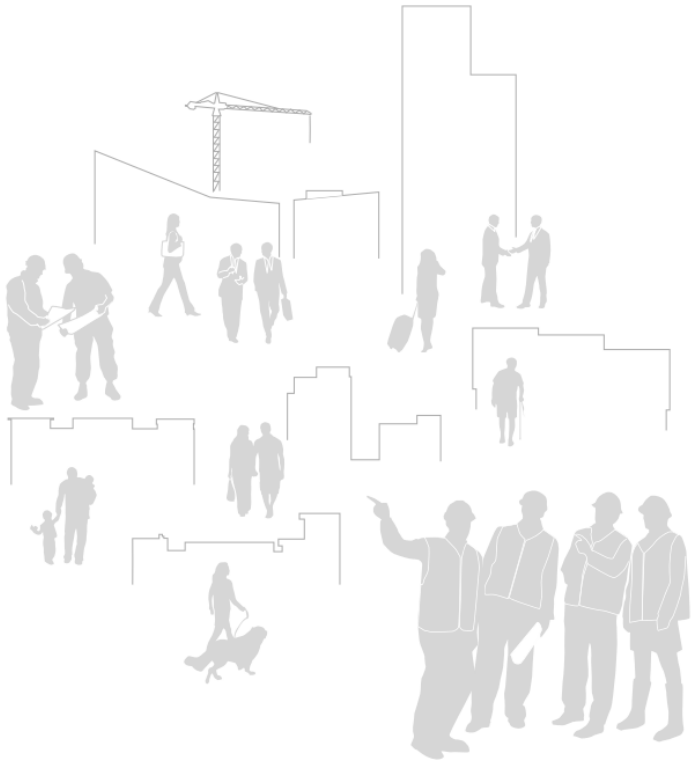
BUILDSMART

Energy efficient solutions ready for market



Technical Report on End-User Training Programmes Achieving Actual Energy Savings

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Dissemination level	
X	PU = Public
	PP = Restricted to other programme participants (including the JU)
	RE = Restricted to a group specified by the consortium (including the JU)
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Contents

1 Introduction

The following report details Think Energy, an energy awareness campaign created as part of the BuildSmart project. One of the key aims of the project was to realise significant energy savings through behavioural change. Think Energy was first created and delivered in Dublin City Council's Civic Offices which is a large consumer of energy with up to 1,500 staff. The campaign was delivered over the course of one year with regular monthly activities throughout. The ethos behind Think Energy was to show Dublin City Council as exemplary in implementing a holistic energy campaign that can easily be applied to other buildings and in the home as well, thus achieving even further energy savings over the lifetime of the campaign.

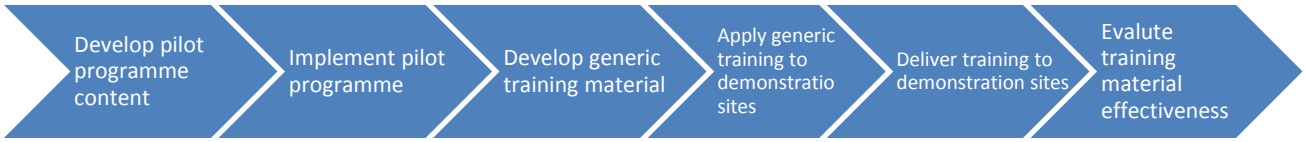
The objectives of the Think Energy campaign were as follows:

1. Raise awareness about why and how staff can save energy
2. Increase the understanding of how and where energy is used in the building
3. Change behaviour & consequently save on energy and cost - to reduce annual consumption by at least 5%, equating to an annual saving of 207 MWh or €17,000
4. To develop a campaign that can be successfully replicated in other buildings

Think Energy was then adopted for delivery in other sites with particular focus given to the demonstration projects within the Buildsmart project. The programme is evaluated based on a number of key performance indicators and the results of which are outlined in this report.

2 Methodology and Approach to Programme Development

The Think Energy campaign was developed and delivered following six key steps. It was decided, based on Codema's experience of developing and running previous energy awareness campaigns, that the best approach and the one most likely to succeed was to develop a campaign in a live environment. The alternative approach is to develop a full campaign as a desktop exercise and then deliver, however this was found in previous campaigns to have limited long term effect. Development in the live environment provides for a more flexible approach that can be adopted and modified to meet the needs of the target audience without losing the overall focus of the campaign.



The first two steps of the campaign are the development and delivery of the initial pilot training material. The pilot project was delivered over the course of a full year. This is the ideal situation, as it allows for a full energy consumption cycle to be measured. During this phase, various approaches and ideas are trialed and their effectiveness measured across a range of indicators. The overall energy reduction achieved during the campaign period is also measured.

The third step is the development of generic training material and guidelines from the lessons learned during the pilot programme. This consists of a full suite of training material including all marketing and promotion templates developed during the pilot phase. This is material that can be applied to any site.

The fourth and fifth phase is the application of the generic training material to the project demonstration sites. The final step is the evaluation of the effectiveness of the programme.

3 Phase 1: The development of the local training programme

3.1 Planning the Campaign

Planning and development of the training programme began in early 2013. Initial discussions were held with Dublin City Council Architects Department concerning the development of a training programme to be delivered to the tenants of the proposed new development in Dominick Street. These discussions were very positive and a basic plan was put in place. Due to a delay in the constructing the proposed new development, and in order to develop a training programme with real people (as opposed to a desktop study), it was decided to develop and pilot the programme in the Dublin City Council's headquarters, Civic Offices, where there was the possibility of having live energy feedback. The intention was then to take the lessons learned in communicating live energy data and energy saving messages to the people in the Civic Offices and apply these to the residents of the new Dominick Street development.

Considerable delays in the development of the demonstration projects became apparent in 2013. This added to the difficulty of developing the training material, as no engagement was possible with the residents of the proposed Dominick Street development. During this phase of the BuildSmart project, very little other project activity was taking place due to the general downturn in the construction sector across Europe.

3.1.1 Communications & Marketing

Codema's Communications & Marketing team brainstormed up to 10 different titles for this energy saving campaign. They decided to go with the title 'Think Energy' as it is simple and clearly sums up the message of what the campaign is all about. A 'Think Energy' logo was developed in numerous variations and the design was kept very simple; clean text with the letter 'e' in 'energy' changed to the power symbol, which is easily recognised in an energy campaign.

Fig 1: Example of Think Energy logo created

The following tools were used to spread the messages of the campaign:

- Online tool – Think Energy Online Hub where staff can inform and be informed
- Regular mailshots to over 4000 staff from thinkenergy@dublincity.ie

- Regular energy-saving tips/news in First Post, the internal Dublin City Council newsletter
- Regular updates on DubNet, Dublin City Council's Intranet
- Staff events such as energy days and Competitions
- Face to face meetings with staff – team talk leaders
- Expert talks on saving energy
- Posters
- Additional branded material such as mousemats and keyrings

3.1.2 Preparing the Think Energy campaign

In order to implement a successful campaign, Codema carried out extensive research in Civic Offices in a number of areas. There are approximately 1,500 staff working in the building at any given time. Typical offices appliances include computer work stations, monitors (some workstations have two monitors per user), photocopiers/printers, faxes, scanners and shredders. Many offices have a separate kitchen with kettle, water boiler, microwave, etc.

Civic Offices is one of Dublin City Council's largest energy consumers using €611,712 of electricity and €157,253 of gas in 2012. Large buildings such as the Civic Offices use significant amounts of energy which can generally be split into two categories; the background energy needed to operate the building (the base load) and the energy that is used directly by people who work in the building. It is reducing this direct energy use that was the focus of the Think Energy campaign.

There are many ways in which people use energy in a building. When they arrive in the morning they take the lift to their office, turn on the lights, turn on their computer, make a cup of tea, print a document, etc. Figure 2 shows the effect of this behaviour on the electricity consumption in Civic Offices for the month of May 2013. The red squares show high energy use and the blue low energy use; bottom to top shows the hour of the day and left to right shows the day of the month. The five blocks of red/yellow show the five working weeks in May.

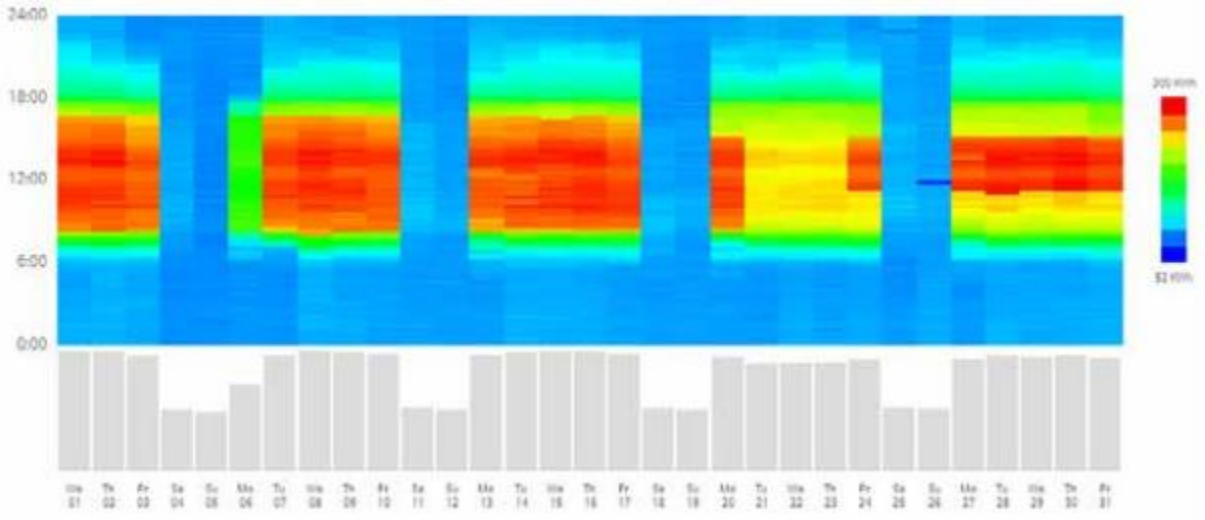


Fig 2: Diagram showing how user behavior affects electricity consumption in Civic Offices for the month of May 2013

Figure. 2 clearly shows the weekdays and the weekends. When there are no people in the building the energy use is lower and only the background energy is being used. This is also the case at the weekends. But during the weekdays when the building is fully occupied, we can see the effect the people have on the buildings electricity use. The most intense period of energy use is during the hours of 8am to 5pm, when the building is fully occupied. At the beginning of each day, we can see that the energy rapidly increases as staff arrive and take the lift, switch on the lights, etc. In the evening the line is not as clear as in the morning. This may be due to people leaving at different times but we can also see days where appliances are clearly being left on (for example the evening of Tuesday the 7th running into Wednesday the 8th). The aim of the Think Energy campaign was to positively influence a change in this evening pattern.

Figure 3 shows the electricity, gas and water use in the Civic Offices on Thursday the 23rd of May 2013. This was a fairly typical day, cloudy with some rain and an outside temperature of 7.5 Degrees Celsius. Again, we can clearly see when people arrived at the office, a peak in energy use at 12pm and then a gradual fall off in the evening. We can also see the difference between the electricity and gas consumption. The electricity increases and decreases with the occupancy of the building, whereas gas use peaks first thing in the morning and then falls off throughout the day. This is due to the building cooling down during the night.

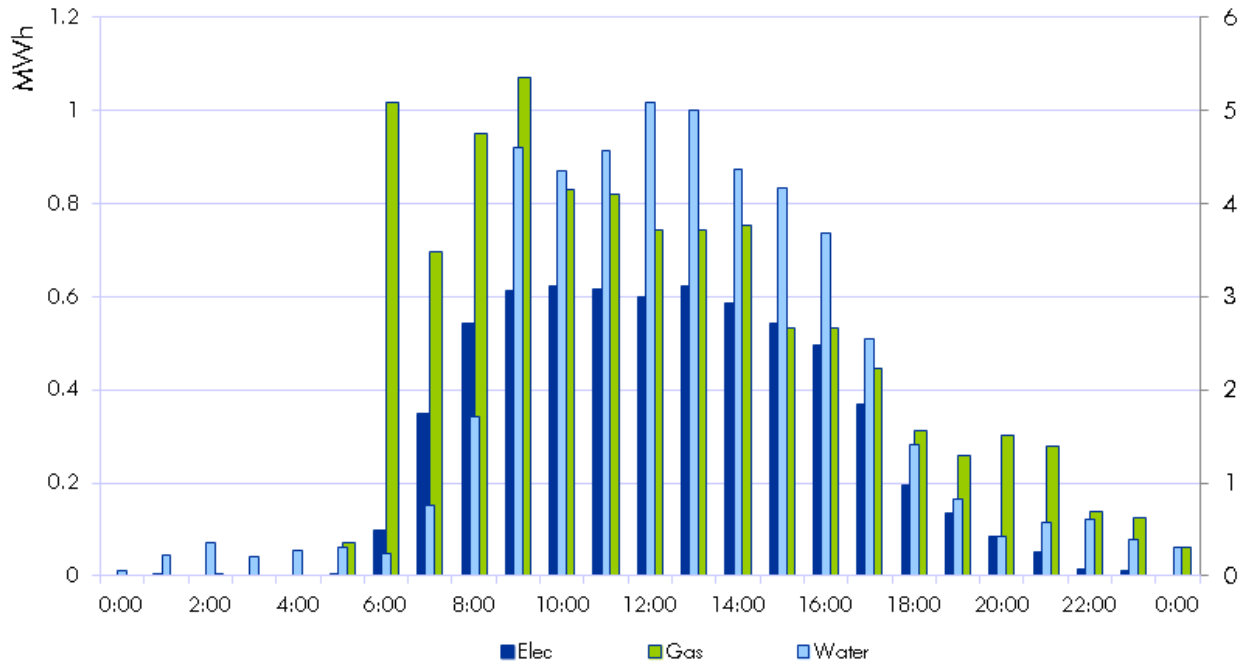


Fig 3: Chart showing electricity, gas and water use in Civic Offices on Thursday, 23rd May 2013

Of the total energy consumed in Civic Offices on a typical day, approximately 64% can be linked directly to people in the building. This amounts to over 17 MWh or €1,400 per day. The Think Energy campaign aimed to reduce this annual consumption by 5%, equating to an annual saving of 207 MWh or €17,000.

