

THE MARIE PROJECT CONSORTIUM:
9 Mediterranean countries - 23 partners

Lead partner: Government of Catalonia.
Department of Territory and Sustainability.
Housing Agency of Catalonia, *Spain*

ACC1Ó. Agency to Support Catalan
Companies, *Spain*

Region Provence-Alpes-Côte d'Azur, *France*

ANKO (Regional Development Agency of
Western Macedonia S.A.), *Greece*

Piedmont Region, *Italy*

LIMA (Low Impact Mediterranean
Architecture Association), *Spain*

IREC (Catalan Institute for Energy
Research), *Spain*

AVRA (Housing and Refurbishment
Agency of Andalusia), *Spain*

CRMA (Chambre Régionale
de Métiers et de l'Artisanat), *France*

Forest Sciences Center of
Catalonia (CTFC), *Spain*

EFFINERGIE, *France*

IASA (Institute of Accelerating
Systems and Applications), *Greece*

Umbria Region, *Italy*

AREA Science Park, Trieste, *Italy*

University of Evora, *Portugal*

Basilicata Region, *Italy*

ARE Liguria (Regional Energy Agency
of Liguria), *Italy*

UMAR (Union of Mediterranean
Architects), *Malta*

LCA (Local Council Association
of Malta), *Malta*

University of Ljubljana, *Slovenia*

GOLEA (Goriska Local Energy Agency),
Slovenia

Bar Municipality, *Montenegro*

Larnaca Municipality, *Cyprus*



MARIE

FIRST RESULTS OF THE MEDITERRANEAN BUILDING ENERGY EFFICIENCY STRATEGY

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MARIE 3rd BROCHURE

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WHY IS A STRATEGY FOR ENERGY RENOVATION OF BUILDINGS (ERB) NECESSARY IN THE MEDITERRANEAN?

EU Energy Efficiency in Buildings Directives (2002, 2010 and 2012) are a complete and clear EU policy framework to understand why it's important to prepare and implement a shared strategy amongst professionals, business, society and public administrations at all governance levels. Especially, Directive EED/27/2012 (art. 4) establishes that all EU Member States should develop long term strategies for energy renovation of buildings.

With the main aim to facilitate EED/27/2012 implementation, the MED

strategic project MARIE (Mediterranean Building Rethinking for Energy Efficiency Improvement) has been working since May 2011 to prepare the MEDBEES (MED Building Energy Efficiency Strategy) for Mediterranean Member States, Regions and Local Governments. This initiative is based in 14 strategic measures organised in 4 main outputs: **Intervention Factory, Innovation Laboratory, Awareness and Training Campaign**, which will be implemented through a common, public and private transnational **Cooperation Hub**. ❖



Rénover+: local network of companies and professionals for ERB successfully implemented in 2 villages (Digne and Frejus) of PACA Region (France).



Ville de Frejus.



Ville de Digne.

