



"Retrofitting of a residential district under
near zero energy buildings criteria"

SUSTAINABLE PLACES 2017

Fundación CARTIF
Miguel Á. GARCÍA-FUENTES
REMOURBAN Project Coordinator



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_EU](https://twitter.com/Remourban_EU)

Source: Jason Hawkes. Valladolid: Cúpula del Milenio

the goal is providing a
model to make cities

smarter
a n d m o r e
sustainable





DECISION
MAKERS



PUBLIC
ADMINISTRATORS



INVESTORS



INDUSTRY



PEOPLE



[...] displaying or flashing a very bright light for the **guidance** of ships in avoiding dangerous areas, in following certain routes, etc.



EU roadmap of SCC Projects and Initiatives

EUROPEAN INNOVATION PARTNERSHIP ON SMART CITIES AND COMMUNITIES



CITYkeys (SCC2)
Smart City Indicators



ESPRESSO (SCC3)
Smart City Standards

SCC1-2014



triangulum

DEMONSTRATE DISSEMINATE REPLICATE



SCC1-2015



SHARINGCITIES



SCC1-2016



RUGGEDISED

Designing smart, resilient cities for all

SMART CITIES INFORMATION SYSTEM (SCIS)



EU Smart Cities
Information
System



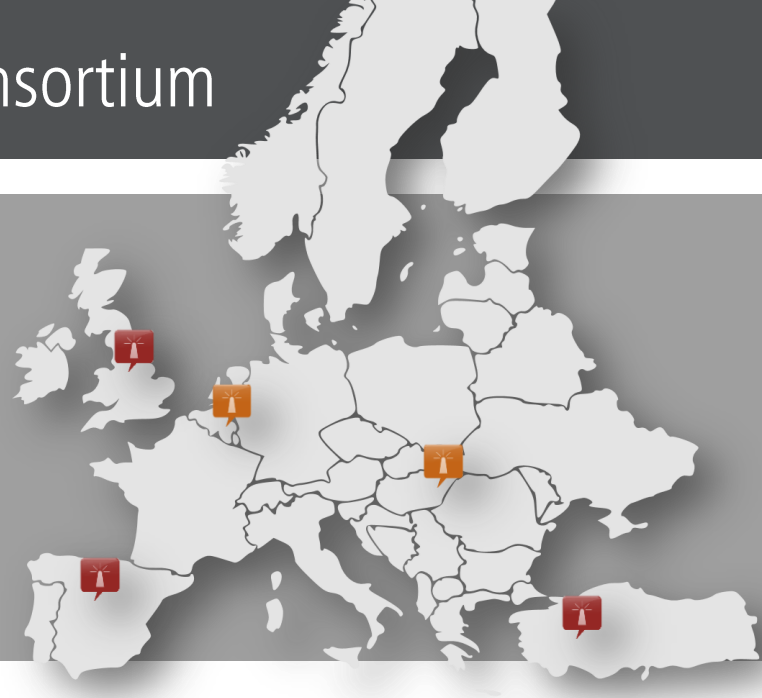
6th EU Smart Cities Information System Exchange (SCIS) Workshop
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REMOURBAN project and consortium

Total REMOURBAN budget: **32.5M€** (21,5M€ EU funded)
Total investment in REMOURBAN actions: **22.9M€** (80% public)
Energy savings: **6,858 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)





