

What has this winter taught us about home heating?

*Apart from we are paying too much – **AshburnStoves.co.uk***

Whether it is the rising cost of utility bills, the difficulty of dealing with faceless energy companies or environmental concerns; people's thoughts are certainly more focused since the recent wintery weather reminded us how challenging the weather can be.

One of the first things people find when looking at 'alternative' or 'off-grid' heating options, is how confusing the options can be when they simply want heating and hot water 'on-demand' with as little fuss as possible.

So, we hope this short review will help give some clarity, but will also open people's minds to some innovative and 'different' thinking.



Energy

Renewable or sustainable energy is a term used to describe energy which does not release Net carbon emissions, currently locked into a form such as coal, into the atmosphere from where it cannot be recovered.

Comparing wood to coal; the biomass carbon cycle allows the carbon released into the atmosphere when wood is burnt, to be recovered again by the next generation of trees which absorb Carbon Dioxide when growing. Provided the timber is from a managed resource where sufficient new timber is grown.

Solar energy is generated by sunlight, whether hot water or electricity, while heat pumps use a small amount of electrical energy to produce a larger amount of heat energy. How sustainable heat pumps are depends upon the source of the original electrical energy – On-grid or self-generated via solar panels.

Biomass

Biomass energy is produced by burning wood or agricultural crops (whether surplus production or specific Biomass crops). Modern Biomass boilers are very efficient and can be largely automatic; running on fuel pellets. Biomass boiler-stoves combine a log stove with the functionality to run a heating and hot water system.

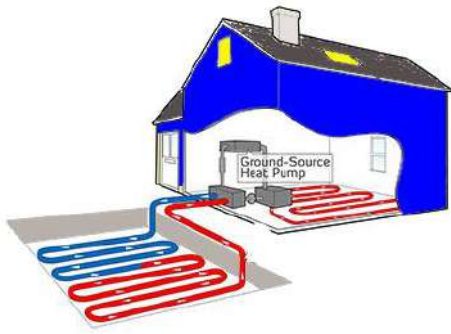


Solar Thermal

Solar thermal systems use the heat of the sun to heat water. Modern solar thermal panels are very efficient and can be flush fitted on a roof, to provide less visual impact even in a National Parks.

Solar PV

Solar PV systems generate electricity. Until recently this generated energy would be fed back into the electricity network, to provide a modest 'pay-back' on electricity bills. Recent innovations from companies such as Tesla however mean that storing such generated electricity 'in-house' via a large battery is now a reality.



Heat Pumps

Heat pumps can draw heat from a number of sources: the ambient air, the ground via a bore hole, or from water. They are effectively an air conditioning unit in reverse.

Heat pumps need an electrical source of energy to run, but produce more heat energy than the electrical energy they use. The big innovative development for heat pumps will be the continued development of home battery units, allowing electrical Solar PV to generate and store energy which can be used by a heat pump through the night.

On-Demand v Energy Storage

This conundrum is the source of many questions; ***'how can solar energy keep us warm at night' 'I won't have any hot water in the morning until I light the stove'.....***

The answer lies in efficient energy storage and management of that stored energy.

Tesla (and others) is developing high efficiency battery storage for home use. This can power lighting and run infrastructure such as heating system pumps through the night. This can ultimately make the home self-sufficient or 'off-grid' and replaces the option of feeding energy back into the National Grid at very low rates of return.

Central heating generally relies on hot water, available 'on-demand' and controlled to provide heating and hot water in the right places. Modern intelligent heat stores are effectively water tanks with extreme insulation fitted. Properly configured with heat exchangers and fitted with smart controllers, such a heat store can provide storage for hot water generated by Solar Thermal panels or Biomass



Multi Energy Intelligent Systems

The future for home heating and energy is without doubt Multi-Energy-Systems, combining two or more energy sources into one system depending upon personal preferences, lifestyle and location. The enabling factor being the ability to store energy, whether hot water or electricity.

Fossil Fuels and Renewables combinations

People looking for environmental benefits may question this statement; ***'for many people a mix of renewable energy and fossil fuels may be the reality for some years'***

It is likely that cost, lifestyle and other practical consideration will limit most people's ability to turn entirely to renewables in the near future. Government has tried offering RHI grants and may soon move towards penalties by loading domestic rates, however the scale and complexity of the decision making process will be more powerful for most people. By opting for the right heating system options now, which are intrinsically 'multi-energy' a combined fossil fuel and renewable system could potentially halve environmental impact in many cases, with the option to add 'plug & play' changes in the future.

Insulation and energy transfer

Property insulation is one of the most cost effective ways to reduce heating costs and lower environmental impact. It is also one of the easiest ways to make a difference.

Energy transfer uses a system of ducts and fans to move heat from one part of a property to another, managed by a smart system. Often difficult to retro-fit into a property.