microgeneration

section one
microgeneration

What it includes

This section includes new and innovative products which not only reduce our carbon footprint, but can also lead to economies when considering energy savings over the lifetime of the product. It covers the following products:

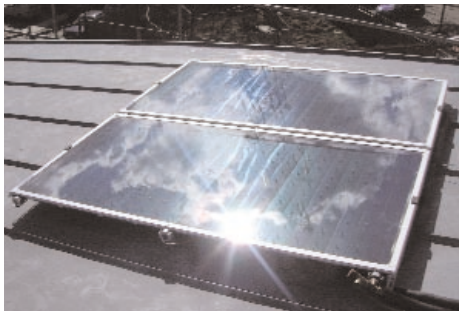
- **Solar thermal heating**
- **Photovoltaic cells**
- **Wind turbines**
- **Combined heat and power(CHP)**
- **Heat pumps**
- **Biomass boilers**

Sustainable Procurement Task Force

In 2005 the Government stated its intention in its Sustainable Development Strategy of putting the UK amongst the EU leaders in sustainable procurement. To this end the Sustainable Procurement Task Force identified 10 high priority areas out of 174 Government spending areas. One of these was energy, with an annual pubic sector spend of £3.5 billion. In this part of the catalogue we offer a range of technologies that help reduce the need to procure non-renewable fossil-based fuels.

Solar thermal heating

Solar Thermal Heating Systems: for the absorption, retention, transfer and storage of heat energy either through the use of flat plate collectors or evacuated tube collectors. May include the manufacture, supply or maintenance of suitable units for small and medium-sized applications, and may also include boilers and associated units as part of a thermal heating system.



How We Specified

- **All collectors were specified in accordance with Clear Skies Initiative criteria (www.clearskies.org)**
- **All collectors had to be tested in accordance with the appropriate European BS standard, and had to pass its durability test**
- **A minimum of two years' warranty for components had to be supplied by manufacturers.**

How Green is Solar Thermal Heating?

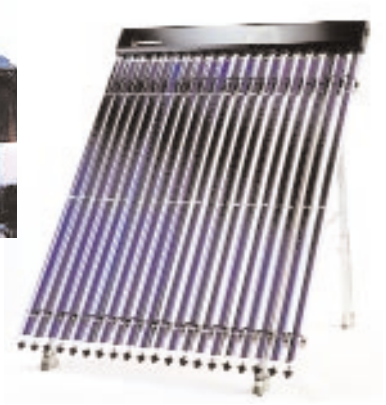
Suppliers typically state that a system can supply between 30% and 70% of heating requirements for a typical dwelling. It should be noted that this is dependent on a number of factors including:

- **Orientation of collectors in relation to the sun**
- **Efficiency of system**
- **Size of system**
- **Geographical location**
  (some parts of the UK are sunnier than others!)
- **Heating requirement.**

Description and Pricing

Descriptions are given to distinguish alternative types of technology used to provide solar thermal heating. Prices are given for the cost of individual units.

A note of caution is required in relation to manufacturer's claims for the efficiency of solar thermal heating systems. The figures quoted above are more representative of ideal conditions. Lower levels of efficiency may be experienced in practice. Customers need to be aware that, as yet, there is no third party assurance available.



A Above Roof Evacuated Tube Collector

Features:

- High performance evacuated tube, on-roof solar collector
- Vacuum tube ensures high efficiency by insulating direct flow tubes from external influences such as cold, wind and humidity
- 30 tube systems – Peak output 2.5kW. Can be expected to generate approximately 1,750kWhr per year with zero emissions, saving over oil heating of 598kg CO_2
  *(Source: T*Sol Pro 4.3 Valantine software)*
- Systems can be connected in series for greater capacity.
- Versatility - suitable for fitting on most tiled or slated roofs, pitched or flat. They can also be mounted vertically.

