Building Services News

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March/April 2016

Building Services news

Managing Your Facility's Energy

Minimising 'Fuzzy Edge' Disease

CIBSE SDAR Awards 2016

ENERGY SHOW PRODUCT AWARDS

Giraffe wins category by a neck

Making a
World of
Difference

MELCORETAIL
Solution Interface

Controls

CONTROLS

MELCORETAIL is a dedicated retail interface designed for energy efficient control of up to 8 M Series and Mr Slim indoor units, and 50 City Multi indoor units, including Lossnay.

It is preconfigured with standard inputs and outputs to suit the needs of any small to medium retail outlet.

Key Features

- Monitor and control up to 8 split indoor units
- Dedicated Retail Interface
- Control third party equipment
- Advanced energy saving and energy metering
- Ethernet remote connectivity to MELCOREMOTE Web PC, Smartphone / Tablet App (5 years web hosting included)

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Energy Show points the way

While the sentiment within building services has been cautiously optimistic over the last six months, there are now more that €60 million worth of reasons to believe that this optimism is well founded. That is the level of business that will be generated in the sustainable energy sector by the recent SEAI Energy Show.

Held in the RDS, it attracted nearly 5,000 trade visitors and had 170 exhibitors, numbering among them all the market-leading brands. Between them they presented a massive array of new products and innovative technologies, thereby adding to the armoury available to those involved in the sustainable energy sector to capitalise on the €1.5 billion market it represents.

Given that this sector is but one, albeit very large and important element of the broader building services industry, there are multiple reasons to be optimistic and even confident in the future.

Fly in the ointment? … getting our politicians to man up so that the structures and policies are in place to allow this recovery to continue.

Building Services news

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NEWS AND PRODUCTS

€7 million investment for Grant

Grant Engineering is to invest a further €7million as part of an ongoing expansion plan for its manufacturing facility in Birr, Co Offaly. The expansion will include a state-of-the-art innovation centre, a new extension to the manufacturing facility, a customer services centre and a training school. It will also create 50 new jobs.

Grant Engineering founder Stephen Grant said: "Over recent years we have continued to grow our business and this investment will allow us to continue to increase capacity, expand into new markets, engage with new customers and develop new products. It also reinforces our commitment to innovation, the local community and the local economy."

Grant Engineering employs over 320 people in Ireland and 70 in the UK. The 50 new jobs will include a range of part time and full time positions ranging from operative roles to highly-skilled engineering roles and are being supported by Enterprise Ireland.

Duff joins C&F Quadrant

Derek Duff has recently joined C&F Quadrant as Sales Manager for the Commercial Heating Division. Derek has a number of years experience in the building services industry and his remit is to manage and develop the commercial division's activities in the Irish market.

Contact: Derek Duff, C&F Quadrant. Tel: 087 – 269 8725; email: derek@cfquadrant.ie

Foxley appointed by Siemens

Siemens has appointed Steven Foxley as the new Managing Director of Siemens Building Technologies for Ireland and the UK. Steven brings a considerable breadth of experience in customer-facing roles, as well as business administration, programme performance, project delivery and lifecycle services.

Steven told *Building Services News:* "The UK and Ireland face many challenges with increasing population growth, the need to improve sustainability and pressures to reduce energy costs. These are set against a background of keeping the public secure. Building technologies has an important role to play in meeting these demands and we are at the forefront in delivering these".

Carrier now Ecodesign compliant

All ventilation equipment (including AHUs and related heat recovery systems) sold in the EU from 1 January 2016 has to comply with new efficiency standards set out in the Ecodesign Directive.

The aim is to cut energy use and enable the EU to achieve its target of a 20% overall reduction by 2020. The key is to ensure efficiency standards are achieved while maintaining required indoor conditions.

"When you choose Carrier", says Austin McDermott from distributors Core Air Conditioning, "you can rest assured that your systems are fully compliant, and that your energy costs will fall without any loss of performance."

Contact: Austin McDermott, Core Air Conditioning. Tel: 01 – 409 8912; austin@coreac.ie

Diamond Air partners with Whitestar

Diamond Air Conditioning entered a partnership agreement with Whitestar Prestige Services in Northern Ireland. Pictured at a recent meeting of the directors of both companies were Alwyn Campbell, Director, Whitestar with Graham McCann and Michael Clancy, Directors, Diamond Air Conditioning and Eddie Finn, Director, Whitestar.

NEWS AND PRODUCTS

InTouch Control Systems … seven years on

InTouch Control Systems specialises in the supply, commissioning and maintenance of building energy management systems (BEMS) for commercial, industrial and pharmaceutical applications. It was established in 2009 by John Reddin and now has three offices around Ireland and a large committed workforce. John and his team are looking to the future and to building on the success of the last seven years.

Services provided include:

- Supply and commission of building energy management systems;
- Maintenance of energy management systems;
- Stand-alone boilerhouse control systems;
- Identification and implementation of energy reduction strategies;
- Technical support and training;
- Supply of instrumentation and spare parts.

"We are a solutions provider for both Trend Control Systems and Distech Control Systems", says John, "and this ensures that we provide clients with both effective and cost-efficient solutions to suit their requirements.

"InTouch Control Systems is focused in ensuring that its workforce has all the necessary skills and training needed for this ever-changing sector. As well as nurturing new talent, we provide our employees with opportunities to develop through continuous training and development programmes. We now have three engineers who have recently achieved Trend Expert Status, with more to follow over the next few years.

"Having and maintaining our ISO9001:2008 Quality Management status has given InTouch Control Systems the platform to deliver an efficient, streamlined and customer-focused service to our clients. Our mantra is do it right first time, every time.

"Due to our consistent professional approach, we are now the preferred BMS specialist with some of the highest profile companies in Ireland such as University College Cork, Teva Pharmaceuticals, Cork Airport and the Irish Aviation Authority.

"Our mission is to provide a good value, high-quality, personal and friendly service while maintaining a secure and progressive company for our staff with ongoing challenging projects."

Contact: InTouch Cork – Tel: 021-0423 2258;
InTouch Dublin – Tel: 01-440 8610;
email: projects@intouchcontrols.ie;
www.intouchcontrols.ie

CIBSE NEWS

High standard at Student Awards

This year's annual DIT Student Awards competition was tight with judges commenting that the standard was getting tougher. In the BEng Technician Programme (Level 7), Andrew Cruise presented on "Micro CHP for Residental and Commercial Applications". He delivered a convincing argument for CHP, offering details on running costs for actual projects.

Second up saw Ger O'Neill take to the podium with "VAV & Displacement Ventilation Systems". Ger explained and compared the two systems, detailing the pros and cons.

Finally, Seamus Murphy presented his project on "Applications of Geothermal Heat Pumps". He explained the principal operation and benefits of a heat pump and different types of collectors.

The awards were sponsored by Hevac and presentations were made by Aaron Brogan, Hevac Technical Sales Manager. Seamus Murphy was confirmed as winner by the judges with CIBSE Chairman, David Doherty making the announcement.

The second part of the afternoon saw presentations from BEng (Hons) Programme (Level 8). First to present was Sean Flynn O'Connor on "Economic and Environmental Benefits of CHP Systems". Sean detailed his findings and summarised his project.

Callum O'Toole then presented on "District Heating and its Feasibility in Ireland". He offered actual site data from a live site to present his findings.

Last to present was David Keogh on "Cleanroom Technology & Design Analysis". He displayed flowcharts on air movement within cleanrooms.

The awards were sponsored by CIBSE Ireland and presentations were again made by David Doherty, CIBSE Chairman. David Keogh was confirmed as winner by the judges.

Back Row: Brian West, and CIBSE Ireland Vice-Chair with Ciara Ahern, DIT; Micheál O'Flaherty, DIT; and David Doherty, Chair, CIBSE Ireland. Middle Row, Level 8: Callum O'Toole, Runner-up with David Keogh, Winner and Sean Flynn O'Connor, Runner-up. Front Row, Level 7: Seamus Murphy, Winner with Andrew Cruise and Gerard O'Neill, both Runner-up.

Building simulation made simple

Catherine Simpson, CIBSE Vice-President, gave an excellent CPD presentation on building simulation when she visited DIT Bolton St Dublin recently. Catherine is a chartered engineer and fellow of CIBSE, and has over 30 years experience in the building services sector.

Catherine Simpson, CIBSE Vice-President with Ciara Aherne, DIT.

Catherine is the business owner of Building Simulation Ltd, a specialist company focusing on building investigation using on-site measuring and monitoring, infrared thermography and building modelling. Her presentation style was captivating and direct, and this made the whole process sound like common sense.

She also fielded questions from the audience and provided those present with the opportunity to experience at first hand the interactive use of her thermal camera and aids. ■

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MITSUBISHI HEAVY INDUSTRIES, LTD.

Our Technologies, Your Tomorrow

CIBSE Ireland presents the SDAR Awards 2016

The annual CIBSE Ireland SDAR Awards – which are managed and collated by Michael McDonald of DIT – took place in DIT Bolton St recently. There were four excellent papers presented, with the competition this year being won by Dervilla Niall of the School of Civil & Structural Engineering, DIT.

Her research on the thermal mass behaviour of concrete panels incorporating phase-change materials was a narrow but deserved winner. She won a €1,000 prize sponsored by John Sisk & Son and her paper will be published in the next *Journal of Sustainable Design & Applied Research (SDAR)*.

Chair of the judging panel Kevin Gaughan, DIT said that this was the most competitive year since the competition began six years ago with all papers and presentations being very strong. This was evident in the decision by SDAR editors, Kevin Kelly and Keith Sunderland, to offer an opportunity to all four authors to publish in the next *SDAR Journal*. Kevin Kelly says this has never happened before. The other judges were Paul Martin of CIBSE and SEAI, and John McGrory of DIT.

The three runners up (in no particular order) were:

An investigation into the cost optimality of the Passive House retrofit standard for Irish dwellings using life cycle cost analysis by architect Daniel Coyle;

Hygrothermal risk evaluation of existing and proposed retrofit options for the junction of solid wall with ground floor in a typical Edwardian house in Dublin by Benat Arregi and Joseph Little;

Importance of feasibility studies for grid-connected PV systems in Ireland by Andrew Hogan

CIBSE Ireland wishes to encourage all involved in building services to think about their leading-edge designs and to consider entering this competition next year. Apart from the £1,000 first prize and €250 runners up prizes, it is an excellent opportunity for engineers to get published in a peer review journal. You can see the journal at http://arrow.dit.ie/sdar/

If you are interested in being published in this journal then you should contact the Editor, Kevin Kelly, at kevin.kelly@dit.ie

To enter the SDAR Awards 2017 contact Michael McDonald at michael.mcdonald@dit.ie. In addition, the call is now out for the Irish Lighter competition 2016. To enter contact Michael at the same email address. ■

Back row: David Doherty, CIBSE Chairman with Padraic O'Connor, SISK; Kevin Kelly, Michael McDonald, Kevin Gaughan and John McGrory, DIT and Paul Martin, CIBSE Ireland and SEAI. Front row: Andrew Hogan, runner-up with Daniel Coyle, runner-up, Dervilla Niall, winner and Beñat Arregi and Joseph Little, runners-up.

Centralised Control

New Touch Centralised Controller from Samsung

- 7-inch Colour Capacitive Touch Screen
- Easy and Intuitive UI
- Individual/Zone control, Scheduling, Energy saving control
- Emergency operation control by external contact
- Control up to 128 indoor units
- DS card for programming and data download

SAMSUNG

HEAT PUMP Association of Ireland

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www.gtphelan.ie

Market-leading heating brands from C&F Quadrant

C&F Quadrant has a diverse and varied heating portfolio, featuring cutting-edge technology from some of the word's leading brands such as Glow-worm and Vaillant. Both continuously bring innovative products and systems to the marketplace, recent examples of which are detailed here. They can also be seen at the forthcoming PLUMBEX in City West on 25/26 May next

The Glow-worm Energy System boiler is a high-efficiency and high-quality boiler designed using automotive grade aluminium and featuring a high-quality heat exchanger that makes it light to install. It has a modern high-impact design and comes with a bright easy-to-read LCD display, a smart timeless case design and super-quiet running.

Energy System requires simple water flush cleaning for the heat exchanger which means lower costs and no special cleaning tools. The patented 4-sided cooling reduces the stress on the heat exchanger, thereby increasing the long-term reliability for customers.

Glow-worm Energy System

It is ErP A rated and comes with a wide range of outputs –12kW, 15kW, 18kW, 25kW and 30kW. It is suitable for homes with high hot water demands and can be installed with Glow-worm's range of cylinders for hot water storage.

Vaillant's ecoTEC range is more efficient, more durable and easier to use than ever before. Models are so compact that they fit in the smallest niche, and yet are so effective that they provide single and multi-family houses with reliable central heating and hot water at any time of day or night.

The multi-featured ecoTEC plus is concentrated heating power on only 0.32m² of wall area. With up to 35kW of power, it supplies even larger houses more efficiently and reliably than ever before. The new model uses an electronic gas-air mix system and operates with optimum modulation. This reduces energy consumption and emissions, and also increases the efficiency of water heating.

Vaillant ecoTEC Plus

The integral condensation heat exchanger and the new high-efficiency pumps provide additional energy savings, while the ingenious connection system allows for quick and perfect installation in any location. Outputs of 20/24kW, 25/30kW and 30/34kW are available as mixed units for heating and generation of domestic hot water, and of 16kW, 24kW and 38kW as a system boiler for heating only.

The proven ecoTEC pro is the ideal solution for smaller heating needs. It is especially lightweight and compact, and yet offers a surprisingly high hot water output. The ecoTEC pro's high quality is now demonstrated by the new design and new technology.

Its automatic combustion control, a new pneumatic gas-air mix system and an automatic 2-stage energy saving pump ensure high energy efficiency. The new appliance concept and easy-to-read interface with backlit display make the installation, maintenance and operation easier than ever.

Contact: C&F Quadrant,
Tel: 01 - 630 5757 (Dublin);
028 9036 5555 (Belfast);
email: sales@cfquadrant.ie;
www.cfquadrant.ie ■

Panasonic Etherea now with R32

Panasonic has relaunched its Etherea range with an innovative new line of products and the first from the company fully optomised to contain R32 refrigerant.

Now more environmentally-friendly than ever, the new Z and XZ domestic air conditioning units comprise modern designs that are sleek, compact and suitable for any interior. Main features are as follows:

- R32 refrigerant with low global warming potential (GWP);
- Efficiency rating of A+++/A++;
- Super quiet technology – only 19dB(A);
- Sleek, compact design
- *Nanoe i* air-purifying system and Econavi sensors with Z range.

The high spec Z and XZ ranges feature the white Z7SKE, Z9SKE, Z12SKE, Z15SKE and Z18SKE indoor wall-mounted models, and the silver XZ7SKE, XZ9SKE, XZ12SKE, and XZ18SKE units.

The new Z range has been fundamentally re-designed to suit the interior of any home or commerical property. The sleek new design means the units are not only unobstrusive, but are also more compact than ever before.

The new Panasonic Etherea range is sleek, compact and suitable for any interior. Top silver, centre white, bottom matt.

