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Welcome to Networks for heating and cooling - opportunities, challenges and new solutions

**hosted by
Newcastle University**



*Sustainable Innovation in Refrigeration Air Conditioning and Heat
Industrial Academic Research Partnership Network.*



Programme

- 10.00-10.05** Introduction to the day and **SIRACH** by Professor Graeme Maidment
- 10.05-10.25** Introduction to Newcastle University, Professor Tony Roskilly, Newcastle University
- 10.25-10.45** District Heating Matters, Professor Jim Swithenbank, University of Sheffield
- 10.45-11.05** District Energy in Newcastle: Past, Present and Future, Allen Jones, Newcastle City Council
- 11.05-11.20** Coffee
- 11.20-11.40** Heating Network Efficiency, Controls, Storage and ORC. Lessons Learned, Joel Cardinal, University of Warwick
- 11.40-12.00** 90°C 13MW Heat pumps retrofitted to DH; 67% cost saving, 100% carbon saving and free cooling.....what are you smoking? Dave Pearson, Director, Star Renewable Energy
- 12.00-13.00** **SIRACH** networking facilitated by Carole Bond, Carbon Data Resources
- 13.00-14.00** Lunch
- 14.00-14.40** Outlook on the Future - Refrigeration, Heating, Ventilation & Air Conditioning Technologies, Professor Reinhard Radermacher, University of Maryland and Winner of the J&E Hall International Gold Medal.
- 14.40-16.00** Transfer to the Byker District Heating Site for a tour.
Delegates will be transported by coach and the coach will return to the University via Newcastle Train Station

SIRACH-(Sustainable Innovation in Refrigeration, Air Conditioning and Heat Pumps)

Graeme Maidment



- A dissemination network
- Sustainable Innovation in Refrigeration, Air Conditioning and Heating
- Built on SIRAC – a successful Network with 400 members, website, etc

What are our deliverables?

- Disseminate i-STUTE results via Network meetings.
- Hosting Network meetings in the UK and overseas.
- Provide regular features in a key monthly journal.



Article Title	Published Month
Innovation in Air Conditioning and Heat Pumps (Edinburgh)	November 2014
Commercial refrigeration, cooling and heating (Leicester)	January 2015
Components for Air Conditioning and Heat Pumps (Leamington Spa)	March 2015
An eye on the future of heating and cooling technologies- Introduction	April 2015
Magnetic heating and cooling	May 2015
Development in Heating and Cooling Technologies (Hereford)	July 2015

Upcoming Articles

Innovation and how it is carried out in various parts of the world	Due September 2015
Electrocaloric Refrigeration	Due October 2015
District Heating and Cooling (Newcastle University)	Due November 2015
Thermoacoustic	Due December 2015
Domestic and Commercial Heating and Cooling - next generation technologies	Due January 2016
Absorption	Due February 2016



REFRIGERATION AND AIR CONDITIONING MAGAZINE

“ – The Cooling Awards have played a major role in improving the industry [click here for editor's view](#) ”

Adam Ford Editor

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Home

STI SIRACH | Exploring innovations in heating and cooling



sirach Innovation in heating, energy storage and cooling technologies

THE NETWORK FOR SUSTAINABLE INNOVATION IN REFRIGERATION AIR CONDITIONING AND HEAT RECOVERY

SIRACH AUTUMN 2014 MEETING

Innovation in Air Conditioning and Heat Pumps



The Autumn SIRACH networking meeting took place on 2nd September and focused on innovations in air conditioning and heat pumps. The meeting was hosted by Mitsubishi Electric at their plant in Livingston, Scotland. The meeting included a series of talks on innovation in the heat pump and air conditioning market, facilitated networking session and a tour of the Livingston factory. The focus was on AC and heat pumps because this is a very topical subject, with large growth predictions as we work towards the Government targets of zero carbon heating and cooling targets for buildings.

THE TRANSITION TO LOW CARBON HEATING

presentations from SIRACH meetings please visit www.sirach.org.uk

adoption of innovation to be better identified, understood and worked

tober to explore the topic of heating and cooling

presentations and a tour of an innovative supermarket ing presentations will take place at the Abbey ce and Technology, displaying Leicester's industrial, ent to the National Space Centre, a visit to the two technology from the early days of steam and

the future

re Dearman Engine,

Friday of Lancaster

re sustainably minded



sirach Innovation in heating, energy storage and cooling technologies

THE NETWORK FOR SUSTAINABLE INNOVATION IN REFRIGERATION AIR CONDITIONING AND HEAT RECOVERY

SIRACH MEETING - ENERGY SOLUTIONS FOR GREEN BUILDINGS

The SIRACH networking meeting was held on 5th February 2015 at the Climate Center at their Sustainable Building Center in Leamington Spa. Metkel Yebiyo reports.



