

Caso Studio

Dal 7° Programma Quadro ad Horizon 2020

Prof. Anna Osello

Roma, 15th May 2013



Contenuti

1 Introduzione

2 Breve inquadramento generale del 7° PQ

3 Caso studio 1: il progetto SEEMPubS

4 Caso studio 2: il progetto DIMMER

5 Siete pronti per Horizon 2020?

6 Conclusioni

Introduzione

2007

1.1.2014

2020

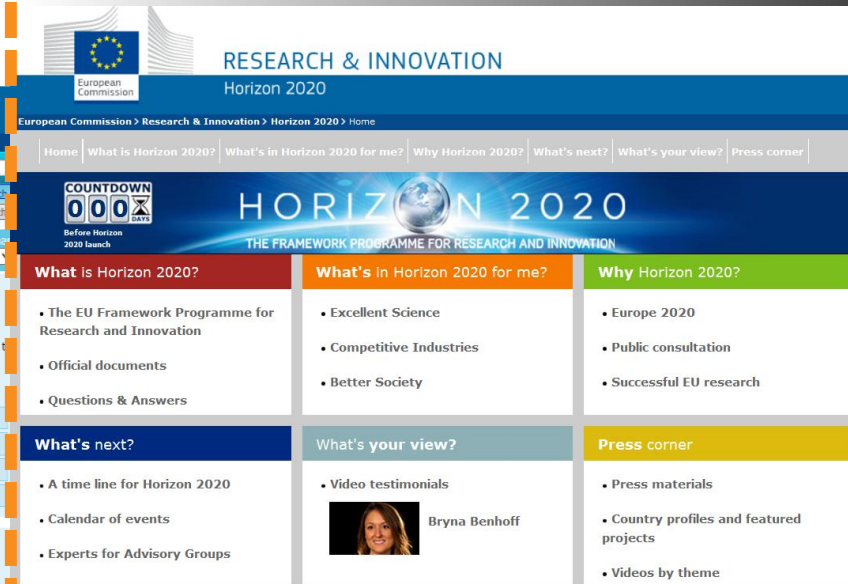
FP7



The screenshot shows the CORDIS (Community Research and Development Information Service) website for the Seventh Framework Programme (FP7). The header includes the European Commission logo and the text 'CORDIS Community Research and Development Information Service'. Below the header is a navigation bar with links: Home, News, Funding, Projects, Results, Partners, Go local. A search bar is also present. The main content area features a grid of colored boxes representing different themes: Cooperation (red), Ideas (orange), People (purple), Capacities (pink), Euratom (green), and JRC (blue). There are also links to 'Previous Framework Programmes' and 'Next Framework Programme: Horizon 2020'. A sidebar on the left lists various actions like 'FP7 Home', 'FP7 newsroom', 'Understand FP7', 'Participate in FP7', 'Find a call and Submit Proposals', 'Register your organisation', 'Get support', 'Find project partners', 'Find a project', 'Find a document', and 'Register as an Expert (Participant Portal)'.

http://cordis.europa.eu/fp7/home_it.html

HORIZON 2020



The screenshot shows the Horizon 2020 website. The header includes the European Commission logo and the text 'RESEARCH & INNOVATION Horizon 2020'. Below the header is a navigation bar with links: Home, What is Horizon 2020?, What's in Horizon 2020 for me?, Why Horizon 2020?, What's next?, What's your view?, Press corner. A 'COUNTDOWN' timer is visible, showing '000' days before the launch. The main content area features a grid of colored boxes representing different themes: What is Horizon 2020? (red), What's in Horizon 2020 for me? (orange), Why Horizon 2020? (green), What's next? (blue), What's your view? (teal), and Press corner (yellow). Each box contains a list of links or information related to that theme. For example, 'What is Horizon 2020?' includes links to 'The EU Framework Programme for Research and Innovation', 'Official documents', and 'Questions & Answers'. 'What's in Horizon 2020 for me?' includes links to 'Excellent Science', 'Competitive Industries', and 'Better Society'. 'Why Horizon 2020?' includes links to 'Europe 2020', 'Public consultation', and 'Successful EU research'. 'What's next?' includes links to 'A time line for Horizon 2020', 'Calendar of events', and 'Experts for Advisory Groups'. 'What's your view?' includes a video testimonial from Bryna Benhoff. 'Press corner' includes links to 'Press materials', 'Country profiles and featured projects', and 'Videos by theme'.

http://ec.europa.eu/research/horizon2020/index_en.cfm



Breve inquadramento generale del 7° PQ

Il Settimo programma quadro (7° PQ) riunisce tutte le iniziative dell'UE collegate alla ricerca che hanno un ruolo fondamentale per raggiungere gli **obiettivi di crescita, competitività e occupazione**.

I vasti obiettivi del 7° PQ sono stati raggruppati in quattro categorie:

- **Cooperazione**
- **Idee**
- **Persone**
- **Capacità**

per ciascuna delle quali esiste un programma specifico, che corrisponde alle aree principali della politica di ricerca dell'UE.

1
2
3
4
5
6



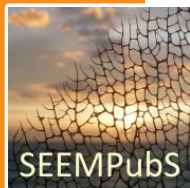
FP7 ICT-2010-10.2 ICT for energy-efficient buildings and spaces of public use



The project incubation

Proposal submission





Caso studio 1: il progetto SEEMPubS

... and an even longer way until project starting

4 Remarks (Threshold 10.6/11)	TOTAL
The proposal has passed all the thresholds.	
The validation phase should adopt an iterative approach, and the timing of the final system must be extended to at least 12 months. This should not affect the proposed reductions in resources, estimated at 15% of the total person-months.	12.00

Evaluation Summary Report

DOW accepted **GA** signed by EU **CA** (final)

February 2010

April 2010

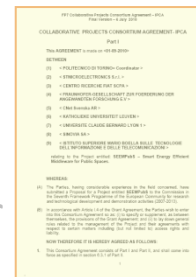
April 2010



July 2010



July 2010



4-5 October 2010

Negotiation in Brussels with PO Patricia Arsene



9 July 2010

Info day in Brussels



1 September 2010

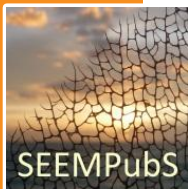
Official project start



Kick-off meeting



1
2
3
4
5
6



Caso studio 1: il progetto SEEMPubS

Smart Energy Efficient Middleware for Public Spaces

1

2

3

4

5

6

Proposal Acronym: **SEEMPubS**

EU Call: **EeB.ICT.2010.10-2 - ICT for energy-efficient buildings and spaces of public use**

Start Date: **September 1, 2010**

Duration: **36 months**

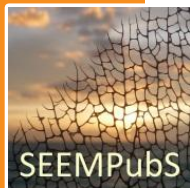
Coordinating organisation: **Politecnico di Torino, Italy**

Coordinating contact: **Enrico Macii**

Estimated indicative person months: **436,4**

Total cost: **4.1 MEuro**

Total funding: **2.9 MEuro**

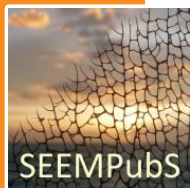


Caso studio 1: il progetto SEEMPubS

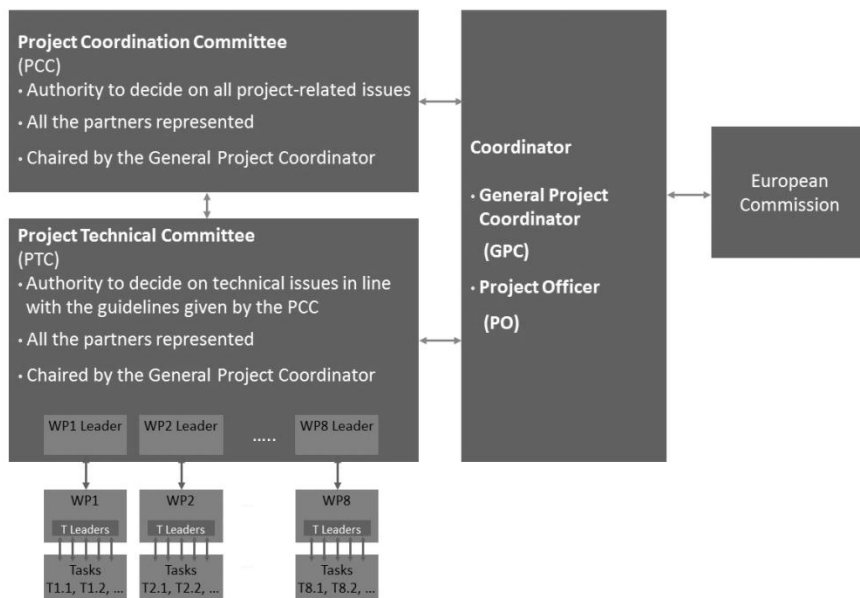
University	<u>Politecnico di Torino</u>	Italy
	Katholieke Universiteit Leuven	Belgium
	Université Claude Bernard Lyon 1	France
Research Center	Centro Ricerche Fiat	Italy
	Fraunhofer FIT	Germany
	Istituto Superiore Mario Boella	Italy
Industry and SME	ST Microelectronics	Italy
	CNet Svenska AB	Sweden
	Sinovia SA	France
	EniServizi	Italy