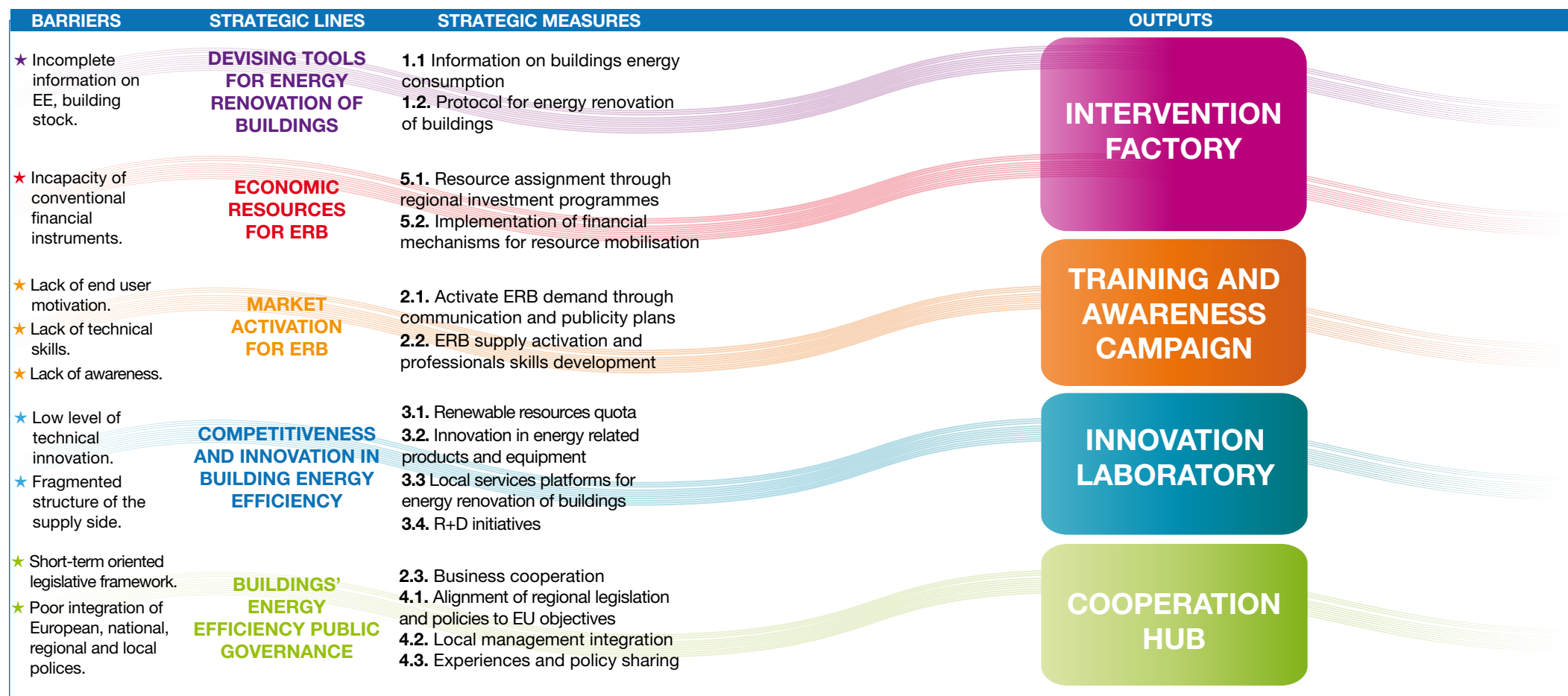
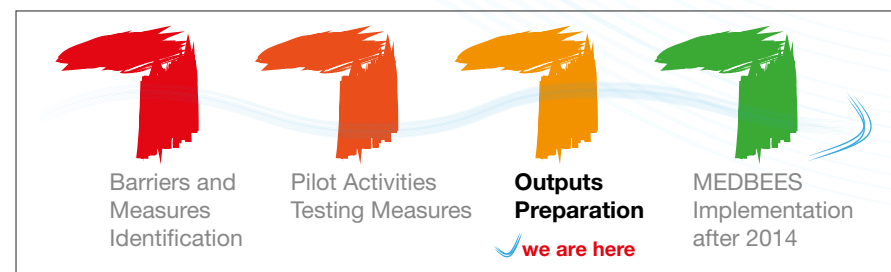
HOW THE MEDBEE STRATEGY IS BEING BUILT?

The process to build MEDBEES started with the diagnosis, determining the main barriers and outlining a first scheme of the most promising strategic lines.

As a result of this diagnosis process, 14 strategic measures have been defined and are currently being tested through

the MARIE's 14 pilot activities. These strategic measures will be integrated in 4 main outputs and the final results will be presented during the World Building Conference in Barcelona, October 2014.

