

Recycling heat from industry could reduce carbon emissions

March 7 2014, by Harriet Jarlett



Industrial processes that require high temperatures often expel any surplus heat into the environment. While industries are fairly good at using as much of this surplus as possible, a small amount of heat is always wasted.

A range of technologies already exists to help industries recycle heat, but they have never been fully evaluated.

In a new study, published in *Applied Energy*, scientists from the University of Bath evaluated the opportunities for industry to recover heat, and analysed which technologies would work best.

'A large potential was seen in opportunities for re-use on site, which is the simplest method often practiced at the moment. If you have this heat

currently going into the atmosphere, and you have a demand for heat at a lower temperature elsewhere in the [manufacturing process](#) you can directly use it,' explains Dr Jonathan Norman of the University of Bath, lead researcher on the project.

'We also found good potential for converting heat into electricity. The advantage with this is that you don't need to re-use the heat nearby, because electricity is easily transported, and can be used for many things,' Norman says.

Although the technology to convert surplus heat to electricity already exists, it's expensive to install the equipment and the small amount of electricity generated is often seen as too small to make the cost worthwhile.

'The recovery options we identified were ones with real potential. We based these on previous studies of those industries and in some cases we spoke to industry and sectors. The heat is there and could be recovered, but the biggest barrier is the cost,' says Norman.

With industry under pressure from the government to reduce its carbon emissions, the researchers assessed what impact it could have if industries cut their surplus energy emissions into the atmosphere.

'If we supplied [electricity](#) from the heat surplus, it wouldn't have to be generated by a fossil fuel, and if it was used locally then it wouldn't place more pressure on the emission-intensive national grid. Overall, through a combination of technologies, we think recycling heat would save about 2.2 mega tonnes of CO₂ equivalent per year. In comparison, onshore wind generation in the UK saved about 3.5 Mt of CO₂ equivalent in 2010, compared to the average emissions of the national grid' Norman explains.

While surplus heat could be better utilised, Norman believes that improving the efficiency of the current processes used to generate heat is also possible.

'It's important to not just consider the potential for heat recovery but also the potential for improving efficiency on a larger basis, if processes were made more efficient the heat available might decrease and in some cases that would be preferred,' Norman concludes. 'In some cases there might be more economic methods to save CO₂ than installing this [heat](#) recovery equipment, and in many cases more easily implemented efficiency methods could save emissions at a lower cost.'

More information: Study paper: www.sciencedirect.com/science/.../S030626191300901X

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