1
2
3
4
5
6

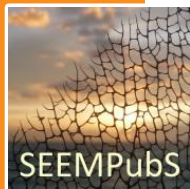


Caso studio 1: il progetto SEEMPubS



PCC	
GPC	Enrico Macii
EM	<i>To be appointed</i>
Polito	Anna Osello
ST	Salvatore Rinaudo
CRF	Massimo Ippolito
FhG-FIT	Markus Eisenhauer
CNet	Peter Rosengren
KU Leuven	Georges Gielen
UCBL	Joseph Virgone
Sinovia	Edwige Brossard
ISMB	Maurizio Spirito

WP	WP Leader	Task	Task Leader
WP1	Joseph Virgone, UCBL	T1.1	Joseph Virgone, UCBL
		T1.2	Joseph Virgone, UCBL
		T1.3	Anna Pellegrino, Polito
		T1.4	Anna Pellegrino, Polito
WP2	Franco Anzioso, CRF	T2.1	Franco Anzioso, CRF
		T2.2	Markus Eisenhauer, FhG-FIT
		T2.3	Anna Osello, Polito
		T2.4	Markus Eisenhauer, FhG-FIT
WP3	Marco Jahn, FhG-FIT	T3.1	Marco Jahn, FhG-FIT
		T3.2	Marco Jahn, FhG-FIT
WP4	Giuliana Gangemi, ST	T4.1	Markus Eisenhauer, FhG-FIT
		T4.2	Joseph Virgone, UCBL
		T4.3	Giuliana Gangemi, ST
		T4.4	Peter Rosengren, CNet
		T4.5	Peter Rosengren, CNet
		T4.6	Peter Rosengren, CNet
		T4.7	Markus Eisenhauer, FhG-FIT
WP5	Anna Osello, Polito	T5.1	Anna Osello, Polito
		T5.2	Anna Osello, Polito
		T5.3	Anna Osello, Polito
		T5.4	Giuliana Gangemi, ST
		T5.5	Peter Rosengren, CNet
		T5.6	Joseph Virgone, UCBL
		T5.7	Joseph Virgone, UCBL
WP6	George Gielen, KU Leuven	T6.1	Ben Geeraerts, KU Leuven
		T6.2	Franco Anzioso, CRF
		T6.3	Anna Osello, Polito
		T6.4	Ben Geeraerts, KU Leuven
WP7	Enrico Macii, Polito	T7.1	Enrico Macii, Polito
		T7.2	Enrico Macii, Polito
		T7.3	Enrico Macii, Polito
		T7.4	Enrico Macii, Polito

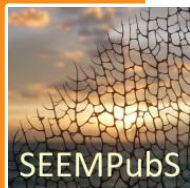


Caso studio 1: il progetto SEEMPubS

Objectives

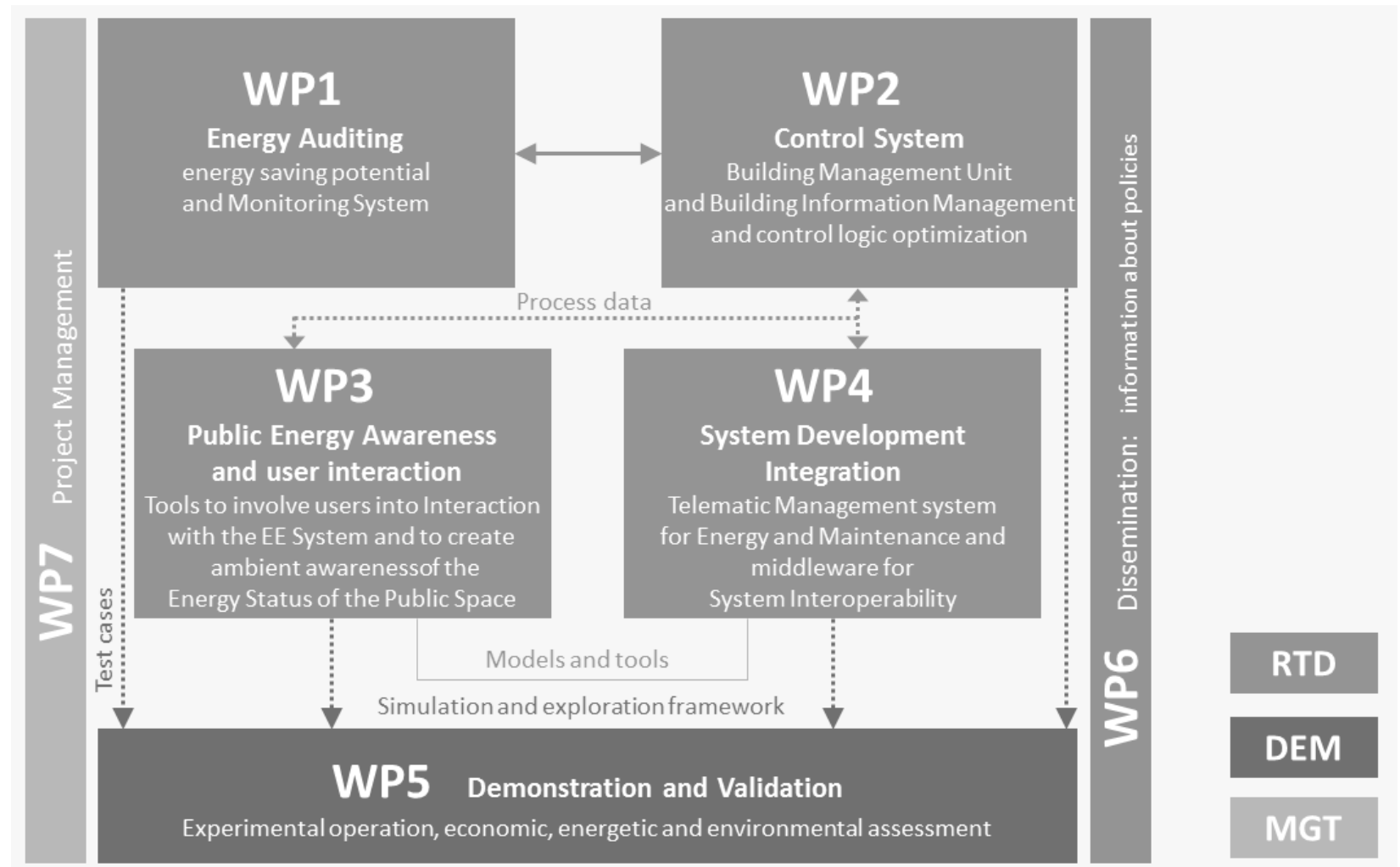
SEEMPubS addresses energy and CO2 footprint reduction in existing public buildings and spaces **without significant constructions works, by an intelligent ICT-based** service-based monitoring and management of energy consumption.

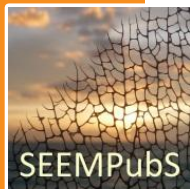
1. To develop an **integrated electronic system and interoperable web-based software solution** for real-time energy performance monitoring and control of lighting, heating, ventilation and air conditioning services through wireless sensor networks in existing buildings and open public spaces.
2. To significantly raise people's awareness for energy efficiency in public spaces basing on the management philosophy of the integrated facility. The system will provide **multidimensional visualization** of parameters of building operations and data sharing from energy-consuming equipment and appliances.
3. To define **standards** (such as ISO) and a **model** for existing buildings and public spaces in Europe starting from the most significant research results achieved through project.



Caso studio 1: il progetto SEEMPubS

The project workplan





Caso studio 1: il progetto SEEMPubS

The **expected project impact** is in accordance with the European Commission directives:

- Contribute to the **opening of a market for ICT-based** customized solutions integrating numerous products from different vendors and offering services from design of integrated systems to the operation and maintenance phases.
- Establish a **collaboration framework between the ICT and the building industry** aimed at exploiting opportunities for the development of ICT-based systems in compliance with the Energy Performance of Buildings Directive.
- **Reduce energy consumption and CO2 emissions**, in line with the policy framework for facilitating the transition to an energy-efficient and low-carbon economy through ICT.

1
2
3
4
5
6

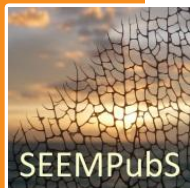


- 1
- 2
- 3
- 4
- 5
- 6

[illegible]

Number of deliverables:

- 1th year: 20
- 2nd year: 15
- 3th year: 21



Caso studio 1: il progetto SEEMPubS

The campus of Politecnico di Torino is **the demonstrator** of SEEMPubS.