This brochure advances the initial schemes and ideas of these 4 outputs. ❖



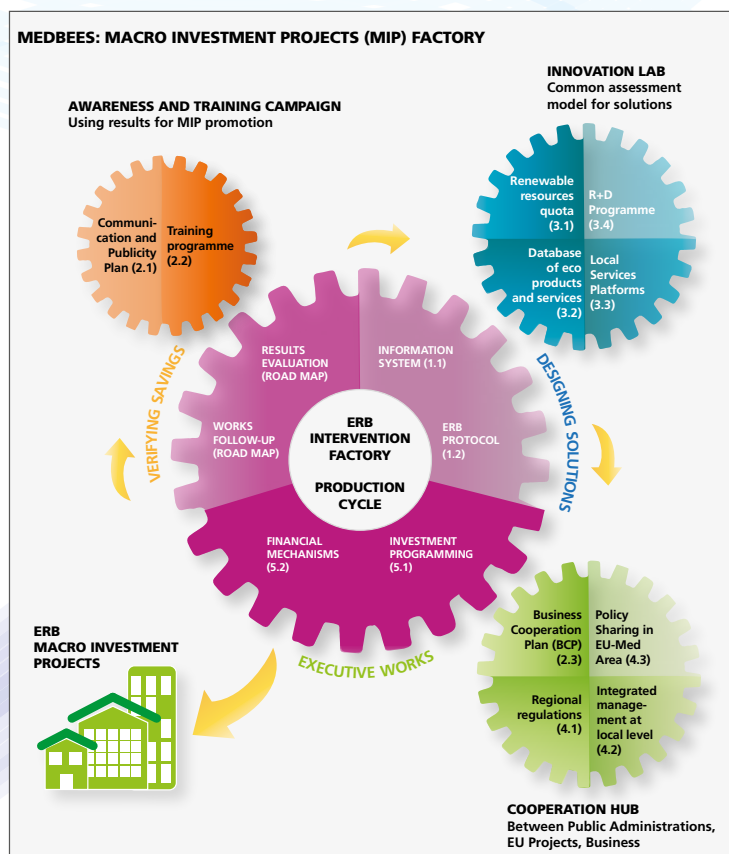
HOW WILL THE MEDBEE STRATEGY WORK?

The key point of the MEDBEE Strategy is to create and implement an **Intervention Factory** to produce ERB Macro Investment Projects (**MIP**). This Intervention Factory is devised as a continuous and efficient process of ERB MIP generation from a suitable information system planning and specific protocol for ERB projects, implemented with appropriate funding mechanisms and overlooked by a monitoring and evaluation system.

The analogy may be a plant of Macro Investment ERB Projects (**Intervention Fac-**

tory) with a managing department (governance model sustained on a **Cooperation Hub**), a marketing and communication department (**Awareness and Training Campaign**) and an R+D department promoting new products' development (**Innovation Lab**). Therefore, all 3 departments combine and coordinate its work in order to achieve the expected effect and results.

This process is conceived as an open cycle, activated, on a permanent basis, by new solutions, experiences and best practices in management, communication, training and technical innovation. ❖



