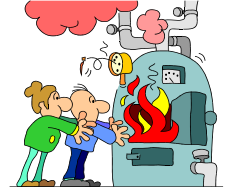


Fact Sheet No. 4

HEATING AND HOT WATER: How to get the best from your new or existing system.



First things first!

Before carrying out any major changes such as installing a new central heating system or replacing an old boiler, make sure that your home is really well insulated (see fact sheet 2 and fact sheet 3). There is little point in incorporating the most energy efficient generation and distribution system, if the building is leaky and un-insulated - allowing an unwanted flow of heat energy from the dwelling. A poorly insulated house could be losing up to 30% of its heat through its roof alone – costing you money and contributing to global warming.



Not only will this reduce fuel bills year-on-year, but initial costs will be lower as smaller boiler, radiators and pipe work can be used.

Which type of new system?

Table of Efficiencies of Heating System	
Heating Element	Efficiency of Heating System
Open Fire	30 - 40%
Open Fire with Back Boiler	40 - 55%
Oil/Gas Heating System	60 - 75%
Oil/Gas Fired Condensing Boilers	90 - 95%
Heat Pumps	300-500%
Biomass Boiler	75-95%

Should I upgrade?

Generally speaking, the older the system, the less likely the house has:

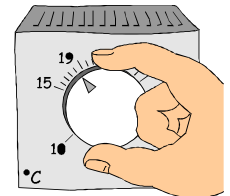
- A high-efficiency boiler/Heat-Pump installed.
- Radiators and hot water controlled independently (separate thermostats and motorised valves)
- Energy-saving electronic controls - digital time switches, programmable or optimising room thermostats, Summer/Winter/Holiday facilities
- Thermostatic radiator valves, etc.
- Zonal control of heating system.
- Insulated Pipe work.

And the more you could gain from improving the system, both financially and in terms of improved comfort. This leaflet explains some of the possibilities - by following this advice, there is a

potential to halve the heating and hot water fuel bills, and the investment could be repaid in as little as 1-2 years.

Some basic advice

- Turn down the radiators in any rooms not in use.
- Have a combustion efficiency test carried out on your gas/oil boiler every 1-2 years. This ensures that your boiler and burner are operating at optimum efficiency. An efficiency test by an OFTEC licensed service engineer is preferable.
- Turn down the heating thermostat as much as possible whilst still feeling comfortable.
- Use modern electronic controls which can regulate the heating and hot water system to provide just enough heat, just when it's needed, and no more.
- Ensure the hot water cylinder is really well insulated - with a jacket at least 80mm (3") thick. This will cost €15 or so but will pay for itself in about 1 year. Similarly, insulate all hot pipes (heating and hot water).



Boilers

An oil/gas boiler 15-20 years old may only be around 65-70% efficient, whereas a modern high-efficiency boiler will be 75-80%, and a condensing boiler 90-95%. Therefore, you could potentially reduce your heating bills by up to 40% just by replacing an old, inefficient boiler with a new condensing boiler.

Gas fired high-efficiency and condensing boilers can also be obtained as “combination” boilers (“combis”) which provide all your hot water requirements as well as doing the central heating. No hot water is stored - it is heated up instantaneously within the boiler, so there is an unlimited supply of it. The old hot water cylinder, the tank, and all of the associated pipework are not used anymore, so you can remove it all (and reclaim the airing cupboard if you want some extra space). Because all hot water is at mains pressure it can normally be run in 15mm pipework everywhere, and gives a good, powerful shower without the need for any booster pumps.



Old systems can easily be converted to a combination boiler system, and if the combi also has “sealed-

system equipment” (which most do) you can get rid of *all* your old tanks, cylinder and associated pipework etc. (thus reducing maintenance and the risk of pipes freezing in the roof space as well). Typically, combination boilers are most suited to apartment buildings where the heat and hot water requirement is lower than that of conventional houses.

Air to Water Heat-Pumps

An air-water Heat Pump acts as a fridge in reverse. The Heat-Pump extracts energy from the air in the outside environment in order to provide domestic heating and hot water.

There are two main types of Air-Water Heat-Pumps, a split system heat pump and a mono block system.

Split System:

A split system heat pump consists of an outside heat exchanger, fan unit compressor and an indoor unit. The two units are connected by refrigerant pipes. The outdoor unit extracts heat from the air and passes this heat energy to the refrigerant in the system. The refrigerant is compressed up to a high temperature and is circulated to the indoor unit which has a heat exchanger which takes the high temperature heat from the refrigerant and passes it to the water that circulates to the heating and hot water system.

Mono Block System:

A mono block heat pump consists of a single outside unit that contains the air to refrigerant heat exchanger, the compressor and the refrigerant to water heat exchanger. The mono block system works the same as the split system except the process is all done in the external unit. The outside mono block is connected into your house or building by two water pipes similar to an outside boiler system.

Co-efficient of Performance (COP)

The COP for a heat pump is the ratio of the energy transferred for heating to the input energy used in the process. The higher the COP the lower the operating costs therefore the lower the utility bills. Heat pumps usually have a COP around 3.5:1.

Control for Space Heating and Hot Water Supply Systems as per 2011 Building Regulations

Bring the standard of your heating system up to Building Regulations standards (Technical Guidance Document L Conservation of Fuel and Energy 2011) (For fully pumped hot water and water based heating system)

- Hot water storage vessels should be fitted with thermostatic control that shuts off the supply of heat when the desired storage temperature is reached.

- Separate and independent time control for space heating and for heating of stored water should be provided.
- The operation of controls should be such that the boiler is switched off when no heat is required for either space or water heating. Systems controlled by thermostatic radiator valves should be fitted with flow control or equivalent device to prevent unnecessary boiler cycling.
- Provision should be made to control heat input on the basis of room temperature, e.g. by the use of room thermostats, thermostatic radiator valves or other equivalent form of sensing device.
- Where a dwelling floor area exceeds 100m², independent temperature control on the basis of two independent zones will generally be appropriate.

Insulation of Hot Water Storage Vessels, Pipes and Ducts

All hot water storage vessels, pipes and ducts associated with the provision of heating and hot water in a dwelling should be insulated to prevent heat loss, except for hot water pipes and ducts within the normally heated areas of the dwelling that contribute to the heat requirement of the dwelling.

Thermostatic Radiator Valves (TRV's)

A radiator can be fitted with a TRV for about €20. A TRV senses the room temperature and turns the radiator up or down to maintain the desired temperature. TRV's can be fitted to most radiators, and are especially useful in rooms which could occasionally overheat (such as kitchens, bathrooms, conservatories and rooms containing fires etc.). On some systems you cannot fit a TRV to *every* radiator so check with your installer first. You should not fit a TRV in a room which has your main heating thermostat.

Smart Metering

With modern smart phones and iPhones, it's possible to turn these devices into a remote control heating device. This offers remote access to the main heating controls of homes.

Waterford Energy Bureau is a sub-section of Waterford City and County Council.



Waterford Energy Bureau
The Mall, Co. Waterford
Phone No: 0761 10 2429

www.waterfordenergy.ie
info@waterfordenergy.ie

Note: Disclaimer – While every effort has been made to ensure the accuracy of the document, no responsibility is accepted for any errors or omissions.