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

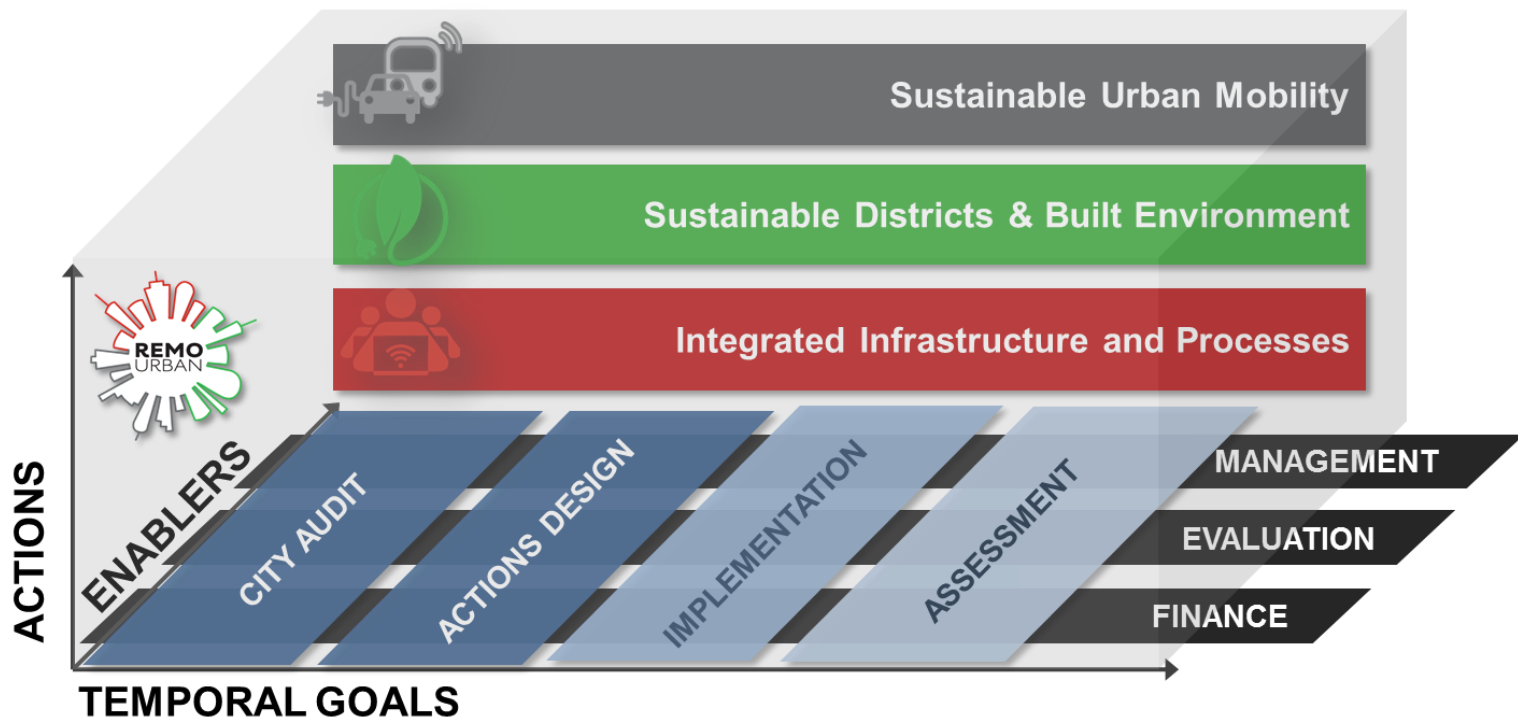


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Integrated Urban Regeneration Model