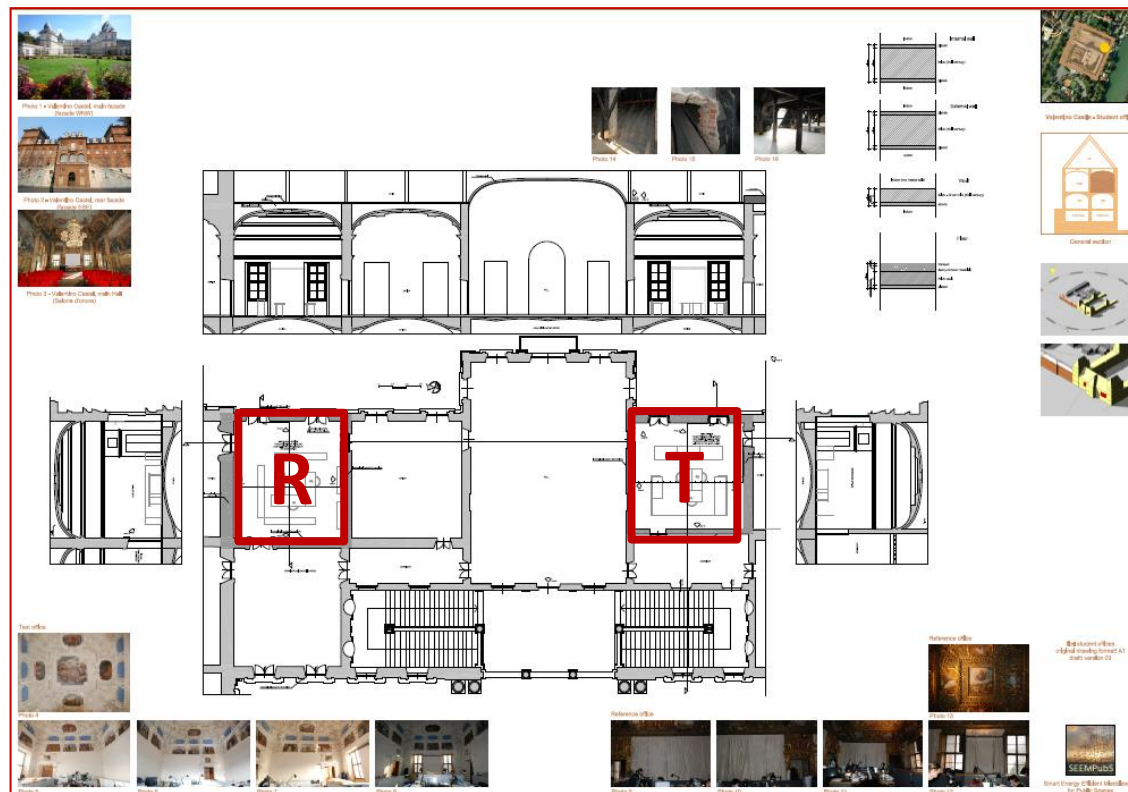


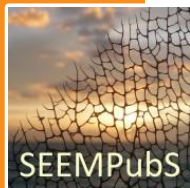
Caso studio 1: il progetto SEEMPubS

To optimize the SEEMPubS activities, six representative Rooms (**Test Rooms**) were selected within the demonstrator and for each of them a new BMS is designed based on a specific sensor network infrastructure. Similarly, six twin Rooms (**Reference Rooms**) were selected to compare all data during the research period.



At the same time as the choice of the Rooms a detailed survey was started to define the state of the art of the campus buildings and in particular of the 12 selected Rooms.

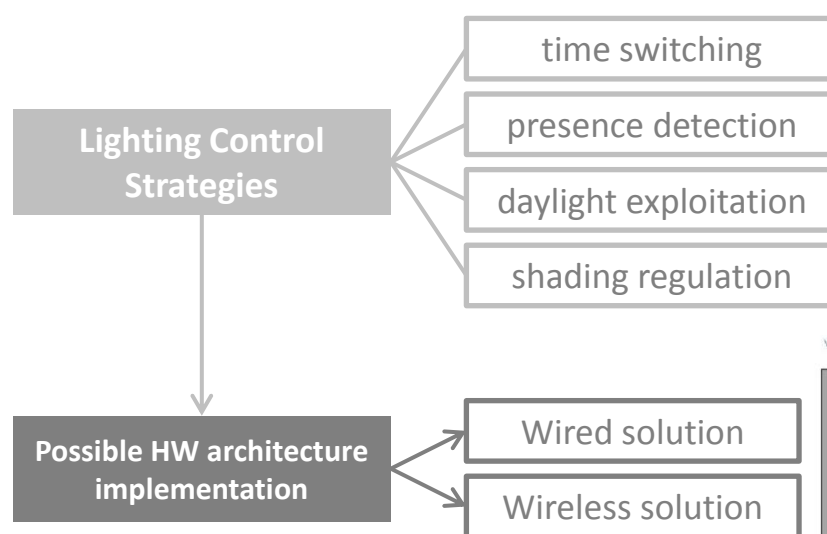
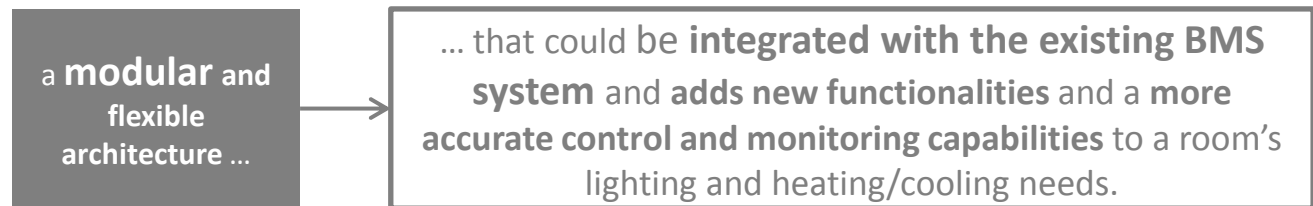




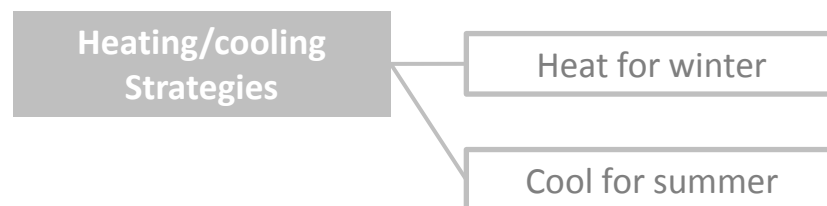
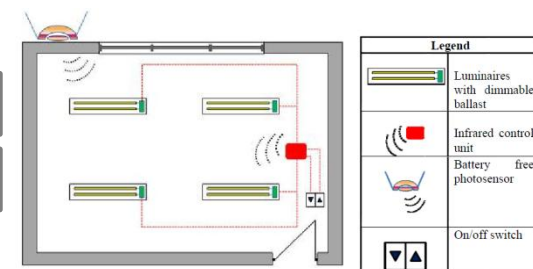
Caso studio 1: il progetto SEEMPubs

The HVAC and lighting control system

A new HW architecture description for lighting and heating/cooling monitoring and control has been defined based on:



In SEEMPubs a single strategy or a combination of them will be used in each selected rooms depending on the features of the rooms in terms of daylight availability, activities carried out in, working hours, number of users, absence probability, etc.

