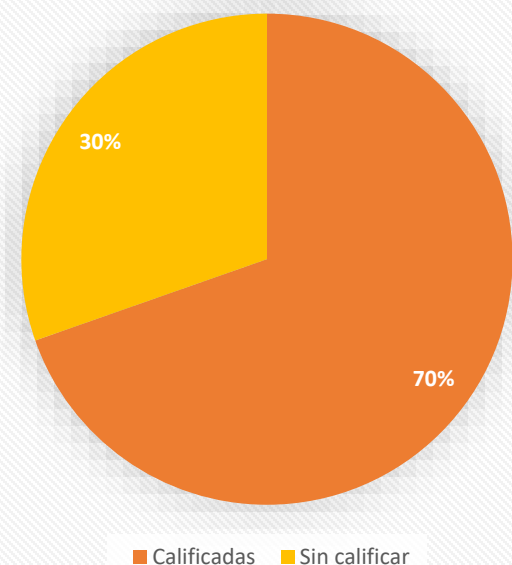
On the strategy...

A medium- to long-term strategy to implement renovation actions that will transform the Basque Government's social housing stock towards better performance, allowing us to offer a better service to our tenants, being at the same time more respectful with the environment and a driving force of economic activity.

It aims to determine the technical, economic and operational feasibility of the energy renovation, and including also accessibility, of buildings towards a scenario of almost zero energy consumption in 30-year time, with buildings that will have a high energy performance consistent, in a broader sense, with profitability, economic viability, and sustainability, without leaving the social tenant aside.

Diagnosis

Viviendas por calificación (%)



- The energy challenge covers 84% of the energy certified dwellings, 67% of those requiring a medium intervention, 15% a high intervention and 2% a complete intervention (including accessibility).
- About 3% of the dwellings have a good energy rating but no lift.
- 13% of dwellings have a good energy rating and have a lift, so the urgency of intervention would be less.

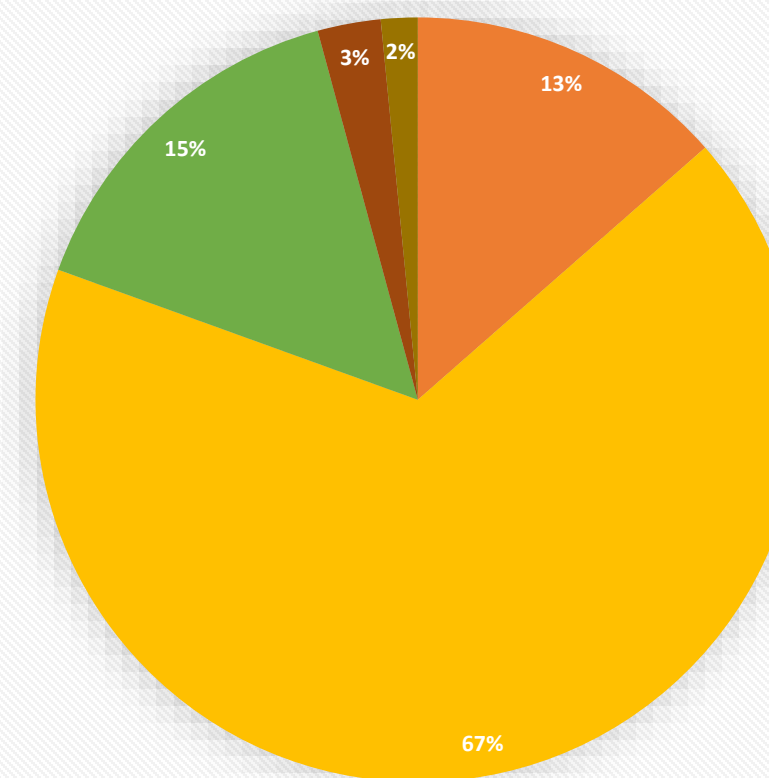
zero CO₂ plana

Viviendas calificadas por tipo de intervención necesaria (%)

GOVERNMENT STOCK

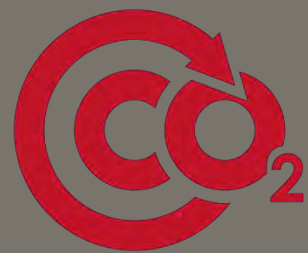
239 buildings

7691 dwellings



■ I. Menor ■ I. Energética media ■ I. Energética alta ■ I. Accesibilidad ■ I. Integral

3 Axes y 9 objectives

zero  plana

The nine pillars of the plan's strategy are :

AXE 1: HEALTH AND WELLBEING

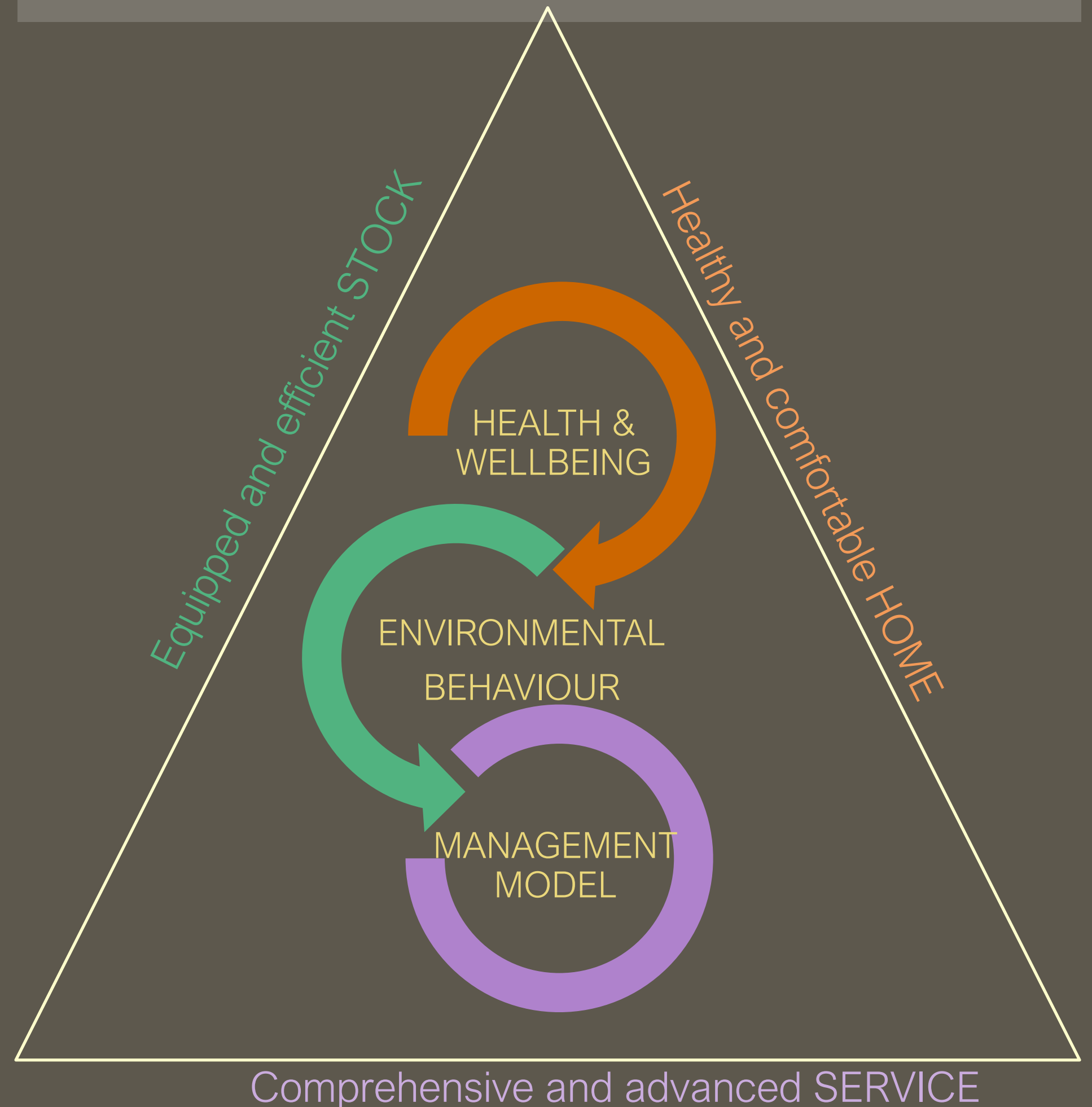
1. Support in case of energy Poverty
2. Accessibility of the dwellings and buildings
3. Affordable Comfort