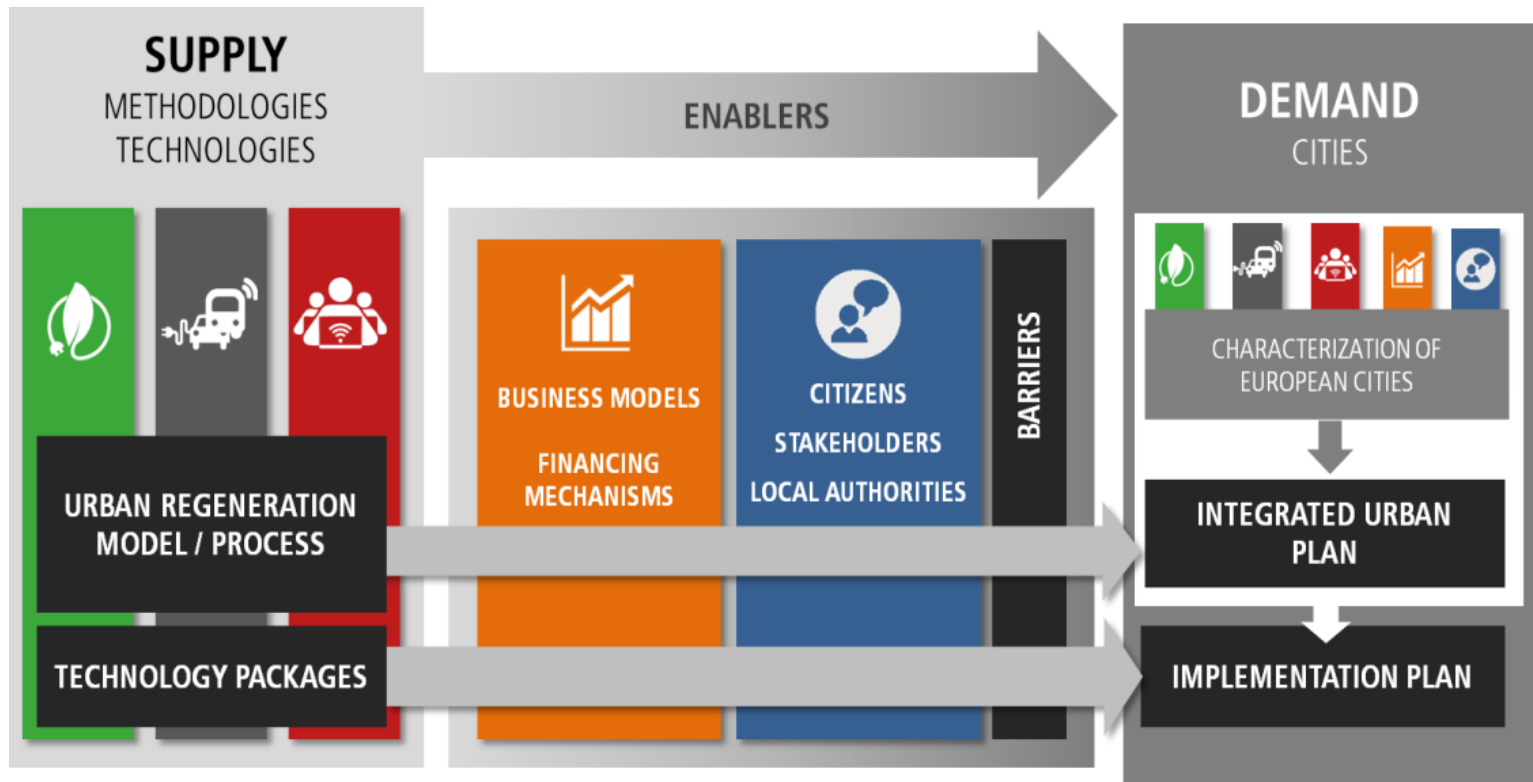


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Integrated Urban Regeneration Model





Low energy districts

Following current tendencies, by 2050 the building sector alone will be responsible for all the global emissions that the 2°C increase scenario allows.

It is impossible to reach desirable climate change scenarios with the current building sector.

*"Building a common home.
A Global Vision Report"*
Global Vision Area within the WSB14



Challenges:
Improve energy efficiency
Changing energy resources



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Low energy districts



MONITORING TOOLS FOR ENERGY

Develop and deploy monitoring tools to achieve performances related to energy efficiency and financial viability



DISTRICT SCALE RETROFITTING

Systemic implementation of passive and active technologies to improve comfort and reduce the energy consumption



RENEWABLE HEATING AND COOLING

Use of heating and cooling from RES and implementation of innovative DH technologies (Low Temperature District Heating)



ELECTRICITY DISTRIBUTED GENERATION

Electricity generation from small scale energy sources located close to where the electric energy is being used



ADVANCED BUILDING ENERGY MANAGEMENT SYSTEMS

Integration of advanced monitoring and control strategies for thermal and electric energy uses



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Low energy districts: Nottingham (UK)