The new Etherea Z and XZ ranges are also incredibly quiet. Operating at 19dB(A), this ultra-low level of noise is equivalent to night-time in the counrtyside, ensuring that the air conditioning units cause no disturbance to sleep or distraction in the office environment.

While other systems use refrigerant R410A as standard, Panasonic's new Etherea products use the environmentally friendly R32 alternative. R32 is a single component refrigerant which means it is easy to recycle. It also has a much lower impact on global warming, reducing the effect on global warming by 67%.

The Z range includes Panasonic's Econavi sensor and *Nanoe i* air purifying system. Econavi features an in-built human activity sensor and new sunlight detection technology to adjust output, therefore providing the best comfort at all times, while still saving energy. Econavi not only optimises air flow orientation and volume according to human presence, it also reduces cooling power automatically by no/less sunshine. With Econavi, energy savings of up to 38% are possible.

Furthermore, the *Nanoe i* air purifying system utilises nanotechnology fine particles to remove and deactivate 99% of both airborne and adhesive micro-organisms like bacteria, viruses and mould.

In addition to updating its Etherea range, Panasonic has introduced its new TZ range of air conditioning units, which includes the TZ9-SKE, TZ12-SK, TZ15-SKE TZ18-SKE and TZ24-SKE wall mounted units. The TZ range also uses the new refrigerant R32, making it one of the most efficient and environmentally friendly units on the market. Its near silent operation, at 20dB(A), means that it offers exceptional comfort for end users, without compromising performance. The TZ models are powerful and efficient, with an outstanding energy ranking of A++/A+.

Contact: Vincent Mahony, Panasonic Ireland. Tel: 087 – 969 4221; email: vincent.mahony@eu.panasonic.com ■

Delivering quality heating and air conditioning solutions for 20 years

This year marks the 20th anniversary since the founding of Core Air Conditioning. Established in 1996 by Managing Director Austin McDermott, the objective was to deliver quality heating and air conditioning solutions that offered extended lifespans and saved on energy use, way before "sustainability" became the fashionable buzzword it is today.

"It may not have been called sustainable back in 1996", says Austin, "but we pioneered the ideals the term embodies right from the outset. Part of that process involved developing close links with both our suppliers and clients, sharing information and ideas, and devising new ways of doing things.

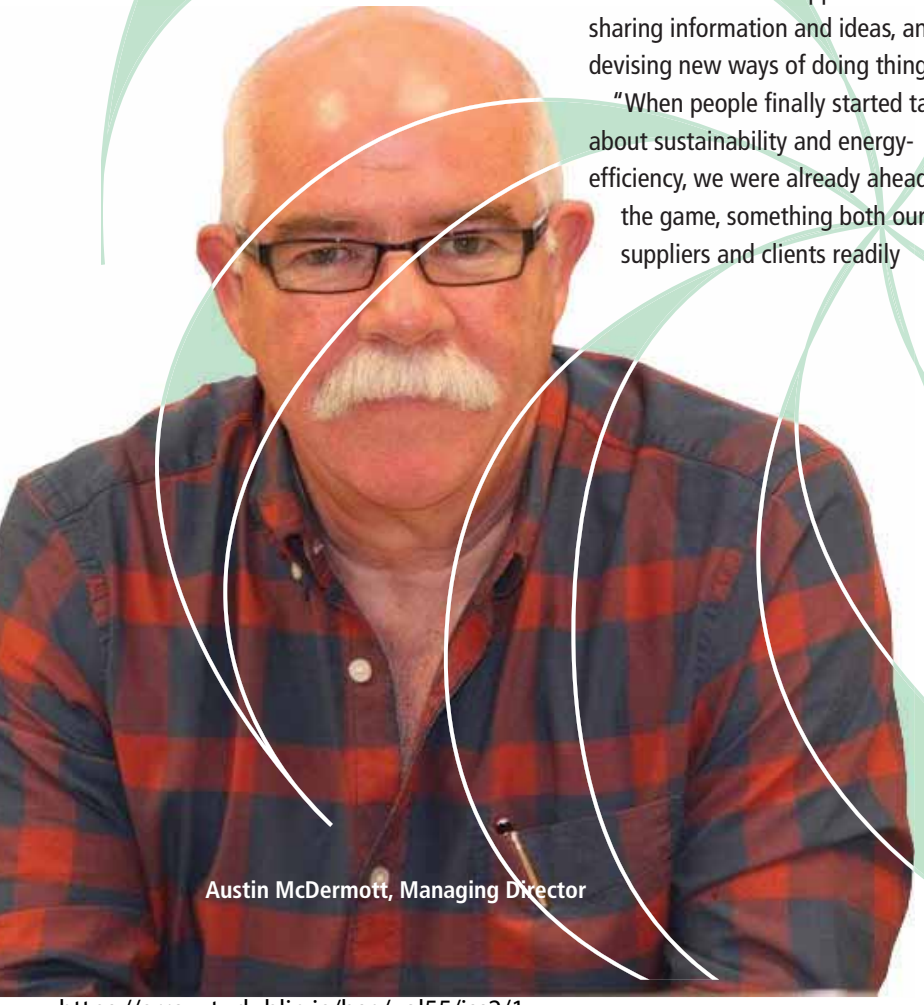
"When people finally started talking about sustainability and energy-efficiency, we were already ahead of the game, something both our suppliers and clients readily appreciated. As a result, today we are one of Ireland's leading providers of heating and air conditioning solutions that meet the exacting performance and energy efficiency requirements the marketplace demands."

Steve Wood, Sales Manager

Core has always "partnered" with market-leading brands to ensure that it offers a continuous stream of innovative, technology-driven products that meet the market's requirements for performance-driven, energy-efficient, eco-friendly solutions.

While renowned for professionalism and structured management systems, Core Air Conditioning delivers these in a flexible and friendly manner. Its ability to adapt and make changes, especially when unforeseen circumstances arise, is well known.

Core Air Conditioning is the sole distributor for Carrier and Emerson Network Power's Liebert portfolios of commercial, industrial and computer room air conditioning products in Ireland. It also supplies the full range of Mitsubishi Electric, Holland Heating, Lu-Ve Clint and Jacir air handling and air treatment equipment, and can



Austin McDermott, Managing Director

Meet the team ...

Dave Clarke, Service Sales Engineer

Fintan Brewster, Service Manager

Antoinette Freeley, Financial Controller

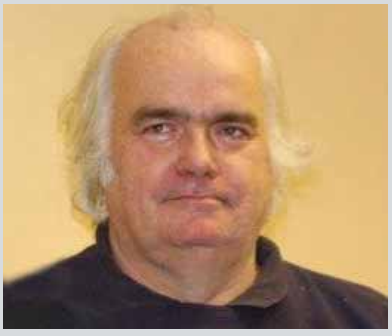
Jenny Courtney, Service Co-ordinator

Carol Malone, Sales Administration

John Rossiter, Service Engineer

Jonathan Flynn, Service Engineer

Eivan Ferris, Service Engineer



Patrick Quill, Service Engineer

John Walshe, Service Engineer, Cork

now offer a full package of air conditioning and process-related products for all applications.

The diversity and scope of the portfolio is an added advantage as, no matter what the project application, Core can devise a tailored solution in conjunction with the specifying consultant and client to match their specific requirements. Regulatory compliance in relation to all relevant national and international standards is also assured.

Service and maintenance

Core combines this product portfolio with excellent technical support that is delivered through its highly-qualified team of service engineers. They have wide-ranging experience across all HVAC brands and equipment and so can offer all-embracing solutions.

In addition to commissioning and trouble-shooting, the team also provides customised maintenance packages. These ensure the optimised performance of installed systems and prolongs equipment and system lifespan. They also minimise the risk of system failure or total shut down.

Core's planned maintenance and service agreements are extremely flexible and carefully structured to suit each individual installation after a full site survey has been completed.

In addition to service, repair and planned maintenance, diagnostic and proactive recommendations for improvements are also provided, along of course with emergency callout cover.

core 20 YEARS ANNIVERSARY
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ASHRAE Conference offers fresh perspective on future of building services in Ireland

The inaugural ASHRAE Ireland Conference took place in Dublin Castle recently and was attended by 80 representatives from both industry and academia. In addition, 10 sponsoring organisations were also present on the day, representing building design, HVAC equipment, refrigeration and controls. Engineers Ireland provided the CPD accreditation for the event proceedings.

Frank Caul, ASHRAE Ireland President, opened the proceedings and, in his address, commented on the current state of the building services industry. He spoke of the challenges posed by public misperceptions of the sector, and the general lack of experienced graduates coming through with the required skills to serve in the industry. This is reflected in a recent Hays industry survey which suggested building services engineers are currently the most sought-after professionals in the construction industry, with up to 20 jobs per candidate on average.

Mr Caul also commented on the need for collaboration within the industry, particularly given the interplay between architecture, engineering and software solutions in modern developments.

Ken Goodman, ASHRAE Sub-Region B Chair, introduced ASHRAE and its core values of excellence, commitment, integrity, collaboration and volunteerism. He talked about the role of the ASHRAE Ireland section, the latest in a network of 178 Chapters/Sections covering 35 countries across four continents, with a current global membership standing at over 53,000.

There are also many technical and research committees, as well as wide-ranging certification and training programmess. The main message was to get involved as there are opportunities at all levels, from local organisation, section participation or even involvement in the technical/research committees.

Dr Bruce Hunn, Building Energy Quotient: ASHRAE's Building Energy Labeling Program, spoke about "Performance measurement protocols for commercial buildings", giving an in-depth discussion on characteristic measures for energy, water and indoor environmental quality (IEQ), as well as best practice guidelines for the application of each.

This talk covered many important aspects of performance measurement, including setting the objective (why is it measured?), the metric (what to measure and how?), and finally the outputs in terms of appropriate benchmarks or

Attendees at the ASHRAE Ireland Conference

C&F Quadrant to present Glow-worm and Vaillant at PLUMBEX

www.cfquadrant.ie

C&F Quadrant will feature the full product ranges from both Glow-worm and Vaillant at the forthcoming PLUMBEX which takes place at the Citywest Exhibition Centre on 25/26 May 2016. Here we feature two ranges that will be on display. Visit our stand to see the full portfolio, and to talk to experts on the features, benefits and applications of the entire portfolio.

PLUMBEX TRADE EVENT DUBLIN 2016

Glow-worm

The energy you need

The Glow-worm Energy System boiler from C&F Quadrant is a high-quality, high-efficiency boiler made from automotive grade aluminium that makes it very easy to handle and install.

Incorporating a high-quality aluminium heat exchanger, the Energy System boiler has a modern high-impact design suited to modern homes and comes with a bright, easy-to-read, LCD display, a smart timeless case design and super-quiet running.

Energy System boiler is ErP A rated and comes in an extensive range of outputs for various applications, including 12kW, 15kW, 18kW, 25kW and 30kW models.

Vaillant

The new generation Vaillant ecoTEC appliances are more efficient, and durable than ever before and are so compact that they fit in the smallest niche. They provide single and multi-family houses with central

heating and hot water at all times. Vaillant ecoTEC uses an electronic gas-air mix system and operates with optimum modulation. This reduces energy consumption and emissions, and also increases the efficiency of water heating. The integral condensation heat exchanger and the new high-efficiency pumps provide additional energy savings.

Output versions of 20/24kW, 25/30kW and 30/34kW as a mixed unit for heating and generation of domestic hot water are available, and of 16, 24kW and 38kW as a system boiler for heating only.

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CREATING A QUALITY ENVIRONMENT

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performance indicators. It dealt with the three levels of performance objectives – basic, intermediate and advanced, giving detailed examples for each case, utilising the ASHRAE HQ building in Atlanta as a case study.

In the afternoon session, Kevin O'Rourke, Marchena Management Services Ltd, opened with a discussion on building energy policy and standards, and in particular the policies guiding us towards near-zero energy buildings (NZEB). These policies are translated from EU Directives (EPBD and EED) into national building regulations in the form of Part L guidance documents, and new Building Control Regulations (2014).

From policy to research and practice, Dr Daniel Coakley, ASHRAE Ireland Secretary and Research Fellow at Integrated Environmental Solutions Ltd (IES), introduced the concept of smart cities and smart buildings, and spoke about how research in this space is driving improved integration between systems, buildings, communities and cities. The solutions being developed through collaborative research projects and training networks, such as Horizon 2020 and Marie Curie, are helping to create the next generation of urban energy planners and engineering solutions which are capable of leveraging novel ICT technologies to improve design and operational efficiency.

In particular, Dr Coakley highlighted the EINSTEIN Project, a Marie Curie IAPP project in collaboration with Trinity College Dublin, which aims to develop the next generation of optimised building controllers, through a combination of data-driven fault detection and prediction-based control optimisation.

Kevin O'Rourke, Marchena Management Services with Dr Bruce D Hun, ASHRAE; Michael Dawkins, RPS, ASHRAE Ireland Treasurer; Tom Morgan, DPS Ltd; Frank Caul, Sirus, ASHRAE Ireland President; Seamus Kerr, RSL Ireland; Simeon Oxizidis, IERC, ASHRAE Ireland Vice-President; Ken Goodman, ASHRAE Sub-Region B Chair; Daniel Coakley, IES, ASHRAE Ireland Secretary; Nohad Boudani, ASHRAE RAL RMCR – Region Members Council Representative; Hugh O'Gorman, Johnson Controls and Donal Finn, UCD.

Ken Goodman introduced the final session of the day which focussed on one of the core elements of ASHRAE – technical standards, guidelines and regulation. Seamus Kerr, RSL Ireland, gave an update on new Ozone Depleting Substances (ODS) and F-Gas Regulations, and the implications for industry, as well as some of the long-term alternatives for refrigeration. Finally, he discussed the challenges these regulations place on the industry in terms of phase-out time, safety, training and upskilling, as well as the need for investment and change.

Bruce D Hunn then gave the final talk of the day on the topic of ASHRAE technical committees, task groups and research committees, as well as giving guidance on how individuals and organisations can participate. These standards and research committees play an important role in driving industry standards, regulations and best-practice guidelines. In fact, the most widely recognised ASHRAE publications, the four-part Handbook series, is compiled and updated almost entirely by voluntary members of technical standing committees who write, review and vote on updates to these guidebooks.

In addition, ASHRAE conducts a wide range of research projects across all interest areas, from building and HVAC design, to equipment, refrigeration and materials. ASHRAE independently invests approximately €2.6million per annum in over 70/80 ongoing research projects conducted by research institutes and organisations, both within the US and elsewhere throughout the world.

Overall, the event was a tremendous success with very positive feedback from attendees, sponsors, invited speakers and guests. ASHRAE hopes that it will lead to the growth of the organisation in Ireland, with further events already planned and a growing interest in the formation of technical sub-committees.

Contact: secretary@ashrae-ireland.org; or visit http://ashrae-ireland.eventbrite.com/

A recent Hays industry survey suggested building services engineers are currently the most sought-after professionals in the construction industry, with up to 20 jobs per candidate on average.

DIAMOND AIR CONDITIONING, LTD.







AIRBLOC

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Blanchardstown, Dublin 15.

