

# Global Energy Management System Implementation: Case Study

Spain

## Mutua Madrileña

*Energy Management to provide better services, reduce costs (7'5% annually) and protect the environment.*



### Business Case for Energy Management

Buildings account for 40% of carbon emissions in the European Union. As a large insurance and real-estate company, Mutua Madrileña is committed to playing its part in reducing its impact on the environment.

The business case for energy management is sustained by two main pillars, indivisible and interdependent. On one hand, as an insurance and asset-managing company, corporate strategy places resource efficiency as a top priority. On the other, as a real-estate and asset manager offering office spaces to a variety of tenants, occupant comfort and wellbeing are a key element in making Mutua Madrileña's buildings a good option for the most demanding clients.

Mutua Madrileña's corporate values are based on solvency, transparency, teamwork, improvement and social commitment. To our company, sustainability cannot be understood without the triple bottom line of

social awareness, economic prosperity and environmental stewardship.

Corporate Social Responsibility (CSR) is a strong value that makes Mutua Madrileña different, with recognition from several awards on employee and customer satisfaction, prizes for technological innovation and energy efficiency, etc.

However, more is needed to integrate efforts in a common strategy that can cover Mutua Madrileña's variety of operations. With 14 buildings in Madrid, some occupied, some rented, some old, some new...costs range from building operation costs, tenants' costs, energy and water consumption, etc. A focused approach on effective management is key.

Furthermore, in the world of real-estate and asset management, investments in energy efficiency are always a tricky topic: it is the building owner who must invest and carry out energy saving measures, but it is the tenant who will benefit from these savings through lower operating costs. Therefore, it is frequent to find that neither wishes to overcome the effort.

However, Mutua Madrileña's approach is that investing in sustainability and energy efficiency is always positive. Our company is committed to complying with energy saving targets, set as part of corporate goals.

This is one of the reasons Mutua Madrileña has found a perfect solution in ISO 50001. Its method focuses on performance improvement through people and management. With training, awareness and open communication, staff is motivated to lead change and consider energy in daily operations. If a building changes or a tenant moves out, a team of staff can simply take care of another site, making the investment in time and resources valuable at all times.

This provides added value to all of Mutua Madrileña's operations. In addition, better operation of buildings

*“Through ISO 50001 implementation, our buildings provide good indoor environmental quality with lower energy consumption, fulfilling the most demanding clients’ needs.”*  
 —Emilio Colomina, Real-Estate Director

**Business Benefits Achieved**

Focusing in reducing energy consumption and CO<sub>2</sub> emissions, the company implemented an ISO 50001 Energy Management System in 2014. This is part of the “2<sup>nd</sup> Energy Efficiency and Saving Plan” a corporate long-term strategical plan aimed at reducing our company’s environmental footprint, working towards the EU’s targets and make its buildings more energy efficient, sustainable and healthy.

The first initiative of its kind, this company-wide effort has proven not only beneficial for the environment and the company’s balance sheet, but for employees and clients. Every person in Mutua Madrileña has a part to play, making the Energy Management System (EnMS) a shared success among all and an element of pride.

Since ISO 50001 implementation in March 2014, Mutua Madrileña has reduced its environmental footprint by 21.9%, lowered its electrical and gas consumption by 20.5% and 27.7% respectively, and become the first Spanish real-estate company to certify such a large number of assets in the country.

Even though not an energy source, water was also included in the EnMS, responding to Spain’s continuous water scarcity.

Prior to ISO 50001 implementation, many initiatives aimed to reduce our company’s energy consumption. Large investments in lighting technology (which accounts for up to 50% of energy use in office buildings) or ground-breaking HVAC systems hoped to lower Mutua Madrileña’s environmental footprint. Even though they helped, they were missing a binding strategic approach to energy and coordination.

