

Renewable Energy

Think Renewable Think Heat Merchants

Clean Energy **4 Life**

HEAT MERCHANTS



RENEWABLE
ENERGY



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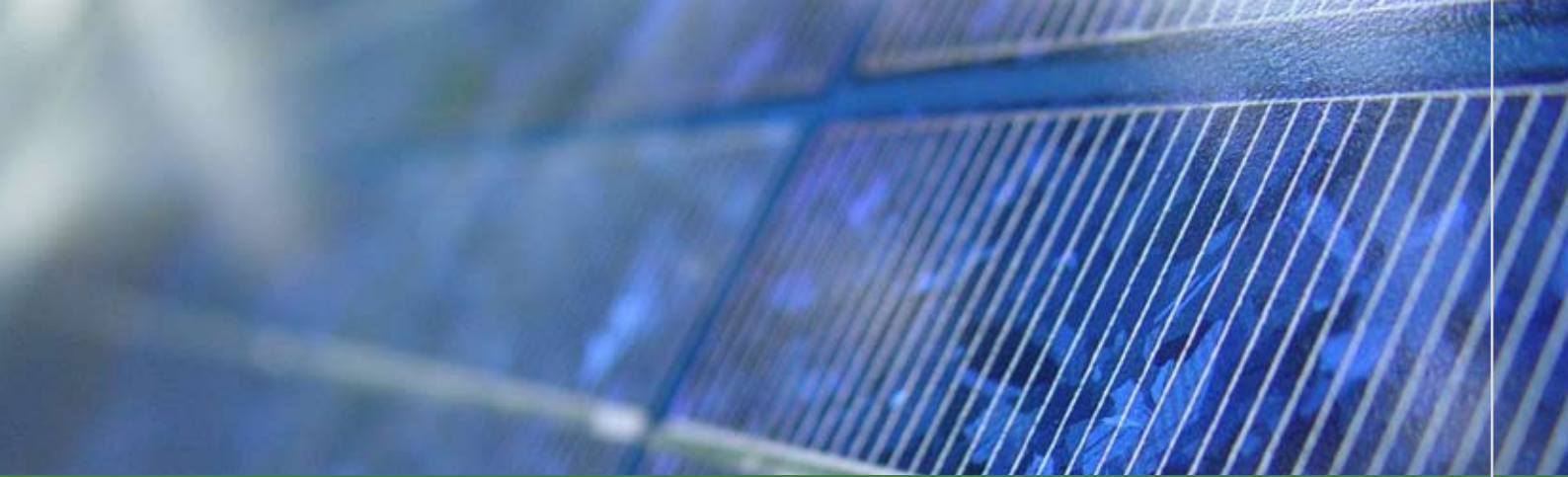
Energy can be derived from two main sources: renewable and non-renewable.

Renewable energy comprises readily available elements such as wind, solar, wood burning, and geothermal. No hazardous by-products or toxic emissions are associated with renewable energy. Global warming is not an issue and the source is renewable. Renewable energy products will reduce our dependency on fossil fuels, lower energy bills and cushion us against increasing energy prices.

Non-renewable energy sources include fossil fuels such as oil, gas, and coal. This source is finite and once the source has been depleted it is gone forever. Burning of fossil fuels is detrimental to the environment and poses health risks for individuals.

This renewable energy guide has been produced to give you our customer an insight into the various environmentally friendly methods of providing space heating and hot water. It outlines the various renewable energy options such as wood pellet stoves and boilers, solar panels for hot water, geothermal heat pumps and underfloor heating that utilizes energy efficient low temperature water.





Solar Panel Think Renewable

A solar panel consists of a collection of water filled copper tubes assembled together using a copper plate treated with a special absorption coating. The special coating traps radiant heat from the sun and transfers the heat onto water, thus creating hot water. This can be stored for use as and when required.

One of the most effective ways to trap the sun's heat is with a solar collector. Flat plate solar collectors absorb the heat from the sun and transfer it to a liquid passing through the solar collectors. The liquid, water & antifreeze, is then transferred to a storage tank to be used for heating or domestic hot water as required.

By using solar water heaters the amount of fossil energy required for space heating and hot water is reduced. The resultant drop in CO₂ emissions will benefit the environment and save on fuel costs.

Solar water heaters will reduce our dependency on fossil fuels, lower energy bills and cushion us against increasing energy prices.

The home energy-rating scheme is set to be introduced by government soon. This will make energy efficiency a significant factor in consumer purchase, rental decisions and house valuation. This EU directive on Energy Performance of Buildings will be passed into Irish law by January 2006.

In Ireland, we import approx. 85% of our energy needs. By utilizing renewable energy resources we can make some inroads into reducing this dependency and go some way towards protecting the environment.



