FAIRENERGY

Community Interest Company

SOLAR & WOOD FUEL HEATING SOLUTIONS

Product Brochure

SUMMER 2009

"Securing a sustainable energy future for all"

0845 126 6555 www.fairenergy.org.uk

"Securing a sustainable energy future for all"

"A biomass boiler could save you around £470 a year on heating bills."

SOURCE: ENERGY SAVING TRUST 2009

FAIR ENERGY CIC

Fair Energy installs high efficiency solar and wood fuel heating systems into domestic and commercial properties.

We have a diverse skills base of technical, mechanical and heating engineers with the capability to design and install the most efficient system in your property. Together we encompass many years experience in the renewable heating industry at domestic and commercial scale.

We are dedicated to providing turnkey solutions from conception to completion and are committed to installing systems that provide real benefit to the end user.

We have a range of products selected for their outstanding efficiency, build quality and long service life.

Once installed we offer annual servicing and general backup should a problem arise.

Please call our design team on
0845 126 6555
to discuss your requirements

Or visit our website
www.fairenergy.org.uk
for more information

DOMESTIC SERVICES

Fair Energy will help you through the process of assessing your heating requirements, selecting the best heating option for your property and ensuring all works are planned, conducted and completed to a high standard.

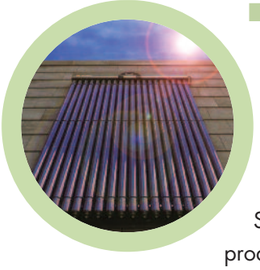
For wood fuel installations in domestic properties we generally recommend the use of pellet or log systems as these offer reduced capital installation costs when compared with chip systems. Please see opposite for further information on the benefits of each system.

COMMERCIAL SERVICES

Fair Energy offers renewable heating solutions for the commercial, public sector and community environment. We offer full project management and installation from conception to completion. Services we offer include the following:

- System sizing and specification
- Boiler room design and installation
- Fuel delivery system design and installation
- District heating main installation
- Technical drawings
- Full project management
- Fund-raising support

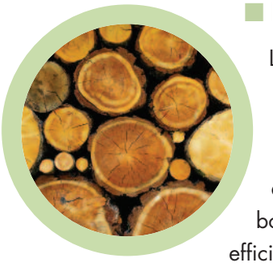
SOLAR SYSTEMS



The average household puts 428kg (gas) to 1037kg (electricity) of CO_2 into the atmosphere each year through hot water heating. Solar energy is free, produces no CO_2 emissions and the technology to capture it is now well developed.

Fair Energy installs evacuated tube and flat panel array solar hot water systems that provide up to 70% of annual hot water requirements. In summer this is estimated to be 95% and in winter the solar system will pre-heat incoming cold water to provide up to 25% of hot water needs.

LOG SYSTEMS



Log boilers are now an efficient means of heating your home, with the application of technology to assist the burning process log boilers can burn with over 80% efficiency, turning more of your log into useful heat.

Log boilers can be connected directly to your existing heating system or via an accumulator tank. The tank stores heat and enables the user to only fire the boiler once or twice a day, or every 2 or 3 days, according to how the system is designed. Heating is then run automatically via a programmer from the tank.

PELLET SYSTEMS

Pellets are a uniform fuel with a high calorific value that allow the boiler to respond quickly, acting in a similar way to a traditional oil or gas boiler. Most pellet boilers provide over 90% efficiency.

Pellet systems offer the advantages of full automation of your heating system, lower capital installation cost and much reduced fuel storage space for the same calorific value. Pellets are simply poured into the boiler's fuel hopper, ignition is automatic and the internal programmer then controls your heating and hot water automatically.

CHIP SYSTEMS

Wood chip turns timber into a form that is easily used in automatic wood burning equipment. Fuel handling automation can convey chip from store into the boiler, unlike logs. Like logs the chipped material needs drying to achieve a low moisture content of 25-35%. Chip systems give lower heating costs however initial capital outlay is much greater. With automatic ignition and control the customer has only a low need to attend to the boiler.