The main focus of the SIRACH event was to explore the latest developments and innovations that are creating energy solutions for Greener Buildings. The event included a series of presentations, an interactive group networking session and a tour of the UK's first commercial showcase for

According to DECC it is estimated that 4.5 million heat pumps will be installed by 2030. Key to their application is their high efficiency whilst fitting into the conventional space currently occupied by a gas boiler, the economics associated with their purchase and their proven reliability during development

a unique combination of a high efficiency gas combi boiler combined with the air to water heat pump. The boiler and the heat pump can run in combination or in isolation to maximize energy efficiency, minimise running costs dynamically in response to variable electricity and gas tariffs. Hybrid heat pump with condenser and

RRI incentives which provides subsidy back to the user of 7.5 p/kWh heat generated. On a typical house this provides an annual return around £2300/year.

The final presentation was from the 2014 iSB, JSE Hall Gold Medal Winner, Professor Ruzhu Wang of Shanghai Jiao Tong University, Wanz

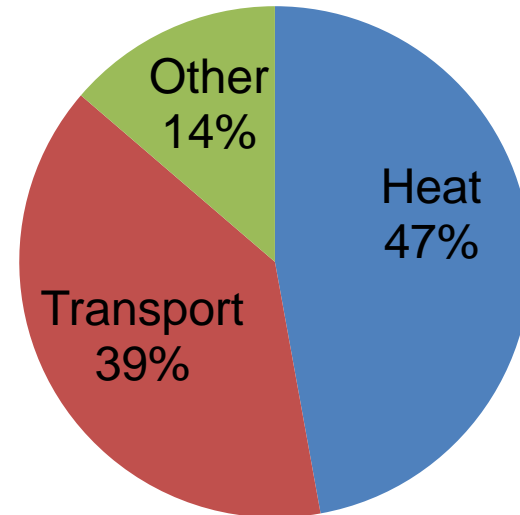
Past & Future Meetings

Event name	Date	Subject	Attendees
Emerson Technologies, Northern Ireland	25 February 2014	Heat pump and compressors	29
Spirax Sarco, Cheltenham	21 May 2014	Heat powered cycles	36
ICCC International Conference - London	25 June 2014	Challenges to implementing sustainability	35
Mitsubishi Electric – Edinburgh	2 September 2014	Innovation in Air Conditioning and Heat Pumps	32
Sainsbury's Supermarket – Leicestershire	22 October 2014	Commercial refrigeration, cooling and heating	50
Climate Center – Leamington Spa	5 February 2015	Components for Air Conditioning and Heat Pumps	42
Arctic Circle, Hereford	23 April 2015	Development in Heating and Cooling Technologies	35
IRC Congress, Yokohama, Japan	16 - 22 August 2015	Sustainable heating and cooling	48
Newcastle University	01 October 2015	Energy Storage	
Daikin Training Centre Woking	20 January 2016	Domestic and Commercial Heating and Cooling - next generation technologies .	
Brunel University	20 April 2016	Energy reduction and sustainability in the food chain.	
Ireland Energy Research Centre in Cork	23rd November 2016	Title programme to be confirmed.	

Why heating and district heating/ cooling?

Energy Consumption by end use 2012

- 47% of fossil fuels in the UK are burnt for low temperature heating
- 19% of electricity used for cooling

