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Best practices developed
in EU projects for **energy
efficiency** renovated and
new buildings and districts

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D'Appolonia S.p.A.
AN ISO 9001 AND ISO 14001 CERTIFIED COMPANY
www.dappolonia.it

Energy Efficiency Projects

A general **overview** of **best practices** and **solutions** for **energy efficiency** implementation in **renovated** and **new buildings** and **districts** is presented, with particular reference to **projects co-funded** by the **European Commission** within the Seventh Framework Program (FP7)



Energy Efficiency Projects



Sporte²
Energy Efficiency for European Sport Facilities



energywarden
Renewable Energy Sourcing Decisions
and Control in Buildings



H2Ocean

R2CITIES



RESILIENT
www.resilient-project.eu



IREEN
ICT Roadmap for Energy
Efficient Neighbourhoods



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Energy Efficiency Projects

Selection of **five projects** with different objectives as concrete examples of **energy efficient solutions** and **applications** developed at both **retrofitting** as well as **new building** and **district level**:



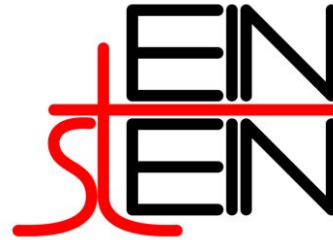
- Renovated context:

- **EINSTEIN** – “Effective INtegration of Seasonal Thermal Energy storage system IN existing buildings”
- **EFFESUS** – “Energy Efficiency for EU Historic Districts’ Sustainability”
- **R2CITIES** – “Renovation of Residential urban spaces: Towards nearly zero energy CITIES”
- **A2PBEER** – “Affordable and Adaptable Public Buildings trough Energy Efficient Retrofitting”

- New context:

- **NEED4B** – “New Energy Efficient Demonstration for Buildings”

EINSTEIN Project



Full Title: Effective integration of seasonal thermal energy storage systems in buildings

Theme: New Efficient solutions for energy generation, storage and use related to space heating and domestic hot water in existing buildings

Founding Scheme: Collaborative Project

Duration: 4 years

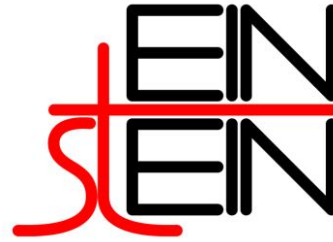
Kick Off: January 2012

Budget: 9 M€

Coordinator: Fundacion Tecnalia, Spain

Web-site: www.einstein-project.eu

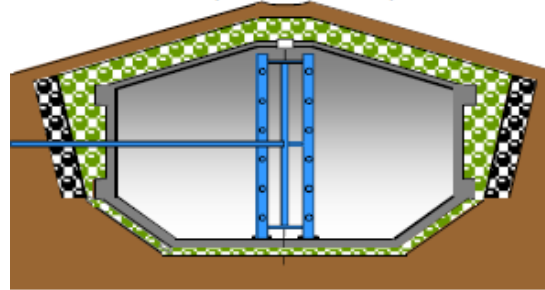
EINSTEIN Project



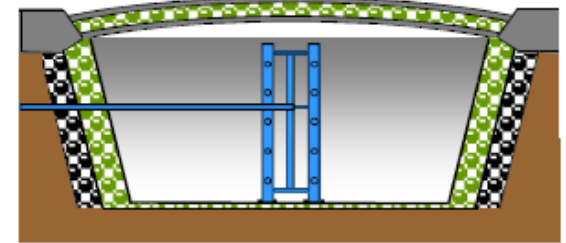
Objective:

The overall objective of EINSTEIN project is the development, evaluation and demonstration of a **low energy heating system** based on **Seasonal Thermal Energy Storage (STES)** concept in combination with **heat pumps** for space heating and **DHW** requirements for **existing buildings** to drastically **reduce energy consumption**.

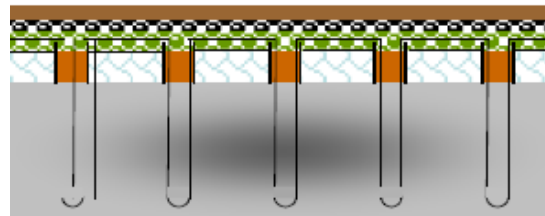
Tank thermal energy storage (TTES)
(60 to 80 kWh/m²)



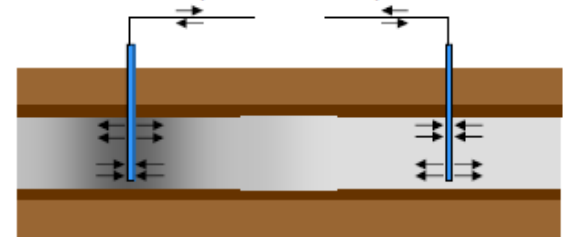
Pit thermal energy storage (PTES)
(60 to 80 kWh/m²)



Borehole thermal energy storage (BTES)
(15 to 30 kWh/m²)