ACCUMULATOR TANKS

Put simply, an accumulator tank is a large, well insulated, hot water tank, and forms the heart of your home heating and hot water system. Log and chip boilers operate at very high temperatures to achieve their efficiency so should not be turned down. Accumulator tanks allow the boiler to run at full output by storing the heat produced. This is then released slowly when the boiler has finished its cycle. Solar heat can also be fed to the tank and make a contribution to heating and hot water.

COMBINED SOLAR AND WOOD FUEL SYSTEMS

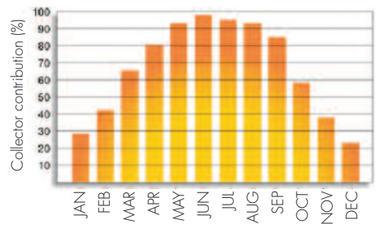
A wood burning appliance is the perfect companion for solar thermal panels because in summer when you wouldn't dream of lighting your stove the panels provide your hot water and you don't need the heating. In the winter the stove provides hot water and heating, and the solar panels contribute.

SOLAR HOT WATER SYSTEMS

The average household puts 428kg (gas) to 1037kg (electricity) of CO_2 into the atmosphere each year through hot water heating. Solar energy is free, produces no CO_2 emissions and the technology to capture it is now well developed.

Fair Energy installs solar hot water systems that provide up to 70% of annual hot water requirements. In summer this is estimated to be 95% and in winter the solar system will pre-heat incoming cold water to provide up to 25% of hot water needs. The table below shows the annual useful solar contribution from a collector in London.

Annual useful solar contribution

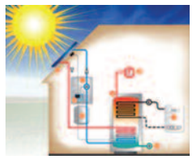


We work closely with Kingspan Thermomax as our experience has shown their systems to be of very high output efficiency and of superior build quality. Being designed for northern climates, they offer the following benefits:

- Up to 70% of annual hot water requirements
- Rapid conductivity and transfer of energy into heat
- Provides heat even in cold, windy or humid conditions
- Maintenance free
- Excellent build quality
- 25 years manufacturing solar hot water systems

Solar hot water systems are simple in operation with few moving parts. A temperature sensor on the panel tells the solar controller when there is heat and the controller then runs the pump to move the heat to the hot water cylinder. Systems are maintenance free with no moving parts to wear out.

Products and services



Fair Energy designs and installs solar hot water systems that are suitable for your property and hot water requirements.

We have a network of qualified and experienced solar heating engineers who carry out installations and who are on hand for maintenance and servicing.

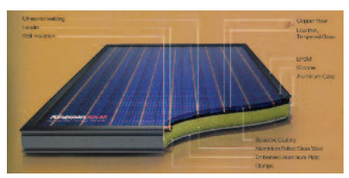
Thermomax Evacuated Tube Systems

These systems use vacuum filled glass tubes with internal absorbers with a selective coating. The vacuum insulates the internal absorber and the cylindrical nature of the tube means the sun is almost always at 90° to the glass, thereby allowing most of the solar radiation through. They have the following advantages:

- Lower weight
- Longer heating season
- More effective in cloudy weather
- Consistent performance

We install both Thermomax DF100 and HP200 panels.

Marvel Flat Plate Collector



An insulated flat panel with a selective absorber surface. Well insulated to prevent thermal bridging. They offer the advantage of multiple installation options including roof integrated, freestanding and wall mounted.

We install Kingspan Marvel Flat Plate Collectors.

AKVATERM ACCUMULATOR TANKS

Akvaterm are the market leaders in accumulator tank construction. Their tanks have a design life of over 50 years and are of high quality steel construction.

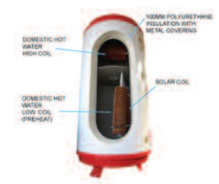
They are very well insulated with 100mm polyurethane foam insulation and a steel sheet covering to protect from wind chill. They lose less than 2°C of heat per day.

