



# Bi-State Chapter Exchanger

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Serving the Hudson Valley and Western Connecticut

February 2015

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## Save the Date 1 PDH Credit

Chapter Meeting  
February 11, 2015



Meeting Location: Belimo  
33 Turner Road  
Danbury, CT 06810

5:15 - 5:30PM Arrival  
5:45 - 6:45PM Tour  
6:45 - 7:30PM Dinner  
7:30 - 8:30PM Main Presentation

*Admission courtesy of Belimo*  
Space Limited: RSVP by February 4th  
[ashraebistateRSVP@olace.com](mailto:ashraebistateRSVP@olace.com)

## Tour of NEW Belimo Facility

February's meeting will kick off with a tour of Belimo Americas' new 200,000 square foot headquarters. The facility highlights the company's products with ceilings that highlight—not hide—heating and air conditioning systems at work. The tour will begin in Belimo's customer lounge.

**Chilled Water Energy Savings Study (PDH Available)** Our industry has proven that chiller water low Delta T causes chiller plant inefficiency and a dramatic increased pumping cost. This presentation will analyze how correcting low Delta T will eliminate over pumping and costly chiller plant inefficiency. We will review the MIT low delta T chiller plant study and how one building reduced its pumping 50% by correcting low delta T. We will also share the savings the end user can realize by correcting low delta T and show how savings can be calculated. Key points covered:

- Manual, dynamic and delta T balancing
- An Independent DT Study
- Chilled Water System Design
- MIT Beta Site Study-Correcting Low delta T
- Data Analysis and Optimization and Functionality
- Calculate Savings
- Additional Applications

## President's Message

By James F. Dolan, P.E.



Hope everyone is faring well during this snowy winter. I had a quick trip planned to Chicago for the ASHRAE Conference and Expo and one of our weekly snow storms had other plans and my flight was cancelled. I heard it was a good time and there was even a sighting of Terry Connor our past President who moved to Texas.

We were fortunate in January to have a warm meeting on a cold, but snow free night, at Casa Rina. Charles Waddell an expert on air purification discussed ASHRAE 62 and ways to approach the ventilation and other IAQ requirements. There was a robust discussion about ventilation and ways to ensure that air treatment is comprehensively understood and delivered in a way that is best for occupants while using less energy.

We have our upcoming tour of the Belimo Plant this Wednesday February 11<sup>th</sup>. We will have the tour as well as food provided by Belimo and will have the opportunity to obtain a PDH for a presentation on maintaining proper delta T for hydronic systems.

In this issue of the Exchanger on page nine we have another member profile written by Brendan Smith. Brendan is our YEA Chair and recently received his PE. Enjoy the article and Congrats to Brendan on this recent achievement.

Beyond February, we have our March meeting at Casa Rina where we will have a presentation on control of airflow for applications such as fume hoods and other applications by Accuspec.

Our golf date has been set so see that "Save the Date" in this issue as well. We anticipate a great turnout at the Links, so get your golf group in early and shore up your sponsorships.

See you on the 11<sup>th</sup> at Belimo!

Jim

## Los Alamos National Laboratory Develops New Technique for Growing High-Efficiency Solar Cells

Recently in the journal *Science*, Los Alamos National Laboratory researchers reported a new solution-based hot-casting technique that allows growth of highly efficient and reproducible solar cells from large-area perovskite crystals. "These perovskite crystals offer promising routes for developing low-cost, solar-based, clean global energy solutions for the future," said Aditya Mohite, the Los Alamos scientist leading the project.

State-of-the-art photovoltaics using high-purity, large-area, wafer-scale single-crystalline semiconductors grown by sophisticated, high temperature crystal-growth processes are seen as the future of efficient solar technology. Solar cells composed of organic-inorganic perovskites offer efficiencies approaching that of silicon, but they have been plagued with some important deficiencies limiting their commercial viability. It is this failure that the Los Alamos technique successfully corrects.

The researchers fabricated planar solar cells from perovskite materials with large crystalline grains that had efficiencies approaching 18%, among the highest reported in the field of perovskite-based light-to-energy conversion devices. The cells demonstrate little cell-to-cell variability, resulting in devices showing hysteresis-free photovoltaic response, which had been a fundamental bottleneck for stable operation of perovskite devices.