System contents:

- Thermomax DF100 evacuated tube collector (30 tube)
- Hydraulic connection & roof fixing components
- Solar pump station with electronic system controller
- Expansion vessel & fittings
- Automatic air vent & valve

Accreditation:

- Test/Approval (Solarkeymark) EN12975-2
- Clear Skies Product Code: ST1005

	Each
Thermomax DF100	unit **£1932.70**
	10+ **£1922.33**
	100+ **£1870.35**
	1000+ **£1766.45**

B Flat Plate Collector

Features:

- High performance flat plate solar collector, either roof integrated (as shown) or on-roof.
- Multiple panel systems. 2 Premium panels – Peak output 4kW. Can be expected to generate approximately 2,240kWhr per annum, making a saving over oil heating of 749kg CO_2
  *(Source: T*Sol Pro 4.3 Valantine software)*
- Versatility – either roof integrated mounting system suitable for use with most tiles and slates, or on-roof system. Can also be mounted on flat roofs.
- Solar pump station with gravity brakes and electronic system controller.

System contents:

- 2 x Schüco Premium Line flat plate collectors
- Hydraulic connection & roof integration components
- Solar pump station & electronic controller
- Expansion vessel & fittings
- Automatic air vent & valve

Accreditation:

- Test/Approval (Solarkeymark) EN12975-2
- Clear Skies Product Code: ST1053
- EC Guidelines 97/23/EC
- SPF Quality label

	Each
Flat plate collector	10+ **£3075.72**
	100+ **£2992.56**
	1000+ **£2826.32**

Prices are nett, supply only,excluding Carriage & VAT. Installation services available at additional cost.

Ecofirst Ltd.
The Tithe Office
Abbey Manor Business Centre
Preston Road, Yeovil
Somerset BA20 2FJ

Aidan Morris
Managing Director
Telephone: 01935 848561
Fax: 01935 848544
Email: aidan@ecofirst.net
Web: www.ecofirst.net

ecofirst
The Energy Saving Experts

Built to last

A panel to fit every roof

Commercial applications

Innovative, Advanced Heating Systems

- Saving tonnes of CO_2 per year
- Full European Certification BS/EN 12975
- Generating up to 70% Hot Water for FREE
- 35 Year Life Expectancy
- 20 Year Warranty

www.genersys.com

Certified and independently tested to comply with BS EN 12975 Parts 1 & 2 *and comply with all applicable official standards in the USA and Canada.*

solar water heating

Each Genersys panel is one metre wide and two metres high and only seven centimetres deep. Kits come with digital controllers, pump stations, pressure vessels and roof fittings as well as a cylinder.

Genersys 2 panel solar system kits need a two hundred litre cylinder to get optimum performance and so the price of the cylinder is included. Buyers will need to establish which kit is most suitable for specific properties by site surveys as there is a range of "on roof" fittings but buyers can when buying in bulk order different roof fittings in the same order.

Genersys provide technical support and recommend using approved installers or can train buyers' nominated installers.

ESPO/Genersys 2 Panel On Roof Kit (Tile or Slate) Including a 200 Litre twin coil Cylinder

(Price per kit)

Quantity	Vented Cylinder	Unvented Cylinder
10 kits	**£1,495**	**£1,794**
100 kits	**£1,389**	**£1,698**
1000 kit	**£1,252**	**£1,653**

Add £180 per system for In-Roof Flashing Kit (Tile or Slate)

Commercial systems can be specified on request at:
technical@genersys.com

Genersys Plc, 37 Queen Anne Street, London W1G 9JB
Contact: Felicity Campbell **Tel:** 020 7637 9708 **Fax:** 020 7637 0901
Email: enquiries@genersys.com

Swimming pool heating

Solar Thermal Heating

The Baxi Solarflo Domestic system

The Baxi Solarflo system uses the sun's solar energy to provide domestic hot water. Using roof mounted panels to harness the power of the sun's rays, the system can provide around 50% to 55% of your total hot water requirements.

Solarflo, a fully integrated domestic hot water system consists of three main purpose built components, to provide optimum performance; Solar collector panels, Hot water cylinder and Heat transfer system.

The **'on roof'** Solarflo panels are installed on mounting rails above the roof tiles and is particularly suited to existing properties.

The **'in roof'** Solarflo panels are installed within the roof structure and replace the roof tiles. The system includes the flashing kit and is well suited to new build properties and major roof refurbishment projects.

A comprehensive range of options is available across 'on roof' and 'in roof' systems; and prices vary dependent on the optimum specification for each site.

Galliford Try supplies microgeneration products on an 'integrated solutions' basis, whereby they also require to survey, design and install the products.

The cost associated with these services will vary, dependent upon the requirements for each location.

