

Case Study

Údarás na Gaeltachta Energy Management Bureau

Údarás na Gaeltachta combines an economic development role with community, cultural and language-development activities. Údarás sponsors hundreds of companies that employ approximately 9,000 people.

It is estimated that the Údarás building stock of approximately 300 buildings, comprising 300,000 m² of floor area, has CO₂ emissions of 44,089 tonnes/yr and energy costs of €12.5 million/yr. These buildings are mostly on the atlantic seaboard and are occupied by Údarás staff, community organisations or companies.

In 2008, Údarás na Gaeltachta established an Energy Management Bureau operated by Enerit Ltd with 50% funding from Sustainable Energy Ireland. This three-year pilot project involves 5 Údarás-occupied buildings and 10 buildings occupied by community organisations or SMEs. The project targets are to reduce energy consumption and carbon dioxide emissions for these 15 buildings by 4% consecutively each year, i.e. 12% by Year 3.

The unique challenges in running an energy management bureau for Údarás are:

- The buildings are widely dispersed -- from Donegal to Kerry to Waterford

- The buildings and units are small, and it is not economically justifiable to have local energy expertise employed at each location
- Because of the remoteness of the locations, it is expensive to have energy consultants make on-site visits
- Converting obsolete factory buildings to comfortable and energy efficient office buildings

The team set out to overcome these challenges by demonstrating how a systematic energy management approach combined with advanced web based IT systems can be used.

This case study details the actions and the energy saving results in the headquarters building (Ard Oifig), Galway, the regional offices in Donegal (Oifig Réigiúnach Gaoth Dobhair), Kerry (Oifig Réigiúnach an Daingean) and the Islands' Services Centre (Ionad na Seirbhísí na nÓileán), Galway over an initial period.





Labelling light switch panels to encourage staff to only switch lights on that are required

They were built between 1970 and 2008. The number of staff ranges from 15 to 101 and the floor areas range from 382 m² to 2,364 m². All the buildings have a combination of open plan areas and offices including training and meeting room facilities. Three of the four buildings use oil fired central heating with radiators and one uses a geothermal heating system, consisting of a ground source collector and heat pump. The energy performance is typical of similar office buildings in Ireland. Based on 2007 costs, the energy bills for each building is in the range of €15,000 to €100,000 with electricity costs comprising 63% of total costs.

WORK CARRIED OUT – CENTRAL ENERGY BUREAU ACTIVITIES

The central activities of the Údarás Energy Bureau are:

- › Overall coordination
- › The creation of action plans in cooperation with Steering Group
- › Monitoring and targeting system operation
- › Monthly and annual reports
- › Tracking actions on a daily basis
- › Triggering corrective actions, where there is a repeated failure to maintain action deadlines
- › Continually updating all plans and actions on Web with visibility to all relevant staff
- › Organising monthly progress meetings with the steering team (including minutes)
- › Tendering for the supply of electricity and fossil fuel each year

The first task carried out was to identify clear roles and responsibilities for the key players involved in the project. A steering committee was appointed and an energy champion was brought on

board. The steering committee is made up of representatives of each of the Údarás regions, the energy champion and external energy expertise and is constituted as follows:

- › Frank Conlan, Energy Bureau Sponsor
- › Gerry Darcy, Chairman
- › Fiona Ní Mhurchadha, Údarás Energy Champion
- › Donal McGettigan, Donegal Energy Champion
- › Conall Mac Gearailt, South Region Energy Champion
- › Máirín Ní Fhéinne, Galway Energy Champion
- › Mike Brogan, Enerit Ltd, Energy Bureau Project Manager/ Steering Committee Secretary
- › Paul Monaghan, Enerit Ltd

The key roles and responsibilities are as follows:

- › The Údarás Energy Champion has overall responsibility for day-to-day decisions on operation of the Energy Bureau
- › Enerit provide several levels of support to the Údarás Energy Bureau:
 - Management support on decisions regarding the structure and set-up of the Energy Bureau
 - Operational support for the day-to-day operation of the energy bureau relating to the software infrastructure,
 - Energy advice for the different buildings
 - Daily monitoring of actions and reports
- › The steering committee has the responsibility to identify a main sponsor (i.e. a lead manager) in each participant building and this person must demonstrate commitment to the energy-saving programme