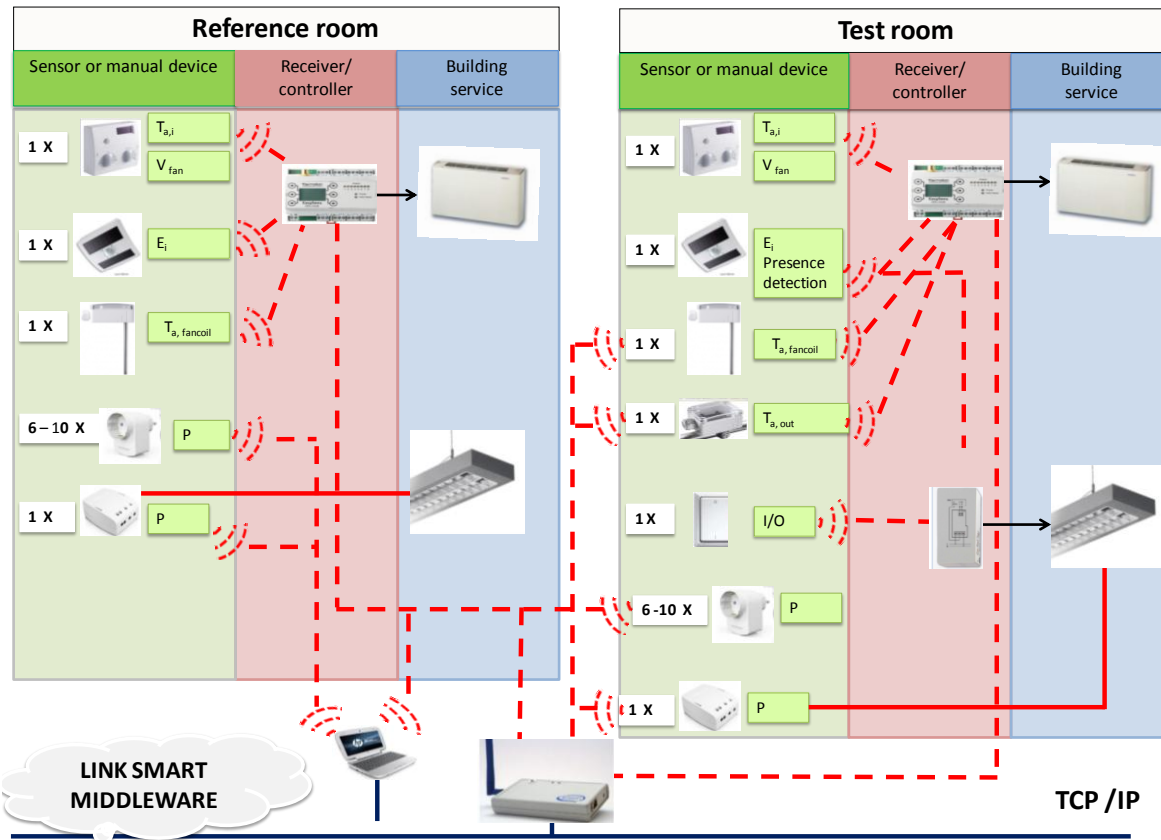


- Upper control
- Minimum power
- Lower control
- Recovery at maximum power

Caso studio 1: il progetto SEEMPubS

Implementation of the Intelligent Control System

Wireless devices architecture: for the historical rooms in Valentino Castle

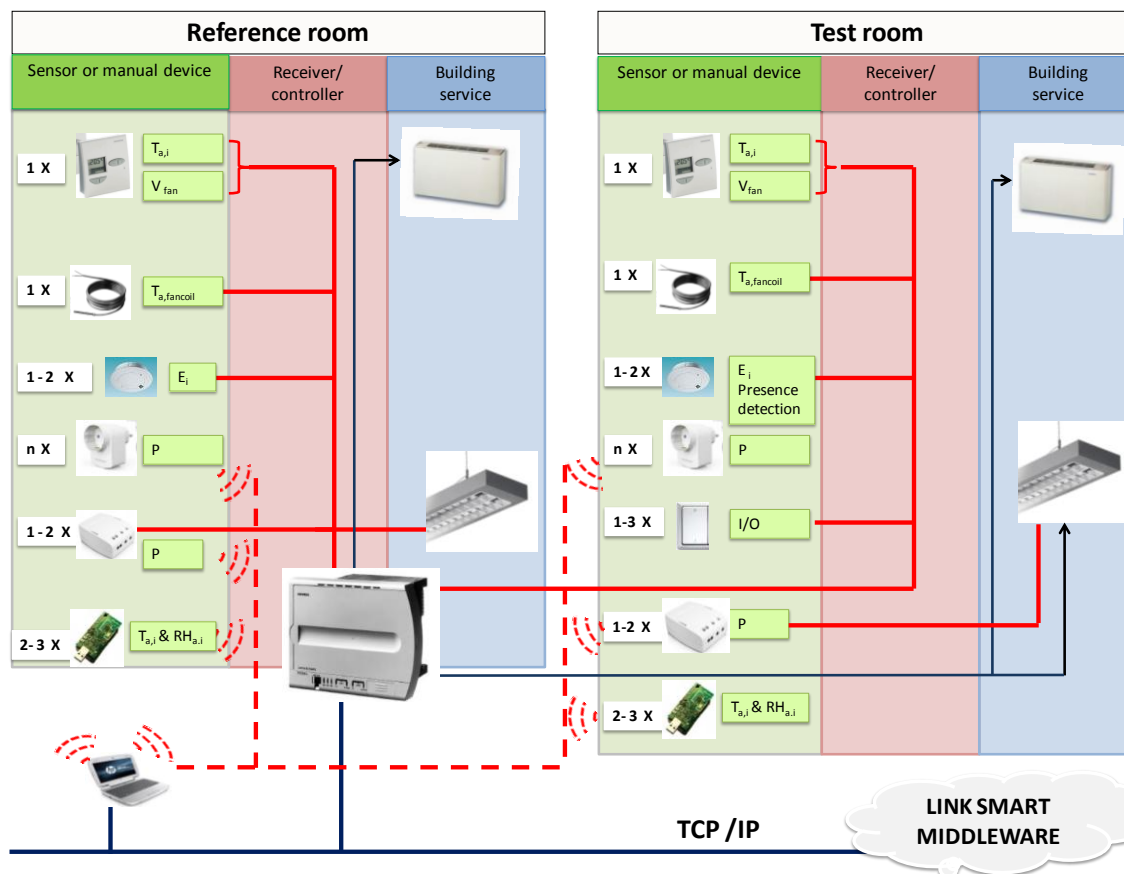


$T_{a,i}$: Indoor air temperature	V_{fan} : fan velocity
E_i : Indoor illuminance	I/O: switch
P: Electric power	E_i : Photosensor
$T_{a, out}$: Outdoor air temperature	Presence detection: occupancy sensor
$T_{a, fancoil}$: supplied air temperature	
 Indoor air temperature sensor	
 Occupancy & light sensor	
 Outdoor air temperature sensor	
 Supplied air temperature sensor	
 Power meter for appliances	
 Power meter for lighting systems	
 Switch	
 Elta light controller	
 Thermokon fan coils controller	
 Fan coil	
 Luminaire	
Gateway	

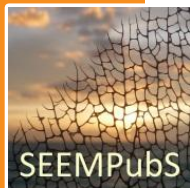
Caso studio 1: il progetto SEEMPubS

Implementation of the Intelligent Control System

Wired & Wireless devices architecture: for modern buildings where Desigo BMS was already partially installed



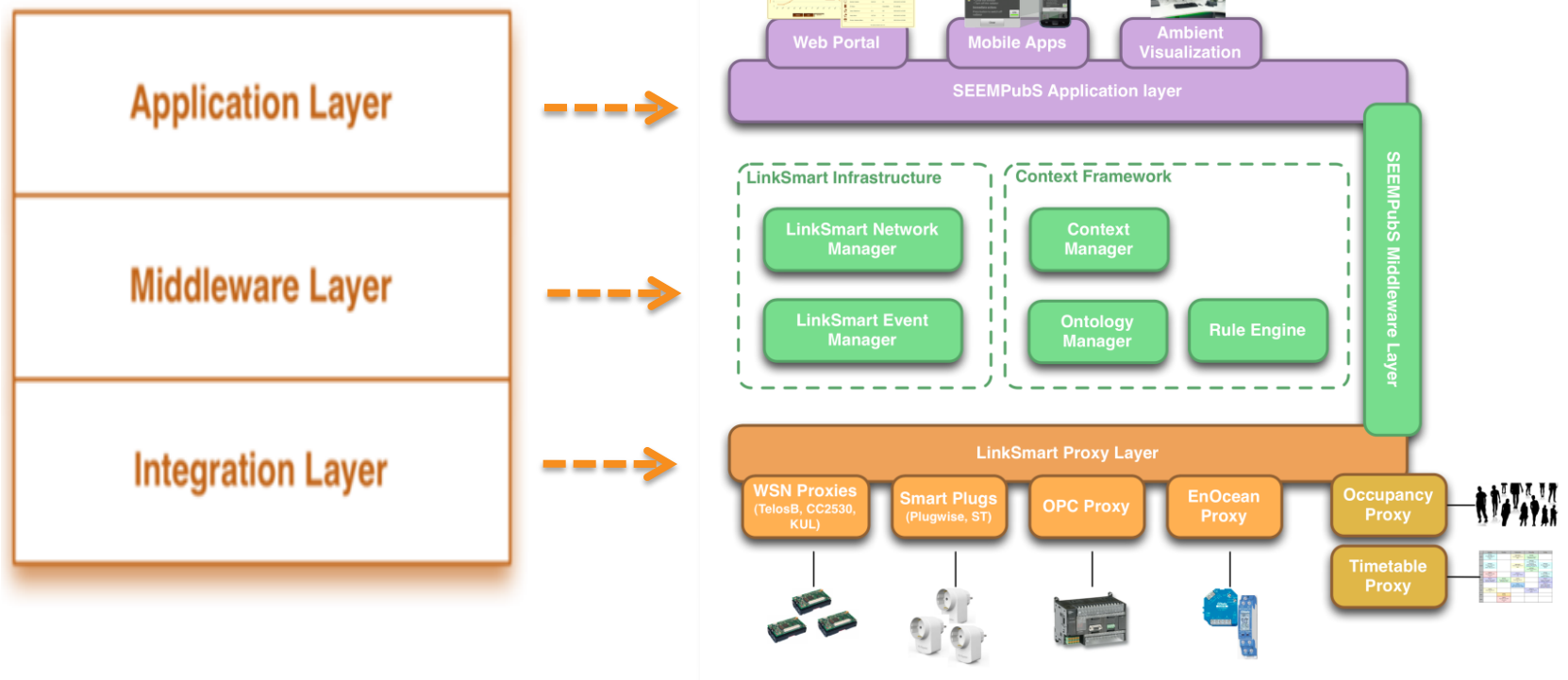
$T_{a,i}$: Indoor air temperature	V_{fan} : fan velocity
E_i : Indoor illuminance	I/O: switch
P: Electric power	Ei: Photosensor
$T_{a,out}$: Outdoor air temperature	Presence detection: occupancy sensor
$T_{a,fancoil}$: supplied air temperature	
$RH_{a,duct}$: duct air relative humidity	
 Indoor air temperature sensor	
 Occupancy & light sensor	
 Supplied air temperature sensor	
 Power meter for appliances	
 Power meter for lighting systems	
 Switch	
 Indoor air temperature sensor (TelosB)	
 Siemens controller	
 Fan coil	
 Luminaire	