Case Study Snapshot	
Industry	Insurance and Real-Estate
Product/Service	Large range of insurance (life, home, automotive, health, etc.) and property management.
Location	Madrid, Spain
Energy Management System	ISO 50001
Energy Performance Improvement Period	3
Energy Performance Improvement (%) over improvement period	ELEC: 20.4% GAS: 27.7% TOTAL: 22.5%
Total energy cost savings over improvement period	ELEC: \$ 402,677 GAS: \$ 78,411 TOTAL: \$ 481,088
Cost to implement EnMS	GEN: \$ 118,325 SATEL: \$ 72,996 DEXMA: \$ 7,633
Payback period on EnMS implementation (years)	0.41 years
Total Energy Savings over improvement period	ELEC: 15235 GJ GAS: 5810 GJ TOTAL: 21045 GJ
Total CO <sub>2</sub> -e emission reduction over improvement period	ELEC: 1254 TCO <sub>2</sub> GAS: 314 TCO <sub>2</sub> TOTAL: 1868 TCO <sub>2</sub>

helps tenants appreciate the benefits of improved energy management, through lower costs and higher indoor environmental quality.

The ISO 50001 approach towards energy management allows for optimisation of available resources, keeping efforts on track and priorities clear. Thus, a solid base for global improvement is established as a core corporate principle.

The ENMS's success lies in its company-wide approach. ISO 50001 implementation has brought teams together, instilled a sense of ownership in employees and a motivation to continuously improve. It is people, and not buildings, who consume energy. Likewise, it is people, and not systems, who have the power to change the way energy is managed.

Through efficient energy management, Mutua Madrileña has proven that its staff is its greatest asset, achieving outstanding savings through simple daily operation. This is ISO 50001's largest benefit.

Environmental footprint reduction is a corporate target to which all staff relates, as energy and resource waste are present in everyone's daily life. Through extensive awareness and communication campaigns, company goals are shared monthly with all employees. Suggestion boxes are open to all and staff are encouraged to contribute their best ideas and tips on how Mutua Madrileña could improve.

With a two-year old EnMS in place, it is also important not to lose focus and motivation. A central piece of internal communication and pride, energy management success is shared among all at Mutua Madrileña.

## EnMS Development and Implementation

The EnMS in Mutua Madrileña is a success shared by a large team which includes participants from all departments. The company earned ISO 50001 certification in May 2015, after 9 months' implementation, and has applied for recertification for June 2017. Over this period, electricity consumption reduction targets have been set, and met, every year, with 9.5% reduction in 2014, 4.9% in 2015 and 7.8% in 2016. A closed-loop approach also mean that savings achieved during the EnMS' first few years go back into the system, nurturing it and helping savings grow.

### **Implementation - people**

EnMS implementation began in March 2014 after a Gap Analysis was conducted. Mutua Madrileña's Board of

Directors was seeking a way to pursue environmental footprint reduction and found in ISO 50001 a useful tool that would lead the way to a new, ground-breaking approach on energy management.

With help from all departments of the company, a Roles and Responsibilities matrix was set up. The concept behind this was that energy management needed to be integrated into daily operation on all levels of the company, not just in specific teams. Goals were set for all roles and time-limits to develop them.

An Energy Team was created to lead implementation, in charge of setting regular meetings and check-ups from all participants. The Energy Team coordinates work between departments and contractors, analyses consumption data and evaluates new saving opportunities found by any person of Mutua Madrileña's staff.

Following Top Management's desire to take an active part in the EnMS, the *Energy Saving and Efficiency Committee* was created. Through quarterly meetings, the Committee reviews targets and achievements. This regular forum is instrumental for keeping up support, adopting decisions and achieving continuous improvement.

Two years on from initial certification, departments that were previously never related or had any business together work closely to achieve their targets. The EnMS keeps promoting employee awareness about the importance of energy saving.

Training is conducted regularly to keep all stakeholders aware of potential savings and part of the EnMS' progress.

Monthly meetings are held between maintenance teams and contractors and the engineering department to track energy performance and identify the reasons behind deviations, implement action plans and check that targets are being met.