WORK CARRIED OUT -- ACTIVITIES FOR EACH BUILDING

Once a new building is accepted into the Energy Bureau by the Steering Committee, then a systemised set of actions are triggered (Figure 1). These steps for participating client company/ organisations in the Údarás Energy Bureau are as follows:

1. The Steering Committee identifies the Lead Manager (Main Sponsor), local Energy Champion and Key Energy Staff at the new building
2. The Local Energy Champion and Key Energy Staff complete a pre-audit questionnaire, provided by Enerit, for gathering building information prior to on-site audit
3. The Local Energy Champion gathers energy bills for the past 3 years so that any trends in energy consumption can be identified
4. The Energy Bureau Portal is configured with the new building details and usernames and passwords are set-up for the energy champion and the key staff
5. When the pre-audit questionnaire has been completed and the energy bills have been gathered, the first on-site visit is scheduled
6. During the first on-site visit, an energy audit is conducted, energy awareness training is provided to all staff. The training is customised based on the energy requirements and operation of the building
7. A kick-off meeting is arranged with the Energy Champion and the Key staff. The kick-off meeting discusses and agrees initial actions based on feedback from the energy audit and suggestions/feedback from energy awareness training. This initial visit is usually completed in 1.5 days

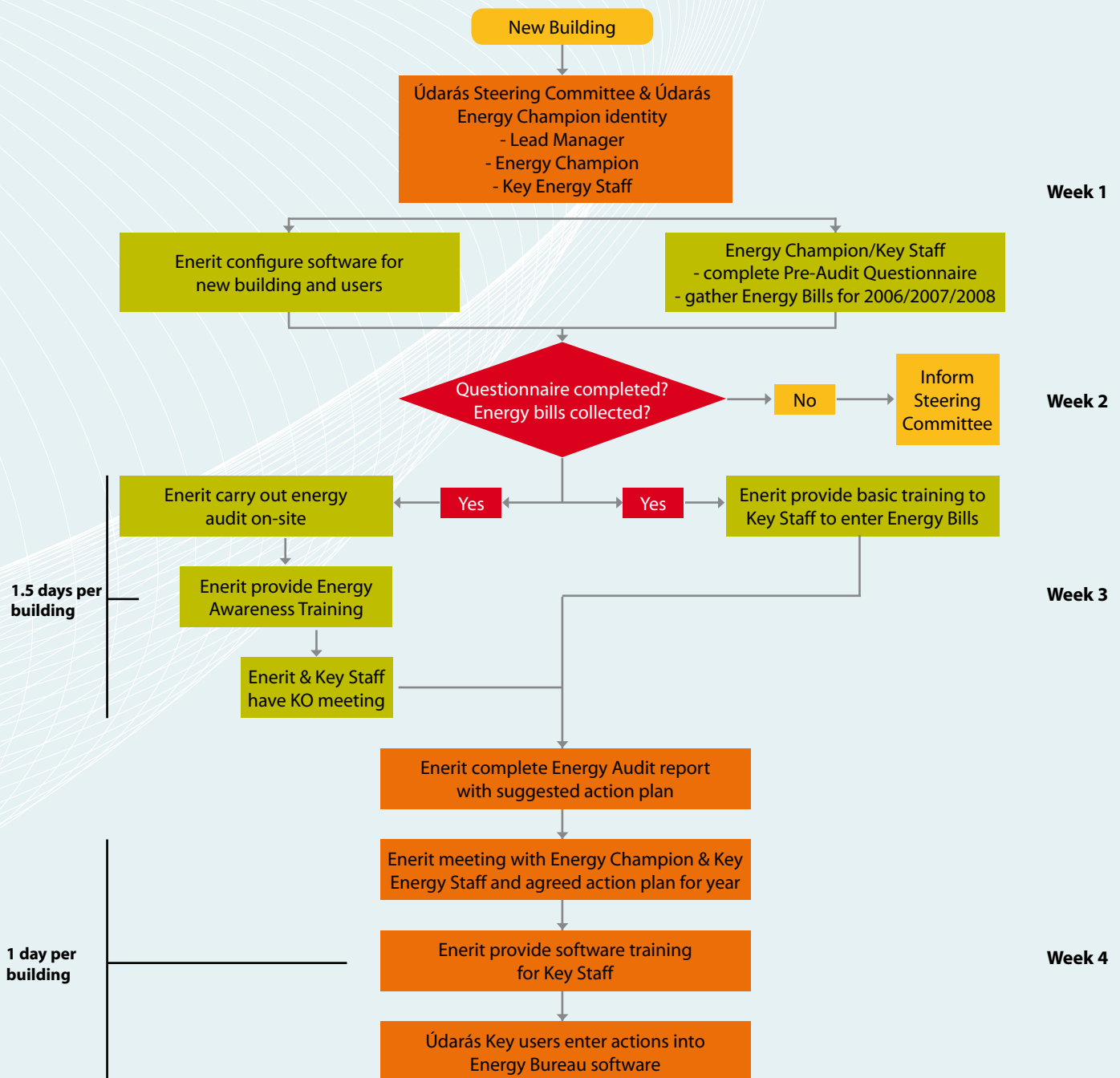


Figure 1: Schematic of information flow and decision points in setting up new building.

8. After the initial on-site visit, the energy analysis and the Energy Audit report with a suggested action plan is completed off-site
9. A follow-up on-site meeting is scheduled with the local Energy Champion and Key staff. Any further actions based on the detailed audit report, the local person responsible for completing the agreed actions and the target dates for these actions are all agreed
10. During the follow-up visit the local Energy Champion and the Key Staff are trained on how to access the online Energy Bureau Portal, enter information, and view reports and results. During the training, energy bills, electricity meter readings and oil and gas meter readings are entered into various templates via the Energy Bureau Portal

