


9-2020

### BS News September/October

Follow this and additional works at: <https://arrow.tudublin.ie/bsn>

 Part of the [Civil Engineering Commons](#), [Construction Engineering Commons](#), and the [Construction Engineering and Management Commons](#)

#### Recommended Citation

(2020) "BS News September/October," *Building Services News*: Vol. 59: Iss. 5, Article 1.  
Available at: <https://arrow.tudublin.ie/bsn/vol59/iss5/1>

This Article is brought to you for free and open access by the Journals at ARROW@TU Dublin. It has been accepted for inclusion in Building Services News by an authorized administrator of ARROW@TU Dublin. For more information, please contact [yvonne.desmond@tudublin.ie](mailto:yvonne.desmond@tudublin.ie), [arrow.admin@tudublin.ie](mailto:arrow.admin@tudublin.ie), [brian.widdis@tudublin.ie](mailto:brian.widdis@tudublin.ie).



This work is licensed under a [Creative Commons Attribution-NonCommercial-Share Alike 3.0 License](#)

# building services

engineering

## Why Do We Even Need Data Centres?



**Brexit –  
the elephant  
in the room**

Gay  
Byrne



**Glare and  
the law  
of lighting**

Iain  
Macrae



**Design not  
matching  
reality**

James  
Duggan



**Infection  
control and  
ventilation**

Jarek  
Kumitski

# I.T. Cooling Tower

## Close Control Computer Room Air Conditioning Systems

The need for high sensible cooling and close control of both temperature and humidity in critical IT environments has never been greater. Mitsubishi Electric is to the forefront in developing solutions for this specialist sector and has just unveiled its new DX range which provides close

control of temperature and humidity, especially in small to medium sized enterprise data centres. Apart from addressing the critical issues of density and capacity, other benefits include low-noise impact and significant energy savings.

**Mitsubishi Electric ... making it possible.**






[www.facebook.com/buildingservicesnews/](https://www.facebook.com/buildingservicesnews/)

# Contents

## EDITORIAL


### Minister gone AWOL!

Everyone acknowledges the current dilemma faced by the Government, and by individual ministers. However, when you put yourself forward for a leadership role it is imperative you take on that responsibility.

Some of the key traits of leadership are an ability to act strategically; to communicate effectively; to set clear goals and measures to realise them; to be creative; and to promote unity and collective buy-in. Can we honestly say that is happening?

News bulletins on every radio and TV station open with "Chief Medical Officer has advised etc etc", or something similar. This news is very important but, where are the regular updates from Minister Varadkar. His portfolio covers enterprise, trade and employment – three areas that are decimated, not just by the pandemic, but also by the (at times) confusing policies being pursued.

Businesses in Ireland need a champion now more than ever ... Minister, it's time to show some real enterprise.



# 28

**David McAuley,**  
CEO Bitpower,  
gives the low-down  
on data centres,  
their essential role  
in our modern IoT  
lifestyles, and the  
importance of  
keeping them  
functioning, but  
sustainably so.

building services engineering

Why Do We Even Need Data Centres?

Cover Story

Published by: Pressline Ltd, Carraig Court, George's Avenue, Blackrock, Co Dublin.  
Tel: 01 - 288 5001/2/3 email: pat@pressline.ie  
web: [www.buildingservicesnews.com](http://www.buildingservicesnews.com)  
Publisher and Editor: Pat Lehane  
Design and Production Editor: John Gibney  
Advertisement Director: Joe Warren  
Design: Pressline Ltd.  
Printed by: W&G Baird  
ISSN 2712-0198  
© All contents copyright Pressline Ltd.

## TRENDING

### Glare misunderstood

When talking about glare, a large number of lighting people would mention UGR, and in particular a UGR 19 fitting. Fundamentally, there is not much wrong with that ... except for misunderstanding glare, says Iain Macrae.



# 58

News and Products	2	Exhaust air not new	43
Guaranteed Irish	10	Calpeda boxes clever	44
CIBSE looks to 2021	12	Xylem GHVR boost	46
PJ Duffy guard change	14	Radiator options	47
Cleaner energy future	16	Meet CIBSE Committee	48
Elysator chem-free	18	IT cooling	49
Grant future-proof	20	New building contract	50
Gas part of solution	22	Grundfos GO Install	51
New Baxi 800	24	Victoria's Cool Secret	52
Brexit challenge	34	Ecodesign compliance	56
REHVA Covid guide	38	Lighting Manifesto	61
Wilo one of 50	42	Obtuse Angle	64



# 14



# 34



# 52



# 56

## DESIGN DILEMMA

### Aspiration not being realised

Why are buildings typically consuming two to five times more energy than at design stage? Why is the industry letting this happen? James Duggan, Senior Sustainability Engineer with Lawler Sustainability probes for answers.

# 54





## NEWS AND PRODUCTS

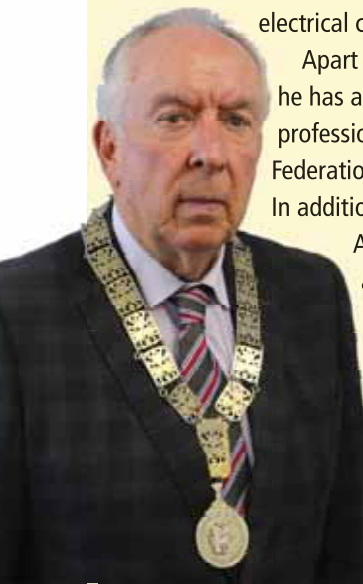
### Byrne appointed EIFI President

**Gay Byrne, Chairman** of Fantasy Lights Group, has been appointed President of the Electrical Industries Federation of Ireland (EIFI). Gay is a long-standing member of Ireland's electrical community with a service history stretching back to the 1970s.

Apart from spearheading the growth and success of his own company, he has always supported, and played a very active role in, the various professional and trade bodies within the industry. These include the Federation itself and the Electrical Manufacturers Distributors Association. In addition, he was a founder member and first Chairman of Lighting Association Ireland (LAI) and still serves on the LAI Executive as ex-officio.

Gay is also a keen supporter of the Electrical Industries Golfing Society, the Irish Electrical Benevolent Association, and various other social and charitable electrical industry initiatives.

In accepting the EIFI chain of office recently following the virtual AGM, Gay vowed to build on the tremendous work of his predecessor Mark Keogh, while harnessing the collective strengths of the member associations to help meet the challenge of these extraordinary times.



### Saint-Gobain appoints Barry

#### Saint-Gobain Construction

has appointed Pádraig Barry as its new Managing Director. Barry has worked with the Saint-Gobain group since 2007 and has held various senior roles, including MD of Saint-Gobain Weber (UK & Ireland) and, prior to this, MD of Isover Ireland.

In his new role Barry is charged with developing and executing business strategies for the Saint-Gobain brands Gyproc and Isover in Ireland. He will also be responsible for overseeing the company's business operations, as well as continuing to grow and enhance Saint-Gobain's brand and profile.

A Limerick native, Barry has a BSc in Manufacturing Technology and an MBA from the University of Limerick. He has a passion for hurling, running, rugby and golf.



### Introducing Lawler Sustainability

**Noel Lawler Green** Energy Solutions recently rebranded to Lawler Sustainability after launching its energy business back in 2010. Its sister company, Noel Lawler Consulting Engineers, has also rebranded to Lawler Consulting and the closely-connected businesses offer a very unique proposition to the marketplace by putting together pathways for their clients around carbon reduction.



Much of their work in energy and sustainability is in engineering projects or the integration of renewable technology. This combined 40 years in business means the experience

they have in engineering design brings an understanding that many other companies in the energy and sustainability space don't have. See [www.lawlersustainability.com](http://www.lawlersustainability.com)

### CIBSE ACTS for Meningitis

**While the CIBSE** Annual Dinner scheduled for this coming December has been cancelled (see Page 12), the Institution has, nonetheless, continued the tradition of donating to a selected charity. Every year substantial funds are raised for a nominated charity, ACT for Meningitis being this year's nominee.

ACT for Meningitis was established in 2011 by Siobhan and Noel Carroll following the tragic loss of their daughter Aoibhe to meningitis. ACT for Meningitis is a charity which aims to raise awareness and educate society about the signs and symptoms of meningitis while offering free support services in Ireland to those affected by the disease. Its support service is tailored to the needs of the individual/family to find the most appropriate and beneficial service for them.

Those who would normally have contributed at the event can do so directly by logging on to <http://actformeningitis.ie/>



### Preempt/Sonica



Preempt, the property and facilities management company established in 2019, has appointed Paul Nelson as General Manager. Preempt, based in Dublin, is a subsidiary of Sonica Fitout. Paul is a graduate of TUD and joins Preempt from a property management agency where he was senior property manager. See [www.preempt.ie](http://www.preempt.ie)

# NOW. PUMP TECHNOLOGY OF THE FUTURE.

## WILO-STRATOS MAXO: THE WORLD'S FIRST INTUITIVE SMART-PUMP\*.



Your new partner is the most flexible pump: the Wilo-Stratos MAXO is the perfect fit for any application and ensures optimal system efficiency thanks to its intelligent control mode. Furthermore, the pump can be integrated into all relevant systems due to diverse interfaces. And with optimised and innovative energy-saving features the Wilo-Stratos MAXO meets the changing requirements superbly. No other pump on the market offers you more efficiency, connectivity and convenience. This is how already today we are making your life easier with the innovations of tomorrow.

An added strength is the ENERGY METER FUNCTIONALITY.

## WILO BRINGS THE FUTURE.

Discover the future of pump technology:  
[www.wilo.com/wilo-stra-tos-maxo](http://www.wilo.com/wilo-stra-tos-maxo)

\*We understand a smart-pump as a new category of pumps, which goes far beyond our high-efficiency pumps or pumps with pump intelligence. Only the combination of the latest sensor technology and innovative control functions (e.g. Dynamic Adapt plus and Multi-Flow Adaptation), bidirectional connectivity (e.g. Bluetooth, integrated analogue inputs, binary inputs and outputs, Wilo Net interface), software updates and excellent usability (e.g. thanks to the Setup Guide, the preview principle for predictive navigation and the tried and tested Green Button Technology) make this pump a smart-pump.



## NEWS AND PRODUCTS

### McCabe forms Passive Dynamics

**Ciaran McCabe**, an experienced engineer with a keen interest in sustainability, has formed a new sustainability consultancy called Passive Dynamics. Client services include advice on the latest trends

in energy efficiency, carbon reduction strategies and on-site renewable energy generation within the built environment.

Passive Dynamics, with a detailed knowledge of all facets of sustainability, uses

the latest building performance simulation software to determine the optimum green building design solutions.

Its in-depth technical knowledge of conceptual energy analysis, building physics, commissioning management and green building certification provides added value to building owners, design teams and corporate clients.

Contact Tel: 086 - 047 3666.  
email: [info@passivedynamics.ie](mailto:info@passivedynamics.ie)



### Grundfos Museum features 'the pig'

**A pioneering spirit** and technology landmarks dominate "Grundfos Museum – The Factory", which has now opened and features more than 150 historical artefacts presented through 14 themes spread over 1600sq m on two floors.

The museum boasts a wealth of machines and tools from Grundfos' 75-year history, objects that not only illustrate the development of the company but the overall evolution of industry, technology and society.

The "carousel" is the exhibition's key focal point. The enormous machine from 1972 was then a landmark for efficiency in pump manufacturing, and visitors to the museum can bring it back to life by pushing a button.

Other ground-breaking items include some of the world's first electrical controls, ton-heavy casting tools, active robots and the world's smallest Grundfos logo (hint: this is about nanotechnology).



1945 – Poul Due Jensen developed the groundwater piston pump Foss 1, which is referred to as "the pig." It marked the start of Grundfos' activities in the world of pump technology.

### New MD for Baxi UK and Ireland



Baxi Heating has appointed Karen Boswell, OBE, Managing Director of Baxi Heating UK and Ireland. She will lead the next stage of Baxi Heating's journey towards a sustainable future and net zero carbon. Karen, an accomplished leader whose career spans different industry sectors joins from Hitachi Rail. She is passionate about equality, diversity and inclusion, and has extensive experience in manufacturing, supply chain and customer service.

Of her new position, Karen said: "Baxi Heating has some of the best known and respected brands in the market, and people who are passionate and successful in delivering for customers. It is well placed to build on its core solutions with new sustainable technologies. I look forward to leading the business through the exciting next phase of its story." See [baxiheating.co.uk](http://baxiheating.co.uk)

### New SCSi President

**Micheál Mahon**, a chartered quantity surveyor from County Wexford, was elected President of the Society of Chartered Surveyors Ireland (SCSi) at its recent AGM. In his address he said the country needs a sustainable construction and property industry if progress is to be made in addressing the housing crisis and our infrastructural deficit.

Mahon, who is also Chair of the Construction Industry Council, recently presented the findings of the SCSi's *Real Cost of New Housing Delivery Report 2020*. It found that the cost of delivery of a new 3-bed, semi in Dublin has increased by €41,000 to €371,000 over the last four years.

He said that if the Government was serious about tackling the housing crisis and building the 30,000 to 35,000 homes which are required, it needs to tackle the significant increases which have occurred in housing delivery costs urgently.



### EDC get EI CPD accredited

**EDC has been** awarded CPD-accredited employer standard by Engineers Ireland in recognition of its continuing professional development (CPD) strategy.

Headquartered in Cork and with offices in Dublin and London, EDC is a progressive engineering company working in a range of construction sectors from residential, commercial, industrial, pharmaceutical, retail, hospitality and leisure.

CPD has played a crucial role in the successful growth and expansion of EDC with its employees delivering major engineering projects across Ireland, the UK and Africa.

Pictured is Richard O'Farrell, Managing Director, EDC.





# Think Heat Pumps. Think Grant.



\*13kW & 17kW Heat Pump

## AERONA<sup>3</sup>

INVERTER DRIVEN TECHNOLOGY



[www.grant.eu](http://www.grant.eu)

## NEWS AND PRODUCTS

### Building controls and Covid-19

**With companies looking** at how they can safely bring their staff back to work, the Building Controls industry Association (BCIA) believes that it is more important than ever that building energy management systems (BeMS) are correctly installed and maintained.



The BCIA also says correct utilisation of BeMS will be vital, with many buildings finding themselves under-occupied since the beginning of lockdown in March.

Terry Sharp, BCIA President, said: "Many companies and their employees have demonstrated that they can remain engaged with their work through online meetings and document sharing. The technology that enables this has of course been

available to us for years, but it has taken a global pandemic to make us fully appreciate its benefits.

"We can apply a similar logic to smart buildings and the BeMS systems that have proved beneficial during lockdown and will continue to do so after, as we need to adapt to new work practices in the future. A BeMS can keep unoccupied or partially occupied buildings ticking over, saving energy and maintenance costs.

"Office staff may be working remotely but, in instances where factory or warehouse workers have to go into work, the BeMS will be scheduling main plant to only serve the occupied areas and zones – avoiding energy wastage in unoccupied spaces."

### Daikin E-shop

**The Daikin E-shop** is an online system that allows customers place orders and generate quotes. It provides a quotation template which includes the project name, installer reference and other related details. It can also include company branding.

E-shop provides details of each product and allows the user to filter products based on the specifications. Products can be compared on price, output, capacity, refrigerant etc.

The order and check-out step gives the option to apply any discount offered by Daikin. Additionally, reference number or order reference is asked at the checkout to proceed to the next step. Users can then view, download and share the quotation generated by email.

### OKTOair wellness system

OKTO Technologies, a NI family business providing full building technology solutions, has established a new Wellness Division called OKTOair to distribute its AI-led air filtration solution. Testing of the new system, which is specifically designed to address indoor air contamination, is currently underway.

According to Philip Dowds, Managing Director of OKTO Technologies, OKTOair's system will consistently monitor, contrast and manage indoor air quality, temperature and humidity. It also incorporates a user-friendly dashboard to keep occupants fully informed of air quality both inside and outside their properties.

The new system is now available either as a stand-alone installation or within the user-focused smart building systems for which OKTO Technologies is already known.



### Sodexo appoints Fox as MD



**Sodexo, the integrated** facilities services provider, has appointed David Fox as Managing Director, Sodexo Ireland. David has held several senior management roles within the organisation but his new role will focus on evolving the country strategy.

With a background in facilities services management, Fox joined Sodexo in 2011 as Group Facilities Manager for one of its Irish-based global FMCG manufacturing clients. He subsequently moved through various roles within the organisation, increasing in seniority, until his latest appointment.

### RACGS programme for 2021

**Details of the RACGS programme and outings' sponsors for the 2021** are as follows:

- 30 April, Carton House, O'Meara Course, 12.00am. Captain's Drive-In (Sponsor: Daikin Ireland);
- 28 May, Headfort (new course), 10.30am. (Sponsor: Core A/C);
- 25 June, Powerscourt West Course, 11.00am. President's Day (Sponsor: Mitsubishi Electric);
- 27/28 August, Farnham Estate (overnight), 12.00am. Ryder Cup (Sponsors: RDL/Carel/DWG/IRI);
- 24 September, K-Club, Smurfit Course, 10.45am. Captains Day (Sponsor: Burlington Engineering);
- 29 October, Carlow Golf Club, 10.30am. Charity Outing (Sponsor: RSL Irl.)

Some great events are planned including the President's Day, Captain's Day, Charity Outing, Ryder Cup and the Golfer of the Year so book early and enjoy the opportunity to play some great courses.

Committee for 2020 – President: Fergus Daly; Captain: Martin Baneham; Handicap Sec: Michael Clancy; Secretary: Mark Kiely.



**Coming soon in  
shadow black**



- Automatic energy saving control
- Keep maximum comfort with minimal draft
- Quiet operation

### **Performance**

Mitsubishi Heavy Industries offers a unique modest air conditioner, quiet and comfortable, and providing precise air flow and capacity control.

Quieter and improved aerodynamic – by reducing the fluctuation pressure, Mitsubishi Heavy Industries has reduced noise while keeping capacity and comfort at an optimum.

### **A sustainable solution**

High energy saving with comfort air conditioning, providing the user with multiple solutions of comfort and energy savings.

The FDT can achieve high energy efficiency by the use of Mitsubishi Heavy Industries' technology, such as a high-performance compressor and DC PAM inverter technology.



[www.mhiae.com](http://www.mhiae.com)

Available from  
our distributor





## NEWS AND PRODUCTS



Lighting specialist TaskLED has moved to new headquarters at 6 Eden Gate Centre, Delgany, Co Wicklow, A63 EK44. It is currently fitting out the premises which will include full working models and extensive showroom/shopfront displays.

