i-STUTE breakfast forum 3rd June 2014, London
"Heating and cooling to 2020 and beyond"

Panel discussion and debate – Carole Bond, Carbon Data Resources

Reflecting on what came out of the presentations during the morning that particularly came out for you, your work or your organisation.

Gary Hayes (HGEN Capital) said that there was little research regarding Organic Rankine Cycles (electricity from waste heat).
Phil Eames (Loughborough University) responded that a storage cascade and an ORC project that used waste heat from industry have been funded.
Neil Hewitt (University of Ulster), who researches high temperature heat pumps (150 -200 °C), replied that conversion of waste heat to electricity is possible on a small scale.
Turbine expanders are used rather than expansion valves and so can recover power.
Both these projects feed into i-STUTE.
Greg Gebrail (DECC) referred to a commercial ORC installation in North England.
DECC carried out research on ORCs and they did not meet the payback criteria but there were a few models set up on the back end of kiln-based industrial sites.
Gary Hayes (HGEN Capital) has one project in Stoke.
Incentives for use of surplus heat are not currently available but DECC is researching possibilities.

Jon Saltmarsh (DECC) - considering how innovation is brought into modelling and thinking about high efficiency boilers (Bob Critoph), a slow transition from gas boilers to heat pumps is projected. He would hope for a more rapid transition.
Bob Critoph replied that there tends to be a long lead time due to economies of scale, resistance to innovation and slow increases up to a certain threshold.
Andrew Keating pointed out that there is the need to reach the tipping point of uptake for market to make rapid changes.
Once new incentives and energy labelling comes into force next year, greater rates of change in the market and changes in consumer behaviour could be observed.
Research showed reasonably pragmatic change rates in the boiler market.
Lindsay Sugden (Delta EE) said that big retailers, such as British Gas, offer new technologies that could influence the market as consumers trust the reliability of big suppliers.

Bill Watts (Max Fordham) was concerned about DECC information on heat networks and CHP.
What data is available to prove that heat networks and CHP can really save carbon?
His experience is that it does not.
What is the carbon intensity of fuel and effect of heat losses, etc.?
Everyone says heat networks are an inevitability in a low carbon future but he is concerned about whether this would work in practice.
Greg Gebrail (DECC) confirmed that some heat networks built in the UK in 1960s have not performed very well. He could not verify loss figures but probably greater than 5%.
DECC should gather more evidence on performance but it is really interested in Next Generation heat networks, installed in a more considered way i.e. good insulation, metering etc, and believes that this could provide substantial improvements.

Bill Watts (Max Fordham) is concerned that even with building and designing "best in class" there are still high heat losses.

Daniel Read (University of Warwick) was interested in how consumers change their behaviour. He asked what behaviour consumers should adopt to change carbon emissions.
It seems as if consumers are waiting for a better technology to come along and they are not clear on what they should be doing right now.
Maybe there is nothing they can do for the cost?
Lindsay Sugden (Delta EE) replied that it is not a single behaviour that needs to change but they need a greater engagement with their energy usage – for example if energy prices increased people would take more notice.
There is the possibility that IT remote control would give consumers the power to study their bills, access them in real time and understand what they can do better.
Visibility is important.
Andrew Keating (Baxi) noted that the 'threat of loss' is a big driver e.g. in tackling CO_2 emissions for cars, road tax incentives etc.
In the heating market, if everyone was forced to pay Council tax in relation to EPC or discount for better EPC, maybe this could have an impact.
David Elmes (University of Warwick) – if you look at projections for different technologies they are very broad based and no one dominant design.
There is the need to watch what is influencing how those technologies progress in the market in order to spot trends.
In behaviour terms – is information enough or do you need to provide greater control e.g. smart meters transition to on/off control?
Financial incentives / comparisons against neighbours or average may be motivators.
He noted that people were more concerned about food and petrol prices – perhaps because paying fuel in regular payments or quarterly consumers don't notice the changes.
More efficient heat is competing against other more visible things like more efficient cars, pv installation, etc.

Tony Bowen (HPA) pointed out that there are quite a lot of tools already available for people to understand technologies currently available i.e. Microgeneration Certification Scheme provides performance criteria, 3rd party certification, technology lists on the website, installation and sizing criteria are also laid down in written guidance which end users can review and there is a list of skilled accredited installers.
i-STUTE is looking at the future but there are also current websites and initiatives that will help address current needs.

Lyndsey Humphries (DC Professional Development) – we heard a lot about end users using new technologies – what emphasis should be placed on professional development in end users and educating the next generation of consumers?
Graeme Maidment (LSBU) talked about the dissemination output of i-STUTE via SIRACH with events at industry sites e.g. Mitsubishi Manufacturing plant and Sainsbury's low carbon supermarket (www.sirach.org.uk).
One area of work is looking at skills and training requirements to deliver benefits of new technologies.
Traditionally heating engineers are separated from cooling engineers, perhaps it is needed to consider integration.
Government, BIS, are reviewing qualifications and apprenticeships to give employers more control.

David Elmes (University of Warwick) noted they are looking at lots of different models - maybe collaborative ones between industries or 'do it alone' versions. The skills development is an issue.
Greg Gebrail (DECC) said that BIS are known to be looking at promoting science, technology and maths skills as they foresee a shortage of professional engineers to implement new technologies.
Graduate engineers often leave the profession and as an industry need to think about how we bring them back or keep them in the sector.

David Holtum (EPSRC) noted that a lot of what is being discussed is subject of additional research centres who work together to share information and outputs and feed in together. There are six large networks in this area: www.eued.ac.uk/centres

The i-STUTE website, available at www.i-stute.org, has information about these projects and programmes.

In closing Hywel Davies (CIBSE) noted that business as usual was not considered a realistic option by any contributor, even if fracking becomes a major new source of gas it will still change the way we supply energy.
Noted repeated comments that the grid has a limited capacity, we cannot go all electric, we know we will need a range of solutions to address concerns about security of supply.

We have to "sell" novel ideas to an audience who are quite resistant to change: over 24m home owners.
This will be a major culture change programme for the wider population.

There is a skills problem with 1.3m engineers needed at Chartered and Technician levels across the economy by 2020, and we need to find a way to achieve this.
BIS are engaged as it is a clear growth and competitiveness issue for the economy as a whole.