





A smarter way to delivering sustainable urban renovations at district level

 @cityfied_eu

 CiTyFiED Project

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

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 ENERJİ



Istanbul Teknik Üniversitesi



IVL Svenska Miljöinstitutet



Kraftingen Energi AB



Lund Kommun



Lund Kommuns Fastighets



MANISA



MIR Unique Solutions



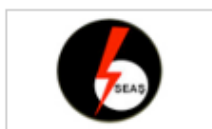
MONDRAGON



REENGEN



SEAŞ



Soma Belediyesi



Steinbeis Europa Zentrum



TECNALIA



TÜBİTAK



VEOLIA



youris.com



3IA Ingeniería



4 CITIES

5 IND

5 RTO

7 SMEs

April 2014 – March 2019

37.8 M eur

21.7 M eur

21 partners

29% SMEs

Expected impacts

190.462 m² of living space

44% energy savings

2,067 dwellings involved

Demonstration sites




Laguna de Duero

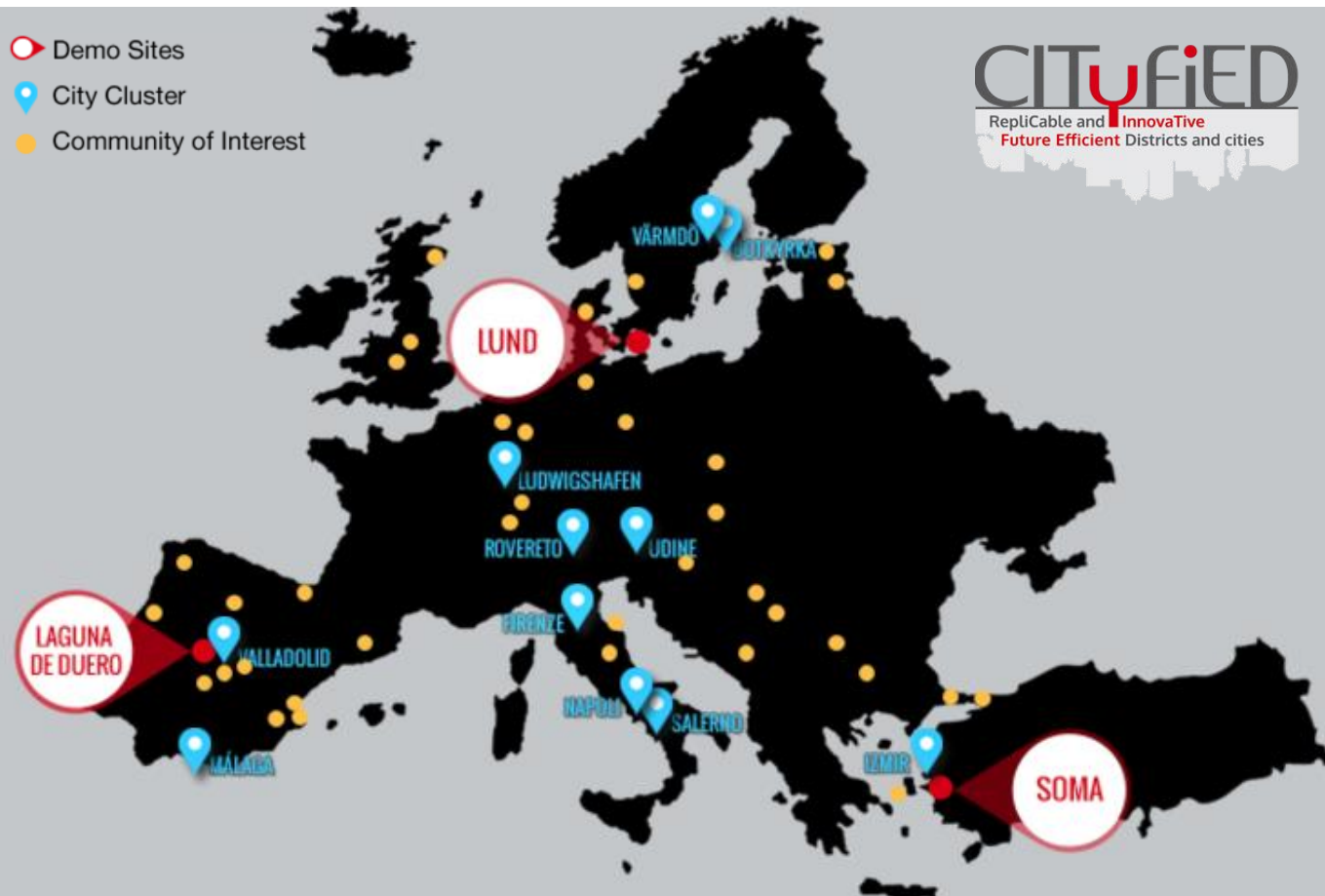
Soma

Lund

The project – more than 50 cities!

CITYfiED Community

-  Demo Sites
-  City Cluster
-  Community of Interest



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Demonstration sites

Laguna de Duero

Soma

Lund



Botkyrka Firenze Izmir Ludwigshafen Málaga Napoli Rovereto Salerno Udine Valladolid Värmdö

The main objectives

SET Plan



Consumers



Energy
Efficiency



Renewables

01 Methodologies for city renovation at district level

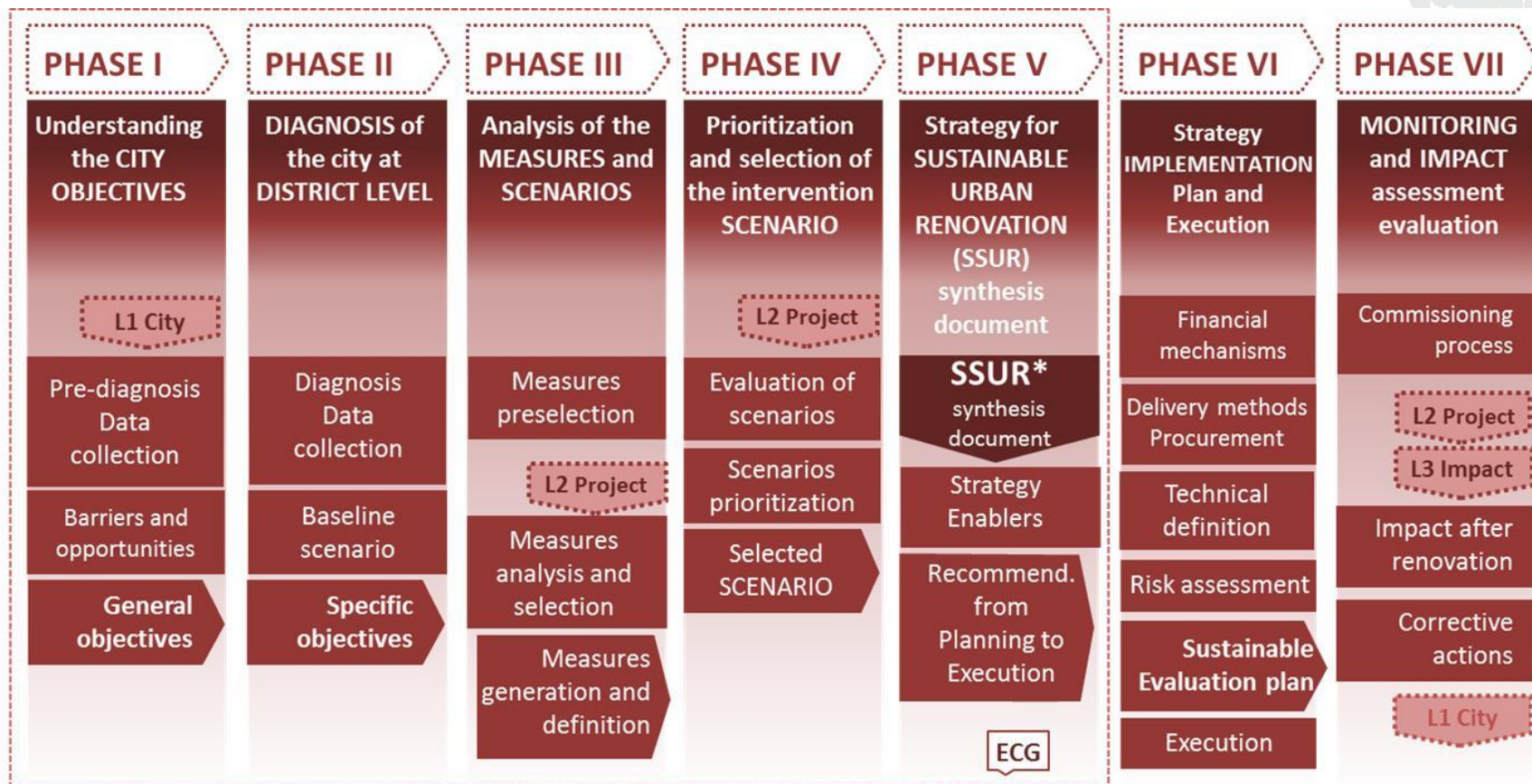
02 Business models and non-technological barriers