"Characterization and modeling attribute the improved performance to reduced bulk defects and improved charge-carrier mobility in large-grain perovskite materials," said Mohite, "and we've demonstrated that the crystalline quality is on par with that observed for high-quality semiconductors like silicon and gallium arsenides."

The researchers anticipate that their crystal growth technique will lead the field towards synthesis of wafer-scale crystalline perovskites necessary for the fabrication of high-efficiency solar-cells and be applicable to several other material systems plagued by polydispersity, defects and grain boundary recombination in solution-processed thin-films.

The work at Los Alamos National Laboratory was supported by a DOE Office of Basic Energy Sciences proposal and by the Los Alamos National Laboratory Directed Research and Development (LDRD) program. This work was done in part at the Center for Integrated Nanotechnologies, a DOE Office of Science User Facility.



## 2015 Annual Golf Outing



Save the Date

**May 13, 2015**

for the ASHRAE  
Bi-State Chapter  
Annual Golf Outing  
hosted at

**The Links at Union Vale**







## **ASHRAE Research**

ASHRAE's Research Program sets ASHRAE apart from other professional societies and associations of its kind. ASHRAE's Handbook series, technical programs, standards, and special publications all utilize the results of Research conducted through ASHRAE funding. ASHRAE conducts timely research to remain the foremost, authoritative and responsive international source on the interaction between people and the indoor and outdoor environment through the operation of HVAC&R systems in buildings and other applications.

Research Donations in particular are the foundation of the ASHRAE Research Program. We at the Bi-State Chapter of ASHRAE would like to invite you to invest in ASHRAE Research. ASHRAE is a not-for-profit organization and needs your support for continued success! The Bi-State Chapter of ASHRAE has continued to raise the bar for research funding, and we couldn't have done it without your help. We would like to thank last year's contributors shown below.

We hope that we can count on you to help us reach our goal of \$6,250 for the 2014 – 2015 campaign year. You can do this by filling in the form below or by contributing on-line at: <https://xp20.ashrae.org/secure/researchpromotion/rp.html>.

For further information or assistance contact Cliff Konitz, RP Chair, at 845-297-5864 or <mailto:c.konitz@verizon.net>



**2013 - 2014 Research Promotion Donors**

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# ASHRAE Research and YOU

## HOW IS ASHRAE RESEARCH USED?

- Update the Society's standards and guidelines
  - Special ASHRAE publications
- Articles published in the ASHRAE Journal



## WHAT FUNDS ASHRAE RESEARCH?

- Contributions from members and corporations
- A percentage of member dues
- Income from the ASHRAE cosponsored AHR Expo
- Interest earned on the Research Reserve and ASHRAE Foundation

## HOW IS MONEY RAISED?

- Personal contact made by volunteers
- Special contracts with major donors
  - Direct solicitation of ASHRAE members at the time of dues billing



## HOW DOES ASHRAE RESEARCH HELP ME?

- Decreasing the spread of airborne diseases
- Conserving energy in hot and humid climates
- Understanding the relationship between occupant health and ventilation rates
- Decreasing the risk of spoiled food



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**PLEASE COMPLETE THE INFORMATION BELOW AND RETURN WITH YOUR CONTRIBUTION TO:**

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Donors are recognized for their contributions as follows:

**Honor Roll** contributors are listed in the October ASRHAE Journal and receive the commemorative coin recognizing Giants in HVAC&R invention or innovation.

Individual Honor Roll beginning at \$100  
Corporate Honor Roll beginning at \$150

**Investors** with contributions of \$250 or more receive a wall plaque that can display six commemorative coins.

Contributions in any amount are gratefully received and 100% of the contribution goes directly to research. All contributions are tax deductible.



## ASHRAE Bi-State Young Engineers in ASHRAE

By Brendan C. Smith, P.E., YEA Chair



If you are an ASHRAE member and you're under 35 years old, you are a YEA member. Congratulations! YEA is a very clever acronym for Young Engineers in ASHRAE. What do you get for being a YEA member you ask? Well, you get invited to YEA events that the regular (read: older) members aren't. That's right, you're part of an exclusive invite list. You've probably gotten several of my invitations already to one of our happy hours at some of the better pubs throughout Westchester. If you haven't been able to make it out to one of these events, I strongly encourage that you change that. You'll meet friendly and interesting members that are experts in HVAC design, Johnson Controls systems, Victaulic pipe fittings, dungeons and dragons, plumbing design, professional football, York equipment, college football, choir singing, motorcycling, pipe installation, beer selection, costume making, etc.