AXE 2: ENVIRONMENTAL BEHAVIOUR

4. New options available thanks to the self-supply
5. Optimum solutions for energy renovations
6. Renewable Energies

AXE 3: MANAGEMENT MODEL

7. Digital Transformation of the processes
8. Advanced Model of Energy Management
9. Management of the Risk for the case of rental



Roadmap

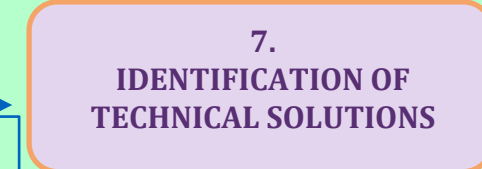
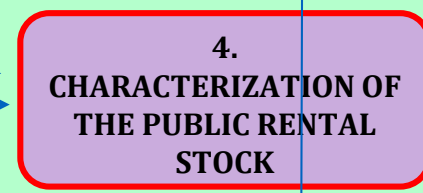
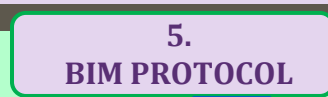
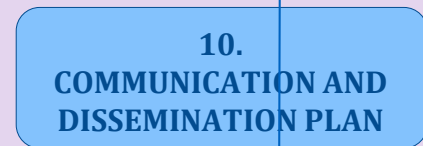
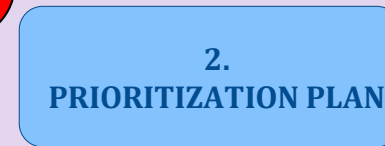
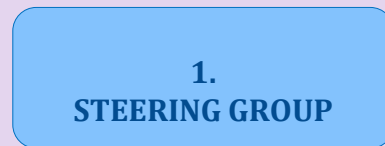
2018

2019

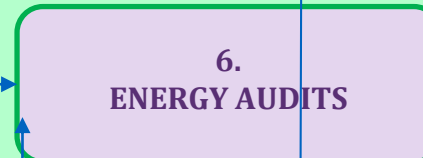
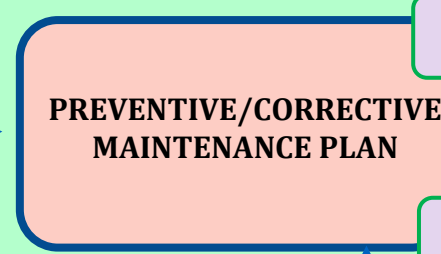
2020

ENERGY+ACCESIB RENOVATION PLAN

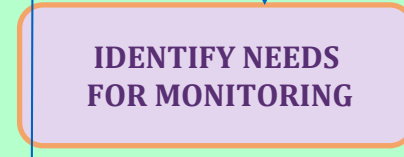
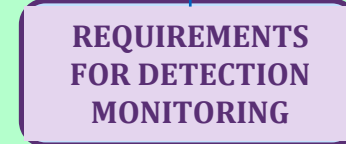
Comprehensive and advanced SERVICE