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 CITYFiED Methodology



CITY scale

DISTRICT scale

Citizens' and other stakeholders' participation

Process stage

Indicators

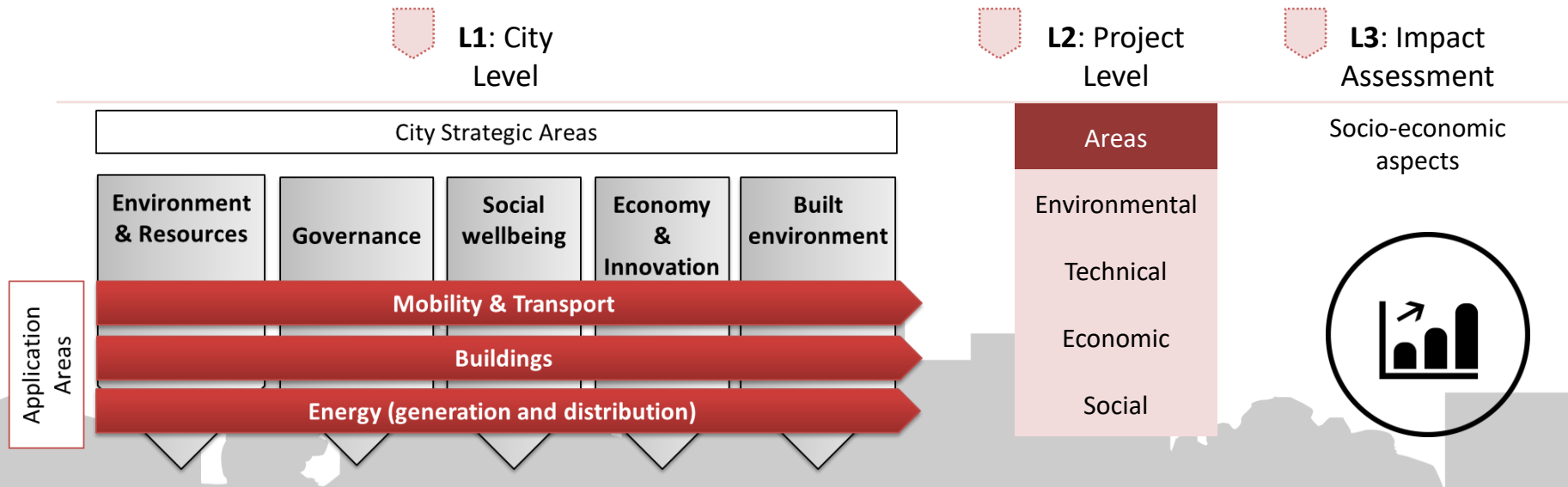
ECG Assessment core – External Consultancy Group

