

Global Energy Management System Implementation: Case Study

Republic of Ireland

An Garda Síochána

Total cumulative energy cost savings of \$11.3m since baseline year 2009.



Business Case for Energy Management

Company Profile: An Garda Síochána (AGS) is the national police force of Ireland, established in 1922. Today, An Garda Síochána is a community-based organisation with over 16,144 Police and Civilian employees, who serve all sections of the community. For policing purposes, the country is divided into 6 regions and comprises 564 individual police stations. AGS Transport Division manages a fleet of approximately 2,800 vehicles distributed throughout policing divisions, regions and specialist units.

EnMS Drivers: AGS has been improving its approach to energy management for several years, supported by a strong top-level management commitment. Since 2009, AGS has been working towards improving its energy efficiency by 33% in accordance with its EU mandated 2020 targets under Ireland's 'National Energy Efficiency Action Plan' (NEEAP).

EnMS Program: The NEEAP is a national target mandated by the European Union, which aims to improve energy

“An Garda Síochána are the first national police force in the world to achieve ISO 50001 certification, achieving energy savings of 21.9% and energy cost savings of 9.3% since 2009”

- Mike Dodd (Management Representative, ISO 50001 Energy Team, An Garda Síochána)

Case Study Snapshot

Industry	Public Sector
Product/Service	Police Service
Locations	Garda Headquarters, Dublin, Ireland Garda College, Tipperary, Ireland
Energy Management System	ISO 50001
Energy Performance Improvement Period	8 Years
Energy Performance Improvement (%) over improvement period	21.9 %
Total energy cost savings over improvement period	US \$ 11,307,142
Cost to implement EnMS	US \$ 4,200,000
Payback period (years) on EnMS implementation	5 months
Total Energy Savings over improvement period	810,827 GJ
Total CO₂-e emission reduction over improvement period	70,340 tCO ₂ -e

efficiency by 20% by 2020. To demonstrate exemplary leadership, the Irish Government increased the energy efficiency improvement target to 33% for public-sector organisations.

Energy Reduction Approach: In 2010, the Garda Commissioner established a group, under the chair of the Executive Director of Finance and Services, to develop an Energy & Environmental Strategy for AGS. To properly implement this strategy, AGS provided top management commitment to form a dedicated sustainability team of influential people who could successfully implement this project. As part of a structured energy management program, AGS made the decision to begin with the larger energy facilities to achieve the greatest energy savings, with approximately 80% of the annual AGS energy spend attributed to the 20 largest facilities. Energy projects were driven by both economic benefits and operational improvements. The implementation of AGS’s EnMS and ISO 50001 ensured that energy efficiency is now considered in every day policing operations.

In 2015, AGS set an ambitious target of becoming the first international police force in the world to achieve the ISO 50001 standard for energy management. In May 2016, AGS received ISO 50001 certification from Certification Europe comprising the Garda Headquarters site in Phoenix Park, Dublin and its entire Transport Fleet. AGS are committed to extending ISO 50001 across the entire organisation, and recently extended the accreditation to Garda College, Tipperary in December 2017.

Business Benefits Achieved

Since the implementation of a structured EnMS, AGS has achieved significant savings across the organisation - reducing energy consumption by 810,827 GJ (21.9% saving) and CO₂ Emissions by 70,340 tCO₂ (22.2% saving) versus the baseline year 2009. This has resulted in energy cost savings of US \$ 11,307,142 (9.3% saving vs 2009).

AGS’s target is to reach at least 33% improvement in its energy performance by 2020. To date, AGS are exceeding their performance target and have achieved 21.5%

energy efficiency improvement versus the baseline year 2009.

In addition, adopting ISO 50001 has achieved other non-financial benefits within AGS, such as

- Improved operational efficiency;
- Increased energy awareness within the organisation;
- Better decision making through greater understanding of energy management;
- Enhanced reputation;
- Improved data collection.

EnMS Development and Implementation

AGS developed its organisational EnMS with the goal of meeting its 2020 energy performance targets. This EnMS was initiated in 2010 with the objective of improving energy efficiency within the AGS organisation, and ultimately led to achieving ISO 50001 certification.

