# Integrated solutions - process profile of ENGINENCY

The storyline of ENGINENCY is described as a sequential process-oriented solution, along with each stage's involved activities. The categorization of pre-construction, construction and post-construction related actions was followed for this process profiling.

PRE CONSTRUCTION
new buildings

Planning & Design

1
ICM
Engineering service

2
Uvigo
BCORE product
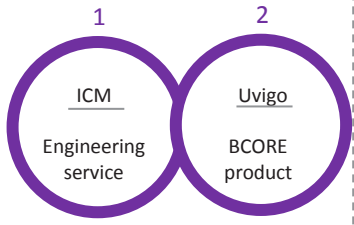
1. Description
Planning, studies, equipment, documentations

2. Description
Energy analysis & performance prediction

CONSTRUCTION
new buildings

Construction

3
ICM
Engineering service

4
DEMO
RE Suite
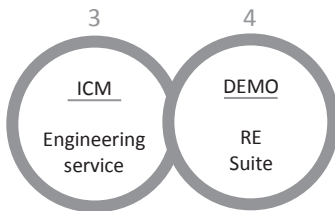
3. Description
Installations, set-ups, facilities

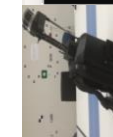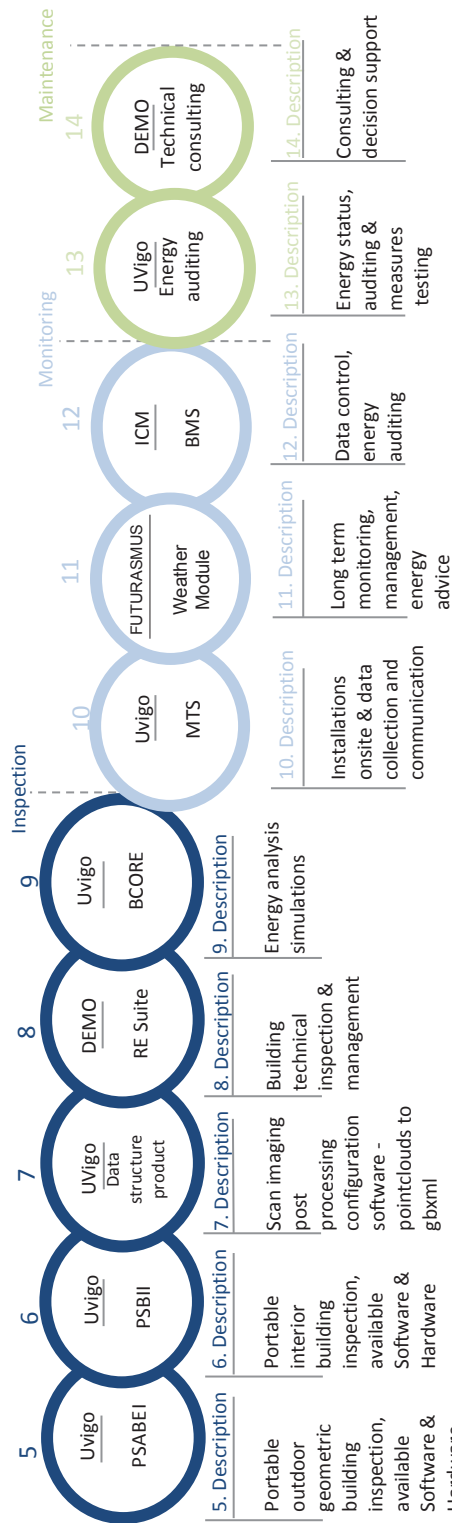**4. Description**
Real Estate Information management during construction

POST CONSTRUCTION
new & existing buildings

Inspection

5
Uvigo
PSABEI

5. Description
Portable outdoor geometric building inspection, available Software & Hardware

6
Uvigo
PSBII

6. Description
Portable interior building inspection, available Software & Hardware

7
UVigo
Data structure product

7. Description
Scan imaging post processing configuration software - pointclouds to gbxml

8
DEMO
RE Suite

8. Description
Building technical inspection & management

9
Uvigo
BCORE

9. Description
Energy analysis simulations

POST CONSTRUCTION
new & existing buildings

Monitoring

10
Uvigo
MTS

10. Description
Installations onsite & data collection and communication

11
FUTURASMUS
Weather Module

11. Description
Long term monitoring, management, energy advice

12
ICM
BMS

12. Description
Data control, energy auditing

Maintenance

13
UVigo
Energy auditing

13. Description
Energy status, auditing & measures testing

14
DEMO
Technical consulting

14. Description
Consulting & decision support

ENGINENCY

Toolset to improve building's energy efficiency

*A **holistic solution** for energy efficiency in buildings, which brings support in the energy experts' daily activity, increasing their current capabilities in a single automatic solution to optimize and decrease the use of energy.*