*SSUR: Strategies for Sustainable Urban Renovation

The CiTyFiED Methodology

Indicators

- Three levels of indicators have been defined
 - City Level Indicators (**L1**) at city & district level
 - Project Level Indicators (**L2** Key Performance Indicators - KPIs)
 - Impact Assessment Indicators (**L3**)



The CITYFiED Replication approach

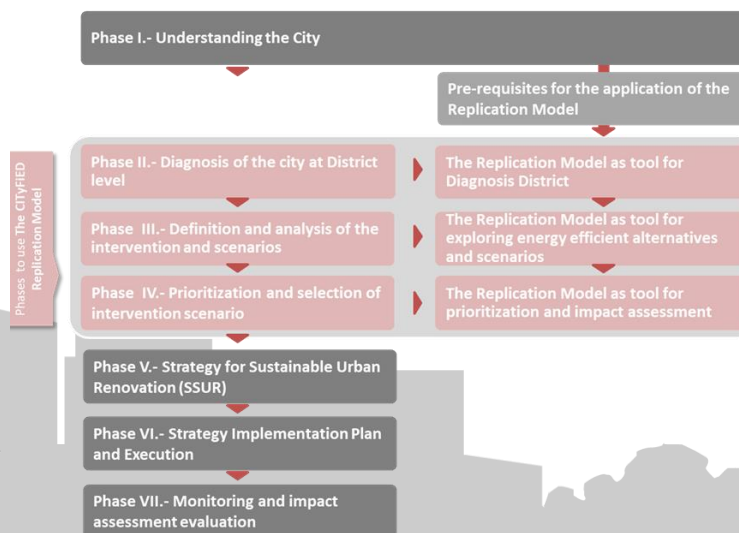
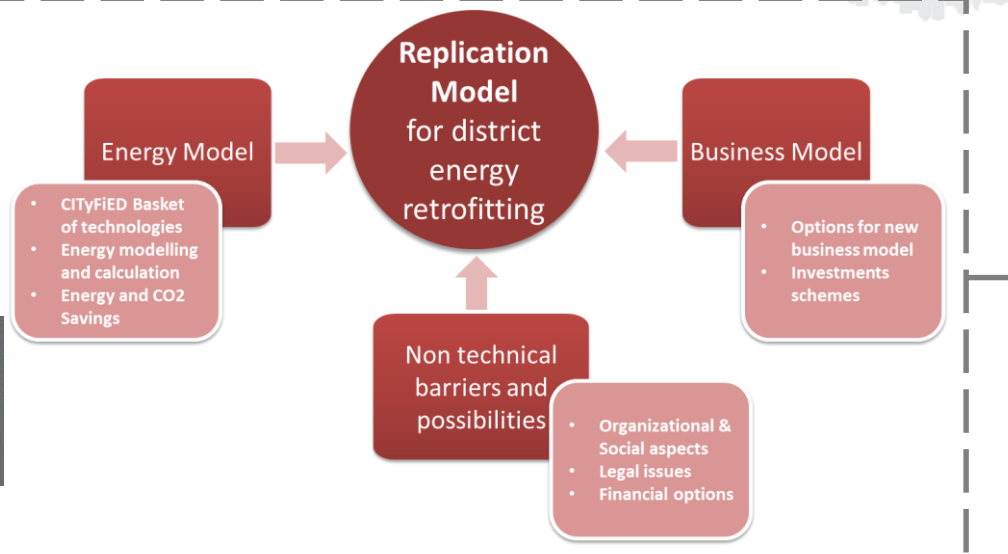
REPLICATION MODEL



Botkyrka Firenze Izmir Ludwigshafen Málaga



Napoli Rovereto Salerno Udine Valladolid Värmdö



REPLICATION PLAN

The demonstration sites

Laguna de Duero (España), Distrito de Torrelago

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

Soma (Turquía), Distrito de Soma-Manisa

SOMA | Manisa Province

The Soma demo district comprises 9,970 m² of gross area with 7,037 m² of conditioned area. Seventeen buildings with 200 dwellings have been energy-efficient retrofitted and some 150 inhabitants have directly benefited directly. The buildings were built in 1982 and the retrofitting took place between 2014 and 2018.