Tel: 01 – 636 3131;
Email: info@diamondair.ie;
www.www.diamondair.ie

wilo
Pioneering for You

Wilo Ireland Spearheads Group 2020 Vision

With current turnover at €1.3 billion and sustained profitable growth envisaged right up to 2020, the Wilo Group has implemented a worldwide expansion and development programme that will see major investment in each of its locally-based subsidiaries. Wilo Ireland has a critical role to play in this strategy and hence the large investment in the company's new purpose-designed headquarters in Calmount Business Park, Dublin 12.

Pictured at the official opening of Wilo Ireland's new Dublin headquarters recently were Andy O'Brien, Financial Director, UK/IE; Marc Stiebing, Senior Vice President Region EU + North/East, Wilo SE; Derek Elton, Sales Director, Wilo IE; and Gary Mannus, Managing Director, UK/IE, Vice President Sales Area North America, Wilo SE.

A measure of the status Wilo Ireland enjoys within the group was demonstrated by the fact that all Wilo Ireland attended the recent official opening.

Derek Elton, National Sales Director, Wilo Ireland and his team are very excited by this initiative as the new premises incorporate state-of-the-art facilities including modern office layouts, a staff restaurant, service centre, specially fitted out warehousing and a dedicated CPD training theatre.

> Wilo employs over 7000 people and has a turnover of €1.3 billion

Wilo Ireland is the sales arm of the business and it is responsible for all sales, marketing and service functions throughout the country. It is managed from the new Dublin headquarters but interacts closely with sister-company Wilo Pumps, the production unit based in Limerick. Between them they employ a committed team of 35 people and this brings a wealth of experience, knowledge and expertise to bear when devising pumping solutions for its customers.

Wilo Ireland … building on its 36-year history – and the 144-year history of its parent – to realise the Wilo Group 2020 vision.

Still made in Ireland

When Wilo SE chose Limerick as the location for its first manufacturing facility outside of Germany in 1980 it was a declaration of confidence in Ireland's educated, engineering-based workforce. Thirty six years later that leap of faith has been truly vindicated as Wilo Today it specialises in the assembly of high-end, energy-efficient products such as the Wilo Star-Z Nova domestic hot water circulation pump and has a cutting-edge R&D department that develops product for the future.

Wilo Pumps is still exclusively export-oriented and today specialises in the assembly of high-end, energy-efficient products such as the Wilo Star-Z Nova domestic hot water circulation pump. Cutting-edge R&D plays a major role in the Limerick facility's activities and it contributes significantly to the development of new products and ground-breaking pump technology innovations.

Technical and after sales support

Customer support – including commissioning, service, fault-diagnosis and prompt response – are especially important for all Wilo's partners in today's marketplace. Hence the holistic approach the company takes to every project, irrespective of size.

Engineers are constantly engaged in continuous professional development, participating in training and educational courses at Wilo in Ireland, and at various Wilo centres of excellence worldwide. The benefits of this programme are then brought to bear when delivering CPD and other training modules at its new headquarters.

History dating back to 1872

Founded in 1872 as Kupfer-und Messingwarenfabrik in Dortmund, Wilo has evolved from being a local engineering specialist to a global market player. Today, nearly 145 years since it was established, 5th generation Oplander family members still guide the company's continuity and independence. It employs over 7,000 people worldwide and has a turnover of €1.3 billion.

An uncompromising customer-driven mindset, coupled with a culture of innovation, has positioned it as one of the world's leading manufacturers of high-tech pumps and pump systems.

Wilo is synonymous with first-class German engineering and the product range includes high-efficiency pumps exceeding current EU Directives on energy requirements, through to complex booster, waste water and sewage systems.

Going digital with €100 million investment

Digitalisation has become a key factor in Wilo's success, and this is also true when applied to the product portfolio. It changes the entire value chain, but particularly production processes and working procedures. Wilo has identified some tough challenges, but also great opportunities in implementing digitalisation in its products and processes. Thus, everything in the Wilo Group is now firmly focused on digitalisation and technological progress.

That is why it is has embarked on the largest site development programme in the company's history at its Dortmund headquarters with a planned investment of well over €100 million.

"This is an investment in the future. It will reinforce our leading position in the marketplace and secure our technological leadership in a range of areas", says Oliver Hermes, CEO of the Wilo Group. The foundation stone of the new headquarters will be laid this autumn.

Supporting BIM

Wilo is the first pump manufacturer to provide product data in digital form for Building Information Modelling (BIM). This means Wilo products' technical details, features and benefits can be incorporated directly into the 3D CAD planning process for a building.

Close the door on energy loss with Airbloc solutions

With every retail outlet across Ireland throwing its doors open to customers, it's no wonder their energy bills make a huge hole in their profits. As internal temperatures drop by as much as 10°C within moments of the doors opening, it's time for businesses to close the door on energy loss.

The solution lies in the installation of air curtains and in Airbloc distributor Diamond Air Conditioning has a model to solve every application. Airbloc air curtains cut energy loss by over 80% and deliver a uniform flow of air to separate the interior and exterior atmospheres, maintain the internal climate, offer significant cost savings and deliver vastly-improved worker comfort.

Comparative temperature readings show a drop of between 4°C and 10°C every time a shop door is opened. However, with an air curtain the difference is normally just 1°C.

Diamond Air Conditioning has already specified hundreds of Airbloc installations throughout the country, and in all of the leading-brand retail chains.

For instance, Airbloc AC Series door curtains are now being used in all new Costa Coffee stores in Ireland. They have helped to maintain a comfortable temperature throughout the stores as the front doors are constantly left open. Other outlets using the AC Series are United Drug (multiple units), Fat Face in Wexford, Boots in Cork and multiple outlets in Kildare Village.

Opening and closing external doors also affects the internal temperature and reduces comfort levels for employees. Temperature-sensitive and other perishable goods can also be compromised.

Airbloc air curtain installation

Airbloc air curtains can be positioned directly over or on the side of a doorway. When doors are opened in heated buildings, colder external air flows in through the bottom part of the opening, while internal air flows out through the upper part. In air conditioned buildings, the opposite applies. Over-door air curtains deliver a uniform flow of air across the full door width that separates the interior and exterior atmospheres.

As well as their energy saving capacity, air curtains also have "hidden" benefits. Over-door air curtains induce warm air down from high level that would otherwise be lost through the roof, thus helping to de-stratify the building and eliminate cold spots. New developments feature a fresh design that promotes a laminar airflow and includes deep-profile aerofoil section air straightening veins. These improve the efficiency of climate separation between the indoor and outdoor environment, compared to previous models.

When combined with an energy-saving control unit such as the SmartElec2 from Airbloc, both power consumption and energy costs can be reduced by up to 50%. The attractive unit offers a number of control options to suit all applications, including thermostats linked to door-closed sensors that turn units down or off to increase energy saving. Outside temperature sensors can also turn off in warmer times, while timers will ensure the units only operate when required.

The latest addition to the SmartElec2 is the proportional control algorithm which drives the leaving air temperature of the door curtain up when the outside temperature drops, and reduces the leaving air temperature as the outside temperature increases. This makes for fully automatic control and huge energy savings.

For more information contact Diamond Air Conditioning, Tel: 01 – 636 3131; Michael Clancy (087 – 262 0701) or Graham McCann (087 – 950 9402), email: info@diamondair.ie; www. diamondair.ie ■

Strengthened portfolio expands GT Phelan market

As we enter the second quarter of 2016, GT Phelan's decision at the beginning of the year to expand its portfolio with the addition of a second market-leading brand is already paying dividends. Clients, specifiers, dealers and installers recognise the added strength of the expanded portfolio, and the additional heating and air conditioning solutions GT Phelan can now provide.

Already synonymous with Toshiba throughoput Ireland for just on 35 years, the addition of Samsung in January of this year makes for a far stronger, and more diverse, product offering. Both Toshiba and Samsung are recognised market-leading brands and they sit very comfortably as complementary entities within the GT Phelan portfolio.

Indeed, GT Phelan is a renowned brand in itself, serving the industry's needs in Ireland since 1981. Founder Gerry Phelan was instrumental in establishing and spearheading the company's early growth and his sons – Kevin, Derek and Rodney – have been very much an integral part of its expansion and development since taking the reins.

All are directors of the company and GT Phelan is every bit a service provider as it is a product supplier. Its objective is to clearly identify the clients requirement, and then to help the consultant and dealer devise the most energy-efficient solution that offers value for money and trouble-free operation.

> "GT Phelan is every bit a service provider as it is a product supplier

GT Phelan is one of a handful of independent building services companies in Ireland who pioneered the introduction of air conditioning to Ireland back in the early 1980s. Since then it has played a major role in developing and shaping what was originally an insignificant market segment into the multi-million euro business it represents today.

As product innovations and technological developments were introduced, GT Phelan not only embraced them but championed their adoption by the industry at large. While conscious of its longevity and history, the emphasis has always been on satisfying current market requirements while, at the same time, looking to future solutions.

In essence, GT Phelan brings all the benefits and massive resources of Toshiba and Samsung to bear when using its own considerable experience and expertise to devise tailor-made solutions for the conditions which prevail in Ireland.

Contact: Derek Phelan, GT Phelan. Tel: 01 – 286 4377; info@gtphelan.ie; www.gtphelan.ie ■

Derek Phelan, Sales & Marketing Director with Kevin Phelan, Operations & Service Director, and Rodney Phelan, Managing Director.

Hevac

Strong innovative brands, represented by a local and reliable distributor, offering a complete packaged solution

Hevac established a dedicated ventilation division in March 2015 to meet customer requirements and complement its existing product offering. Over the last year this division has grown significantly, helping Hevac strengthen its position as a market leader in the industry. Hevac Ventilation is headed up by Barry Naughton and Stephen Martin, both widely known and respected in the industry.

"The addition of ventilation equipment to the Hevac portfolio has enhanced our ability to offer a full mechanical package on projects", says Karl Carrick, Hevac Director. "Working with our large customer base, the Ventilation Division can now offer complete solutions from specification supply through to commissioning and after sales support".

VENTILATION

Hevac Ventilation has teamed up with some of the most reliable and trusted brands in the ventilation industry, including:

nuaire — Fan and Heat Recovery Units

Nuaire is a market leader in energy-efficient ventilation solutions. From its main production plant in Cardiff, it manufactures innovative heat recovery units and fans with world class performance in quality, delivery and service.

Hevac Ventilation offer a complete service that includes design support and software, installation advice and excellent after-sales care.

robatherm
the air handling company — Air Handling Units

robatherm manufactures Eurovent-certified air handling units (AHUs) in Germany to the highest standards of quality, safety and sustainability. It offers unrivalled versatility and controls, all of which are tailored to the project including HTM, pharmaceutical and ATEX applications. robatherm's highly automated and state-of-the-art manufacturing ensures impressive lead times with excellent characteristics as standard. These include:

- Thermal Bridge: TB1;
- Leakage Class: L1 (M);
- Thermal Transmittance: T2;
- Casing Deflection: D1/D2 (M).

The Complete Packaged Solution

ADVANCEDAIR
INNOVATION IN ACTION

Fire Dampers and VCDs

Advanced Air has been supplying fire/smoke, fire and volume control dampers and associated control systems to the Irish market for more than 20 years. Manufactured in the UK, all fire dampers are CE marked according to EN15650:2010. They've been fire tested to EN1366-2 and classified to BS EN 13501-3. Fire dampers have been tested horizontally, vertically and from both directions (inside and outside of the furnace).

GRADA

Diffusers and Grilles

GRADA International is a well-known manufacturer of diffusers and grilles. Headquartered in Belgium, it has developed a vast array of products including swirl, slot, multi-directional diffusers, wall and floor grilles, louvres, valves, VAV units and plenum boxes. Grada offers free access to its FACT Software (flow and air comfort tool) which allows the easy computation of air velocity profiles. This is an excellent support tool for engineers, installers and architects.

AirMaid®

Ozone Generators

Airmaid ozone generators are one of the most innovative air treatment systems on the market. Designed and developed in Sweden to successfully tackle odours and grease, they are perfect for applications such as commercial kitchens/restaurants, cleaning plants and pumping stations, refuse storage rooms and waste compactors.

Barry Naughton

Stephen Martin

Darragh Cullivan

Hevac Ventilation welcomes enquiries on any of these exclusive product ranges.

Hevac

Muirfield Drive, Naas Road, Dublin 12. T: 01 – 419 1919.

Unit 1, Furry Park Industrial Estate, Dublin 9. T: 01 – 842 7037.

South Ring West Business Park, Tramore Road, Cork. T: 021 – 432 1066.

email: vent@hevac.ie

www.hevac.ie

Hydronic balancing key to extra energy efficiencies

Considering the sharp focus on upgrading heating systems to energy efficient solutions, *Liam McDermott, Sales Director, Grundfos Ireland,* suggests there are extra gains to be made through correct system balancing. With equipment manufacturers developing smart balancing methods based on mobile phone technologies where "apps" can be used to simplify and speed up the balancing process, Liam asks is it not time to place more emphasis on heating system set-up and commissioning?

In recent years, energy efficiency has become a topic of increasing importance for both business and domestic consumers. General awareness of our environmental responsibilities, combined with the ever-increasing cost of energy, has focused our attentions on the need to become more energy efficient. At global and European level, there is a focus on energy saving which in recent years has provided the impetus behind the implementation of the EuP Directive.

The EuP Directive is the framework obligating manufacturers of energy-using products (EuP) such as heating circulators, boilers, fans and motors, to mention just a few, to reduce the energy consumption of their products, an initiative the European Commission says will result in energy savings of 175 Mtoe by the year 2020. That's equivalent to the energy consumption of Italy. This will result in a positive environmental impact and savings for consumers. It all contributes to the EU 20-20-20 strategy. See Figure 1.

Household energy consumption is a major contributor to the total EU energy bill, and many initiatives are in play to increase the energy efficiency of the housing stock and promote the use of new and renewable technologies to further the 20-20-20 vision. From a heating perspective practical advice and, in some cases incentives, are available to promote the upgrade of domestic heating systems. Improved insulation and draught-proofing can reduce heat losses. Solar and heat pump technologies utilise renewable energy sources, while boiler and heating control upgrades improve heating efficiencies. EuP-compliant pumps save energy in distributing the heat.

While such upgrades undoubtedly help improve a heating system's efficiency, what is often overlooked is the opportunity to maximise the system's overall efficiency. Hydronic balancing is just such an opportunity. This should be the final step in commissioning a heating system but, unfortunately, it is very often omitted. Even in Germany – where it is compulsory to balance a heating system – research shows that 85% of systems are unbalanced.

A study of residential heating systems (Project Optimus) conducted by two German professors reported that radiators were oversized by a ratio of 1.7, boilers by 1.8 and circulator pumps by a ratio of 3, leading to over-consumption of energy. By optimising these heating systems through control and hydronic balancing significant energy savings can be achieved.