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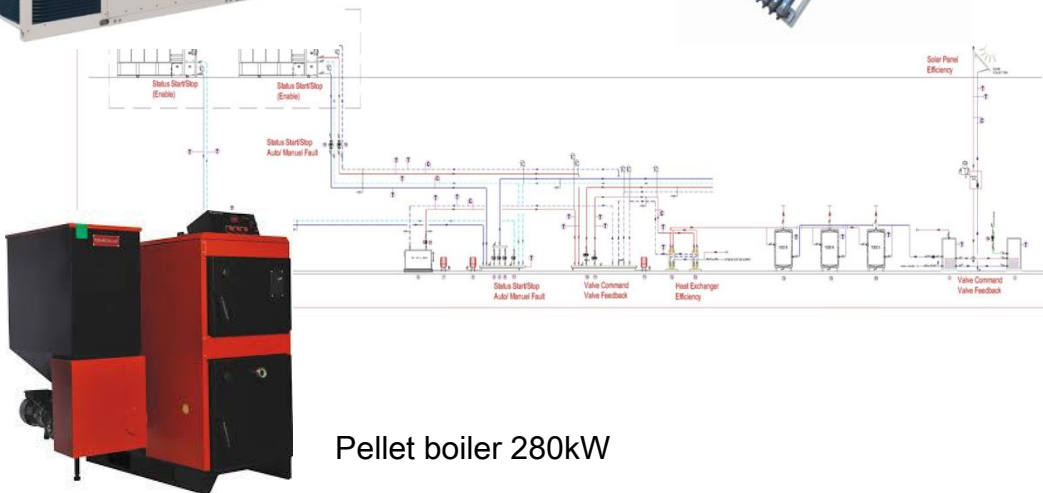




Low energy districts: Tepebasi (Turkey)



27kW Solar Thermal system



Pellet boiler 280kW



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Low energy districts: Valladolid (Spain)

BEFORE



AFTER



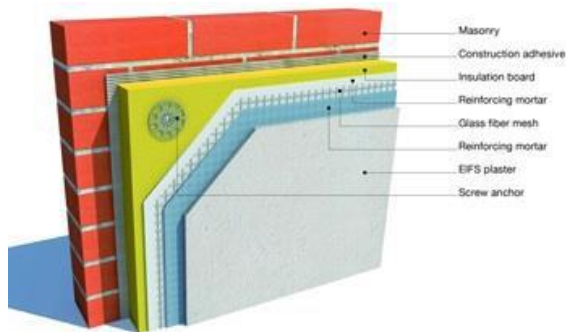
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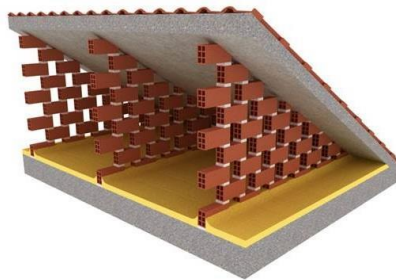


Retrofitting of FASA residential district

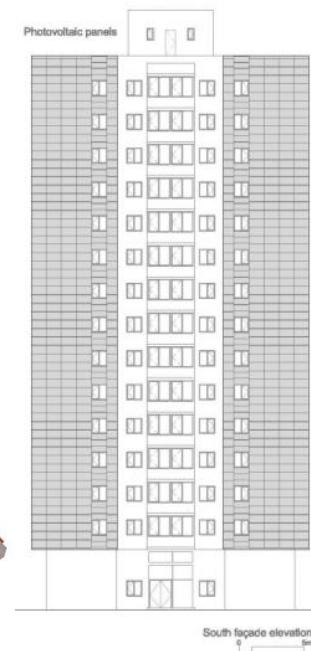
Façade insulation



Roof insulation



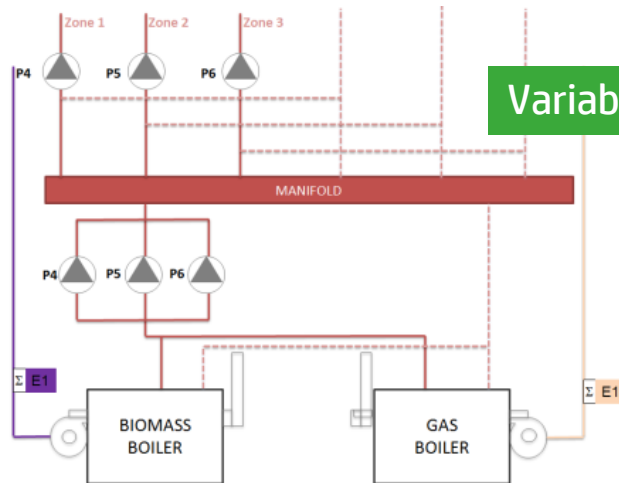
PV façade





Retrofitting of FASA residential district

Biomass boiler (850 kW)