Energy Efficiency Measures

- Façade renovation
- Solar thermal
- Monitoring platform



17 buildings



200 dwellings



Conditioned area
7,037 m²



40.6 %
energy savings



7.7 % renewable
energy sources

Lund (Sweden), Distrito de Linero

LUND | Linero District

Linero is a housing district where two blocks – Eddan and Havamal – consist of 28 three-level council dwellings, built in the early 1970s. The demo site involves approximately 2,000 tenants. Buildings after the retrofitting have an energy performance that resembles new buildings.

Energy Efficiency Measures

- Façade renovation
- District heating (100% renewable)
- Photovoltaic integration
- Smart district heating
- Smart grid
- Monitoring platform



16 buildings



379 dwellings



Conditioned area
40,400 m²



30.8 %
energy savings



75.6 % renewable
energy sources



LAGUNA de DUERO (Spain)



Province of Valladolid

22.696 inhabitants

29,23 km²

The town is surrounded by pine woods and its municipal territory is bathed by the River Duero

Laguna de Duero, Torrelago district

*31 buildings
1,488 dwellings
140,000 m² cond. area*



The Spanish demo site



SOMA (Turkey)



Soma is a town and district of Manisa Province

74,158 inhabitants

839 km²

Lignite mining and a lignite-fired thermal power plant
are the main economic activities

Soma, Manisa province

*17 buildings
200 dwellings
7,037 m² cond. area*



The Turkish demo site



LUND (Sweden)



Founded A.D. 990

120 000 inhabitants

Growing population: +40% since 1990

University > 40 000 students

Aiming at -50% CO₂-eqv 1990-2020

Lund, Linero district

*16 buildings
379 dwellings
40,040 m² cond. area*



The Swedish demo site



The Monitoring Platform

CITYfIED
ReplCable and InnovaTive
Future Efficient Districts and cities

**Analytics
Dashboard**



Key Performance Indicators (KPIs)
[environmental, technical, economic, social]

SP Middleware Platform



HEMS

BEMS

DEMS



Torrelago district

SW Integration Gateway



HEMS

BEMS

DEMS



Linero district

Provolta Energy OS™



HEMS

BEMS

DEMS



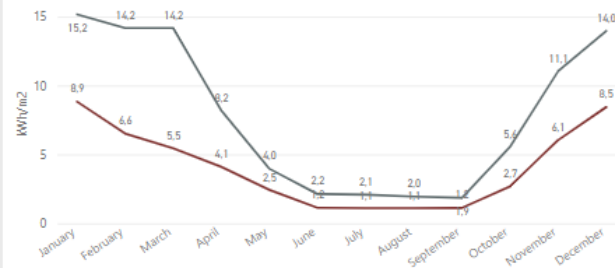
Soma district

The Monitoring Platform

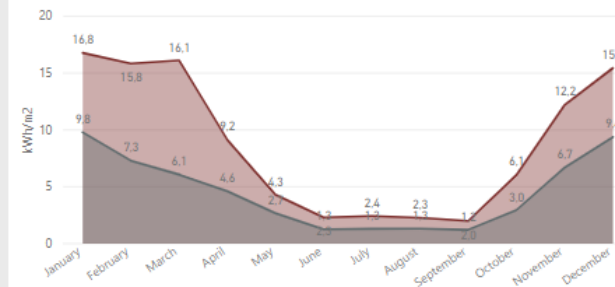
Analytics Dashboard (KPIs)

Environmental KPIs

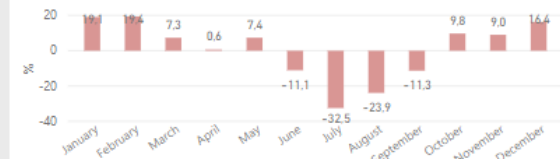
Energy demand (simulated) [E1d] vs. Energy consumption (monitored) [E1c] (kWh/m²/month)