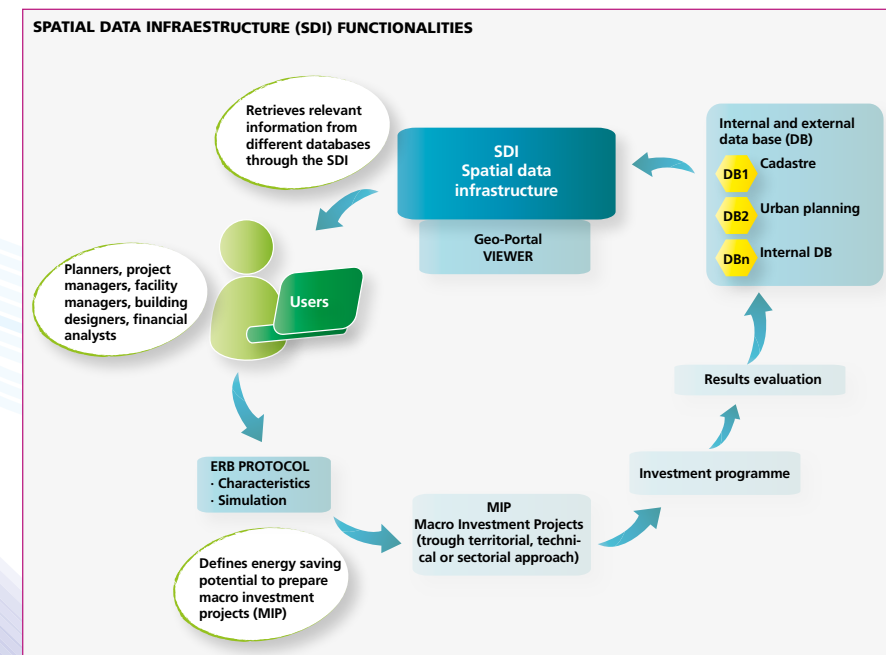
INFORMATION SYSTEM

Planning energy renovation of buildings needs an integrated approach, taking into account an important number of parameters. But nowadays there is a lack of detailed information on the characteristics of the building stock at regional level. In most cases, the data available is incomplete, unshared, unstable, spread or asymmetric.

MARIE proposes a common information tool (a Spatial Data Infrastructure, **SDI**) for ERB, based on the INSPIRE Directive¹, integrating all relevant data related to the energy consumption pat-

terns of the building stock, obtained from different data bases: Cadastre, Energy Certification of Buildings, Technical Inspections of Buildings, energy consumption, urban planning, climate, socioeconomic databases, etc.

The SDI will include a geo-portal viewer to facilitate user's data visualisation and treatment of information in order to identify energy saving potential and prepare Macro Investment Projects (**MIP**) following a territorial, technical or sectorial approach. MIP will allow to develop ERB programmes and their results will be integrated in the SDI. ❖



¹ Directive INSPIRE: an EU initiative to establish an infrastructure for spatial information in Europe, that will help to make spatial or geographical information more accessible and interoperable for a wide range of purposes, supporting sustainable development.

A COMMON PROTOCOL FOR ENERGY RENOVATION OF BUILDINGS (ERB)

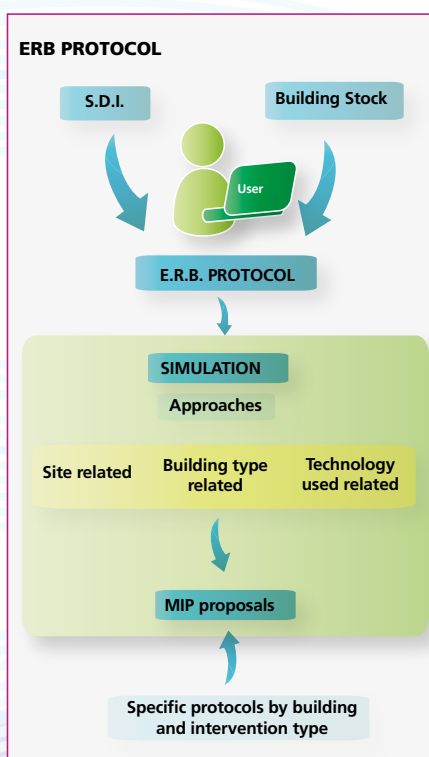
MARIE is developing a common protocol that will facilitate MED Regions and Cities to scan existing information on the building stock, detecting opportunities and planning the energy renovation of buildings (ERB).

The user –when starting applying the energy renovation protocol- retrieves all available information from the **SDI**, determines the energy consumption baseline and the impact of the improvement measures. This can be done by applying user-friendly simulation tools or by using a simplified simulation, based on the assignment of archetypes (pre-calculated performance results of the main building typologies) to the buildings of the planning area.

In order to maximize the development of ERB opportunities, MARIE partners have prepared three different planning approaches that will facilitate the preparation of ERB Macro Investment Projects (**MIP**):

- Site approach.
- Building characteristics approach.
- Technology approach.

Detailed protocols by building and intervention type are being developed to ease interventions. ❖



Results of total energy consumption (kWh) for the different typologies in Bar urban area (Montenegro).

