Advice on getting an air source heat pump

Bob Langton of Low Carbon Gordano has kindly written about his personal experience of having an air-source heat pump and thanks also to Matt Wood from Bio-Regional who has added his thoughts below.

Air-source Heat Pumps

We installed an air-source heat pump in June when our gas boiler showed signs of imminent death. We thought it made sense for us, given that we have a 4kW solar PV system and have only been using a small fraction of the output - about 85% goes to the grid.

There are two main manufacturers available in this country - Mitsubishi and Daiken. Both are probably equally efficient and should turn one unit of electricity into about 4 units of heat, but we went for a Daiken model, even though they are more expensive, because they will heat hot water as well as deal with the central heating. You'd be looking at spending about £10 000+ in any case, but should get about £7000+ back thought the Renewable Heat Incentive over the course of 7 years.

Have we made a good decision? It's too early to tell, really. The hot water aspect is proving good now we've got it set up so that it heats the water in the middle of the day when there's most solar power available but we've hardly used the central heating element yet. I'm pretty sure that it wouldn't be worth it except in combination with solar PV and with a house that's been fairly well insulated. One aspect of it all is that the control units are really complex and difficult to manage - this seems to be true of both sorts: the principle is that controls are set up at installation and the user leaves them alone, but that didn't really work for us and I've had to use the (very effective) Daiken Helpline to get things more as we want them.

In the longer term, most experts seem to expect that we will want to 'electrify heat' as it's put. But that will only make sense on the large scale when the electricity grid is almost entirely based on low-carbon sources and when the nation's homes are much more energy efficient. Wales & West Utilities (that manages the gas grid in our region) is trialling a combined heat pump/gas boiler approach, which will use the heat pump when the sun is shining and the gas boiler when it's not. It may prove a good option if it becomes generally available, though I've no information about costs.

From Matt Wood

Heat pumps are best in well-insulated houses because they emit heat through the radiators at about 50°C rather than the 80° from a gas boiler. This also means that it is less responsive than a gas boiler – you'll need to rely more on thermostats and timers than turning the heating on high for a short period like many people do with older boilers. My house is 1930s (cavity wall) and fairly warm so with a bit more insulation it should be ok.

Older houses will be more challenging for a heat pump without expensive insulation. Most of the problems I have heard about are councils/housing associations that have installed them and either didn't really know what they were doing and/or haven't trained the householders in how to use them properly.

Hot water is not a problem for heat pumps. Scalding water from the tap is about 55° and comfortable hot water for a shower is about 42° so well within the heat pump's normal range. Heat pumps come with a hot water tank, so you have instantaneous hot water.

I think the key things to know about installing them are:

- The heat pump internal unit (including hot water tank) is about the size of a large fridge-freezer so it may not fit where your boiler currently sits.
- The external unit includes a fan which does create noise so you should consider where to put this where it won't bother you or neighbours (and will still easily pipe into the house). I don't know how bad the noise is in practice because I haven't lived with one, but newer models are quieter than older ones. Mitsubishi Ecodan has been recommended to me for efficiency and quietness.
- You may need to replace your radiators, because heat pumps need larger surface area radiators due to the lower temperatures. Newer radiators used in gas central heating should be ok.
- If you do need to replace radiators it's worth considering underfloor heating, and it's definitely worth insulating under the floorboards when you do it. Obviously this adds to the cost and is quite disruptive as well because you'll have to move all the furniture out, but it will make a big difference to comfort and running costs.

In terms of installers, I've had mixed results in getting a quote. You don't need to look ultra local because most companies are regionally focused. However, Gem Solar came to survey my house and gave me the information I was looking for. Nu-Heat did a desktop quote for me too and were very professional. You can look for other companies here.