3.1.3 Night-time energy audit

A night-time energy audit of Civic Offices took place on 25th June 2013 with 14 people taking part. This audit helped to establish a baseline of the current 10ehavior in the building. Codema and Dublin City Council staff surveyed every office to see what lights and office equipment were left on (either on full or on standby mode) or were switched off.

The information gathered from the audit helped Codema to tailor the implementation of the campaign and to carefully target problem areas within the building.

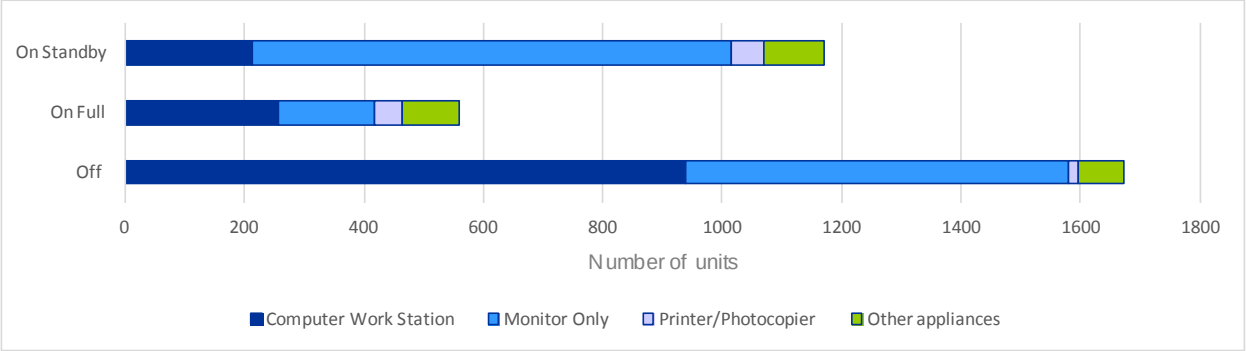


Fig 4: Appliances left off, on full or on standby out of office hours

Just under half of all the appliances surveyed were completely off. Of the remainder 34%, were on standby and 16% were fully on. This showed that there was very significant room for improvement in relation to appliances being left on during out-of-office hours.

The majority of the appliances left on standby (68%) were computer monitors. While in both energy and monetary terms this energy use is quite small, accounting for an estimated €1,359 per year, turning off a computer monitor is a very simple action and this is just for one building in Dublin City. Appliances that are left on full power have a much bigger impact, accounting for an estimated €39,983 per year in wasted electricity, which is almost one month's electricity usage for the building. Of this the electricity used by computers (CPUs) that are left on fully account for 67% or €26,856. The IS department in Civic Offices implemented a night-watchman system around this time to remotely turn off all the PCs in the building at 5pm every evening, however there are 105 PCs excluded from this which will still cost over €10,000 in electricity costs per year.

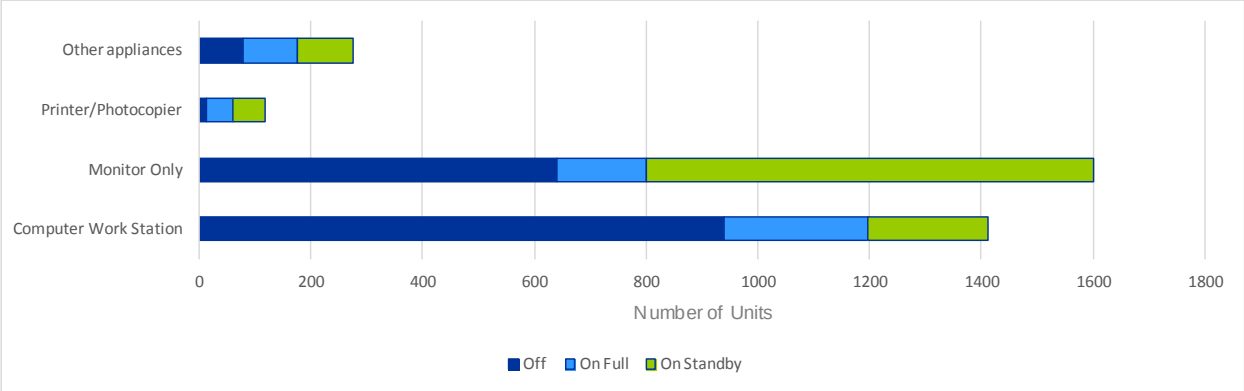


Fig 5: Breakdown of appliances switched off, on full power or on standby mode out of office hours

During the survey it was also noted that a significant number of lights were left on particularly in the toilet areas and in some of the offices (meeting rooms, store rooms, main office area). Lighting in general is much more energy intensive than computers and so it only takes a small number of lights to have a significant impact in the overall energy consumption.

However, of much greater concern was the number of air-conditioning units that were left on full power during the night. These units have very significant energy consumption and need to be closely monitored as they tend to be very silent by design and run in the background and hence are easy to forget. These units left on full power will consume more energy than all the other appliances combined.

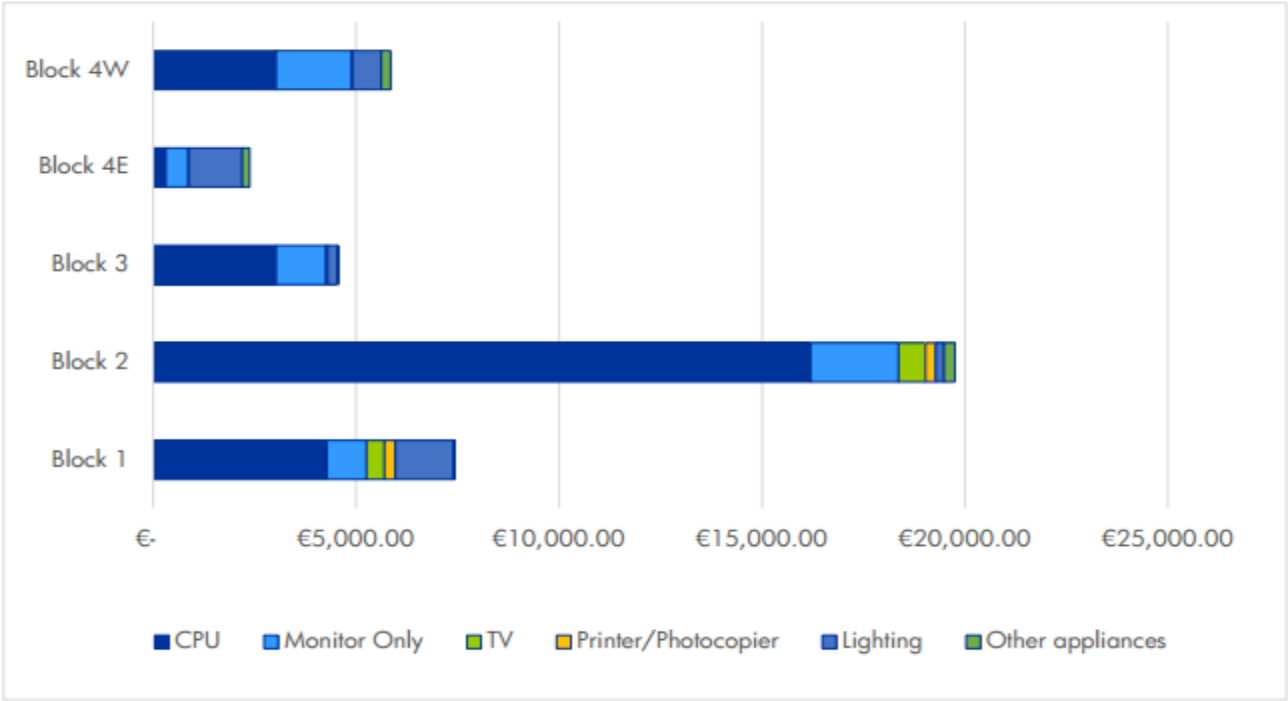


Fig 6: Annual cost of appliances left on out of office hours. Appliances left off, on full power or on standby mode out of office hour

3.2 Implementation of Think Energy

3.2.1 Staff Survey

Think Energy was officially launched with a staff survey about energy awareness on Wednesday, 26th June 2013 during EU Sustainable Energy Week. The link to the survey was emailed to all Council staff and a notice went up on DubNet, along with an article in First Post. On the same day, Codema also had a stand in the staff canteen of Civic Offices as a further way of promoting the campaign and encouraging staff to complete the survey. 190 staff members completed the survey in total. The main findings of the survey showed that the vast majority (85%) of respondents believed that energy saving is very important to Dublin City Council. A further 94% felt that everyone is responsible for energy management within the Council, with lights (69%), computers (53%) and heating (33%) identified as the main problem areas for energy wastage. Most respondents (78%) cited money as the main reason they try to save energy. Please see Appendix 2 to see read the survey questions in detail.

3.2.2 The Think Energy Hub

The core communications tool developed specifically for the Think Energy campaign was the Think Energy Hub, an interactive online space created to encourage maximum engagement with the staff working in Civic Office. This was the central focus of the campaign and all data, news, events and general interaction with staff around the campaign flowed from this online portal. The Energy Hub is still live and active today and has been expanded to other areas and local authorities can be seen here http://www.codema.ie/think-energy-home-hub. It has also been adopted to the Buildsmart project and to the Buildsmart website http://www.buildsmart-energy.eu/training/.

For example, the energy hub displayed detailed, real-time information of the energy consumption of the building in a way that staff could easily understand. This information has since been adopted into the screen saver of all PCs within the building. The energy hub also provided valuable energy-saving tips for both the home and workplace, energy saving quizzes for staff to complete and informative videos. Staff were able to interact with the site by providing their own tips or sending in their own videos. In order to celebrate and promote the 'going live' of the energy hub, Codema hosted an energy day in Civic Offices where staff were invited to interact with the campaign and explore the hub using a staff competition as an incentive.

3.2.3 The Think Energy Campaign

The initial Think Energy Campaign ran for one year (from June 2013 to June 2014), in order to cover one full energy cycle. Having researched innovative ideas from national and international energy-saving initiatives, Codema implemented a number of energy saving events that were seasonal in theme to maximize staff interest and interaction. Each month of the campaign focused on a different topic and was supported with both online and offline activities.

A full list of the monthly activities carried out during the campaign can be seen in Appendix 1.

3.3 Campaign Evaluation

Dublin City Council's Civic Offices is a large consumer of energy with up to 1,500 staff working and consuming energy in the building during peak hours. However, this offers great potential for both energy and cost savings. While many savings can only come from building upgrades and the introduction of more sophisticated technology, changes in staff behaviour can have a significant impact on energy reduction and can often be implemented far more quickly and cheaply than building upgrades. The ethos behind Think Energy was to show Dublin City Council as exemplary in implementing a holistic energy campaign that can easily be applied to other local authority buildings and in the home as well, thus achieving even further energy savings over the lifetime of the campaign.

The objectives of the Think Energy campaign were as follows:

- Raise awareness about why and how staff can save energy
- Increase the understanding of how and where energy is used in the building
- Change behaviour & consequently save on energy and cost - to reduce annual consumption by at least 5%, equating to an annual saving of 207 MWh or €17,000
- To develop a campaign that can be successfully replicated in other buildings

3.3.1 Indicators of the programme's success

In order to fully assess the impact of Think Energy in achieving actual energy savings a number of key performance indicators were considered.

2. **Staff engagement with the campaign**

Over the course of the campaign a total of 3,132 engagements with staff were recorded. The significant majority of these engagements were made through the Think Energy Online Hub (2,346) amounting to 75% of the total. This is quite significant as the Think Energy Hub is the centerpiece of the Think Energy Campaign and is the source of the principal energy savings messages that the campaign strived to communicate. The main purpose of the various monthly events carried out throughout the year was to drive traffic to the Think Energy Hub and in this regard the events were very successful considering the target audience totaled just 1,500 people.

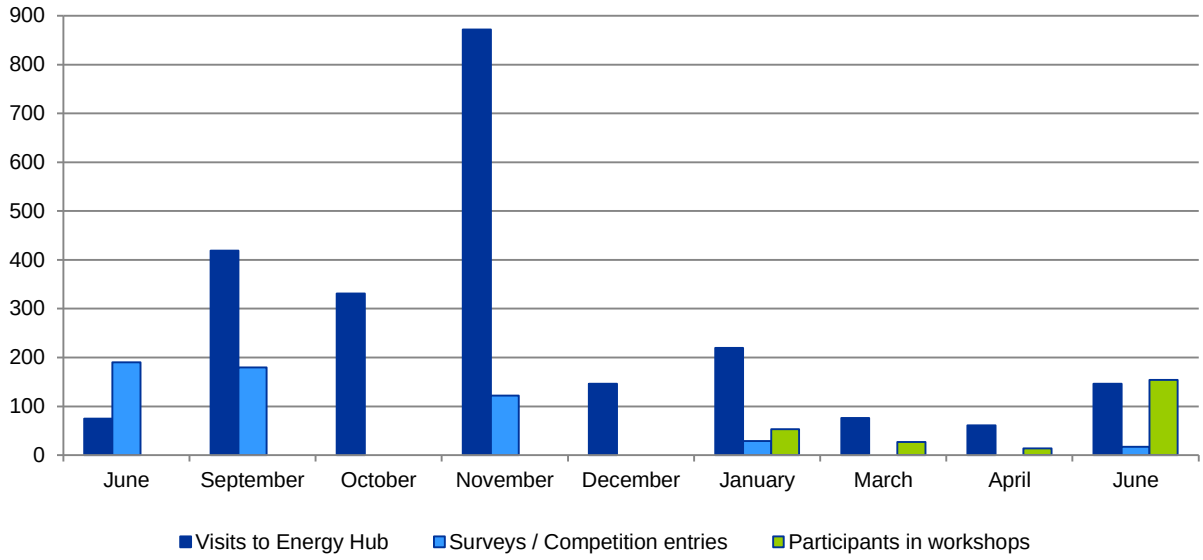


Fig 7: Staff engagement numbers with the Think Energy campaign

The most successful event by far was the Christmas Colouring Competition which targeted the staff's children. This resulted in a total of 872 visits to the online hub. The next most successful event was the competition that was held in September for a two night stay in an eco lodge (419 visits to the online hub), followed closely by a Halloween poster event (331 visit to the energy hub). A number of face to face workshops were held in the second half of the campaign. These were also very successful with a total engagement of 248 people. The most successful workshop was the lunch time talk on energy saving in the home. This was held in January and was attended by 53 people.