PROGRAMMING INVESTMENT

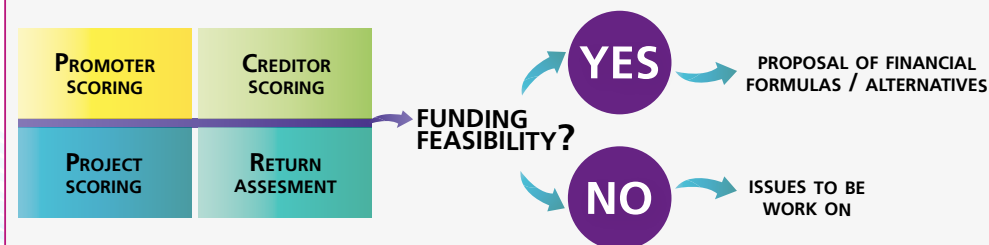
The first step to devise and implement an effective ERB investment programme at regional level is to perform a good characterisation, at all levels, of the existing building stock. After this, ERB Protocol will give us both the diagnose and technical solutions available.

After this, a cost-benefit analysis will undergo, contrasting investment and maintenance costs against expected energy savings. Other criteria of social or environmental considerations, as well as potential risks, will be taken into account.

Following this step, the estimated volume of investment needed for the ERB programme will be inferred, and the most appropriate formulas to finance the different project families (according to typologies, technologies or scale of intervention) come determined.

A regional investment programme will be the final result of this complex process. Such programme will be composed by the most achievable Macro Investment Projects for the next EU programming period (2014-2020). ❖

ASSESSING MIP's



AN EXAMPLE OF MACRO INVESTMENT ERB PROJECT: SUBSTITUTE 150 GAS OIL BOILERS BY BIOMASS-FUELLED BOILERS IN PUBLIC BUILDINGS IN CATALUNYA

- Investment: 11.200.000 €
- Boilers have small to medium thermal power (80-300 KW.).
- 15% savings until payback. Then, up to 40% saved in energy expenses.
- Backed by the Government of Catalonia, 4 Provincial Councils, and supported by the Forest Sciences Centre of Catalonia.
- 10 years pay-back.
- Expected finance through EU financial instrument.



FINANCING AND IMPLEMENTING ERB MACRO INVESTMENT PROJECTS

The output of the investment programme will be a selected group of MIPs, in terms of types of measures and building typologies where actions will be focused. The next phase in the **Intervention Factory** is to determine the proper financial mechanisms for each MIP, via promoting new investment formulas and fiscal measures that facilitate action by private and public investors, and that establishes an attractive financial framework for private investors and owners.

More specifically, to make existing financial support mechanisms more accessible to owners and private investors through simple, easy to apply, integrated programmes thus reinforcing friendly frameworks for investments in EE improvement. Likewise, to define a method to support decision makers to select suitable financial mechanisms according to the ERB project typology (sector, territory, technology) and regulatory frameworks of Countries/Regions is equally important. ❖

FINANCIAL MECHANISMS

PUBLIC FUNDING

E.U.
Operational programs: Feder, JESSICA
European Fund for Energy Efficiency
Programs innovation and competitiveness: ELENA, PAC, TIC
Investigation funds: Concerto, Smart Cities, E2B, CPP's
Enlargement funds: FHARE, BEI, BERD, BCDE

Central & regional
ICO, IDAE, ICF
Subventions
Fiscal incentives

PRIVATE FUNDING

Bank financing
Project financing
Conveyed credit lines
Corporate funding
Leasing/renting
Ethic funding
Family funding

Investment Funds
Investing funds
Specialised investment funds (Cleantech, EE...)

Targetted investors
Private Placement / FFOO

Utilities
Energy companies

Energy Services Enterprises
ESE's, maintenance companies, final clients



Building in Granada (Spain) selected as a pilot ERB MIP (AVRA)



The Hospital of Ptolemaida "Bodosakio": Hospital in greece selected to test the Third Party financing formulas.

AWARENESS CAMPAIGN

One of the main challenges that ERB has to face is the lack of motivation of building owners, tenants and users on energy efficiency. Aesthetic, bigger space, fashion and updating and well-being issues are currently the main drivers for buildings refurbishment. On the of supply side, there is a lack of technical skills and know-how at all levels, and a reluctance for collaborative work among professionals and companies, but also a lack of schemes and resources for marketing ERB products and services, leading to a fragmented offer structure at all levels of the value chain.