- > audit reports
- > steering committee meetings
- > automated employee suggestion scheme
- > training sessions
- > other informal events

In the four months since implementation, 159 actions have been assigned through the Energy Bureau Portal and 120 of these actions have been completed. Figure 2 shows a report from the Energy Bureau Portal displaying the breakdown of completed actions by category. Intranet users can click on the chart to drill into more detailed information on individual actions, as required.

All of the above steps can be completed for each building in 4 weeks. This was completed for all 4 buildings in the period May/June 2008. An effective energy management programme needs to balance activities dealing with:

- > Organisational Management
- > Technical Matters
- > Human Behaviour Change

These three topics are now dealt with separately.

ORGANISATIONAL MANAGEMENT

In addition to the clear identification of people's roles, the actions are planned and tracked in a very unique way. The action tracking management system in the software drives these actions to conclusion through the use of: workflow based on e-mail alerts; automated reminders and alarms; management reports displayed on the intranet. All actions are created, assigned and completed using the Energy Bureau Portal throughout the organisation. These actions are triggered by:

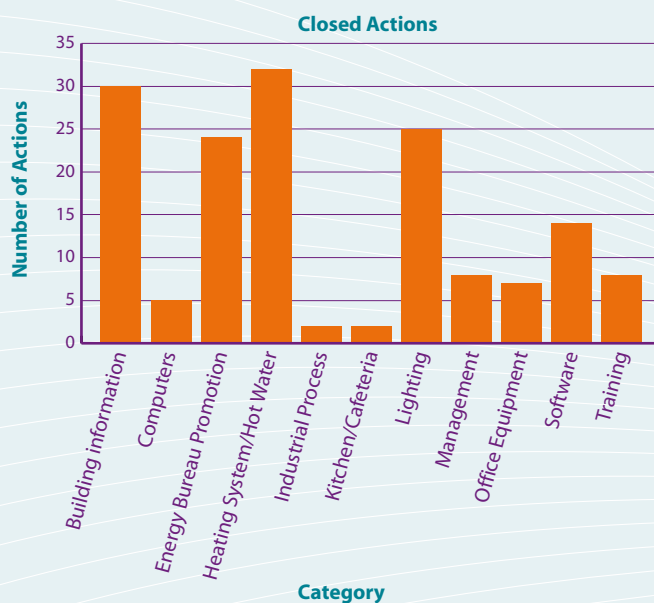


Figure 2: Chart from Energy Bureau Portal -- Completed Actions by Category.



As well as reminder e-mails and alarms, actions are driven to completion by management reports. These reports are reviewed at every steering committee meeting, every key users meeting in each building and remotely, on a daily basis, by the energy bureau administration team. When targets are missed, corrective action is taken.

The kind of energy-saving actions taken so far are the typical "no-cost" or "low-cost" actions that are recommended at the early stage of an energy management programme. The types of electrical energy saving actions that have been carried out are listed in the two sections "Technical Matters" and "Human Behaviour Change" below.