An unbalanced system results in excessive heat output from some radiators and insufficient heat output from others, with the radiators closest to the pump usually providing too much heat and the remote ones struggling to satisfy the heating requirement. The effect is uneven temperatures throughout the building. In an attempt to achieve a comfortable environment, occupants tend to increase the flow temperature from the boiler and increase the flow rate through the

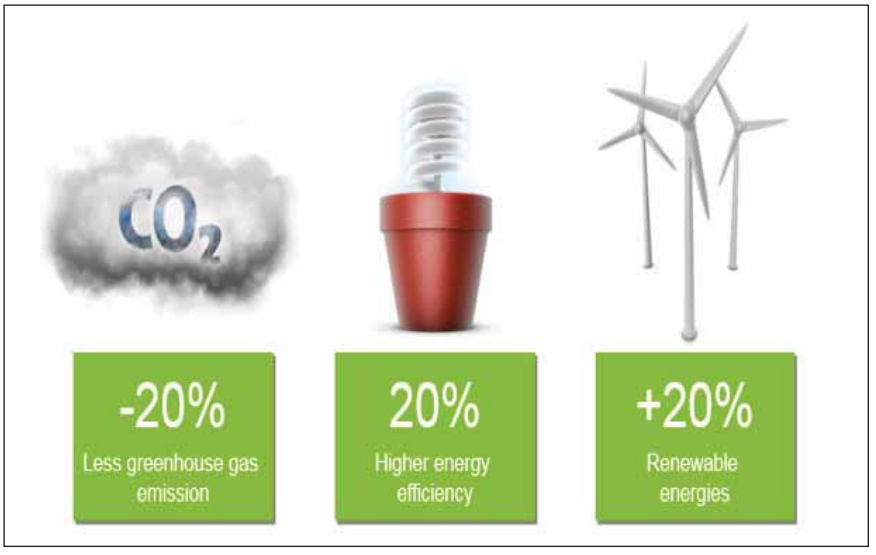


Figure 1. The 2020 target for Energy and Climate Protection = 20-20-20

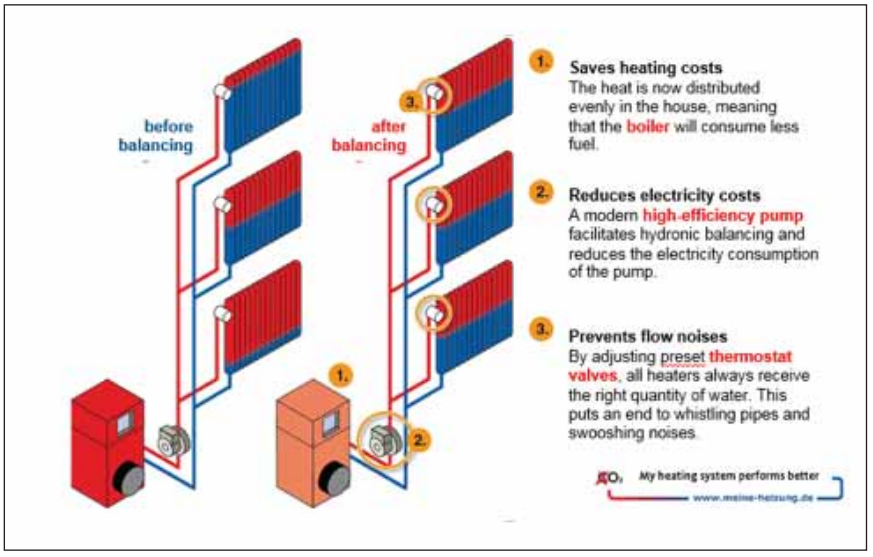


Figure 2

pump, which leads to increased energy consumption and noise in pipework and valves (as verified by research conducted by Ciara Ahern and Brian Norton of the DIT Energy Lab). Another consequence is higher return temperature, which disrupts the condensing effect of the boiler leading to increased energy consumption. See Figure 2.

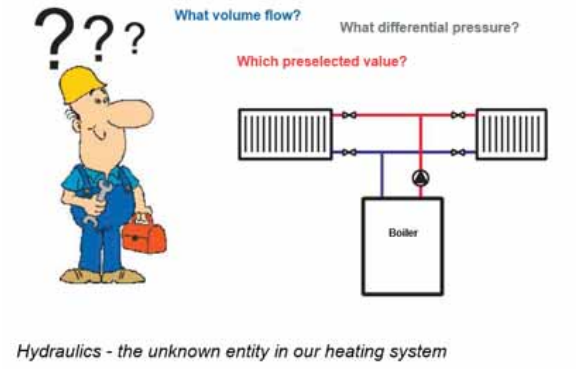
Hydronic balancing is achieved by calculating the heat requirement for each room in the dwelling and matching the heat output from the radiators to meet that demand. Pre-settable thermostatic radiator valves or adjustable lock-shield valves are set to regulate the flow to each radiator to match the required heat output.

Traditionally, there are several methods used for hydronic balancing. These include the following:

- "Gut feeling" approach or radiator-recommended standard settings. This may provide heat throughout the dwelling, but it might not match the heat output to the room's requirements;
- Table look-up and adjustment on the radiator (various versions). Gives the correct output from the radiator but not necessarily the space;
- Use of FGA thermos-couples to measure temperature differential. This requires specialist equipment … not to mention training. See Figure 3.

There are tools and methodologies for hydronic balancing but these tend to be under-utilised. There are probably some valid reasons for this, including:

- It is time-consuming and adds labour cost to completing an installation or upgrade of a heating system;
- The methodology can, at times, be complicated and requires specialist skills and calculations to complete the task correctly;
- There is a knowledge gap with few tradespeople, and even fewer end-users, understanding the energy savings achievable through correct balancing of a heating system. Research indicates that, depending on the system, the condition, age, location and usage profile of the dwelling, up to 20% energy savings are achievable through system optimisation, with an average of 10% very achievable. ■



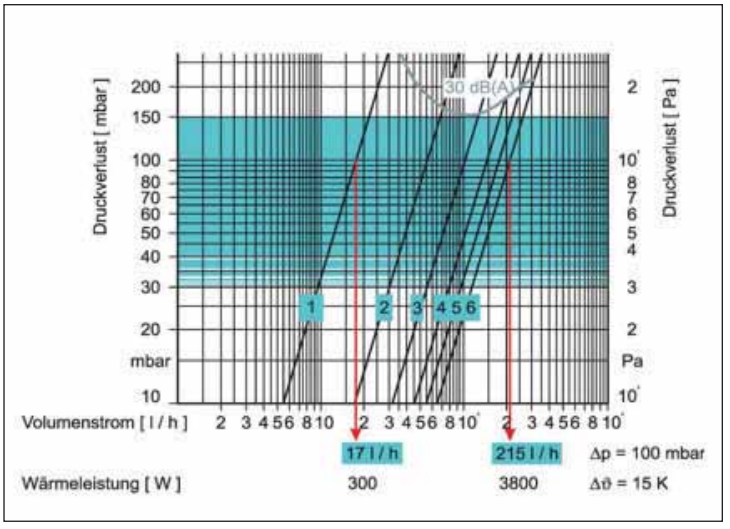


Figure 3.

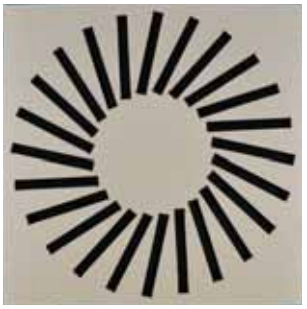
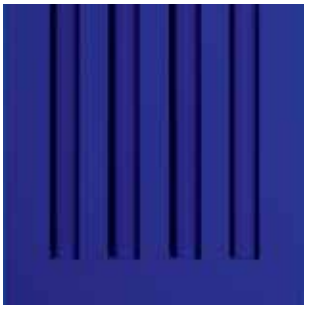
Figure 4. Hydronic balancing procedure

St Botolph

St Botolph combines high specification with aesthetics. The HVAC system is an integral part of the design, the challenge was to meet the design aesthetics whilst ensuring that the diffusers provided the highest aerodynamic and acoustic performance levels. Many of the diffusers were custom built and featured a combination of sweeping 11, 12 and 13 metre curves replicating the many curvatures of the building's design. The Fixed Blade Swirl Diffusers provided an attractive but aerodynamically efficient alternative to conventional circular or square ceiling air terminals.

Bon Accord

Air terminal devices have been used throughout the Bon Accord shopping centre where there was a need to design an efficient air distribution system to help reduce emissions and carbon footprints. Air distribution was a key element, requirements included providing the most effective air distribution to maximise airflows and ensure that the air throws deliver the correct temperatures throughout the centre. Waterloo's 'CSF' range of linear slot diffusers have been used throughout the centre including the food court, atrium and Upper Mall. The modern architectural design of the food court required a customised solution, with Waterloo manufacturing bespoke products to provide long sweeping curved designs above the food court.



Products



Waterloo Air Products manufacture an extensive catalogue of products suitable for all wall, ceiling and floor applications. Designed to suit both performance and aesthetical requirements, most can be ordered in customer specified colours and finishes. The majority of Waterloo's products are produced in the UK, meaning higher quality, shorter lead times and lower costs.

The **Waterloo Aircell** presents a contemporary style combining high performance and robust construction with the significant cost advantage of injection moulded engineering polymers. Waterloo Aircell are multi-purpose products which bring particular benefits to chlorinated environments (swimming pools) or high cleaning regime areas (hospitals). However, these products can be used in any air distribution system where temperatures do not exceed 50°C.

available from S&P Ireland Ventilation Systems Ltd

Soler and Palau are suppliers of domestic, commercial, industrial and process ventilation equipment in Ireland.

The team at Soler and Palau have over forty year's experience in the ventilation business. With their knowledge and experience of fans their staff will offer you professional and technical advice on the optimum ventilation solution from their extensive product portfolio.

For more specific information, contact:

Tel: 00 353 (01) 4124 020 www.solerpalau.ie sales.ie@solerpalau.com

THE ENERGY SHOW 2016

APRIL 6TH & 7TH – RDS, DUBLIN 4

The Sustainable Energy Authority of Ireland's (SEAI) annual two-day business-to-business event, *The Energy Show 2016,* was a huge success with visitors up a quarter on last year. The show took place at the RDS and included live retrofit demonstrations, an international markets pavilion, multiple networking events, lots of free briefings and workshops, and an extensive electric vehicle showcase.

The Energy Show plays an important role for the growing Irish energy sector, hosting over 170 exhibitors, two thirds of whom were Irish, with the remaining third travelling from overseas to take part. Over 4,700 professionals attending the show saw the latest sustainable energy technologies and services on the market.

Commenting on the success of the Show, SEAI's William Walsh, Interim CEO, said: "The sustainable energy sector is worth around €1.5 billion to Ireland annually and the Energy Show generates about €60 million of business in its own right. Witnessing the scale of business activity over the last couple of days at the Energy Show confirms that this is a strong and growing sector, with significant international opportunity. There is now constant innovation in smart energy solutions and as we work towards meeting our energy targets, this expertise is definitely to Ireland's advantage."

The Product of the Show accolade went to Solar Electric Ireland for its product sonnenBatterie. This high-tech energy storage solution also won Best Innovative Product. It combines a solar photovoltaic system and a battery, meaning homeowners can get about 75% of their yearly electricity requirement from clean energy generated on their roof. The system is already installed in thousands of homes in Europe.

Commenting on the win, Solar Electric Ireland co-owners, Robert Goss and Tom Foley, said: "Our business is supplying and installing solar PV systems across Ireland. Now that storage systems have become technically and financially viable, we are delighted to have secured the rights to the market-leader in Germany, the Eco8 from sonnenBatterie. The fact that our product was chosen as Best Innovative Product and Product of the Show puts an important 'seal of approval' on the product and supports our plan to launch the product in Ireland this summer. The product was very well received by visitors to The Energy Show and we have already had a number of good enquiries from the show that will make up our pilot projects for June installation."

The full list of Product of the Show winners is listed in the panel opposite while video highlights from the show can be seen at www.seai.ie/energyshow.

AWARD WINNERS

Overall Winner

Solar Electric Ireland
sonnenBatterie ECO8 energy storage solution

Best Energy Efficient Product

Winner: Origen – Robur gas absorption heat pump
Highly Commended: Unipipe – NIBE F730 Heat Pump
Commended: Grundfos Ireland – Grundfos Alpha3 hydronic balancing system
Commended: Vent-Axia – Sentinel Kinetic Advance MVHR

Best Innovative Product

Winner: Solar Electric Ireland – sonnenBatterie ECO8 energy storage solution
Commended: Smart Innovation Products – Heat Hero heat system efficiency enhancer
Commended: EPSE – CHIP50 woodchip cogenerator
Commended: Daikin – Daikin/Rotex HPSU air to water heat pumps

Best Renewable Product

Winner: MCC Energy – Giraffe 2.0 hybrid power station
Highly Commended: EPSE – CHIP50 woodchip cogenerator
Commended: Unipipe – NIBE F730 Heat Pump
Commended: Daikin – Daikin/Rotex HPSU air to water heat pumps

Best Services Provider

Winner: Metac – Energy training centre and assessor

Best Product of the Future

Winner: Rexel Energy Solutions – Enphase AC battery energy storage system

Overall Winner – Brian Scannell, Product of the Show Awards judge with Tom Foley and Robert Goss, Solar Electric and Declan Meally, Head of Department, Emerging Sectors, SEAI.

David Doherty, Product of the Show Awards judge with Liam McDermott, Grundfos Ireland and Declan Meally, Head of Department, Emerging Sectors, SEAI.

Enda Gilroy, Product of Show Awards judge with Chris Halligan, Lindab, Barry Murphy, Vent Axia and Declan Meally, Head of Department, Emerging Sectors, SEAI.

Matteo Vecciato, ESPE and Declan Meally, Head of Department, Emerging Sectors, SEAI.

John O'Shaughnessy, Daikin and Declan Meally, Head of Department, Emerging Sectors, SEAI.

Dominic Dunne, Metac and Declan Meally, Head of Department, Emerging Sectors, SEAI.

Gary Watson, Damien Philips and Martyn Berry, Rexel Energy Solutions.

Joe McCarthy, MCC with Marcus Ulmefors.

Joe Durkan, Product of the Show Awards judge with Nick O'Donnell, Unipipe.

Chris Hughes, Product of the Show Awards judge with Peter Mulvihill and Kevin Devine, Origen Energy, Stefano Favari and Federico Morini, Robur.

Enda Gilroy, Product of the Show Awards judge with Arthur McArdle and Adrienne McArdle, Heat Hero and Declan Meally, Head of Department, Emerging Sectors, SEAI.

AquaBox System

Compact design, Constant pressure

The new all in one Aquabox System for Domestic and Commercial clean water applications. A compact system designed for transporting clean water with constant pressure. The Aquabox System makes plumbing easy, with less work, creating more space and less noise for greater comfort. A cost effective plug n'play system from Xylem.