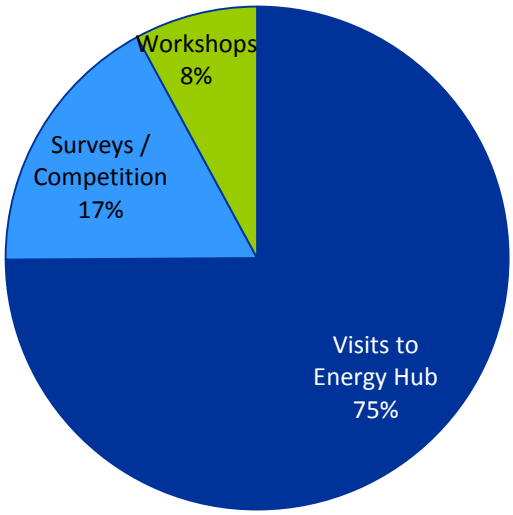


Fig 8: Areas of staff engagement with Think Energy

2. Energy reduction in the building

The principal indicator in measuring the success of the campaign is actual energy reduction in the building. In order to measure the actual energy reduction in the building over the course of the campaign, a baseline for both gas and electricity consumption was generated. This baseline was calculated using regression analysis based on the historical energy consumption data for the building. The main driving factor for the gas consumption was external temperature (degree days) and the main driver for electricity was building occupancy.

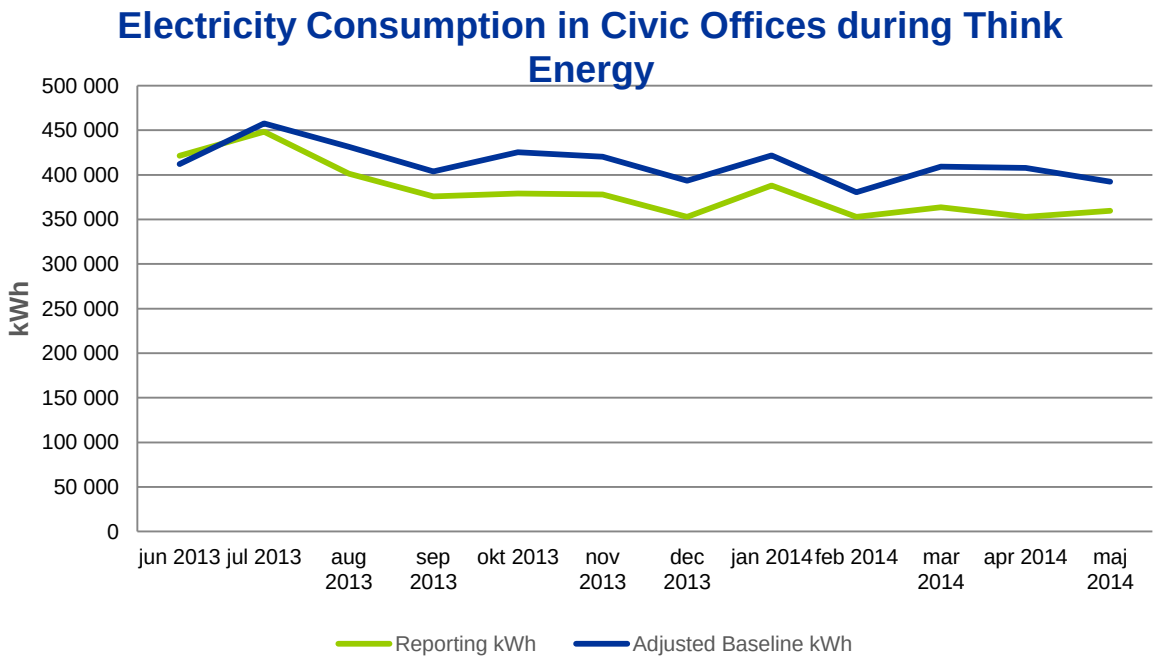


Fig 9: Comparison of electricity consumption during Think Energy with temperature adjusted baseline

As figure 9 shows, electricity consumption reduced by 8% over the course of the campaign. However directly attributing actual energy reductions to the campaign is rather difficult. Over the course of the campaign a number of energy conservation measures were implemented in the building by facilities management. Detailed information on these measures and their effect on energy consumption is not available, as the actions were not formally recorded. Without a detailed record of each action, it is impossible to say exactly how much of the 8% savings were directly linked to the Think Energy campaign. All we can say with certainty is that an 8% reduction was achieved during the period that the campaign was active.

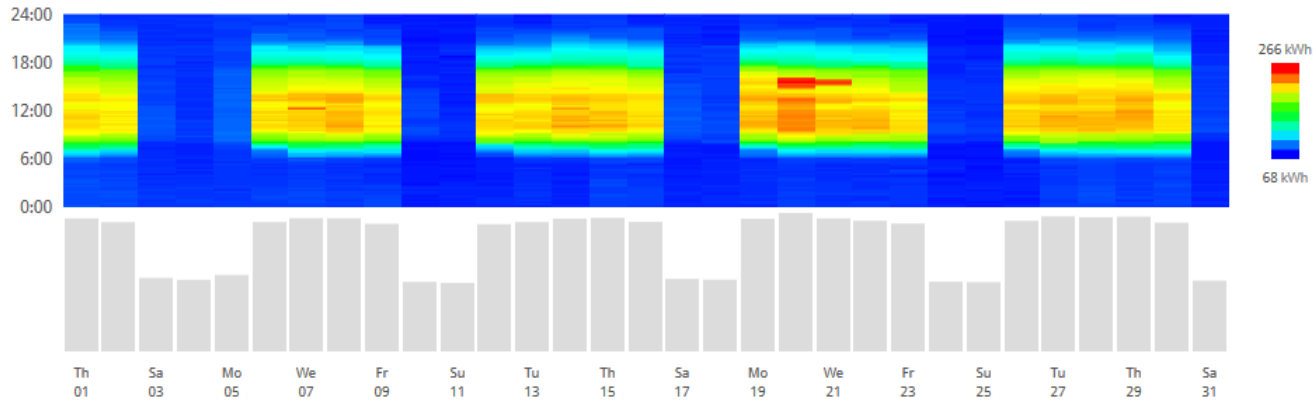


Fig 10: Spectral analysis of 15 minute electricity consumption for the month of May 2014

If we review the spectral analysis of the electricity consumption for May 2014 (figure 10) and compare it to the earlier spectral analysis of May 2013 (figure 2) we can see some evidence of reduced electricity consumption outside of the main office hours, this is illustrated by the more clearly defined weekly blocks and significant reduction in consumption on the May public holiday (5th May).

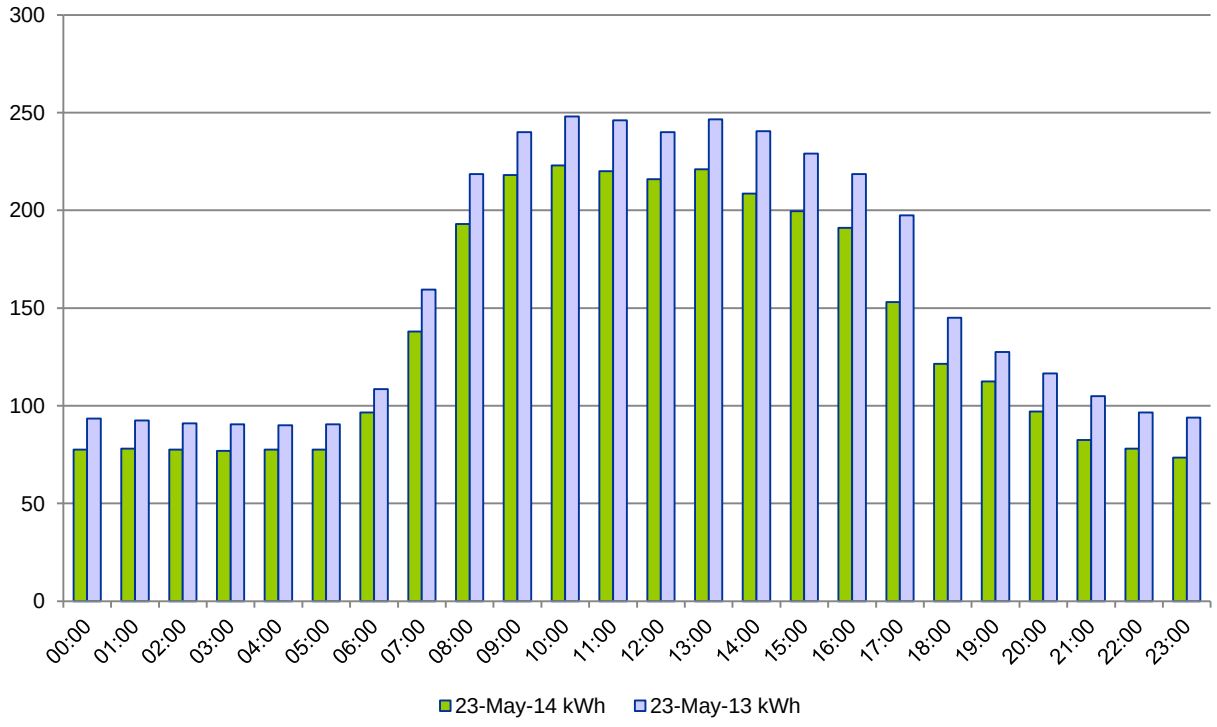


Fig 11: Comparison of electricity consumption on the 23rd of May 2013 and 2014

In figure 11 we can see a comparison between electricity consumption on the 23rd May 2013 and the same day in 2014. This chart again illustrates that a considerable reduction in energy consumption was achieved a considerable reduction in daily energy consumption was achieved. A reduction in energy during the out of office hours can be seen between the hours of midnight and 8am and again between 6pm and 11pm. The staff occupying the building has little to no effect on energy consumed during these hours. However, the staff does have a very direct effect on the energy consumed during the hours of 8am to 6pm. Careful inspection of figure 11 shows that there is a greater energy reduction during the peak office hours than during the out-of-office hours period. The total energy reduction for this day is 517 kWh, the proportion of this saving attributable to the out of hours period is 212 kWh, with 315 kWh attributable to office hours. A similar pattern can be seen throughout the year. This would indicate a reduction in energy consumption by staff during office hours.

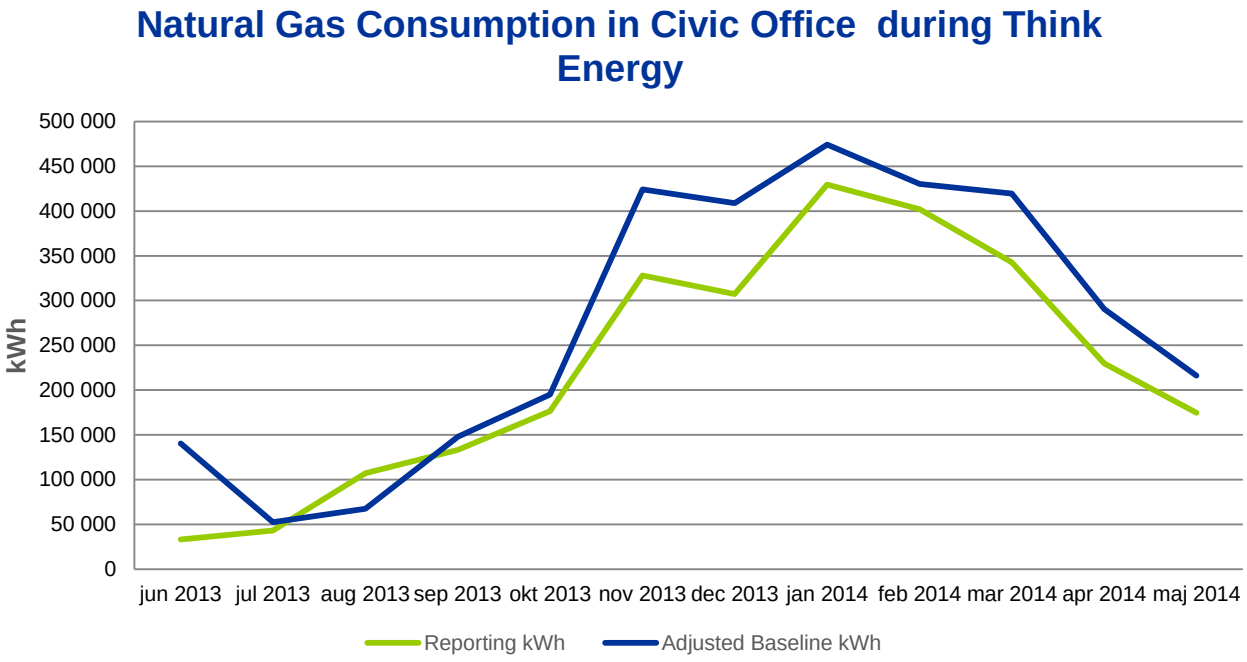


Fig 12: Comparison of natural gas consumption during Think Energy with temperature adjusted baseline

Considerable savings were also achieved in the consumption of natural gas over the same period. From figure 12 we can see that gas consumption reduced by 21%. Overall, the combined energy savings achieved over the course of the campaign amount to 13%, which is considerably more than the 5% target. While it is not possible to directly proportion an amount of these savings to changes in staff 17ehavior, it can be argued that some of these savings occurred as a result of the constant energy saving message that was delivered by Think Energy over the year.

3.4 Key Outcomes and Lessons Learned

As this initial campaign was Codema's first behavioural awareness campaign of such magnitude many valuable lessons were learned in relation to the communication of the energy saving message. One of the most successful aspects of the pilot project was the Think Energy Online Hub. Over the course of the majority of engagements were made through the Think Energy Online Hub (2,346) amounting to 75% of the total making it by far the most effective communications channel.

The campaign was also very successful in achieving actual energy savings in the building, achieving an overall reduction of 13%, 8% more than the target set at the outset of the campaign.

A key outcome of the initial phase of the pilot was the recognition of the need to focus the message on the individual and all aspects of their life and not limit the message to the work place.

Another key element of successfully delivering this message is the Energy Ambassador. The Energy Ambassadors are key for the long term sustainability of the campaign. The ambassadors receive energy training on how to save energy in the home and in the office and this in turn enables them to transfer this message to their colleagues, neighbors, family and friends.