They are available in all shapes and sizes and can be built to requirements. Their two main standard models are the AKVA tanks and the AKVAir Solar tanks. The AKVAir tanks are designed with solar in mind and feature a baffle plate two thirds of the way up to prevent the creation of convection currents being generated from the solar coil. The AKVA tanks can also receive a solar coil.

Kaaviokuva

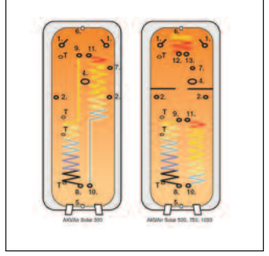
These tanks can provide mains pressure hot water via a high recovery finned copper coil placed in the top of the tank. This offers a far superior way of providing mains pressure hot water over unvented systems, with no annual servicing required.

AKVAir Solar tank



The use of a tank in conjunction with a log boiler allows you to only fire the log boiler intermittently. The tank stores heat which can then be used for your heating or hot water at a later time, rather than having to fire the log boiler directly into your heating system.

AKVAir Solar



These tanks allow you to combine very efficiently heat from a wood fuel boiler with heat from a solar panel. In winter heat is provided by the wood fuel boiler with a small contribution from the solar panel, in autumn and spring they combine which allows you to only run the wood fuel boiler moderately and in summer you will be able to run almost solely on solar.

AKVAir solar tanks are available in a range of sizes from 300 litres to 1000 litres.

AKVA standard tanks are available in a range of sizes from 300 litres to 5000 litres.

Please call our design team on **0845 126 6555** to discuss your requirements

Visit our website **www.fairenergy.org.uk** for more information

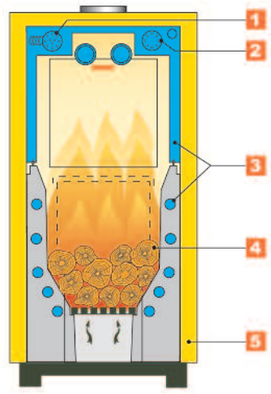
PERGE LOG BOILERS

Chaudieres Perge SA is the leading French manufacturer of wood burning boilers and has many thousands of units in service throughout France and Europe. They are heavily constructed boilers that offer a range of outputs from 20kW to 40kW.

Perge log boilers are an extremely efficient way of producing heating and hot water. In a traditional boiler the walls of the combustion chamber barely exceed the temperature of the water within. The Perge MC design utilises a number of tubes cast into a high temperature refractory ceramic combustion chamber. This design allows the inside surface of the combustion chamber to reach temperatures of over 500°C which ensures complete and efficient combustion and eliminates tar, even with wet wood. This patented design also protects the heat exchanger tubes from condensation and corrosive flue by-products which facilitates a long service life from the boiler.

The boiler's lower heat exchanger absorbs up to 50% of the heat produced through the refractory ceramic material. The large surface area of the upper heat exchanger then allows maximum absorption of heat from the combustion flue gases.

1. Anti-boil water thermostat
2. Optional immersion heater
3. Durable long life heat exchanger
4. Automatic temperature regulation
5. Fully insulated casing



The generous combustion chamber allows a high volume of wood to be loaded at once, resulting in a burn time of up to 10 hours. This is aided by the high boiler efficiency and low heat loss. The loading door and firebox accept logs of up to 50cm long and 30cm diameter.

We install these boilers with a wide range of accumulator tanks which allow you to only fire the boiler once or twice a day, or every 2 or 3 days, or even longer in summer. This is achieved by filling the firebox with timber and allowing it to burn unattended until the tank is fully charged. Heating and hot water is then automatically fed from this tank. We install all systems with safety features that take account of power or overheating failures.

Systems are sized appropriately to your property's heating load, the available space and your personal requirements.

