

Isdefe's Headquarters

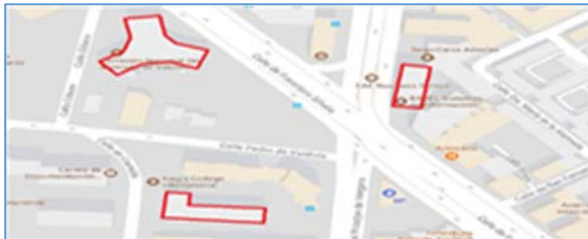
From obsolete to efficient and smart building. A defence example.

Why?

Ingeniería de Sistemas para la Defensa de España, S.A., (Engineering Systems for the Defence of Spain) – Isdefe - is a state owned public company part of the National Public Sector.

Isdefe is the in-house technical services provider for the General State Administration (AGE), and is a part of Spain's Ministry of Defence. The company was founded in September 1985 by a Council of Ministers agreement.

At the end of 2000, the company owned 700 m² of office space while at the same time renting more space in a nearby building. In 2007, due to the growth of the company, two more floors in a third building were rented.



Consequently, it was decided to acquire and deeply renovate a building that would suit and adapt easily to the growing and changing needs of **Isdefe**. This would have to take into account varying users' capacity, security requirements, and highest possible energy performance ratings.



*Isdefe's headquarters render
Madrid, Spain*

How?

Isdefe decided to purchase an obsolete building and transform it into a highly energy efficient smart building with the following overall objectives:

- The centralisation of the activities of **Isdefe** in Madrid.
- The deep renovation of the building to increase its commercial value and life cycle for another 30 years.



The renovation project was done in accordance with the current Spanish construction and environmental legislation and energy performance requirements, in order to achieve the highest achievable energy performance rate (B) and energy production for self-consumption, and to comply with the most stringent security measures required in the defence sector, among others:

- Security in access points, division of zones according to security levels (ZAR).
- Security in the classified projects development:
 - Classified Documentation: NATIONAL / NATO / EU / ESA.
 - TEMPEST Room
 - NATO / EU / ESA / SLP Control Point
- Security systems.

The project was approached and developed by a multidisciplinary technical and management team comprised of:

- Project Management team.
- Architecture team.
- Engineering team.
- Health and safety coordination team
- Specialised consulting firms when needed.

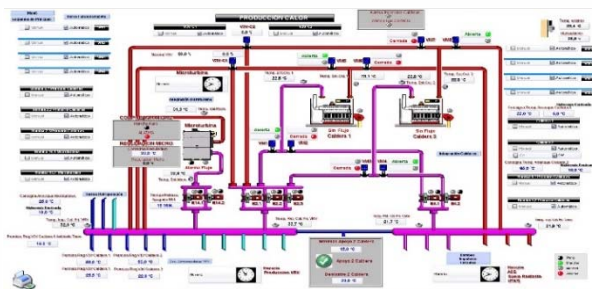
The requirements for the distribution of spaces were also common to those identified generally in the defence sector, such as:

- Facilitate collaboration between multidisciplinary work teams.
- Provide flexibility in the reconfiguration of teams and spaces (within 2 days).
- Cooperation between different departments.
- Facilitate communication and exchange of information.
- Facilitate staff mobility.
- Productive and comfortable work environment.

Through this renovation, an obsolete building was transformed into a highly efficient smart building which can be easily and quickly adapted to varying numbers of occupants and uses, through interventions in the building envelope, building interior fabric and structures, and installation of highly efficient technical building systems, including solar PV, solar thermal, and cogeneration technologies.



All technical building systems are monitored and controlled in real time with a centralised SCADA system which keeps the whole building at the required levels of comfort with the most efficient consumption of energy.



Results

All of the overinvestments resulting from key project decisions (replacing of new facade, VRV HR WC air condition system, lighting control system with electronic ballasts) were amortised in less time than estimated in the project phase.

Now, after six years from the completion of the project and beginning of *Isdefe's* activities in the building, we have evidence of payback periods of 10,1 years for all the overinvestments. By system, updated payback period for the light system (LUXMATE lighting control system and DALI electronic ballasts) is 3,92 years, and 11 years for the VRV system condensed by water (expected to be shortened upon realisation of further savings before reaching 11 years).



Applicability/Replicability/ Scalability in the Defence sector.

The defence sector in the EU is one of the largest owner of free land and building stock. Most of the buildings are outdated and do not comply with the current energy performance requirements and legislation.

This renovation project is replicable and scalable to other Ministries of Defences' and Armed Forces' office buildings, and may serve as an example of a cost-effective deep renovation in the EU defence sector.



Benefits

- Extended life and increased commercial value of the building, while fulfilling all energy performance (rate B) and security requirements for use of classified documentation.
- Energy savings (even more than originally estimated) in the project phase and reduction of energy costs.
- Flexibility in the reconfiguration of working spaces in accordance to organisation varying needs, facilitating the collaboration between multidisciplinary work teams and different departments, and a more productive and comfortable work environment.
- Easily monitoring and maintenance of all technical building systems and installations through the centralised management and control system.
- Capacity for energy consumption analysis and modelling for continuous energy performance improvement

through the centralised management and control system.

Challenges

- Multiple, varied and complex initial requirements and constraints:
 - ◆ Quality Policy and Environmental Policy
 - ◆ **Isdefe's** functional programme
 - ◆ Security requirements (comparable to those of Ministries of Defence)
 - ◆ **Isdefe's** image.
- Building state of maintenance:
 - ◆ Building's volumetric constraints and conservation state.
 - ◆ Urban and neighbourhood constraints.
 - ◆ Pre-existing infrastructures
- Regulations in force:
 - ◆ Urbanistic regulations.
 - ◆ Construction Technical Code and security specific regulations.
 - ◆ Stringent energy performance requirements (leading role of public bodies)

Opportunities

- The configuration of the building and versatility of the new facilities and installations make it possible (and easy) to incorporate new technologies.
- Centralised management and control system help in the implementation and follow up of Energy Management Plans aimed at fulfilment of ISO 50001 standard (or any similar) provisions.

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