During the delivery of the Think Energy campaign in the Dublin City Council Civic Offices, two distinct types of ambassador were identified, the "Energy Change Makers" and "Energy Change Supporters". The "Energy Change Makers" are all employees who work with energy or can make decisions in relation to energy topics (such as the facilities manager). They would be responsible or indirectly responsible for decisions made on energy upgrades etc. They have an interest in energy as it is part of their job performance and they can get a better reputation by enabling this.

The second group of ambassador are the "Energy Change Supporters", who may work in areas without direct influence over energy consumption in the building (such as legal, customer service, etc.). They are not motivated by job performance but interested in learning more about energy to improve Home Comfort. They are a crucial part of the campaign as they help with the implementation (putting up posters, spreading the message, helping at event, etc). Once they have learnt about what to change at home and their experience with this, they will use the same practices at work. Most commercial and large residential buildings typically have 2-3 Energy Change Makers and the rest are Energy Supporters. A critical aspect of early engagement of the ambassador is the energy saving message for the home. If the campaign does not deliver a home energy saving message, then it may struggle to get off the ground as it will not have the general support it requires to succeed.

4 Phase 2: Adaptation of the local training programme to the demonstration sites

4.1 Adapting the Campaign for Other Locations

Based on the valuable experience gained and the various lessons learned in the development and delivery of Think Energy in the Dublin City Council; Civic Offices, four key documents were created to support the roll out of the campaign to other locations:

1. Think Energy - Step-by-Step Behavioural Change Training Programme
2. Think Energy - How to develop the Think Energy Online Hub
3. Think Energy - Energy Ambassador Support Manual
4. Think Energy - Training Guide to Energy Efficiency

The aim of the generic guide is to allow the project partners (and others) to develop and deliver an effective behavioural awareness campaign. The campaign is designed so that it can be delivered over any time period and can be tailored to match available resources. This material is developed as a step by step guide with examples and suggestions of how it may be implemented in different building types. It also provides guidance on how to utilise all the additional promotional material that was created for the delivery of the pilot project and how this can be adapted locally. These main guide documents are supported by the *Think Energy Resource Catalogue.* The catalogue contains all the template documents developed during the delivery of the Think Energy campaign in the Civic Offices, including all survey documents, competition documents, online hub documents, etc.

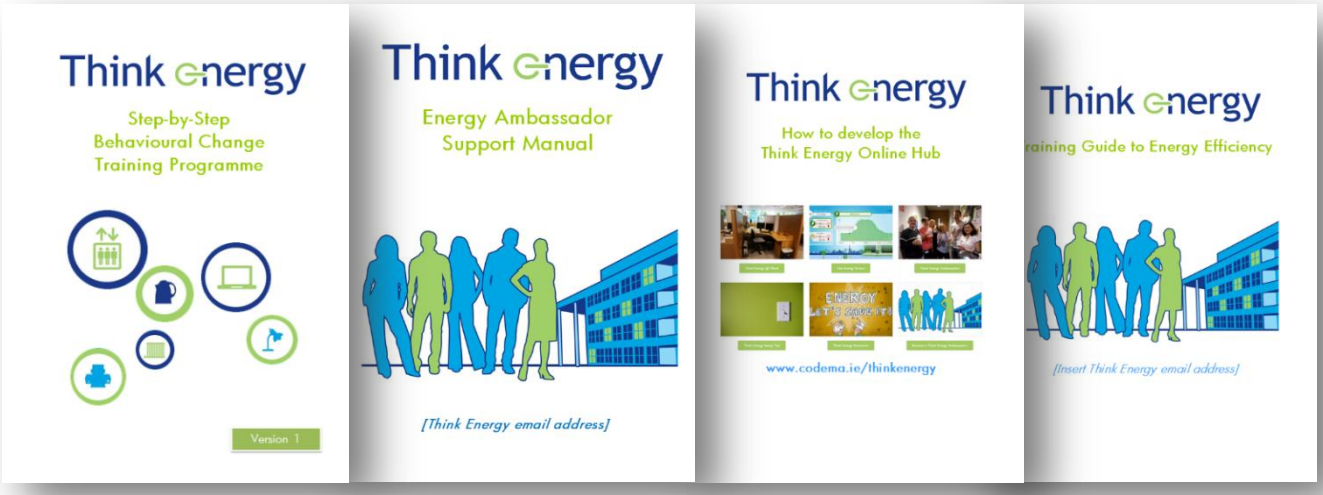


Fig 13: Think Energy campaign development and training guides

4.1.1 Step-by-Step Behavioural Change Training Programme

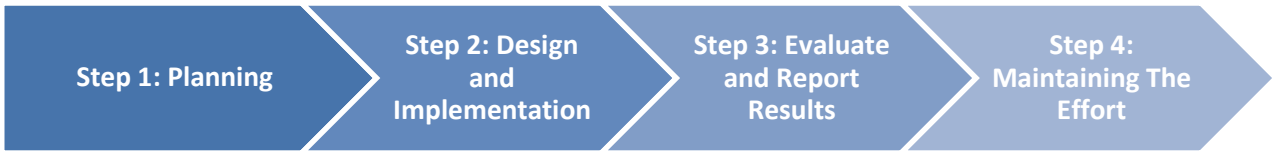
This document introduces the Think Energy campaign and provides a step-by-step guide to its implementation. It shows how behavioural change can have a real impact on energy bills, CO_2 emissions and on energy waste reduction. The guide is accompanied by two training documents which help deliver energy training to users or occupants in the BuildSmart demonstration sites. However, the guide can also be used independently by anyone who wishes to implement a behavioural change campaign.

Each section of the guide provides examples for implementation in three different types of buildings: hotels, commercial/public buildings and residential buildings, which helps the adaptation of the campaign to these target audiences. The following symbols are used throughout the document to indicate appropriate actions for particular building types, making the document more user-friendly.

A development example is provided under some of the sections to clarify the step and highlight the approach that was taken in a public building in Dublin, the pilot-test of the campaign. The reader is also given a list of the Think Energy training materials which should be used during the lifespan of the campaign.

A wide range of training materials was developed as part of the Think Energy campaign, of which some are referred to throughout the guide by using the displayed Think Energy file icon. The user of the document is encouraged to look up the material in the *Think Energy Resource Catalogue* and use or adapt the resources according to their local needs.

To create a successful behavioural change campaign and train Think Energy Ambassadors on energy awareness, it is recommended to apply the following four steps:



Step 1: Planning

The planning step is essential for the success of every behavioural change campaign as it involves research, the setting of appropriate targets and working towards the implementation of the campaign together with your campaign team. The guide takes the user through the main steps of allocating a budget for the campaign, setting a timeframe and conducting background research on the building in question, such as collecting baseline energy data and conducting and energy audit of the building. The guide also helps the user to establish a mission and goals for the campaign and to define the target audience from which suitable communications channels and content can be based. The guide also advises on the establishment of a Think Energy team and the recruitment of Think Energy Ambassadors.

Step 2: Design and Implementation

The second step guides the user through the design and implementation of the campaign, offering advice on how best to launch the campaign and the planning of seasonal events and activities. It also provides advice on how to train the Think Energy Ambassadors.

Step 3: Evaluate and Report Results

The third step focuses on the results of the campaign. The evaluation of the campaign and its results is of essential importance for the further tailoring of the programme as well as to report the success of the campaign to the management. The guide offers advice on setting performance indicators, gathering feedback and the reporting of results. The guide advises the user to obtain feedback on the programme's effectiveness through surveys and to consider a mid-course evaluation as well as a final evaluation at the end of the campaign.

Step 4: Maintaining the effort

The final step focuses on maintaining the gains that have been achieved during the campaign, making energy awareness a part of the culture of the organisation or ethos of the community. The guide highlights the importance of including energy efficient practices in workplace procedures or bringing it up at regular community meetings. Communication channels need to be maintained and materials refreshed at regular intervals. The guide highlights the possibility of reinvesting financial savings in future energy conservation measures and the need to engage new employees or residents at an early stage.

4.1.2 How to Develop the Think Energy Online Hub

One of the core aspects of Think Energy is to provide energy saving tips to employees and residents, allowing them to become their own energy managers. This information should be delivered in an engaging and interactive way. The Think Energy Online Hub therefore offers a platform where the end-users can find useful resources such as informative videos, seasonal energy saving tips, live energy data for their building as well as advice from the Think Energy Ambassadors. The Online Hub is the main communications tool for the Think Energy campaign, and can easily be updated and integrated into

existing websites. It allows the campaign organisers to add latest campaign news, promote an upcoming event as well as communicate the wider social and economic sustainability issues.

This guide takes users through the various elements of the online hub such as the homepage, interactive features, the Think Energy tips and resource page, the Think Energy ambassadors page and live energy display screen. Users are also invited to visit http://www.codema.ie/think-energy-home-hub for the implementation example in Dublin.

4.1.3 Energy Ambassador Support Manual

To carry out a successful energy awareness campaign, it is very important to provide information and educational resources to the target audience. While the Think Energy Online Hub, together with supporting events and activities, provides an effective communications channel, information is best spread through “word-of-mouth”. This can be achieved through the dissemination of the "energy-saving message" by the Think Energy Ambassadors. These Think Energy Ambassadors may be volunteers or nominated by an organisation to help spread the word, talk to their neighbours or colleagues and help distribute communication materials. The ambassadors will best know their environment and can therefore identify energy saving opportunities by conducting energy walkabouts or applying energy checklists at home.

This guide is aimed at the potential Think Energy Ambassador. The document guides them through the role of Think Energy Ambassador and illustrates examples of how one person can make a difference and implement real change and addresses some of the more frequently asked questions in relation to energy and climate. It also focuses on the more practical role within Think Energy such as how to conduct an energy walkabout of a building.

4.1.4 Training Guide to Energy Efficiency

This document was prepared as a training guide to energy efficiency. It provides a suggested training schedule for Think Energy Ambassadors and gives useful tips on how to save energy in a building by looking at space heating, domestic hot water, appliances, lighting, cooking transport and energy monitoring and rating.

While this Training Guide to Energy Efficiency provides energy tips which can be applied at home and at work, more specific advice is given to hotels and public buildings in the last section of the document.

This guide can also be used as a checklist for actions and may be adapted by BuildSmart partners depending on the building type of their demonstration site. They may also wish to prioritise different energy saving tips to match their climate zone.

4.2 Delivering the Think Energy Campaign in the Demonstration Sites

Once the creation of the generic training material was complete, the next task was the adoption of this programme to the Buildsmart demonstration sites. This phase proved very difficult for two key reasons. The first issue was with the delays in project initiation and completion. The second is related to the measurement of energy and the generation of a baseline.

The economic crisis that affected Europe in the first year of the project was the main reason for the delay in the construction of the demonstration projects. This resulted in a number of planned demonstration projects withdrawing from BuildSmart including the pilot project planned in Dublin. This delay to the development of the pilot projects made it very difficult to implement Think Energy in a similar way to the Dublin Civic Offices example. As we will see, the most successful engagement was in the Roth residential building in Hyllie, which was the only demonstration building to proceed as planned.

The second and much more significant issue, in terms of delivering a successful awareness campaign, was the availability of complete and historical energy information. As the demonstration buildings were all new developments, no historical information was available and therefore the information that was available may not give a true reflection of the performance of such buildings. It is impossible to develop a baseline for energy consumption from which to measure the success of the campaign, as was possible in the Dublin Civic Offices example. In reality a meaningful bassline can only be generated after two to three years of occupancy. This allows for a suitable period of time during which all initial issues with building energy system commissioning can be resolved. It also allows time for the building to reach full occupancy for a full measurement cycle of one year. The use of standard energy benchmarks for similar buildings from which to measure success would not yield meaningful results as until the building is fully occupied and all technical issues resolved, the measured energy use for the building will not give a true reflection of the building performance.

Despite these issues, Codema did endeavour to assist the project partners in adopting and delivering the Think Energy campaign in each of the demonstration sites. To initiate this process, Codema contacted each of the partners to discuss how the programme could be delivered in their demonstration sites. A needs assessment was sent to each of the demonstration sites to evaluate the individual requirements of each site and to better understand what was currently in place, where end-users had difficulties and what training opportunities existed. The needs assessments highlighted a number of existing training programmes that were being delivered such as the training offered by E.ON in the Hyllie residential building and Skanska's internal training and initiation programmes.

Once the needs assessments were completed and returned Codema developed *End-User Training Specifications* for each demonstration project. These documents included general building information, details of the target audience such as types of tenancy and current energy awareness. It also included information on energy consumption and cost and key technologies used in the building and details on live energy feedback systems. It examined energy training already undertaken or planned and suitable communications channels for the campaign.

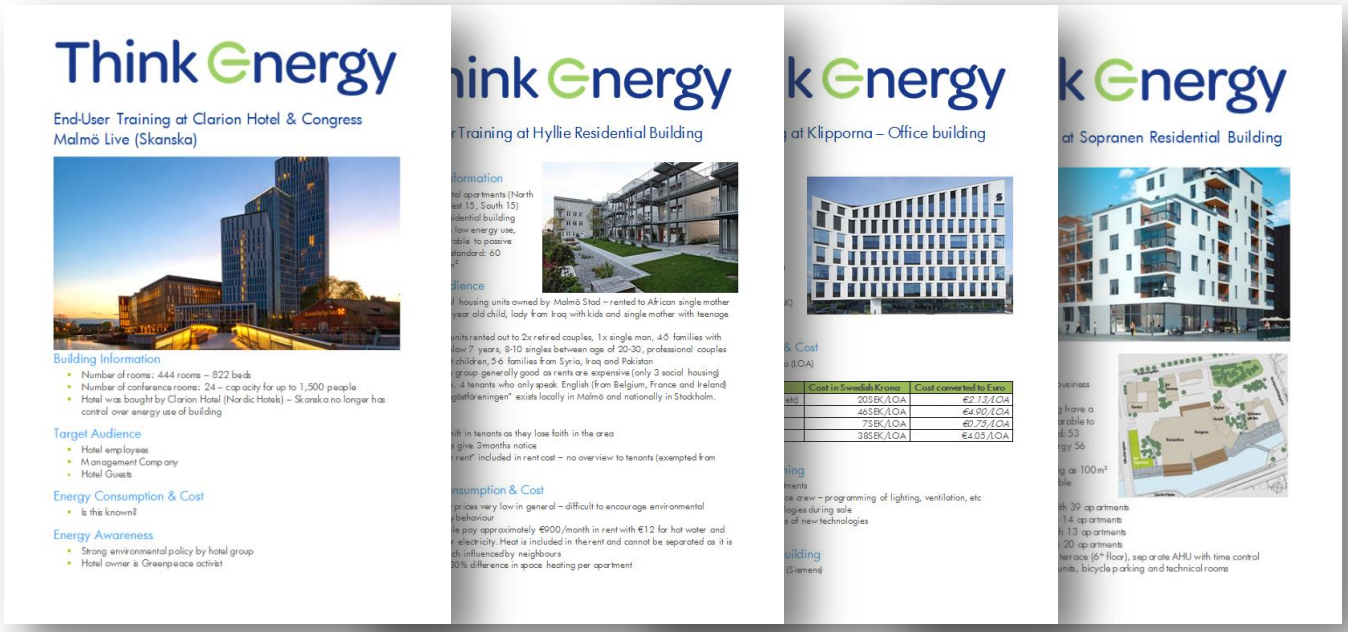


Fig 14: End-User Training Specification Examples

The next step was to Train the Trainer. These sessions were delivered through individual consultations with each partner as it was deemed to be more effective than a group session. To deliver these sessions Codema visited each of the demonstration sites, traveling to Malmo in October 2015 and Bilbao in November 2015.