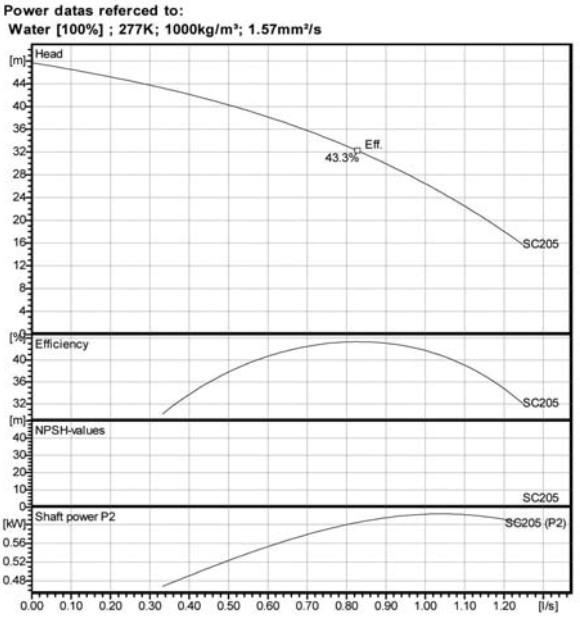
Components

- 300 Litre & 500 Litre Tank
- Lowara SC205 Stainless Steel Submersible Scuba Pump
- Auto Genyo Controller
- Ball Valve & Float
- 25mm BSP Brass Connection

Please Note: Overflow connection not supplied

SCUBA Series

The Lowara SC205 Scuba, is a 5" Close Coupled Multistage submersible pump (0.55kw) with Electrical motor cooled by pumped liquid which is FDA compliant. The Lowara Scuba can be installed in vertical and horizontal positions. The pumps low noise tolerance, stainless steel structure, Double Mechanical Seals system and engineered motor is designed for constant use.



GENYO Series

The Lowara Genyo electronic control and protection system designed with pressure sensors, delivers constant water pressure on demand. The Genyo enables automatic control of pump start up and shut down based on actual water demand, preventing any pressure fluctuations. The Genyo has built in dry run protection and auto-restart.

www. xylemwatersolutions.com

xylem
Let's Solve Water

Dublin: 01 452 4444
or email lowara.ireland@xyleminc.com

Belfast: 07990 706 933

Tank Details

The Tanks is manufactured from medium density recyclable polyethylene with UV light stabilizer for outdoor endurance, they are compact and strong. The Tanks light weigh design makes for easy transportation and installation.

Tank Dimensions

Dimensions in mm

Capacity 300 Litre

Height	710
Width	664
Length	1029

Capacity 300 Litre

Height	1300
Diameter	580
Width including handles	653

Capacity 500 Litre

Height	803
Width	728
Length	1201

BUILDING SERVICES ENGINEERING DESIGN

Cardinal sin to omit energy meters

This article by *Enda Gilroy** focuses on energy monitoring and analysis, the objective being to provide a general overview of how to set up and optimise a facility's energy monitoring and targeting (M&T) system. It also deals with the importance of metering gap analysis, and discusses some of the M&T systems available.

Monitoring energy and water is a critical component of a facility's services design, either new or retro-fit, if it is to be comprehensive. It is also essential to understand what we mean by the term monitoring. Effectively, we mean the measurement of energy and water quantities delivered or consumed, for example, kilowatt-hours of electricity, cubic meters of natural gas, kilograms of steam and litres of water. An integral part of that process is setting relevant energy (or water) performance indicators (EnPI)s by cross-referencing with other measured relevant data such as weather or production data.

Targeting refers to critically analysing the monitoring efficiency results and identifying improvement strategies. M&T may also involve identifying times-of-use and maximum demand, relevant when comparing and analysing tariff structures, as well as identifying energy use for a collection of buildings, individual buildings, rooms, or specific equipment (e.g., boilers, chillers, motors, process lines and/or equipment etc.).

A lack of visibility in relation to energy and water consumption has meant that facility operators have historically struggled to manage these resources effectively. A well-structured M&T system is a crucial tool that helps facility energy managers control costs, diagnose equipment malfunction, allocate usage and set efficiency goals. With the escalating volatility of energy and water rates, these needs are becoming more important.

Energy monitoring

Energy and facility managers have long known the value that resides in metered data. Recent advances in M&T systems and metering has resulted in increased functionality at lower costs. Obtaining data in a cost-effective manner and turning it into useful information is now a standard practice. Whether energy managers are trying to comply with legislation, or looking to apply accepted building and facility management best practices – such as utility bill verification, benchmarking, or setting and achieving company energy reduction targets – today's M&T technologies incorporating well thought out metering, can provide the information needed to meet energy goals, save money, and improve facility operations.

The application of an M&T system with well-placed meters provides facility managers and operators with real-time information on how much and how efficiently energy is being used. This type of information can be used to assist in optimising building, equipment and production operations, in utility procurements, and in building energy budget planning and tracking.

It is important to keep in mind that meters only provide data. A well thought out metering placement strategy is required to allow the energy manager to identify trends and analyse consumption effectively. There are far too many examples in Ireland of legacy metering installations that are data rich and information poor due to a lack of strategic thinking at the design phase when placing meters. Strategically placed meters and their supporting systems are resources that provide users with information that can be used to:

- Reduce energy use;
- Reduce energy costs;
- Improve equipment operations;
- Initiate demand response or load shedding to optimise utility electricity usage;
- Measure and verify energy project performance;
- Benchmark building energy use;
- Identify operational efficiency improvement opportunities and retrofit project opportunities;
- Report on and track energy and water consumption and costs;
- Estimate future consumption and costs;
- Develop energy, management, annual reports etc.

Energy management planning

The development of an M&T plan is highly dependent on a site's needs and its energy strategy. The available budget, existing

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metering equipment and available infrastructure will influence the implementation and rollout.

When it comes to an M&T system, one size does not fit all. Figure 1 shows some very general guidelines identifying the steps and actions necessary for energy management planning.

EnPIs and metering gap analysis

The critical first step for all M&T systems is to establish appropriate EnPIs for the facility. This should be done in conjunction with end-users which are typically facility and operations managers. Metering positions and the M&T system interface and set-up will all follow on from the selected EnPIs so getting this right is crucial. Typically, EnPIs fall into two main categories:

(1) Reporting – typically consumption and costs to management;

(2) Energy analysis and conservation – typically allowing the energy manager (and others such as production and facility managers, etc) to constantly monitor and analyse performance of utilities, equipment and processes at selected strategic points throughout the facility. Typical EnPIs might be a unit of production/kg steam, m^3 air/kWh_e, etc.

Where a facility has a legacy M&T and/or metering system, it is highly recommended that the EnPIs be set as described and then a metering gap analysis should follow. Once the EnPIs are established, a metering gap analysis identifies what existing meters can be utilised and what new meters are required. (Note: meters in the context of this article may be physical instruments such as steam or electrical meters, etc, or could equally be production units from a machine or other management system, air system data from a BMS, or weather data from the web etc).

Don't try to make existing meters fit onto your M&T system. If they feed into selected EnPIs then great. If not, just disregard them or move them to somewhere in the system where they can contribute to the selected EnPIs.

While the ultimate goal of the M&T system is to reduce energy and water consumption and costs, how this is done will depend on how the metered data is used. Some of the more typical uses include bill verification, demand management and energy use diagnostics.

Meters should be applied where they will lead to a cost-effective reduction in facility energy and water consumption and costs. Determining which systems can be metered cost-effectively requires that criteria be established and applied that takes into account the life-cycle costs of metering and the potential benefits to be realised. The location of meters needs careful consideration and engineering knowledge is vital.

For example, adding a meter to a fan or pump that runs at a fixed supply or known schedule will offer little benefit over engineering calculations. However, where the flow rates vary or other variables influence the power consumption, then metering can give an invaluable insight into a system's operational performance and provide the monitoring information required for analysis and targeted energy reduction.

Implementation, design, installation

The planning process up to this point has been largely analytical. Based on the goals, objectives, analysis needs and application of evaluation criteria, there is now enough information to design the actual metering system. Help should be sought from a suitably-qualified controls/instrumentation engineer around the performance specification, selection and placement of the meters. As it is critical to the future success of energy management initiatives, sufficient time and resources should be deployed during the review to ensure that an accurate picture of energy use is generated.

Validation and persistence

Once the metering system is up and running, the overall programme focus shifts to making sure that:

- Accurate data is obtained and put to timely productive use;
- The M&T/metering system continues to operate effectively and reliably.

Opportunities to save energy

The detailed meter data that is collected will be invaluable for helping to find and quantify energy-saving opportunities. The easiest and most cost-effective energy-saving opportunities typically require little or no capital investment.

For example, most modern buildings have advanced control systems that could, and should, be controlling HVAC well but, unbeknown to the facilities-management staff, are often faulty or misconfigured, and consequently committing such sins as heating or cooling an empty building every night and every weekend, or simultaneously cooling and heating due to a passing valve or unrealistic set points.

However, even though these building management systems offer great levels of control, they seldom log useful data and the ones that do

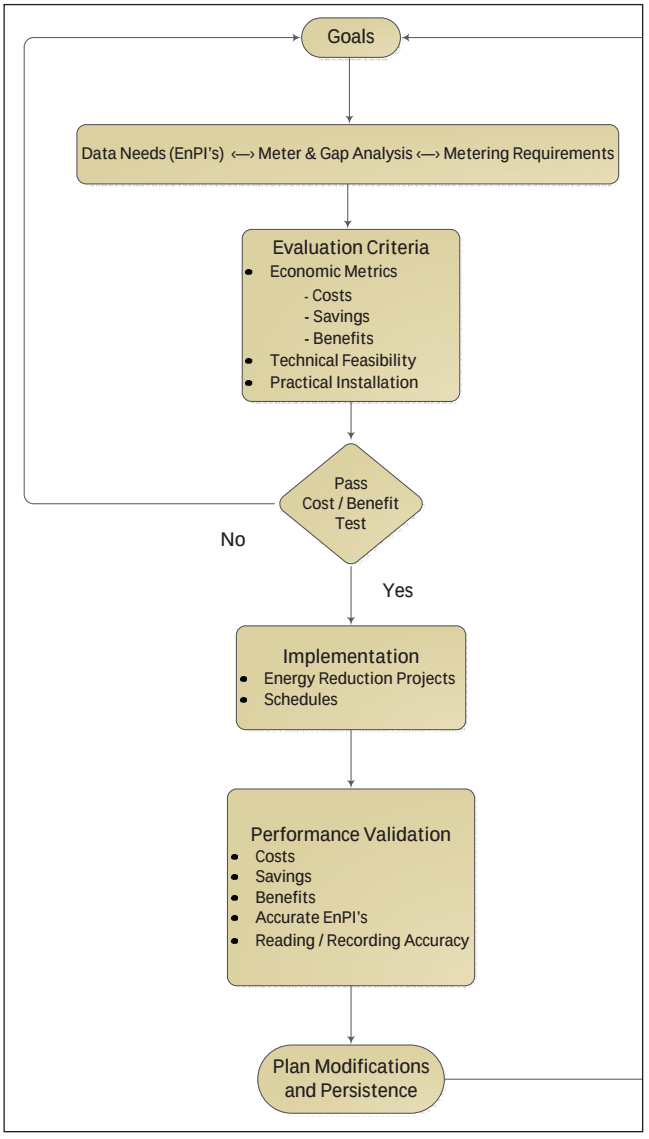

Figure 1 – Energy Management Planning

heating through innovation

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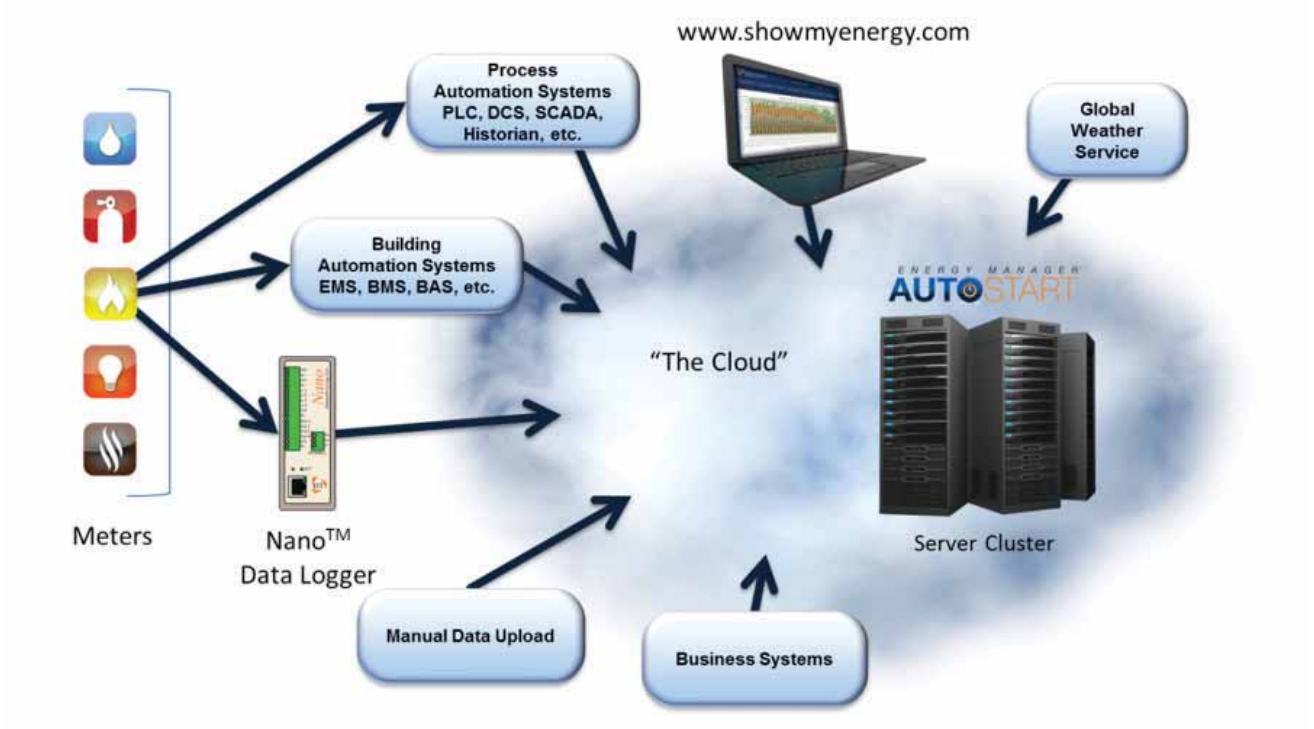


Figure 2 *(Image courtesy EFT Energy)*

generally have a short data logging period and can rewrite over existing data. It is important that data logging covers as long a period as is practically possible and, with advances in cloud storage, this is now a reality for most modern BMS and energy M&T systems.

Looking at detailed interval energy data is the ideal way to find routine energy waste. The detailed data can check whether staff and timers are switching things off without having to patrol the building day and night and, with a little detective work, it is straightforward to figure out who or what is causing the energy wastage that will inevitably be found. By using detailed interval data, it's usually pretty easy to make reasonable estimates of how much energy is being wasted at different times.

Practically all commercial and industrial buildings have a mix of equipment or building-fabric-related energy-saving opportunities, most of which require a more significant capital investment.

Well-selected, detailed meter data will aid in identifying potential energy saving opportunities and will allow an engineer to quantify the potential savings that each opportunity could bring. It's much more reliable to base savings estimates on real metered data than on rules of thumb alone.

Measurement and verification

The measurement and verification (M&V) of energy performance improvements is an important method to determine and report on the value of an implemented energy conservation measure or project. M&V data quality is a particularly important aspect for M&V practitioners to consider in order to guarantee the credibility of reported energy performance. This is of utmost importance to ensuring investor and stakeholder confidence in the reported results.

Energy savings are determined by comparing measured use before and after implementation of a project, making appropriate adjustments for changes in conditions. Implementing M&V will include how to isolate savings generated by the proposed energy conservation measures (ECMs), which will allow the facility to claim potential energy credits as a result of the energy efficiency works.