Principal Gearóid McKenna has spent 40 years in the lighting industry and has first-hand experience of product manufacture, functionality and design. Under his direction, TaskLED's objective is to deliver the most innovative and progressive ideas in modern, task-focused lighting.

Lighting has never had more significance as, apart from energy efficiency and sustainability, it is also critical in delivering wellbeing and quality indoor environments. Gearoid and his colleagues at TaskLED are experts in designing and implementing solutions that do just that.

Contact: TaskLED. Tel: 01 – 287 0528; email: gearoid@taskled.ie; [www.taskled.ie](http://www.taskled.ie)

Pictured above is the TaskLED management team outside its new premises in Delgany – Ronan McKenna, Jake McKenna and Gearoid McKenna.

## EI Best Presentation Award 2020

**Engineers Ireland** has called on each of its regions, divisions and societies to nominate their top presentation for the 2019/2020 lecture season for the Best Presentation Award.

Co-sponsored by Beale & Co and Griffiths & Armour, the Best Presentation Award recognises members who have contributed to the engineering profession by delivering outstanding technical presentations to Engineers Ireland's members during the 2019/2020 lecture season.

Caroline Spillane, Director General, Engineers Ireland (pictured), commented: "Engineers Ireland's sectors – our regional branches, engineering divisions and societies – play a pivotal role in our community and we recognise their contribution through these awards. We look forward to celebrating the achievements of our sectors, and showcasing the valuable CPDs they provide to the engineering community, during our month of Engineering Excellence."

See: <https://www.engineersireland.ie/Professionals/Communities-Groups/Best-Presentation-Award>



## Zehnder ComfoAir comfort/wellbeing

Listed on the SEAI Triple E Register of approval for energy efficiency and Passive House certified, Versatile Heating, Cooling & Ventilation's Zehnder ComfoAir whole-house heat recovery ventilation can recover up to 96% of the heat, according to Andrew Treacy, Managing Director, Versatile Group.

It is the ideal choice for energy performance and indoor air quality, as the system creates the perfect environment with fresh, filtered air. Benefits include:

- Heat recovery efficiency at 96%;
- Noise reduction through attenuated manifold box;
- Comfort – no draughts or "dumping" of air down on room occupants;
- Constant fresh air delivery and stale air removal;
- Energy-efficient
- Pre-insulated pipes avoid condensation and make for quicker and easier installation;
- Lined ductwork for easy maintenance;
- G4 filter as standard;
- Appearance – choice of grille type and size;

Contact: Versatile Group. Tel: 046 – 902 9444; email: [sales@versatile.ie](mailto:sales@versatile.ie); [www.versatile.ie](http://www.versatile.ie)





# AQUARIUS®

**2-YEAR  
WARRANTY**



## Calpeda Aquarius® Tank System

### Features and Benefits

- Very quiet operation (48DB)
- Ideal in areas where mains pressure is low or inconsistent
- Certified for use with drinking water
- Over 30 different pump options
- Jacketed motor technology
- Dry-run protection built in as standard
- Pressures up to 12 Bar and flow of 183 litres/minute
- Forty different water tank size options (100lt to 2000lt)
- Pressure control options
- Outlet drain connections of 1 1/4" and 1" fitted as standard
- Tanks can be inter-connected for larger storage capacities
- All units fully leak and pressure-tested, and certified

"Calpeda Aquarius, the Irish designed and manufactured tank system, meets the demand for a self-contained, integrated pump and water storage solution."

### Calpeda Pumps Ireland Ltd

Unit 5 Old Quarry Campus

Northwest Business Park

Phase 3

Blanchardstown, D15 Y4EK

Tel: 01- 861 2200; email: [info@calpedaireland.com](mailto:info@calpedaireland.com)



# 'Guaranteed Irish House' initiative

The "Guaranteed Irish House" initiative is Ireland's first national online listing of sustainable construction sector businesses. Spearheaded by Guaranteed Irish, it offers architects, engineers, quantity surveyors and interior designers a listing of locally-produced raw building materials and home furnishings for both private and commercial builds.

The online listing includes all elements of the supply chain and is supported by Guaranteed Irish construction members, the Royal Institute of the Architects of Ireland (RIAI), Engineers Ireland (EI), the Construction Industry Federation (CIF) and many more. The listing is open to all Guaranteed Irish members that manufacturer and supply products and services that are used in the build, retrofit and design of private and commercial projects in Ireland, at no additional expense to the member.

Calpeda Ireland is among the leading

global construction firms such as Kingspan, Tegral, IPL, Tretford, Glennon Brothers, Wavin and SISK on the register. All support the need for a standardised specification listing of sustainable construction businesses for Ireland. These firms operate in Ireland, protect local jobs, and support Irish communities. Additionally, the initiative is another step to support Ireland's *Greenhouse Gas Emissions Projections 2040*, while also supporting local manufacturers and suppliers, and in turn contributing to the local economy.

Paddy Kelly, Managing Director of Tegral Building Products and Chair of Guaranteed Irish said: "The concept of providing access to a one-stop-shop for local Irish suppliers of building materials was borne out at last year's Construction Forum with support from the CIF, the RIAI, EI and the SCSi. Members of the RIAI welcomed a resource that would allow them reference and source Irish suppliers for both public and private builds. This will also reduce the carbon footprint as there will be less travel miles involved."

Minister for Housing, Local Government & Heritage, Darragh O'Brien, TD, sees the "Guaranteed Irish House" initiative as a collective showcase of all Irish-based businesses that can contribute to the building of homes, schools, factories hospitals, office etc. He said it would raise awareness of the range of Irish construction products available to architects and developers, and encourage them to make use of the resource when determining specifications.

"Quality, robust, sustainable construction products that result in good-quality housing for citizens is essential. When using locally-produced raw building materials we are not only benefitting local jobs and the local economy, but also furthering our climate action aims. Ultimately, homes which are built to the highest standards and which are safe and healthy to live in are the top priority," he said.

Kathryn Meghen, CEO of the RIAI also welcomed the new initiative as, "a useful specification listing of businesses based in Ireland for the construction industry. It is a welcome resource by Guaranteed Irish, allowing industry members reference and source Irish suppliers for both commercial and private projects. The initiative is a step forward in supporting the local economy."

See [www.guaranteedirishhouse.ie](http://www.guaranteedirishhouse.ie) ■



Left: Brid O'Connell, CEO Guaranteed Irish with Paddy Kelly, Managing Director Tegral and Chairperson of the Board of Directors, Guaranteed Irish and Darragh O'Brien, TD, Minister for Housing, Local Government & Heritage.



Steve! Look at ya  
there... big happy head,  
blindly diggin' away  
with not a notion  
I'm here!



### DIAL BEFORE YOU DIG YOURSELF INTO A HOLE

Hitting a gas pipeline could mean major disruption to your work, or much worse.

If you're planning to break ground, always check the location of gas pipelines first.

Call **1850 42 77 47**

Visit [www.gasnetworks.ie/dbyd](http://www.gasnetworks.ie/dbyd)



**Gas  
Networks  
Ireland**



## CIBSE NEWS

# Croke Park to host CIBSE Ireland Annual Lunch 2021



Given the uncertainty surrounding public gatherings and permissible numbers who can attend, CIBSE Ireland has cancelled the CIBSE Annual Dinner which was scheduled for the Clayton Hotel in Galway this coming December. All those who had booked tables for themselves and their guests for the event have been notified and all payments refunded. However, looking forward with confidence to the 2021 event, CIBSE Ireland has already secured Croke Park as a venue for the CIBSE Ireland Annual Lunch for Friday, 3 December 2021.

The occasion has now become a charity event with substantial funds being raised for a nominated charity each year. ACT for Meningitis, which was established in 2011 by Siobhan and Noel Carroll following the tragic loss of their daughter Aoibhe to meningitis, was to be this year's recipient. CIBSE Ireland will still make a donation in 2020.

"While it is indeed unfortunate that this year's dinner could not go ahead," says Michael Curran, Chairman, CIBSE



Michael Curran, Chairman, CIBSE Ireland.

Ireland, "we felt we owed it to our sponsors and those who had booked tables to dispel the uncertainty and take decisive action. We are very appreciative of the excellent support we get from the industry at large and trust that you can all join us for a return to the traditional lunch format in 2021.

"In the meantime, we will continue with our virtual CPD series and are currently finalising an extensive

programme to be rolled out over the coming months. We are also looking at other possible events that can be delivered virtually or, depending on Government guidelines, at locations where specified numbers of people can congregate.

"As many engineers are still working remotely and possibly have a little more time on their hands, this is the ideal opportunity to peruse the CIBSE Ireland website to see the many benefits membership entails. As for those who are already members, now is the time to consider applying for chartered status. The process is quite straightforward and we have a team at CIBSE Ireland who can explain it to you and help guide you through the various stages."

Meanwhile, CIBSE YEN Ireland is also very proactive. "Our hugely successful virtual quiz earlier in the year was rolled out across all CIBSE regions throughout the world," says CIBSE YEN Ireland Chair Ryan Loney.

"We are currently looking at a number of other virtual initiatives, one of which will entail a project profile with building walk-through, schematics, etc, and interactive narration by both the consultant and contractor to demonstrate collaboration on the project.

"I would also like to hear from young engineers if they have any new or alternative ideas or suggestions for future virtual events."

For more information see <https://www.cibseireland.org/contact-us/> ■



Croke Park will host the 2021 CIBSE Ireland Annual Lunch.



# IT'S **ALL** INSIDE!

- NO OUTDOOR HEAT PUMP REQUIRED
- VENTILATION INCLUDED

## EXHAUST AIR HEAT PUMP

### NIBE F730

- An ideal solution for apartments & housing schemes
- Heating, ventilation & hot water
- Inverter compressor 1.1 to 6kW
- Remote control & monitoring by Uplink – Smartphone App & PC
- Modular construction – pre-plumbed & pre-wired

Erp info ready for assessors – call 01 2864 888 or visit [www.unipipe.ie](http://www.unipipe.ie)



Suitable for apartments and homes up to 220m<sup>2</sup> – more cost effective than a separate heat pump and HRV – and nothing outdoors!

Nibe – Ireland's largest range of heat pumps for almost twenty years



- Unipipe Underfloor Heating
- Heat Recovery Ventilation & System Ducting
- Ground Source Heat Pumps
- Air to Water Heat Pumps
- Exhaust Air Heat pumps
- Nibe Solar PV







Left: Declan Glynn with Fergal Moran, Brendan Duffy and Keith Haughton.

## Changing of the guard at PJ Duffy & Sons

Having celebrated its golden anniversary in 2017, PJ Duffy & Sons Ltd has now embarked on a new phase with non-family members Keith Haughton, Fergal Moran and Declan Glynn becoming shareholder directors. The firm was originally established in 1967 by PJ Duffy with his sons Kevin and Brendan, along with Laurie McCluskey, who took up the reins on his retirement in 1988. Under their stewardship the company became one of Ireland's leading mechanical contractors in the commercial sector with a diverse portfolio of both public and private sector projects. Laurie, who was Managing Director

from 1988 until his retirement in 2002, sadly passed away last year.

Looking to the future, Kevin and Brendan recently decided to put a strategic succession plan in place and so turned to long-standing senior personnel Keith, Fergal and Declan who are now in the process of taking over the company. Kevin retired from the business this year with Brendan and KC Duffy remaining as Managing Director and Company Secretary respectively until the transition is complete.

Speaking with *Building Services Engineering* recently Keith Haughton described it as a case of all change but

no change. "PJ Duffy & Sons is not just a very successful company but a major brand that stands for quality and excellence when it comes to mechanical contracting", said Haughton. "Our objective is to embrace and reinforce the traditional values that have underpinned the company for 50 plus years, and to build on them to secure the future.

"A key resource is the incredible team here at PJ Duffy & Sons. The experience and diversity of skills represented by our highly-qualified workforce is unequalled in the sector, while the collective spirit and sense of unity makes us a formidable force.

"Longevity of service underpins these strengths and many of our senior tradesmen and operatives have been with us for over 20 years. That said, the company ethos has always been training oriented and it has always engaged more than its fair share of apprentices. In addition, all staff members participate in regular skills updates and education to ensure they keep fully up to speed with technology and industry developments.

"Fergal, Declan and myself are very excited and privileged to be entrusted with the PJ Duffy & Sons heritage. Under Brendan's leadership and guidance over the coming months, we hope to take the company to new heights while retaining its core values." ■



St Vincent's Hospital in Merrion Road, Dublin 4, was one of the many prestigious projects where PJ Duffy & Sons were responsible for the mechanical contracting installation.  
<https://arrow.tudublin.ie/bsn/vol59/iss5/1>

### Services provided

- Chilled water systems
- Plant installation
- Air conditioning
- Ventilation
- Heating services
- Kitchen extract
- Building management systems
- Combined Heat and Power
- Water service installations
- Fire-fighting and external mains
- Steam installations
- Compressed air installation

# Why ecocirc is a smarter choice.

## EFFICIENCY

- Best-in-class energy efficiency (EEI  $\leq 0.18$ )
- ECM motor for intelligent speed control
- Lower power consumption
- Optimized hydraulic

## SIMPLICITY

- Easy to set up
- Compact and easy to install
- Easy to read (ecocirc+)
- External control and monitoring via Bluetooth® wireless technology (ecocirc+)

## RELIABILITY

- Robust design
- Dry-run protection
- Warnings and alarms visualization
- Error codes (ecocirc+)

## ECONOMY

- Insulation shell as standard
- Cost savings with Night Mode (ecocirc+)
- Comfort self-optimization with eAdapt (ecocirc+)



[www.xylem.com/ie](http://www.xylem.com/ie)  
+353 (0) 1 452 4444  
[enquiriesireland@xylem-inc.com](mailto:enquiriesireland@xylem-inc.com)



# Building a cleaner energy future

The gas network  
– an integral part  
of Ireland's cleaner  
energy future



The way we think about energy is changing. All of us, whether architects, engineers, contractors, property managers or utility companies, have a role to play in creating a cleaner energy system.

**Natural gas** has already helped many businesses lower their emissions by switching from oil, but with Ireland's first dedicated renewable gas entry point now injecting biomethane into the network in Kildare, gas is not only integral to the energy mix today, but is key to a cleaner energy future tomorrow.

Gas Networks Ireland is working to create a zero carbon gas network by replacing natural gas with renewable gasses, such as biomethane and hydrogen, on the existing €2.6 billion state-owned network, one of the safest and most modern in the world.

Natural gas is secure, affordable and unmatched in terms of reliability, flexibility and high heat performance. As the volume of renewable gas on the network increases, all 700,000 homes and businesses connected to the network will continue to enjoy the benefits of natural gas while also reducing their carbon footprint.

A familiar solution for many that is easy to operate, gas-powered systems can be implemented with little or no disruption to a business.

Natural gas can be combined with renewable technologies to offer cost-effective, energy efficient and fully proven heating solutions that meet the Part L – Conservation of Fuel and Energy building regulations and associated NZEB standards today, and reduce emissions further in the future.

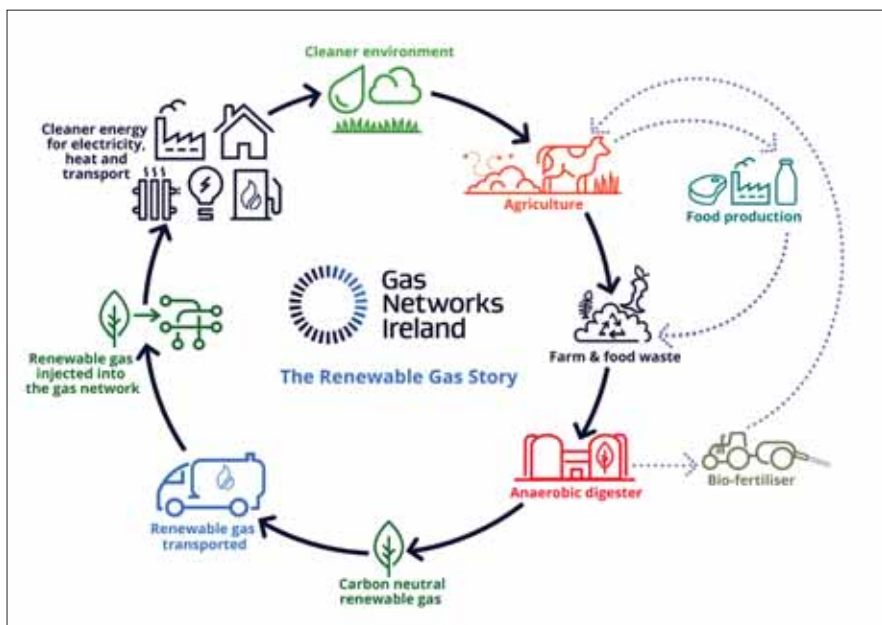
Combining natural gas with gas absorption heat pumps, gas-fired heat pumps, solar photovoltaic (PV) panels or combined heat and power are all

options that may be suitable for application across pharma, medical facilities, manufacturing, agri-food, commercial offices, warehousing etc.

## Did you know?

Renewable gas production is already facilitating sustainable circular economies. Irish food and agricultural businesses are reducing their emissions by providing waste used in the production of renewable gas and purchasing the carbon neutral energy to power their businesses and fleets.

To find out more about how gas can play a role in the energy efficiency of buildings contact Gas Networks Ireland. Tel: 1850 - 411 511 ■



# EVERYTHING YOU ASKED FOR. AND MORE.



We asked UK installers what they wanted in a boiler, and built it into the Baxi 600. Compact but powerful with tough brass fittings, and now there's more.

**Introducing the Baxi 800 with a 10 year warranty and a filter in the box.**

Find out more



[baxi.co.uk](http://baxi.co.uk)

Follow us



**BAXI**  
Make it easy

†Terms and conditions apply. Visit [www.baxi.co.uk](http://www.baxi.co.uk) for details.



# Elysator – chemical-free water engineering

**Anyone involved in the** management of heating and/or cooling systems will be aware of the problems caused by corrosion. Oxygen, acids and salts in mains water, raised electrical conductivity and pH values that are too low can all lead to corrosion, the formation of sludge, and blockage of the system and the components within it.

Previously, the most common method of corrosion protection was to add chemical corrosion inhibitors. Many building services professionals, however, are seeking alternative solutions. It is costly and time consuming to monitor inhibitor levels and often, where their use has not prevented problems, the only answer is to add more. Environmental awareness also plays a major part for those seeking to deliver sustainable outcomes, preserving

the life and operational efficiencies of the systems under their control without the use of chemicals.