All that being said, YEA is an excellent tool for social and professional networking with other young HVAC & R professionals. Being close in age means that YEA members are more relatable to one and other. This gives us the opportunity to share experiences and learn more about the industry as a whole. Even though the older ASHRAE members aren't there to share their years of experience, the diverse backgrounds and positions of the YEA body can offer plenty of knowledge to absorb.

As a design engineer myself, having drinks and sharing work stories with an equipment sales engineer or a pipe fittings representative has given me a better understanding of how portions of my work look from another perspective. Understanding the way the rest of the industry works together to get projects done has helped me schedule my design process and fine tune my specification to make projects go smoother from start to finish. Hearing how other companies function has also helped to shape how I view where I want my career to go. The relaxed and familiar environment of our YEA events creates a situation where I feel I've gained professional experience vicariously.

Apart from the professional advantages to networking and sharing experiences with other young HVAC & R industry workers, YEA events are a thoroughly enjoyable social experience. While the turn-out has not been lofty for our previous happy hours, it's still a fun time. When I was brought into the chapter, I was dragged in by my boss at the time, and I will confess that I did not wholly look forward to chapter meetings and involvement in the Board of Governors. Now that we have been actively having YEA functions for two years, involvement in chapter operations has become less of a chore and more of a social event I look forward to each month. YEA encourages chapter participation by offering a younger, more relatable face to what can otherwise be an older, possibly intimidating chapter membership (no offense intended to the rest of the chapter). More importantly, who doesn't like to unwind and make some new friends every once in a while?

Our past YEA events have been at The Lazy Boy Saloon in White Plains and The Tap in Tarrytown. Our next YEA event will be on **February 25 at The Thirsty Scholar Pub in Pleasantville**. Please look for my email, save the date, invite coworkers, and come join us for a drink and a good time.

## ASHRAE, IAQA Approve Consolidation

A consolidation between ASHRAE and the Indoor Air Quality Association has been finalized by both organizations. Under the consolidation, IAQA will become a part of the ASHRAE organization while maintaining its own brand and Board of Directors. IAQA will operate independently within ASHRAE's organizational structure.

"We are excited about the opportunities presented by this consolidation," ASHRAE President Tom Phoenix said. "It opens the door to alignment of ASHRAE and IAQA programs to create high-impact resources for building professionals around the globe."

"This is an historic event for both associations and has great promise for growth and development for both organizations," IAQA President Kent Rawhouser said. "The opportunities and possibilities for members are only limited by our own imaginations. IAQA and ASHRAE are committed to growing and developing the IAQA brand. The consolidation will open new avenues for programs and benefits for our members."

Brought to you by the ASHRAE Chapter Technology Transfer Committee

# New Tomorrows for Today's Buildings: Existing Building Commissioning

April 23, 2015 | 1-4pm EDT



[www.ashrae.org/webcast](http://www.ashrae.org/webcast)



Thomas H. Phoenix,  
P.E., Fellow ASHRAE,  
BEAP, BEMP



Robert G. Baker,  
OPMP, Fellow  
ASHRAE

This webcast will feature industry experts who will define the benefits of existing building commissioning for the environment, occupants, operations staff, and overall ownership costs. Viewers will be able to recognize the varied scopes of commissioning, when to apply comprehensive versus focused commissioning, and best practices in existing building commissioning specifications & contracting.



James K. Vallort,  
Fellow ASHRAE



Ronald J. Wilkinson,  
P.E., CPMP

### Earn PDHs!

Attend this FREE webcast program and you may be awarded three Professional Development Hours (PDHs).



## **ASHRAE, REHVA Jointly Publish Guide to Chilled Beam Systems**

Guidance on designing chilled-beam systems is contained in a new book from ASHRAE and the Federation of European Heating, Ventilation and Air-Conditioning Associations (REHVA). The “Active and Passive Beam Application Design Guide” is the result of collaboration by worldwide experts to give system designers a current, authoritative guide on successfully applying active and passive beam technology.