TECHNICAL SPECIFICATIONS

	MC 5-20	MC5-30	MC15-40
Max. output	20kW	30kW	40kW
Operating range	5-20kW	5-30kW	15-40kW
Efficiency	83%	83%	83%
Max. log length	500mm	500mm	500mm
Firebox size	340(w)x535(d) x495(h)mm	340(w)x535(d) x495(h)mm	394(w)x638(d) x717(h)mm
Water volume	49ltr	59ltr	85ltr
Max. pressure	3 bar	3 bar	3 bar
Flue outlet	180mm	180mm	180mm
Weight	425kg	445kg	530kg
Height	1270mm	1270mm	1400mm
Width	600mm	600mm	640mm
Depth	1010mm	1010mm	907mm

Please call our design team on **0845 126 6555** to discuss your requirements

AQUATHERM INSERT BOILER STOVES

Fitted F26

Aquatherm insert boiler stoves feature high output, high efficiency boilers that are capable of heating both small and large properties.

F21

They offer excellent build quality combined with stunning contemporary style and design. With very large viewing screens combined with large fireboxes they provide a very attractive visual display.

They feature:

- Over 80% efficiency
- An airwash system for keeping the screen free of soot
- Preheated secondary air intake for more efficient burning
- A baffle that opens to increase draught when you open the door

P26 and P34

- Option of flat, curved or panoramic viewing glass
- Doors slide up into hidden recess or open sideways

These stoves need to be built into place, ideally into an existing fireplace. We supply these stoves fully installed and connected to your existing heating system.

C26 and C34

F26 and F34

TECHNICAL SPECIFICATIONS

	F26	F34	F21	C26	P26	P34
Output	26kW	34kW	21kW	26kW	26kW	34kW
Heat to room	9kW	10kW	6kW	9kW	9kW	10kW
Heat to boiler	17kW	24kW	15kW	17kW	17kW	24kW
Efficiency	80%	80%	80%	80%	80%	80%
Max log length	600mm	750mm	n/a	600mm	600mm	750mm
Weight	230kg	275kg	175kg	230kg	230kg	275kg
Height	1380mm	1380mm	1380mm	1380mm	1380mm	1380mm
Width	800mm	990mm	790mm	740mm	750mm	920mm
Depth	680mm	800mm	640mm	760mm	680mm	780mm
Glass type	Flat	Flat	Flat	Curved	Panoramic	Panoramic

Visit our website **www.fairenergy.org.uk** for more information

EXTRAFLAME PELLET BOILER STOVES

Comfort

Extraflame's range of pellet boiler stoves are well constructed Italian built stylish stoves that offer efficiencies of up to 95%. These models offer an attractive addition to any living space and allow you to view the fire through the front door. They feature an airwash system that maintains a clear viewing glass. They are available with either steel or ceramic side panels and in a range of colours.

The Comfort Idro model is an insert boiler and can be built into an existing fireplace or recess.

They offer complete automation of your heating system and feature a built in 7-day programmer, automatic ignition, expansion vessel, central heating pump, integral pellet hopper and fuel feed system. They offer relatively straightforward connection to your existing central heating system and the various models cover up to 24kW, enough for a large property. They have modulating outputs so can meet a varied heat load.

Ecologica

Lucrezia

Pellets can be ordered as a 1 tonne pallet containing 66 individual 15kg bags for easy loading into the boilers' hopper.

Duchessa

TECHNICAL SPECIFICATIONS	Lucrezia Idro	Duchessa Idro	Ecologica Idro	Comfort Idro
Output	5-25kW	3.9-13.1kW	3.8-16kW	4-14kW
Output to water	4.9-23.7kW	3.6-12kW	3.5-12.5kW	8kW
Efficiency	95%	91%	80%	90%
Fuel type	Pellet	Pellet	Pellet	Pellet
Electric consumption	150-180W	120-150W	120-150W	100-120W
7 day programmer	Yes	Yes	Yes	Yes
Electric ignition	Yes	Yes	Yes	Yes
Weight	265/230kg	170/158kg	179kg	157kg
Height	1339mm	1034mm	974mm	777mm
Width	544mm	538mm	667mm	663mm
Depth	647mm	543mm	691mm	781mm

Please call our design team on **0845 126 6555** to discuss your requirements

EXTRAFLAME PELLET BOILERS

TP30

Extraflame's range of pellet boilers are well constructed Italian built boilers that offer efficiencies of up to 94%. These are robust, advanced and practical pellet boilers that offer full automation of your heating system. They have large fuel hoppers that allow for long periods of continuous use. They are compact units and can fit into small spaces, ideally located in a garage, boiler room, outbuilding or utility room.

