

Mediterranean University as Catalyst for Eco-Sustainable Renovation

- **Duration:** 36 months (from 1 september 2019 to 30 september 2022)
- **Thematic objective:** B.4 - Environmental protection, climate change adaptation and mitigation (Address common challenges in environment)
- **Priority:** B.4.3 - Support cost-effective and innovative energy rehabilitations relevant to building types and climatic zones, with a focus on public buildings
- **Budget:** € 2.934.856,69
- **ENI contribution amount:** € 2.641.371,02



PARTNERSHIP:

- **MEDREC (Tunisia) – Lead partner**
- **University of Tunis El Manar (Tunisia)**
- **University of Florence – Department of Architecture (Italy)**
- **University of Seville - Thermothechnics Group at Thermal Energy Engineering Department (Spain)**
- **An-Najah National University - Energy Research Centre (Palestine)**
- **Naples Agency for Energy and Environment (Italy)**
- **Spanish association for the internationalization and innovation of solar companies (Spain)**

ASSOCIATED PARTNERS

- **Università degli Studi di Napoli Federico II (University of Naples)**
- **DADI - Department of Architecture and Industrial Design of Università della Campania**
- **DOMOTYS - Asociación Española para el Impulso y la Innovación en la Domótica, la Inmótica y las Ciudades Inteligentes**

7 partners

3 associated partner

4 involved countries (2 EU and 2 MPC)



UNIVERSITÀ
DEGLI STUDI
FIRENZE

DIDA
DIPARTIMENTO
DI ARCHITETTURA



elanea
agenzia napoletana
energia e ambiente



UNIVERSIDAD DE SEVILLA



SOLARTYS



Università
degli Studi
della Campania
Luigi Vanvitelli

Dipartimento di Architettura e
Disegno Industriale



domotys

GENERAL OBJECTIVE

Value and implement innovative and eco-sustainable energy renovation solutions for Mediterranean higher education institutions and introduce active collaborating approach for decision support.