Caso studio 1: il progetto SEEMPubS

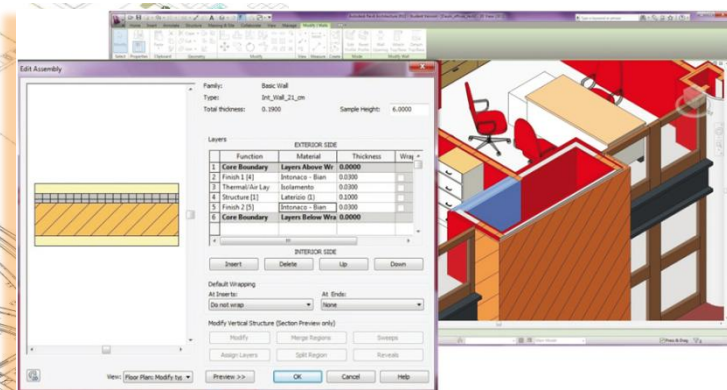
The software infrastructure

The control system architecture based on the **LinkSmart middleware** has been under implementation.

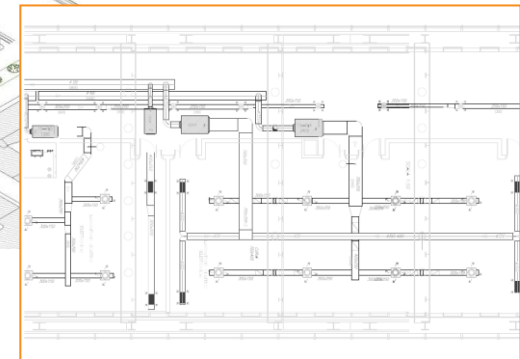


Caso studio 1: il progetto SEEMPubS

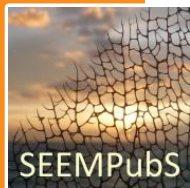
The **building information model** of the Politecnico campus is a semantic representation of each building and of the associated services.



Architectural model

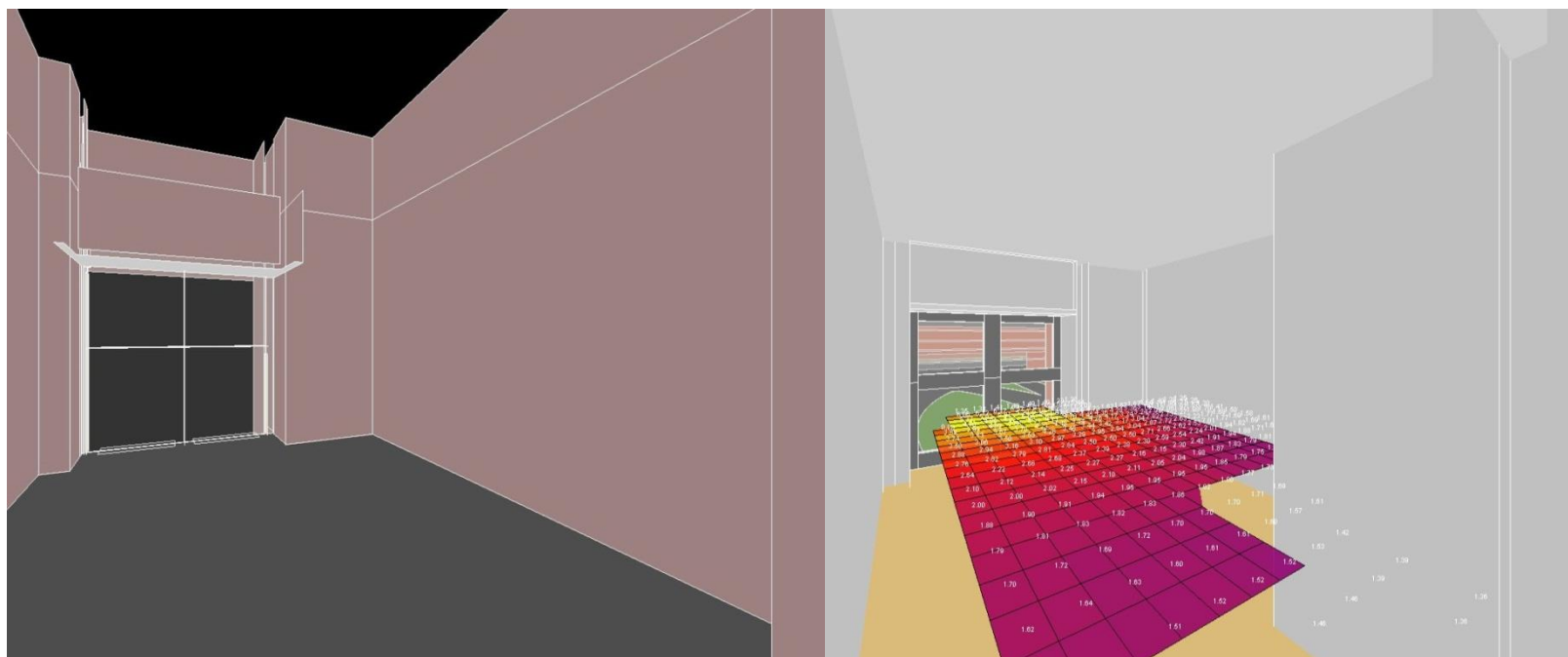


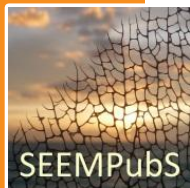
HVAC and lighting model



Caso studio 1: il progetto SEEMPubS

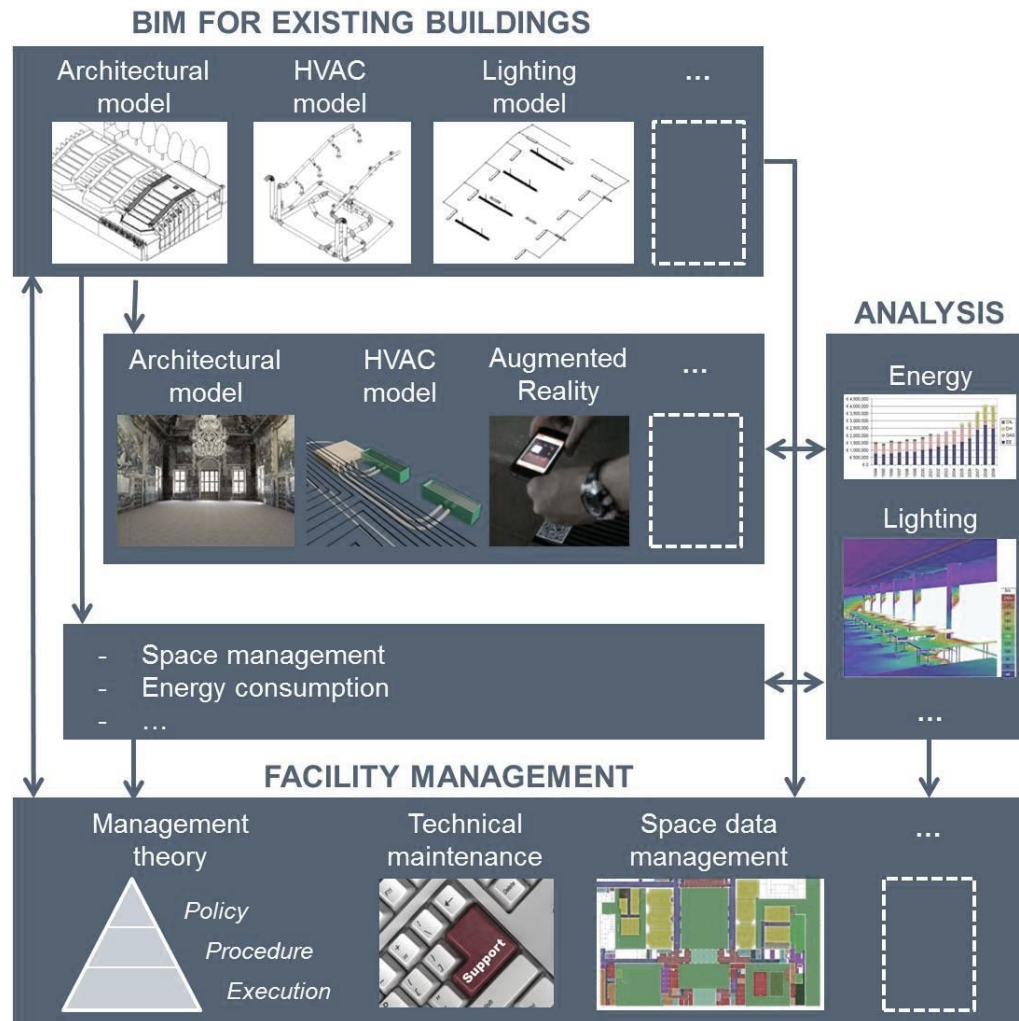
Since SEEMPubS focuses on achieving energy efficiency in existing buildings through the use of ICT, an essential component of the research is represented by the energy simulations with **BIM methodology based on interoperability**.