They feature a built in 7-day programmer, automatic ignition, expansion vessel, central heating pump, integral pellet hopper and fuel feed system. They offer relatively straightforward connection to your existing central heating system and come in outputs of 15, 22 and 31kW. Power outputs are modulating so can meet a varied heat load. The TC30 model can also burn logs.

TC30

LP14

Pellets can be ordered as a 1 tonne pallet containing 66 individual 15kg bags for easy loading into the boiler's hopper.

LP20

TECHNICAL SPECIFICATIONS	LP14	LP20	TP30	TC30
Output	4.3-15.3kW	4.4-22 kW/h	9-31kW	27.4/34.5kW
Efficiency	91%	94%	89%	91/85%
Fuel Type	Pellet	Pellet	Pellet	Pellet/Log
Min/max fuel consump.	1.0-3.3kg/h	1-4.7kg/h	1-6.9kg/h	1-6.9kg/h
Boiler volume	32ltr	32ltr	65ltr	120ltr
7 day programmer	Yes	Yes	Yes	Yes
Electric ignition	Yes	Yes	Yes	Yes
Weight	220kg	260kg	505kg	806kg
Height	1327mm	1368mm	1438mm	1600mm
Width	533mm	525mm	1398mm	1446mm
Depth	663mm	941mm	892mm	1179mm

Visit our website **www.fairenergy.org.uk** for more information

WHAT IS BIOMASS?

Biomass is biological material derived from living, or recently living organisms. In the context of biomass for energy this is often used to mean plant based material, such as wood or plants such as miscanthus which are commonly chipped ready for boiler consumption.

Why use Biomass?

Biomass is a renewable, low carbon fuel that is widely available throughout the UK. The production and use of Biomass brings additional environmental and social benefits at national and local levels.

Correctly managed, biomass is a sustainable fuel that can both offer a significant reduction in net carbon emissions compared with fossil fuels and also many ancillary benefits:

- Biomass can be sourced locally, throughout the UK, on an indefinite basis, contributing to security of supply.
- UK sourced biomass can offer local business opportunities and support the rural economy.
- The establishment of local networks of production and usage allows financial and environmental costs of transport to be minimised.
- Woodlands, forestry and agriculture are generally perceived to be an environmentally and socially attractive amenity by the UK population, providing opportunities for recreation and leisure activities.
- Correctly managed, biomass is a sustainable fuel that can deliver a significant reduction in net carbon emissions when compared against fossil fuels.
- Many biomass fuels generate lower levels of atmospheric pollutants such as sulphur dioxide, that contributes to 'acid rain'. Modern biomass boiler supplied by Fair Energy are highly sophisticated, offering combustion efficiency and emission levels comparable with the best fossil fuel boilers.

SOLAR

FREQUENTLY ASKED QUESTIONS

Do you offer grants on installed systems?

With our Microgeneration Certification scheme accreditation we can fully support your grant application. For more information call us on 0845 126 6555.

How long will installation take?

Installation usually takes between one and two days. Our engineers will arrive with all necessary materials and equipment to install and commission the system.

Is my property suitable?

For a domestic system you will need 3-4 square metres of south-east to south-west facing roof receiving direct sunlight for the main part of the day. On east/west facing roofs we are able to fit a 2 panel east-west configured system.

Panels can be fitted to most types of roof, including pitched,flat or curved.

If there are any large trees or buildings that overshadow your roof then your property may not be suitable.

Do I need planning permission?

You do not normally need planning permission in England. However, if your property is a Listed Building or within a Conservation Area or World Heritage Site then you may need permission. In this case we recommend calling your local Building Control office to check.

Will I need to change my cylinder?

You do not necessarily have to change your existing cylinder. We are able to use a special valve enabling us to make use of your current cylinder. However, for cylinders more than 10 years old we prefer to fit a new cylinder to provide greater efficiency and to avoid issues with old plumbing connections.

