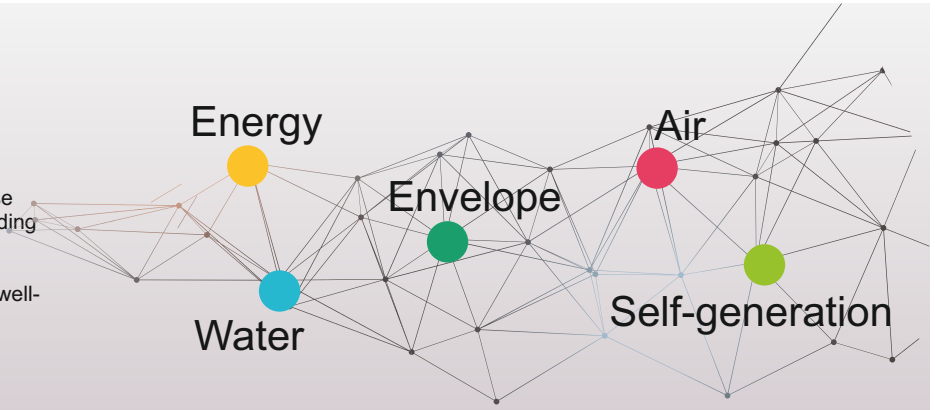


Hospital Sudoe 4.0 Monitoring

The ultimate goal of monitoring is to supervise and evaluate in real time the state of the building in terms of its efficiency in each of the five established pillars, as well as to warn of any changes that may affect the performance or well-being of the occupants.



BADAJOS

Perpetuo Socorro Hospital.
 | Envelope |

 **169** variables monitored



Energy

To analyse the key parameters related to energy consumption and use that take place in the hospital in order to be able to compare them and to know the energy efficiency of the building.

Sufficient parameters shall be measured to characterise the general consumption of the building and the main consuming equipment, therefore, for the latter it will be necessary to identify those equipment whose energy consumption represents a significant portion of the total consumption of the building.

Grouped into 3 categories:

- i Electricity Consumption.
- ii Fuel Consumption.
- iii Energy Generation.



Water

The objective of this pillar is to study and analyse the key parameters related to the water consumption of the building at a general level and by use, in order to monitor water consumption and use and to identify irregularities and low efficiencies.

Sufficient parameters shall be measured to characterise the overall consumption of the building and to understand the distribution of water consumption between the different water consuming systems.

The parameters are divided into IV categories, a general one that will affect the water supply from the service connection, another one that will control the domestic hot water, the cold water consumption will also be measured and, finally, the DHW recirculation ring will be measured..

BAYONA

Ramsay Sante. Belharra Clinic.
 | Self-generation | Energy |

 **124** variables monitored



Envelope

The objective of this pillar is to study and analyse the key parameters related to the energy performance of the building envelope, in order to know the current situation of the different elements that form part of the envelope and their behaviour in response to outdoor and indoor conditions.

On the other hand, it is important to plan the correct location of the equipment to be installed, which will require a prior study of the building, in order to know its physical conditions and identify the key surveillance locations.

The analysis of the building envelope has been divided into 4 fields, Outdoor Conditions, Building Elements, Indoor Conditions and Additional Control Parameters, this last field will be used to characterise the building after monitoring and to contrast the results of the measurements.

LEIRIA

Santo André Hospital.
 | Water | Energy | Indoor air quality |

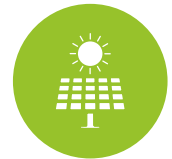
 **98** variables monitored



Air

Indoor air quality (IAQ) is closely related to the health and comfort of building occupants, and can be affected by airborne elements such as gases, particles, microbes or other elements that can affect human health, and by the temperature inside the building.

There are numerous methods to control air quality, from filtration to air renewal. The aim of this pillar is to monitor the amount of these health-damaging suspended elements and compare them with the admissible values, thus verifying that the admissible values for these pollutants and indoor temperature are met, as well as checking the efficiency of the air quality control systems.



Self-generation

The aim of this pillar is to measure the building's capacity for energy self-sufficiency, either at an electrical or thermal level, through renewable energies. On the other hand, the energy use of the energy discarded in the building is also a way of reducing the energy supply from external sources and therefore the measurement of this energy surplus is also considered.

The types of installations proposed here are:

- Installation of Photovoltaic Solar Energy.
- Installation of Thermal Solar Energy.
- Wind Energy Installation.
- Heat pump.
- Biogas installation.