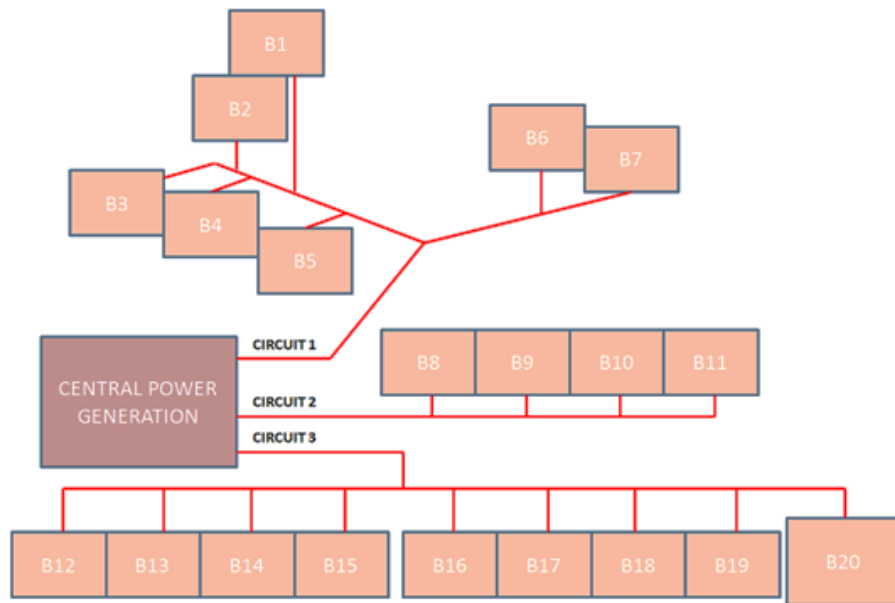
Variable flow pumps





Retrofitting of FASA residential district

Distribution network retrofitting



Replacement of substations



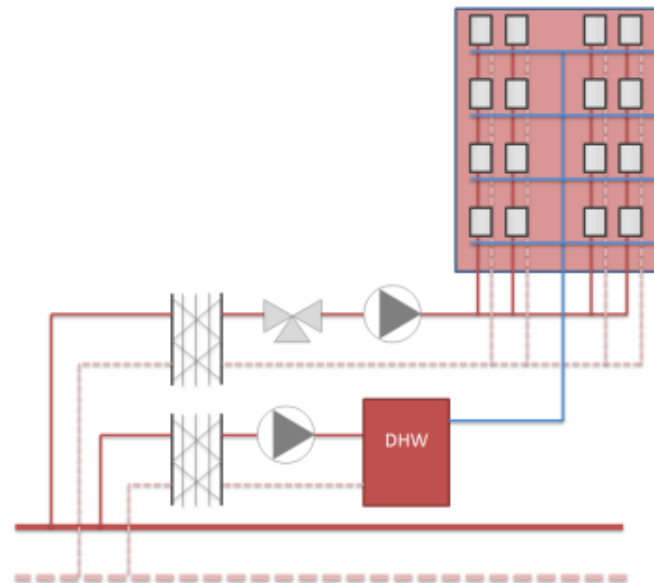


Retrofitting of FASA residential district

Heat storage installation



DHW centralisation





Retrofitting of FASA residential district

Heat allocators installation



Thermostatic valves installation





Retrofitting of FASA residential district

	Tower		Grouping blocks 9-10-11-12		Block 7		Whole district	
	Conditioned surface (m2)	3.836 m2	Conditioned surface (m2)	4.392 m2	Conditioned surface (m2)	1.098 m2	Área acondicionada (m2)	24.698 m2
	Before kWh/m2*year (consumption)	After kWh/m2*year (consumption)	Before kWh/m2*year (consumption)	After kWh/m2*year (consumption)	Before kWh/m2*year (consumption)	After kWh/m2*year (consumption)	Before kWh/m2*year (consumption)	After kWh/m2*year (consumption)
January	35,90	19,60	39,36	21,49	43,16	23,56	40,00	21,84
February	23,65	12,91	25,47	13,91	27,88	15,22	25,94	14,16
March	16,12	8,80	17,08	9,33	18,82	10,28	17,47	9,54
April	10,52	5,74	10,49	5,73	11,97	6,53	10,95	5,98
May	3,89	2,12	3,49	1,90	4,37	2,39	3,82	2,09
June	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
July	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
August	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
September	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
October	4,47	2,44	4,91	2,68	5,19	2,83	4,93	2,69
November	21,96	11,99	23,45	12,80	25,34	13,83	23,80	13,00
December	34,98	19,10	38,01	20,76	41,70	22,77	38,69	21,13
Total consumption	151,48 kWh/m2a	82,71 kWh/m2a	162,26 kWh/m2a	88,60 kWh/m2a	178,42 kWh/m2a	97,42 kWh/m2a	165,62 kWh/m2a	90,43 kWh/m2a