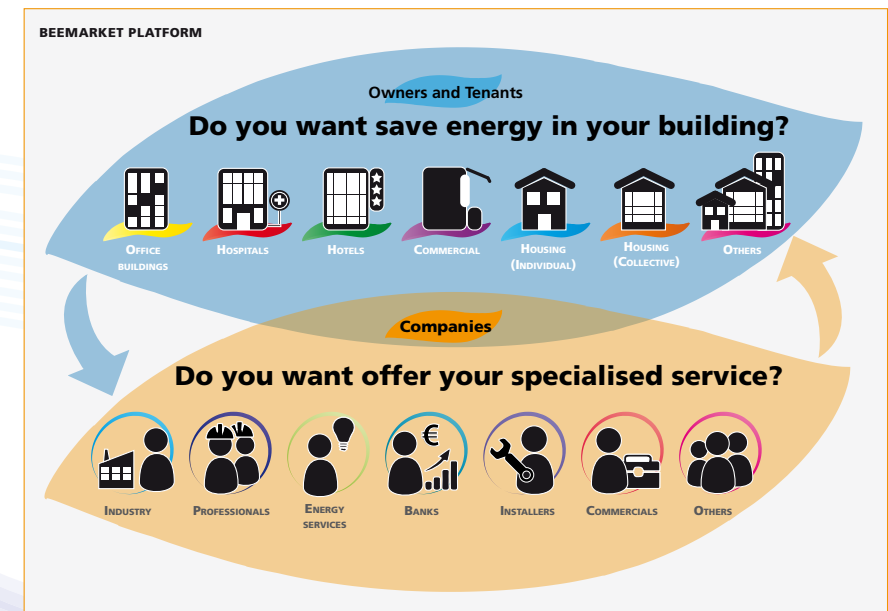
The MARIE output **Awareness and Training Campaign** aims to bridge these gaps, by activating the Intervention Factory from both the demand and supply side as a key issue for success on the building energy efficiency im-

provement process.

MARIE will define common guidelines for Communication and Publicity plans at regional level, focused in ERB main markets: Individual homeowners, co-ownership, commercial, hotels, offices, schools, sanitary buildings, sport centres, etc.

Regarding business cooperation, the MARIE project is working on the consolidation of the MARIE Business Network at the Mediterranean level, in order to reinforce cooperation in joint R+D projects, as well as the dissemination of innovation approaches in financing, outcome guarantee and business models applied to ERB.

All these initiatives will converge in the BEE market initiative, a common platform where specific ERB demands will meet the appropriate solutions from the supply side. ❖