BIG DATA ARCHITECTURE



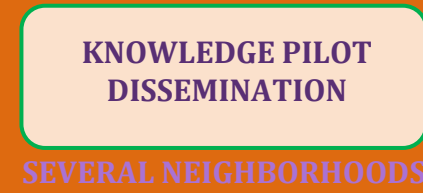
Equipped and efficient STOCK



Healthy and comfortable HOME

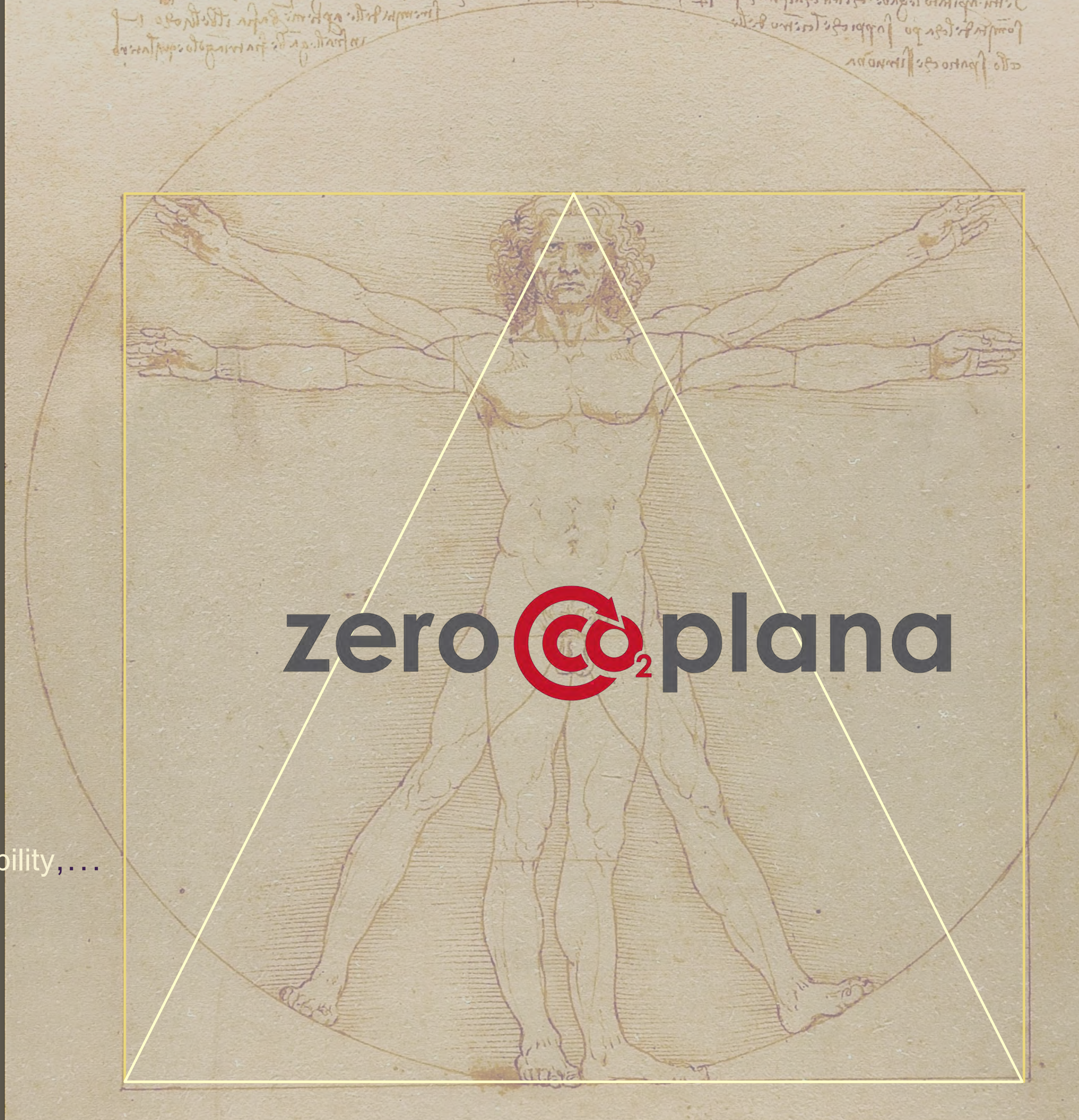


DISSEMINATION





Impacts

- ✓ Client becoming the centre
- ✓ Holistic view of the nZEB concept
- ✓ Service versus Housing
- ✓ Social management of the energy
- ✓ All of us will reach the old age
- ✓ Always at the lowest possible cost
- ✓ New technology scenario
- ✓ Advanced Management
- ✓ New future challenges: online services, mobility, . . .





 @cityfied_eu

 CITYfiED Project

 My Smart City District <http://www.cityfied.eu/>

Workshop on district renovation towards nZEB

Vitoria

27 March 2019

ENERGY.2013.8.8.1

Collaborative Project – This project has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration under grant agreement No 609129



The background



As urban areas are responsible for 70% of Europe's energy consumption, they play a crucial role for the decarbonisation of the EU's energy system. Within cities, buildings consume the biggest share of energy followed by transport.

*DHC Technology Platform
Brussels, January 2016*

When transforming European cities into Smart Cities, actions should, amongst others, focus on ways to cover thermal needs in urban areas in a smart way

Main challenge

Reduce the energy demand and GHG emissions and increasing the use of renewable energy sources in cities

The project



CITYFiED consortium <FP7 collaborative Smart City project>

PARTNERS

ACCIONA Infraestructuras S.A.	Ayuntamiento de Laguna de Duero	CARTIF	DEMIR ENERJI	Istanbul Teknik Universitesi	IVL Svenska Miljoeinstitutet
Kraftringen Energi AB	Lund Kommun	Lund Kommuns Fastighets	MANISA	MIR Unique Solutions	MONDRAGON
REENGEN	SEAS	Soma Belediyesi	Steinbeis Europa Zentrum	TECNALIA	TÜBİTAK
VEOLIA	youris.com	3IA Ingenieria			
			4 CITIES	5 IND	
			5 RTO	7 SMEs	