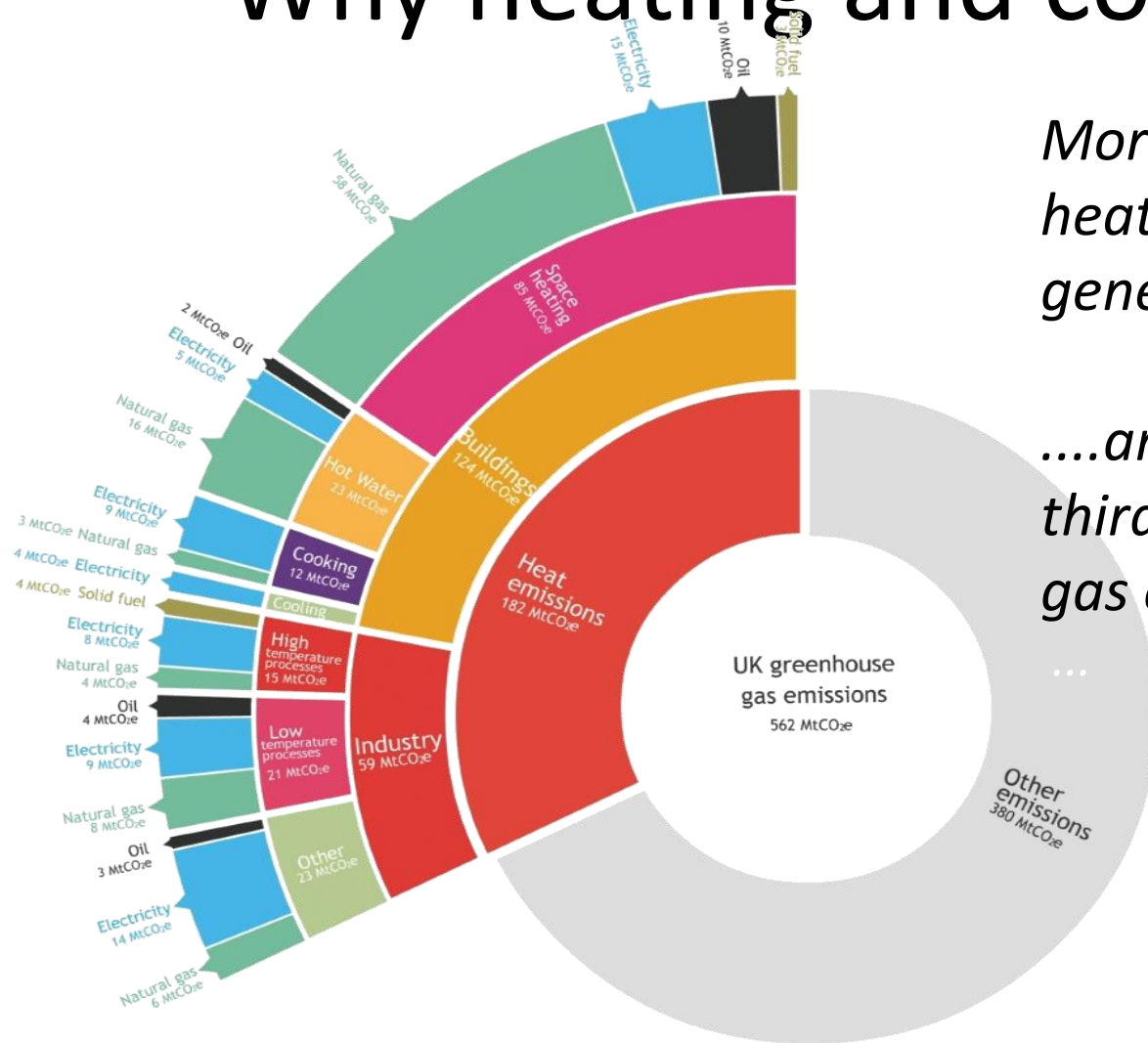


Provisional data for 2012
(DECC)