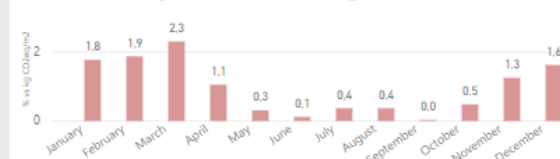
Primary energy demand (simulated) [E3d] vs. Primary energy consumption (monitored) [E3c] (kWhPE/m²/month)



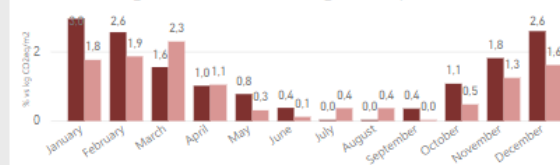
Thermal energy savings [E2t] vs. Electrical energy savings [E2e] (%)



Electrical Greenhouse gas emissions reduction [E5e] (%) vs. Greenhouse gas emissions [E4] (kg CO₂eq/m²/month)



Thermal Greenhouse gas emissions reduction [E5t] (%) vs. Greenhouse gas emissions [E4] (kg CO₂eq/m²/month)



Filters

Country

- ☒ Spain
- ☐ Sweden
- ☐ Turkey

Year

- ☐ 2017
- ☒ 2018
- ☐ 2019

Month

- ☐ January
- ☐ February
- ☐ March
- ☐ April
- ☐ May
- ☐ June
- ☐ July
- ☐ August
- ☐ September
- ☐ October
- ☐ November
- ☐ December



The CITYFiED info packs

More info packs here:

[CITY SMART SPACE](#)



SOCIAL

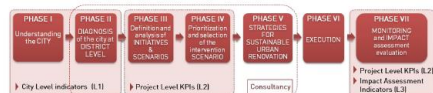
Social barriers were found to be common to all cities with a general lack of awareness, knowledge and interest among residents about energy efficiency, as well as a clear lack of acceptance for building renovation work and temporary annoyance. A good communication or even the involvement of tenants and/or owners in the decision and implementation process from the very beginning is the key. By means of info campaigns both on qualitative (e.g. comfort) and economic (e.g. energy saving) benefits, the use of trusted ambassadors among the residents, "show houses" and study tours to retrofitted apartments.

01 Non-technological barriers

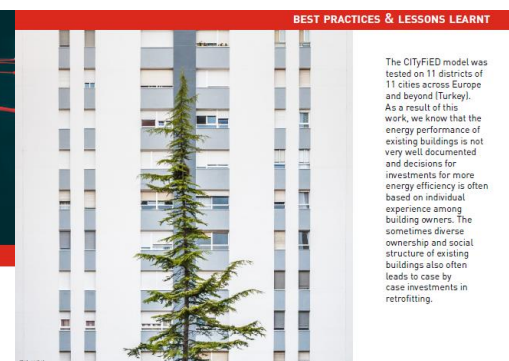
02 CITYFiED model for selection of energy retrofitting strategies at district level



The methodology is deployed in 7 phases, ensures an effective dialogue among all stakeholders and considers different ways to strengthen confidence in decision-making processes. Our approach is tested through the active participation of the demonstration teams, with the demonstration cases as a reference; and the CITYFiED network of cities, which are the City Cluster and the Community of Interest.