Thankfully, Ecopipe offers a solution in the form of the Elysator range. The Elysator approach – unlike most within the marketplace – focuses on the causes of corrosion rather than perpetually treating the symptoms. By removing the gases, minerals and pollutants responsible, they eliminate the potential causes of corrosion and ensure that they are not reintroduced.

The Elysator follows the rules of science, using the anode/cathode principle. Sacrificial anodes are highly active metals used to prevent a less active material such as copper, aluminium, steel and carbon steel from corroding. Elysator's magnesium anodes have a more negative electrochemical potential than the other metals they will serve to protect.

In dissolving the anode(s), the concentration of dissolved oxygen in the system water is reduced to a negligible level. The magnesium hydroxide produced in this process raises pH value to an optimum range, electrical conductivity

drops as does the water hardness, thus engineering environments where corrosion cannot occur and bacteria cannot survive. In so doing they meet the explicit requirements set out by VDI 2035, Europe's most stringent standard for water quality within heating systems. VDI 2035 is referenced by many major industry manufacturers as a condition of warranty.

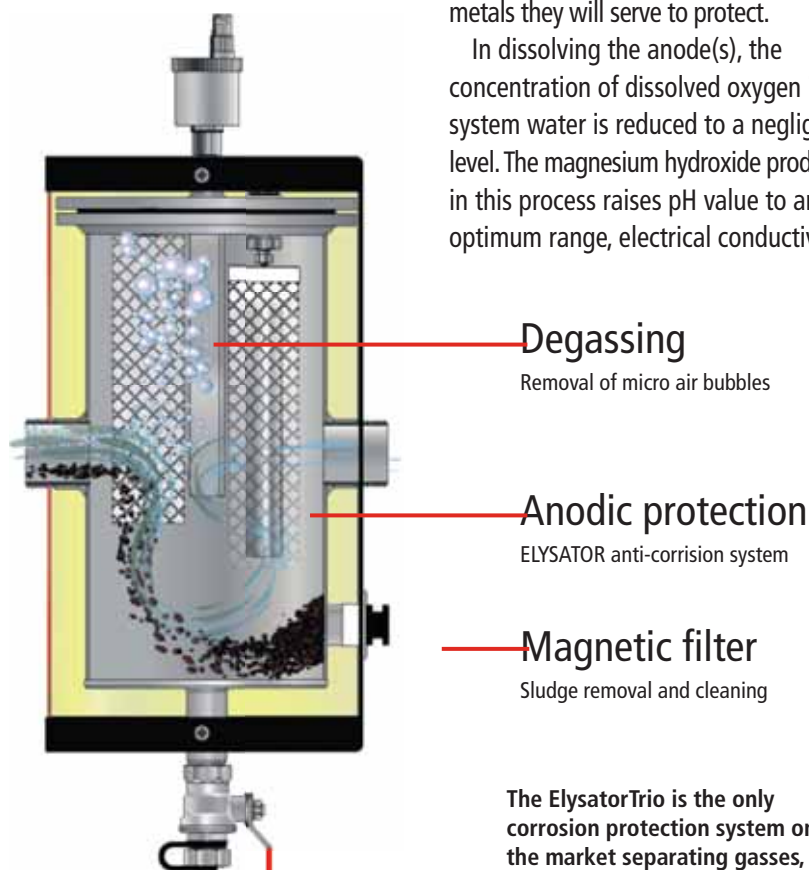
Elysator equipment offers significant environmental and financial savings and is equally suited to protecting new installations and restoring existing systems to health. On new-build, owners will see considerable savings on the cost of chemicals and maintenance. On retrofit, when engaged to correct existing water quality and corrosion issues, savings of 50% plus against the cost of flushing and re-dosing treatments are commonplace. It is also simple to install and maintain with retrofit installations typically completed within one day with no system downtime. Subsequent maintenance simply involves changing the anodes every three years.

The technology is elegantly scalable, the same scientific principles applied to residential systems of 100L and industrial systems of 300,000L+. Whatever the interest – district heating, agriculture, heat pumps, steam, biomass, CHP – there is a proven Elysator product available.

The first Elysator was manufactured in 1970. Clients include BP, IKEA, Forsmark Nuclear Power Plant, Wartsilla Power Plants, Vital Energi, Sheraton Hotels and, in Ireland, Ulster Hospital and Butler's Chocolate.

"This is a very simple and cost-effective solution to what can be a major headache in terms of poor system performance and system downtime," says Macartan McCague of Ecopipe. "It is also sustainable in that it improves energy efficiency and prolongs the lifetime of all the primary elements of the installation".

Contact: Macartan McCague, Ecopipe. Tel: 01 – 210 9970; email: sales@ecopipe.ie; www.ecopipe.ie



**The ElysatorTrio is the only corrosion protection system on the market separating gasses, absorbing acids and filtering sludge particles at the same time.**

# We're the No.1 choice for new builds.



We work with the  
top homebuilders to  
provide warmth  
throughout Ireland

## Not just any rad. **Stelrad.**



Find out more at **Stelrad.ie**



From designer styles right through to energy saving radiators, our extensive No.1 ranges will add extra appeal to all new homes. We're not just any rad. We're Stelrad.





# Future-proof with Grant's high-efficiency boilers

Renowned for its research and development of innovative heating technologies, Grant continues to lead the way with its highly-efficient, reliable heating solutions for both new-build and retrofit properties. Barry Gorman, National Renewable Sales Manager, Grant Engineering, outlines here how the company continues to focus on sustainability to help achieve decarbonisation, and advises that an oil boiler such as Grant's award-winning Vortex condensing oil boiler is still a good option as part of a heating system upgrade as it can help future-proof Irish homes.

"At Grant our core focus is to provide innovative, eco-friendly and reliable heating solutions," says Gorman. "Although we started developing boilers over 40 years ago, for almost two decades now we have been developing highly-efficient sustainable heating technologies like the A+++ Aerona<sup>3</sup> R32 air to water air source heat pump, solar thermal and condensing biomass boilers.

"The Grant Aerona<sup>3</sup> R32 air to water air source heat pump is a popular choice for new-builds, especially where the house design is specifically matched to the heat

pump. This is due to the Aerona's cleaner, more environment-friendly performance and its ability to lower a property's overall carbon footprint, while helping to meet NZEB building standards.

"For those considering renewable technologies for heating system upgrades, Grant Solar Thermal panels offer significant savings on annual hot water bills, as they can supply up to 70% of a property's annual domestic needs. The Solar Thermal collectors use renewable energy from both direct and diffused sunlight and

are easily integrated with conventional heating systems.

"When upgrading a heating system, in most cases it is impractical to remove and replace the entire system. Therefore, installing a Grant Vortex condensing oil boiler is often the best option. The highly-efficient Vortex range is available in 63 different models with outputs from 12kW to 70kW. It can reduce carbon emissions without compromising comfort levels, and save money on annual fuel bills.

"In preparation for a decarbonised future, the Grant Vortex range is compatible for use with future biofuel blends (depending on type of biofuel and % blend eg: HVO, FAME). This means that by installing a Grant Vortex condensing oil boiler you are future-proofing a property for its changing heating needs. The adaptability of the Vortex range also provides peace of mind for both installers and homeowners alike, as it helps Irish homes move to a low-carbon future.

"Highly-efficient supporting technologies within Grant's product portfolio also work effectively to support heating systems within both new-build properties and those undergoing heating system upgrades. These include pre-plumbed hot water cylinders and a range of heat emitters – the Grant Uflex underfloor heating system, Grant Afinia aluminium radiators and Grant Solo fan convactor radiators.

"The Grant Afinia range offers a high-efficiency option with excellent conductivity and flexibility for both new-builds and upgrades, as it is designed to work with both low and high-temperature heating systems. Models within the range offer a versatile choice for heating individual rooms as they can be easily paired with a Grant Aerona<sup>3</sup> R32 air to water air source heat pump or a Grant Vortex condensing oil boiler."

From new-build and retrofit projects to heating system upgrades, Grant has a heating solution to suit all requirement.

Visit [www.grant.eu](http://www.grant.eu) for more information or follow Grant on Facebook and Twitter@GrantIRL or Instagram @Grant\_IRL.

**Think Heating. Think Grant.**



The Grant Vortex condensing oil boiler range is compatible for use with emerging biofuel blends and so can help future-proof a heating system installation.

<https://arrow.tuadublin.ie/bsn/vol59/iss5/1>



# Industry Leaders in Chemical-Free Water Treatment



Technical applications demand high standards of water quality. Gases, minerals and pollutants must be removed from water using environmentally responsible processes, until the water is suitable for the required application. We call this: engineering water®.



Ecopipe Ireland | Tel: 01 210 9970 | e: [sales@ecopipe.ie](mailto:sales@ecopipe.ie) | [www.ecopipe.ie](http://www.ecopipe.ie)



# Gas part of the solution for decarbonising apartment blocks

Ireland's gas network has an important role to play in reducing emissions across multi-apartment developments, one of the more challenging areas of the housing sector to decarbonise. The €2.6 billion, 14,000km state-owned asset is an integral part of Ireland's energy system and key to achieving a clean energy future for this and future generations.

**One way** in which the gas network will help Ireland meet its energy reduction targets is by providing cheap, reliable and increasingly-renewable energy to households. With the introduction of new, more stringent requirements under domestic Building Regulation Part L 2019, Conservation of Fuel and Energy, dwellings constructed from 2020 will need to be 70% more energy efficient and 65% more carbon efficient than a house built in 2005.

The new regulations are accompanied by a wide and varied increase in the types of renewable energy technologies currently available on the market to help achieve these requirements. Photovoltaic panels (PV) have steadily increased in efficiency to a point that, in some circumstances and when combined with a gas boiler, they can deliver a lower household carbon footprint than using an air-to-water electric heat pump.

The installation of these technologies is simplified when you have the floor or roof space to install them. While most new, three-bedroom semi-detached homes do, multi-storey, multi-apartment building developments, where both roof space and internal apartment space is at a premium, do not. Developers and their design teams can meet this <https://arrow.tudublin.ie/bsn/vol59/iss5/1>

challenge by using networked gas in combination with other technologies to produce robust heating systems that not only provide constant heating and hot water to each individual apartment, but also supply renewable heat and electricity to the building.

This communal (district) type heating system comprises standard system gas boilers, combined heat and power (CHP) unit(s), air-to-water electric heat pumps, and/or gas absorption heat

pumps. The CHP system can supply hot water to the heating medium and electricity to the heat pumps, which in turn raise the return temperature of the heating medium before starting the cycle again. In the unlikely instance that the CHP system is impacted, standard gas boilers are also installed for redundancy, ensuring a continuous supply of heating and hot water for each apartment.

This type of system has been successfully deployed in a recent development in Santry, Co Dublin. Bridgefield and Pappan Grove apartments are a development of three six-storey buildings and one five-storey building featuring over 250 apartments. The apartments have achieved an A2 BER rating and are fully compliant with the domestic 2019 Part L Building Regulations. Each apartment can manage its own individual heating and hot water needs through the touch of a button on the resident's smartphone.

System designers and installers can learn more about this type of system from Gas Networks Ireland at [technicalqueries@gasnetworks.ie](mailto:technicalqueries@gasnetworks.ie) ■



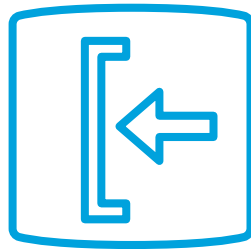
Bridgefield and Pappan Grove apartments, Santry, Co Dublin.



# WE BELIEVE IN COMMERCIAL SOLUTIONS



**EVOMAX 2**  
30kW - 120kW



Wall Hung



**EVO S**  
50kW - 135kW



EXCLUSIVELY AT

**IDEALENERGY.IE**  
**EMAIL: INFO@IDEALENERGY.IE**



# New Baxi 800 range comes with 10-year warranty

Early October 2020 saw the introduction to Ireland of the highly-innovative Baxi 800 boiler range. With a 10-year warranty and Adey Magnaclean Micro 2 magnetic system filter in the box, this premium range of boilers offers complete peace of mind for installers and homeowners alike.

**Laurence Cox**, Commercial Manager, Baxi Potterton Myson, explains. "The new range of Baxi 800 boilers includes the Baxi 800 Combi with outputs of 25kW, 30kW and 36kW; the Baxi 800 System with 18kW and 24 kW outputs; and the Baxi 800 Heat with outputs of 16kW, 25kW and 30kW. The boilers were designed following extensive installer research, so they are compact to fit discreetly into a standard kitchen cupboard, straightforward to install, simple to maintain and service, and very reliable."

The combi and system models have OpenTherm interface so they can be operated very simply using a smart phone or tablet. The boilers come with a simple hanging bracket and built-in stand-off frame. The central flue makes it a perfect replacement for an existing boiler and extensive flue options of up to 20 metres offer <https://arrow.tudublin.ie/bsn/vol59/iss5/1>

flexible siting. The Baxi 800 Combi has an "Easy-Fill" filling loop so that the householder can easily top up the central heating system pressure.

The Baxi 800 Heat has the option within the boiler case for a rear flue for a neater finish. Starting at just 17.4kg for the

**“ This is one of the lightest boilers on the market, making it easy to manoeuvre and install.**



Baxi 800 Heat (above) and System (top right) boiler types. Both have Adey filter.



16kW and 25kW models, this is one of the lightest boilers on the market, making it easy to transport, manoeuvre and install. It is also compatible with the market-leading Megaflo range of cylinders.

In addition to the Baxi 800 range, Baxi Potterton Myson has extended the Baxi 600 range to include a higher-output LPG model, the Baxi 636 Combi LPG. This compact, yet powerful, addition will provide up to 15 litres per minute hot water flow rate for off-mains gas homes.

Also, by popular installer demand, Baxi has introduced the Baxi Platinum+ 32kW System and Baxi Platinum+ 40kW Combi boilers for homes with a higher demand for hot water. These boilers also come with a 10-year parts and labour warranty and a compact Adey Magnaclean Micro 2 magnetic system filter in the box.

Contact: Baxi Potterton Myson.  
Tel: 01 – 459 0870 or  
visit [www.baxi.co.uk](http://www.baxi.co.uk) ■

fastrack to the top

Join  
**CIBSE Ireland**

Boost your work opportunities  
by joining the group of relevance

You need to be in the  
room with the group that  
supports your designs,  
accredits your course  
and sets the highest  
standards for your  
industry





# THE ENERGY RANGE

Everything you need to keep glowing



## Say hello to the Energy range

Glow-worm's Energy boiler range offers attractive modern design, easy-to-use interfaces and a wide choice of models and controls. Its light-weight, compact construction makes life easy for installers, while its long-lasting, quiet performance is a hit with homeowners too.

## Energy Combi

- ErP A-rated for efficiency
- Compact size allows installation flexibility
- High efficiency
- Low running costs
- Outputs – 25kW, 30kW or 35kW
- Rear flue option
- "Quiet Mark" approved
- Aluminium heat exchanger
- Modulating Grundfos pump



## Energy System

- Outputs – 12kW, 15kW, 18kW, 25kW or 30kW
- Compact size
- Rear flue option
- ErP A-rated for efficiency
- Quiet Mark approved
- Easy to fit and install
- Modulating Grundfos pump
- Low running costs



## Energy Regular

- ErP A-rated for efficiency
- Outputs – 12kW, 15kW, 18kW, 25kW or 30kW
- Compact size
- Rear flue option
- Low energy bills
- Easy to maintain



## Energy 35 Store

- All-in-one system and combi
- Instant/unlimited hot water
- Stainless heat exchanger
- High flow rate
- LPG compatible
- 5-minute reheat



CREATING A QUALITY ENVIRONMENT

## COVER STORY

David McAuley, Founder and CEO, Bitpower

# Why do we even need data centres?

## Because they are essential to our IoT lifestyle

Google, Amazon, Microsoft and Facebook – the vast majority of interactions on the internet filter through these four companies, all of whom have large portions of their European infrastructure based in Ireland.

**Some of these** interactions seem obvious – perform a Google search and clearly you are connecting to a Google server somewhere. But Google (Alphabet) also owns YouTube, so there's that. Many e-payments are verified through a Google authentication service. Then you have Google maps, Google docs, Google drive and Gmail. Google's key revenue comes from selling ads that you see while accessing these free services. Facebook is a similar story. Even if you don't "do Facebook" you probably have a WhatsApp account – that's owned by Facebook too, as is Instagram.

Okay, so you're a MAC user, and you <https://arrow.tudublin.ie/bsn/vol59/iss5/1>

don't use Microsoft. Wrong. Microsoft is well known for MS Windows and Office applications, but it also provides a hosting service it calls Microsoft Azure. Organisations can lease the use of Azure's IT Infrastructure as a service (IaaS), or Platform as a Service (PaaS), or adopt the full Software as a Service (SaaS) to achieve their business and connectivity needs. Many household names host their services on the Azure platform – examples include 3M, Boeing, eBay, Rolls Royce, FedEx, Intel, NBC, Sony's PlayStation Network, Samsung, BMW, Toyota and many more. Microsoft claims that 95% of *Fortune 500* companies use Azure<sup>1</sup>.

You never order anything from Amazon.co.uk, so you don't need Amazon's data centres – wrong again. Amazon is way more than just a bookseller. AWS (Amazon Web Services) is the world's largest data hosting service. It hosts most of the online services we use every day. These services require robust and reliable infrastructure, and Amazon has mastered the science of delivering content where and when it is needed. Netflix, LinkedIn, Twitter, Adobe, Airbnb, Baidu, BBC, Channel 4, Disney, European Space Agency, ESPN, Expedia, Johnson & Johnson, NASA, NASDAQ, Nokia, Novartis, Pfizer, Pinterest, Sage, SAP, Schneider Electric, Siemens, Slack, Sony, SoundCloud, Spotify, Ticketmaster, Unilever, and thousands more all use the AWS platform.

Apple does not have a dedicated



The author David McAuley is a specialist in infrastructure for data centres. He advises the data industry on energy issues and is active in the data centre community. He established Bitpower in 2017 and provides market research on the data industry for the investment community, including a quarterly analysis of the scale of data centres in Ireland ([www.bitpower.ie](http://www.bitpower.ie)). He collaborates closely with the data centre industry group Host in Ireland on sustainability challenges.