Maintenance

Flat plate solar collectors have no moving parts and therefore require little or no maintenance. Heat Merchants offer a 10-year warranty with all flat plate solar collectors.

Reliability

All solar panels supplied by Heat Merchants are certified and conform to the following International Standards:

EN.12975

EN.12976

Solar Keymark

GE Pruft Standard

DIN Standard

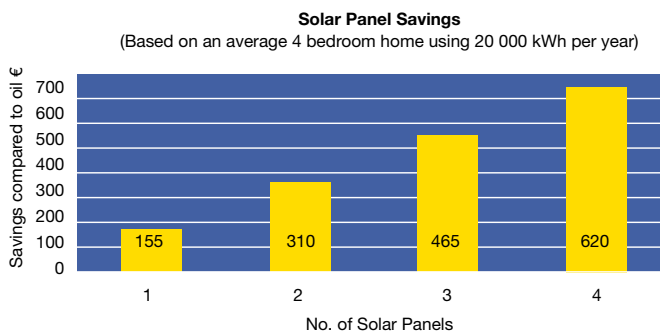
Benefits

Economy

A correctly designed and installed solar water heating system will provide 60-70% of domestic hot water. Based on typical hot water demand for a house with up to 4 occupants a saving of approx. €465 per year can be expected.

Apart from the very low cost of running the circulating pump all energy from the sun is free and not liable for carbon tax.

The addition of solar panels to a property will give an added value in excess of the cost of the installation.





Geothermal Heat Pumps Think Renewable

A geothermal heat pump or ground source heat pump collects naturally produced low-level heat from the ground, pond or lake through a series of plastic pipes filled with water and anti-freeze. This heat is then converted into usable heat for space heating and hot water. Efficiencies in excess of 400% are commonplace with these systems.

A geothermal heat pump extracts low-level heat from the ground and passes it through an evaporator, compressor and a condenser. This process combined with the input of electrical energy raises its temperature to a level suitable for space heating. The preferred method of space heating is underfloor heating, however, other forms of heating such as radiators or fan coils can be used.

Operating efficiencies of up to 400% can be expected with a geothermal heat pump, i.e. an input of 4.0 kW of electric energy will give a usable output of 16 kW.

Benefits

Cost Effective

The initial investment required to install a geothermal heat pump is considerably more than a conventional oil or gas boiler. However, the running costs associated with a heat pump are significantly lower. The expected payback on a geothermal heat pump when compared to oil fired heating system is approx. 6 to 7 years.

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Low Maintenance

Geothermal heat pumps require very little maintenance. With relatively few moving parts and no combustion heat pumps are very reliable and require minimal maintenance.

Low Emissions

Geothermal heat pumps emit 40% less CO₂ than conventional heating systems (ref: Sustainable Energy Ireland).



Wood Pellet Burners Think Renewable

Space heating using modern wood burning appliances is highly efficient and can be fully automated. Indoor and boiler house models are available to suit most applications. The main source of fuel is commercially produced wood pellets.

Wood pellet stoves are primarily used as room heaters; however, with the increasing cost and uncertainty regarding supply of imported fossil fuels a range of models fitted with highly efficient boilers are available. These wood pellet boilers are supplied in indoor and boiler house versions ranging in output from 8kW to 43kW for domestic use.

Automatically controlled wood burning stoves offer a high level of convenience, are up to 90% efficient and have significant aesthetic appeal.



Benefits

Independent of rising fossil fuel prices

With CO₂ – emitting coal, gas and oil prices set to increase and with the ever-increasing dependency and demand on these products it is merely a question of time before these resources are exhausted.

Availability

Wood is available in abundance and is a renewable resource. With this availability it is fair to assume that prices for wood pellets will remain stable and continuity of supply won't be a problem.

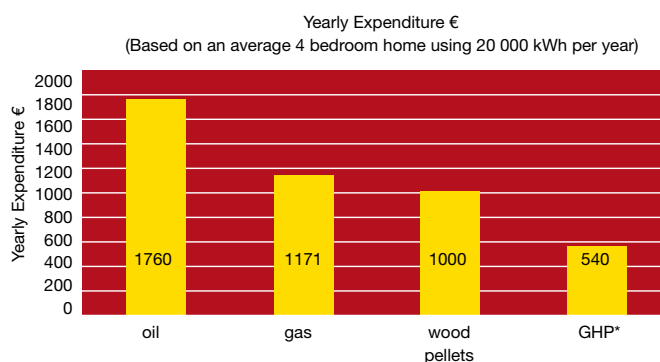
CO₂ Neutral

Burning pellets only releases carbon dioxide previously absorbed by the wood and is therefore referred to as CO₂ neutral. Irish produced wood pellets come from sustainable resources and by-products of timber production. We are no longer dependent on imported fossil fuels and have the opportunity to protect the environment, support local forestry and save on fuel costs.