	581,07 MWh/a	317,29 MWh/a	712,65 MWh/a	389,13 MWh/a	195,91 MWh/a	106,97 MWh/a	4.090,37 MWh/a	2.233,49 MWh/a
DH performance	Before	56,16%						
	After	61,71%						
Total demand	85,07 kWh/m2a	51,04 kWh/m2a	91,13 kWh/m2a	54,68 kWh/m2a	100,20 kWh/m2a	60,12 kWh/m2a	93,01 kWh/m2a	55,81 kWh/m2a





Retrofitting of FASA residential district

Political
Support

Dissemination &
Communication
Activities

Technical
Support

Financial
Support

 **Ayto. de Valladolid**
@AyuntamientoVLL

Siguiendo

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



Luis Vélez @velezpsoe · 5 abr. 2016

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



i+D Valladolid @INNOLID · 24 ago. 2016

Avanzando en proyectos #smartValladolid #Remourban S2CITY #smartcities #Valladolid



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Retrofitting of FASA residential district

Political
Support

Dissemination &
Communication
Activities

Technical
Support

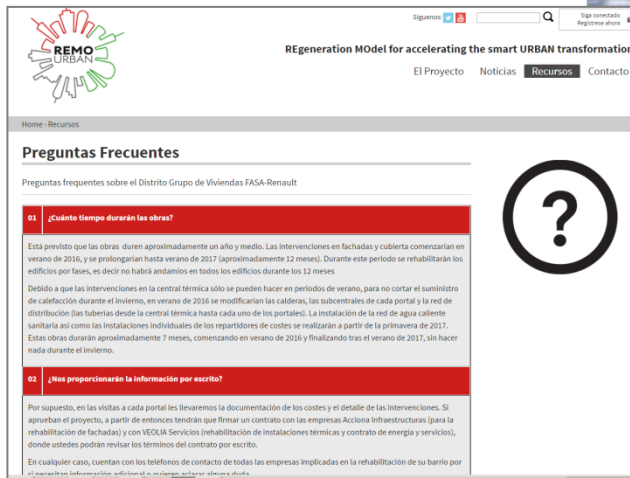
Financial
Support



Leaflet

...tas
...a durante las obras?
...realizaremos 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
...oficios con medidas similares a las planteadas
...tantados con la reducción de su consumo en
...de sus viviendas. Si tiene oportunidad, jno
...Si tiene alguna más...
...Abril y el 29 de Abril pasaremos por su vivienda
...lo prefiere, también puede contactarnos en:

Fundación CARTIF
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Ayuntamiento de Valladolid / Agencia de Innovación y Desarrollo Económico de Valladolid
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<http://es.remourban.eu>



Spanish Web /FAQ



Local TV



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Retrofitting of FASA residential district