David previously worked as R&D Manager at the Sustainable Energy Authority of Ireland (SEAI) with roles in low carbon technology innovation and as an advisor to Irish industry on strategies for sustainability and energy efficiency. He graduated from DIT (now TU Dublin) as a mechanical engineer in 1997 and subsequently worked as a facilities engineer in pharma and electronics manufacture.

data centre in Ireland, but it uses a combination of Azure, AWS and Google platforms to deliver its services. So, if you're streaming movies to your Apple TV or backing up your iPhone photos on iCloud, you're likely connecting to a server in one of Dublin's data centres. The relative scale of data centre operations in Ireland at the beginning of 2020 is shown in Figure 1.



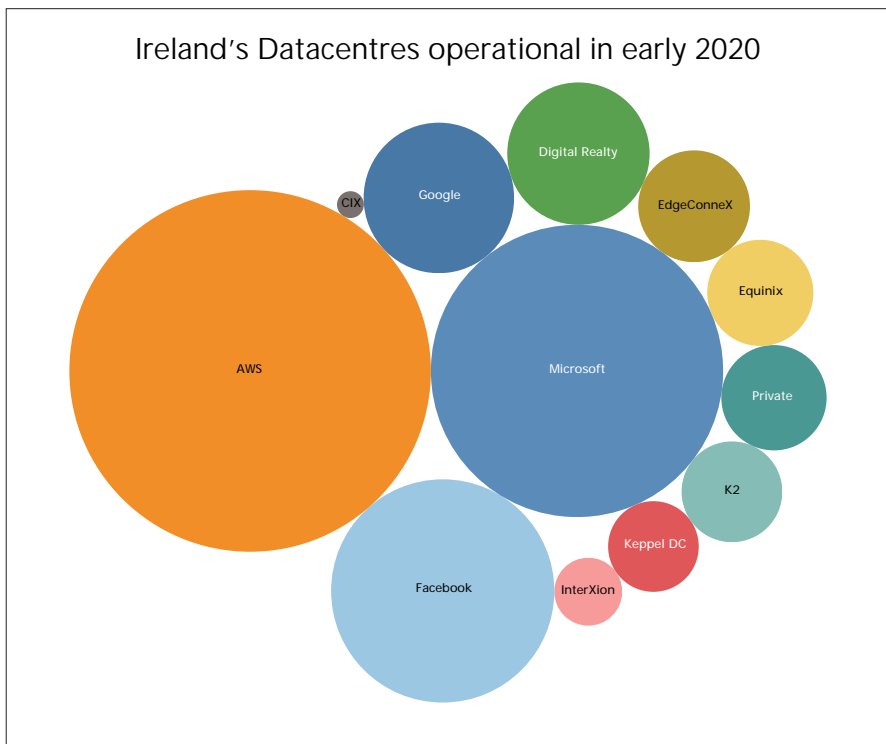


Figure 1 – Relative scale of data centre operations in Ireland at the beginning of 2020.

### Data centre options

Some organisations choose to keep their IT operations in-house but this practice is now becoming increasingly rare. For specialist operations not requiring international connectivity it can still make sense. Think High Performance Computing. The middle ground then is to manage and maintain your own IT equipment and to outsource the building management to a third party. Colocation datacentres offer this service – a pre-built facility with power, cooling, connectivity and security already in place, with headroom for future expansion.

Microsoft and Google began their Dublin operations in such facilities. A big advantage these facilities offer is connectivity to the big four mentioned above. Every online query actually passes through multiple servers and platforms before returning. This in part explains why data centres tend to cluster together. Colocation providers in Dublin include Equinix, InterXion & Digital Realty, Keppel DC, and Sungard AS, with other providers such as Vodafone, BT, PlanNet21 and Blacknight also providing ancillary services.

Another emerging type of data centre is the wholesale cloud data centre. These are large facilities

developed with a single client in mind. Some are built in collaboration with one of the big four, and others are speculatively developed. EdgeConneX, K2 datacentres, Echelon data centres, CyrusOne, EngineNode and T5 all fit this model. Expect to see more of these third-party developments pop up in Dublin.

Figure 2 shows the main data centre clusters in Ireland and how they are expected to develop over the next decade. This is based on market analysis of existing operations and an ongoing review of local authority planning databases.

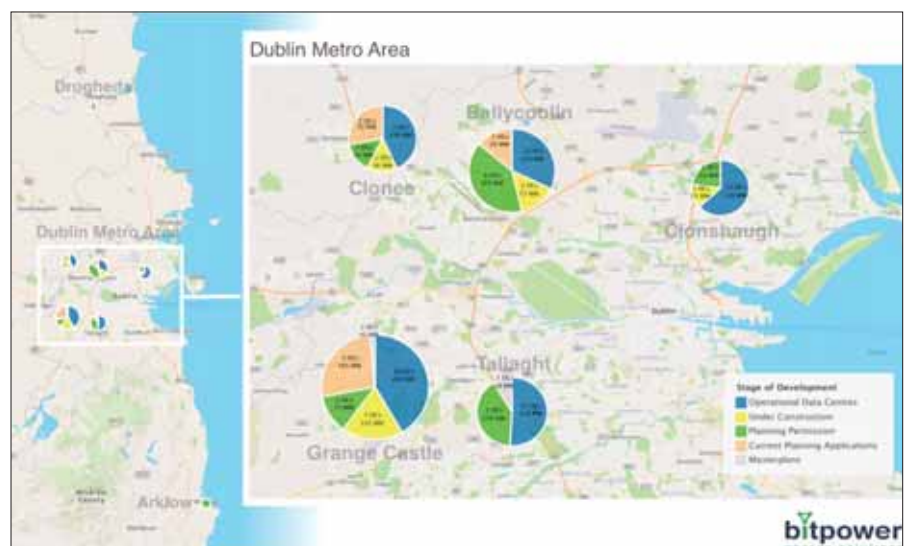


Figure 2 – Data centre clusters in Ireland and projected growth.

### Connectivity

All these data centre types have one common thread connecting them – fibre. Fibre-optic cables span the globe, delivering data limited only by the speed of light (and some switching). Across the Atlantic Ocean lies a growing number of the latest generation of fibres. Ireland is the only country in Europe with more than two such cables (three), offering more diversity than any other country. (The UK and France have two each, with no more than one for other countries).

On land, these fibres are connected to the data centres via a trunking ring around Dublin called the T50. This network underlies the main data centre clusters in Dublin – Ballycoblín, Clonsilla, Grange Castle, and Tallaght. The round-trip latency between these data centres is very low. Beyond Dublin we are beginning to see developments up to 60km distant from the main clusters, indicating that for some operations, these locations are within acceptable latency limits.

As a side note, 50% of all internet traffic crossing the Atlantic is Facebook. Google is 30% and 20% is everything else. This is partly due to the nature of these businesses. An AWS server streaming a Netflix series needs only to transmit across the Atlantic just once – thereafter the same content is distributed from a local server. This morning's Facebook video post of your cat is unique (to you anyhow) and would be downloaded as needed to anywhere in the world almost instantly. No surprise then that Facebook and

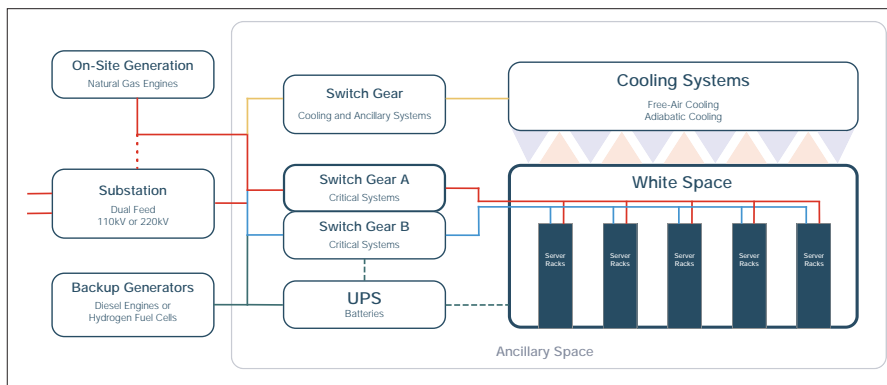


Figure 3 – Simplified data centre topology for hyperscale operations.

Google are also in the business of owning their own subsea fibres.

### Data centred design

The big data centre operators each have their own design preferences, but all essentially comprise a contained space (often called the “White Space”) for housing rows of racks containing servers, switches and storage. Hot and cold aisle containment is standard practice. The cold space is cooled using a combination of recirculated and filtered fresh outside air, known as free-air cooling. Adiabatic chilling units located on the roof and fed with water provide supplemental cooling for warm days. Power is delivered through redundant 2(N+1) power supply infrastructure. Batteries and UPS systems provide instant back-up and power stability, and can be located in separate rooms or within the racks themselves. Longer-term back-up is provided using diesel gensets with up to 72 hours capacity stored on-site.

A simplified power and cooling arrangement for a hyperscale data centre is shown in Figure 3. Alternative power paths are shown. Data centre design may include some or all of the elements and may interact with the grid in a two-way arrangement.

Power requirements depend on the density of racks in the data centre. In terms of space, each rack requires 2.8m<sup>2</sup> (30ft<sup>2</sup>). Power densities of 8kW per rack average are typical design setpoints for hyperscale data centres. Hotspots up to 30kW per rack should be allowed for to accommodate some AI applications (see Figure 4). As an example, a 2,000-rack data centre is designed for 16,000kW of IT load, with 5,600m<sup>2</sup> of “white space”. A

scenario) to allow for the power and cooling overhead therefore requires 22,400kW (22.4MW) of incoming power capacity.

Colocation datacentres have multiple clients with varying requirements. Their design often includes localised mechanical cooling with raised floors, and caged “white space”. Their scale is smaller, between 3MW and 10MW per building compared to hyperscale at 18MW to 25MW per building. Clients lease space or power capacity. Colocation design must also allow for interconnection (meet-me-rooms containing telecoms Points of Presence or PoPs), as well as actual meeting rooms, and even office space and parking for clients. Security and access control are particularly important.

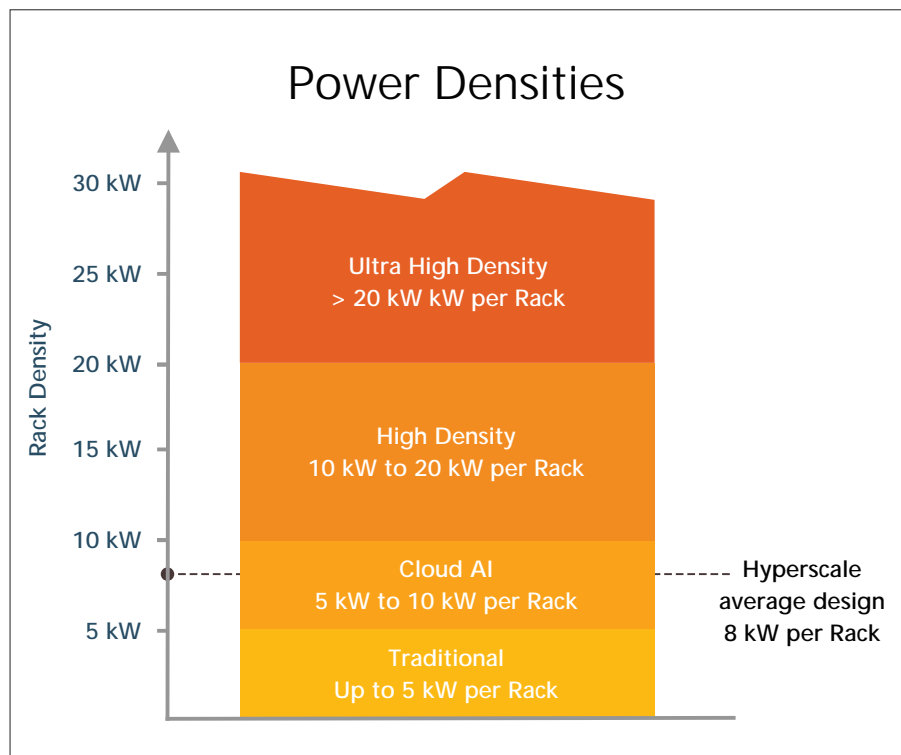


Figure 4 – Design power requirements for server racks in a data centre.

### Power for data centres

Large data centres are now built in clusters of three or four buildings. The large power densities mean most are now connected directly to the transmission grid, often fed from two separate grid nodes for redundancy. On-site 110kV or 220kV substations are usually required, which can be a substantial cost. Dublin’s power grid (like that of any data centre cluster – e.g. North Virginia, Amsterdam, Frankfurt) is under pressure to accommodate the 700MW of capacity booked by data centres today, and set grow to 1,700MW in the next five to six years.

It is worth noting that these are maximum capacity design figures and it will likely take up to 10 years for actual maximum demand to reach 80% of this number. The projected ramping-schedules of data centre developments are now of critical importance to the success of power systems design.

There is a trend towards building on-site gas-fired power stations to bridge the gap while grid power infrastructure is developed. This may help to alleviate pressure on the electricity system in the longer term too, by replacing older baseload generation and allowing less curtailment of renewables



in a predominantly island grid. However, sustainability credentials are compromised for the data centre in this scenario.

#### Innovation in data centre design

The future of data centre design will be driven by sustainability. Efficiency is inherent in the data centre model in so far as they replace less-efficient server rooms in offices, and can offer an economy of scale, with continually optimised management. Powered by electricity, they will reap the benefits of a greening grid.

Data centres can provide support to renewables by opening up the use of their resilient power infrastructure to the grid, thereby increasing the amount of wind and solar that can be absorbed before the electricity grid becomes unstable (the point at which grid operators curtail wind). Flexibility management can provide great benefits, if the right incentives are in place.

Hydrogen as a source of power is receiving increasing attention with trials by Microsoft in using hydrogen powered fuel cells to replace diesel generators. The benefit of hydrogen is that it can be generated from surplus renewable electricity. If Ireland was to take advantage of its vast offshore wind capacity, there would be plenty of electricity available for this use. This “green hydrogen” can be used to augment natural gas in the existing network, fuelling generators on-site, resulting in a low-carbon alternative to fossil fuels.

Many ICT-related efficient products already available can benefit from capital allowances, including servers, storage, networking, cooling, power supplies, UPS, etc. SEAI maintains a list of eligible products worth checking out.

Sustainability of data centres is coming under increased scrutiny nationally and internationally. In early 2020, Microsoft announced its plans to become carbon negative for all of its operations by 2030. This includes Scope I, II, and III emissions. It also states that by 2050, it will have reversed all carbon emissions related to its operations since the founding of the company in 1975.

Other hyperscale cloud operators have also announced plans to tackle climate change. Apple made a similar commitment in July 2020 while Google aims to procure renewable power for all of its operations on an hour-by-hour basis in its “27x7 Carbon Free” initiative. As I write this article, Facebook has just announced its intention to become carbon neutral by 2030.

These are ambitious plans by some of the world’s biggest companies. From an Irish perspective, we must see this as a golden opportunity to develop solutions which can have an international impact.

Data centres are just the latest evolution of our success with tech companies. There are 100,000 people employed in ICT in Ireland and those jobs are dependent on continued development of the ecosystem. We have a vibrant data centre design and construction industry which has expanded into Europe. Wherever there is a datacentre in construction in Europe, there are sure to be Irish boots on the ground. ■

#### References

1. Microsoft Azure customers - <https://azure.microsoft.com/en-us/overview/azure-vs-aws/>

# building services

engineering

**Building  
your  
business  
requires  
trusted  
partners**

Today, more than ever, good business is about mutually-beneficial and well-balanced trading partnerships. Creating, sustaining and growing such partnerships is a demanding process that, in addition to the delivery of quality products and services, requires informed communication. Existing and potential clients need to know about, and fully understand, what you provide.

*Building Services Engineering* is the means by which to do that. We are the partner that bridges that communications gap and helps you cement the partnerships that underpin your business.

*Building Services Engineering*  
print and online.

Visit our website:

[www.buildingservicesnews.com](http://www.buildingservicesnews.com)



Find us on  
Facebook

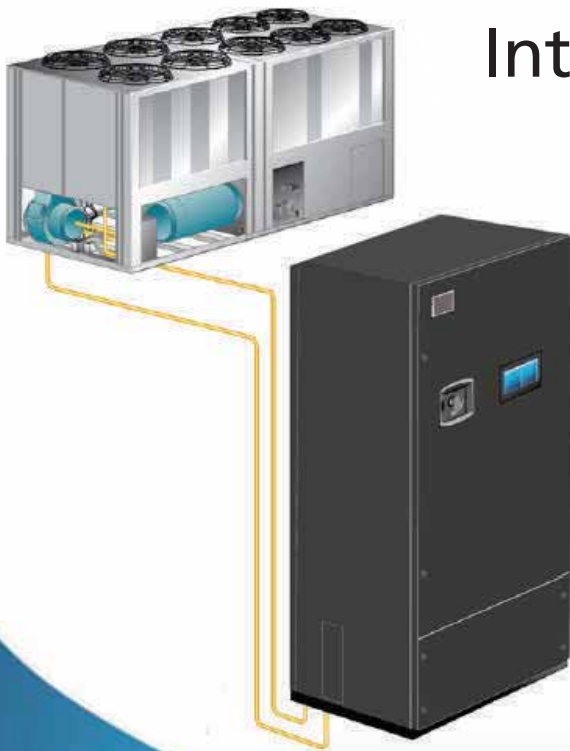


# *Consider it solved ...*



## **VERTIV™**

### Intelligent, Integrated Infrastructure for Data Centres



Downtime affects every aspect of a business, and especially data centre networks that support multiple businesses. Working closely with Vertiv, Core Air Conditioning Ireland offers solutions that prevent downtime in mission-critical IT facilities.



Free-cooling and  
adiabatic free-cooling  
chillers



In-row cooling and  
smart containment  
solutions



**AIR CONDITIONING IRELAND LTD**



Chilled water,  
DX and dual  
fluid close  
control  
solutions

Indirect evaporative  
free-cooling units



Racks and closed loop  
cooling systems



**Contact:**

Steve Wood, Sales Manager,  
Core Air Conditioning Ireland Ltd.  
Unit A6 Centre Point Business Park,  
Oak Road, Clondalkin, Dublin 12. D12 PW95  
T: +353 1 409 8912 M: +353 86 380 3882  
E: [steve@coreac.com](mailto:steve@coreac.com)

**[www.coreac.com](http://www.coreac.com)**

BUSINESS MATTERS

# BREXIT

## Head in the sand approach won't make it go away!

While the far reaching business implications of the Covid-19 pandemic are now becoming apparent, they have somewhat overshadowed the proverbial elephant in the room ... Brexit, so says Gay Byrne, President, Electrical Industries Federation of Ireland (EIFI).