Aquifer thermal energy storage (ATES)
(30 to 40 kWh/m²)



EFFESUS

Project



Full Title: Energy efficiency for EU historic districts sustainability

Theme: Energy efficiency in buildings

Funding Scheme: : FP7-2012-NMP-ENV-ENERGY-ICT-EeB

Duration: 4 years

Kick Off: September 2012

Budget: 5 M€

Coordinator: TECNALIA Research & Innovation, Spain

<http://www.effesus.eu>

EFFESUS

Project



Main Objectives:

- The EFFESUS concept is to reduce the environmental impact of Europe's valuable urban heritage by making significant **improvements to its energy efficiency while conserve and even promote the cultural, historic, urban and architectural value** of European's historic cities
- Energy efficiency improvement of historic urban areas will contribute to a better **urban environment, including social, economical and environmental progress.**
- A **dynamic repository** of available and novel energy efficiency technologies will be developed
- **Analysis of the barriers** hindering the application of identified solutions



Istanbul



Santiago de Compostela



Budapest



Glasgow



R2CITIES Project



Full Title: Renovation of Residential urban spaces: Towards nearly zero energy CITIES

Theme: EEB.ENERGY.2012.8.8.3 Demonstration of nearly Zero Energy Building Renovation for cities and districts

Founding Scheme: Collaborative Project

Duration: 4 years

Kick Off: July 2013

Budget: 9 M€

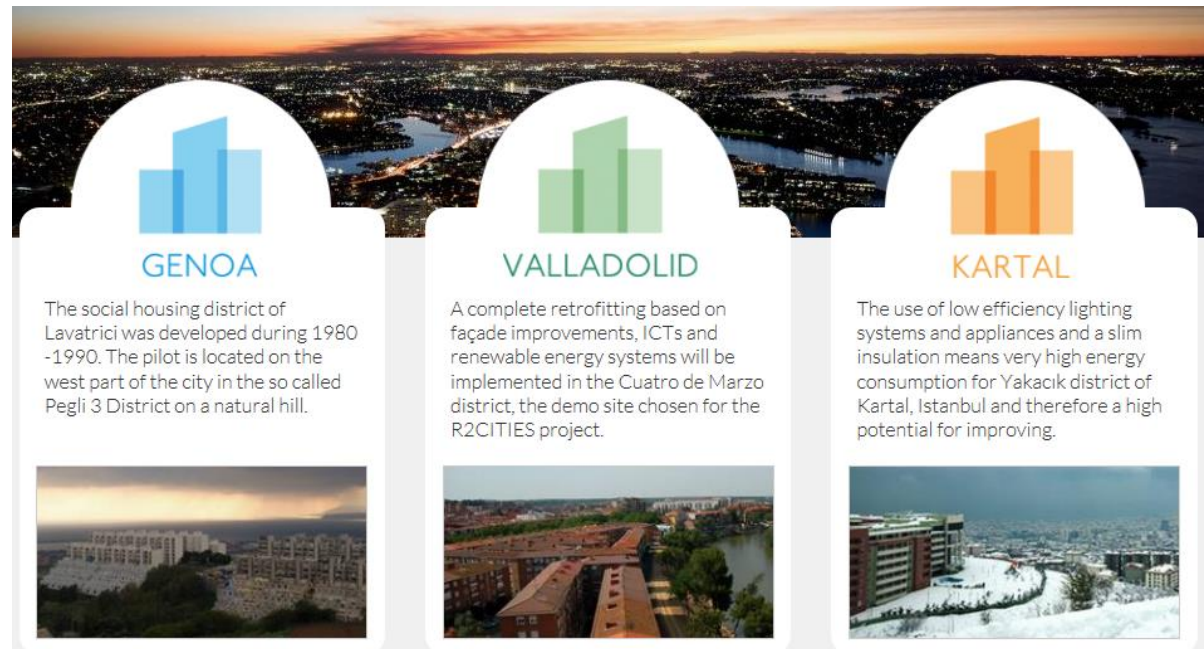
Coordinator: Fundación CARTIF (Boecillo-Valladolid) Spain

R2CITIES Project



R2CITIES aims to develop and demonstrate an **open and easily replicable** strategy for designing, constructing, and managing large scale district renovation projects for achieving nearly zero energy cities.

- **Three demonstrations** of residential district retrofitting
- Several studies of **cost-effective solutions**
- Deployment of a **measurement and verification plan** of energy performance and savings
- A **market and replication deployment plan**





A2PBEER Project

Full Title: Affordable and Adaptable Public Buildings through Energy Efficient Retrofitting

Theme: Integration of technologies for energy efficient solutions in the renovation of public building