4.2.1 Hyllie Residential Building (ROTH)
Planning the campaign:

The Hyllie residential building consists of 53 rental apartments. The building has a low energy use, comparable to passive house standard: 60 kWh/m^2. The tenancy of the building is a mixture of retired couples, single occupants, families with young children and young professional couples without children. There are also a number of different nationalities living in the building and some who only speak English. The income levels of the tenants are generally good as the rents in this area of Malmo are expensive. Three of the apartments are rented by Malmo Stad and are used as social housing.

The turnover of tenancy is approximately 30% as the area which is still underdevelopment and still feels somewhat like a construction site. However this is changed rapidly with new buildings being completed in the area.

Energy prices are very low in general and this makes it difficult to encourage environmentally friendly behaviour. Rent of two people is approximately €900 per month with €12 for hot water and €35 for electricity. Heat is included in the rent and cannot be separated as it is influenced greatly by neighbours which is common in all Swedish apartment blocks. If this is separated, tenants living in mid-floor, mid-terrace apartments will have much lower heating bills than those living on the top floor or end of terrace apartments. There can be up to a 30% difference in space heating for a similar apartment.

In 2015, the building consumed 102,642 kWh for tenant electricity, 118,597 kWh for space heating and 100,600 kWh for hot water. Electricty and hot water consumption remained relatively consistent throughout the year, consuming approximately 8,500 kWh each, per month. Space heating demand responded to external temperatures as expected with little or no consumption during the summer months.

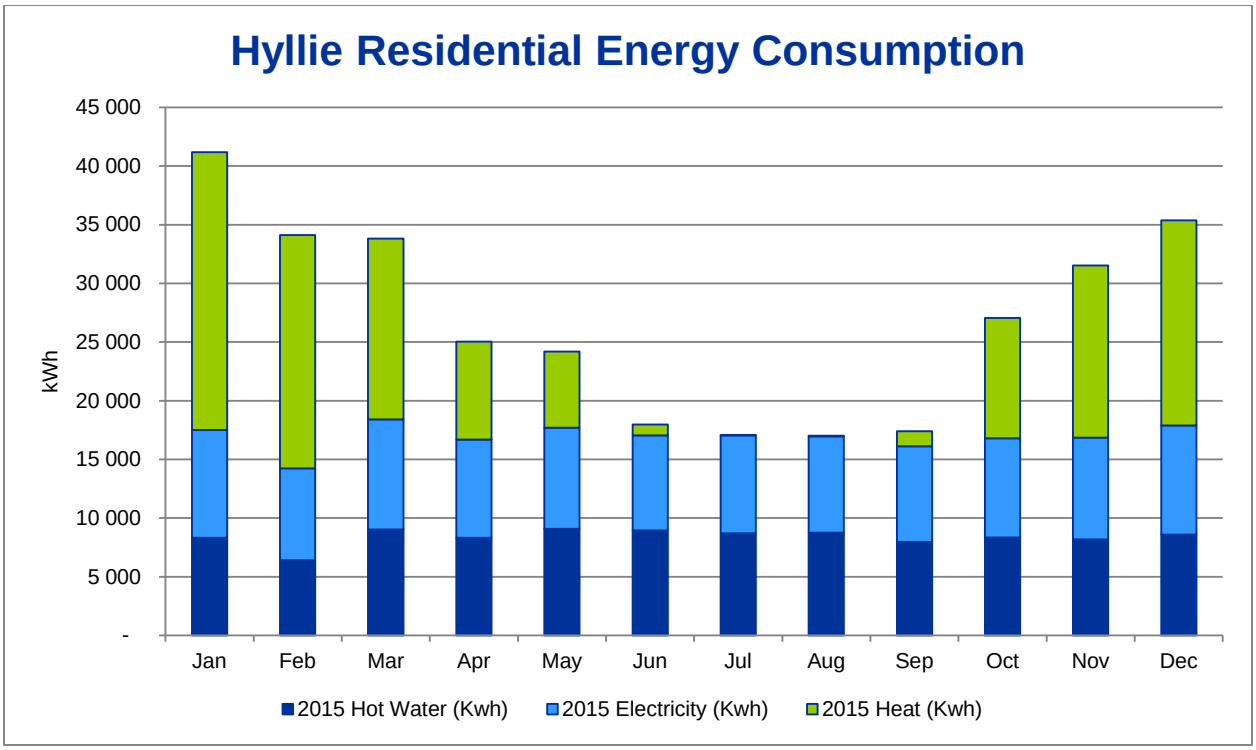


Figure 15: Energy consumption in Hyllie residential during 2015

Levels of energy awareness is considered very low among tenants with little interest in behavioural changes to reduce energy. One of the main reasons for this is the low cost of energy. Space heating is the largest energy consumer but tenants are not being directly charged for this as it is included in the rent.

Key technologies of the building:

- High performance, well insulated building envelope reduces energy need for heating
- Ventilation with high energy recovery and individualised per apartment so that the flow can be adapted to each household.
- Advanced steering and control systems will reduce energy for ventilation and lighting. Lighting with motion detectors.
- Measuring and visualising household's consumption of tap water, heating and electricity will involve and motivate tenants to reduce energy use and change consumption patterns - Smart home system from E.ON. via an iPod Touch in the hall, tenants can follow their energy consumption in cost, and they have the possibility to sign electricity contracts linked to spot prices on the power exchange Nord Pool.

Implementing the campaign:

The main training at the Hyllie building was delivered on a tenant bases as this was deemed the best way to deliver the training on site. In addition to this tenant by tenant training two training events were also delivered on the E.on system but low attendance with only 10-12 tenants out of 53 attending.

In the Hyllie building each apartment is equipped with a live energy feedback device. This a system developed by Eon and is in the form of a smart energy, application on an Apple device providing information on the tenants energy consumption directly into their apartment. The system appears to be working well, however there have been a number of technical issues with application updates, and a potential future issue of Apple support for the iPods that are currently installed in each apartment.

There was another technical issue with the thermostats installed in each apartment. As they were battery-powered, they lose power after approximately 4 months. This resulted in an almost continuous task of changing the 3xAAA batteries in each thermostat which costs a lot of money and time. These thermostats have now all been replaced with main electricity powered alternatives.

A range of information material is also provided to each new tenant in the building including the Think Energy guide for residents, a manual describing the E.ON system, an additional 2-page leaflet on key functions of the E.on system, a more digestible information format developed by Rikard Roth and information video developed in both Swedish and English demonstrating how to use the Eon system and to better understand the tenants energy use within the apartment. E.on carried out a survey through the app with 35 questions in Swedish. However there were only 9 respondents and only 2 surveys completed

Figure 16: App demonstration video

Key focus areas of the training:

- Temperature controls of apartments – as apartments use underfloor heating and not radiators the response time will be slower. Floor remain cold even if fully working at 21-22°C
- Ventilation system and airing of apartments – it is a tradition in Sweden to air out apartments by opening the windows for a period of time. However, this has a significant effect on the energy performance of the building by reducing surface temperatures and reducing the effectiveness of the ventilation system.
- Solar Thermal technology - explaining what this is and how it works and that it is independent of the District Heating system.
- Electricity and Hot Water – providing information on how to reduce consumption is important as these are the only parts of the energy bill that tenants have direct control of. However the costs of these are very low in Sweden and so it can be difficult to motivate the tenant. For example, cold water charges were introduced in January 2015 but no change in consumption behaviour was detected.

Campaign evaluation:

Training in Hyllie was delivered mainly during 2015. A complete year of energy consumption data is available for 2015 and 2016 to date. Based on this information, and as it is the only year of complete data, 2015 was selected as the baseline year from which to measure the impact of the training in energy terms.

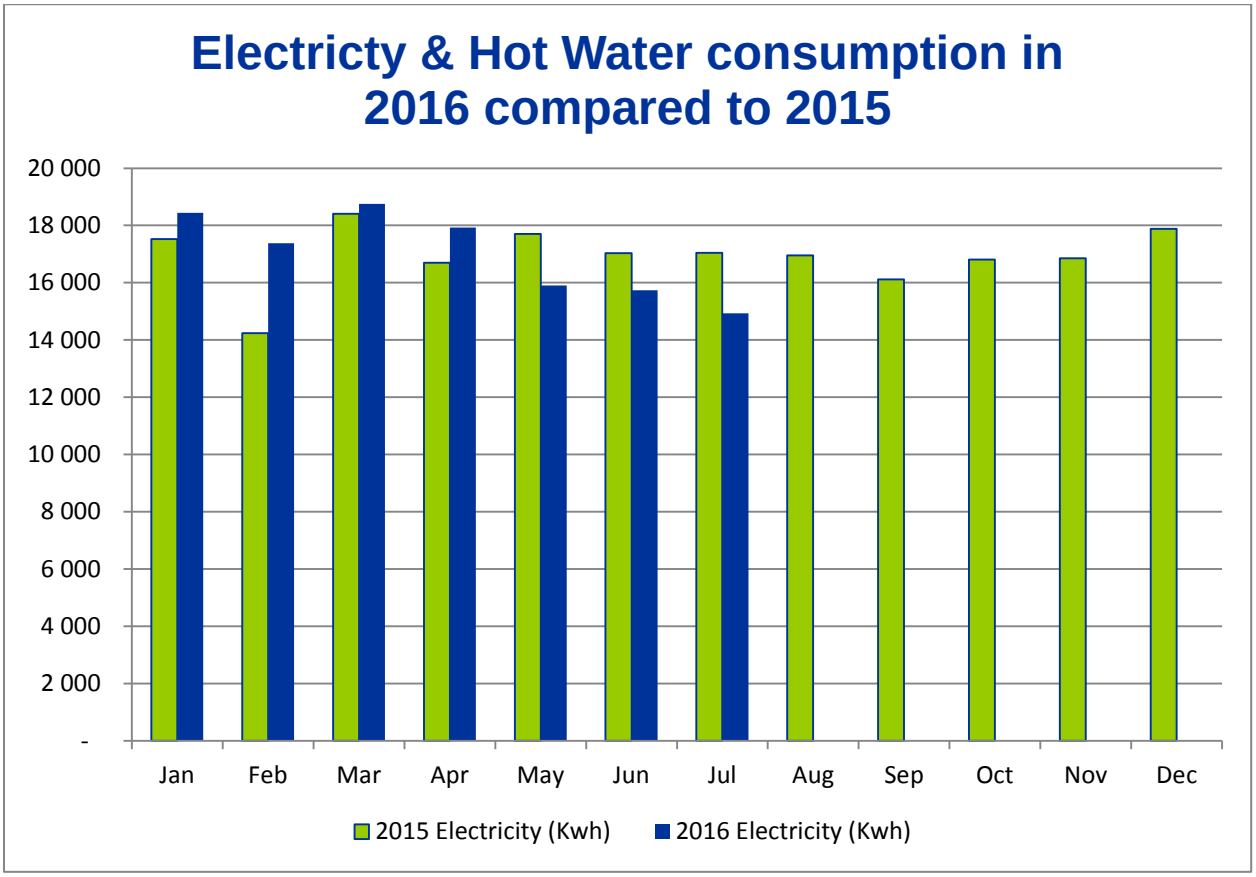


Figure 17: Comparison of electricity consumption in Hyllie residential between 2015 and 2016

From Figure 17 we can see that electricity and hot water consumption is relatively consistent for both 2015 and 2016. This is the proportion of the energy that the tenants have direct control over. There is a slight reduction evident in the months of May, June and July of 2016, however overall energy consumption in 2016 increased by 0.4% when compared to the same period in 2015.

