London South Bank University

i-STUTE

WP0 SIRACH-(Sustainable Innovation in Refrigeration, Air Conditioning and Heat Pumps)

Judith Evans, Metkel Yebiyo & Graeme Maidment

WP0
Originally intentions and timescale The aim of this workstream has been to host network meetings in the UK and overseas which promotes the development and uptake of new technologies in Refrigeration, Air conditioning and Heat pumps and also to disseminate i-STUTE results via the network meetings and published articles.
Achievements to date Total of 8 SIRACH meetings have been held since the start with 400 attendees Articles reaching more 20000 professionals
Outputs to date SIRACH has published total of 11 featured articles.
Has the effort been justified?
Synergies with other WPs All and Other EUED Centres
Recommendations - is it worth continuing? Continued
Targets / deliverables for 3rd annual report or elsewhere Meeting with CSEF, International meetings in Cork and Edinburgh

WP0 Deliverables

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

London South Bank University

i-STUTE

Progress and Achievements

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	District Heating and Cooling	50
Daikin Training Centre Woking	20 January 2016	Domestic and Commercial Heating and Cooling - next generation technologies .	30
Brunel University	20 April 2016	Energy reduction and sustainability in the food chain.	
Heriot Watt	August 2016	Gustav Lorentzen Confernece	
Ireland Energy Research Centre in Cork	23rd November 2016	Title programme to be confirmed.	

London South Bank University

Outputs

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
Innovative Heating and Cooling Technologies Introduction (CIBSE Journal)	October 2015
District Heating and Cooling (Newcastle University)	December 2015
Magnetic Heating and cooling (CIBSE Journal)	February 2016
Upcoming Articles	
Hybrid Heat Pumps	Due April 2016
Energy reduction and sustainability in the food chain.	Due May 2016

Magnetic refrigeration has the potential to reduce energy use by 30% and requires no refrigerant. **Metkel Yebiyo** and **Graeme Maidment**, of Sirach, describe the technology, its main applications, and the challenges facing firms trying to get the concept to market

MAGNETIC ATTRACTION

INNOVATION MAGNETIC REFRIGERATION

Step1: Heats up when material is magnetised
Step2: Remove heat using heat-transfer fluid
Step3: Cools down when material is demagnetised
Step4: Absorb heat from cooling load
Hot fluid out
Cold fluid in
Cold fluid out
Cold fluid in

REFRIGERATION AND AIR CONDITIONING MAGAZINE rac

"– The Cooling Awards have played a major role in improving the industry click here for editor's view"
Andrew Gaved, Editor

SEARCH THE SITE.

HOME | NEWS | FEATURES | COMMENT | DIRECTORY | SHOWCASE | AWARDS | CONTRACT LEADS | JOBS
AIR CONDITIONING | REFRIGERATION | LEGISLATION | F-GAS | REFRIGERANTS | DATA CENTRE COOLING | LOW CARBON | ANDREW'S BLOG | USA FOCUS

Home ▸ News

SIRACH cooling technology network to visit Mitsubishi Electric in Livingston

31 July 2014 | By Andrew Gaved

Event on September 2nd for IOR group to focus on both air conditioning and heat pump technologies

Air conditioning and heat pump innovation will be on the agenda on September 2nd whien SIRACH, the Sustainable Innovation in Refrigeration Air Conditioning and Heat recovery network holds its

Tweet 0

COOLFLOW
High Efficiency Glycols
Secondary Refrigerants for the protection of Process Cooling, Refrigeration and AC systems

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 m
please visit www.sirach.org.u

OPENING PRESENTATION FROM THE HOSTS MITSUBISHI ELECTRIC

Presentations included a Welcome and company overview, followed by "Heat pumps - the pivotal technology" by Carl Dickinson, Mitsubishi. Mitsubishi Electric is a supplier of energy efficient air conditioning equipment that will cool, heat, ventilate and control buildings. Carl highlighted some key facts on the Mitsubishi Facility at Livingston: Land Area: Factory 72,560 m2; Employees No.: 592 (April 2014) Turnover: GBP 94M (FY 2013). His presentation also focussed on heat pump technology and introduced a main focus for the meeting of heat pumps linked into heat networks – again a key part of the government's heat strategy.

10 NOVEMBER 2014

SIRACH UPDATE

sirach Innovation in heating, energy storage and cooling technologies
THE NETWORK FOR SUSTAINABLE INNOVATION IN REFRIGERATION AIR CONDITIONING AND HEAT RECOVERY

the future
ve Dearman Engine,
Friday of Lancaster
ne sustainably minded

HEATING AND COOLING MAGNIFIED

The Sirach network encourages research and debate to promote sustainable innovation in refrigeration, air conditioning and heat pumps. Members **Metkel Yebiyo** and **Graeme Maidment** introduce the group

The energy used in heating contributes 31% of the UK's total CO_2 emissions while cooling accounts for 10%

The refrigeration, air conditioning and heat pump (RACHP) industry underpins everything we do. It touches many fields that we encounter in our everyday lives. Without heat and refrigeration, for example, the food supply would still be seasonal and limited to locally produced items; data centres would fail to work; comfortable living conditions would be difficult to deliver; zero-carbon heating would not be an option; and certain medical advancements would be impossible.

As we transition towards a low carbon economy, there are sizeable environmental and economic benefits from developing and using efficient, innovative, low carbon heating and cooling technologies that reduce energy use and carbon emissions.

Many heating and cooling technologies other than boilers and vapour compression systems are available. Figure 1 includes technologies

and the challenges and opportunities in penetrating the market – and what is needed for this to happen.

What we use

Because heating and cooling are used so extensively, nearly half (46%) of the energy consumed in the UK is used to provide heat. The energy used in heating contributes 31% of the UK's total CO_2 emissions, and two-thirds of UK heating demand comes from domestic and commercial buildings.

Cooling systems use 10% of the UK's electricity demand and account for 10% of CO_2 emissions.

Fossil fuel-powered boilers dominate the heating market in the UK and, although they are very efficient in energy terms (about 95% for a condensing boiler), they use high-quality fuel combusted at high temperatures to heat water to a low temperature.

The conversion of high-quality fuel to low-quality heat in this way is not a good use of our finite resources.

At the same time, modern cooling is almost entirely based on a compression and expansion refrigeration cycle. Vapour

London South Bank University

i-STUTE

Questions