Building on REHVA’s previously published Chilled Beam Application Guidebook, this new guide provides up-to-date tools and advice for designing, commissioning and operating chilled-beam systems to achieve a determined indoor climate and includes examples of active and passive beam calculations and selections.

Active and passive beam systems are an energy-efficient solution for spaces that require individual zone control and where the internal moisture loads are moderate. “Active and passive beam systems provide good thermal comfort and energy and space saving advantages, and the operation of such systems is simple, with low maintenance requirements,” co-editor John Woollett said. “In a building where the goal is a low energy usage index, beams can be an excellent choice of indoor climate product.”

Although they are often referred to as “chilled” beams, in many cases active beams can be used for both heating and cooling the space. Active and passive beams are room air recirculation devices that transfer sensible heat to and from the space using water. In addition, conditioned primary air is ducted to active beams. This primary air must satisfy the ventilation and latent requirements of the space and drive the induction of room air through the beam’s coil. In the case of passive beams, this primary air is delivered to the space through a decoupled ventilation system. Active and passive beams may be integrated with acoustic ceilings or independently mounted.

Woollett noted that chilled beams have specific applications and work well in commercial office buildings, schools, hospital patient rooms, laboratories and hotels. He said such systems are common in Scandinavian countries where they are a standard choice of indoor climate delivery in a variety of different applications.

The book provides information on the basics of operation but also background from engineers developing the beam technology with manufacturers. The main focus is comfort beam application in their passive and active variants. The cost of the “Active and Passive Beam Application Design Guide” is \$62 (\$53, ASHRAE members). To order, contact ASHRAE Customer Contact Center 1-800-527-4723 (United States and Canada) or 404-636-8400 (worldwide), fax 678-539-2129, or visit [www.ashrae.org/bookstore](http://www.ashrae.org/bookstore).

## **Renewable Energy Booming Around the World**

The world’s total investment in clean energy was \$310 billion in 2014, a new report published by Bloomberg New Energy Finance (BNEF) concludes. The biggest boost in renewable energy investment came from China, where investment in the sector has grown by 415% in the last 10 years. Spending \$89.5 billion last year, China now accounts for almost 29% of the world's total renewables investment. BNEF’s report also identifies the sectors where most of the money is flowing into: solar energy in China and the U.S.; and offshore wind energy in Europe, with the UK and Germany leading that group.

## **ORNL Developing Insulation Panel to Significantly Reduce Cooling, Heating Loads**

A composite foam insulation panel being developed by Oak Ridge National Laboratory (ORNL) and partners potentially could reduce wall-generated heating and cooling loads in buildings by 38% to 50%, and save homeowners \$150 or more on average per year in energy costs. The 2 in. (51 mm) board would feature modified atmosphere insulation and target an R-value of 25 at a projected cost of 30 cents per square foot more than current insulation materials. According to ORNL, that means the insulation would have a payback of 10 years. “This project is in line with the Department of Energy’s goal to reduce energy consumption in buildings by 50% by 2030,” said Kaushik Biswas of ORNL’s Building Envelope Systems Research Group.



## Ancient Climate Records Back Predictions

Evidence from the last warm period in the Earth's ancient past suggests the climate will respond as expected to rising CO<sub>2</sub> levels. The research, published in *Nature*, is in line with future predictions from the Intergovernmental Panel on Climate Change (IPCC), says the UK-led team. The evidence came from ancient plankton fossils drilled from the ocean floor. These creatures' shells contain clues as to how the global climate cycled from cool to warm many times some 2.3 to 3.3 million years ago, across what researchers refer to as the Pliocene and Pleistocene Epochs in Earth history.

Scientists from the UK and Australia used this ancient climate record to reconstruct the CO<sub>2</sub> content of the planet's atmosphere, comparing it to a separate record of CO<sub>2</sub> acquired from bubbles of ancient atmosphere trapped in ice drilled from the poles. "We have shown that the change in Earth's temperature for a given change in CO<sub>2</sub>, once the effect of the growth and retreat of the highly reflective continental ice sheets was taken into account, was not only identical during both the cold Pleistocene and warm Pliocene periods, but was also similar to the understanding recently summarized by the IPCC," said co-researcher Dr. Gavin Foster of the University of Southampton. "This implies that as we approach a Pliocene-like future, the IPCC range of climate sensitivity is likely to be suitable for describing the degree of warming we should expect."