Energy analysis tools

Large-scale analysis of energy data can be time-consuming and expensive. There are many suppliers of M&T systems with software applications to assist in collating and analysing metered energy data. Analytical services can range from simple use-reporting and tenant billing, to more sophisticated activities of energy use diagnostics and system performance indicators.

There are various energy management tools/software on the market at present, all of which collate data from various meters and other data sources located throughout the facility (and in the case of things such as weather data from the web). They invariably present it to the end user in tabular data, graphical interfaces or pre-defined reports. While each provider will have its own unique selling point (USP), most of the platforms share a common theme regarding metered data acquisition. Two examples are as follow.

EFT Energy

One of the platforms operating in this space is called Energy Manager AutoStart™ by EFT Energy. This is a web-based, all-in-one solution for monitoring, controlling and reporting on energy and water consumption and improving operational efficiency. The system easily integrates with existing meters, building control systems, process automation systems, and business systems, providing a wealth of real-time energy data, analytics, and drill-down reporting. It gives managers the information they need to make intelligent energy decisions (see Figure 2).

Active energy management

EFT's analytical tools learn from dynamic production, operational and environmental variables to continuously forecast and optimise

operational and energy needs. The software automatically updates multi-variable regression models to help review past decisions, forecast future requirements, and optimise energy and operational efficiencies. Pattern recognition and alarming capabilities alert users and control systems to anomalies, providing warnings for corrective/control action to prevent inefficiencies, waste and lost production.

Energy analytics

Energy Analytics B2B consultancy service provides specialist expertise in the engineering informatics and analytics space. It carries out detailed energy data analysis for facilities either using available data infrastructure or through the installation of cloud-based solutions. It utilises packages such as Rapidminer, R and SPSS to analyse the operation of significant energy users within an industrial or manufacturing environment with a view to identifying hidden relationships and hence opportunities for energy reduction.

Energy Analytics offers bespoke fault detection, statistical process control and dashboard-based solutions in either a locally-rolled-out or cloud-based environment, depending on the requirements of facility.

Prognostic health management (PHM)

With a view to empowering facility operators to take control of their energy-guzzling utility systems, Energy Analytics has developed a PHM system. This cloud-based analytics tool takes data from a facilities HVAC, compressed air, refrigeration and CHP systems and utilises advanced machine-learning techniques to identify periods of sub-optimal performance.

This PHM tool is built upon a bespoke data pipeline built upon the principles of the 5C cyber physical system architecture (Figure 3) which immediately gives value to the vast quantities of data that facilities BMS log but as yet do not analyse. It also merges the data from systems which, though they operate in parallel, are operated as individual non-optimised stand-alone units.

Energy savings

The use of energy and water data has been shown to result in changes to operations and maintenance practices, and the identification of projects that improve the energy efficiency of building equipment and systems. By implementing these changes, facilities have shown efficiency improvements of between 10% and 20%.

Savings for a specific building will vary based on the current health of the existing systems and the ability to successfully implement, measure and sustain a positive change. If no action is taken as a result of the metered data analysis, then no lasting energy reduction can be expected.

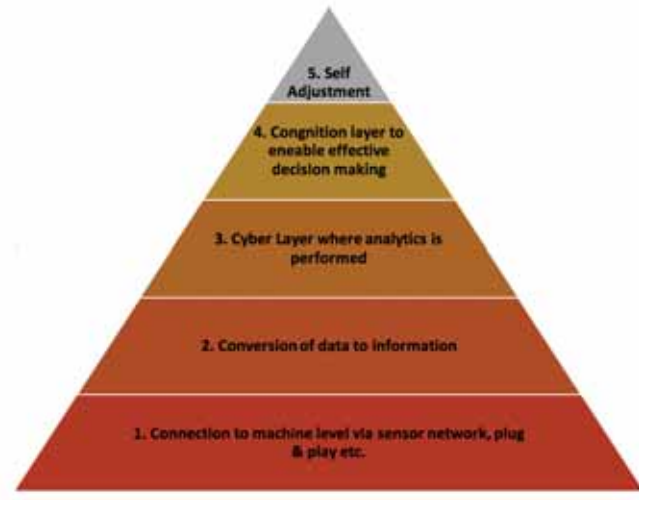


Figure 3 — 5C Cyber Physical System Architecture
(Image Courtesy of Energy Analytics B2B consultancy)

ISO 50001 Energy Management System

ISO 50001 Energy Management System (EnMS) is based on the Plan – Do – Check – Act management system model of continual improvement. The purpose of this standard is to enable organisations to establish the systems and processes necessary to improve energy performance. The ISO 50001 model provides a framework for organisations to:

- Develop a policy for more efficient use of energy;
- Fix targets and objectives to meet the policy;
- Use data to better understand and make decisions about energy use;
- Measure the results;
- Review how well the policy works;
- Continually improve energy management.

Strategically-selected EnPIs and the resulting metering plays a critical role in the Plan and Check portion of the ISO 50001 Plan – Do – Check – Act model. EnPIs and metering should be fully integrated into the overall energy management system, including energy policy, energy planning, implementation and operation. Metered data provides a foundation of support throughout the ISO 50001 continuous improvement cycle.

Conclusion

The careful strategic selection of EnPIs is critical to the successful implementation of any energy M&T system. Metering and monitoring provides the information that, when analysed, allows facility operations staff to make informed decisions on how to efficiently operate energy consuming systems and equipment. These decisions will ultimately affect energy costs, equipment costs and overall building and systems performance.

In modern building services engineering design it is now a cardinal sin to omit energy meters. In general, the cost of energy consumed by plant and systems will far outweigh the capital costs of the equipment, therefore energy management and energy reduction should be at the forefront of engineering design.

Energy monitoring and meters are all too easily the first item on the list when it comes to cost reduction exercises under the guise of "value engineering". It should be a moral obligation on the building services engineer to ensure that these vital services remain in place.

Additional information

An invaluable resource for anyone considering energy monitoring and metering is a document from the US Department of Energy called *Metering Best Practices: A Guide to Achieving Utility Resource Efficiency, Release 3.0*. See also www.eft-energy.com and http://energyanalytics.ie/ ■

*About the author

Enda Gilroy is a Project Engineer/Energy Consultant at Electric Ireland and a committee member of CIBSE Ireland. As part of the Business Energy Services team at Electric Ireland he advises facilities on their energy usage and provides key services in energy reduction programs.

New control system from Mitsubishi Electric Ireland

Mitsubishi Electric has launched a new control system for the retail sector which allows even the smallest shop to benefit from advanced, energy-saving measures, while still enabling full control and measurement across an entire retail estate.

MelcoRETAIL is a dedicated air conditioning controls interface designed specifically for the retail environment, with a simple wall-mounting design to ease installation, remote maintenance and updating to minimise disruption in-store.

It provides a flexible and technically-advanced BEMS (building energy management system) that works in various sizes of retail outlet and is also compatible with third-party equipment. The system improves the ability to measure and control energy in medium and small shops which may not in the past have had access to this level of sophistication in their controls.

Designed specifically with a focus on the requirements of retail customers, MelcoRETAIL is pre-configured with standard inputs and outputs to suit the needs of any small to medium store. This makes the product straightforward for store managers to use effectively. Behind the simple store interface though are advanced capabilities which means that the system can offer advanced metering and energy-saving capabilities.

MelcoRETAIL offers ethernet-remote connectivity and a SIM card connection to the company's MELCOREMOTE system, allowing users to view data on energy use via any web-enabled device. This also means that MelcoRETAIL can provide control and measurement across an entire retail estate if desired. This makes for a highly cost-effective and scalable BEMS solution for retailers who are increasingly looking to find ways to reduce energy consumption.

The system can control up to eight M-Series and Mr Slim indoor units, and 50 City Multi indoor units, which are the most commonly-used Mitsubishi Electric air conditioning products in the retail environment.

However, the controller goes further, allowing store managers to control third-party equipment as well, which is an enormous advance, and an important step away from "proprietary" controls which are limited in what they can achieve in energy saving.

MelcoRetail dedicated air conditioning control for retail outlets from Mitsubishi Electric.

MelcoRETAIL offers third-party air curtain control, as well as two-stage lighting control, and occupancy sensing can be added via the store's intruder alarm-disarm or occupancy switch signal – saving on extra cost of adding sensors. Further innovative features make use of MelcoRETAIL's web capabilities. These include a built-in weather feed so no outdoor temperature sensors are required.

The controller has also been designed to be ready for DUOS and TRIAD energy tariff consumption management. These are time periods when energy costs are extremely high and retailers can benefit from load shedding and shifting energy use. This can save a single store around €3,800 per week in electricity costs.

Overall, this product has taken the key features of highly-sophisticated BEMS technology and made them easy to apply in a single, small high-street store … or across an entire retail estate.

Contact: Mitsubishi Electric. Tel: 01 – 419 8800; email: sales.info@meir.mee.com; www.mitsubishielectric.ie ■

Baxi Potterton Myson advanced heating solutions

Baxi Potterton Myson continues to lead the marketplace with innovative heating and hot water products from its many brand-leading partners. For instance, one of the latest introductions is the FASTflo condensing water heater range from Andrews Water Heaters. These provide a continuous flow of hot water instantly and are ideal for installations that are short of space.

The Megaflo Eco Solar PV Ready

Unlike old instantaneous

water heaters, the revolutionary design measures the incoming water flow and temperature through the primary circuit board. It then modulates the burner up or down to meet the hot water demand. Up to 15 litres per minute satisfies the most demanding applications while the availability of internal or external models means flexible siting, especially where space is at a premium.

Factory-fitted frost protection means it can be installed externally and in areas without heating (external model only). It offers up to 103% gross efficiency and, because it is compact, light and robust, it can be installed quickly, saving time on site

Megaflow Eco Solar PV Ready

Coming shortly is the Megaflo Eco Solar PV Ready cylinder. This unique cylinder redirects excess energy generated by solar collectors and uses it to power the immersion heater using Solar Iboost technology to deliver litres of hot water. The Iboost Buddy offers full control and displays how much energy is being saved each day. Even on cloudy days water is pre-heated to a point that only requires a small boost to bring it up to usable temperatures.

Typical savings of €1.30 per day can be achieved using this technology, meaning the investment will be repaid in a relatively short period of time.

Works for installers

Based on feedback from installers, the Baxi Potterton Myson Works loyalty scheme now offers a wider choice of benefits so that those participating on the scheme get more from their membership.

Once registered, they now have access to the new Works website. This includes an error-code look-up function, complete with installer fixes.

The package of benefits offers an automatic service reminder for customers. Installers can register warranties and claim bonus points in a few simple steps. For details visit www.baxipottertonmyson.ie

Charity golf day

Now into its third year, the annual Baxi Potterton Myson charity golf day will once again take place in Newlands Golf Club in Dublin with all proceeds going to the Irish Hospice Foundation. This is now the company's nominated charity partner so a big turnout on Thursday, 9 June, will ensure a bumper donation to this worthy cause. ■

The Iboost Buddy displays exactly how much energy is saved each day.

Accutrol critical environment solutions from ACE Control Systems

Ace Control Systems has been appointed representatives for the Accutrol range of critical environment airflow control products in Ireland and the UK.

Using Accutrol, ACE Control Systems provides the complete "one-stop solution" comprising everything from the mechanical airflow valve through to all control instrumentation and critical environment control systems in the following applications:

- Laboratory spaces;
- Fume hoods;
- Life sciences;
- Cleanrooms;
- Hospital isolation rooms;
- Patient rooms;
- Operating rooms;
- Pharmacies.

Accutrol offers engineered airflow control solutions designed to meet the demands of 21st century sustainable design. The flagship product is the low pressure drop AccuValve® air flow control valve incorporating high accuracy airflow sensing with a revolutionary design based on proven technologies. In 2008 the design characteristics of the AccuValve resulted in the ASHRAE 2008 AHR Innovation Award.

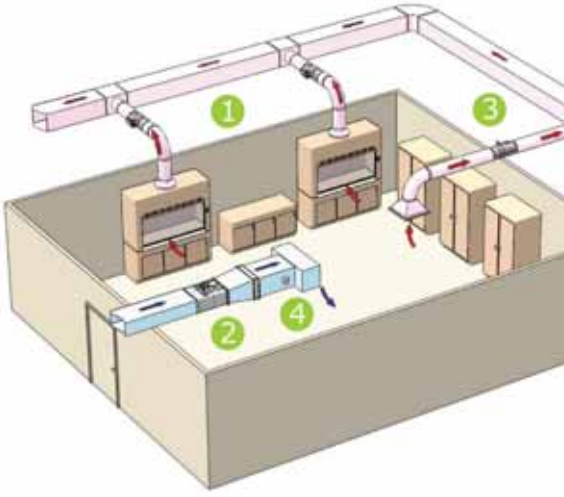
The Accutrol AVC fume hood control system with Insight Graphical User Interface (GUI) combines the low pressure drop AccuValve® AVC5000 airflow control valve with a "smart" display and a powerful, simple and intuitive user interface to deliver ground-breaking airflow control technology.

Notably streamlining installation, start-up, operation and operational modification of variable air volume (VAV) fume hoods, the AVC Fume Hood Control System integrates a smart electronics-driven ePI® airflow measurement and control system that provides pressure-independent performance without use of complex and exposed mechanical components. This system was awarded the ASHRAE "2016 AHR Innovation Award for Building Automation".

The Accutrol TekAir range of products provides precision airflow and pressure measurement for outside air, room, duct and fan inlet applications.

Ace Control Systems has been providing HVAC control building management systems installation, service and maintenance services since 1993. Over this 23-year history Ace has developed key partnerships and today is a system integrator for world-leading BMS manufacturers and specialists.

Ace has now strengthened its customer offering by adding this specialised critical environment airflow control solution to its portfolio. These services are delivered in Ireland and the UK through a network of locally-based offices in Cork. Dublin and London.



Accutrol AVC control system solution in a critical laboratory environment.

Part of the Ace service fleet.

Ace has maintained the highest standards in environmental, health, quality and safety management over the years and has been awarded the OHSAS 18001 Health & Safety Management Certificate; the BS EN ISO 9001: Quality Management Certificate; and the ISO 14001 Environmental Management Certificate.

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Humidifier selection made easy

Selecting the correct humidification system largely depends on being able to extract the right information from the end-user on how the system will be employed. Here *Debbie Batchelor, Sales Manager at Condair*, (below) describes how to pick the right humidifier with a little Q&A.

Level of humidity and fluctuation?

Different applications require different levels of humidity control. The most common application for a HVAC consultant will be the office environment's requirement of between 40-60%rH (relative humidity). At this level people are comfortable and static build-up is reduced. Manufacturing industries may require a more specific level of humidity control. For instance, printers need to control humidity to a tighter 50-60%rH and textile manufacturers will need a higher 65-75%rH. Some pharmaceutical applications need an even tighter ±2%rH.

If an application requires tight control of humidity then the humidifier selection will be restricted to systems that give very fast responses to a drop or increase in humidity, like resistive steam or spray units. Water treatment may also be required to improve the consistency of performance.

Running time/shut down?