**W**hile Byrne's primary brief is the electrical sector, his comments cover all imported products and equipment across the full building engineering spectrum. There is a misconception that it will only affect manufacturers and manufacturers' representatives. However, as he outlines here, the possible logistics disruption – in addition to extra cost implications – will impact the entire sector. This will include order placement, project timelines, etc, not to mention "just-in-time" practices and other short-ordering of critical supplies.

Britain officially left the European Union on 31 January of this year. Under the "Withdrawal Agreement,"

a transition period came into effect on 1 February 2020 and will run until 31 December 2020. During the transition period the UK will remain in the EU customs union and single market. As a result, goods can currently move freely between the UK and the EU without any customs checks or formalities until the end of the transition period.

Unless there is some dramatic breakthrough, the UK will no longer be a member of the EU customs union or single market from 1 January 2021. The UK will effectively become a third country, meaning trading with the UK will







Gay Byrne, President,  
Electrical Industries  
Federation of Ireland  
(EIFI).

be subject to the same requirements as trading with the USA or China.

According to international customs and logistics experts ALS (email: ireland@als-cs.com), in practice this means the following:

- Customs declarations will be a requirement from 1 January 2021 for trade between ROI and the UK;
- Import duty may be payable on goods imported from the UK, tariff code dependent;
- Import VAT will become payable on goods imported from the UK.

Even if a trade deal is negotiated between the EU and UK prior to 1 January 2021 customs declarations

will still be a requirement. It is estimated that the number of declarations carried out in Ireland could increase from 1.7 million to as many as 20 million per year. These requirements will negatively impact both cost and cash flow. In addition to those customs requirements, importers must also be aware of the possible delays in receiving goods due to potential port congestion.

#### Northern Ireland Protocol

The “Northern Ireland Protocol” ensures that there will be no customs controls in place between Ireland and Northern Ireland. Goods may travel freely on the island of Ireland.

However, goods travelling between the UK and Northern Ireland may be subject to controls at the port of entry for Northern Ireland if they are “at risk” of entering the EU. This measure is aimed at safeguarding the integrity of the EU single market by levying VAT and duty on goods that travel from the UK to Ireland via Northern Ireland. This protocol will last until at least 2024. In 2024 a vote will be held to remain in, or leave the protocol. A vote can take place every four years.

#### Getting prepared

With three months to go until frictionless trade with the UK comes to an end, several steps can be taken to help ensure as smooth a transition as possible. These include:

- (1) Ensure you have an EU EORI number. An EORI number is required when importing to, or exporting from, the EU;
- (2) Appoint a customs clearance agent;
- (3) Determine the valuation, origin and tariff codes of your goods. This will determine the duty rate payable upon importation;
- (4) Review the INCOTERMS you have agreed with your supplier. This will determine who is responsible for the customs formalities, import duties and taxes;
- (5) Apply for a customs deferred payment authorisation. This will allow you to defer VAT and duty payments until the following month.

In addition, there are various customs procedures you may be able to avail of, but these will vary depending on your company's circumstances.

For further information on Brexit see: [www.als-cs.com](http://www.als-cs.com)





# EasyVent

*– the most intuitive and adaptable  
ventilation design software on the market*



EasyVent, Soler&Palau Ventilation Group's selection software, is the most intuitive and adaptable ventilation design tool on the market. It aids the system designer to make an exact selection for a fan and can adapt to accommodate different and unforeseen situations that may appear.

## What can you do in EasyVent?

- ✓ Select fans and heat recovery units from your work point;
- ✓ Print technical pdf documents that include the performance and acoustical data of products along with dimensional details;
- ✓ View and add accessories associated to the selected product;
- ✓ Dynamically generate BIM objects of products allowing easy integration into your projects;
- ✓ Create, customise and print full details of the project;
- ✓ Ability to narrow down selection of a fans by tags;
- ✓ Ability to share or access technical data sheets with designer, client and supplier without having to email.





## Fan and heat Recovery selection

- ✓ Detailed description of the selected product stating its real working point;
- ✓ Technical characteristics description of the working point such as consumption, efficiency, sound level or SFP;
- ✓ Physical characteristics product description as well as 3D model available to download in different formats, drawings or weight.



## Multi selection opportunities

- ✓ Quick multi-selection tools;
- ✓ Project basket tool to access the products easily;
- ✓ Customise the project with your logo;
- ✓ Possibility to reconfigure a product completely once added to the project;
- ✓ Possibility to replace a product for another if needed.



## Other features and benefits

- ✓ Printing of personalised technical pdf of the catalogue, product or project;
- ✓ View and add accessories associated to the product;
- ✓ Possibility to pre-calculate the airflow;
- ✓ Create, customise and print your ventilation project;
- ✓ BIM objects download.

Learn the potential of the  
best ventilation selection  
software on the market



## SPECIAL REPORT

REHVA

3E

Federation of  
European Heating,  
Ventilation and  
Air Conditioning  
Associations

CORONAVIRUS | COVID-19

# OPERATING BUILDING SERVICES DURING COVID-19

REHVA, the Federation of European HVAC Associations, has published the second review of its COVID-19 Guidance. The latest version focusses on the reopening and safe use of buildings and suggests mitigation measures on specific components and building types, including a document on how to reopen schools, the use of fan coils with recirculation, and minimising air-leakages across rotary heat exchangers.

<https://arrow.tudublin.ie/bsn/vol59/iss5/1>



The author of this report is Professor Jarek Kurnitski, Chair of REHVA COVID-19 Task Force, Tallinn University of Technology, Chair of REHVA Technology and Research Committee

**The update came** a few weeks after WHO acknowledged the possibility of airborne transmission, especially in crowded, poorly-ventilated spaces, thanks to the intense advocacy by scientists around the globe, including several REHVA experts. Without doubt, ventilation is the most important engineering control measure within infection control of indoor spaces.

New evidence and the general recognition of the aerosol-based transmission route have evolved recently. To date, there is evidence on SARS-CoV-2 aerosol-based transmission, and this route is now recognised worldwide. Transmission routes remain an important research subject, and it has already been reported that the short-range aerosol-based route dominates exposure to respiratory infection during close contact<sup>1</sup>.

Medical literature has started to talk about a new paradigm of infectious aerosols and there is no evidence to support the concept that most respiratory infections are primarily associated with large-droplet transmission. It seems that small particle aerosols are the rule, rather than the exception, contrary to current guidelines. In the context of buildings and indoor spaces there is no doubt that cross-infection risk may be controlled up to 1.5m from a person with physical distancing and beyond that distance with adequate ventilation and effective air distribution solutions. See Figure 1.

### Key aspects to consider

In such a pandemic situation at least three levels of guidance are required: (1) how to operate HVAC and other building services in existing buildings right now; (2) how to conduct a risk assessment and assess the safety of different buildings and rooms; and (3) what would be more far-reaching actions to further reduce the spread of viral diseases in future in buildings with improved ventilation systems<sup>2</sup>.

The latest guidance focuses on temporary, easy-to-organise measures that can be implemented in existing buildings which are in use during or after an epidemic with normal or reduced occupancy rates. While there are many possibilities to improve ventilation solutions in future, it is important to recognise that current technology and knowledge already allows the use of many rooms in buildings during a COVID-19 type of outbreak, if ventilation meets existing standards and a risk assessment is conducted<sup>3</sup>.

The scope of the guidance is limited to commercial and public buildings (e.g., offices, schools, shopping

areas, sports premises, etc.) where only occasional occupancy of infected persons is expected. See Figure 2 (next page).

### Practical measures

REHVA lists 15 recommendations (see below and Figure 3) that can be applied in existing buildings at a relatively low cost to reduce the number of cross-infections indoors, focusing on ventilation solutions as main engineering controls.

1. Provide adequate ventilation of spaces with outdoor air;
2. Switch ventilation on at nominal speed at least two hours before the building opening time and set it to lower speed two hours after the building usage time;
3. At nights and weekends, do not switch ventilation off, but keep systems running at a lower speed;

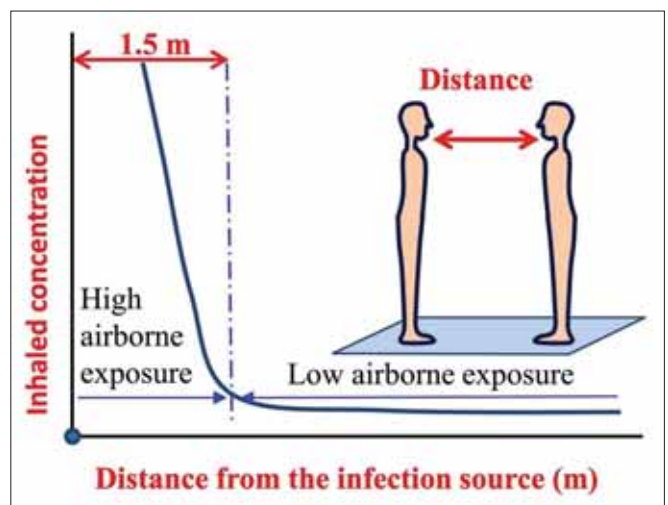
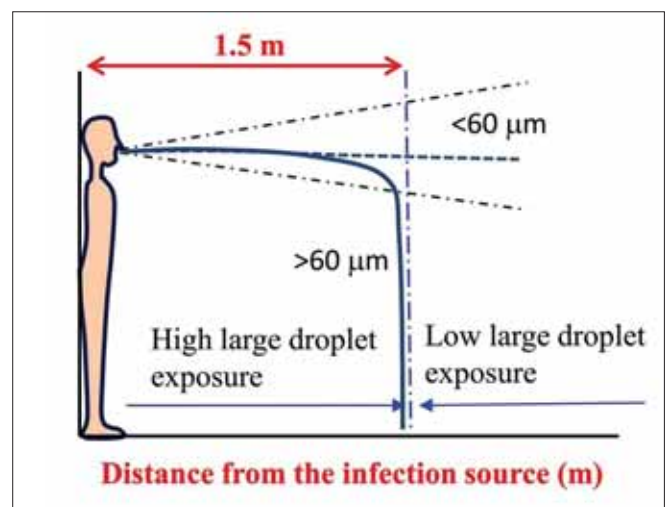


Figure 1 — The distinction between close contact combined droplet and aerosol transmission (left) and long-range aerosol transmission (right) which can be controlled with ventilation diluting the virus concentration to a low level. (Figure courtesy L. Liu, Y. Li, P. V. Nielsen et al.)



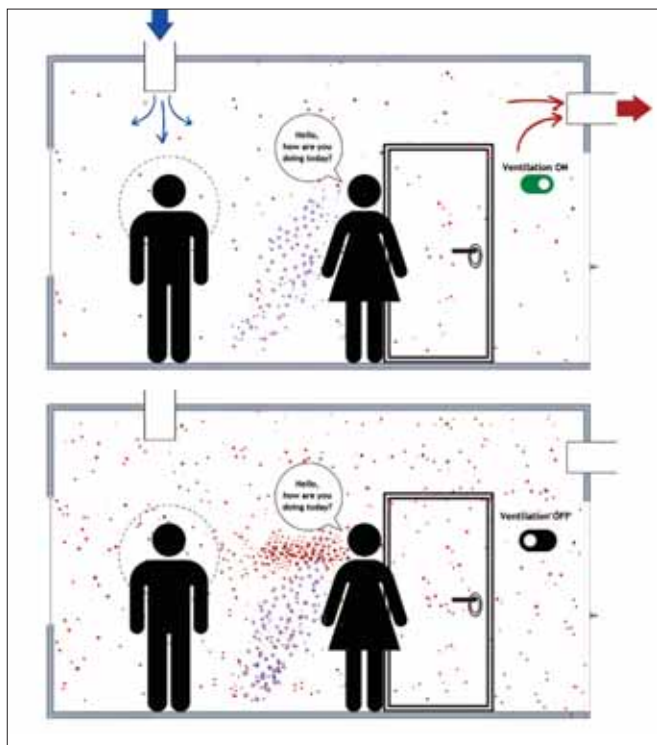


Figure 2 – Top figure: ventilation system on, lower figure: ventilation system off. Illustration showing how an infected person (speaking woman on the right) leads to aerosol exposure (red spikes) in the breathing zone of another person (man on the left in this case). Large droplet exhalation is marked with purple spikes. When the room is ventilated with mixing ventilation system, the amount of virus-laden particles in the breathing zone is much lower than when the ventilation system is off.

4. Open windows regularly (even in mechanically ventilated buildings);
5. Keep toilet ventilation in operation 24/7;
6. Avoid open windows in toilets to maintain the right direction of ventilation;
7. Instruct building occupants to flush toilets with lid closed;
8. Switch air handling units with recirculation to 100% outdoor air;
9. Inspect heat recovery equipment to be sure that leakages are under control;

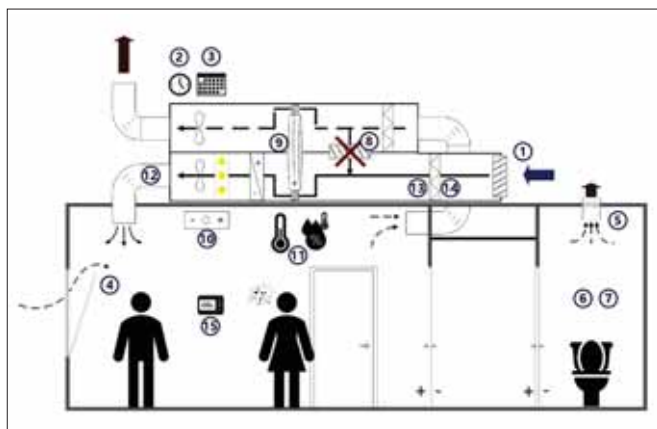


Figure 3 — Main items of REHVA guidance for building services operation.  
<https://arrow.tudublin.ie/bsn/vol59/iss5/1>



*In the context of buildings and indoor spaces there is no doubt that cross-infection risk may be controlled up to 1.5m from a person with physical distancing and beyond that distance with adequate ventilation and effective air distribution solutions.*

10. Adjust fan coil settings to operate so that fans are continuously on;
11. Do not change heating, cooling and possible humidification setpoints;
12. Carry out scheduled duct cleaning as normal (additional cleaning is not required);
13. Replace central outdoor air and extract air filters as normal, according to the maintenance schedule;
14. Regular filter replacement and maintenance works should be performed with common protective measures, including respiratory protection;
15. Introduce an IAQ sensor network that allows occupants and facility managers to monitor that ventilation is operating adequately.

#### REHVA course

A REHVA online course explains how to operate buildings and safely use densely-occupied spaces, targeting facility managers, occupational health and safety specialists, and other professionals involved in the management of indoor climate quality. The course provides a deeper knowledge and practical information. See [www.rehva.eu](http://www.rehva.eu) ■

#### References

1. Wenzhao et al, 2020. Short-range airborne route dominates exposure of respiratory infection during close contact. *Building and Environment* 176 (2020) 106859.
2. More information regarding points 2 and 3 are currently under development by REHVA's COVID-19 Task Force.
3. Currently under development by REHVA's COVID-19 Task Force.



# WE BELIEVE IN MARKET LEADING WARRANTIES

VOGUE MAX<sup>IE</sup>

LOGIC<sup>IE</sup>

LOGIC MAX<sup>IE</sup>



EXCLUSIVELY AT



**IDEALENERGY.IE**  
**EMAIL: INFO@IDEALENERGY.IE**



## Wilo one of '50 Sustainability & Climate Leaders' worldwide

The Wilo Group has been selected to participate (together with 49 other worldwide operating companies) in the global sustainability and climate protection initiative called "50 Sustainability & Climate Leaders" of the United Nations and Bloomberg.

**The participating companies** act on the basis of the 17 sustainability goals of the United Nations. "We are proud and happy to be part of this initiative," explains Oliver Hermes, President & CEO of the Wilo Group. "As a leading technology company in the pump industry, Wilo is committed to achieving better living standards worldwide, and to improving the efficiency of water management systems in the face of climate change."

As a climate protection company, sustainability is an integral part of the Wilo Group's corporate strategy. By 2025, <https://arrow.tudublin.ie/bsn/vol59/iss5/1>

for example, 100 million people should have better access to clean water. "Our products, systems and solutions contribute to supplying people all over the world with water in an intelligent, efficient and climate-friendly way," emphasises Hermes.

"Besides, pumps account for about 10% of global energy consumption. By replacing outdated technology alone, Wilo high-efficiency pumps could save up to 246 terawatt hours – the equivalent output of 80 coal power plants."

As part of the "50 Sustainability & Climate Leaders" initiative, the participating companies make an important contribution to the debate on current issues such as environmental and climate protection or social justice. At the same time, they digitally present the results of their own sustainable actions in short documentaries.

"We take a clear position on issues such as climate protection, energy and resource efficiency, as well as digital transformation," says Derek Elton, Managing Director, Wilo Ireland. "Together with our global network partners, we drive future-oriented climate-friendly solutions and proactively promote

Above: Oliver Hermes, President & CEO of the Wilo Group, in the Group's newly-built Smart Factory in Dortmund.

dialogue with politics, business and NGOs. Corporate political responsibility as a part of sustainable action is a living practice for us."

The companies involved in the "50 Sustainability & Climate Leaders" campaign are masters at turning plans into reality and finding a place for sustainability at the heart of their businesses. The digital transformation facilitates the path to a climate-neutral economy and should therefore be seen as an opportunity for more sustainability and climate protection.

"I am confident that together we can slow down climate change and achieve the global climate protection goals. We have produced a short documentary film which we hope will encourage others to promote the topic of sustainability and climate protection beyond company and national boundaries," concluded Hermes.

Visit <https://www.50climateleaders.com/wilo-se-pumps-and-partnerships-for-a-sustainable-future/w> ■

# Nothing knew about exhaust air heat pumps

**While air to** water heat pumps are now commonplace and the first-preference choice for many new-build and retrofit projects, many think exhaust air heat pumps are in their infancy and novel to Ireland. They are wrong. In fact, this year marks the 20th anniversary of the installation by Unipe of two NIBE Fighter 310P exhaust air heat pumps in the house of Nils-Ove Johansson, the then Swedish Trade Commissioner to Ireland. "They are still working perfectly since installation in spring time 2000, 20 years ago," says Johansson.