April 2014 – March 2019

46.04 M eur

25.83 M eur

21 partners

29% SMEs

Expected impacts

260.000 m² of living space

73% reduction energy use

2,213 dwellings involved

Demonstration sites

Laguna de Duero 100%

Soma 30%

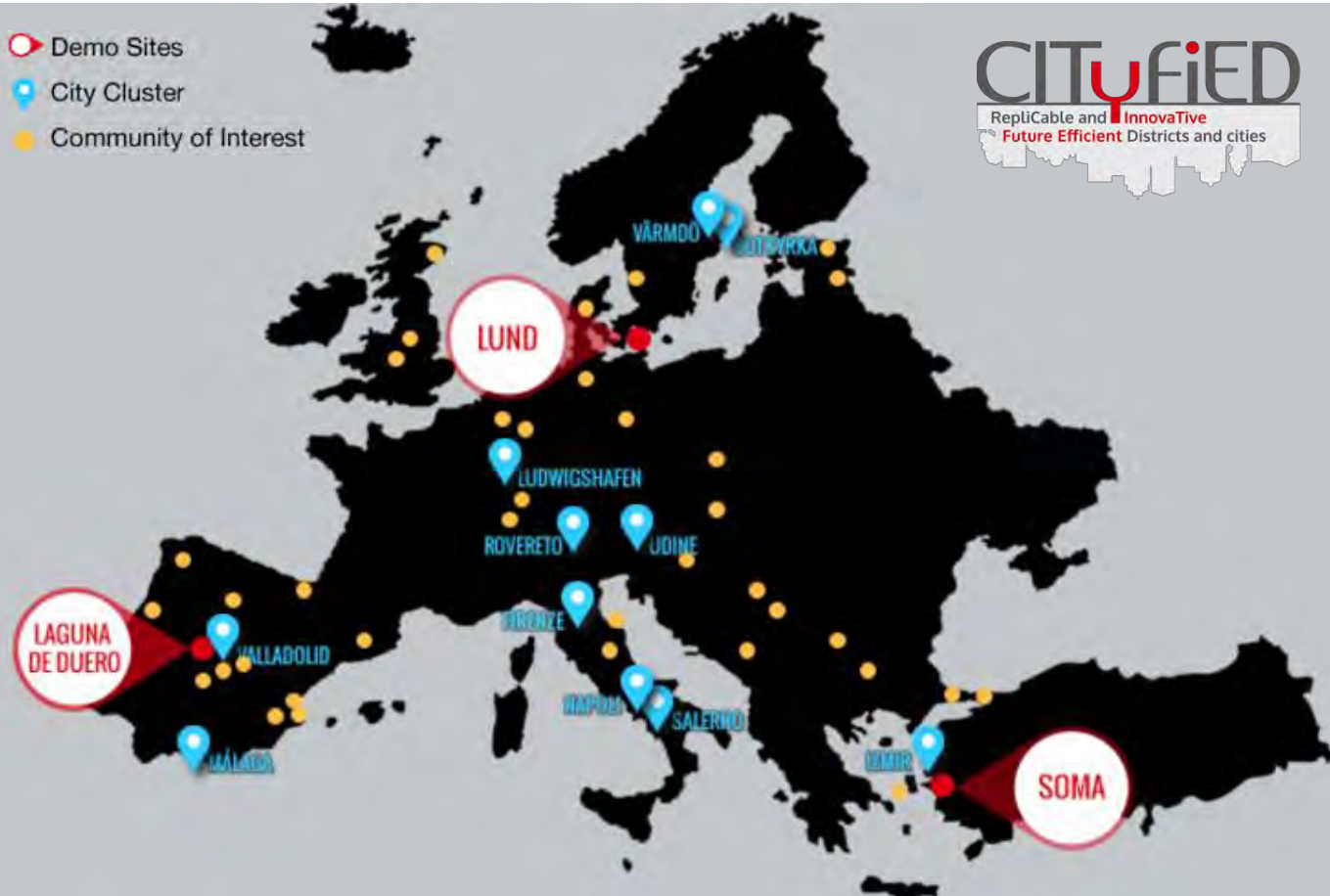
Lund 100%

The project – more than 50 cities!



CITYfiED Community

- Demo Sites
- City Cluster
- Community of Interest



Botkyrka Firenze Izmir Ludwigschafen Málaga Napoli Rovereto Salerno Udine Valladolid Värmdö

April 2014 – March 2019

46.04 M eur

25.83 M eur

21 partners

29% SMEs

Expected impacts

260.000 m² of living space

73% reduction energy use

2213 dwellings involved

Demonstration sites

Laguna de Duero 100%

Soma 30%

Lund 100%

The main objectives

SET Plan



Consumers



Energy
Efficiency



Renewables

01 Methodologies for city renovation at district level

02 Business models and non-technological barriers

03 EE in buildings: Reduction of the energy demand and CO₂ emissions in city districts

04 Integration of renewable energy sources

05 Replicability and citizen engagement

The demonstration sites

LAGUNA DE DUERO

Torrelago District

The Torrelago district demo site involves 31 private multi-property residential buildings, each consisting of 12 floors and 4 apartments. The buildings were built between 1977 and 1981. The retrofitting will take place in two phases covering 12 and 19 buildings respectively and involving over 4,000 residents.



- 31 buildings
- 1,488 dwellings
- conditioned area 140,000 m²
- 35.58% energy savings
- 59.41% renewable energy sources

Energy Efficiency Measures

- Façade renovation
- New district heating (Biomass)
- New pumping system
- Combined heat and power facility
- Smart grid
- Monitoring platform

LUND

Linerø District

The Linerø district is a housing area where the blocks Eddan and Havamal consist of 28 three-level dwellings built in early 1970s. Eddan and Havamal are owned by the public housing company Lunds Kommuns Fastighets AB (LKF). Approximately 2,000 residents live in the demo site.



- 16 buildings
- 379 dwellings
- conditioned area 40,400 m²
- 30.8% energy savings
- 75.4% renewable energy sources

Energy Efficiency Measures

- Façade renovation
- District heating (RES)
- Photovoltaic integration
- Combined heat and power facility
- Smart grid
- Monitoring platform

SOMA

Manisa Province

The pilot demonstrator district consists of a total gross area of 64,971 m², including 41,158 m² which comprises the area involved in the demonstration. The buildings are owned by SOMA Electricity Generation & Trading Joint Stock Company (SEAS) and were built in 1982. Approximately 1,500 - 2,000 residents live in the demo site.



- 82 buildings
- 346 dwellings
- conditioned area 41,158 m²
- 49.14% energy savings
- 58.55% renewable energy sources

Energy Efficiency Measures

- Façade renovation
- District heating (heat recovery – Soma Thermal Plant)
- Photovoltaic roof integration
- Solar thermal
- Smart grid
- Monitoring platform

Laguna de Duero (España), Distrito de Torrelago

*Provincia de Valladolid
22,696 inhabitants
29.23 km²*



The demonstration sites



LAGUNA DE DUERO | Torrelago District

The Torrelago demo site consists of 31 private buildings.

The buildings all have 12 floors with 4 dwellings on each. They were built between 1977 and 1981. Retrofitting took place between May 2014 and March 2018, allowing over 4,000 residents to benefit from the project.

Energy Efficiency Measures

- Façade renovation
- New district heating (Biomass)
- New pumping system
- Combined heat and power facility
- Smart grid
- Monitoring platform