If a humidification system is going to be used 24/7, then the number and type of humidifiers will need to reflect this. A critical system that needs to be constantly delivering a certain level of humidity must include run and standby humidifiers as every humidifier in the world needs to be shut down occasionally for maintenance.

Running costs/environmental impact?

Running costs vary widely with different types of humidifiers. Some steam systems can use 150 times more energy than an efficient evaporative humidifier and require six times more to be spent on them in servicing and spare parts. The initial purchase cost is a lot less for the steam system but an error in the initial product selection can cost the client (and the environment) dearly over the life of the unit.

Consideration should also be given to using some evaporative humidifiers to reduce the running costs associated with the building's cooling system. This can reduce the running costs associated with DX chillers and reduce the building's overall carbon footprint.

Energy types and availability?

This is a critical question as it's not unheard of for contractors to arrive on site to install equipment only to find that the amount of electricity required to run a humidification system is not available.

For really large duties, the energy requirements of using an electrical system can become prohibitive and either evaporative, spray or gas humidifiers may be a more viable option for the end-user.

Water quality and maintenance?

Water quality and maintenance are intrinsically linked when dealing with humidifiers as poor water quality inevitably leads to a higher servicing requirement. The minerals left behind in the humidifier when the water is either boiled or evaporated into an atmosphere need to be dealt with.

If the water has a high mineral content but a high level of maintenance is unacceptable, water treatment should also be specified. This can take the form of reverse osmosis filters and water softeners to help improve the quality of the water and reduce the level and frequency of servicing.

Evaporation distance required?

For humidifiers providing moisture to ducts or AHU systems, the humidifier must be able to evaporate the moisture into the airstream before it meets physical obstructions, like duct corners, otherwise this will cause condensation. If the available evaporation distance is short, specialist steam lances can be used, which give evaporation in under 60cms, or evaporative humidifiers specified, which provide instant evaporation.

Where to locate humidifiers?

If access to the location is restrictive, certain humidifiers may be easier to install than others. Also, if a unit is located in an awkward position, servicing may be difficult or sometimes impossible. Mounting height should also be considered.

Budgets and advice

Asking these questions helps paint a clearer picture of the end-user's ideal requirements. However, the "ideal" obviously has to be balanced against the available budget. While trying to reach this balance it is always worth-while drawing up a matrix of capital cost vs running cost as budgets are often set without this in mind. A higher investment in the initial equipment than the proposed budget can often be in the client's best interests. ■

Going Dutch could mean 'net-zero' energy usage

What if we could change decades-old housing into modern, comfortable, energy-efficient homes in less than ten days without having to move out or pay extra? Does it sound too good to be true? That's exactly what a consortium of construction companies and social housing corporations are doing in the Netherlands. *Here Maaike Witteveen, Project Assurance Engineer for an international energy company in the Netherlands and Linda van Leeuwen, Engineer Business Developer at Royal BAM Group's housing renovation department, explain*.

Retrofit of the façade being carried out on a terraced row of houses in Holland

Called Rapids (de Stroomversnelling in Dutch), its aim is to collaboratively develop an industrial approach to net-zero retrofitting of the Dutch housing stock, while retrofitting 111,000 social houses by 2020.

The built environment is responsible for over one-third of Dutch domestic energy consumption but energy-efficiency improvements in this sector are sluggish because of the slow turnover of outdated housing stock, the large upfront investment for homeowners, and the large number of rental houses. However, according to BAM, one of the companies in the Rapids consortium, this actually presents a massive opportunity.

Innovative approach

The BAM Group is one the largest Dutch construction companies and it built its first prototype of net-zero retrofitting in December 2013. Half a year later the company completed a housing block of six terraced houses. By the end of 2014 the company scaled up its retrofitting approach to 90 houses divided over two different cities in a construction time of just eight weeks.

The renovations are an example of a system approach that incorporates clever innovations that reduce not only the tenant's energy bill but also the total cost of ownership of the renovated house. Besides that, it is possible to do the retrofit in approximately 10 days per house, without having to move out the residents. Innovations include:

- A prefabricated energy module containing all the equipment necessary to sustainably provide heat, hot water, power and ventilation. The energy module is optimised for the equipment (e.g., it is insulated to limit noise from the air-to-water heat pump). The relatively small three-cubic-meter (100 cubic feet) module is placed in the backyard where it can be quickly connected to the house and easily reached for maintenance. In this way the house is equipped with the the most

Terraced row of houses before the retrofit process

up-to-date equipment without having to manoeuvre the installations into the house and lose living space;

- A prefabricated roof with integrated PV and prefabricated insulated facades are attached to the existing roof and facades. Demolition of the existing roof is limited to taking off the roof tiles. The demolition of the facade is limited to removing the existing window frames;
- The house switches from using gas and electricity to all-electric, freeing up the money otherwise spent on the gas connection;
- The bathroom, kitchen and toilets are renovated at the same time, using prefabricated glass panels over the old tiles. This limits demolition and dust during installation and leads to lower maintenance costs in the longer term;
- In the future, a domestic DC network could be a possible addition to the existing AC network. This would feed directly off the PV panels, thereby reducing the DC/AC losses and extending equipment life, as transformers in some equipment are sensitive to wear. However, the current domestic electricity regulations do not yet include the use of a DC network in the house.

Encouraging financials

The retrofits of the Rapids consortium focus on the houses that social housing corporations rent to their tenants. After the renovation, the tenants have a net-zero energy bill, which means that over a year each house produces as much energy as it consumes for heating, hot water, lights, and appliances. Tenants used to have a yearly energy bill of €2,000.

After the renovations, they pay the same amount to the housing corporations, in the form of a monthly fee, in addition to their rent. For no extra cost, the tenants get a house that is much more modern and comfortable. Almost 100% of the neighbours of the prototype houses are volunteering their houses for the next round of retrofits. That is good news as these renovations can only be done if all tenants in a block agree to it.

The social housing corporations finance the upfront investment costs with capital from the Dutch Social Bank. The prefabricated refurbishments come with a 40-year builder's guarantee that covers the entire loan period. The participating housing corporations make approximately 5.25% yearly return, based on their reserved funds – already assigned for normal renovations during that period – plus the utility bill savings amortised over the 40-year lifetime of the renovated house.

Lowering retrofitting costs is the biggest challenge for the consortium even though, according to BAM, the upfront investment costs have fallen from €130,000 to €80,000 per terraced house in two years. If the aspired target of €40,000/€60,000 per house is reached, it could bring the retrofits within reach for privately-owned homes.

This cost reduction is essential if the concept is to be applied to countries like Ireland where private ownership is far more significant. It would require adjustments to both the technology and the business model, as housing types and the structure of the housing market are very different here compared to the Netherlands. That said, it is undoubtedly a model that, appropriately adapted, could offer real potential. ■

The same row of houses with the retrofit process completed

Minimising the 'fuzzy edge disease' in building services design

According to the Oxford Dictionary, responsibility can be defined as "The state or fact of being accountable or to blame for something". In any project, failure to clearly identify scope at the outset and the responsibility to deliver that scope can lead to omissions and mistakes, often which are costly, cause delays and ultimately blame.

Here *Ken Goodman, CEng MCIBSE, ASHRAE RAL Sub Region B Chair,* outlines the complete scope definition to avoid the "fuzzy edge disease" afflicting building services design and delivery.

While working on a number of large projects in Europe, time was afforded during the concept, basic and detailed design stages to allow the scope to be robustly developed and specified, including the identification of responsibility, reducing the risk of uncertainties and changes during the construction, commissioning and handover of the project. Project scope, when clearly defined, can transform from a moving target to an achievable objective. This is true not just for the contractor, but also for the client team, the EPCM and the commissioning team.

One project consisted of a new 14,000 m^2 building for the manufacture of vaccines on a greenfield site. At its peak, there were over 500 contractors working in the building, speaking over 18 different languages. There was a total of 36km of piping and over 24,000m^2 of ductwork.

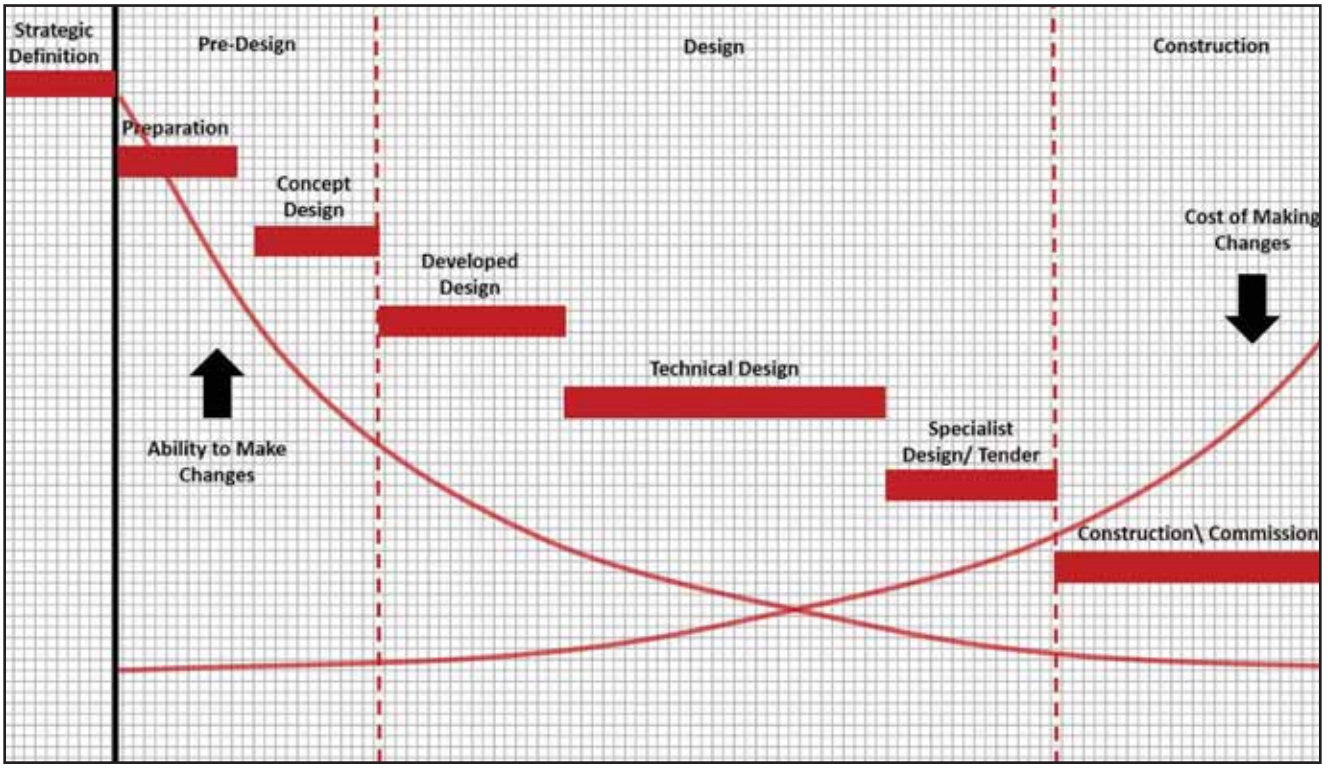


Figure 1: Project Costs versus Schedule (https://arcadisblog.wordpress.com/2016/03/03/project-controls-critical-information-for-proactive-decision-making/)

My role was as a multiple package owner on behalf of the client, ultimately responsible for ensuring systems were delivered operational, maintainable, efficient and safe. The project was designed using a 3D model, with multiple design reviews to capture all stakeholder requirements.

At the feasibility stage, the project scope incorporating client requirements was broken out into individual work packages and the battery limits and interfaces for each work package were identified and defined. Instead of the "typical" approach, where a contractor is assigned to a specific discipline, for example the mechanical contract, the package design and engineering was the responsibility of the EPCM, and the construction and commissioning of each package the responsibility of one contractor.

An RACI matrix was developed to clearly identify which stakeholder would be responsible for each project-deliverable for each package at every stage of the project. Contract documents were prepared to reflect this, defining the specific requirements necessary at each stage (mechanical completion, pre-commissioning, commissioning and handover). Any changes required after contract award managed to control scope creep, delays and cost over-runs.

Let us look at an example in the plant utilities package. This package consisted of all equipment (free issued and contractor purchased), the piping, the electrical and the automation (nominated BMS contractor). One contractor was engaged to deliver it up to the pre-defined battery limits.

The plant utilities consisted of multiple systems including the chilled water, steam and compressed air, and had many interfaces to other packages on the site. One such package was the clean steam generator package, which required chilled water, compressed air and steam/condensate.

The plant utilities battery limits were the piping connections to the generator skid for chilled water and steam/condensate, and a vendor-supplied manifold for the compressed air. All control loops were specified as part of the generator scope and the plant utilities were to be provided at predetermined conditions (temperature, flow and pressure).

The interface between the packages was specified on both sides, for example using a PN16 raised face flange for steam and condensate. Isolation valves were provided on each utility line as part of the utilities package to allow for isolation for pressure testing and flushing, and for maintenance after handover. A balancing valve was also included in the plant utilities package to allow for balancing the chilled water and a trap station for the condensate.

This mode of thinking was duplicated across each interface, allowing the utilities package to be completed, tested and commissioned without having to wait on the package to which it was connected.

Although this may seem to some as very intensive, the final outcome justified the efforts. The end users got a package they were very willing to accept and the package was delivered in line with the budget due to limited change after contract award. Clearly defining the scope and the limits of responsibility early will reduce, if not eradicate, the "fuzzy edge disease"[1] that can be associated with some projects and help deliver systems that satisfy the true expectations of the client. ■

Parsloe C J., BSRIA TN 14/97. The allocation of design responsibilities for building engineering services – A code of conduct to avoid conflict. September 1997.

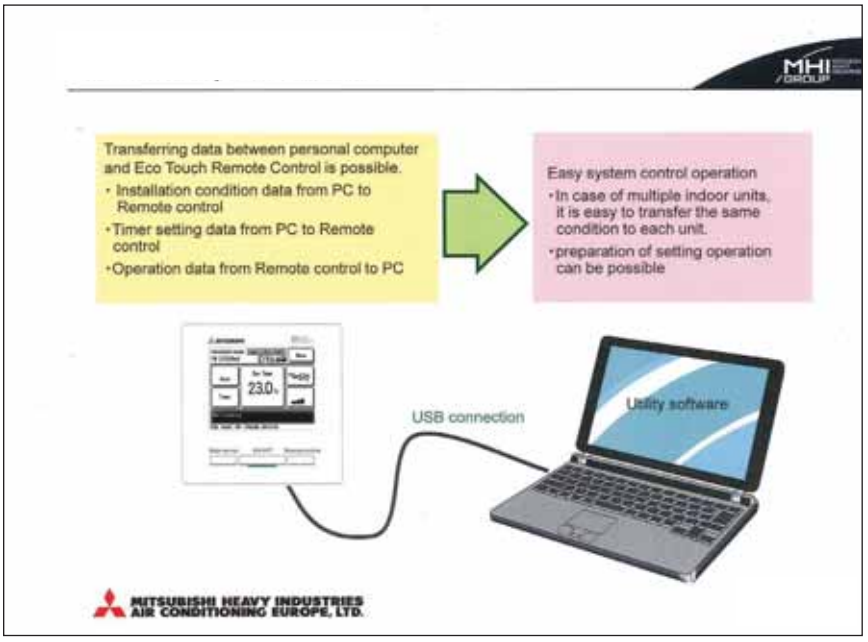
Sophisticated controllers from Mitsubishi Heavy Industries

MHI was the first ever company to create a touch-screen controller and its current range of sophisticated controllers provides options for simple system control and monitoring (locally or remotely). Ease of operation and long-term reliability are common to all models in the range with distributors Diamond Air Conditioning providing advice and guidance on model selection depending on the application requirement.