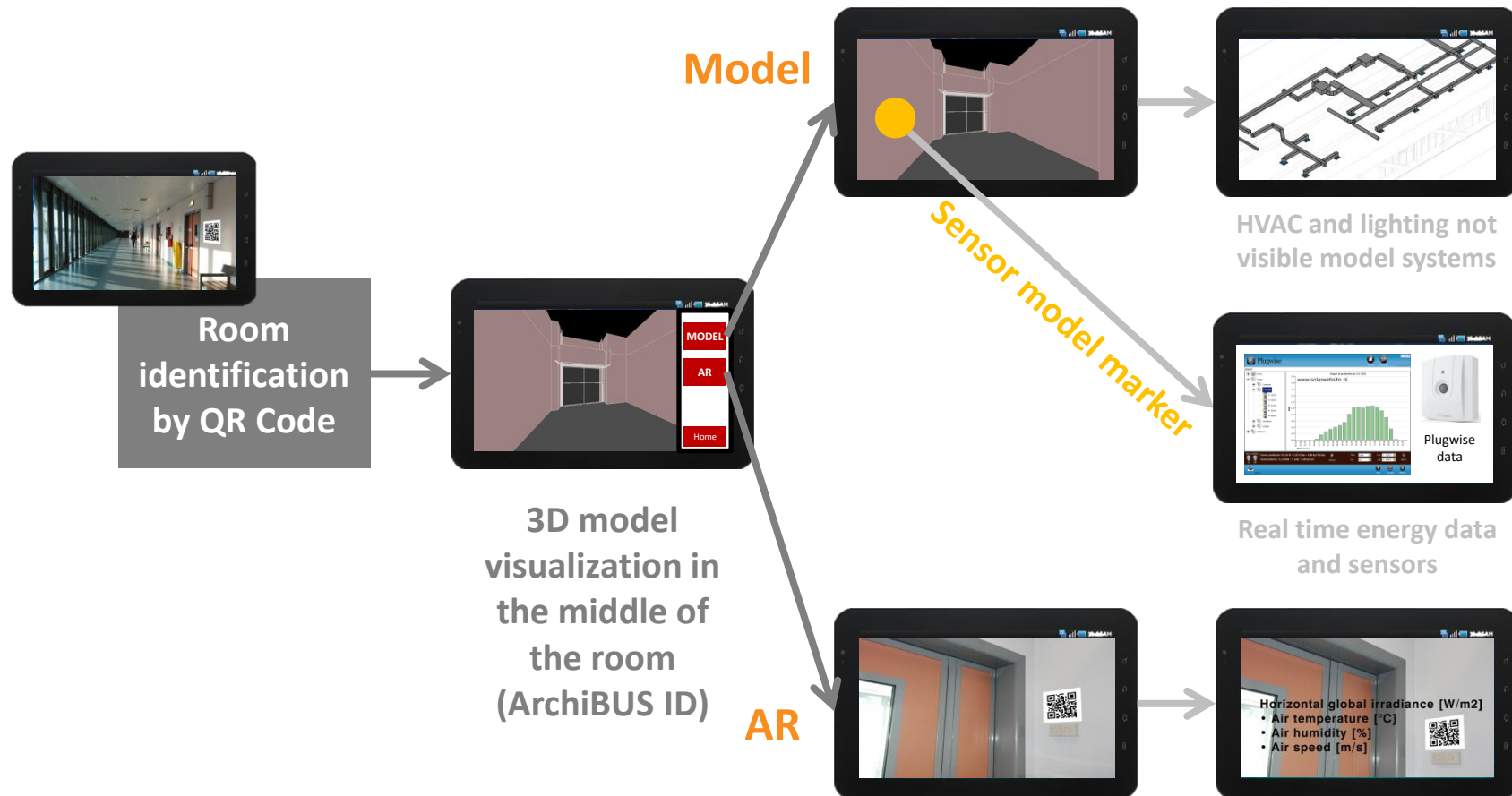
Caso studio 1: il progetto SEEMPubS

The Building Management System



Caso studio 1: il progetto SEEMPubS

An integrated use of **QR Code, Model, Virtual and Augmented Reality** for real data display is under testing.



Caso studio 2: il progetto DIMMER

District Information Modeling and Management for Energy Reduction

1

2

3

4

5

6

Proposal Acronym: **DIMMER**

Proposal Number: **609084**

Call: **FP7-SMARTCITIES-2013**

Funding scheme: **CP-FP-INFISO**

EC Contribution: **4.060.000,00 €**

Duration: **36 months**

Strategic objective/theme: **ICT-2013.6.4**

Project Officer: **Sorsaniemi Ari**

Coordinating organisation: **Politecnico di Torino**

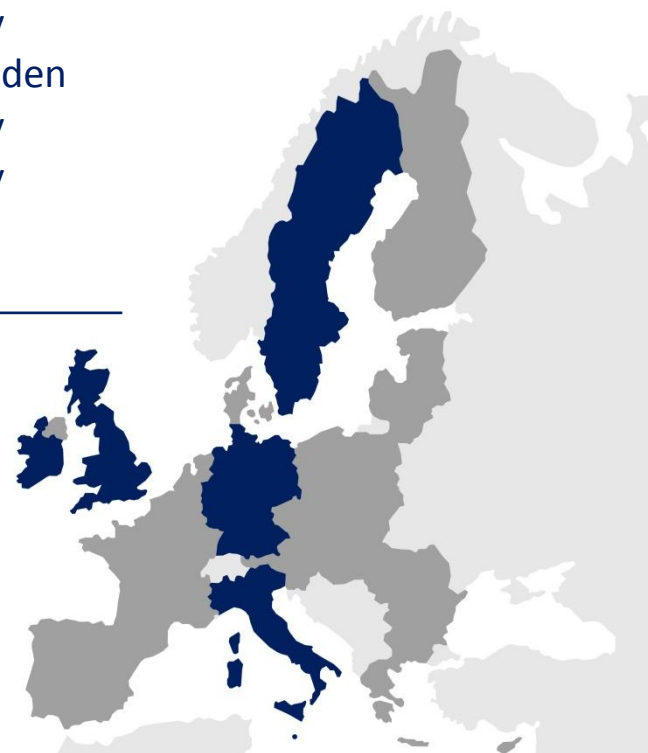
Coordinating contact: **Enrico Macii**



Caso studio 2: il progetto DIMMER

	Participant	Country
University	Politecnico di Torino University of Manchester	Italy UK
Research Center	CSI Fraunhofer Institute of Technology	Italy Germany
Industry	ST Polito CNet D'Appolonia Iren Energia Click and Link Arup	Italy Sweden Italy Italy UK Uk
Other	Greater Manchester Combined Authority	Uk

	Third-parties	Country
University	Università di Torino	Italy
Research Center	ISMB	Italy



Caso studio 2: il progetto DIMMER

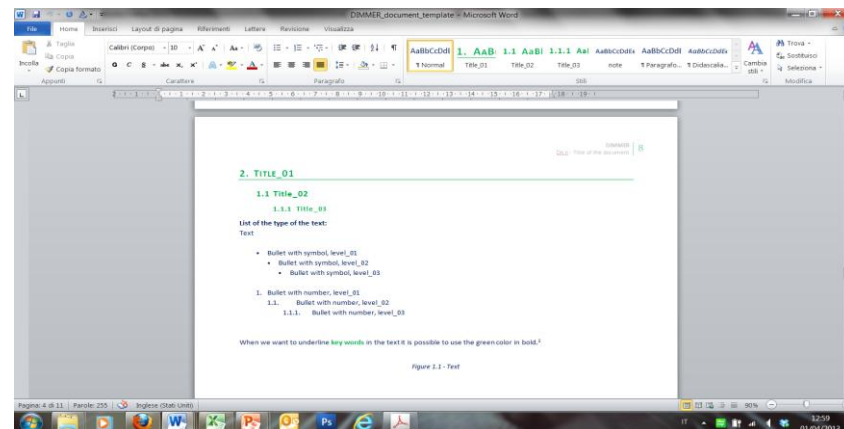
			Polito	CSI	STP	CNet	Dapp	FhG-FIT	IREN	Click	Arup	Uman	ISMB	UNITO
3	D1.1	Districts and buildings selection: criteria, methodologies, and description.												
18	D1.2	Report on optimization of sensors: typology choice, solutions and number of sensor for a tailor made energy monitoring and control system.												
6	D1.3.1	Energy auditing: report.												
12	D1.3.2	Data collection: type, format and methodology.												
24	D1.3.3	Data collection: implementation of the data collection and preliminary comparison based on methodology defined in D1.3.2.												
36	D1.3.4	Data collection: implementation of the data collection and final comparison.												
12	D1.4	Energy saving potential: report on existing technologies and methodologies.												
18	D2.1.1	Middleware: preliminary report.												
36	D2.1.2	Middleware: prototype and final report.												
18	D2.2.1	Interoperability: definition.												
30	D2.2.2	Interoperability: implementation.												
24	D2.3	Intelligent sensor network: report.												
36	D2.4	Ontologies: report.												
10	D3.1.1	Hierarchy of the data: contents, standards and tools.												
24	D3.1.2	District Information Modeling: set up and interoperability test.												