"It was a very unusual and exciting project at the time" recalls Unipe's Paul O'Donnell, "and our first installation for NIBE. Located on a hillside site outside Cork City, it featured a purpose-designed, kit-built wooden structure incorporating a very demanding services spec featuring ventilation, heating and hot water. The system is still performing perfectly to this day, the full service record bearing testimony to its excellent performance output and lifetime value.

"In the intervening years we continued to deliver exhaust air heat pump solutions and were instrumental in introducing the concept to developers and specifiers for modern apartment blocks. We are now seeing further penetration of the technology with more and more exhaust air heat pumps going in to domestic dwellings.

"Apart from the obvious heating and hot water benefits, the fact that exhaust air solutions incorporate ventilation makes them ideal given the emergence of wellbeing as a requirement, and the emphasis on indoor air quality, quite apart from comfort."

In keeping with the pioneering ethos of NIBE, it is constantly adding new models to the portfolio, one of the latest being the new NIBE F730 intelligent exhaust air heat pump. This new model delivers heating, ventilation, heat recovery and hot water efficiently, simply and economically. With its attractive stylish design and compact size, it is easy to handle and install, both in new-builds and when upgrading an existing system.

The heat pump's inverter control produces an extremely high and economical heat output. It is also well insulated and energy efficient, and this keeps energy consumption to a minimum by minimising heat loss. Thanks to smart technology, the householder has full control over energy consumption as part of the internet of things (IoT) connected lifestyle that is now commonplace, while the efficient control system automatically adjusts the indoor climate for maximum comfort.

While only recently introduced to the Irish marketplace, the NIBE F730 is already proven internationally with the manufacturing plant in Sweden producing hundreds units per day

to meet demand. This, in itself, is further endorsement not just of the established nature of exhaust air heat pumps, but of the marketplace demand for the new F730.

Contact: Paul O'Donnell, Unipe. Tel: 01 – 266 4888; email: [info@unipe.ie](mailto:info@unipe.ie) ■



Cut-away image showing the interior of the recently-introduced the NIBE F730.



# Calpeda thinks OUTSIDE THE BOX with Meta

The new Calpeda Meta range is the latest in the evolution of the already highly-successful e-idos portfolio. It is a compact, variable-speed water booster set measuring just 146mm by 420mm by 235mm, and incorporating a frequency converter, a pressure transducer, a non-return valve and an integrated pressure vessel IE4 efficiency class.



**"This is a** very significant addition to our portfolio," says Graham Fay, Managing Director, Calpeda Ireland. "It incorporates the latest energy efficient variable speed controls and is aimed primarily at the domestic and light commercial/industrial water boosting/pump markets. The Calpeda Meta will be very competitively priced and our route to market for this product will be through merchants, in addition to specifiers and key decision-makers."

Calpeda Meta is a "plug-and-play" solution that makes installation and servicing simple for the installer, its unique design and flexibility making it suitable for domestic, civil and irrigation applications. As with all Calpeda pumps, it is equipped with programmable software that offers intelligent control and is part of the same common interface platform across all e-idos and Calpeda products. In addition to energy saving, this capability also makes for significant water savings.

"Our company motto worldwide is 'Water Passion'," says Fay, "and we <https://arrow.tudublin.ie/bsn/vol59/iss5/1>

are committed to study, to develop and to manufacture pumps and pumping systems that are sustainable, energy efficient and save water. This goal is the continuing legacy of our founder, Vinicio Mettifo, and what inspired him when he started out pioneering pump design and pump technology many years ago.

"Today, our ability in Calpeda Ireland to create engineering-led solutions comes from a unique mix of innovative pumps that are complemented by a team of in-house specialists offering design advice and technical support. These in-house strengths are further reinforced as we have full access to the vast resources and R&D facilities at our parent, Calpeda SPA."

This pioneering spirit has also inspired innovation at local level, and led to the development of the Calpeda Aquarius tank system. This unique pump and water storage solution was devised by Calpeda Pumps (Ireland) and is manufactured at its premises in Blanchardstown, Dublin 15. Aquarius, carrying the prestigious Guaranteed Irish symbol

of accreditation, is designed to meet the demand for a self-contained, integrated pump and water storage solution and is suitable for applications such as houses, apartments, retail, commercial, hospitality, nursing homes, sports clubs and gyms.

Reflecting this versatility, there are multiple tank size options in capacities ranging from 100lt to 2000lt, and any number of different pump sizes with pressures up to 12 Bar and flow of 183 litres/minute. Tanks can be interconnected for larger storage capacities.

All Calpeda Aquarius tanks come with secure access lid and screened vent, and dry-run protection built in. The pumps use jacketed motor technology in order to prevent heat transfer to the stored liquid, while pressure control options are possible via the patented Calpeda IDROMAT and EASYMAT variable speed controls.

Contact: Calpeda Pumps Ireland;  
Tel: 01 – 861 2200;  
email: [info@calpedaireland.com](mailto:info@calpedaireland.com);  
[www.ie.calpeda.com](http://www.ie.calpeda.com) ■

# CIBSE Ireland Region ... ... just a click away

CIBSE Ireland's interactive website gives a comprehensive overview of the Institution's aims, objectives, officers and committee members, along with details of its extensive CPD programme and technical evenings. It also includes regular news updates, and reports on inter-association activity, industry awards, participation in Government consultation bodies, and other promotional activity on behalf of the building services industry.



CIBSE Ireland is the leading organisation for information, guidance and advice on all building services related matters. Membership brings many benefits, including access to the full suite of CIBSE publications available online via the knowledge portal. For more information on how to become a member, or to progress to a higher grade of membership, log on now.

www.cibseireland.org

# Xylem's GHVR variable speed booster set

Commercial operations of all types, including hospitals and care homes, offices and hotels, need confidence in their critical systems, and especially their water management. Resilience, reliability and sustainability are the keys to ensuring pumping equipment operates 24-hours a day, seven days a week, with minimal outages and maximum energy efficiency.

To address this challenge, Xylem recently introduced the new GHVR variable speed booster sets with Hydrovar inverters. The reduced space design and unique manifold layout comprises up to eight vertical multi-stage pumps featuring e-SV's hydraulics with a high efficiency (IE3) motor for maximum efficiency. For projects with limited space, this offers a great deal of benefits.

Equipment failure is a perpetual worry in commercial buildings, where



The new GHVR variable speed booster set available from Xylem.

the cost of outages can quickly spiral out of control. GHVR set motors are rated to IP55 as standard, offering high levels of protection against water and dust. They can also be modified to include added protection, such as anti-condensation heaters.

The system also features Hydrover, Xylem's intelligent pump controller. This uses a multi-master system that ensures the set does not stop working when a single drive fails.

Downtime is further reduced by the set's innovative design. The mechanical

seal can be removed without having to take out the motor, reducing repair time by up to 50%. The system uses a standard DIN mechanical seal, wearing components, service tools and IEC motors. These features allow for easier, faster maintenance and servicing.

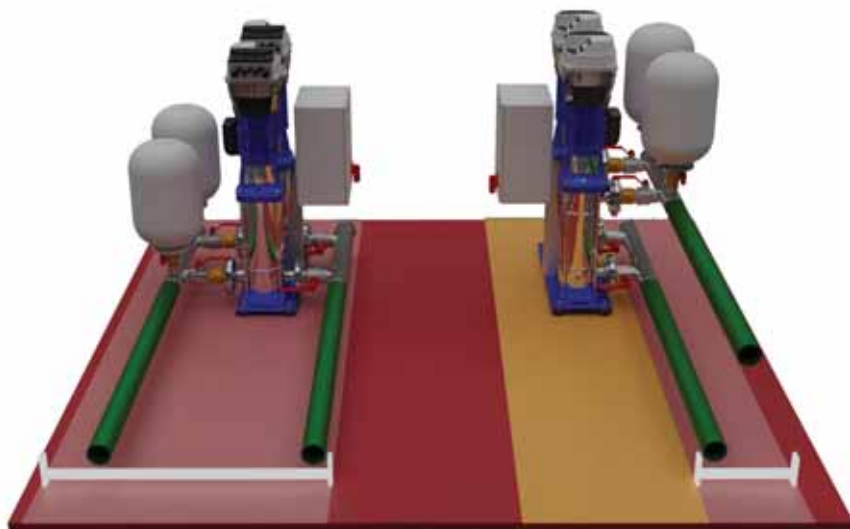
Crucially, being manufactured at Xylem's UK Centre of Excellence (CoE) in Axminster, the GHVR booster set comes with the full support of a team of experts with decades of experience in understanding organisations' specific requirements. The CoE means Xylem can slash order turn-around times from two weeks to just one or two days. This can prove invaluable in emergency situations, and provides a one-stop shop for collaboration, consultation, assembly and support.

Energy efficiency is another key consideration. Water pumping equipment is operational all day, every day, making it one of the most power-hungry applications in a commercial operation ... and low-hanging fruit when it comes to cutting energy consumption.

Thanks to its Hydrovar variable speed drive, which matches performance to demand, and a Lowara PLM IE3 motor, the GHVR booster set has the highest possible rating of both frequency converter (IE2) and Power Drive System (IES2), as featured in the EN 50598-2 European Standard for Energy Efficiency.

Ultimately, the booster set's energy efficient, resilient and easy to maintain design, backed up by local CoE support, means owners of commercial operations are assured that their pumping operations are also future-proofed.

Contact: Kevin Devine, General Sales Manager, Xylem Water Solutions Ireland. Tel: 01 – 452 4444; Mobile: 087 – 7577411; email: kevin.devine@xylem-inc.com



Maximising floorspace – this illustrates the evolution of the space-saving booster pipework footprint from that on the left to the new unit on the right.  
<https://arrow.tudublin.ie/bsn/vol59/iss5/1>



# RADIATORS ... take a closer look at the choices

**Radiators can offer a new and exciting range of options for homeowners, and installers need to be aware of the opportunities these new options bring to them, says Chris Harvey, Head of Marketing, Stelrad Radiators.**

**No longer just** a heating appliance, a radiator can be an important part of the décor, and the ability to mix and match radiators around the home means installers can recommend feature radiators in the main living room, the kitchen and the bathroom – along with the master bedroom and the *en suite* – while perhaps utilising less-exciting options in the other rooms in the home.

In today's market there is a radiator for virtually every application, be it a new-build home, a refurbishment project, a bespoke application or commercial development projects. They all require something special to meet the specific application.

The old approach to specifying radiators is changing, perhaps influenced by the many house refurbishment and house purchase programmes being screened on TV. Never before have people been able to see inside so many other people's homes. Not surprisingly, they see things they like and are influenced to mimic the designs and upgrade their own heating systems accordingly. For many, the standard panel radiator is no longer quite enough.

Installers can benefit from this trend by offering a wider choice to their customers, giving them the option to "up spec" to designer or



Concord living room installation.



Stelrad Compact Vertex vertical radiator.

decorative radiators. For example, the love affair with the vertical radiator is well underway with many being a virtual extension of the towel warming radiators that most homes have in their bathrooms. Now people also want these radiators in the kitchen, in the entrance hallway,



Stelrad Vertical Ultra kitchen installation.

in the main living room, in corridors and on landings. Their smaller horizontal footprint makes them easy to slot into spaces where a traditional horizontal radiator simply won't fit.

Increasingly, radiators are quite literally becoming a focal point of a room – even more so now that coloured radiators are growing in popularity, allowing interior designers, architects and more design-savvy homeowners to select radiators that match or contrast with the other décor in a room.

Most of the Stelrad models are available in up to 36 different colours with a short waiting time, while the most popular coloured radiators are available from stock. In fact, Stelrad has widened its selection of in-stock coloured radiators in the past few months to facilitate this changing market trend.

System designers, engineers and installers can capitalise on this trend by logging on to the new Stelrad website at [www.stelrad.ie](http://www.stelrad.ie) where a huge range of styles and options are featured.

For brochures call 0044 - 844 543 6200 or email [marketing@stelrad.com](mailto:marketing@stelrad.com). There are also regular updates from Stelrad on Twitter@Stelrad and Facebook@StelradRadiators ■

# CIBSE Ireland Committee 2020/2021

CIBSE promotes the career of building services engineers by accrediting courses of study in higher education. It also approves work-based training programmes and provides routes to full professional registration and membership, including Chartered Engineer, Incorporated Engineer and Engineering Technician. Once you are qualified, CIBSE offers you a range of services, all focused on maintaining and enhancing professional excellence throughout your career. CIBSE members in Ireland are represented by an active Regional Committee, which is involved in organising CPD events, technical evenings, training courses, social events, awards, etc.



## Get Involved with CIBSE Ireland

- Visit our website [www.cibseireland.org](http://www.cibseireland.org)
- Join our LinkedIn Group ... CIBSE Ireland
- Join the committee
- Contact: [CIBSEIrelandContact@gmail.com](mailto:CIBSEIrelandContact@gmail.com)

# IT COOLING SOLUTIONS from Mitsubishi Electric

"We are all becoming more and more reliant on technology," says *Fergus Daly, Area Sales Manager, Mitsubishi Electric*, "with most businesses dependent on their IT systems to provide the data they need, 24/7, year after year. Even the shortest outages can cause significant disruption and loss of revenue. That is why it is vital that these IT servers and equipment are housed in optimal conditions, with effective cooling being paramount."

**"The new range** of DX computer room air conditioning (CRAC) systems from Mitsubishi Electric was designed to do just that. It combines the latest in DX technology with the RC brand's expertise in IT cooling. Mitsubishi Electric purchased the RC Group in 2015, enhancing our product line-up and marking our full-scale entry into the IT cooling market.

RC is a strong European brand supported by 50 years of customer trust and high-quality production, and its range of energy-saving, low-noise and innovative IT cooling technology further expands our



Most businesses are dependent on their IT systems to provide the data they need, 24/7, year after year.

Published by ARROW@TU Dublin, 2020

application and customisation capabilities," says Daly.

These new innovative and energy-efficient computer room air conditioning solutions from Mitsubishi Electric offer a range of high sensible systems that deliver robust solutions to IT environments with ease. They are specifically designed to provide close control of temperature and humidity, and are perfectly suited for small to medium sized enterprise data centres.

## Key features

- DX or chilled water versions;
- Precise temperature and humidity control;
- High sensible cooling;
- Easily integrates into existing/new control networks;
- Back-up and rotate functions;
- Inverter-driven capacity control;
- New generation EC PUL (Polymeric Ultralight);
- High efficiency fans;
- Free cooling;
- Dual fluid circuits available.

A typical example from the new range is the s-MEXT-G00 DX R32 close control system. This split cooling package consists of the indoor s-MEXT high precision air conditioner connected to a Mr Slim R32 power inverter outdoor unit. The result is a full inverter split system,



The s-MEXT-G00 DX R32 close control system from Mitsubishi Electric.

designed according to the best quality standards and dedicated to the most reliable IT environments.

## s-MEXT benefits

- High Efficiency: full Mitsubishi Electric inverter technology and EC plug fans;
- Small footprint;
- Pipe runs up to 100m;
- Trusted Mr Slim power inverter technology;
- Available in upflow (over) and downflow (under) variants.

"At Mitsubishi Electric, we offer advanced technology that really can make a world of difference," concludes Daly.

Contact: Fergus Daly, Area Sales Manager, Mitsubishi Electric.

Tel: 01 – 419 8800;

email: [fergus.daly@meir.mee.com](mailto:fergus.daly@meir.mee.com) ■



# New building contract available for Private Sector Contracts

“

*This contract aims to achieve a fair and balanced allocation of risk between the employer and the contractor.*

**B**etter allocation and management of risk and improved transparency around project cost are some of the benefits of a new form of contract now available for use by Ireland's construction industry. Called *Private Sector Contract (PSC) for Building and Engineering Works designed by the Employer*, this new contract and its associated *Form of Agreement and Schedule* were jointly published recently by the Construction Industry Federation (CIF), Engineers Ireland (EI) and the Society of Chartered Surveyors Ireland (SCSI). The new contract is suitable for all medium to large-scale building or civil engineering works where the design of the project has been provided by the employer, i.e. the client.

The new *Conditions of Contract* have been drafted with the objective of achieving a fair and balanced allocation of risk between the parties in order to promote long-term sustainable efficiency. Specifically, risk has generally been allocated to the party best able to bear and manage it.

Chair of the project's Standing Committee Ciarán Fahy, said: "Successful building projects are those which are delivered safely to the required quality standards, on time and within budget. Choosing an appropriate contract is an important part of this process. It is our collective view that this new form of contract will provide greater clarity around all stages of the process, help reduce time at the negotiation stage and provide a sound base for a project's success."

Tom Parlon, Director General of the CIF, said: "We have published this contract collectively to ensure that a more accessible form of contract is available for users who are working on medium to large construction contracts in the private sector, and where the employer has the responsibility for



Maurice Buckley, Chairman, Engineers Ireland.

the design. This contract is aimed specifically at achieving a fair and balanced allocation of risk between the employer and the contractor."

Maurice Buckley, President of EI, said: "Engineers Ireland has a long history of publishing conditions of contract going back to 1959 and we are pleased to have collaborated with the CIF and SCSI to publish this new contract. It should be particularly useful for medium to large-scale construction projects where the employer wishes to retain design responsibility.

Micheál Mahon, President of SCSI, said: "We know a significant amount of resources are expended on the use of project-specific contracts in the private sector. This new and adaptable standard contract should improve efficiencies and reduce unnecessary administrative costs. It should also increase productivity and reduce costs in the construction sector in general.

This *Conditions of Contract*, together with ancillary and related documents, is available free of charge, in electronic form only, from the three sponsoring organisations. As a template it uses the Government's Public Works Form of Contract (PWC), with amendments, though the structure and format has been retained to allow for ease of use. ■



## Grundfos GO Install – the mobile toolbox for professionals

**Winter is coming**, and that means it's time for homes to get ready for the cold weather. While many factors contribute to keeping a home warm, an efficient and balanced heating system is at the top of the list.

Holding true to its history of innovation, Grundfos developed a range of digital tools designed to help installers fit and balance a heating system efficiently and effectively.

### Grundfos GO Install App

Grundfos GO Install is the mobile toolbox for professional users on the go and is the most comprehensive platform for pump selection, sizing, replacement and documentation.

The app offers intuitive, hand-held

assistance and access to Grundfos online tools, and it saves valuable time for reporting and data collection.



Hydronic balancing is easy with the ALPHA2 circulator pump and the GO Balance app.