CITYFiED MODEL FOR SELECTION OF ENERGY RETROFITTING STRATEGIES AT DISTRICT LEVEL



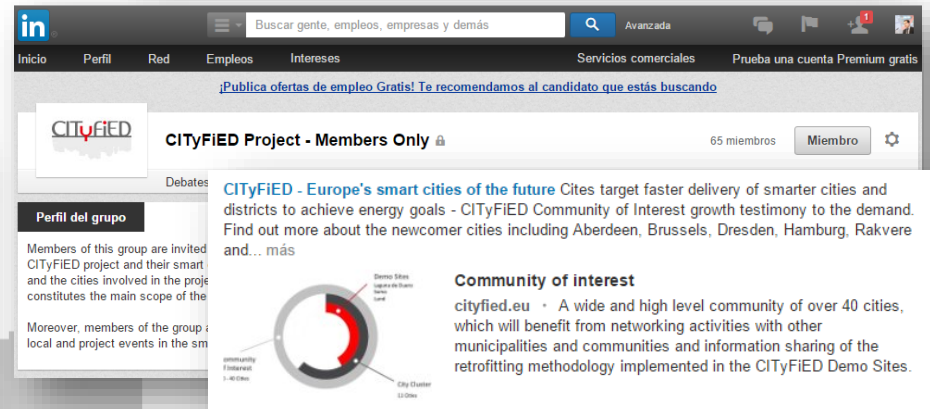
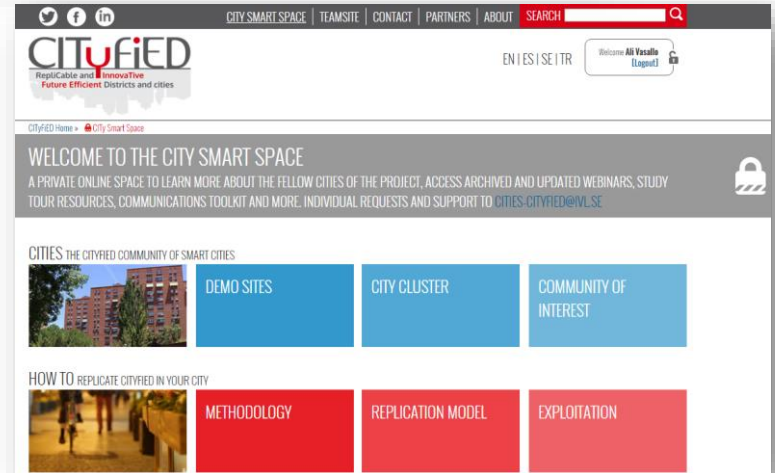
The CITYFiED model was tested on 11 districts of 11 cities across Europe and beyond (Turkey). As a result of this work, we know that the energy performance of existing buildings is not very well documented and decisions for investments for more energy efficiency is often based on individual experience among building owners. The sometimes diverse ownership and social structure of existing buildings also often leads to case by case investments in retrofitting.

03 CITYFiED methodology for sustainable urban renovation at district level

CITYfIED social media



facebook



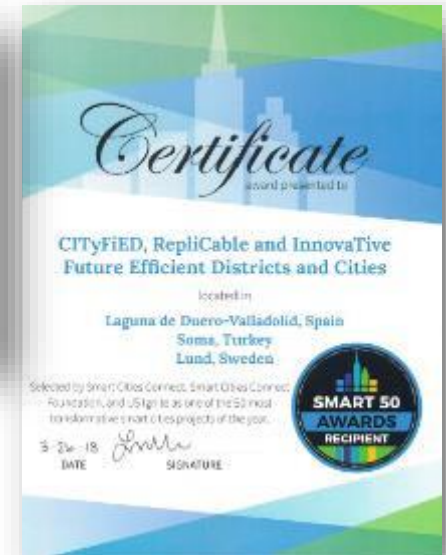
LinkedIn

Our awards

Best poster of SET Plan 2016
– Central European Energy
Conference X



Mapei Award
for Sustainable
Architecture
2017



Torrelago District Heating network was
awarded the Global District Energy
Climate Awards 2017 in the
category "Emerging Market"



Smart 50 Awards 2018

7th Edition of the Sustainable
Buildings Awards 2018

Krafringen Energi AB recognised for outstanding CSR efforts





Our objective:

**“Help you get smarter, faster...
... be a risk-saver, cost-saver, time-saver for
you and your projects”**

A formula designed to facilitate achieving your energy goals.