### **Implementation – data**

Mutua Madrileña's focused on people approach meant that data analysis was, and is, understood as a tool for action.

The EnMS was implemented using existing available data. No complex metering systems were installed. Instead, every single energy meter in all 14 buildings was checked and mended and/or calibrated. Where meters were not available, company invoices were used to track consumption.

With the information available, the Energy Team developed a baseline to each building. Equal comparison between all 14 buildings was also a key issue. However, different occupancy rates, areas and even uses made ratios an unappropriated "one-fits-all" solution that didn't suit Mutua Madrileña's needs.

Using regression analysis, the Energy Team was able to identify which variables drive consumption in each building and develop indicators according to those drivers. With this approach, deviations can be identified in each case and their reason tracked down and addressed in a personalised and focused way.

After one year and a half in operation, the EnMS had achieved savings of € 349,779 (4,768,295 kWh) at zero cost. It was time to reinvest into the system.

A high-tech system is now in place, where meters measure all energy uses independently. An online platform is accessed by all energy technicians from the RnR matrix (building maintenance, facility managers, office managers, etc.).

The Energy Team centralizes information from this monitoring tool to build tendencies and analyse behaviour as a company. Its main goal is to reduce Mutua Madrileña's buildings' baseload. One example of its usefulness is in understanding consumption at the weekends and night-time periods, when office buildings are empty and unoccupied.

Results from the tool help the *Energy Saving and Efficiency Committee* reviews progress and sets objectives and targets for each new period in its regular meetings.

### **Implementation – technology**

Every month, savings achieved are shared on the company intranet, where everyone (related to the EnMS directly or not) can comment and share ideas to improve.

With a long history of technological efforts in the company's buildings, the EnMS arrived as a management solution to optimize equipment and systems.

Groups of maintenance staff were formed to receive tailor-made training. Then, each group was given the task of analysing their equipment to identify improvements in daily operation. With help from the energy team, a list was created to gather all the opportunities found. A live "saving-opportunities menu", the list currently has over 600 ideas ready to be implemented (with expected investment cost and ROI based on NPV and IRR). Most of them at zero or low-cost investment (ROI below 1 year).

This promotes a more systematic approach to energy management and continuous employees' interest in energy, by granting each maintenance team to choose the opportunities that best suit each facility.

The online monitoring system then allows for monitoring and energy mapping, assessing which measures are most successful.

The Energy team and financial team (onboard the EnMS) go through each opportunity to assess Return on Investment (ROI). If ROI is below 1 year, measures are categorized as top priority and carried out immediately. If ROI is above 1 year, measured are analysed on a case-by-case basis

Results are reviewed monthly and reported to Top Management, who then has a strong basis to direct new investments.

In addition, maintenance staff embraced this new approach, enjoying the recognition to their efforts and ideas, and wanting to contribute on a regular basis.

*“My invoice has been greatly reduced and comfort has increased thanks to better management.”*

—Asunción Guerrero, SERGESI Director (client/tenant)

## Performance Improvement Verification and Validation

After two years in place, efficient monitoring and tracking is essential to keep savings on target.

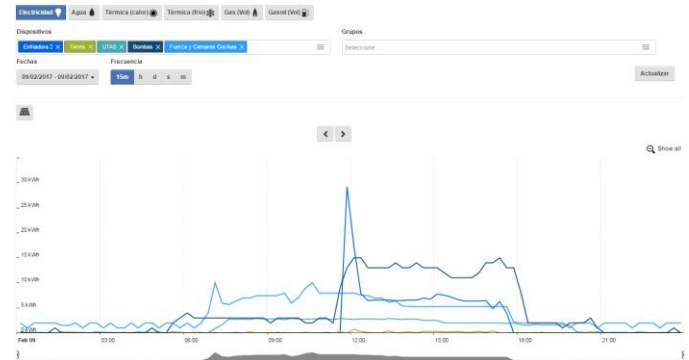
With the money saved from the first year of implementation, Mutua Madrileña invested in an online monitoring tool which measures Significant Energy Uses in each building independently, presenting them all in a real-time user-friendly interface.