The DIMMER internal deliverables review plan: Leader (green), Participant (blu), Reviewer (red).

Template

TABLE OF CONTENTS

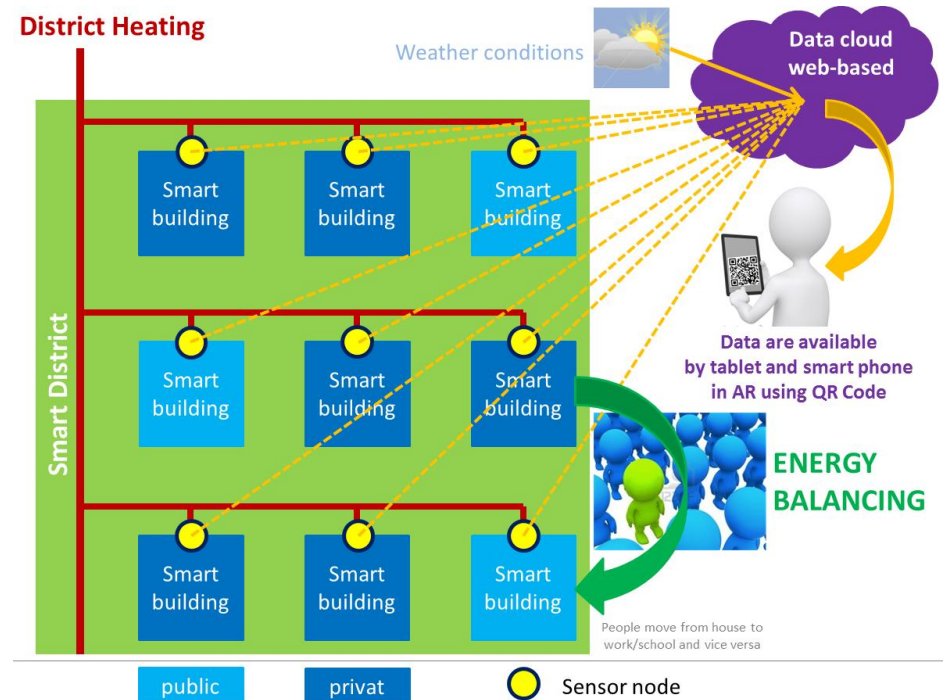
Revision History	2
Copyright.....	3
Table of Contents	4
Table of Figures.....	5
Abbreviations	6
1. Executive Summary	7
2. Title_01.....	8
1.1 Title_02.....	8
1.1.1 Title_03	8
3. Title_01.....	9
2.1 Title_02.....	9
2.1.1 Title_03	9
4. Conclusions.....	10
Bibliography.....	11



Caso studio 2: il progetto DIMMER

In the DIMMER project a **web-service oriented**, open platform with capabilities of **real-time district level data processing and visualization** will be developed. Thanks to the web-service interface, applications can be developed exploiting such an **interface to monitor and control energy consumption and production from renewable sources**.

For **public buildings** like schools or university campuses, application can be developed to visualize in real-time energy utilization leading to a considerable **educative impact**.

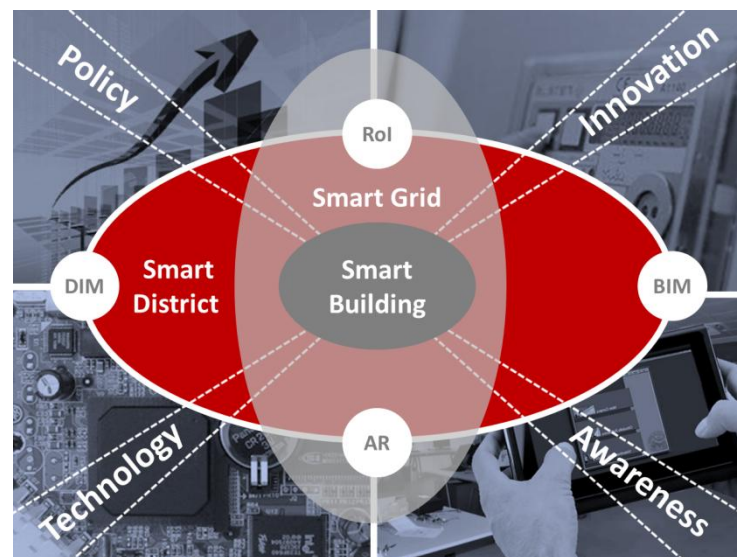


Caso studio 2: il progetto DIMMER

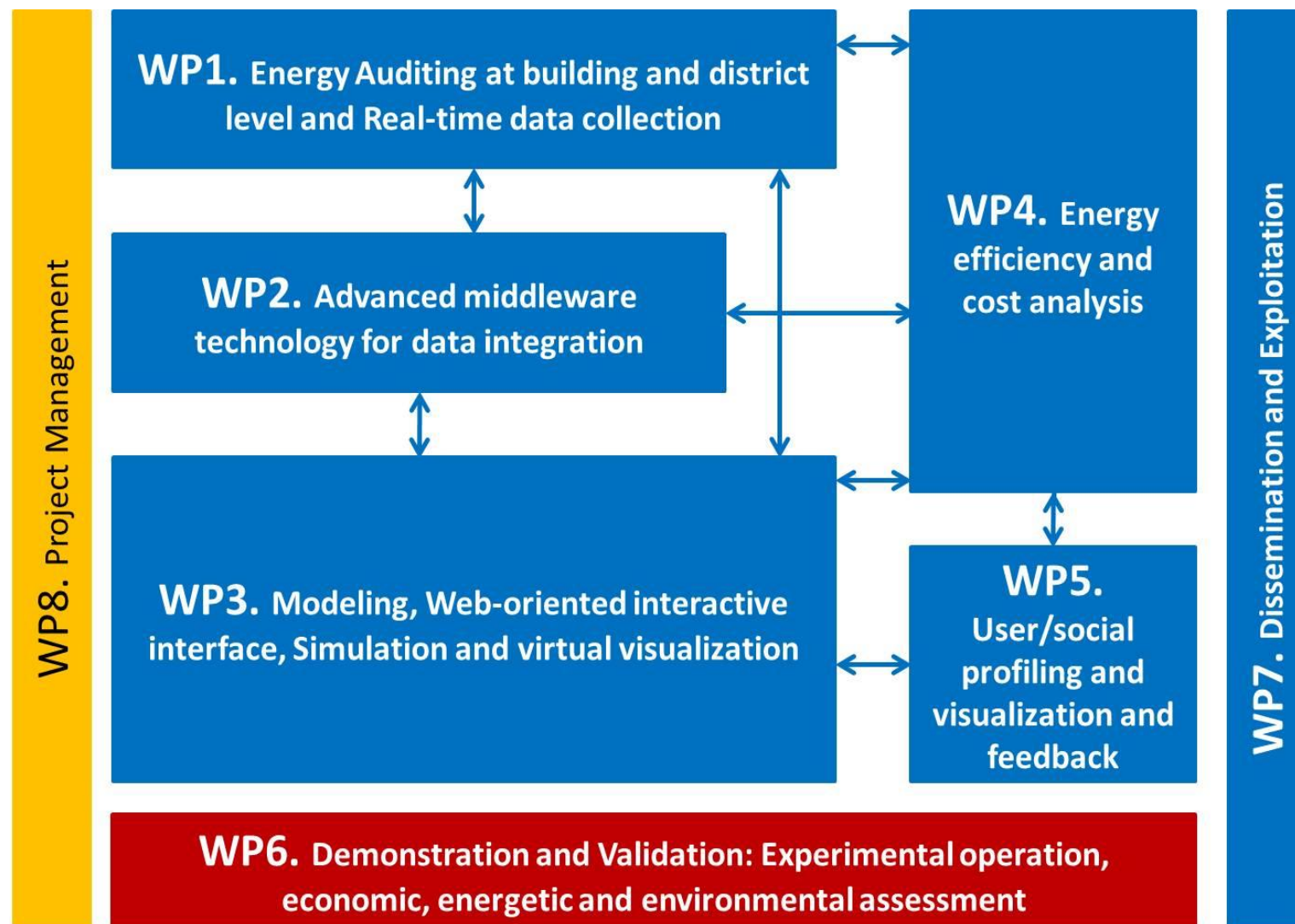
In the DIMMER project, the following technologies will be developed:

- **Real-time** data collection.
- Advanced **middleware** technology for data integration.
- Simulation and virtual **visualization**.
- **User/social** profiling, visualization and feedback.
- **Energy efficiency** and cost analysis engine.
- **Web** interface and interaction.