EXPECTED RESULTS

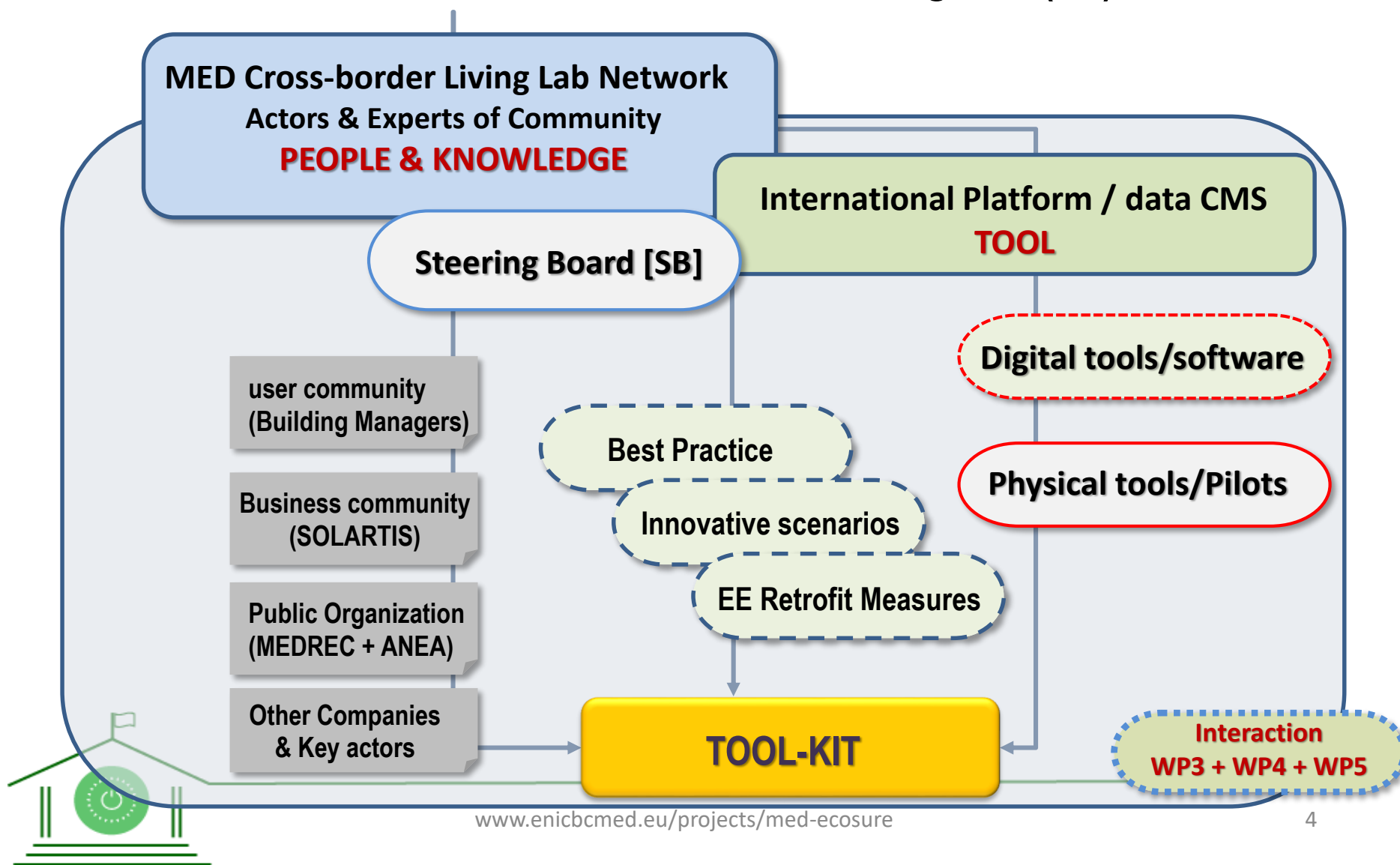
- Developing and transferring knowledge on the design and implementation of energy high-performance renovations within higher education institutions and promoting eco-sustainable technical solutions and best practices for reduced and cleaner energy consumption in the rehabilitated building
- Initiating an intermediation entity, a living lab, for the collaboration between academics, decision-makers and stakeholders, in order to support energy managers on planning and implementing innovative sustainable energy measures within higher education buildings

EXPECTED OUTPUTS

- **6 toolkits** of passive solutions design for higher education buildings retrofitting
- **2 policy tools** for energy efficiency retrofit in higher education buildings
- **6 cross-border strategic plans** for university building retrofitting
- **6 energy audits** performed in selected higher education institutions
- **9** energy efficiency retrofitting **pilot actions**
- **2 technologies transfer** for higher education retrofitting building



Mediterranean cross-border Living Lab (LL)



Management Structure of LL

LOCAL LIVING LAB

Operational level

Technical Coordinator

Multidisciplinary TEAM

LL Action Plan

PHYSICAL Place of Living Lab

*Services / Infrastructure /Tools /
Technologies / sensors/
Monitoring tools and protocol*

DIGITAL Twin of Living Lab

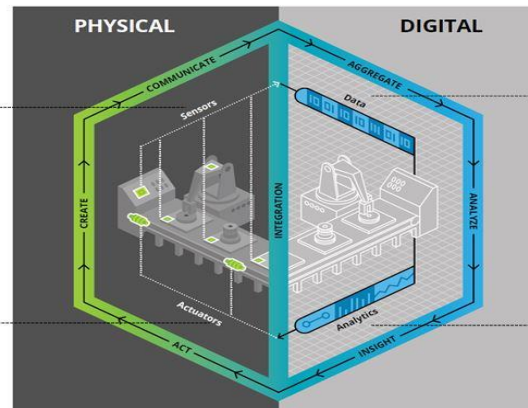
*Digital model of the LL space to create virtual
scenarios of solutions and performances,
IOT data management and behavior evaluation*

Sensors

Sensors distributed throughout the asset *create* signals that enable the twin to capture operational and environmental data pertaining to the physical assets in the real world.

Actuators

Should an *action* be warranted in the real world, the digital twin produces the action by way of actuators, subject to human intervention, which trigger the maintenance & reliability process.