During the Pliocene, the Earth's temperature was often several degrees higher than in pre-industrial times, while atmospheric CO<sub>2</sub> levels were around 350-450 parts per million (ppm), similar to the levels reached in the past few years (400 ppm). By studying the relationship between CO<sub>2</sub> levels and climate change during a warm period in the Earth's history, the scientists have been able to estimate how the climate will respond to increasing levels of CO<sub>2</sub>, a parameter known as climate sensitivity.

The findings suggest that climate sensitivity was similar in a warmer world to other times - allaying concerns that warming could produce positive feedbacks that would accelerate warming above that expected from modelling studies. Prof. Richard Pancost, from the University of Bristol Cabot Institute, said: "When we account for the influence of the ice sheets, we confirm that the Earth's climate changed with a similar sensitivity to overall (radiative) forcing during both warmer and colder climates."



### APPLY

Each year the ASHRAE Foundation awards scholarships of up to \$10,000 each to qualified students.

### DONATE

Help support ASHRAE's student scholarship programs.

[www.ashrae.org/scholarships](http://www.ashrae.org/scholarships)

## Bi-State Chapter Officers and Governors 2014—2015

Position	First Name	Last Name	Email	Phone
<b>Officers</b>				
President	James (Jim)	Dolan	jdolan@olace.com	(914) 919 3106
President-Elect	TBD		TBD	
Vice President	TBD		TBD	
Secretary	Brendan	Smith	bsmith@lynstaar.com	(914) 741-1290 ext 17
Treasurer	Dennis	LaVopa	dlavopa@dIFlowTech.com	(845) 265-2828
<b>Governors</b>				
BOG (term ends June 2017)	John	Fusco	jfusco@kohleronan.com	(203) 778-1017
BOG (term ends June 2017)	Cliff	Konitz	c.konitz@verizon.net	(845) 297-5864
BOG (term ends June 2017)	Stephanie	O'Dea	Stephanie.L.Odea@jci.com	(914) 593-5245
BOG (term ends June 2016)	Michael	Circosta	mjcarmonk@optonline.net	(914) 273-9173
BOG (term ends June 2016)	Dennis	LaVopa	dlavopa@dIFlowTech.com	(845) 265-2828
BOG (term ends June 2016)	Robert	Roston	bob@rostonfamily.com	(914) 761-3364
BOG (term ends June 2015)	Tom	Quartuccio	tquart@optonline.net	
BOG (term ends June 2015)	Brendan	Smith	bsmith@lynstaar.com	(914) 741-1290 ext 17
BOG (term ends June 2015)	Larry	Sturgis		
Chapter Delegate	James	Dolan	jdolan@olace.com	(914) 919 3106
Chapter Alternate	TBD	TBD		
<b>Committee Chairs</b>				
CTTC	Marc	Wilson	Marc.Wilson@victaulic.com	(571) 271 8955
Government Affairs	Michael	Circosta	mjcarmonk@optonline.net	(914) 273-9173
Research Promotion	Cliff	Konitz	c.konitz@verizon.net	(845) 297-5864
Student Activities	Stephanie	O'Dea	Stephanie.L.Odea@jci.com	(914) 593-5245
Young Engineers in ASHRAE	Brendan	Smith	bsmith@lynstaar.com	(914) 741-1290 ext 17
Membership Promotion	James	Dolan	jdolan@olace.com	(914) 919-3106
Refrigeration	John	Fusco	jfusco@kohleronan.com	(203) 778-1017
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Golf	Steven	Abbattista	sabbattista@olace.com	(914) 919-3102

### Why Be Involved in a Local Chapter?

- Learn about the latest technologies presented in the program sessions
- Attain continuing education credits
- Meet industry associates and discuss local concerns
- Network amongst designers, installers, vendors, educators, in your local area to help improve business for all
- Share experiences with others
- Enjoy a social hour
- Carry out ASHRAE's mission on a local level

*To advance the arts and sciences of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world.*



## Notice to business card advertisers:

We are currently accepting business card advertisements for this year's newsletters. The cost of a business card ad is \$125.00. The newsletter is published monthly, September through June (ten issues). That means for \$125.00 (\$12.50 an issue), your business card ad will circulate to approximately 300 recipients a month or an advertising cost of approximately 4 cents/recipient.