TECHNICAL MATTERS

- › Removing or disabling light fittings in areas where there is excessive lighting
- › Replacing incandescent bulbs with CFLs
- › Replacing halogen spotlights with mini CFL spotlights
- › Installing 7 day time clocks on office equipment (photocopiers, printers)
- › Installing 7 day time clocks on water boilers
- › Installing motion sensors or daylight sensors in toilets and other areas where suitable.
- › Modifying settings on the hot water heating immersion coil controls
- › Ground source heat pumps for under-floor heating system: adjusting time clock settings
- › Switching off immersion electric heating to allow the oil heating to take over domestic water heating
- › Reducing heating in unoccupied offices

HUMAN BEHAVIOUR CHANGE

- › Awareness training for all staff
- › Access to the energy bureau energy-saving reports on the intranet for staff motivation
- › League tables on the intranet showing the energy performance of the different buildings
- › Competition for prizes at annual staff dinner
- › Automated suggestion scheme on the intranet
- › Eliminating electric space heaters -- which were informally introduced to the building
- › Switching lights off in areas at times when sunlight is sufficient
- › Switching off banks of lights in zones of open space areas as each zone empties
- › Switching lights off when employees depart, i.e. not leaving them on for the cleaners.
- › Audit checks of numbers of computers and monitors left on at night and weekends
- › Follow-up instruction to staff groupings that are "switching off" less
- › Labelling light switch panels to encourage staff to only switch on lights that are required
- › Displaying energy saving posters and other motivational information
- › Sending email reminders to all staff to switch off computers, monitors and other equipment



Installing 7 day time clocks on office equipment

OVERALL ENERGY-SAVING RESULTS

In the months of May and June 2008, the following were completed for all four buildings:

- › audits
- › awareness training
- › software training
- › set-up of the actions in the intranet software system

The energy consumption before and after this implementation period are shown in Table 1.

The results indicate that, in the four months before implementation, of the programme electricity consumption in 2008 had risen by 1.7% compared to 2007. This is a common trend due to increased automation of office work.

	Before Jan to Apr	After July to Oct
2007	162,096 kWh	172,181 kWh
2008	164,819 kWh	146,277 kWh
2008 Compared to 2007	1.7%	-15.0%

Table 1: Total Energy Consumption for the Four Buildings for the Four Months before the Beginning of the Programme, and the Four Months after Implementation Period

In the four months after the implementation period, electricity consumption in 2008 had dropped by 15% compared to 2007.

The impact of the programme, so far, is that energy electrical energy is reduced by 15% year-on-year, or by almost 17% compared to a “business as usual” scenario.

RESULTS FOR INDIVIDUAL BUILDINGS

Results for each building are shown in Table 2. The results show that, in every month for every building, 2008 consumption is lower than 2007. This is an indication of the strong control, introduced by the action management system.

Building	July	Aug	Sept	Oct	Average
Furbo	-3.9%	-17.0%	-11.9%	-8.0%	-10.2%
Gaoth Dobhair	-9.9%	-25.9%	-12.1%	-9.2%	-14.4%
An Daingean	-25.0%	-34.7%	-27.0%	-31.9%	-29.8%
Tir an Fhia	-17.0%	-22.1%	-27.7%	-31.9%	-24.7%

Table 2: Percentage Electrical Energy Reduction in 2008 versus 2007 for Each Building

CONCLUSIONS

The average reduction of 15% of electrical consumption within four months of implementation shows the approach taken in this energy bureau to be highly effective. This reduction was beyond expectation -- the original target was to achieve this reduction over a four-year programme of work. The team will now focus on beating the four-year target in these buildings by a long way.

The systematic approach has ensured that all buildings, managers and staff are included in the programme. Management commitment and staff motivation is high. The team members can view their buildings performance on the internet and what actions each person is to carry out.

The approach to automation has ensured very strict management of actions. As a result, in some cases, actions have been completed within weeks of their assignment. In four buildings, in four months, 159 actions have been agreed and 120 of these have been completed.

Because meetings and energy documentation are organised on the intranet, meetings are highly effective and backup information is easy to find.

The next steps at the Údarás na Gaeltachta Energy Bureau are to focus on thermal energy reduction through the 2008/2009 winter and to immediately add another 11 buildings to the system.

The approach taken here is directly applicable to other owners of large stocks of commercial and institutional buildings such as: other development agencies (IDA and Enterprise Ireland); hospital groups and other health providers; local authorities; offices of electrical and gas utilities; banks; insurance companies; hotels; and supermarkets.

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