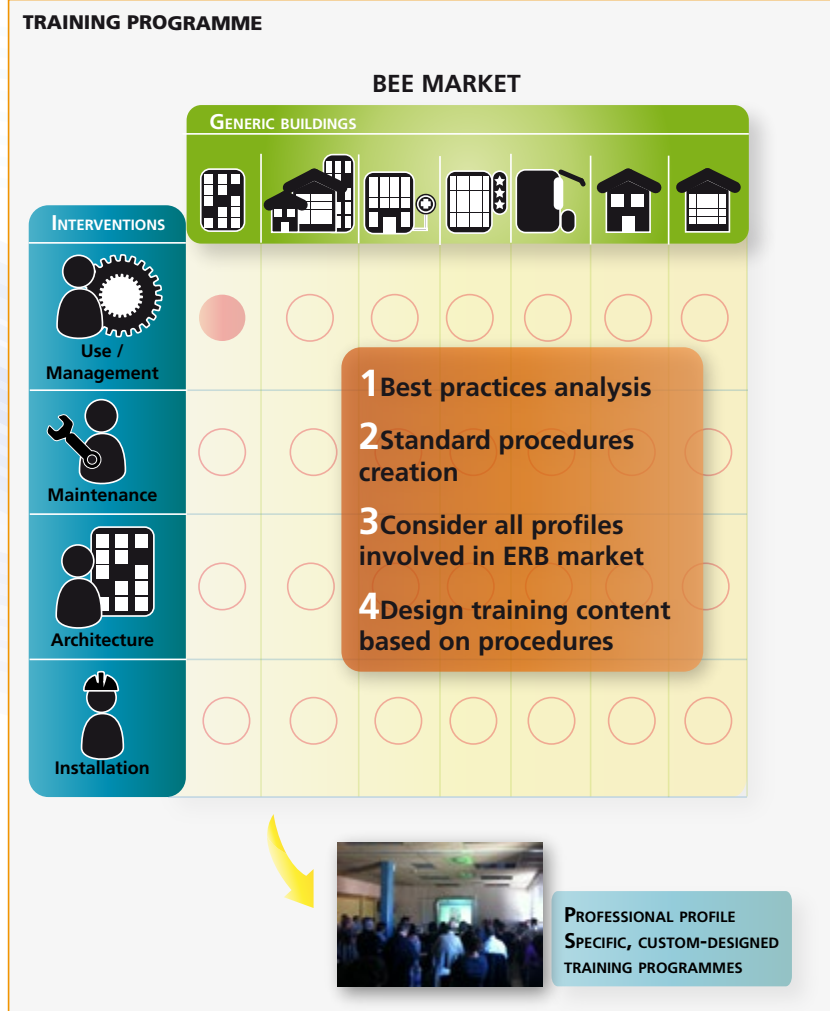
BEEmarket: Web app model to be replicated at regional scale.

TRAINING PROGRAMME

Concerning capacity building, MARIE is preparing a **Training programme**, based in real cases and best practices of ERB, instead of the traditional approach (theoretical models, generic buildings, etc.) of the vast majority of the existing programmes.

First step is to search throughout best practices to find out which are the profes-

sional profiles behind success cases. Afterwards, and depending on the profiles found and its specific formative necessities, several standard procedures will be deployed, belonging to each of the building and/or intervention typologies, considering all ERB-market implied profiles. This will outcome in specific, custom-designed training programmes. ❖



FINDING NEW SOLUTIONS FOR ERB

The building sector traditionally experience a poor level of technical innovation: development and spread of new processes and techniques are scarce and they take a long time to reach the market.

MARIE is developing an Innovation

Lab in order to impulse the development of new solutions in all ERB-related fields and, through the Intervention Factory, their real implementation.

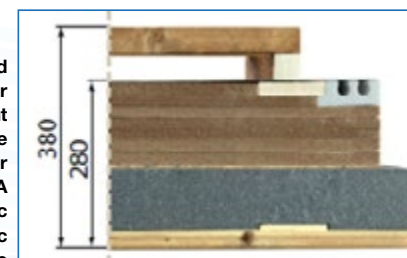
In this sense, the **Innovation Lab** will integrate four main pillars:

THE PROPOSED INNOVATION MODEL AND THE ASSOCIATED EUROPEAN ADDED VALUE

DESIGN & BUILDING MATERIALS	Life Cycle Assessment (LCA)
	Integrated Energy Design tools
USER	District and urban scale design
	Business models
SERVICES & MANAGEMENT	Structure materials
	Multi-objective scope
	Comfort and healthy building
	User behavior
SERVICES & MANAGEMENT	Energy management
	Data collection and information systems
	Energy storage
	Smart metering
SERVICES & MANAGEMENT	ICT in Smart Cities

1. R+D Programme for Energy Efficiency in Buildings of MED Space.

Test of wood modular roof element developed by the MARIE partner Consortium AREA for Scientific and technologic research of Trieste



2. Innovation in local and renewable materials for ERB.

3. Innovation in certification and environmental evaluation of new ERB products.

4. Innovation in ERB services.



A NEED FOR A MULTILEVEL GOVERNANCE MODEL

Regions, being close to both the final users of the buildings and local agents, can be the most efficient administrative level leading the implementation of an ERB process.