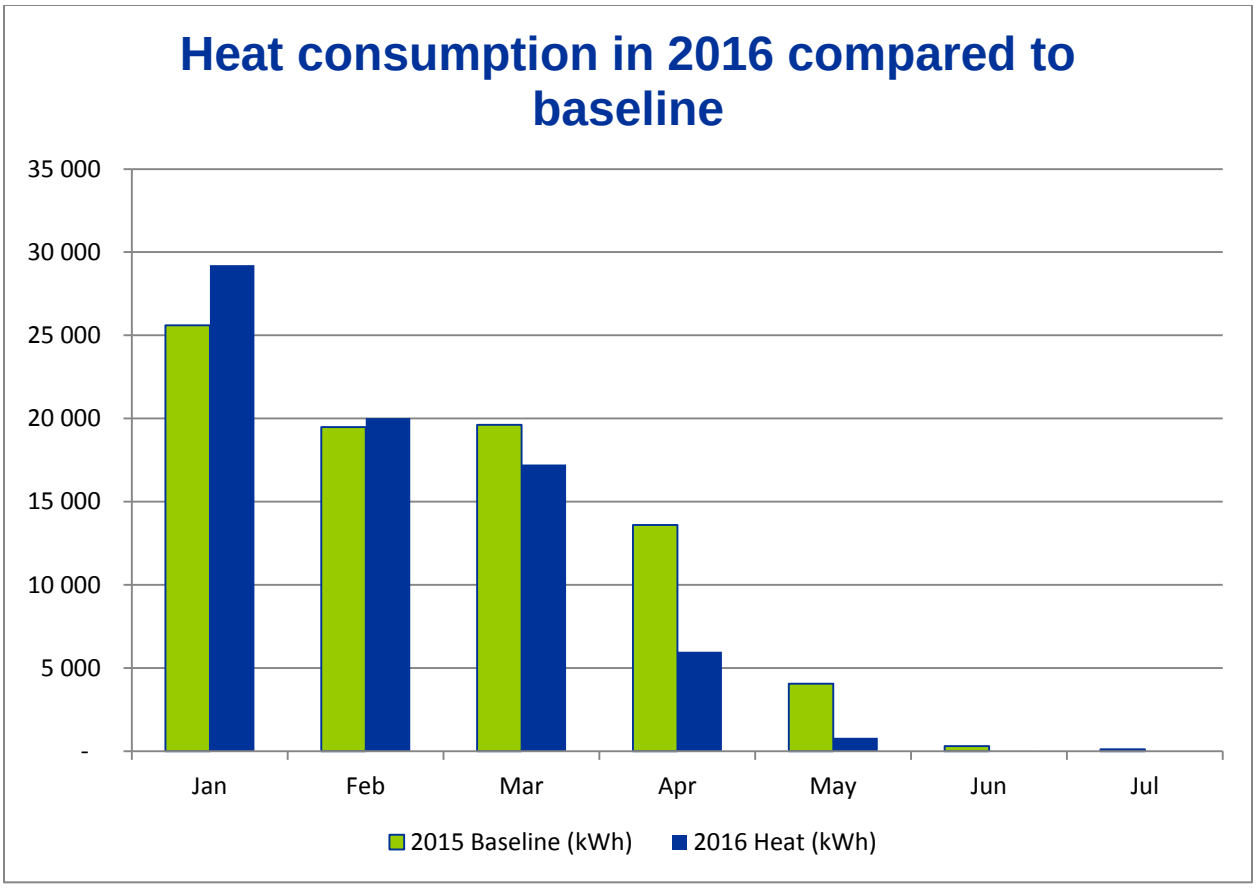


Figure 18: Comparis78yujn on of Heat Demand for Hyllie Residential Between 2015 and 2016 (weather compensated)

However, when we look at heat demand we see a much more significant reduction in energy demand. Once adjusted for climate differences between the two years there is an 11% reduction in heat demand in 2016 when compared to the same period in 2015. This is again mainly as a reduction in demand in the months of March, April, May and June of 2016.

The effectiveness of the training that was delivered and the provision of direct energy feedback in each of the apartments will only become apparent with better quality data. As this building is new, it is only now reaching a fully commissioned state.

4.2.2 Sopranen Residential Building (Skanska)
Planning the campaign:

The Sopranen Residential Building consists of 86 apartments and 4 business facilities. The residential building are designed as low energy buildings, comparable to passive house standard: 53 KWh/m², primary energy 56 KWh/m². Apartments range in size with the largest having a floor area of 100m^2, and there are also smaller bedsits available

The building consists of 4 blocks; Bock A has 14 floors with 39 apartments. Block B has 5 floors with 14 apartments. Block C has 5 floors with 13 apartments and Block D has 8 floors with 20 apartments. There is a common area on roof terrace (the 6th floor).

- Key technologies of the building:
- Better standard of insulation – very air tight
- 2x2 windows instead of triple glass – these can be opened separately
- Advanced mechanical ventilation system, both intake and exhaust with heat recovery system
- Small flat radiators included in apartments as tenants wanted to be able to regulate temperature. No control over air ventilation
- District heating for heating the air in ventilation system and hot water
- Groundfloor shell wall with bricks, other non air insulated plaster walls.
- Carbon filter kitchen fans
- Low energy lighting, LED-lighting for emergency lighting, common areas as stairs and basement
- Energy efficient pumps

4.2.3 The building was constructed between August 2013 - June 2015. Tenants moved in in July 2015 before summer vacation. The building is mainly occupied by older people approaching retirement age who can afford expensive prices (not a rental house) in the centre of Malmö. As with the Hyllie building heating is included in rent. Day to day power consumption and hot water is separately charged on a monthly basis (with 3 months delay). The energy measurement system is up and running, however no data was available at the time of writing this report.

Implementing the campaign:

The main training at the Sopranen Residential Building will be delivered by Skanska. A technical management company was hired by the housing company of the building and they received training orally and in writing on the energy systems within the building. A housing company board took over the administration of the building from the week of 19th Oct 2015. The housing company board was trained on the practical issues in relation to maintenance of the building and information about technology and installations.

The tenants were provided with information in a number of ways ranging from selling evening of apartments where they were provided a lot of information on how the apartments work and the technologies employed. In addition, 1 month before tenants moved in a large event in was organized in Malmö Live for new tenants about the energy consumption of the buildings. All businesses involved in the construction and commissioning of the apartments presented at this event. In addition Skanska provided a passivhus Information Sheet to residents which included energy saving tips and how to ventilate a passive house. The housing company now acts as Energy Ambassador for the tenants.

A number of issues were raised by the tenants about the new energy features in the building. There were a number of questions from tenants about why the windows are so wide (2 double glazed window units) which they found very heavy to open. There were some issues with the heat buildup in the concrete in late summer, causing confusion about ventilation of the apartments. There were also questions as to why the radiators are so small. The airing of apartments was also raised (similar to the problems in the Hyllie building) and it had to be explained why tenants should not open the windows for long periods.

Four live smart screens were originally installed at each entrance which displayed live data on energy consumption in the building, but these were unfortunately stolen. There are plans to replace these. In addition, there is a web platform to show energy consumption for building as a whole and individual apartments. Tenants have login details to energy consumption as individuals.

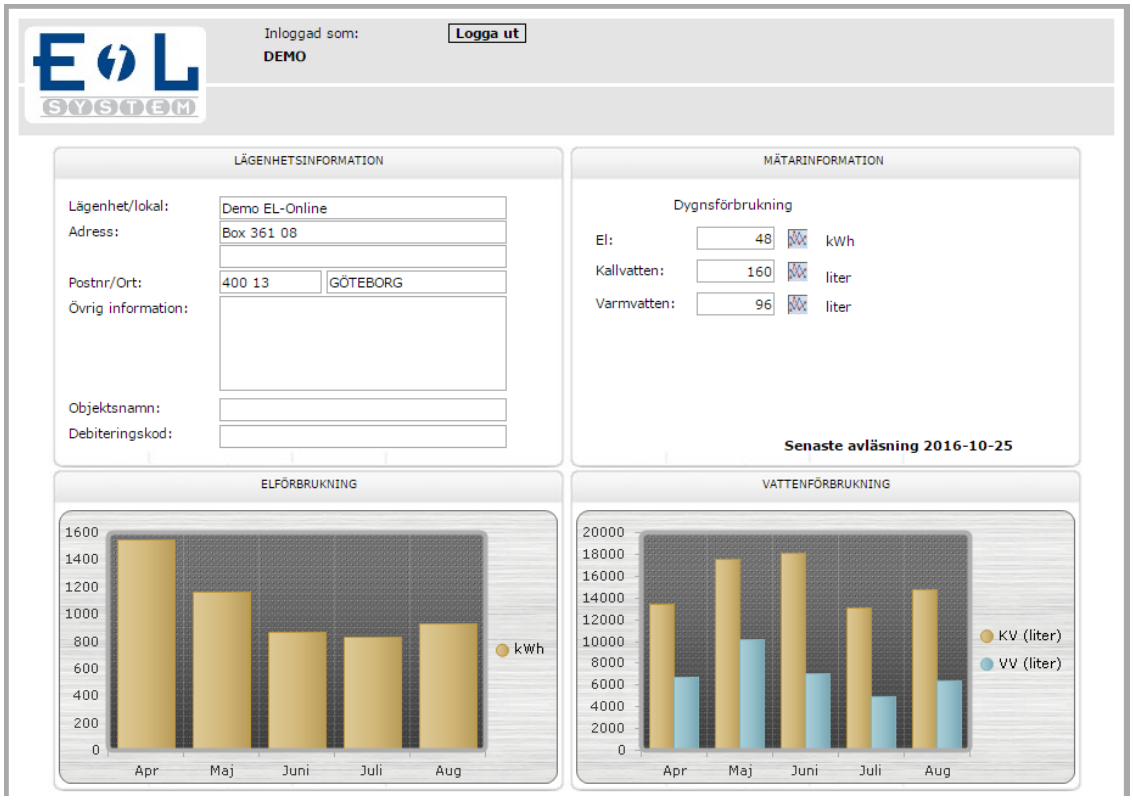


Figure 17: Demo login for the energy and water consumption used to the tenants.

As the building is new, no historical energy consumption information is available and as the building was first occupied in summer 2015, there is not enough information to give a true reflection of the performance of the building. It is impossible to develop a baseline for energy consumption from which to measure the success of the training as was possible in the Dublin Civic Offices example.

4.2.4 Klipporna Office (Skanska)

Planning the campaign:

The Klipporna Office consists of 3 buildings with a total Gross Building Area (GBA) of 27,800m^2 including basement. The building is occupied by a number of different tenants.

Current tenants of Klipporna include:

- Skanska
- Siemens
- Ikano
- IKEA
- AarhusKarlshamn (AAK)

Energy costs are calculated based on the size to the lettable floor area for each tenant. From the table below we can see the current costs for each consumption type. This arrangement means that the cost of energy for each tenant is not directly affected by end user behavior.

Area	Cost in Swedish Krona	Cost converted to Euro
Electricity (lighting, elevators, etc)	20SEK/LOA	€2.13/LOA
District Heating	46SEK/LOA	€4.90/LOA
Domestic Hot Water	7SEK/LOA	€0.75/LOA
User Electricity	38SEK/LOA	€4.05/LOA

There are a number of key technologies used in this building:

- Live Energy Feedback (Siemens)
- High performance insulated building envelope, designed as passive house standard, this reduces the energy required for space heating.
- Energy demand for cooling is reduced with automatic sunshades on the facade.
- Advanced steering and control systems reduce energy required for ventilation and lighting.
- Low energy lighting and individualised lighting for each workspace.
- Advanced ventilation system with heat recovery system.
- Locally produced renewable energy sources are integrated into the building: a geothermal ground water based energy system for cooling and photovoltaic panels for electricity. The panels are integrated in the building design on the façade.

4.2.5 Malmö Live Hotel (Skanska)
Planning the campaign:

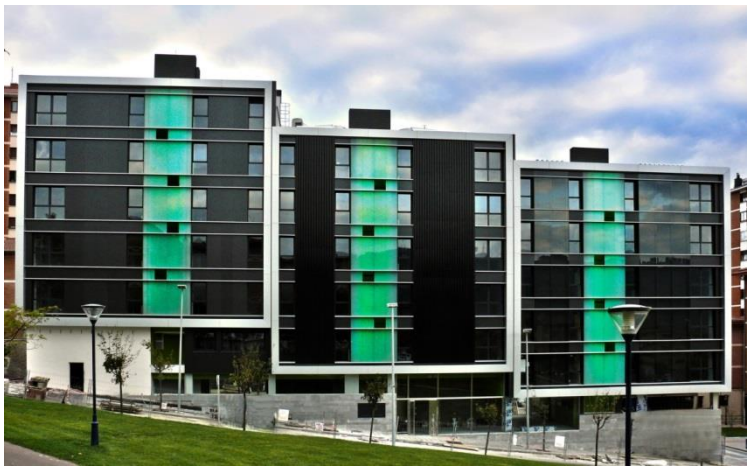
The Malmo Live Hotel consists of 444 rooms. It also has 24 conference rooms with the capacity for 1,500 people. The hotel was bought by the Clarion Hotel group (Nordic Hotels). Skanska no longer has control over energy use of the building

There is good environmental and energy awareness within the hotel group with a strong environmental policy. The hotel owner is also a Greenpeace activist.

Key technologies of the building include a highly insulated building envelope with high thermal inertia, constructed with a heavy frame of pre-casted concrete to reduce the energy need. The energy demand for cooling is reduced by using green roofs, automatic solar shields and blinds and windows with low U-values. The building also uses an advanced ventilation system with heat recovery. Advanced controls systems help reduce energy for ventilation and lighting through the use of presence motion to detect people in the building. Locally produced renewable energy sources are integrated in the building, including solar panels for producing hot water and geothermal energy for heating as well as cooling. A system for storing ice will increase the cooling capacity needed on during large concert events. Food waste is used for biogas production at local biogas plant. Food grinders will be installed for this purpose.

Hotel guests receive a sustainability message when entering the hotel. The room key cards operate lighting and guests are only able to adjust room temperature by 3°C up and down to prevent overheating or overcooling. Occupancy levels are connected to the booking system which will help regulate the temperature of each room. The unoccupied rooms are maintained at a constant lower temperature and only raised when the room is about to be occupied saving on energy costs. The hotel management company has received training and a full manual on the operation of technologies.

4.2.6 Portugalete (Tecnalia)
Planning the campaign:



Spanish demo building developed within Buildsmart project is a residential building located in the neighborhood of Repélega, in the city of Portugalete. The building is owned by the regional Basque Government and it has been constructed for social housing purposes.

The construction is formed by three blocks of 5 floors. Each of these blocks has 10 dwelling, 2 per floor, and two additional dwellings adapted apartments on the ground floor of one of the blocks, giving a total number of 32 dwellings. Furthermore, the building includes 2 underground parking floors.

Tenants profile includes families with and without children characterized by low incomes. **They have started moving in in the end of July 2016.**

Basque Government has employed a company to be in charge of the energy management. Due to the special character of the building, a prepaid system is installed in order to perform energy billing. Currently high energy prices are often a problem to be faced by low incomes residents; therefore the energy efficiency concept integrated in the building as well as energy efficient use awareness are especially relevant in this demo building.

The energy efficient design concept of the building is based on a minimized energy demand (heating and cooling), optimized system technologies and integration criteria, the deployment of onsite electricity production Technologies and on an advanced control and monitoring platform to ensure optimum operation of all the systems of the building.