A multidisciplinary approach will be required.



Caso studio 2: il progetto DIMMER



The validation phase of the project will include case studies in **Turin** and in **Manchester** selected with the criteria of heterogeneity, complementarity and replicability.



Siete pronti per Horizon 2020?



EUROPEAN
COMMISSION

HORIZON 2020



**Excellent
Science**

**Industrial
leadership**

**Societal
challenges**

1
2
3
4
5
6



Siete pronti per Horizon 2020?

Priority 1. Excellent science

- World class science is the foundation of **tomorrow's technologies**, jobs and wellbeing
- Europe needs to develop, attract and retain **research talent**
- Researchers need access to the **best infrastructures**

1

2

3

4

5

6



Siete pronti per Horizon 2020?

Priority 2. Industrial leadership

- Strategic investments in **key technologies** (e.g. advanced manufacturing, microelectronics) underpin innovation across existing and emerging sectors
- Europe needs to attract more private investment in **research and innovation**
- Europe needs more **innovative SMEs** to create growth and jobs

1

2

3

4

5

6



Siete pronti per Horizon 2020?

Priority 3. Societal challenges

- Concerns of citizens and society/EU policy objectives (climate, environment, **energy**, transport ,etc.) cannot be achieved without innovation
- Breakthrough solutions come from **multidisciplinary collaborations**, including social sciences & humanities
- Promising solutions need to be tested, **demonstrated** and scaled up.

1

2

3

4

5

6



Siete pronti per Horizon 2020?

- Commission proposal for a **80 billion euro** research and innovation funding programme **(2014-2020)**
- A core part of Europe 2020, Innovation Union & European Research Area:
 - **Responding to the economic crisis** to invest in future jobs and growth
 - **Addressing people's concerns** about their livelihoods, safety and environment
 - **Strengthening the EU's global position** in research, innovation and technology

1

2

3

4

5

6



Siete pronti per Horizon 2020?

What's new?

- **A single programme** bringing together three separate programmes/initiatives*
- **More innovation**, from research to retail, all forms of innovation
- **Focus on societal challenges** facing EU society, e.g. health, clean energy and transport
- **Simplified access**, for all companies, universities, institutes in all EU countries and beyond.

* The 7th research Framework Programme (**FP7**), innovation aspects of Competitiveness and Innovation Framework Programme (**CIP**), EU contribution to the European Institute of Innovation and Technology (**EIT**)



Siete pronti per Horizon 2020?

Semplificazioni di Horizon 2020

- obiettivo di ridurre il *time to grant* di 100giorni (da 350 a 250)
- un solo programma per l'intero ciclo
- un solo corpo di regole
- solo due tassi di rimborso: 100% per RTD, 70% per attività vicine al mercato (demo, pilot, market replication), senza differenziazioni di status legale
- un solo metodo di calcolo costi indiretti (single flat rate). Es. 25% dei costi diretti
- riduzione di: ex-ante financial capacity checks e del numero di certificates on financial statements
- vicinanza al mercato ("market demand")
- approccio maggiormente bottom-up
- un nuovo strumento per le PMI
- sostegno attraverso EIT/KICs (ad oggi sono 3)

1
2
3
4
5
6



Siete pronti per Horizon 2020?

Novità per le PMI

Ci sarà un grande focus per le PMI al fine di facilitare il loro coinvolgimento in programmi di ricerca, supportandole in tutto il ciclo (innovazione tecnologica, di processo, di livello organizzativo, fino al mercato), **mettendole al centro** e non solo più 'solo' coinvolgendole nei progetti di ricerca.

- Progetti per le PMI dovranno essere “market driven”, ossia dovranno arrivare dal mercato e al mercato dovranno essere destinati
- La ricerca per le PMI che si accingeranno al mercato sarà favorita attraverso consorzi più piccoli e con progetti più piccoli

1

2

3

4

5

6

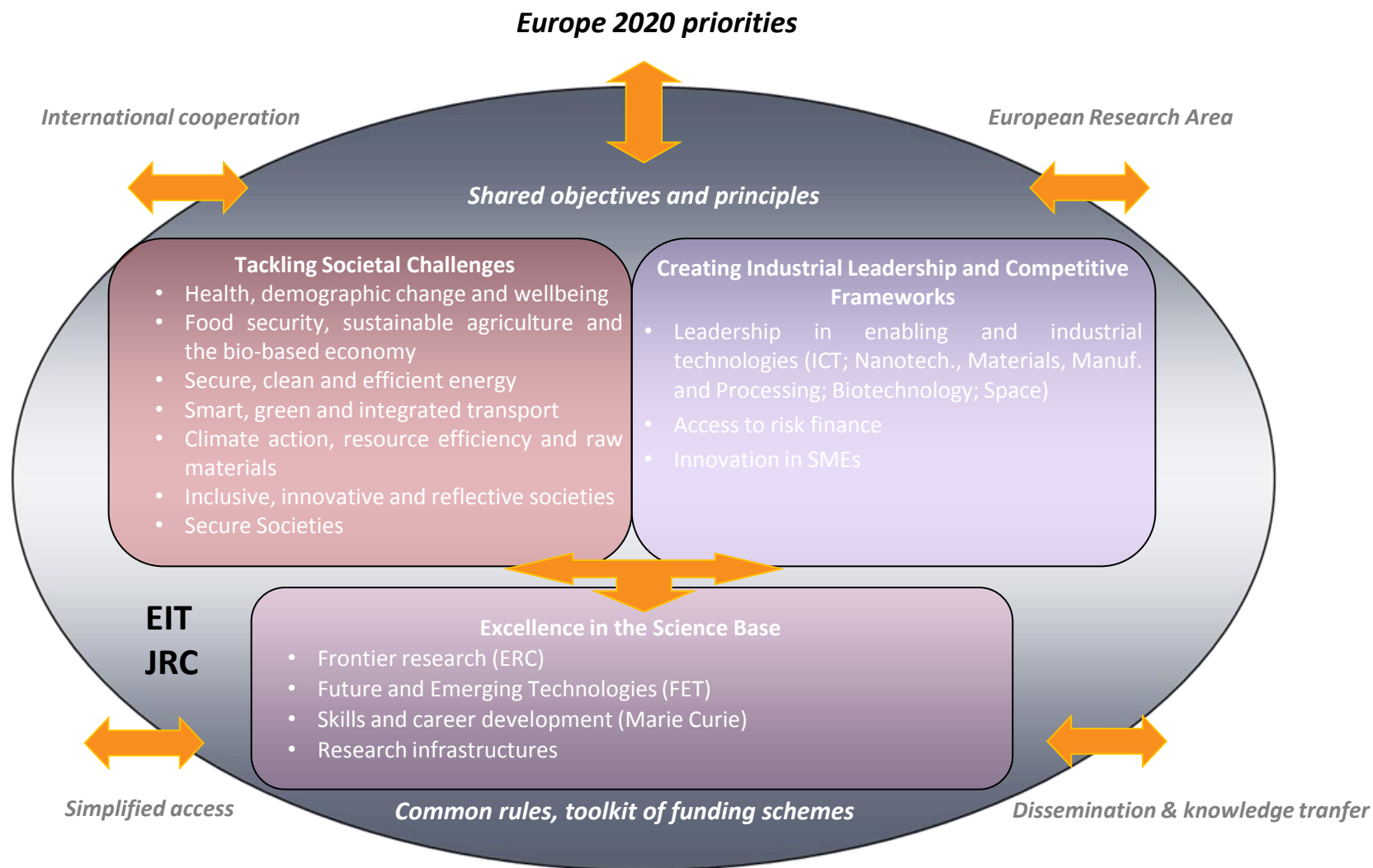
Siete pronti per Horizon 2020?

Novità per le PMI

Per supportare le PMI nei programmi di ricerca saranno previste 3 fasi distinte:

- Fase 1: **valutazione della fattibilità**. La PMI dovrà proporre un'idea con business plan di 10 pagg. Se l'idea è buona ed innovativa la CE finanzia la PMI con 50.000€ per 6 mesi per l'acquisto di servizi di cui ha bisogno.
- Fase 2: **R&D, demo e market replication**. 3 valutatori valuteranno il business plan, i costi, quanto vale ogni deliverable e stabiliranno il confinanziamento CE per l'ottenimento di ogni deliverable. Se il risultato sarà positivo, la PMI dovrà implementare il proprio business plan con una strategia di commercializzazione (piano di marketing). Per fare questo riceverà dalla CE 1-3 M€ di confinanziamento (pari al 70% del costo totale per i successivi 12-24 mesi).
- Fase 3: **commercializzazione**. La PMI dovrà sviluppare un'adeguata strategia di marketing e comunicazione. Se la PMI supererà le fasi 1 e 2, avrà una corsia preferenziale attraverso finanziamenti agevolati, coaching, training, ecc.

Conclusioni



Grazie per l'attenzione



Contact
anna.osello@polito.it