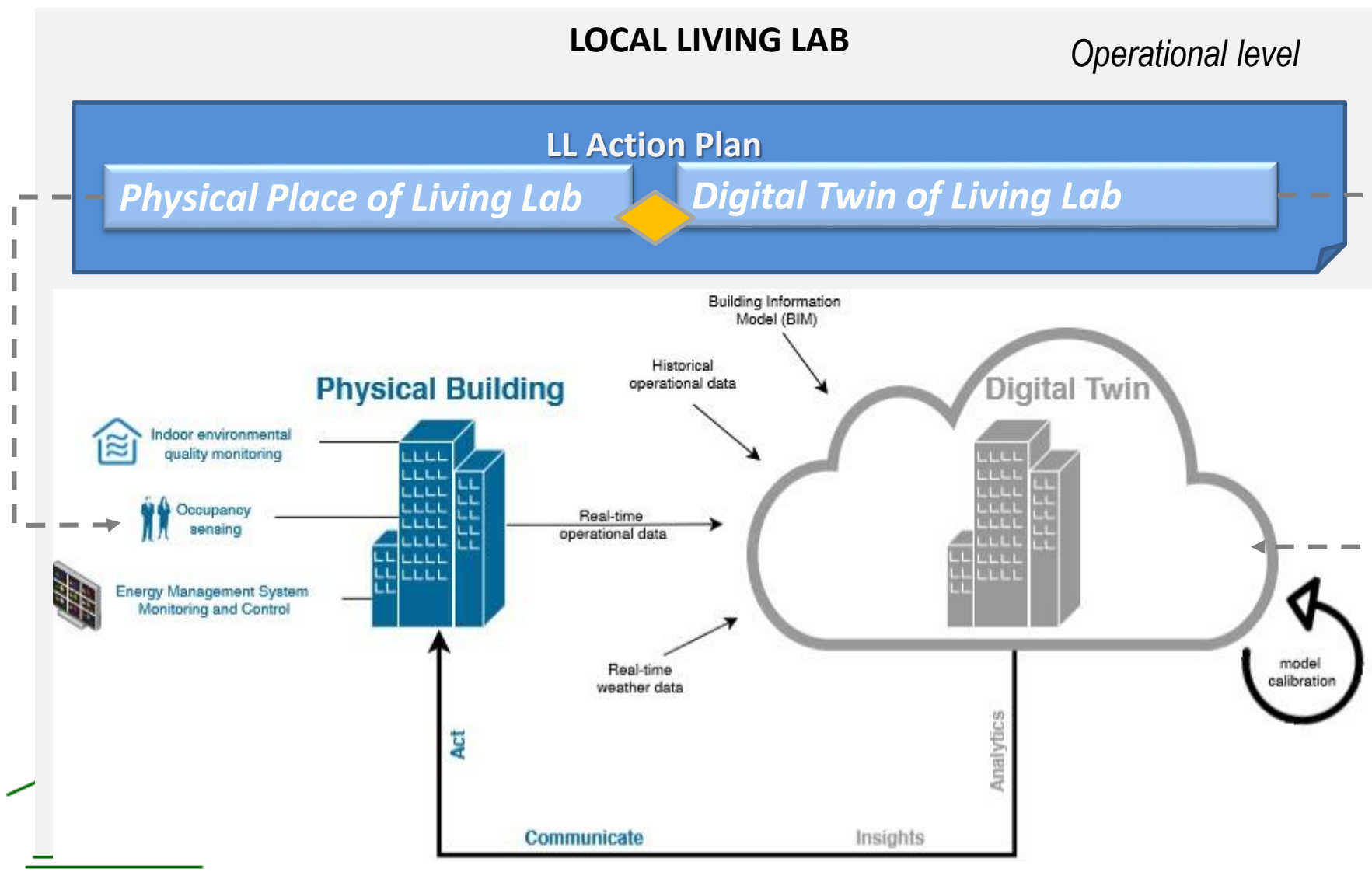
Data

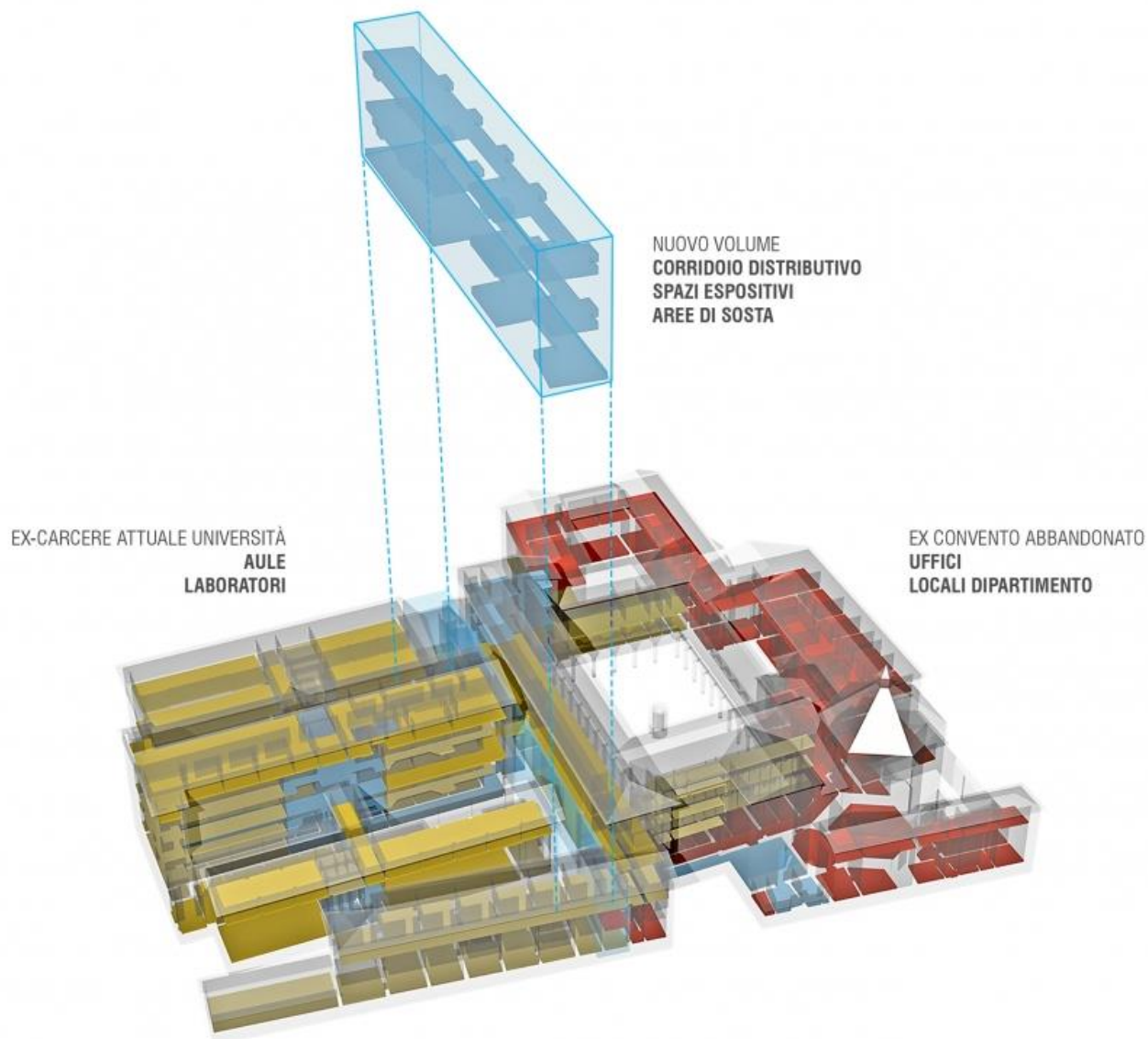
Real-world operational and environmental data from the sensors are *aggregated* and combined with data from the enterprise, such as the bill of materials (BOM), enterprise systems, and design specifications. Data may also contain other items such as engineering drawings, and connections to external data feeds.

Analytics

Analytics techniques are used to *analyze* the data through algorithmic simulations and visualization routines that are used by the digital twin to produce *insights*.

Management Structure of LL







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Thank you
For your attention

18 of June 2020

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