Key technologies of the building:

- Low embodied energy and low environmental toxicity wherever possible
- Very well insulated building envelope in order to reduce heating demands in winter
- Passive solutions integrated in the building façades in order to maximize the use and storage of solar energy:
- A trombe wall connected to the ventilation system of one of the blocks.
- A solar wall connected to the heat pump aiming to increase its performance though higher air temperatures feeding the heat pump.
- Efficient mechanical ventilation system with heat recovery technology
- Heating energy provided by an advanced system integrating a cogeneration unit and a high efficiency heat pump. Both systems have priority, in addition a condensation boiler is installed to be used only when necessary

- Underfloor heating system allowing lower water temperatures for working than other typical heating emission systems normally used in the north of Spain
- Electricity generation by cogeneration unit and solar panels

Implementing the campaign:

Training campaign at the Portugalete building was mainly implemented though face to face training sessions addressed to building tenants. First training session was performed on 30th of June of 2016, taking advantage of the scheduled meeting for the handover of keys in Alokabide[1] offices in Bilbao. Another meeting was performed on 6th of October, this time celebrated in Portugalete building.

In both sessions, tenants were informed about the singular characteristics of the building, energy management and billing system, and some energy efficiency tips.

Apart from these specific general meetings, the company in charge of energy management in the building made in person meetings with each tenant completing the particular commissioning of the monitoring system in each dwelling and providing specific information and advices about the optimal use of the whole system.

Figure 19: Training session in Alokabide offices

Each dwelling is equipped with a live energy feedback device which consists on a smart screen where tenants can visualize their energy consumption and energy costs among other provided information. This device is also the tool to be used in order to charge prepaid energy billing system.

Information material available for addressed to building tenants includes the Think Energy Guide for residents, a video and documentation about key functions of the Stechome system developed by company in charge of energy management of the building called Simec.

[1] Alokabide is the society of the Basque Government in charge of managing social housing.

Figure 19: Stechome system demonstration video

Key focus areas of the training:

- Temperature control of the dwellings and how to make an appropriate use of the underfloor heating system
- Manage of the visualization screen and the advantages of the information provided
- Energy prepaid system
- Building special characteristics and their influence on total energy consumption of the building

Campaign evaluation:

Due to the recent occupation of the building, for the time being there is not enough available information to take conclusions about the effectiveness of the training program. Besides, as the building is new construction, it is not possible to develop a baseline for energy consumption for comparing and analyzing the potential achieved improves.

For the time being, only some conclusions about tenants' expectations and concerns can be made. In general they are aware about the efficiency of the building; however, it seems that some users have not totally clear idea about the limits of the generation systems assuming that they can use energy for free. This argument is causing problems to the property who is worried about possible unpaid bills.

Building Information

- Passive solar house with a targeted annual energy use on 41,8 kWh per m^2
- Low embodied energy and low environmental toxicity wherever possible

Target Audience

- Social housing oriented to low-income residents

Energy Awareness

- Social scope of the project is important - must be affordable for tenants of low-medium social class
- Key technologies of building
- A parietodynamic wall, integrated within the building ventilation system, to maximise the energy storage in the façade
- An insulating painting with nanotechnology which is designed to insulate and waterproof the walls
- Green roofs, which provide insulation in winter and prevents overheating in summer

Live Energy Feedback

- An energy display screen will be installed in each of the buildings, providing information on heating, lighting and electric energy consumption. This will be a tool for communicating with the residents and to make them aware of their energy consumption to help to improve user's behaviour.

5 Conclusions

Think Energy was first created and delivered in Dublin City Council's Civic Offices; a large consumer of energy with up to 1,500 staff. The campaign was delivered over the course of one year with regular monthly activities throughout. The ethos behind Think Energy was to show Dublin City Council as exemplary in implementing a holistic energy campaign that can easily be applied to other buildings and in the home as well, thus achieving even further energy savings over the lifetime of the campaign.

The objectives of the Think Energy campaign were as follows:

1. Raise awareness about why and how staff can save energy
2. Increase the understanding of how and where energy is used in the building
3. Change behaviour & consequently save on energy and cost - to reduce annual consumption by at least 5%, equating to an annual saving of 207 MWh or €17,000
4. To develop a campaign that can be successfully replicated in other buildings

The first phase of Think Energy was very successful. The main indicator of success used was the overall energy savings achieved over the duration of the behavioural campaign. Over the course of the campaign, from June 2013 to June 2014, a reduction of 943 MWh (electricity - 382MWh, gas 561MWh) was recorded for Civic Offices, this figure is weather adjusted. While this is considerably more than the target set it is, however, impossible to say how much of this reduction was directly as a result of the Think Energy as not all saving are directly attributable to the campaign.

The communication of the energy saving message was also very successful within the Civic Office campaign. Over the course of the campaign a total of 3,132 engagements with staff were recorded. The significant majority of these engagements were made through the Think Energy Online Hub (2,346) amounting to 75% of the total. This is quite significant as the Think Energy Hub was the centerpiece of the Think Energy Campaign and is the source of the principal energy savings messages that the campaign strived to communicate.

One of the difficulties experienced in the project was the delivery of Think Energy in the demonstration sites. While the campaign was delivered in each of the sites it is impossible to evaluate the success as the buildings are all new constructions and as such do not have any historical energy consumption or established behavioural patterns for Think Energy to work with. It is only possible to measure the effectiveness of such a campaign in established buildings where all commissioning issues have been dealt with and behaviouiral patterns established.

The focus on energy reduction as the key measurement of success in such a campaign is also problematic. As stated earlier it is impossible to uniquely attribute actual energy savings to a behavioural campaign. Over the course of a campaign various actions and measures will positively affect the consumption of energy in a building; it would be disingenuous for a campaign to claim credit for all of these actions, while it is plausible that the existing of the campaign indirectly caused these actions to be taken at this time but creating a spotlight on energy consumption. In future campaign a stronger focus on behavioural science would be beneficial. This will help to shift the focus away from direct energy savings on to more indirect savings that are likely to a more wide reaching and long term effect.

Appendix 1: Think Energy

June 2013:

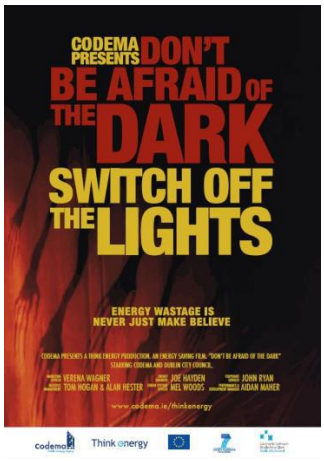
- Set up of Think Energy Team (Corporate Services Human Resources, Information Services, Facilities Management and Codema)
- Think Energy was officially launched with a staff survey about energy awareness on Wednesday, 26th June during EU Sustainable Energy Week.
- Survey results: 190 survey responses and 75 webpage views

September 2013:

- Energy Day featuring the launch of the Think Energy Online Hub.
- This was be supported by a competition to win a two night stay in an Eco-Lodge in order to promote the hub and to drive traffic towards it.
- Results: 186 competition entries and 419 visits to the Think Energy Online Hub.

October:

- Halloween poster campaign highlighting scary energy facts. This involved a series of posters and online information highlighting the need for energy savings focusing on issues such as fuel security and climate change.
- Results: 331 webpage views and very positive verbal feedback


CODEMA PRESENTS DON'T BE AFRAID OF THE DARK
SWITCH OFF THE LIGHTS
ENERGY WASTAGE IS NEVER JUST MAKE BELIEVE
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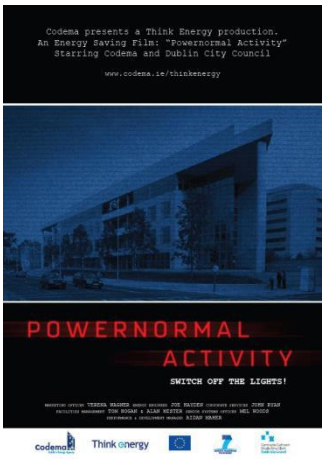
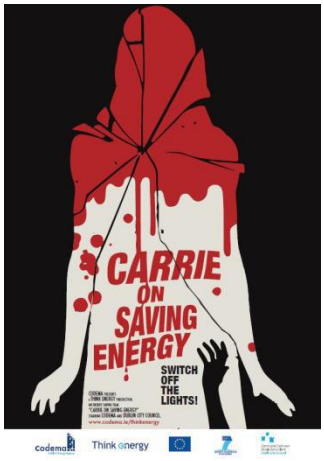
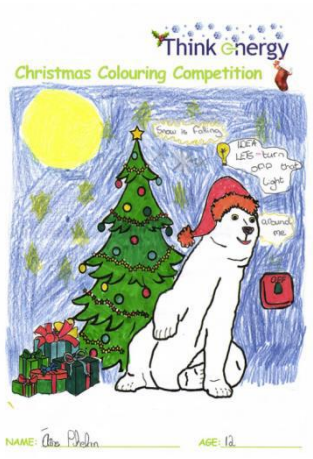
Turn off the lights!
THE DARE SWITCH PROJECT


Codema presents a Think Energy production.
An Energy Saving Film: "Powernormal Activity"
Starring Codema and Dublin City Council
www.codema.ie/thinkenergy
POWERNORMAL ACTIVITY
SWITCH OFF THE LIGHTS!


CARRIE ON SAVING ENERGY
SWITCH OFF THE LIGHTS!

November:

- Sustainable Christmas colouring competition. Codema ran a colouring competition for children of the staff of Civic Offices which centered on an energy-saving message. The competition entries were used to further promote the messages of the campaign via posters and all entries were uploaded to the Think Energy hub in an online photo gallery. Three prizes were on offer, one of €50 and two of €25 gift vouchers for a local book shop.
- Results: 122 competition entries and 872 visits to the Think Energy Online Hub.

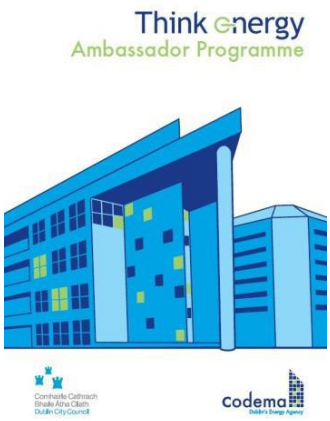


December:

- A sustainable Christmas decoration stand with help and support from a local business with the display of Christmas coloring competition entries, Christmas tree and energy saving leaflet for the home.
- Christmas card sent out to all Dublin City Council staff and the tree was donated to local senior citizens.
- Results: Low engagement to stand but 146 webpage views

January:

- Codema organised Energy Lunchtime Talk “Saving Energy at Home” in Wood Quay Venue for staff to get expert, practical advice on saving energy in work and at home. This was supported by tips and videos on the energy hub.
- The Energy Ambassador programme was promoted.
- Results: 53 participants, 29 survey responses and 220 visits to the Think Energy Online Hub.



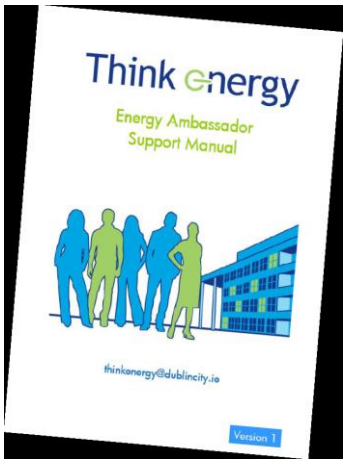
February:

- Participation in Dublin City Councils Tweetalon #MyDCCDay
- Results: 16 tweets about energy awarness

March:

- Don't just be green for St Patrick’s Day, a photo competition for all the staff and their families highlighting creative ways to save energy. Staff were encouraged to wear something green to obviously reflect the time of year but to show their commitment to being green.
- Promotion of Earthhour and Seachtain na Gaeilge via social media and Dubnet notice

- Think Energy Ambassador Training with Ambassador Support Manual and an Energy Walkabout Checklist
- Results: Very low response to photo competition due to late advertisement and high number of staff on annual leave; Ambassador training attended by 27 with positive feedback; 76 webpage views.



April:

- Easter was highlighted by the design of an Easter themed logo and energy saving tips on the Think Energy Hub.
- Drop in lunch for Think Energy Ambassadors sponsored by Dublin City Council.
- Results: 61 visits to the Think Energy Hub for Easter content and 14 participants in drop in lunch

May:

- In May a Think Energy section was established in the staff library.
- May myth-buster campaign launched for the bank holiday weekend via social media.
- Results: 18 new books purchased for the staff library focusing on energy conservation

June:

- June marked the end of the campaign with a final event. This was marked by an energy awareness day held in the civic offices:
- Results: 146 webpage views
    - Water butt competition – 75 participants
    - Bicycle challenge – 42 participants
    - Electric Car test drive – 4 participants
    - Lighting Stand – well visited
    - Visual Minutes – only 2-3 contributors
    - Energy Game – approx. 25-30 participants
    - Film Screening – not properly visible as canteen too bright; no audio available on day
    - Solar Tour for Energy Ambassadors – only 5 participants
    - Kid's of the creche – 18 children visited and coloured in 8 pictures with 2 contributions from Poppintree Colouring Club
    - 1 video produced (only 19 hits on Vimeo) – QuickTime file was uploaded on Dubnet as staff no access to social media
    - Very positive email feedback from several DCC staff
    - SurveyMonkey for overall feedback on the campaign – only 17 responses

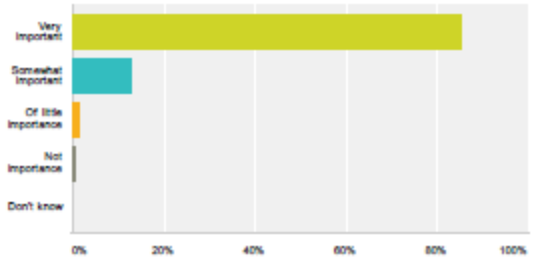

KIDS
ENERGY

Appendix 2: Energy Awareness Survey

Energy Awareness Survey

Q2 In your view, how important is energy saving to Dublin City Council?

Answered: 190 Skipped: 0

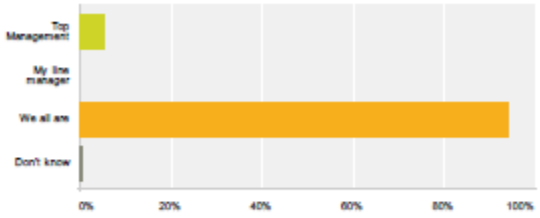


Answer Choices	Responses	
Very Important	85.26%	162
Somewhat Important	12.63%	24
Of little Importance	1.58%	3
Not Importance	0.53%	1
Don't know	0%	0
Total		190

Energy Awareness Survey

Q3 Who do you think is responsible for energy management in Dublin City Council?