If you are interested in placing an ad, please forward a business card and check (payable to ASHRAE Bi-State) to:

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## Employment Opportunities

Employment ads may be submitted for inclusion in **The Exchanger** as follows:

- 1.\$100,000 from companies placing ad for one (1) month.
- 2.\$150.00 from companies placing ad for two (2) months.
- 3.No charge for members looking for employment.

### Chinese Company 3-D Prints Five-Story Apartment Building

Chinese high-tech construction company WinSun has completed a five-story apartment complex and an 11,840 ft<sup>2</sup> (1100 m<sup>2</sup>) villa at the Suzhou Industrial Park. The company's 3-D printer array stands 20 ft (6 m) tall and is 33 ft by 132 ft (10 m by 40 m) wide. The materials used by the printer consist of ground industrial waste, along with a cement that is mixed with a hardening agent. The individual parts needed for the buildings are made in large chunks at WinSun's base. To meet standard building codes, the structures are fortified by steel reinforcements and wall insulation. The company uses a Computer Aided Design (CAD) template, and a mechanical extruder arm lays down the concrete mix that is then treated with the hardening agent. Each individual piece of the structure is joined together at the construction site. Previously, WinSun drew attention for using its 3-D printer to construct 10 full-sized houses in a single day. The company aims to eventually use its technology on larger projects, such as skyscrapers and bridges.



ASHRAE, founded in 1894, is a building technology society with more than 50,000 members worldwide. The Society and its members focus on building systems, energy efficiency, indoor air quality and sustainability within the industry. Through research, standards writing, publishing and continuing education, ASHRAE shapes tomorrow’s built environment today.

ASHRAE will be the global leader, the foremost source of technical and educational information, and the primary provider of opportunity for professional growth in the arts and sciences of heating, ventilating, air conditioning and refrigerating.

## Upcoming Meetings

Month	Date	Promotion	Main Presentation	Tech Session
March	3/11/2015	Student Activities	Accuspec air control valves	
April	4/8/2015	Sustainability	Technical program at sustainable demonstration location	Earth Day
May	5/13/2015	Student Scholarships	Golf Outing	
June	6/10/2015	Membership Promotion	Save the date	

### **British Company Has Invented a Boiler that Generates Electricity as Well as Heat**

A British company has launched an innovative boiler that could change the way people pay for their energy and heat their homes. The Flow boiler provides both hot water and heat for the flats and apartments it is installed in but, on top of that, it also produces electric energy that can power household appliances. It aims at covering several energy needs with one single energy source, potentially allowing customers to generate their own power inside their homes. The more people will be able to generate electricity on their own, the less demand there will be on the national grid.

Flow believes that its boiler can reduce a household’s emissions by 20%. By switching electricity sources from an external service to the Flow boiler, a family can save up to £80 a month, according to the developers.

Here is how it works: In a traditional boiler, gas is burned to heat water, which then passes through the home's pipes and radiators. The Flow boiler instead uses the gas to heat a high-pressure liquid coolant that is sealed inside the system. The vapor created then moves through a dynamo called a “scroll expander,” which spins and acts as a mini electric generator. The hot vapor then moves through a heat exchanger, heating up the hot water for the house. The vapor returns to the boiler as the hot water is pumped around the house. The Flow is using gas from the national grid to do two jobs (create heat and drive a turbine) where a normal boiler does one.

The product was 10 years in development. Flow CEO Tony Stiff is looking forward to seeing how it performs in the market. “I think it is a game-changer for a family.” he is quoted as saying.

Stiff said that the company has stocked up interests for 15,000 boilers prior to launch, but the company has the capacity to produce 200,000 units per year. If that is the case, the company will be able to hire 700 people at its headquarters in Ipswich, the Ipswich Star reports. The boilers are also produced in the UK: in Livingston, Scotland, by the American manufacturer Jabil.