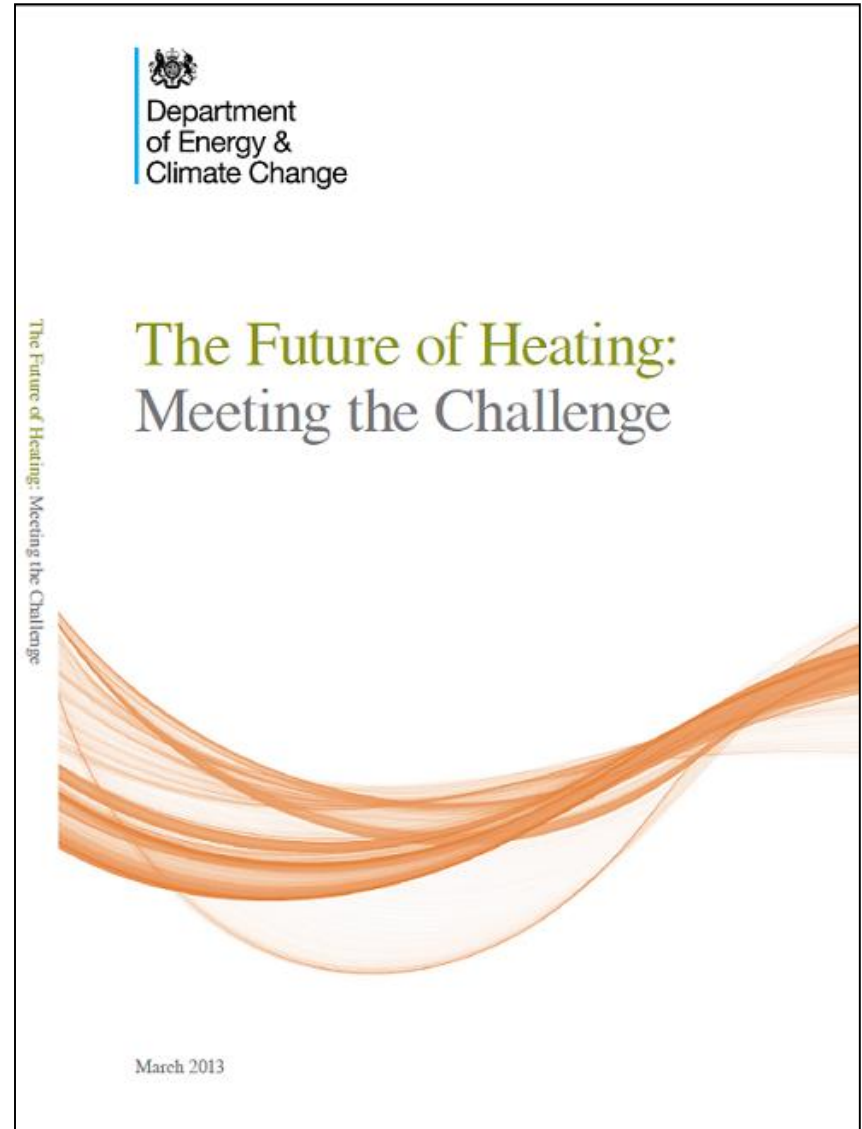
Why heating and cooling?

More energy is used for heating than for electricity generation

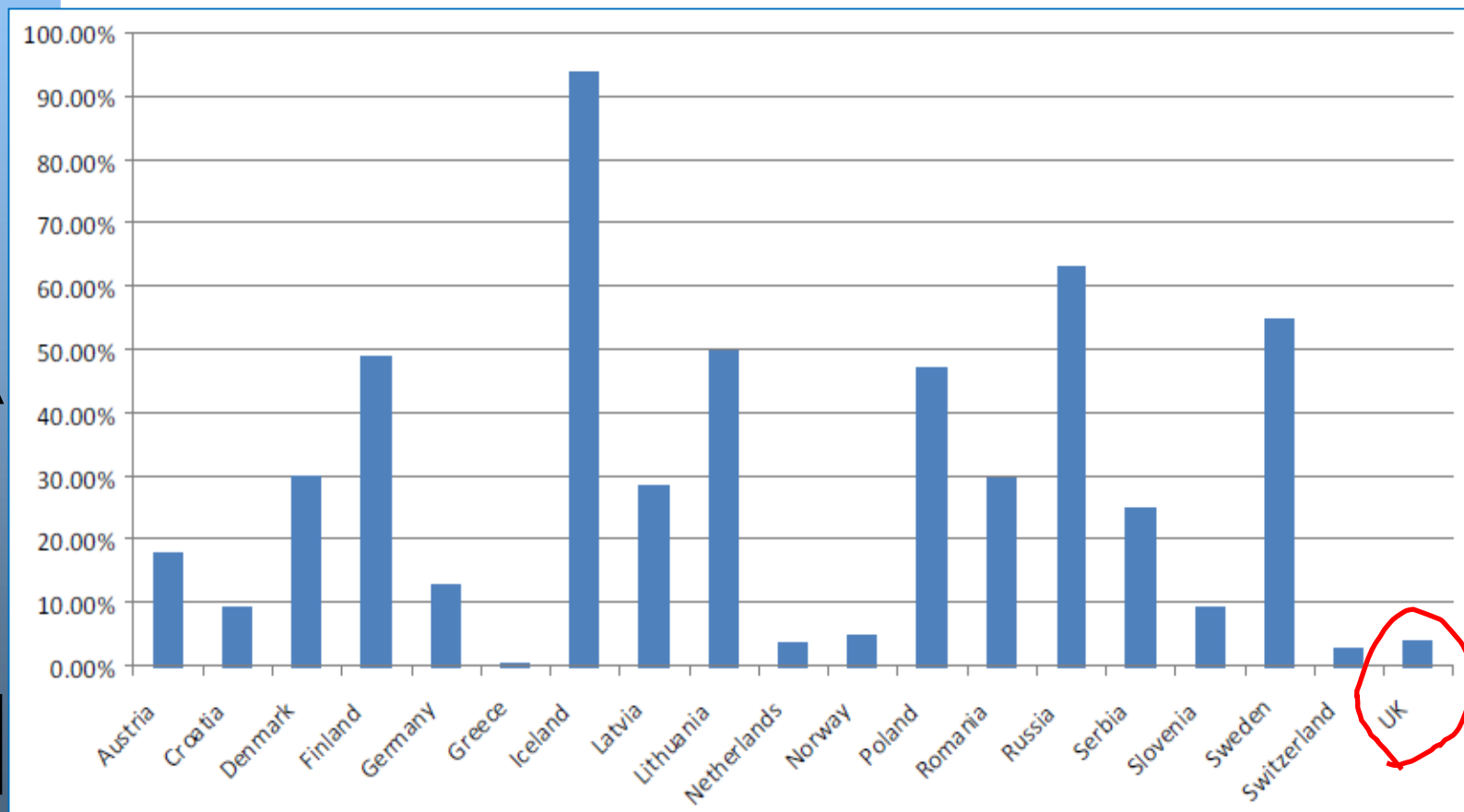
....and it causes around a third of UK greenhouse gas emissions