Based on regression analysis, the tool normalises data consumption to its relevant variables (weather, occupation, date and events held in the auditoriums and large meeting rooms). Furthermore, as water is also monitored, rainfall is considered in measuring how water efficiency efforts are performing.

Using this model, savings are verified as compared to the baseline, which is the consumption each Significant Energy User would have had under its present conditions. This allows for simple and understandable, yet rigorous, comparisons such as “are we performing better than last year?”.

The monitoring tool helps the team assess action plans and correct deviations, keeping track on progress

towards objectives and targets.



EnMS results are checked every year following Mutua Madrileña’s internal auditing program. A method was developed to tailor internal auditing procedures to ISO 50001, developing a checklist that addresses the standard’s requirements.

By establishing this procedure, auditor neutrality and consistency is ensured, providing the security that the EnMS is independent and well established, regardless of the auditor chosen.

Pre-assessments are carried out every 6 months, followed by annual internal surveillance audits, which prepare the EnMS and ensure it is ready for external certification.

## Lessons Learned

### Teamwork is the key to success.

Identifying the EnMS’s needs, assigning tasks and setting goals for individuals and teams helps different interest groups to work together to achieve them.

Through the Energy Management Working Group (EMWG), government officials worldwide share best practices and leverage their collective knowledge and experience to create high-impact national programs that accelerate the use of energy management systems in industry and commercial buildings. The EMWG was launched in 2010 by the Clean Energy Ministerial (CEM) and International Partnership for Energy Efficiency Cooperation (IPEEC).

For more information, please visit [www.cleanenergyministerial.org/energymanagement](http://www.cleanenergyministerial.org/energymanagement).



## Everyone is important.

Give all staff the opportunity to contribute ideas and suggestions. The EnMS must be a shared success and a reason for pride for all employees.

In a true effort for continuous improvement, non-conformances from previous internal and external audits are solved and then worked upon to turn them into future strengths. For example, the first certification audit found that purchasing didn't consider energy as it should.

Today, the Purchasing and Projects Department liaise with the Energy team to make energy a highlight in all tender and purchases, including indicators to consider when assessing proposals.

## Management support is the beginning...but daily work is the end.

Top management provided up-front support to the EnMS, giving it strong initial thrust. However, it is continuous improvement and sustained performance that maintain and enlarge support and recognition.

## Technological innovation does not mean high expenditure on the latest gadgets.

When large investments have been focused on the latest technology, a feeling that "no more can be done" might sink in to the team. However, it is at this point where effective management can provide greatest savings through operation and routine analysis.

## Continuous awareness and training. Make savings personal

Even after two successful years in operation, we continue to carry out training for all employees, tailored to their level of involvement in the EnMS. Awareness and communication campaigns include tips to save energy at work and at home, making energy efficiency part of daily life and providing benefits beyond the corporate environment.



## If you have a goal, go for it!

When EnMS implementation, there was a sense that conservative targets had to be set, fearing not being able to meet them. But daily teamwork proved that goals can be met, and exceeded!

## Keys to Success

- Strong commitment from top management provided the necessary resources and time to work on the EnMS.
- A passionate core energy team involved in all processes related to energy, making it a priority (even while keeping their previous responsibilities) and sharing their enthusiasm with the group.
- A large team involved in a variety of departments allows for an energy-saving conscience to be present in all daily activities.
- Staff awareness and involvement in the EnMS, with an instilled sense of pride at having contributed to make Mutua Madrileña more sustainable.
- Live and user-friendly savings opportunity list where different departments (maintenance, engineering, projects....) can contribute and take ideas to improve.
- Harnessing technical expertise on-site, counting on maintenance teams' inputs.