31 buildings



1,488 dwellings



Conditioned area
143,025 m²



35.6%
energy savings



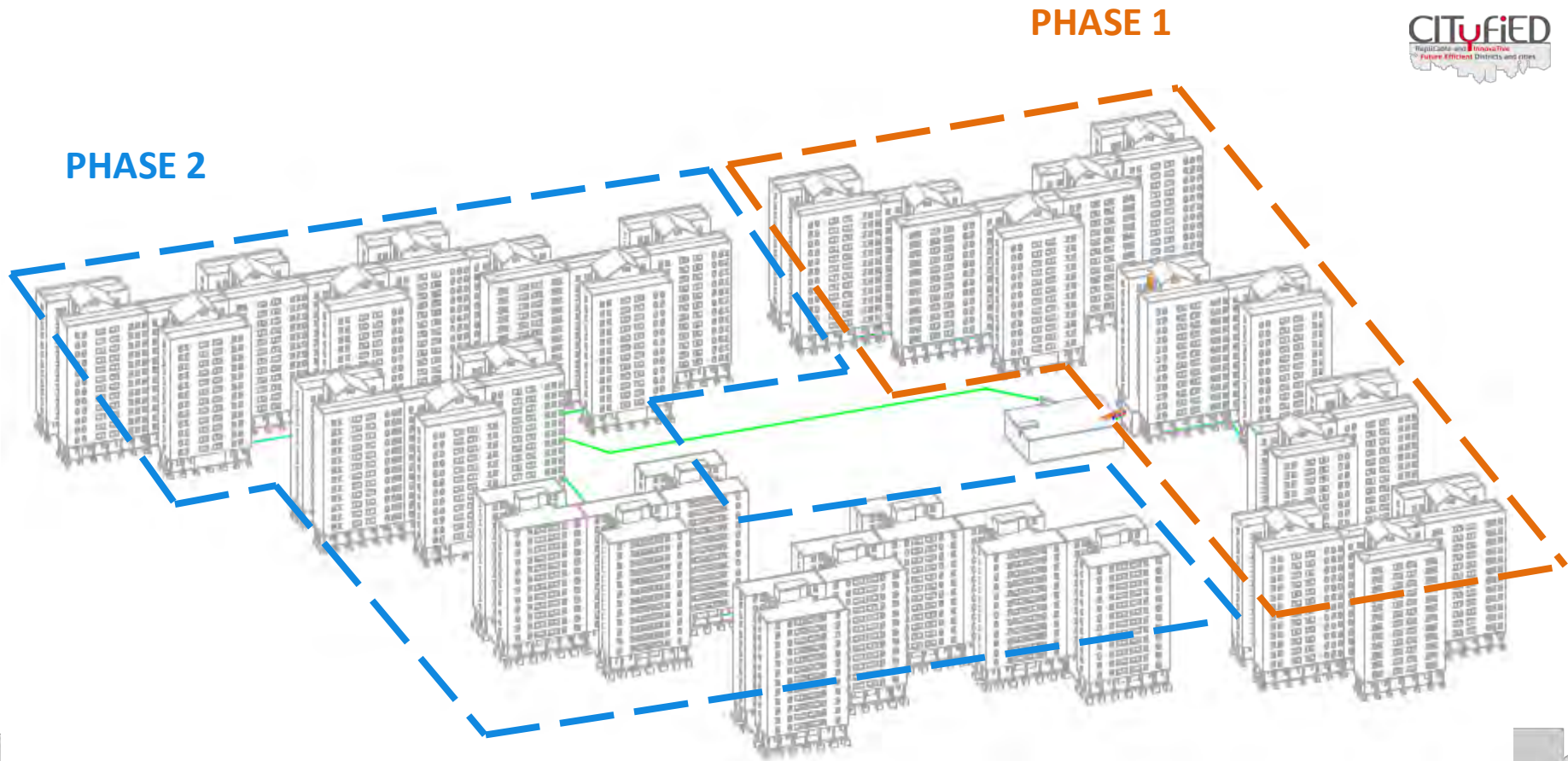
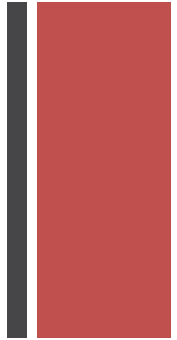
59.4% renewable
energy sources

Demosite Torrelago



Year	1980	2014-2018
Energy systems for heating and hot water	<ul style="list-style-type: none"> Gas natural boiler. 15 MW 	<ul style="list-style-type: none"> Biomass boiler 3.5 MW Gas boiler (3 x 2,9 MW)
Façade	<ul style="list-style-type: none"> U-value 1.36 W/m²K 	<ul style="list-style-type: none"> U-value: 0,34 W/m²K
Retrofitting area	<ul style="list-style-type: none"> 143,025 m² 1488 (31 buildings) 	<ul style="list-style-type: none"> 143,025 m² 1488 (31 buildings)
Control	<ul style="list-style-type: none"> Basic control Thermostat 	<ul style="list-style-type: none"> Advanced control Individual thermostat Valve control on -off