Delivered through in-person workshops, study tours and
online webinars and resources

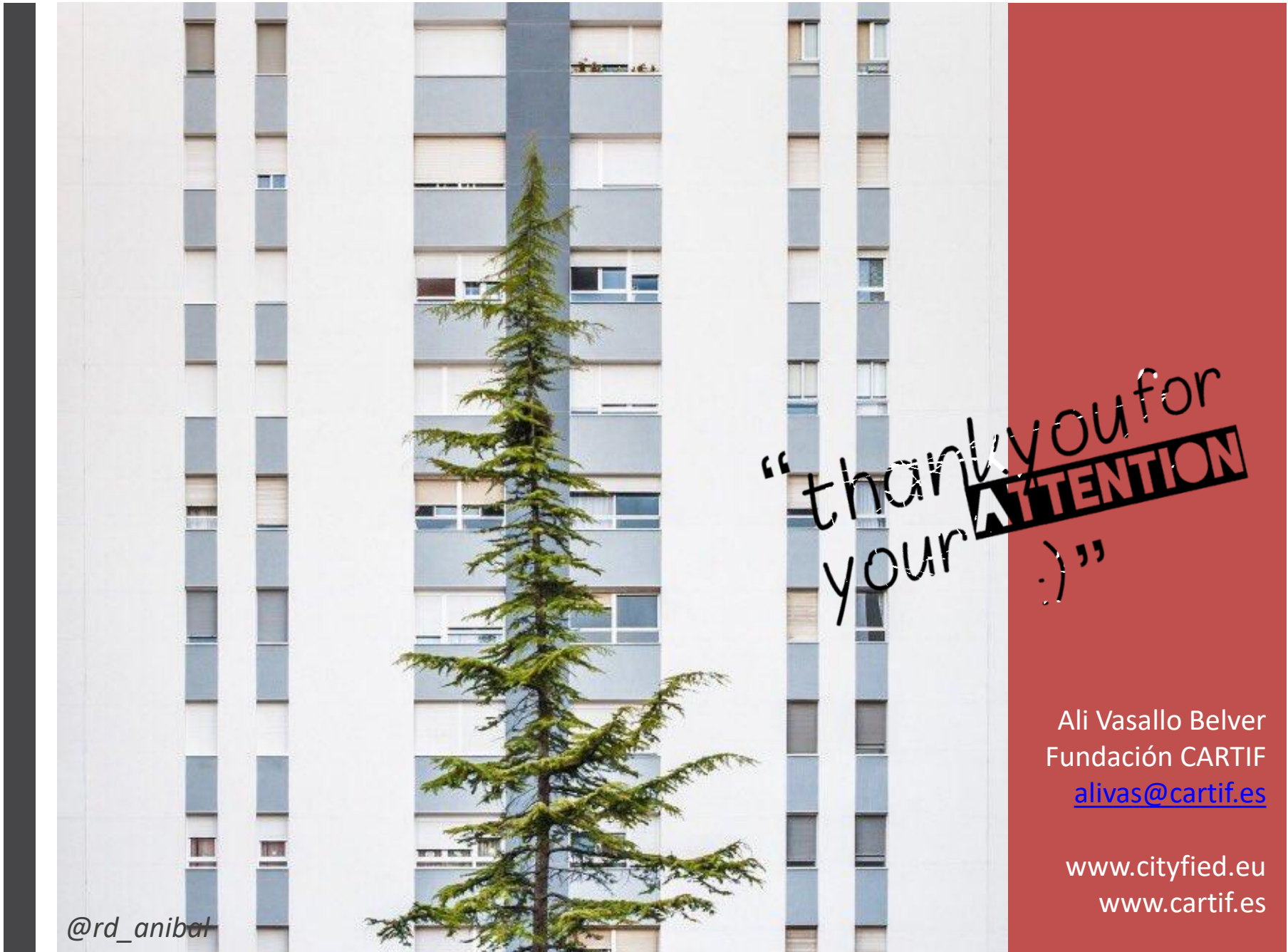
CITyFiED Community: a two-fold role...

“Represent the interest, needs & problems of cities within the project”

“Recognised leadership in the European drive for smarter cities & energy efficiency”

Provide a link between the CITyFiED project and cities planning district renovations, to maximize replication potential

Exploitation & business models from a local authority point of view: public procurement, methodology feasibility...



“thank you for
your **ATTENTION**
:)”

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