Does the system need any maintenance?

Systems generally require very little maintenance – a yearly check by the householder and a more detailed check by a professional installer every 3 years is generally sufficient. We have a range of service packages available, more details are available on request.

What guarantees will I receive?

You will receive a 10 year comprehensive limited warranty for the panel and a 3 year warranty for all other parts and labour.

How does the solar system work?

Solar hot water heating is very simple and uses very few moving parts. Solar hot water systems collect energy from the sun's rays using a series of copper heat pipes located within evacuated glass tubes and positioned in a south east to south west facing location. Liquid in the system pipe work is heated up and circulated through a solar coil

in the base of the hot water cylinder through which heat is transferred to the stored water, which can then be drawn off at the taps. The temperature in the collector is constantly monitored by a solar controller and compared with the temperature in the cylinder so that when the temperature in the collector exceeds the cylinder temperature, the pump is activated to circulate the hot water from the panel. In winter months, when the days are shorter and the sun's rays less intense, the usable energy is still significant but much reduced. This means that an additional heating source such as an immersion element or a conventional boiler is still necessary.

WOOD FUEL

FREQUENTLY ASKED QUESTIONS

Can I use wood fuel to heat my home?

Wood fuel is one of the most appropriate renewable energy technologies for heating the home. In a domestic property the two fuels to consider are logs or pellets. Woodchips are not generally suitable for use in a domestic property because of the ancillary equipment needed.

Where can I buy pellets?

Fair energy can supply information on pellet suppliers. Other suppliers are advertising on the internet and in the local press.

How many pellets would I need to heat my 3 to 4 bedroom house?

About 5 to 10 tonnes per year of pellets to provide space and water heating if the house is not particularly energy efficient.

Can I have solar and a wood burning system?

Yes this combination works very well with the wood burning system providing the added heat during colder periods.

Could I be self sufficient in wood?

If you can produce 6 to 12 tonnes of dry logs annually. As an example one hectare of poplar planted could produce 10 tonnes of logs annually.

Are there grants available for installation costs?

Yes, the low carbon building program offer a maximum of £1500 or 30% of the relevant eligible costs, whichever is the lower. Further details can be found at www.lowcarbonbuildings.org.uk. With our Microgeneration Certification scheme accreditation we can fully support your grant application. For more information call us on 0845 126 6555.

Who will conduct the work?

Fair Energy will organise everything from the initial survey to the commissioning of the system. Please make contact to discuss your needs.

What emissions are produced?

Smoke consists of particles of unburnt fuel which form as a result of incomplete combustion. Higher efficiency boilers release less smoke. Stove maintenance is essential to achieve cleaner burning. Ensure only clean wood is burned. Contaminated woods will produce noxious gases, which will be released into your environment.

"Securing a sustainable energy future for all"

FAIRENERGY
Community Interest Company

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ABOUT FAIR ENERGY CIC

Fair Energy CIC is not just another renewable energy company. We are a Social Enterprise that puts profits into developing future solutions that will secure a renewable energy future for the developing world. We are committed to working against climate change in the UK and abroad.

As a CIC, we are not profit driven. An asset lock is placed upon all company assets and payments of dividends is capped to 5% of all profits, with profits being earmarked for non commercially viable renewable energy projects aimed at benefiting disadvantaged peoples, both in the UK and the developing world.

Profits are re-circulated to meet three aims:

1 **Promotion of district heating systems**
This work includes promoting the benefits and opportunities, undertaking consultation for those considering such schemes, design and viability assessment, and installation. We aim to offer free or low cost consultation to small communities and local councils within the UK who could benefit from district heating.

2 **Research and development into renewable energy solutions for developing countries**
We are involved in the development of technologies that will alleviate the need for women in developing countries having to collect firewood for cooking and the associated deforestation that is caused. We are investigating a number of relevant technologies.

3 **Implementation of renewable energy projects in the developing world**
This would involve the distribution and installation of renewable technologies at no cost to the end user, with the aim of providing real benefit and alleviating fuel poverty in the developing world.