Demosite Torrelago



Demosite Torrelago

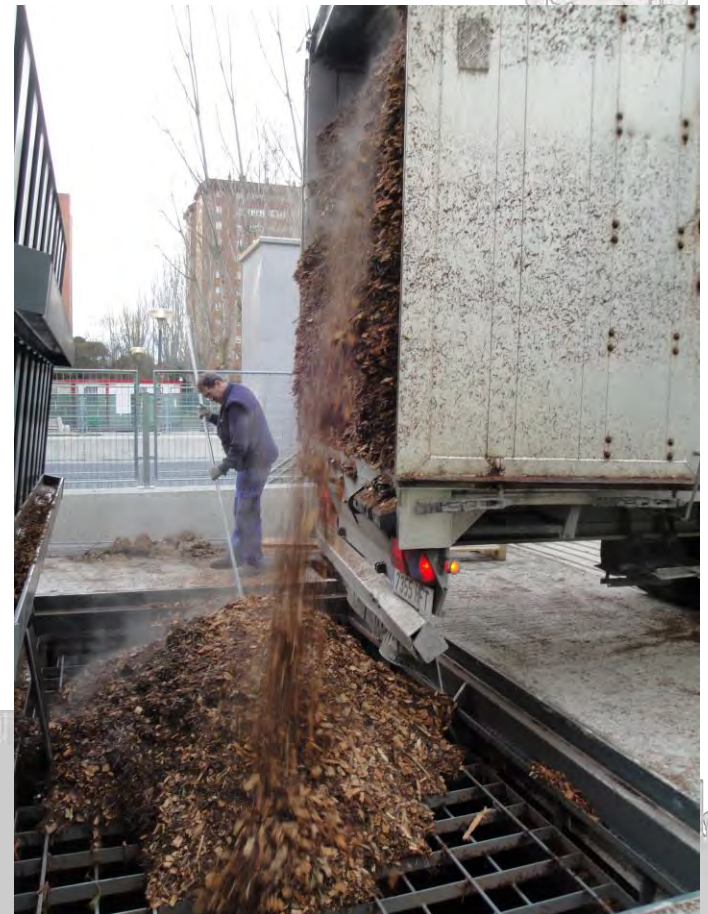


Demosite Torrelago: Façade



Demostrador Torrelago: District Heating

Biomass boiler room

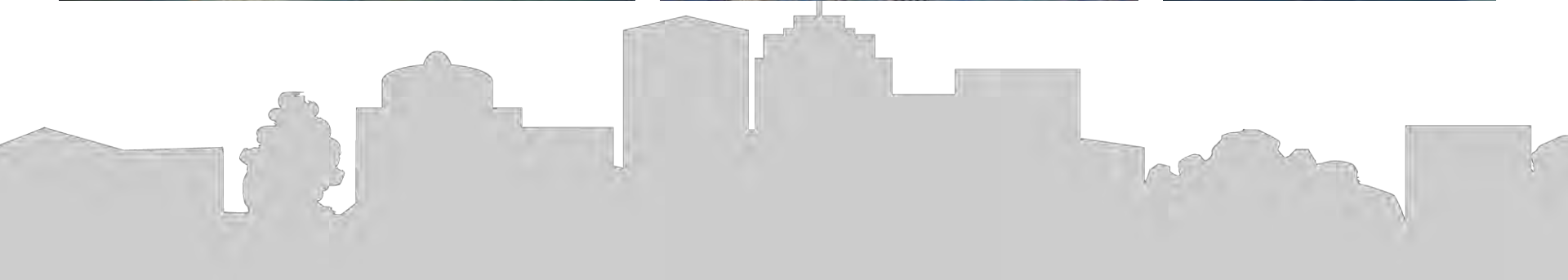


District Heating

Gas natural boiler and CHP room



CITYfied
Regulatable and Innovative
Future Efficient Districts and more



Investment plan for demosite Torrelago



	Budget
Building Retrofitting	14,000,000 €
District Heating	2,500,000 €
Smart Grid	189,703 €
TOTAL	16,689,703 €



Demo team Torrelago



Partner	Role / Responsibility
VEOLIA	Team Leader. District Heating Intervention and Management.
3IA	Building Retrofitting Intervention.
LAGUNA DE DUERO Municipality	Urban planning, permits and licenses.
MONDRAGÓN C.	Smart Grid Elements. Monitoring platform. Building Modelling
CARTIF	Smart Grid Definition and Building Modelling.
TECNALIA	District Heating Optimization, Modelling and Simulation
ACCIONA	Building Retrofitting Definition and Modelling, BIM modelling and Quality Control Definition.



Our awards

[Best poster of SET Plan 2016 – Central European Energy Conference X](#)



[Mapei Award for Sustainable Architecture 2017](#)



[Smart 50 Awards 2018](#)

[Torrelago District Heating network was awarded the Global District Energy Climate Awards 2017 in the category "Emerging Market"](#)



[7th Edition of the Sustainable Buildings Awards 2018](#)

[Kraftringen Energi AB recognised for outstanding CSR efforts](#)



Conferencia Final de CITYFIED, Laguna de Duero, 12 de Marzo 2019



CITYfIED social media





“thank you for
your **ATTENTION**
:)”

@rd_anibal

Conferencia Final de CITYFiED, Laguna de Duero, 12 de Marzo 2019

Ana Quijano
anaqui@cartif.es
Ali Vasallo Belver
Fundación CARTIF
alivas@cartif.es

www.cityfied.eu
www.cartif.es

smar+ en ci+y



Workshop on district renovation towards nZEB

VIIESA, MARCH 2019

TOWARDS SMART ZERO CO₂ CITIES ACROSS EUROPE
VITORIA-GASTEIZ + TARTU + SØNDERBORG



- + 3 Lighthouse cities
- + 2 Follower cities
- + 35 partners
- + 5,5 years (02/2016 – 07/2021)
- + 28M€ EU funding
- + **Main objective:**

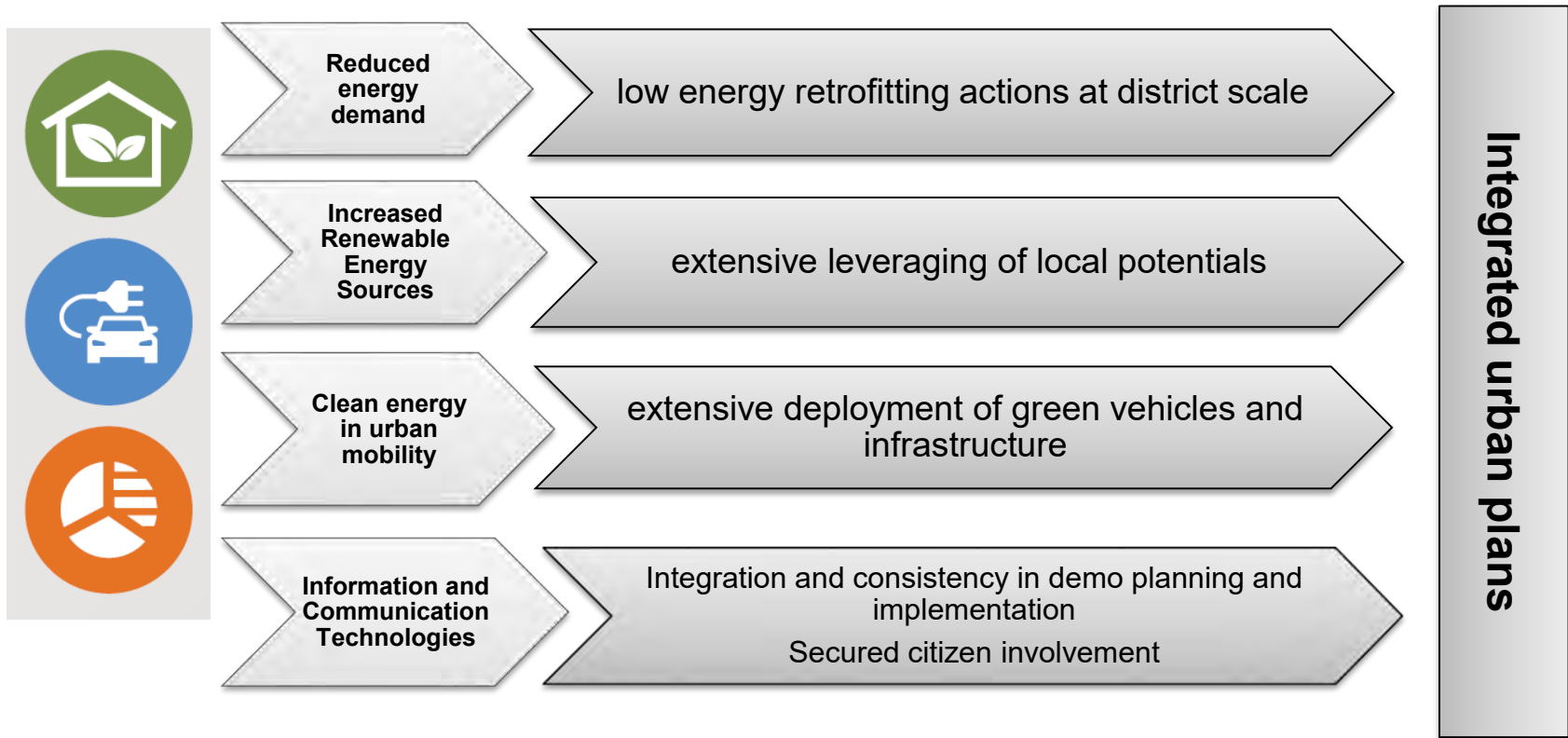


- + To develop a **systemic approach** for **transforming European cities** into sustainable, smart and resource-efficient urban environments in Europe.
- + To develop strategies that can be replicated throughout Europe in order to **reduce energy demand** and **maximise renewable energy supply**.