Above: Grundfos GO Install is the most comprehensive platform for pump selection, sizing, replacement and documentation.

In one app, installers can calculate the necessary radiator capacity, find the right pump and troubleshoot any issues that are in the system.

### Grundfos GO Balance App

Gone are the days where an installer had to use trial and error to balance the system. The Grundfos GO Balance app guides installers through hydronic balancing for underfloor heating, radiators, or both. The app connects to an ALPHA or UPM circulator pump either directly via Bluetooth or through the GO Balance Remote, depending on the model.

Once connected to the pump, the performance of the system is displayed in the GO Balance app and changes to the flow can be seen in real time. This makes it easier and faster than ever to balance a heating system, while ensuring optimal results.

Contact: Grundfos (Ireland) Sales Department. Tel: 01 - 408 9800; email: [salesireland@grundfos.com](mailto:salesireland@grundfos.com) web: [www.grundfos.ie](http://www.grundfos.ie)



## PROJECT PROFILE



## No Secret to Tech Refrigeration and Panasonic partnership

Five floors of Panasonic heating and cooling equipment has been installed at retail giant Victoria's Secret Grafton Street premises by Tech Refrigeration & Air Conditioning. The Panasonic ECO-G high power GHP solution was chosen because of its overall energy efficiency and, in particular, given the limited power supply to the site.

**M**echanical contractor William Coates chose Tech Refrigeration & Air Conditioning for the project because of their in-depth knowledge of the ECO-G high power GHP system, and the engineering strength of its personnel. Tech has a proven track record in delivering the smooth <https://arrow.tudublin.ie/bsn/vol59/iss5/1>

installation of such projects, on time and within budget, despite the challenge of busy retail environments. Indeed, such was the success of the project that Tech won a European-

wide Panasonic PRO Award for Best Retail Project.

The eight Panasonic ECO-G GHP units were integrated on every floor alongside ducted indoor units,



Given the site's limited power supply, the ECO-G GHP was the perfect solution as it runs on natural gas or LPG, and requires only a single-phase supply.



cassettes and a Building Management System (BMS) interface incorporating remote monitoring and smart maintenance. Paul Byrne, Sales Director for Tech Refrigeration & Air Conditioning, described the project: "When approached, we knew the installation was not straightforward. With very little power available to the site, and five floors of air conditioning required, most installers wouldn't go near such a project. Here at Tech we are always excited by, and rise to, such a challenge. We instantly knew the Panasonic ECO-G GHP system was the perfect solution. Using Panasonic's GHP units low power mode was the only way we could successfully provide HVAC for all five floors with limited power supply."

Each floor within the building has a combination of retail and office space with the site's limited power supply down to its location in the busiest retail high street in the centre of Dublin. Panasonic has innovative solutions specifically for buildings with restricted power, hence the Panasonic VRF GHP solution was specified for this project. The positioning and landing of the outdoor units was challenging due to the site location and therefore careful planning and execution of the crane lift was key.

Vincent Mahony, National Manager for Panasonic Ireland commented: "If you are short of electric power, the ECO-G GHP is a perfect solution as it runs on natural gas or LPG, and requires only a single-phase supply. This frees up the building's power supply for other critical electrical demands such as IT servers, lighting, etc during peak times. The electrical consumption of the Panasonic ECO-G is only 9% compared to the standard ECOi because the gas engine is utilised for the compressor driving source.

Other advantages of the GHP unit include no defrost requirement, plus 100% heat output to -20°C ambient. These were also important factors in the final decision-making process."



**The Panasonic floor-standing unit on the right blends seamlessly with the interior décor in Victoria's Secrets..**

The Panasonic ECO-G system can be kept in operation even during maintenance. The manual back-up operating function keeps producing air conditioning, even when the unit is being worked on, making maintenance possible during opening hours. This is a very important feature for Victoria's Secret as it protects the store from losing revenue.

The Victoria's Secret project wasn't short of other challenges. The BMS set-up was completed on site but the BMS controls company operated off-site, based in the UK. This could have made the set-up of the interface extremely difficult but Tech engineers

worked closely with the Panasonic team to overcome this issue.

The construction programme was very tight, being a superstore with structured deadlines, the installation needed to be completed quickly and efficiently in a short space of time. In addition to the tight install timeline, the positioning of units also proved tricky because of the site location. The versatility of the ECO-G didn't disappoint, allowing for an easy and successful installation.

On completion the entire system was fully commissioned with the GHP systems being interfaced with the client's BMS system in the UK, using Panasonic's Smart Connectivity and Victoria Secret's BMS interface.

Paul Byrne concluded: "Out of all the projects that I have personally completed, this is my proudest. I took the project from start to finish and delivered what I believe to be an outstanding installation containing all elements of VRF, ECO-G and PACi. The construction programme was very tight, the positioning of units difficult, and the interface of the BMS was very tricky. That we delivered successfully on this project is self-evident, especially given the energy-efficient, low carbon footprint and cost-effective performance of the system from when it was installed." ■



**Impressive exterior of Victoria's Secret flagship building on Dublin's Grafton St.**

## Design aspiration and reality

# Why aren't we closing the gap?



**Why are buildings typically consuming two to five times more energy than at design stage? Why is the industry letting this happen? James Duggan, Senior Sustainability Engineer, Lawler Sustainability, probes for the answers.**

**S**ince its foundation in 2016, Noel Lawler Green Energy Solutions – now Lawler Sustainability, see page 2, this issue – has been helping clients to improve the energy performance of their property portfolios. These efforts are being hampered by the following key issues:

- Design-for-compliance culture, i.e. energy performance is theoretical and not measured;
- An operational performance that is invisible to the market, most especially investors and occupiers;
- Actual energy performance is not easily acquired and can prove challenging to define;
- Oversimplified mandatory rating systems such as Display Energy Certificates (DECs).

The 2019 Climate Action plan fails to commit to resolving these issues. However, there is a lot that policy makers could learn from international voluntary schemes such as LEED (Leadership in Energy and Environmental Design) and, more

recently, Design for Performance in UK Offices. These schemes give us the pathway to transform buildings into high-performing assets.

Today, the efficiency of building operations increasingly impacts private and public organisations. When their energy costs go up, their ability to fund workforce development and innovation goes

down. By supporting businesses to reduce energy consumption, optimising energy supplies and managing on-site production and storage, it will help the whole organisation to perform better.

There is significant untapped potential by incorporating detailed energy modelling to help yield further energy, carbon and cost savings. Also known as a digital twin, this has significant value to the user and client by enabling building energy targets to be measured against actual usage, ultimately tracking the “performance gap”. By tracking targets versus actual usage we can use this information to drive improvements. Supplemented with cost-effective commissioning



**Right:** The Australian NABERS energy performance method has proved that “what gets measured gets managed”.  
<https://arrow.tudublin.ie/bsn/vol59/iss5/1>





Dublin City Council's Sports & Fitness Centre in Ballymun, Dublin where the performance gap has been successfully closed.

and fine tuning, this becomes a robust approach which helps ensure that buildings deliver on their design intent.

A successful approach to an energy performance guarantee is currently making its way from Australia to the UK and Ireland. It takes the form of an upfront bond provided by the contractor to the client and withheld until the intended energy performance is achieved. This is typically expected to be after 12 months of occupancy. This encourages an “energy in use” approach rather than predicted energy and has been found to be a much more effective way of delivering actual performance.

The energy performance method used in Australia is National Australian Built Environment Rating System (NABERS) and has been a success since its introduction in 2010. This method has proven that “what gets measured gets managed” and has reduced energy consumption on average by 30% to 40% since its introduction 10 years ago.

In addition to saving energy, the NABERS method has stimulated market demand, facilitated progressive policy development,

and ultimately delivered better buildings for the occupants and investors.

I was fortunate to have experience of this approach while working for Brisbane-based commissioning and consultancy engineering firms during my four years of working in Australia. It was a great experience to be the pivotal link between detailed energy modelling, system selection/sizing, commissioning, fine tuning and energy monitoring. This is the normal approach in all Australian buildings and I believe this is something Ireland and the UK needs to improve on.

An initiative to close the performance gap of dwellings is arriving in the form of Smart Readiness which will integrate the Internet of Things (IoT) control, tariff monitoring and usage management within a property. This opens a huge amount of opportunities by enabling the measurement and reporting of usage patterns and spikes to help minimise consumption, while also having capabilities to optimise community energy consumption. The viability of renewables, district heating, demand response measures, car charging etc will take a holistic approach to relieve the increasing

pressure on utility infrastructure while “greening” the grid.

On an international scale we are seeing funders requiring assurances in terms of investment assets from developers to ensure that ethical and sustainable developments are procured. Referred to as corporate Environmental Social & Governance (ESG) or Corporate Social Responsibility (CSR), this additional requirement increases the significance of building performance and rating a building to give the asset some additional security for investors. This will become increasingly more important in the future.

The utilisation of these various efforts to close the performance gap will take time and significant collaboration across many industries. At Lawler Sustainability we are optimistic that increased ethical and sustainability awareness, along with the positive impact on asset values, will drive down building energy consumption and close the gap. ■



James Duggan is a Senior Sustainability Engineer with Lawler Sustainability. His work focuses on optimising building fabric, MEP systems and renewables for all types of buildings. His particular interest lies in assessing the gap between the estimated and actual energy consumption of buildings.



## LIGHTING

# SEAI's role in monitoring energy efficient lighting

## Lighting the way for ecodesign compliance

The transformation of lighting since the introduction of LED technology is bringing significant benefits, particularly for energy efficiency and lighting design. However, some of these benefits can be lost if products are sub-standard, *writes Tim Stokes, Programme Manager, Market Surveillance, SEAI.*

**All lighting sold** in Ireland must meet standards set out in EU regulations relating to ecodesign and energy labelling. These are in place to ensure that the products concerned meet minimum levels of energy efficiency and certain other parameters which impact the environment. They must also provide clear and accurate information in that regard. The EU Ecodesign Directive and EU Energy Labelling Regulations are important policy tools contributing over 40% of the total energy savings required to meet 2020 EU energy efficiency targets.

### How are products monitored?

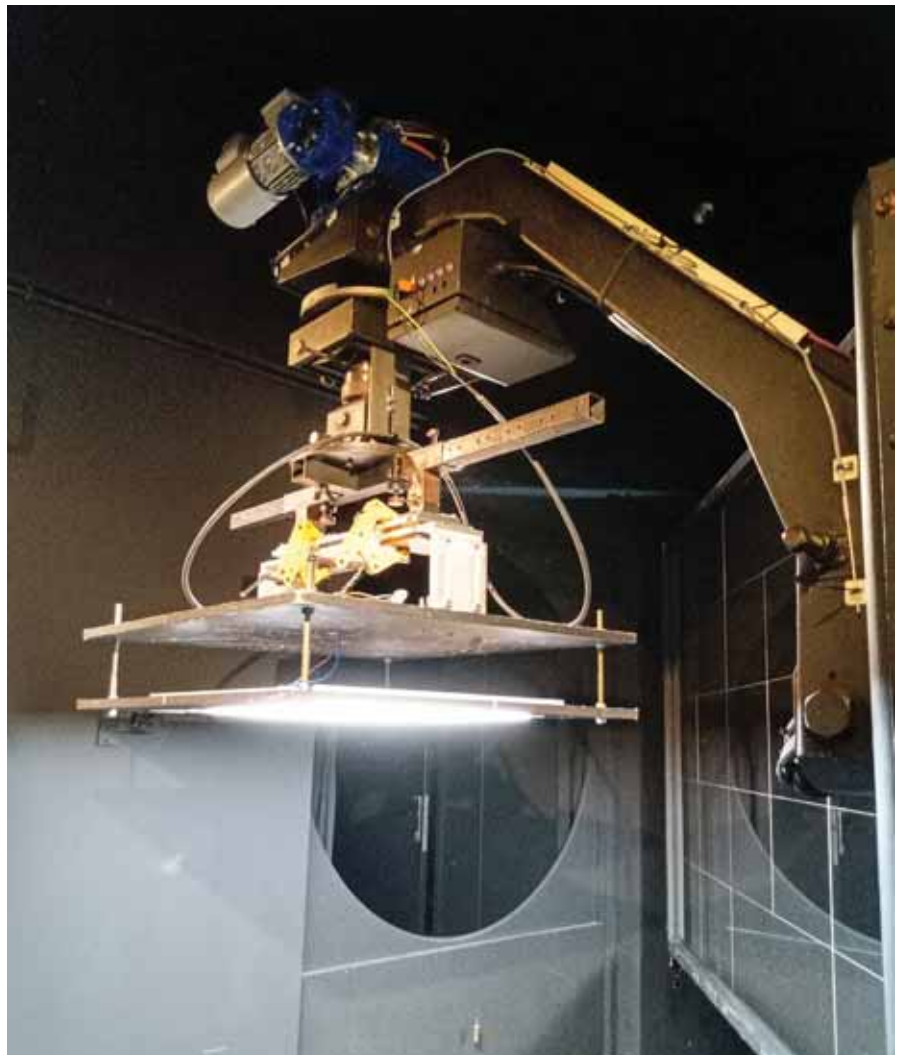
The success of these regulations is dependent in part on compliance. The EU standards system relies on a European network of market surveillance organisations to identify and address non-compliance through engaging with the companies concerned, and ensuring that products are removed from the market if non-compliance cannot be resolved. Non-compliant products can be harmful to consumers and the environment, in particular by using more energy than is allowed under the regulations or claimed by manufacturers. They might also cause

problems for specifiers and installers who have designed and installed a product appropriately, only to have the customer dissatisfied with the performance of the product. Dependent on the type of product, the regulations also cover a wide range of other performance characteristics, including NOx and particulate matter emissions.

SEAI organises market surveillance of these regulations on behalf of the Minister

for Communications Climate Action and Environment in his capacity as Market Surveillance Authority (MSA). SEAI was given this responsibility in 2016 and the Government is aiming to transfer the MSA designation to SEAI in the near future.

Market surveillance involves checking products to see whether they comply with the relevant regulations. It involves market screening, technical documentation checks and laboratory testing. In addition, a



Specially-developed and very sophisticated equipment is used to carry out all testing.

considerable amount of effort goes into promoting compliance by providing or signposting companies to guidance on how to comply with the regulations. SEAI also seeks to work closely with trade associations and other stakeholders to identify and address concerns relating to compliance.

SEAI has been building up its market surveillance service over the past few years and has considerably expanded the range and volume of products that it checks. Current areas of focus include commercial lighting, heating, water pumps, electric motors, and a range of domestic products.

When products are initially found to be non-compliant, SEAI first seeks to engage constructively with the manufacturer to bring the product into compliance. If compliance is not possible, the product must be removed from the EU market. The MSA has enforcement powers to support this work and companies can be prosecuted in relation to serious offences against the regulations leading to fines of up to €250,000.

Awareness of this work is improving product compliance. Through publicising our work, manufacturers and importers will know that we are undertaking regular and sometimes detailed checks of products on the market. This will encourage them to undertake adequate checks to ensure that the products they sell in Ireland are compliant with the relevant regulation.

### Lighting market surveillance

SEAI started its lighting market surveillance work in 2017. Following discussions with Lighting Association Ireland (LAI) and other stakeholders, it initially focussed its work on GU10 LED lamps (as in the technical term for lightbulbs). SEAI checked the technical documentation of around 200 different products and a further 60 lamps on sale in high street shops using a mobile lamp screening device. From this screening 12 lamps, thought to have the highest



**Testing facilities at Laborelec in Belgium where the LED luminaire panels are currently being tested.**

risk of non-compliance, were then sent for laboratory testing.

Eight of the lamps were found to be non-compliant once tested, while three of them had multiple non-compliances across the range of parameters tested. Two of these were voluntarily removed from the market by the manufacturers without the need for enforcement by the MSA, and the other was already no longer on sale.

Because we use a risk-based approach to identify products to be tested and only test those we feel most likely to be non-compliant, the results of testing should not be taken as an indication of the market as a whole. However, we have encountered quite a high level of non-compliance relating to GU10 LED lamps, particularly with regard to supplying correct product information. We are working with the manufacturers

and importers concerned to address this and to help prevent future non-compliance.

SEAI is continuing to investigate GU10 LED lamps and has also embarked on a new campaign relating to commercial LED luminaire panels, typically installed in offices. The technical documentation of 20 products has been checked and testing is ongoing at the Laborelec Laboratory in Belgium. So far all panels tested have passed. SEAI is also checking that halogen lamps on sale have not been placed on the market since a ban came into effect in September 2018. These can still be legally sold if placed on the market before that date.

### Change to legislation

A significant change to the legislative regime comes into effect next year with the introduction of the Single Lighting Regulation. As the name suggests, this brings together a number of different lighting regulations and introduces updated performance requirements. When new legislation comes into force there is generally a higher risk of non-compliance. *Building Services Engineering* will continue to monitor developments on this matter and liaise with SEAI for any further updates. ■

## Reporting non-compliant products

Anyone with concerns about a product covered by the Regulations – for example, seemingly exaggerated claims relating to energy efficiency – can report these on SEAI's website. All information received is treated in the strictest confidence and SEAI will investigate all reports of non-compliance when accompanied by evidence.



If we were to talk about glare, I bet a large number of lighting people would mention UGR, and in particular a UGR 19 fitting, writes *Iain Macrae*.

# GLARE

... the great misunderstood law of lighting design

**Fundamentally, there is** not much wrong with that ... except for misunderstanding glare. It is not about UGR and it certainly cannot be claimed that you have a UGR 19 compliant luminaire, well legally anyway.

So back to the start. Remember the old days of fluorescent luminaires, T8 or even T12 lamps? Three or four lamps per fitting with an opalised drop dish diffuser or flat panel below? If you do, you will remember the glare they caused. Large lamps, bright diffusers, ceilings full of them to get enough light onto typewriters and drawing boards. Glare was a real issue, leading to strained eyes and headaches.

Move on a decade and we develop the louvre, using state-of-the-art, 99.9% pure aluminium and stick one over on glare by hiding the direct view of the lamp and directing light where it needed to go. At the same time, we saw increases in efficacy and



LED flat panel UGR<19.



fewer fittings in the ceiling. Glare understandably dropped.

Add now the modern (for the 1990s) cathode ray tube PC screen and we find reflected glare in these screens becomes the issue. Lighting manufacturers jumped at the challenge and dark light Category 1,2 and 3 louvres were born.

These new louvres caused a problem.

The glare metric of the time suddenly gave out negative values. Louvres appeared to be sucking up glare.