The diagram shown in Figure 1 outlines the timeline of developing and implementing this EnMS:

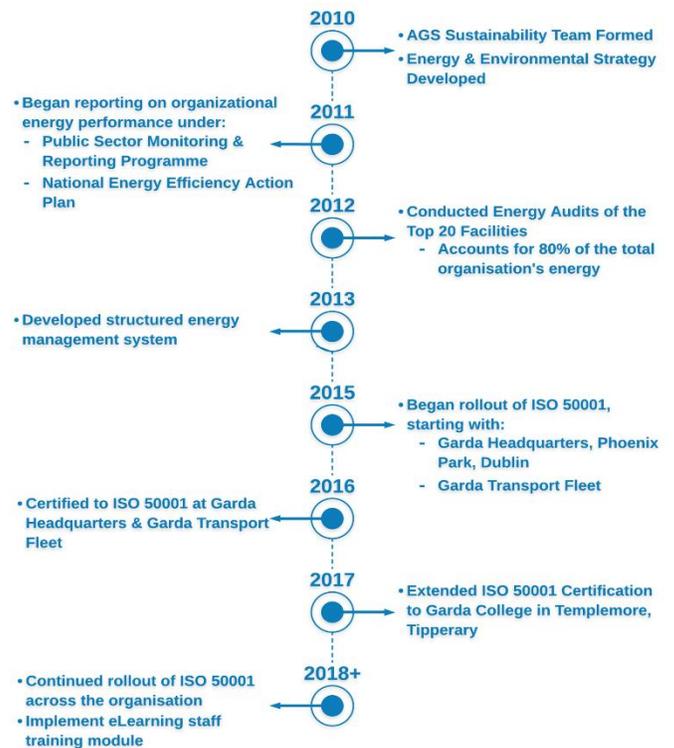


Figure 1: An Garda Síochána EnMS Timeline

Organisational: AGS senior management decided that the best approach of developing an effective EnMS was to create a ‘Sustainability Team’ (see Figure 2). This team was formed in 2010 and has been actively overseeing the implementation of energy improvement projects along with developing the organisation’s EnMS.

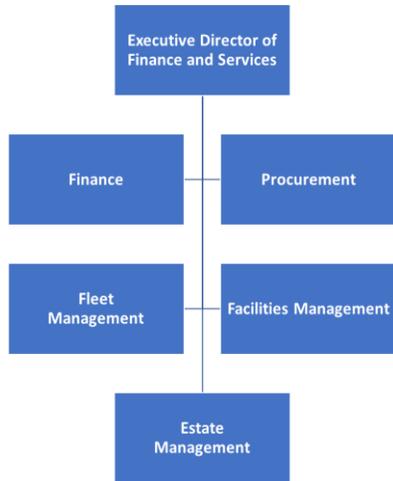


Figure 2: An Garda Síochána Sustainability Team

In 2015, AGS formed a dedicated ‘ISO 50001 Team’ (as shown in Figure 3) with the goal of implementing ISO 50001 across the organization.

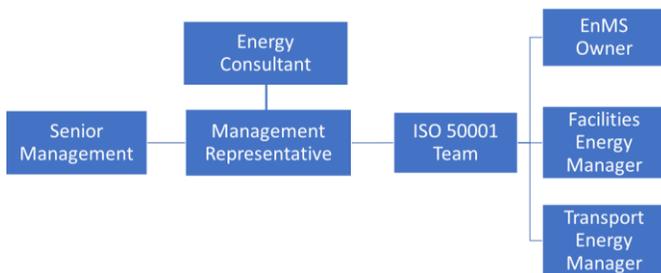


Figure 3: An Garda Síochána ISO 50001 Team Structure

In May 2016, AGS received ISO 50001 certification from Certification Europe, comprising the AGS Headquarters site in Phoenix Park, Dublin and its entire Transport Fleet - becoming the first national police force in the world to receive this accreditation. AGS are committed to continuing the roll out of ISO 50001 across the entire organisation with Garda College in Tipperary achieving ISO 50001 accreditation in December 2017.

Energy Review and Planning: The necessary resources, both financial and personnel, were provided to the Sustainability Team by senior management within the organisation.

AGS conducted several energy reviews to identify the organisational significant energy users (SEUs). AGS appointed external energy consultants to gather relevant data, perform detailed site audits and develop a prioritized list of energy opportunities based on energy & economic feasibility. This methodology allowed AGS to identify that 65% of the energy consumption within the AGS organisation was used in buildings for space heating, lighting, HVAC, IT Systems and LPHW. The remaining 35% energy was attributed to the AGS Transport Fleet. The AGS energy team established a baseline, identified suitable energy performance indicators (EnPIs) and prioritised energy improvement opportunities. The energy team established and maintained an action plan with annual performance improvement targets with the goal of reaching its 2020 energy efficiency objective.