Demo Actions

✦ The three medium-sized cities will develop **coordinated actions** aimed at:



Challenges:

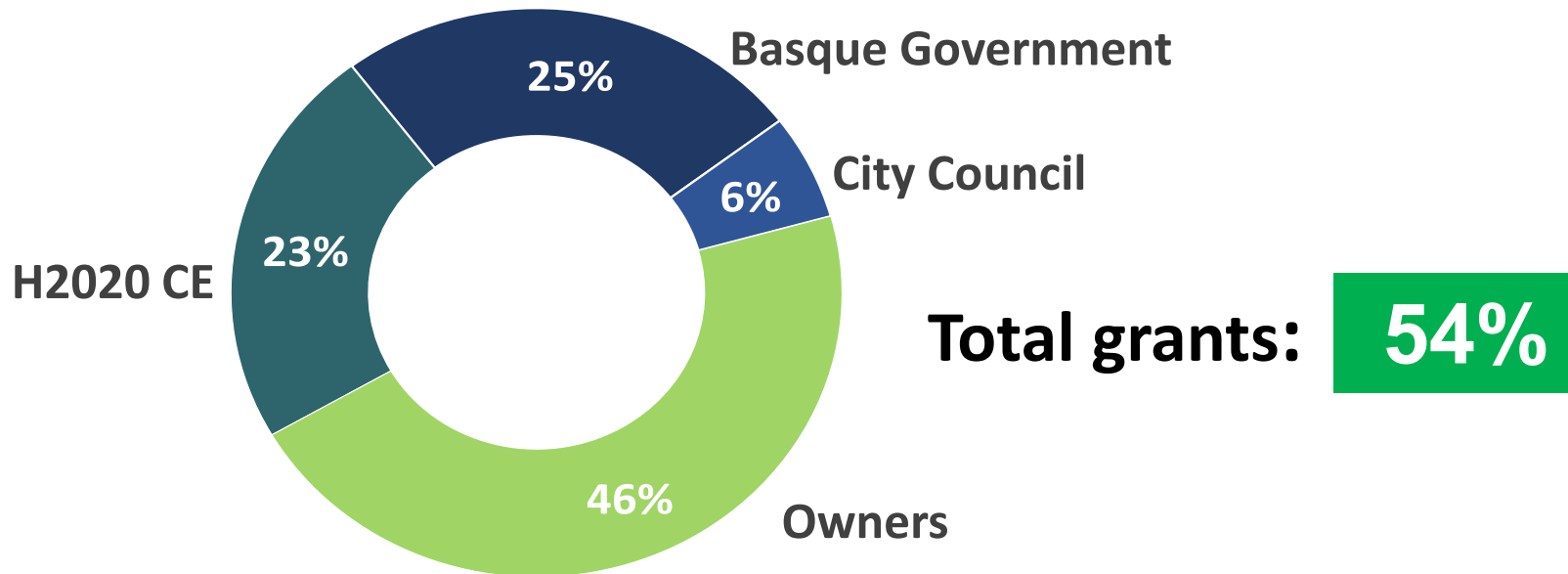
- ✦ Population: 12,797 inhabitants (6,066 dwellings)
- ✦ High population density
- ✦ High percentage of immigrant population
- ✦ Aged population
- ✦ Parking, traffic and mobility issues



- ✦ **Citizen focus:** Citizens integrated in the project from the very beginning
- ✦ **Building Retrofitting:** SmartEnCity ambition: up to 750 dwellings to be retrofitted (total 1,313); 60,000 m²
- ✦ **Integrated Infrastructures: DH network:**
 - ✦ Expected energy savings: More than 50 %
 - ✦ Expected CO2 savings: Over 90%
- ✦ **Sustainable Mobility:**
 - ✦ Reduce conventional vehicles in the district, promoting electric vehicle
 - ✦ Deployment of recharge infrastructure
- ✦ **ICTs: City Information Platform:**
 - ✦ To deploy the Urban Management System for Vitoria-Gasteiz , containing a set of specific end-user applications
 - ✦ Citizen awareness and empowering purposes
 - ✦ Public/private stakeholder decision-making

Cost of the Project for an “average” dwelling:

- Average Energy Retrofitting Cost: 21.000 €
- Public administrations grants: 11.400 € (54%)
- Average cost for the owner: 9.600 € (46%)



Results so far: retrofitting



Results so far: retrofitting



Results so far: district heating



PROYECTO EJECUTIVO DE LA RED URBANA DE CALOR EN EL BARRIO DE CORONACION EN EL T.M. DE VITORIA (NE16108)

GIROA VEOLIA

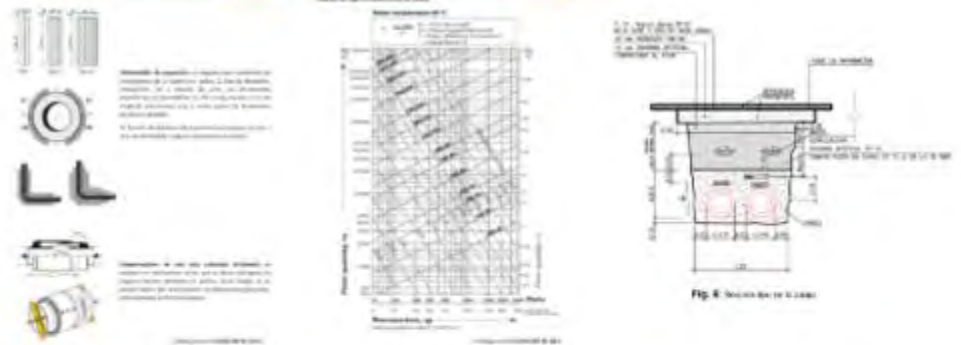
acciona
ingeniería

ENERO 2017
MAYO 2017



Netlux
Ingeniería - Construcción

MEMORIA, PLIEGO, PLANOS Y PRESUPUESTO



Results so far: mobility



Results so far: monitoring



Contact



David Grisaleña / Oskar Bell
david.g@vivesa.eu / oskar.b@vivesa.eu

VIRESA

www.smartencity.eu



Proyecto ZenN en el barrio de Mogel (Eibar)

