Thermodynamic panels

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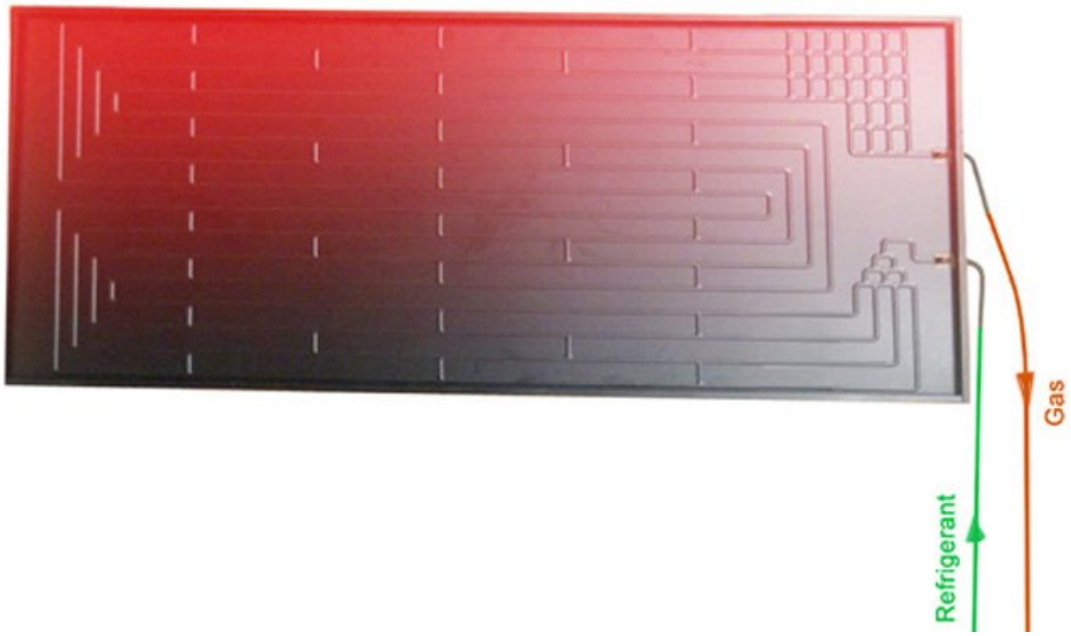

Every so often you hear of a new intriguing energy technology and a few weeks ago this happened to me with thermodynamic panels. I saw an advert in the paper. So what are thermodynamic panels? I'll start describing what they look like. They are jet black and covered in slightly raised pipes running across their surface. They look a little like thin film PV modules except they are bigger. The name I think comes from the scientific fact that for any matter above absolute zero (0°K or -273.16°C) you can extract heat according to the laws of thermodynamics. Obviously the higher the temperature the more heat energy there is available and the easy it is to extract. So how do these things work? Well they extract heat from the air very efficiently by pumping a very cold liquid around (as low as -20°C to -30°C. The heat from the air is transferred to this liquid and then via a compressor to your hot water tank. They work exactly like a fridge or freezer, trying to cool the air. The systems have a number of stated advantages; 1) the first is that they will operate and extract heat from the air in very low temperatures, including at night. Vacuum tube solar hot water will heat water well below zero, so this sounds plausible, although not at night. 2) the second is that unlike solar hot water they don't need to even be on a roof, much less a south facing roof, although would definitely help. 3) the third advantage is that they will work with an existing hot water tank, so you don't need to fit a new one with a built in heat exchanger, saving costs and making them easier to install. 4) Very little if any maintenance is required. The disadvantages are; 1) whilst you don't have to put them on a roof, it clearly helps. It raises efficiency and makes the compressor last longer. 2) They use quite a lot of electricity. Again when the panel is working and how hot it is outside seems to make a difference here. I have been unable to determine whether you have a pump and a compressor, or the compressor acts as both. 3) One of the big selling points of Thermodynamic panels are that they work at night. However since they operate less efficiently then its not thought to be good idea to run them at night due to strain on the compressor. A control system can be programmed with times/temperatures when the system should operate. 4) They don't look very attractive. 5) Tests have shown they are not as efficient as made out to be. 6) They are very costly and are not eligible for Renewable Heat Incentive in the UK (0nly those with standard anti-freeze are?!?). A table of costs suggests they are very competitive if you use immersion heating to heat your water and also very competitive with LPG. But they take quite a long time to pay back if replacing an electric boiler and mains gas over 16 years. (I would question the figures slightly since it suggests a boiler is replaced every 16 years and the mains gas prices quoted seem low.) Also the running costs due to electricity can be semi-negated if you generate your own electricity. In fact this would be economically beneficial rather than sending it to the grid. Watch this space. A lot depends on making compressors more efficient to extract the maximum amount of heat and this technology does appear to be improving. I'm wondering if you could string loads of them together and heat your house. Given a lack of great alternatives this might make sense. Neil

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