If you worked under them, you may have felt the same. Certainly, no glare, no light on the walls or ceiling either, but now glare had been solved.





The louvre was a major advancement for the time and “stuck one over” on glare by hiding the direct view of the lamp and directing light where it needed to go.

To avoid confusion, we rewrote our glare metrics and UGR had a new formula. Negative glare was a thing of the past and we introduced the historic “four just men” – just perceptible, just acceptable, just uncomfortable and just intolerable. Glare had names and, if you looked, numbers (10, 16, 22, 28). *“in a sense, the UGR system represents a triumph of mathematical manipulation over human perception” – Peter Boyce, Human Factors in Lighting, 20.3.*

We allocated these against applications. After all, UGR was an application measure and all was peaceful while fluorescent lamps went from T12 to T8 and lastly T5. In fact, we had it so well controlled, the UGR metric was almost forgotten.

Where did it all go wrong? LED of course. The saviour in our race to reduce energy has brought back glare. LED is inherently bright. To be technical, it can have a centre line luminous intensity greater than 10,000 candelas, all that in a matter of a few square millimetres. Not something you want to look at. Experts suggest anything above 2500cd/m<sup>2</sup> is a problem, though it depends on the ambient and the

observer’s adaptation at the time. That, along with the drive for fewer LED (costly things at the time) and therefore higher light output per LED designs lead us to now. A time of glary fittings or, if you believe the manufacturers, a time of UGR 19 luminaires.

For a start. UGR is a metric only defined in application. You need the room, the surface finishes, the luminaire and its layout. Without

those things you cannot work out UGR. As an expert you should believe me, but recently experts have become a little disbelieved. If you chose not to believe me, look to Frankfurt Higher Regional Court in the matter of XAL versus Planlicht, 2016,

*“Only luminaires that actually have a UGR value (Unified Glare Rating) of less than 19 may be advertised as such. If other luminaires in the same family do not meet this criterion, they may not be advertised as such.”*

Now, given that UGR can only be calculated if you know the background luminance, then you must know of the room before you can confirm UGR. Here’s the equation:

$$UGR = 8 \log_{10} \left( \frac{0.25}{L_b} \right) \sum (L_s^2 \cdot p^2)$$

That bit on the bottom  $L_b$  is the luminance of the background. To get that you need to know the number, lighting power, placement and distribution of the luminaires, and the qualities of the room and its surfaces.

So, how can it be that a manufacturer can sell a UGR 19 luminaire? Assuming they test the luminaire in spaces of all sizes (rectangular only, but we’ll come



Glare is a real issue, leading to strained eyes and headaches.

to that) and with all possible reflectance variables, then it could be true that in all applications the luminaire is indeed UGR 19 or less.

**UGR<19** ✓

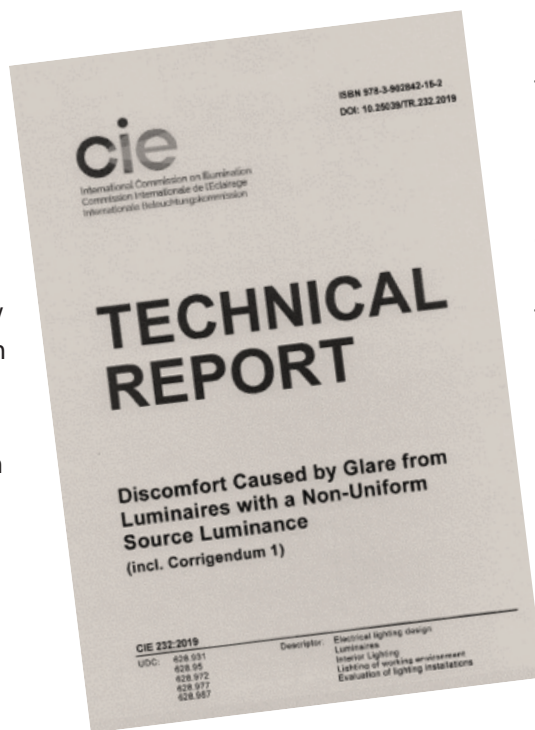
Truth is they don't test all of the possibilities. Maybe they test only those typical of offices? Maybe only reflectance of 70%/50%/20%. Given the number of dangerous fittings found in recent market standards checks, I would bet a few don't even work out anything. Marketing, not necessarily lies, but as good as statistics, if you know the phrase.

Let us pause for a moment and assume you have ignored the manufacturers' claims. You have done the right thing, downloaded validated photometry and used software to calculate UGR in your application. You have the numbers and the scheme is UGR compliant. The client, however, has complained of glare.

Whoa, hold on, how can that be if it meets the standards? Well, UGR is not built on solid ground. For one thing the formula assumes a regular array or uniformly-lit luminaires in a rectangular room. All these things are possible, but you might have an L-shaped room, or a regular array combined with some spotlights or some other variation. Both could affect glare, and the spotlights certainly do.

What about the uniformly lit luminaire? Herein lies a problem. UGR starts diverting from user experience. Research by many across the lighting world has identified that luminaires, where you can see significant differences in luminance across the surface, exhibit higher glare than those with uniform light. If you can see the LED light sources and the spacing of each is just right, you can get pattern effects combined with intensity variation and this leads to even greater glare experience.

<https://arrow.tudublin.ie/bsn/vol59/iss5/1>



The Commission Internationale de l'Eclairage (International Commissions on Illumination – CIE) has been working on this (CIE 232, 2019) and has identified key cases where UGR needs adaptation to be closer to users' experience of glare. For each they suggest amendments to the UGR metric, the main reasons being:

- Non-uniformity of optic, especially when in the centre of view;
- Use of fewer, higher luminance LED for a given luminous flux (lumens);
- LED pitch and patternation approaching 0.14 degrees;
- Background luminance is low (perhaps not a surprise).

There is also some discussion over photometric methods with moves to use high pixel density HDR cameras to image the luminaire rather than conventional photometers. This HDR/ high pixel imaging reveals true intensity. If you know photometry, it is based on measurement via sensors, one sensor seeing the whole luminaire from a suitable distance to call the luminaire a point source. The result is that most photometry you work with is really a form of average measure and hence point two above is disguised

by the way we measure, but not by the way our eyes see.

So, should you use UGR? Well, it is a flawed metric. Add it to the list including Colour Rendering Index, efficacy (lm/W) and the lumen method for discussion at another time perhaps.

However, UGR does give an indication of whether users will experience glare. Given that the "four just men" are number-based on a limited number of subjects, completed many decades ago, you could also argue the targets may be a little skewed too. A flawed measure and target is better than none. Remove it from your application specification and there is nothing to stop glare.

While you are writing it into the next specification, take a moment to question the sales representative or product marketing team. Ask them how a fitting can be UGR compliant when UGR is an application metric. Take a note of the answer and let me know. I think I have heard them all, but there is always a new explanation waiting to be discovered. ■

#### • **Iain Macrae CEng FSLL MCIBSE**

Iain Macrae graduated in mechanical engineering and somehow found his way into lighting. Over 30 years he has worked in manufacturing, design, marketing, application and technical teams, including a wide range of projects across the world. Iain is a Chartered Engineer, consultant and founded the training company Light Unwrapped, delivering blended learning as a recognised expert. He always advises those around him ... "there is no such thing as a stupid question". He is past President of the Society of Light & Lighting and Chair of SLL Lighting Guide 5, Lighting for Education. He also works on British and European standards panels. Iain specifies and designs lighting solutions, as well as working on business and product strategy, and product development for new and existing clients. He is a globally experienced speaker and mentor within the lighting industry.





Peter Boyce



Kit Cuttle



Kevin Kelly



Peter Raynham

# The Ambient Lighting Manifesto

The following article by four lighting industry experts calls for a paradigm shift in lighting practice so that priority is given to lighting the space rather than focusing on visual tasks.



LIGHTING

# A paradigm shift in lighting practice

By Peter Boyce, Kit Cuttle, Kevin Kelly and Peter Raynham

**P**rogress in society, science and technology often depends on a paradigm shift ... think Germaine Greer, Albert Einstein and Tim Berners-Lee. We believe interior lighting, as generally practiced, is ripe for a paradigm shift.

We believe the paradigm shift required is to stop designing lighting to deliver a specified uniform illuminance on a horizontal working plane, and to start giving priority to lighting the space rather than just focusing on the visual tasks.

There are four reasons for this belief. They are:

1. The way information is delivered has changed. Today, a lot of the information necessary for task performance is delivered through self-luminous screens. Unlike paper-based tasks, information on screen does not require task illumination for it to be visible. This means much lighting is being designed to fulfill needs that no longer exist;
2. The number of tasks that require visibility of fine detail is much reduced. This has occurred partly through the wider availability of good-quality photocopying and printing, and partly through the growth in machine vision, computer power and robotics. Again, this means much lighting is designed to fulfill needs that no longer exist;
3. Light is now recognised as generating both visual and non-visual responses, both of which are important for human health and wellbeing. This

recognition is directing attention away from lighting the task to the light received at the eye. This means lighting designed to deliver a set illuminance on a hypothetical horizontal working plane is largely irrelevant to what should be the main functions of lighting, making the whole space visible and supporting human health;

4. Continuing to define good lighting by nominal task illuminance delivered to a horizontal working plane means we will miss an opportunity to ensure lighting will make a real contribution to enhancing human health and happiness. It may also lead to a waste of energy and financial resources, and cause damage to the environment.

## Current practice

Lighting as currently practiced is an activity undertaken by a number of different groups, ranging from professional lighting designers through to lighting equipment manufacturers, architects, building services engineers and electrical contractors. These groups have different levels of expertise and different income streams, meaning the amount of time they can spend on a lighting design varies. However, they do have two things in common. First, they all use software to develop their designs, some more sophisticated than others. Second, they – and even professional lighting designers – mostly follow the illuminance standards produced by authoritative bodies, both national and international, as to do otherwise poses

a risk of litigation should the client be dissatisfied.

The consequences of current practice are many and varied. By designing lighting for a nominal task illuminance on a horizontal working plane, one consequence is that light is being delivered where it is not needed at a level that is not necessary. In other words, energy is being wasted. Excessive energy consumption has implications for climate change. Further, unless lighting practice frees itself from the chains of illuminance on a horizontal working plane, there is a risk that lighting will be seen as a simple commodity where innovation and creativity are limited and price is everything. The implications for the lighting industry are not attractive.

## The objective

To achieve the desired paradigm shift, what is required is to change the lighting standards produced by authoritative bodies such as ISO, CEN, CIE and SLL from illuminances and illuminance uniformity on a horizontal plane to minimum ambient illuminances. Ambient illuminance is defined as the average flux density of the indirect flux field within the volume of a space. As such, it involves consideration of the distribution of light throughout the space and can be expected to relate to peoples' perceptions of the space. It would also be a better approach to quantifying the non-visual impact of lighting as it provides an estimate of the amount of light that will be received by the eyes. Ambient lighting is real human-centric lighting.

A design method suitable for this paradigm shift, the Lighting Design Objectives (LiDOs) procedure, already exists (*Light Lines*, July/August, 2020). The LiDOs procedure first requires the practitioner to specify the objectives of the lighting installation. Once this is done, the ambient illuminance can be determined and target surfaces to receive direct flux selected, enabling objectives to be met by adjusting the target/ambient illuminance ratio values.

This can cover situations ranging from where visually-difficult tasks occur and the ambient illuminance is insufficient to creating distributions of emphasis to achieve envisaged visual effects. It is worth noting that the LiDOs procedure is very flexible and does not limit the possible outcomes. It even allows a uniform illuminance across a horizontal working plane to be produced if that is the objective.

### How to get there

To achieve such a paradigm shift we need to gain the support of a number of different groups such as lighting designers, lighting manufacturers, lighting regulators, professional lighting societies and architects. Among the questions that will have to be addressed are:

- How will lighting practice be changed?
- Will the change increase energy consumption?
- What are the costs of ambient lighting compared with the current practice?
- What are the opportunities for the lighting industry?
- Will it lead to architects and lighting designers working more closely together?
- Can design software be rewritten to support the LiDOs procedure?
- What form should lighting standards take?
- How can daylighting be incorporated into the LiDOs procedure?

There are a number of activities needed before the desired paradigm shift can occur. They are:

- (1) Research aimed at identifying suitable metrics for quantifying ambient lighting and appropriate levels of these metrics for inclusion in standards is essential;
- (2) Research is needed to establish that giving priority to ambient lighting results in a better human response to an interior than current practice, both on first sight and after prolonged exposure;
- (3) Development of a reliable and robust ambient illuminance meter;
- (4) Research is required to estimate the financial and energy costs of implementing an ambient lighting approach relative to current



**The paradigm shift required is to start giving priority to lighting the space rather than just focusing on the visual tasks.**

- practice, including any attempts to influence human health with light;
- (5) The present understanding of lighting efficiency may be literally turned upside down – and needs further investigation;
  - (6) Given the conservative nature of the authorities who prepare lighting recommendations, it is likely that a transitional phase will be required if the movement from standards based on task illuminance on a horizontal working plane to standards based on ambient illuminance is to succeed. A transitional lighting standard would be one in which application tables are given in terms based on current practice (illuminance and uniformity) and in terms suitable for ambient lighting (MRSE, MICI, TAIR

etc). This would allow lighting practitioners to use whichever approach they thought was best suited for a given project. Lighting regulators, such as those revising EN 1246-1, should prepare for this transition by providing information on the ambient lighting approach as soon as possible.

### Coda

There is a long way to go before a shift from working plane lighting to ambient lighting can be justified and made to occur. However, it will never happen unless all those involved lift up their eyes from the horizontal working plane and see the opportunities for better lighting practice presented by ambient lighting. ■

- The Ambient Lighting Manifesto was first published in *SLL Light Lines*, Vol 13, Issue 5, Sept/Oct 2020

# THE OBTUSE ANGLE

Building Services News, Vol. 59 [2020], Iss. 5, Art. 1



PAT LEHANÉ

## Energy Show 2021

Despite the obvious challenges and ever-changing situation, SEAI is currently reviewing plans for the 2021 Energy Show. This is an important event for suppliers, specifiers and buyers in the sustainable energy sector and a key event in the industry's calendar.



So, while a physical event is unlikely, SEAI is exploring some really exciting opportunities to bring aspects of the exhibition, workshops and briefing events online.

Like so many things in today's world, Energy Show 2021 will definitely be different. There will be further updates on this in the coming weeks.

## PJ Duffy Heritage

While PJ Duffy & Sons has commenced a new phase in its long history (see Page 14), the core values of tradition, integrity and longevity are epitomised by a door sign at its premises in Camden St in Dublin. How wonderful that it has been retained.



## 'Aspirational' EU Commission goals



Minister Eamonn Ryan has rightly welcomed the EU Commission President's commitment to increase the greenhouse gas emissions reduction target to at least 55% by 2030.

Here, Ireland's Programme for Government sets out our commitment to an average 7% per annum reduction in emissions from 2021 to 2030 (a 51% reduction over the decade), and to achieving net zero emissions by 2050.

With the Climate Action (Amendment) Bill now being drafted, why not set a legally-binding fixed target as the Danes have done (see below), not an at least that suggests aspiration rather than intent.

## Congrats Paul

Congratulations to Paul Kenny (formerly Chief Executive of the Tipperary Energy Agency) on his new full-time role of Special Adviser to Minister Eamon Ryan. It's great to have one of the industry's staunchest champions in the inner-circle.

Hopefully Paul's extensive experience of rolling out successful energy-saving programmes will be brought to bear when new policies are being formulated.

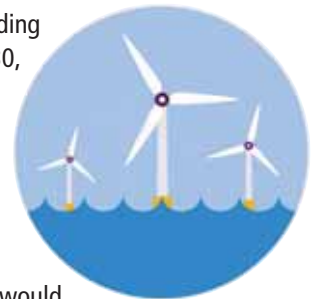


## Emphatic Danish goals

While the Danish Government has set a legally-binding 70% greenhouse gas emissions reduction target by 2030, the rest of the world is watching to see just how it intends to realise it.

It has already achieved a 29% reduction in emissions as of 2018, with coal to be completely phased out by 2030 and power consumption to be 100% based on renewable energy by 2027.

Whether these targets are realised or not – and who would bet against it? – the real lesson for others is to do as the Danes and set emphatic, legally-binding targets.



## Eco-friendly funerals

Balloon Kobo, the company behind the Japanese space funeral service, has claimed the service is totally environment-friendly. The balloon containing the deceased's ashes rises to an altitude of 40 to 50 kilometers above the ground when released, grows three to four times in size as the air pressure drops, then ruptures, scattering the ashes to float freely around the atmosphere for ever more.

Now for the eco-friendly bit. Apparently, the balloon fragments will eventually decompose into the soil from exposure to water and sunlight on their return to earth, while the human remains are mainly comprised of calcium phosphate, so they will not hurt the environment.

In Japan, this eco-friendly gesture – including the cost of grinding the bones so they can be inserted into the balloon – only costs €2000.



ALWAYS SOLID.  
ALWAYS EFFICIENT.  
ALWAYS INTELLIGENT.  
NEVER AVERAGE.

PROUD PARTNER OF  
THE WORLD'S BEST INSTALLERS

Not all pumps are created equal. Based on years of industry-leading innovation, every pump in the ALPHA range goes beyond average - in every way. Whether you need intelligent control, exceptional efficiency or easy replacement - an ALPHA is the answer. With the Grundfos GO Suite designed to make your workday smoother - it allows you to remotely control, balance or replace the ALPHA pumps, all from your smartphone. The full ALPHA range is adaptable to almost any heating system, built to perform reliably for years to come. No matter which ALPHA pump you choose, you know one thing - an ALPHA is never average.

Explore the ALPHA range at [www.grundfos.ie](http://www.grundfos.ie)

ALPHA1 L  
THE SOLID  
CHOICE



ALPHA2  
THE EFFICIENT  
CHOICE



ALPHA3  
THE INTELLIGENT  
CHOICE





## The efficient space-saving solution for heating and DHW

New Aquarea R32 High Performance  
All in One Compact J Generation



An innovative new low-energy system based on Air to Water heat pump technology with R32 Refrigerant



High performance for low energy homes produces domestic hot water, heating and even cooling



Streamlined design for simple integration and an easier installation in the kitchen



A comfortable and energy efficient home all year round, even at temperatures as low as -20 °C



Utilising the latest hydrokit technology with a premium stainless steel tank that requires no maintenance



Save time and money. Aquarea Smart Cloud for end users, installers and maintenance\*