ZenN proiektua Mogel auzoan





PROYECTO ZenN: nearly Zero energy Neighborhoods(2013-2017)

SOCIOS LOCALES PROGRAMA ZenN:



BARRIOS DEMOSTRADOR ZenN: Grenoble – Malmo – Oslo - Eibar



BARRIO DE MOGEL EN EIBAR CUYA REHABILITACIÓN, ES UN EJEMPLO DE CÓMO UNA ASOCIACIÓN DE VECINOS COMO PROMOTOR Y DINAMIZADOR DEL PROYECTO, TRABAJANDO EN COLABORACIÓN CON LAS ADMINISTRACIONES PÚBLICAS A MODO DE FACILITADORES HA HECHO POSIBLE LA REHABILITACIÓN INTEGRAL DEL BARRIO



DESAFÍOS PARA LA REHABILITACIÓN ENERGÉTICA DEL BARRIO DE MOGEL:

- DESAFÍOS TÉCNICOS:

- BARRIO CONSTRUIDO EN 1949

Sin cumplimiento de accesibilidad en los edificios ni en el entorno urbano

Sin cumplimiento de normativa de aislamiento térmico

- DIFICULTADES FINANCIERAS:

- VOLUMEN OBRA REHABILITACION EDIFICIOS: > 7 M €

- DIFICULTADES LIGADAS A LA ESTRUCTURA DE LA PROPIEDAD:

- 201 VIVIENDAS (415 personas empadronadas)
- 21 COMUNIDADES DE VECINOS





PERFIL:

- PLANTA BAJA: 2 VIV.
- CUATRO PLANTAS: 8 VIV
- 10 VIVIENDAS/PORTAL
- PLANTA BAJO CUBIERTA (10 TRASTEROS)

2011: IMPULSO PROYECTO DE REHABILITACIÓN INTEGRAL (> 7 M €) :

INSTALACIÓN DE ASCENSOR

MEJORA DE LA ENVOLVENTE (fachadas, cubiertas, etc.):

INSTALACIÓN DE SISTEMA DE PRODUCCIÓN ACS MEDIANTE PANELES SOLARES



FACTORES DETERMINANTES: BARRIO ACCESIBLE + AYUDAS ECONÓMICAS:

>3 M € GOBIERNO VASCO

1 M € UNION EUROPEA – PROGRAMA ZenN(2013-2017)

0,2 € AYUNTAMIENTO DE EIBAR



EQUIPO DE TRABAJO:

COMITÉ VECINAL
AYUNTAMIENTO DE EIBAR
DEBEGESA

-EQUIPO REDACTOR PROYECTO
-ASESORIA JURIDICA
-EMPRESA CONSTRUCTORA

INSTITUCIONES IMPLICADAS:

- GOBIERNO VASCO – DEPARTAMENTO DE VIVIENDA
- UNION EUROPEA: PROGRAMA ZenN

GRUPO VECINAL CONTRA EL PROYECTO
OBJETIVO: PARALIZAR EL PROYECTO



IMPACTO DE LA OBRA EN EL BARRIO:



RESULTADOS 1ª FASE(2015): BENEFICIOS DEL PROYECTO PARA EL BARRIO-CIUDAD

15 EDIFICIOS DE VIVIENDAS REHABILITADOS (150 VIVIENDAS)
ACCESIBILIDAD(Ascensor)+EFICIENCIA ENERGETICA (Mejora Envolverte + Placas solares)

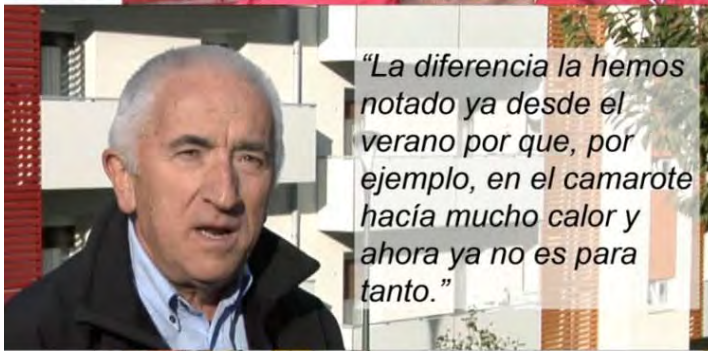
ESPACIO URBANO ACCESIBLE CON NUEVO ALUMBRADO PUBLICO MAS EFICIENTE



EUSKO JAURLARITZA
GOBIERNO VASCO



RESULTADOS 1ª FASE: BENEFICIOS DEL PROYECTO PARA LOS RESIDENTES



RESULTADOS 1ª FASE : CONTINUACION DE LA GESTIÓN



2ª FASE: CONTINUACION DE LA GESTION CON EL COMITÉ VECINAL(2015-.....)
EFECTO DOMINO

OBJETIVO: REHABILITACIÓN INTEGRAL DEL BARRIO

OPORTUNIDADES 2ª FASE
PROGRAMA RENOVE
PROYECTO ZENN

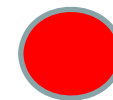


 1ª FASE 150 VIVIENDAS



 2ªFASE 45 VIVIENDAS

EFECTO DOMINO: 2ª FASE



FRAY MARTIN MALLEA Nº 1 Y 3 : 38 VIVIENDAS



EUSKO JAURLARITZA
GOBIERNO VASCO



DESAFÍOS PARA LA REHABILITACIÓN ENERGÉTICA EN BARRIOS: CLAVES PARA LAS ESTRATEGIAS DE REPLICACION

- BARRIOS CON ENTORNO URBANO ACCESIBLE DE TIPOLOGIA SIMILAR (PROBLEMAS COMUNES-SIN AISLAMIENTO -CONSTRUCCION ANTERIOR A LOS AÑOS 80) Y CAPACIDAD DE EFECTO DOMINO
- BARRIOS CON UNA MOTIVACIÓN-PROBLEMA (ACCESIBILIDAD, ETC.) COMO PUNTO DE PARTIDA PARA PROPONER UNA REFORMA ENERGÉTICA.
- BARRIOS CON IDENTIDAD Y SENTIDO DE PERTENENCIA CON ASOCIACIÓN Y/O LIDERES VECINALES
- BARRIOS CON ACCESO A LA FINANCIACION
- EXISTENCIA DE UNA ENTIDAD SIN ÁNIMO DE LUCRO, SOCIEDAD URBANÍSTICA DE REHABILITACIÓN (SUR) O SIMILAR, COMO COLABORADORA Y FACILITADORA





Eskerrik asko zuen arretagatik.

Más información:

www.debegesa.eus

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