To analyse the performance of this EnMS, AGS developed an organisation EnPI activity metric based on the number of full time employees (FTE) and transport kilometres travelled. This composite metric was compared against the organisation total primary energy requirement (TPER) and benchmarked against the baseline year 2009 – in accordance with its EU mandated 2020 targets.

Figure 4 shows the AGS performance to date against its mandated EU targets.

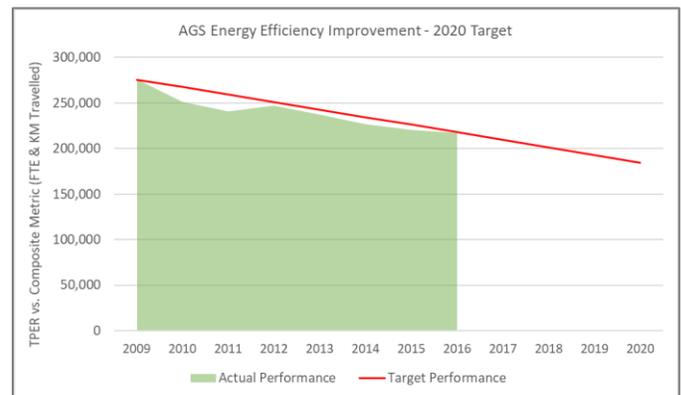


Figure 4: AGS Energy Efficiency Improvement - 2009 to Present

“An Garda Síochána have pushed the boundaries of energy management and put themselves amongst a very select group of organisations worldwide that have achieved ISO 50001”

- Michael Brophy (Marketing Executive, Certification Europe)

Cost Benefit Analysis: AGS has contributed significant resources towards implementing this EnMS and working towards ISO 50001 certification, including the following:

- EnMS development & implementation costs.
- EnMS metering and monitoring equipment.
- External assistance (e.g. consultants, software).
- Energy improvement projects (e.g. lighting retrofit upgrades, HVAC improvements, boiler conversion projects, transport fuel efficiency improvements).
- EnMS certification and audit fees.

In total, AGS has spent a total of approx. \$4,200,000 to develop and implement this EnMS and has achieved savings to date of \$11,307,142 resulting in a simple payback period of **0.37 years (< 5 months)**.

Determining Energy Performance Improvement: Under the ‘National Energy Efficiency Action Plan’, AGS must submit their energy consumption data to the ‘Sustainable Energy Authority of Ireland’ (SEAI) on an annual basis. This data is submitted through the ‘Public Sector Monitoring and Reporting’ web-portal, which is then analysed by SEAI to determine the organisation’s progress towards its 2020 target of 33% energy efficiency improvement. This performance is based on an organisation energy metric which is measured using the following variables:

- Total energy consumption (weather adjusted);
- Number of full time employees (FTE);
- Transport kilometers travelled (Road km);

As shown in Figure 4 on Page 3, AGS are currently performing 0.6% better than the target glidepath (as of 2016 data) and have currently achieved 21.5% energy efficiency performance improvement towards its target of 33%. This has resulted in total energy reductions of 21.9% since the baseline year 2009.

Approach used to Validate Results: The primary tool for determining energy performance improvement is the organisation energy activity metric. AGS internally validates the organisation’s progress towards its 2020 target and compares the results against SEAI glidepath show in Figure 4.

AGS uses measurement & verification to verify the performance of energy improvement projects. In addition, AGS uses regression analysis to compare actual performance versus expected performance. This regression analysis predicts the organisation’s energy performance by comparing historical data with identified energy drivers such as degree days, kilometers travelled, occupancy, etc.

AGS places great emphasis on the importance and need for regular internal auditing of the EnMS to ensure it is systematically reviewed on a regular basis to check its continuing suitability and effectiveness. These internal audits are conducted using detailed check sheets and ensures that any areas of outstanding action are resolved. Audit findings, and any corrective and preventative actions, are discussed with site personnel and validated as part of the EnMS system.

Steps taken to Maintain Operational Control: AGS staff have developed an operational control system to ensure that equipment and systems which influence energy use are operated efficiently on a continuous basis according to pre-determined operating schedules and parameters. This record is completed monthly as outlined by the Energy Management Team and involves checking the following SEUs:

- **Lighting:** Ensure lights are switched off outside of regular office hours and, if necessary, turn off respective lights and inform assistant energy manager;
- **Heating:** Ensure heating schedules and operational parameters are maintained satisfactorily according to pre-determined setpoints;
- **Ventilation & Cooling:** Ensure that parameters such as temperature set points and schedules do not deviate from effective energy performance;

- **Transport Operational Control:** Ensure that all vehicles are serviced at regularly defined intervals based on vehicle type. AGS Transport staff carry out audits of maintenance contractors to ensure vehicles are maintained to optimal performance.