Efficiency

Due to the low moisture content of wood pellets (less than 10%) and ash content (less than 1%) wood pellets burn very efficiently. As can be seen from the table below wood pellet prices compare very favourably with other commonly used fuels.

Efficiency of up to 90%



*GHP - Ground source heat pump

MULTI-HEAT for Bio-Fuels Think Renewable

The MULTI-HEAT type is especially suitable for effective and environmentally friendly firing with bio-fuels such as wood pellets, wood chips and grain/corn.

Firing with wood pellets, wood chips or grain/corn in MULTI-HEAT can achieve considerable savings in comparison to oil.

Construction and function

The construction of the boiler gives high operational security, significant durability, good stoking economy, environmentally friendly combustion and simple operation resulting in a very high efficiency at 89-91%.

The temperature is regulated by a two-step control. This means that the boiler is running at full output until the set temperature is close to being achieved - then the control switches over to reduced output and continues at this rate. The hopper must typically be filled up once or twice a week during cold weather, however, this will depend on the heat requirement, hopper size and fuel. The possibility of automatic feeding of fuel is also available. Ash is removed as required.

Some advantages in short

- For economical, environmentally friendly combustion of various fuels such as wood pellets, grain/corn and wood chips.
- Constant heating gives optimum building comfort. Very high efficiency: 89-91%.
- Multifunctional digital control provides simple operation with continuously variable heat output from 30-100%. The boiler does not require a storage tank.
- Exposed parts of the combustion chamber are constructed in acid-proof, stainless steel (AISI 316L). Remaining steel plates exposed to flue gas are 6 mm thick.
- With automatic shut-off to prevent fuel hopper burn back.
- Convenient top flue exit location.
- Delivered completely assembled and ready-mounted with hopper, casing and control.
- Oxygen control and automated refilling of hopper available as optional extras.



Rehau Underfloor Heating Think Renewable

Underfloor heating works by circulating water at 40°- 45°C through a series of cross-linked polyethylene pipes (PE-Xa). The result is an economical to run, comfortable and safe heating medium with a life expectancy in excess of 50 years.

Conventional heating systems using radiators require water temperatures in excess of 70°C, with heat concentrated in one area of the room. Underfloor heating however works on the principle that the entire floor area is heated to a much lower temperature thus making it ideal for use with geothermal heat pumps or condensing boilers.

Benefits

Comfort

Gentle low-level heat with typical floor temperatures 27°-28°C. All systems designed to suit individual need of each dwelling.

Safety

Warm floors eliminate the growth of house dust mites. Eliminates hot surfaces.

Economy

Low water temperature heating system ideal for heat pump application. Suitable for use with condensing boilers.

Design Freedom

No restrictions on placement of furniture. Curved walls and full height glazing is not a problem.

Maintenance

No cleaning or heat staining. No corrosion - main constituent is plastic pipe.



Control

Silicon chip technology providing the right amount of heat in the right place at the right time.

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Cost Effective

Below is a table showing the heating costs and CO₂ emissions using a 2,000ft² house occupied by a family of four. An average estimate of space heating and domestic hot water expenditure would be based on the consumption of 20,000 kWh of energy per annum. This is the equivalent of almost 3 x 1,000 litre fills of oil, burned using a boiler with an average efficiency of 70%.

TABLE OF HEATING COSTS AND CO₂ EMISSIONS OF DIFFERENT HEATING SYSTEMS

System	Efficiency ^G	Energy Expenditure		CO ₂ Emissions (kg/year) ^F
		Per kWh	Per Annum	
OIL BOILER	70 %	€0.088	€1,760	8,185
NATURAL GAS BOILER	70 %	€0.078	€1,171 ^D	6,000
LPG BOILER	70 %	€0.1233	€2,357 ^C	6,000
ELECTRIC STORAGE HEATING	90 %	€0.0945 ^B	€2,100 ^A	16,000
WOOD PELLETS	90%	€0.05	€1,000	400 (distribution)
GEO THERMAL	350%	€0.033 ^E	€540 ^A	4,114

Notes: (A) Only 50 % of the standing charge per two months is included (Geothermal figures include higher standing charge for night saver electricity), in addition for storage heating extra charge of €1.14 per two months for night storage meter, (B) Storage heating using 75% Night Rate, and 25% Day Rate electricity. (C) Standing charge of €76.18 per year is included. (D) Standing charge of €30.75 per two months is included. (E) Geothermal using 60% Night Rate and 40% Day Rate electricity. (F) Average data from International Energy Agency. (G) Average figures from Sustainable Energy Ireland.

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