ICM INGENIERIA — UNIVERSIDADE DE VIGO — AG gte — futurasmus KNX GROUP — DEMO CONSULTANTS

Three industrial SMEs (ICM, FUTURASMUS, DEMO) and a research institution (University of Vigo) from three EU countries are joining expertise in different building energy efficiency domains to **develop** and **commercialize** Enginency. Enginency will support energy managers and expert's decisions through the **integration of energy audit** with **advanced technological solutions** for automated measurement acquisition, simulation over automatically calibrated models and analysis engines to **deliver a holistic tool** to inspect building, and measure, manage, report and improve their energy efficiency.

THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION
HORIZON 2020

ICM Industrial

ICM Industrial offers technical and professional support in the industrial and infrastructure market to achieve optimum control for efficient construction management. ICM brings in ENGINENCY a wireless network as a **B**uilding **M**anagement **S**ystem, capable of integrating several systems and collecting data from all of them in one single info-point, to get an accuracy model of the building behaviour.
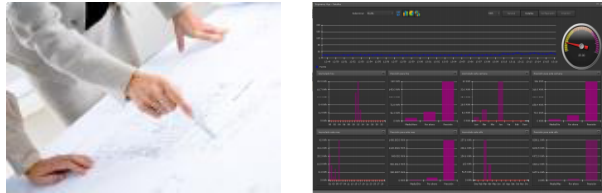

UVigo – PSABEI

Portable **S**ystem for **A**erial **B**uilding **E**nvelope **I**nspection

The system is a product for outdoor geometric measurements based on LiDAR. The portable system can be mounted on different UAVs with a payload higher than 2.5 Kg. The main components of the system are the aerial acquisition unit and the terrestrial control unit.

UVigo - PSBII

Portable **S**ystem **B**uilding **I**nterior **I**nspection

The system is a product for energy auditing of buildings that is able to acquire all the information around it. The main contribution of this system is the portable system and the software to process the data. The components of this system are a mobile device to acquire the data and a software to process and export data to the standard data format.
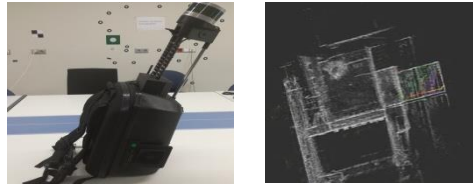

UVigo - MTS

Monitoring **T**hermographic **S**canner

System for thermographic long-term monitoring of buildings. When it is installed in a place in the building, the sensor acquires images in a sweeping form, 9 images of the area in a 3x3 matrix. The acquisition interval can be configured as desired by the user.

UVigo - BCORE

A software for **B**uilding **E**nergy **M**anagement.

Is capable of calibrating the simulation and has a user friendly interface, along with web access. At the moment there is not any other building simulation software capable of this calibration optimization.
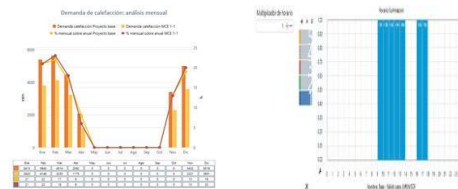
Futurasmus GmbH

Futurasmus GmbH (www.futurasmus-knxgroup.de) is specialized in home and building automation. Apart from being a training centre and specialized wholesaler, Futurasmus also does research and development of electronic components (hardware and microcontroller programming) and complex software solutions with multiprotocol interfaces, like KNX, BACnet, Modbus, etc.

In the Enginency project, Futurasmus facilitated weather data (from physical sensors and meteo weather databases from forecast sites) to the SCADA and cloud services. In order to achieve this, a Multi-protocol OPEN Internet of Things (IoT) GATEWAY has been created, which is a physical device that serves as the connection point between the sensors (weather stations, sensors, intelligent devices and online weather forecast sites) and the CBSE SCADA from the company IPAS which can then be accessed by the SQL client in order to store this data in a cloud database.

DEMO Consultants BV

DEMO develops innovative, yet user-friendly, software tools for investment appraisal, portfolio management, strategic decision making, and maintenance planning. DEMO Consultants are specialists in Real Estate Information Management. The core business comprises strategic and technical consulting, software development and implementation, and applied research. RE Suite allows you to collect, structure, analyze and disseminate your real estate information.