Model RC-EX1 includes all the functions of the older RC-E5 model and is presented as the more advanced remote controller option. The controller has many functions such as high power mode; multiple energy saving mode; extensive weekly timer functionality; night set-back; and auto operation mode setting. Other features and benefits include:

Changeover function – The controller can perform back-up operations with individual units when linked to multiple units in one room. It can also alternate multiple units at set times to spread the capacity and unit usage. Ideal for server rooms;

Service calls – Users can input company information for service calls so that the system informs them who to contact for servicing. There is also an automatic service reminder to alert users. An installation company can include its contact details on the controller;



Transferring data between personal computers and the remote control is also possible.

Automatic temperature set back – This function allows for a user-defined time period and temperature run before the system returns to the set programme;

Administrator settings – Enable/disable, setting/change administrator password, input alternate password, etc can all be set up for administrator operation. A dedicated person can be set as an administrator for all the controller settings;

Overload alarm – When the room temperature differs to the set temperature by a considerable extent after 30 minutes of operation, the overload alarm signal is transmitted from the external;

Remote controller – Transferring data between personal computers and Eco Touch Remote Control is possible. The remote controller can be configured at the user's own desk by using the MHI software programme which can then be uploaded easily on to a USB port and used when required;

Other features include:

- User friendly operation;
- High level of visibility;
- LCD panel with light tap operation;
- Simple interface with only three buttons;
- Big LCD with 3.8 inch full dot display;
- Back light function;
- Multi-language display.

The set temperature can be changed – 28°C in cooling mode; 22°C in heating mode; and 25°C in auto mode. Capacity is automatically controlled based on the outdoor temperature

Contact: Diamond Air Conditioning, Tel: 01 – 636 3131;
Michael Clancy (087 – 262 0701) or Graham McCann (087 – 950 9402), email: info@diamondair.ie;
www. diamondair.ie ■

EU strategy initiative on heating and cooling

The recently-published *EU Heating and Cooling Strategy* is the first EU initiative designed to address the energy used for heating and cooling in buildings and industry, which accounts for 50% of the EU's annual energy consumption. By making the sector smarter, more efficient and sustainable, energy imports and dependency will fall, costs will be cut and emissions will be reduced. The strategy is a key action of the Energy Union Framework Strategy and will contribute to improving the EU's energy security and to addressing the post-COP 21 climate agenda.

Heating and cooling defined

"Heating and cooling" is defined as the energy needed for warming and cooling buildings, be they residential or in the service sector (for example schools, hospitals, office buildings). It also includes the energy which is necessary in almost all industrial processes to produce products used in everyday life, as well as cooling and refrigeration in the service sector, such as the retail sector (for example to preserve food across the supply chain from production, to supermarket and to the customer).

Europe's heating and cooling energy usage

Currently, the whole sector accounts for 50% of the EU's annual energy consumption; it accounts for 13% of oil consumption and 59% of total EU gas consumption (direct use only), which equates to 68% of all gas imports. The reasons given for this are:

Old buildings

Many European buildings are old, which implies various problems, including:

- Almost half of the EU's buildings have boilers that were installed before 1992, with an efficiency rate of below 60%;
- 22% of gas boilers, 34% of direct electric heaters, 47% of oil boilers and 58% of coal boilers are older than their technical lifetime;

The renovation of existing buildings could lead to lower energy consumption. However, the refurbishment rate is currently below 1%.

Renewables not widely used

Natural gas is the largest primary energy source for heating and cooling (46%), followed by coal (about 15%), biomass (about 11%), fuel oil (10%), nuclear energy (7%) and some renewable energy sources (wind, PV and hydro, about 5%). Other renewables like solar (thermal) energy, ambient heat and geothermal energy account for 1.5% all together, and other fossil fuels 4%.

Overall renewable energy accounts for 18% of primary energy consumption in the heating and cooling sector and there is a significant potential to increase its share.

Too much energy wasted

The amount of heat produced from industrial processes and wasted in the atmosphere or into water in the EU is estimated to be enough to cover the EU's entire heating needs in residential and tertiary buildings[1].

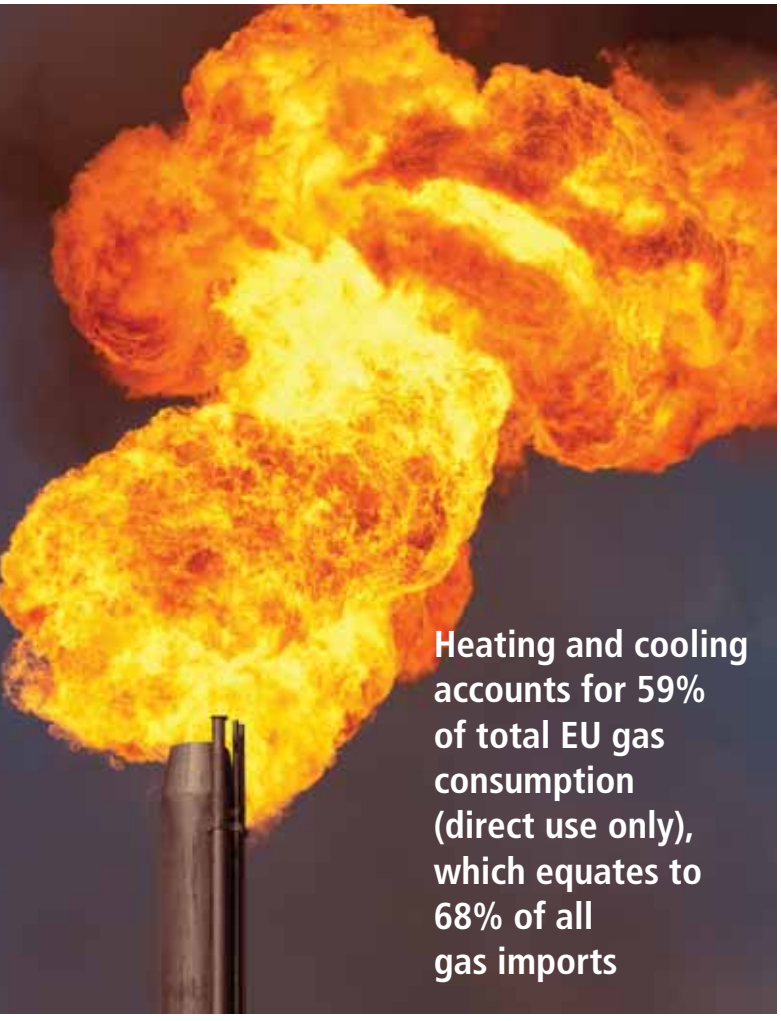
What is in the strategy?

In order to decrease energy leakage from buildings, maximise

efficiency and boost the share of renewables, the EU Heating and Cooling Strategy identifies the following actions:

(1) Make renovating buildings easier

- Development of a toolbox of measures to ease the renovation of multi-apartment buildings, e.g. through modern heating and cooling equipment (such as heat pumps) and insulation materials and advice on the steps to follow;
- Better cost-sharing to allow both tenants and owners to benefit from the investment spent to renovate old buildings and apartments, or to change their old obsolete heating systems with new efficient ones using renewable energy sources or heating sourced from smart new-generation district heating networks;



- Promote proven energy-efficiency models for public schools and hospitals to provide authorities with practices on, for example, how to use energy service companies, energy performance and public procurement contracts, or self-consumption solutions in making these buildings more efficient. It should also include how to go about energy renovation and installing heating and cooling systems supplied by clean renewable energy sources. This will also reduce costs and boost spending power for teaching materials, computers, amenities in sport halls, libraries or in-house restaurants, for example.
- Strengthened reliability of energy performance certificates, which will be assessed in the upcoming review of the Energy Performance of Buildings Directive (EPBD). This will provide clear information for consumers and investors in the use of renewable energy in buildings, and create market signals for a more widespread use of renewable energy in the buildings.

(2) Increase the share of renewables

Today, heating and cooling is still largely dependent on fossil fuels. Renewable energy accounts for just 18% of the heating and cooling supply. *The Heating and Cooling Strategy* draws attention to the fact that energy efficiency and the deployment of renewable energy complement each other.

- Increasing the share of renewable energy solutions in buildings will be considered in the upcoming reviews of the Renewable Energy Directive and the Energy Performance of Buildings Directive;
- Financial support for the deployment of renewable energy technologies is made available through the European Structural and Investment Funds, the EU Horizon 2020 Programme for research and development and the Integrated Strategic Energy Technology Plan.

(3) Reuse energy waste

Industrial and power generation installations produce large amounts of waste heat and waste cold which is currently dissipated unused in air and water. A number of solutions can be implemented:

- Direct feed via district heating systems – This is already practiced, e.g. in the Swedish city of Gothenburg where more than 90% of all apartment blocks are heated with waste heat from nearby industrial plants (refineries and chemical plants), waste incineration and co-generation (i.e. the simultaneous production of electricity and heat, both of which are used) through a 1000km district heating network.
- Cooling via cogeneration and absorption chillers that transform heat into cold that could be used in buildings through a district network. Absorption is a process which uses waste heat from waste incineration and refineries, for example, during the summer months to convert heating to cooling. This is already practiced in many district cooling systems such as the Vienna district cooling system which uses the heat produced by the CHP waste incineration plant during summer to supply cooling;
- Infrastructure development – National and local authorities have a key role to play in establishing their economic waste heat or cold potentials, creating the right regulations and helping to develop the infrastructures needed to use that potential.

(4) Consumer/industry involvement

Consumers – Owners, tenants, building operators and public authorities should be able to make informed decisions on building renovation, efficient and renewable heating/cooling supply options, and on saving energy through advanced metering, billing, real-time control of heating and cooling and automation, capacity-building to understand what they can do, how to structure their projects and secure access to financing.

Industry – In 2012, industry accounted for one fourth of the EU's total final energy consumption, of which the most (73%) was used for heating and cooling.

Energy efficiency improvements for heating and cooling in energy-intensive industries can be achieved in three main ways:
(1) in industrial process improvements;
(2) inter-plant heat integration (and other energy and resource integration) between processes on-site to recover excess heat within

their own sites, often through industrial symbiosis in industrial parks; (3) transferring unused low-temperature heat outside of the industrial site to nearby heat consumers, such as municipalities, through heat networks.

What will the benefits be?

The implementation of the strategy will bring benefits to all, and more specifically:

Citizens – EU citizens would benefit from better living conditions, comfort and health, a better environment which they know is sustainable for future generations, and reduced monthly and yearly expenditures for heating. For example, if your home is equipped with a conventional gas boiler using 20MWh of energy per year, a new condensing gas boiler can save you €275 per year.

Efficient heating appliances based on renewable energy, such as heat pumps combined with solar water heaters, can reduce household yearly expenditure on energy from €1500-2000 to €300-500. Additionally, current passive consumers may become less dependent on energy price fluctuations and even "prosumers", i.e. small renewable energy producers that can sell their excess energy on a liberalised energy market.

Workers – The manufacture and installation of energy efficient and renewable energy based equipment and materials are labour-intensive activities which, on average, can create twice as many jobs than the manufacture and installation of conventional energy generation equipment. Energy efficient goods and services sold in 2010 created approximately 0.9 million direct jobs and 2.4 million indirect new jobs in Europe.

Industry – energy costs could be reduced by 4-10% with investments that pay for themselves in less than five years. Moreover, it will reduce CO2 emissions and air pollution.

Given the EU's climate goals, the demand for heating and cooling is expected to fall by 42% to 56% by 2050, with commensurate reduction in CO2 reduction. The sector is expected to play a crucial role in emissions reduction. For example, the new EU Energy Label and Ecodesign Regulation for boilers, showing efficiency ratings for the first time, is estimated to save 600TWh of energy and cut CO2 emissions by 135 million tonnes by 2030.

Moreover, the new Ecodesign Regulation on air heating products, cooling products, high temperature process chillers and fan coil units completes the set of Ecodesign requirements on heating and cooling.

These measures could save 5Mtoe per year in 2030, corresponding to 9 million tonnes of CO2.

Reducing the energy consumption and increasing the renewable share in the supply of heating and cooling will also contribute significantly to the reduction of air-pollution, especially in urban areas.

What role heating and cooling?

The EU is on track to reach its 20% renewable energy target by 2020. However, the 20% energy efficiency target will be reached only if the current EU legislation on energy efficiency is fully implemented. Heating and cooling therefore has a key role in ensuring that the EU's energy efficiency and renewable energy targets are met.

Europe v rest of world?

Europe is a global leader in energy efficiency and renewable energy.

- More than 90% of the efficient, renewable boilers sold to, and used by, Europeans have been developed and are produced by European companies;
- Europe has the highest share of cogeneration in electricity and heat production globally, ahead of the US and Japan;
- Moreover, Europe is also the cradle of emerging new technologies such as fuel cell cogeneration and geothermal heating and cooling. Its innovative district heating and cooling companies have no competitors capable of substituting their products and expertise, and are invited to China, South Korea, Russia and the Middle East to install and operate their unique systems.

Long-term vision?

Europe wants to decarbonise its building stock by 2050. This means that Europe would save around €40 billion on gas imports and €4.7 billion on oil imports per year. The EU's CO2 emissions would be reduced by 30% and citizens' expenditures for heating and cooling their homes and buildings would be lowered by 70%. Air pollution from heating and cooling would be reduced by more than 90%, eliminating related health problems.

Industry can move in the same direction by taking advantage of the economic case for efficiency and new technical solutions. It is estimated that industry could reduce its energy consumption by 4% to 5% in 2030 and 8% to 10% in 2050 just by implementing commercially-viable and available solutions.

The share of renewable energies would reach 30% and breakthrough technologies would help industries to decarbonise while making production processes 30-50% less energy intensive.

What are the next steps?

The transition towards a low-carbon heating and cooling system requires action from all actors involved. This will be ensured by the EU 2030 governance framework, while the actions will be brought forward by:

(1) the legislative reviews of The Energy Efficiency Directive, the Energy Performance of Buildings Directive and the Smart Financing for Smart Buildings Initiative in 2016;

- The New Electricity Market Design and the proposal for a Renewable Energy Framework in 2016.

(2) By a series of non-legislative actions including:

- Developing a toolbox of measures to facilitate renovation in multi-apartment buildings;
- Promoting proven energy efficiency models for publicly-owned educational buildings and hospitals;
- Extend the work of the BUILD UP skills campaign to improve training for building professionals, in particular through a new module for energy experts and architects.

More information

Website DG Energy: https://ec.europa.eu/energy/en/news/commission-proposes-new-rules-gas-andheating- and-cooling-strategy ■

Reference: [1] Fraunhofer et al. (2015 – ongoing), "Study on Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)", ENER/C2/2014-641

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