Founding Scheme: Collaborative Project

Duration: 4 years

Kick-off: September 2013

Budget: 10.5 M€

Coordinator: Fundacion Technalia, Spain

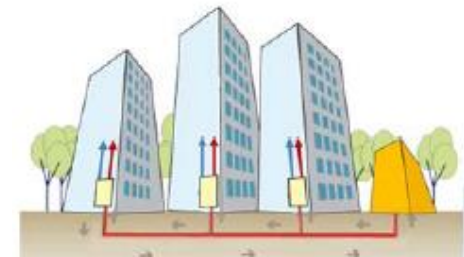
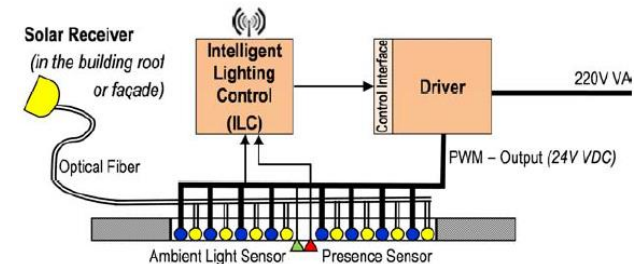
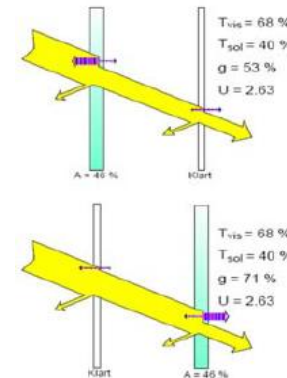
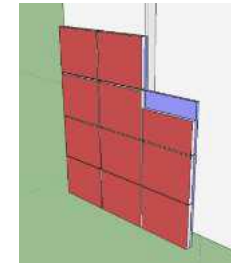
A2PBEER Project



Objectives:

The main objective is to develop a **systemic energy efficient buildings retrofitting methodology** for **Public buildings** including:

- **High performance envelope retrofitting** based on an external and internal **super-insulated** (VIP–Vacuum Insulated Panels) **façade** retrofit
- **Smart windows**
- **Smart lighting systems** combining LED and natural light
- **Smart Dual Thermal Substation**, a new approach to district heating based in smart grid functionality and integrating heating and cooling



NEED4B Project



Full Title: New Energy Efficient Demonstration for Buildings

Funding Scheme: Collaborative Project

Duration: 6 years

Kick Off: January 2012

Budget: 9.5 M€

Coordinator: Fundacion CIRCE, Spain

<http://www.need4b.eu/>

NEED4B Project



Main Objective:

- To develop an **open** and **easily replicable methodology** for **designing, constructing and operating new low energy buildings**, aiming to a large market uptake

Pilots Plants:

- Demo site 1: **Mons, Belgium**, dwellings and social housing, 15.000m²
- Demo site 2: **Zaragoza, Spain**, Offices and laboratories, 2.400m²
- Demo site 3: **Boras & Kungsbacka, Sweden**, Smart wooden houses, 168 m²
- Demo site 4: **Istanbul, Turkey**, College dormitory, 7.500m²
- Demo site 5: **Lecce, Italy**, offices and commercial building, 5.200 m² (Proposal under evaluation from EC)



Mons, Belgium



Zaragoza, Spain



Boras, Sweden



Istanbul, Turkey

NEED4B

Potential new Pilot – Lecce, Italy

Address: Viale De Pietro, Lecce

Building Category: Commercial and office

Total Area (shops + offices): 5214 m²



The project consists in a **mixed use building** composed by **four floors over ground and three floors underground**: in the third and the second floors underground there is a parking for 661 cars in total; **the first floor underground and the ground floor are addressed to shops and commercial spaces**; the first, the second and the third floors over ground are for offices.

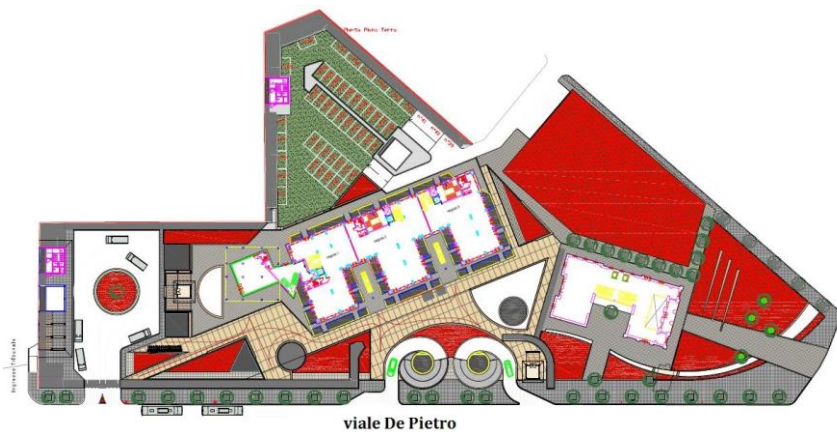


NEED4B

Potential new Pilot – Lecce, Italy

Main highly energy efficiency solutions:

- **PV panels** installed on the roof
- **Heating and cooling system** constituted by **highly efficient heat pump** (COP 4 for heating and COP 3.5 for cooling)
- **Envelope** made of **double skin coating**, and **high performance glazing**
- **Energy consumption monitoring**



GRAZIE PER L'ATTENZIONE!

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