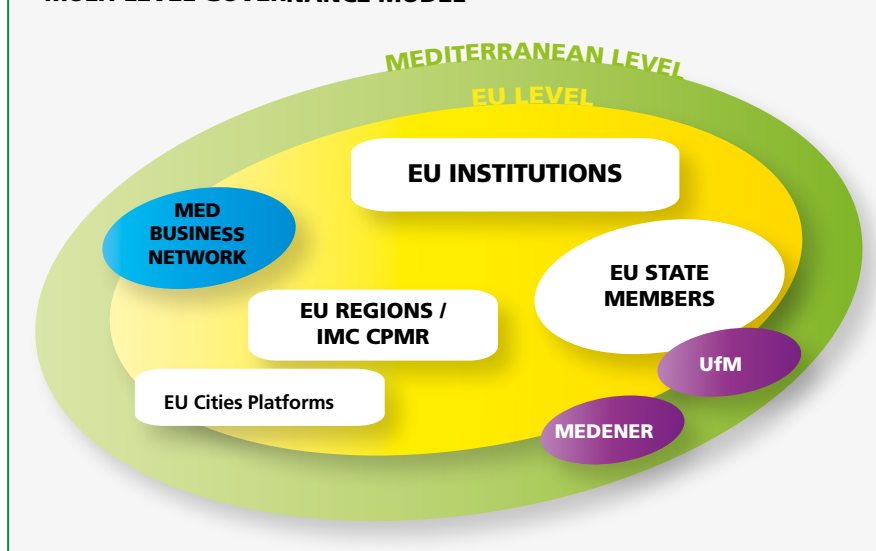
Such a complex process requires an appropriate governance model, linking all parties implied at regional level: policy makers, technical bodies, public and private investors, public organisms, and integrate the use of funds devoted to the ERB programme. Regions also have to be able to establish effective coordination procedures with local authorities, other MED regions, national governments and EU institutions related to the ERB.

The governance model proposed by

MARIE will be based on a regional executive offices network, the coordination with other regions through the **IMC-CMPR** (Inter-Mediterranean Commission of the Conference of Maritime Peripheral Regions), where an Energy Efficiency Working Group has been created and it's working for sharing experiences and policies on ERB. The coordination with national authorities could be realised through the **UfM** (Union for the Mediterranean), in close relation with the Euro-Mediterranean Member States and the major network of National Energy Agencies of the Mediterranean (**MEDENER**).

This multi-level governance model can be seen as the managing unit of the **Intervention Factory**. ❖

MULTI-LEVEL GOVERNANCE MODEL



ERB REGIONAL ROADMAP DEVELOPMENT

To support the implementation of the MEDBEE strategy in MED Regions MARIE is developing a **Roadmap**, model commonly defined as a detailed plan to guide progress towards a goal.

The roadmap of the MEDBEE strategy will be structured in three main sections: objectives, actions and resources, giving priorities for an effective implementation of this strategy by assigning the corresponding time

framework.

MARIE is also working on a guide to help regions define their own ERB regional strategy, to produce the associated roadmap.

One of the main questions of the roadmap is the 2020 objectives definition.

Next picture shows the agreement achieved to define 2020 objectives by 61 Catalan public and private entities representing more than 100 public administrations and 4.000 private companies. ❖

TARGETS FOR THE CATALAN STRATEGY ON ENERGY EFFICIENCY



ENERGY

14,4% reduction on estimated final energy consumptions on Catalan tertiary and residential buildings' park (equivalent to a 558 K TEP saving).



CO₂ EMISSIONS

22% reduction on CO₂ emissions on Catalan tertiary and residential building's park (equivalent to a 2.6 Million Tons CO₂ emissions saving).



ECONOMIC SAVINGS

21% saving of Catalan tertiary and residential buildings' park economic expenses (equivalent to 800 Million €).



BUILDINGS

Intervention through a renovated energy management and/or integral energy renovation on 61% of Catalan tertiary and residential buildings' park (790.673 buildings).



INVESTMENT

1.400 Million Euros investment mobilisation of public and private funds for 120 Energy Renovation Macro projects.



EMPLOYMENT

Creation and/or recycling of 14.000 job positions.