If operational and maintenance activities which are related to the SEUs above deviate on a regular basis, these will be recorded in the 'Non-Conformance' management sheet and discussed and resolved, where appropriate, at the regular energy team meetings.

Professional Expertise, Training, and Communications:

AGS developed a structured approach to ensure proper training and communication is utilised within the organisation.

- **Employee Engagement:**

AGS has raised awareness of energy efficiency within their organisation by including a dedicated page on the internal AGS web portal, highlighting the organisation's energy strategy and allowing staff members to submit energy savings ideas. AGS also conducts 'Energy Awareness Days' to promote energy efficiency in the workplace and has developed an energy mission statement: "To protect and serve the Environment".

AGS conducts annual management reviews to inform top-level management of energy and EnMS performance, completed energy initiatives and upcoming plans to improve the energy and environmental performance of the AGS organisation. Each of the 6 major AGS regions located throughout the country have a dedicated energy representative, each of whom have completed specific energy management training courses, such as ISO 50001 (lead assessor), ISO 50001 implementation training programmes and general energy efficiency training on a regular basis.

- **Professional Expertise:** AGS recruited the services of several external firms to assist with projects such as lighting retrofits, boiler conversions, transport fleet improvements and waste management initiatives.

Tools & Resources: AGS adopted the Enerit ISO 50001 software to assist with document management, audit management, management reviews, meeting legislative requirements and creating energy action plans.

AGS have been successful in securing funding from energy suppliers which has supported the implementation of multiple energy saving projects.

AGS are also participating in the SEAI Better Energy Communities scheme. The Better Energy Community initiative supports new approaches to achieving energy efficiency in Irish communities.

AGS Headquarters located in Phoenix Park, Dublin and Garda Training College, Templemore have introduced a metering system which is managed by the Office of Public Works (OPW) which is accessed online via the OPW 'Energy Monitoring Bureau'. This metering system offers a detailed energy breakdown across the entire site and includes data such as energy consumption, load profiles, energy intensity and CO₂ emissions.

Lessons Learned

Management Commitment: One of the main driving factors which will contribute to the success of implementing a successful EnMS is the support from top management. AGS utilised a 'top-down' approach with the formation of their Sustainability Team (see Figure 2) where influential AGS staff and personnel were appointed to develop an EnMS and affect change within the organisation. This level of management support is key to ensuring that the EnMS is adopted across the entire organisation and that sufficient resources are allocated where appropriate.

Metering and Data Collection: When identified SEUs and creating an action plan, it is vital to have sufficient data to identify the energy consumption of specific sites/buildings/equipment. The availability of accurate and reliable data is a major challenge that must be considered early in the process of developing an EnMS. AGS Transport Division introduced a new data collection procedure across the entire organisation which required local police stations to regularly report on transport data such as vehicle kilometers travelled, vehicle fuel

consumption and fuel type. This resulted in AGS capturing more detailed vehicle data which was then used to track vehicle performance. Staffing resources allocated by top management was instrumental in developing and implementing this data collection procedure.

Training and Awareness: AGS has realised the importance of raising awareness of energy efficiency and sustainability within the organisation. This awareness is crucial to allow for sufficient support to both stakeholders and employees. AGS achieved this by providing extensive training to its energy representatives on energy efficiency and ISO 50001. In addition, AGS regularly hosted energy awareness days to educate its workforce on efficient energy management in the workplace and has provided a platform on the internal AGS web portal for employees to suggest energy improvement ideas.

External Expertise: AGS has invested in its energy representatives and provides extensive energy training to ensure they are training to a sufficient level. However, AGS realises the importance of utilizing expertise in specific areas and projects. For example, engaged experts to support with development of the AGS EnMS. Enerit software was used to manage documentation while AGS also worked with several firms and contractors who offered key expertise on energy projects.

- Appoint a structured energy team with the ability to affect change within the organisation;
- Extensive training and upskilling of core members to continually improve the management system
- Promote staff awareness and engage employees at all levels within the organisation;
- Use existing organisation procedures and incorporate these into the EnMS;
- Acknowledge and reward energy accomplishments.



An Garda Síochána Headquarters, Phoenix Park, Dublin, Ireland.



An Garda Síochána
Ireland's National Police Force



Keys to Success

- Clear goals and targets set within a reasonable timeframe;
- Strong commitment and buy-in from senior management;

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.