- 1) Industrial Heat
- 2) Heat Networks
- 3) Heat in Buildings
- 4) Grids & Infrastructure



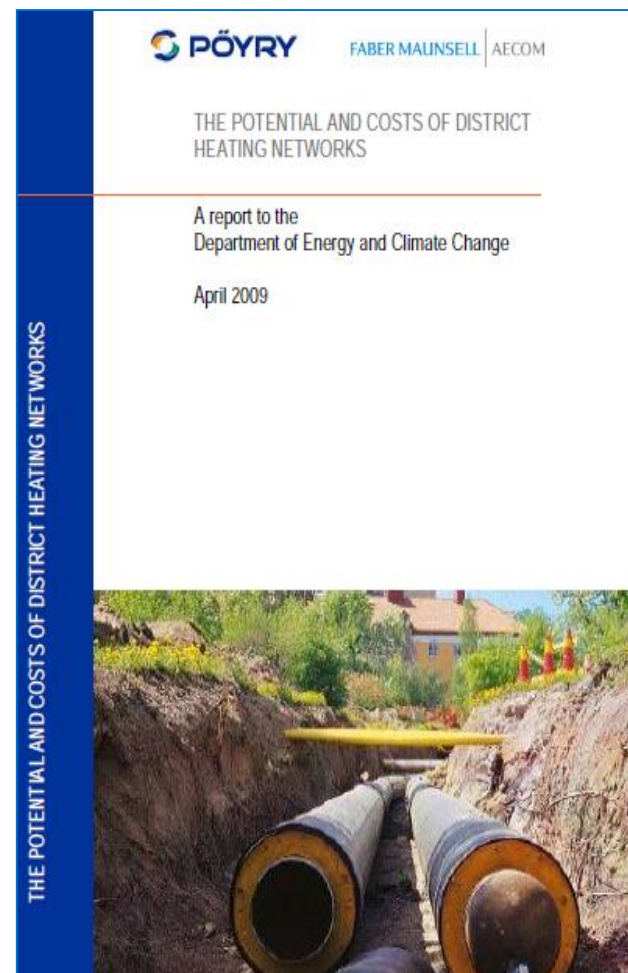
District heating's share of the total market



<https://setis.ec.europa.eu/system/files/JRCDistrictheatingandcooling.pdf>

Benefits and Barriers

- Large energy savings
- Sharing of heat and cold
- Capital cost of the infrastructure
- Disruption to a built up urban environment
- Selling and buying energy



Programme

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Ted Perry Award

Nominate your brightest students

- **Post graduate students undertaking research in a field related to air conditioning, refrigeration or heat pumps can be nominated**
- **Winner received a prize fund of £500 and a set of ASHRAE Handbooks on CD**
- **The award will be presented at the IOR Annual Dinner in February**
- **Details at www.ior.org.uk/awards**

Thanks to our speakers

Next meeting

Daikin Training Centre Woking
20 January 2016

www.Sirach.org.uk

Visit to Byker DH site

- **40 external visitors**
- **Coach outside Hancock Museum – Follow Janie**
- **Take all belongings**
- **1 hour tour – finish at 4pm**
- **Return Coach**
 - **1st Stop Newcastle Station**
 - **2nd Stop University**

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