Political
Support

Dissemination &
Communication
Activities

Technical
Support

Financial
Support

Consulting Office in the district



More than 50 meetings

Multiple doubts resolved



Follow-up Commission



Periodic communications



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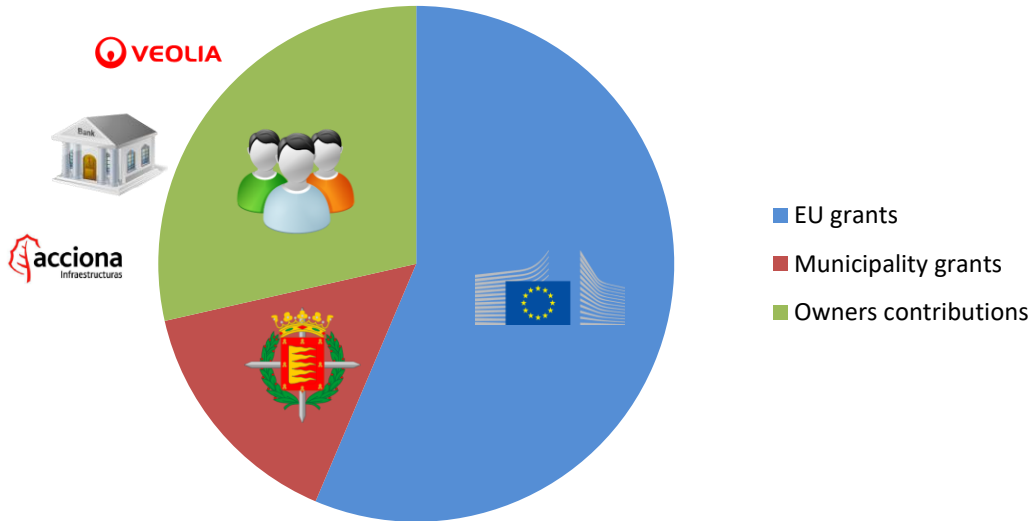
Retrofitting of FASA residential district

Political
Support

Dissemination &
Communication
Activities

Technical
Support

Financial
Support

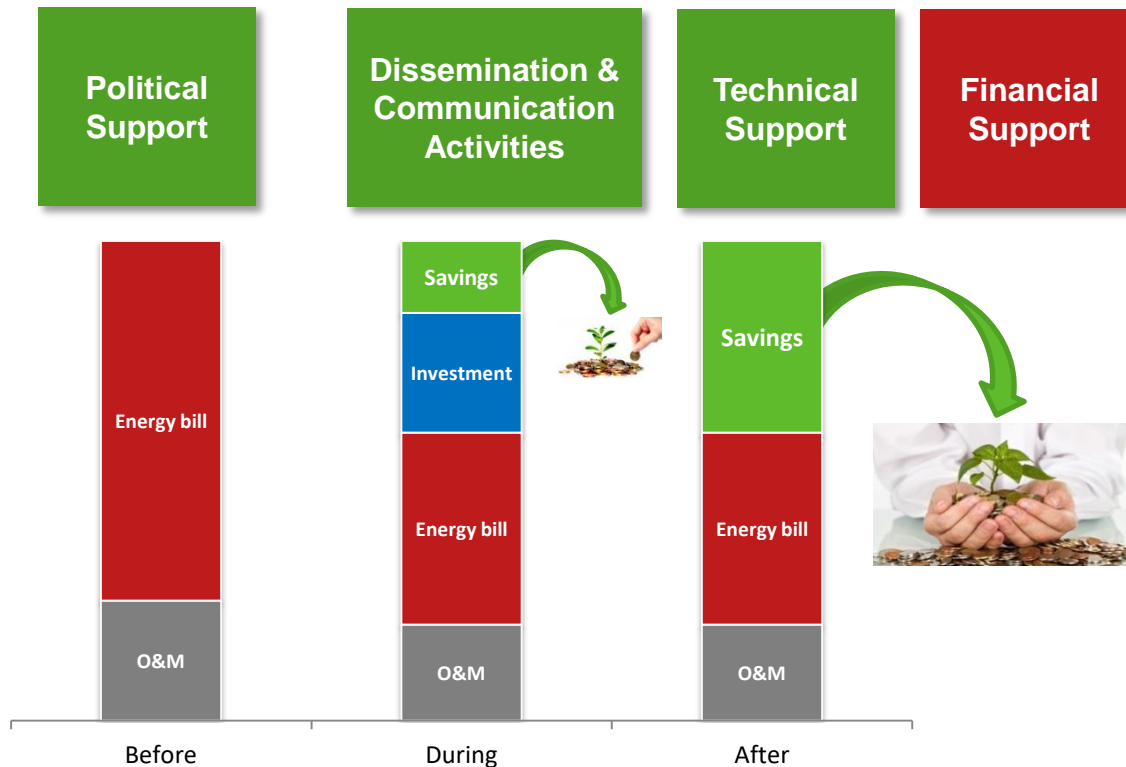


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Retrofitting of FASA residential district



- Grants allocated in 2 years in order to avoid gains on personal incomes taxation





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Regenerate your city with
REMOURBAN!

Thank you for your attention!

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