Answered: 190 Skipped: 0

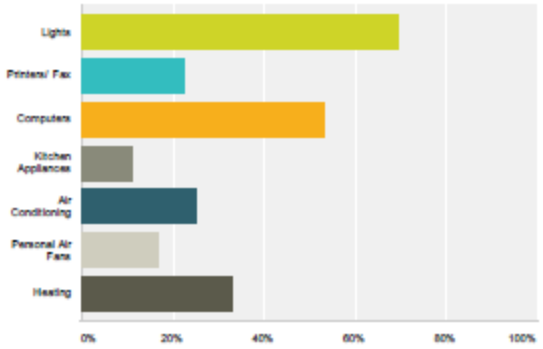


Answer Choices	Responses	
Top Management	5.26%	10
My line manager	0%	0
We all are	94.21%	179
Don't know	0.53%	1
Total		190

Energy Awareness Survey

Q4 Where do you see most energy wasted in Dublin City Council?

Answered: 190 Skipped: 0



Answer Choices	Responses	
Lights	69.47%	132
Printers/ Fax	22.63%	43
Computers	53.16%	101
Kitchen Appliances	11.05%	21
Air Conditioning	25.26%	48
Personal Air Fans	16.84%	32
Heating	33.16%	63
Total Respondents: 190		

#	Other (please specify)	Date
1	Have good quality shielded outdoor lighting	7/4/2013 8:48 AM
2	Doors & outside	7/4/2013 8:34 AM
3	Phones Re charging of phones	6/27/2013 1:09 PM
4	Lifts Using the lift to go up or down one floor	6/27/2013 2:42 AM
5	PCs Computer servers	6/27/2013 1:32 AM
6	Lights PCs leaving lights on and screens/computers on standby rather than shutting down completely every day.	6/27/2013 1:24 AM
7	Heating Lights Also combination of lighting & heating	6/26/2013 11:16 PM
8	Heating /Immersion heaters left on 24/7	6/26/2013 9:42 AM
9	Water water	6/26/2013 8:07 AM
10	Libraries as a rule are very energy conscious and there is little or no wastage.	6/26/2013 6:28 AM
11	AirC Heating Air conditioning in the Blocks 1 & 2 is appalling - its either too cold or too hot, hence all the money wasted with fans & all the money waste on air conditioning that is not fit for purpose	6/26/2013 2:00 AM
12	Don't know details of energy usage/wastage by these items	6/26/2013 1:51 AM
13	AirC Heating Air handling Units	6/26/2013 1:42 AM
14	Lights Too many lights. Could some bulbs be removed in the lifts for example?	6/26/2013 1:34 AM

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Energy Awareness Survey

15	Appliances Lifts Lights use stairs instead of lifts/a few early starters switch on all floor lighting/ hot water boilers left on overnight	6/26/2013 1:23 AM
16	Transport Driving	6/26/2013 1:05 AM
17	Lights Too many ceiling lights are controlledby 1no switch, can not isolate/turn off lights in one small area	6/26/2013 12:57 AM
18	Waste Paper usage	6/26/2013 12:52 AM
19	Appliances water boilers	6/26/2013 12:51 AM
20	Phone CHARGING MOBILE PHONES AT DESKS	6/26/2013 12:49 AM

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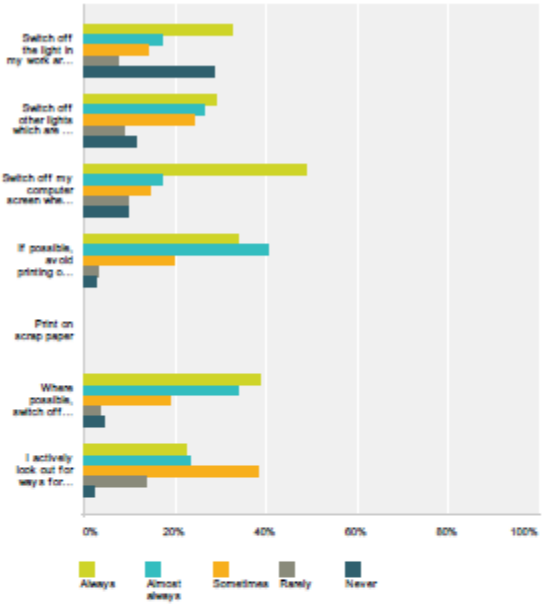
Energy Awareness Survey

Q5 Which of the following actions do you carry out at work?

Answered: 190 Skipped: 0



	Always	Almost always	Sometimes	Rarely	Never	Total
Switch off the light in my work area when away from my desk for extended periods	32.42% 59	17.03% 31	14.29% 26	7.69% 14	28.57% 52	182
Switch off other lights which are not required	29.12% 53	26.37% 48	24.18% 44	8.79% 16	11.54% 21	182
Switch off my computer screen when I'm not using it for extended periods	48.92% 91	17.20% 32	14.52% 27	9.68% 18	9.68% 18	186
If possible, avoid printing out information stored on computer	34.04% 64	40.43% 76	19.68% 37	3.19% 6	2.66% 5	188
Print on scrap paper	0% 0	0% 0	0% 0	0% 0	0% 0	0
Where possible, switch off machinery or equipment when not required	38.83% 73	34.04% 64	19.15% 36	3.72% 7	4.26% 8	188
I actively look out for ways for saving energy at work	22.65% 41	23.20% 42	38.12% 69	13.81% 25	2.21% 4	181

#	Other (please specify)	Date
1	not allowed to switch off first 3 options	7/4/2013 8:41 AM
2	I use boiler instead of kettle,keep blinds up for light	7/3/2013 3:05 AM
3	Phone chargers left plugged in. Water heaters put on timers. Why not introduce paper recycling in our place of work ?	6/27/2013 3:58 AM

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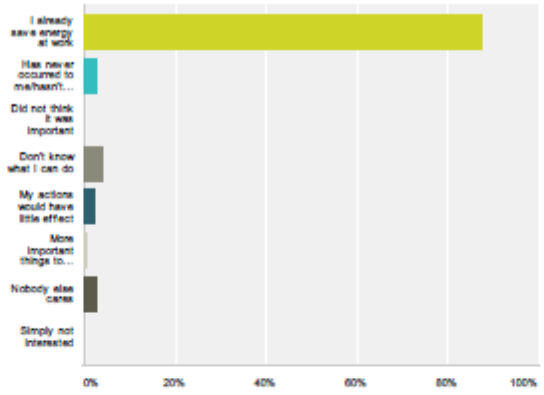
Energy Awareness Survey

4	Not allowed to switch off Printers	6/26/2013 8:07 AM
5	Never thought of switching off my screen when, say, going to lunch - but I will from now on.	6/26/2013 3:03 AM
6	can't switch of light in my work area	6/26/2013 2:53 AM
7	I switch off the lights/boiler/water cooler when I leave the office provided no one else needs them. I also check peoples computers as often the screens are left on.	6/26/2013 2:18 AM
8	My office faces north so the lights are always required	6/26/2013 2:00 AM
9	meter monitoring system	6/26/2013 1:42 AM
10	closing windows near radiators that are on	6/26/2013 1:28 AM
11	see comments in 4 above	6/26/2013 12:57 AM
12	Lights in my area turn off automatically when no movement is sensed.	6/26/2013 12:52 AM
13	leave off the printer til staff come in	6/26/2013 12:49 AM

Energy Awareness Survey

Q6 If you do not save energy at work, please indicate why not (tick one box only)

Answered: 178 Skipped: 12



Answer Choices	Responses	
I already save energy at work	87.64%	156
Has never occurred to me/hasn't entered my mind	2.81%	5
Did not think it was important	0%	0
Don't know what I can do	3.93%	7
My actions would have little effect	2.25%	4
More important things to deal with	0.56%	1
Nobody else cares	2.81%	5
Simply not interested	0%	0
Total		178

#	Other (please specify)	Date
1	but a lot of people just do not care.....	7/1/2013 5:11 AM
2	Open Plan office with shared printer/fax, difficult to switch off	7/1/2013 2:57 AM
3	Rely on computers to shut down	6/27/2013 1:09 PM
4	some things are not in my control..would not want to jeopardise others work /information	6/26/2013 5:57 AM
5	Open office with centrally controled lights	6/26/2013 4:11 AM
6	Energy saving is not given the importance it requires	6/26/2013 3:40 AM
7	But not enough due to lack of time, always in a hurry....	6/26/2013 3:13 AM
8	Constantly switching off conference room lights after other people (who are usually blokes).	6/26/2013 3:03 AM
9	I may not be last person leaving	6/26/2013 2:56 AM
10	No control of such things in a large ope plan office space	6/26/2013 1:57 AM
11	Lights for the whole floor are on one switch, if broken down to small sections more lights could be turned off more regularly	6/26/2013 1:55 AM
12	Lights can not be individually switched off	6/26/2013 1:22 AM

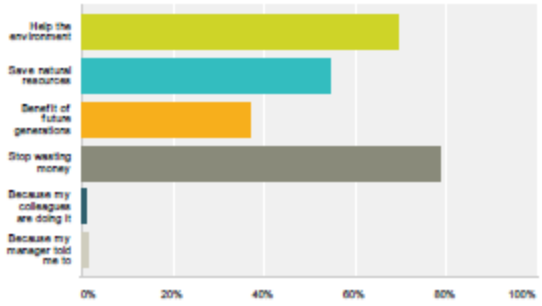
Energy Awareness Survey

13	I'm generally very busy and tend to forget to switch things off.	6/26/2013 1:22 AM
14	Inconvenience - waiting for computers and printers to reboot	6/26/2013 12:55 AM
15	communal area - need to consider needs of others.	6/26/2013 12:49 AM

Energy Awareness Survey

Q7 For which of the following reasons would you be most likely to save energy?

Answered: 190 Skipped: 0



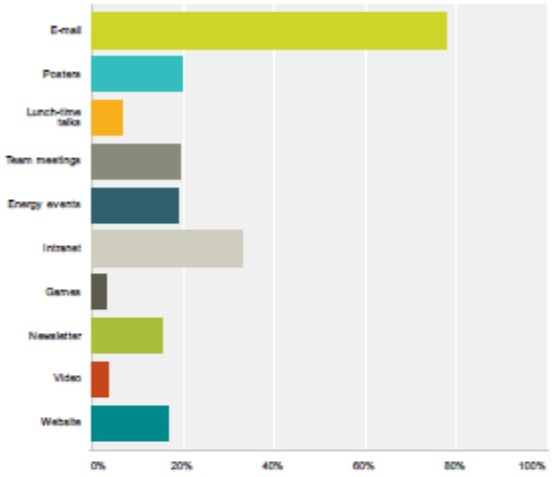
Answer Choices	Responses	
Help the environment	69.47%	132
Save natural resources	54.74%	104
Benefit of future generations	36.84%	70
Stop wasting money	78.95%	150
Because my colleagues are doing it	1.05%	2
Because my manager told me to	1.58%	3
Total Respondents: 190		

#	Other (please specify)	Date
1	To save on Council electricity bills.	6/26/2013 3:03 AM
2	For fire safety reasons, I turn off my computer when going home.	6/26/2013 2:23 AM
3	naturally frugal	6/26/2013 1:05 AM

Energy Awareness Survey

Q8 Which of the following methods would be best to inform you about energy savings?

Answered: 190 Skipped: 0



Answer Choices	Responses	
E-mail	77.89%	148
Posters	20%	38
Lunch-time talks	6.84%	13
Team meetings	19.47%	37
Energy events	18.95%	36
Intranet	33.16%	63
Games	3.16%	6
Newsletter	15.26%	29
Video	3.68%	7
Website	16.84%	32
Total Respondents: 190		

#	Other (please specify)	Date
1	N/a	7/4/2013 8:48 AM
2	some sort of incentive	7/4/2013 8:30 AM
3	we are aware just too lazy to comply	6/27/2013 1:09 PM
4	talks staff are required to attend	6/27/2013 3:07 AM
5	After informing people there is no follow up.	6/26/2013 3:40 AM
6	Twitter	6/26/2013 3:13 AM

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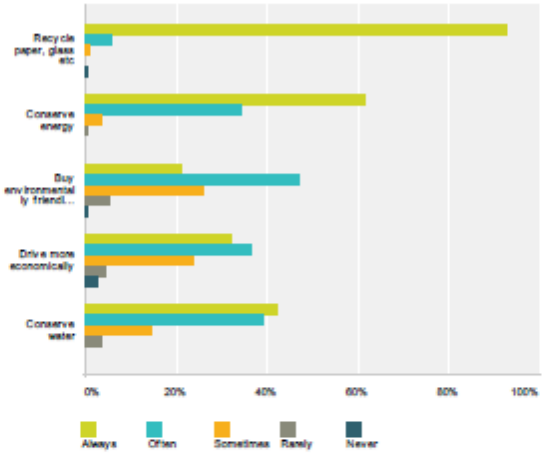
Energy Awareness Survey

7	My mother.	6/26/2013 3:03 AM
8	Get managers/team leaders involved to pass on the message, importance of it	6/26/2013 1:55 AM
9	Feedback about energy costs & estimated savings/waste	6/26/2013 1:51 AM
10	Co-ordinated marketing strategy and promotional campaign required	6/26/2013 1:42 AM
11	Energy-saving habits within section	6/26/2013 1:39 AM
12	A website showing the usage in each block of the Civics and other main locations with a simple diagram showing the saving in electricity and how much money that is.	6/26/2013 1:34 AM
13	Just implement energy saving measures, people will follow	6/26/2013 1:15 AM

Energy Awareness Survey

Q9 Which of the following actions do you carry out at home?

Answered: 190 Skipped: 0



	Always	Often	Sometimes	Rarely	Never	Total
Recycle paper, glass etc	92.63% 176	5.79% 11	1.05% 2	0% 0	0.53% 1	190
Conserve energy	61.41% 113	34.24% 63	3.80% 7	0.54% 1	0% 0	184
Buy environmentally friendly products	21.08% 39	47.03% 87	25.95% 48	5.41% 10	0.54% 1	185
Drive more economically	32.20% 57	36.72% 65	23.73% 42	4.52% 8	2.82% 5	177
Conserve water	42.47% 79	39.25% 73	14.52% 27	3.76% 7	0% 0	186

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This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no ENER/FP7/285091/BUILDSMART

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