The Baxi Solarflo Commercial system

Solarflo offers a complete solar thermal solution for both direct-fired water heaters and commercial boiler applications. The package includes high quality solar collectors, single coil and twin coil duplex stainless steel cylinders, pump station, control unit and system expansion vessels. The major benefits this package affords the contractors is an effective "one stop shop" for a totally integrated solution, including solar system sizing to commissioning from a company with proven expertise and commitment to developing low carbon products and solutions.

A comprehensive range of options is available across 'on roof' systems; and prices vary dependent on the optimum specification for each site.

Galliford Try supplies microgeneration products on an 'integrated solutions' basis, whereby they also require to survey, design and install the products.

The cost associated with these services will vary, dependent upon the requirements for each location.

Galliford Try Renewables
Leicester Road,
Wolvey,
Hinckley,
Leicestershire, LE10 3JF

Maxine Arbuthnott
Telephone: 01455 882317
Fax: 01455 222758
Email:maxine.arbuthnott@gallifordtry.co.uk

Galliford Try

Renewables

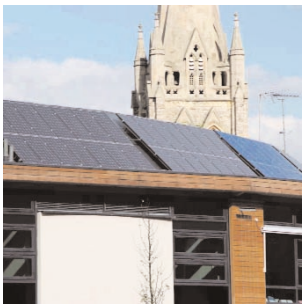
Working throughout the UK Galliford Try Renewables,
together with its technology partners
offer individual or full turnkey services
in reducing energy costs and carbon emissions
through the use of on-site and micro renewable technologies.

Services:

Consultancy • Design • Construction
Installation • Operate

Technologies:

Wind Turbines • Solar Thermal • Solar PV
Ground Source Heat Pumps
Biomass District Heating or Combined Heat & Power



To take advantage of our renewable energy services please contact:

Galliford Try Renewables
Leicester Road,
Wolvey,
Hinckley,
Leicestershire, LE10 3JF

Maxine Arbuthnott
Telephone: 01455 882317
Fax: 01455 222758
Email:maxine.arbuthnott@gallifordtry.co.uk

Working with you every step of the way, we offer a complete range of tailored, integrated solutions, designed for the long term needs of your organisation.

Solar Thermal Heating

Solar thermal technology traps the sun's heat energy in panels or tubes to heat your water supply. Collectors can be easily installed onto, or integrated into, your roof and could provide between 50 and 60% of your water heating needs. We offer a complete range of integrated solar heating products to achieve optimum efficiency and operational reliability from a single source.

Products:

- **Viessmann Vitosol 100**
- **Viessmann Vitosol 200**
- **Viessmann Vitosol 300**

Typical product and installation costs:

Prices vary dependant upon the size and type of system installed:

Evacuated Tube System: **from £2584.**

Flat Plate System: **from £2160.**

These prices include the provision of a stainless steel pressurised hot water cylinder. Installation costs will vary depending on the complexity of each individual site.

For example, a typical nursery school with reasonable physical access needing a low level scaffold platform would have installation costs of approximately **£4,100** plus the unit cost.

Case study: Charing Cross Police Station

Products Installed:

3 Viessmann Vitosol 200 Solar Thermal Panels,

Vitocell 500 litre twin coil cylinder

The Property Services section of the Metropolitan Police Service (MPS) are keen to use renewable and sustainable technologies across their range of properties.

In 2006 they installed three Viessmann Vitosol 200 panels at Charing Cross Police Station.

The station houses operational staff and officers 24 hours a day, seven days a week and there is a constant call for hot water for showers and the canteen.

Since installation the system has contributed to the site's hot water requirements and proved itself an option for future schemes.

Prices shown are indicative net prices for the base product and associated equipment. E.ON supplies microgeneration products on an 'integrated solutions' basis, whereby they require that installation of the product is carried out by E.ON (or E.ON approved) installers. A 'typical' installation cost is shown but will vary dependent on the requirements at each location. E.ON will only install where the design and site survey shows that the technology achieves the customers aims and goals.

E.ON
Sustainable Energy Solutions
Newstead Court,
Sherwood Park, Annesley,
Nottingham NG15 0DR

Colin Grenville
Tel: 0800 051 5687
Fax: 0115 877 5749
Email: lcbpp2@eon-uk.com
Web: www.eonenergy.com/sustainableenergy

Photovoltaic cells

Photovoltaic Cells: photovoltaic systems use sunlight to power electrical equipment such as household appliances, computers and lighting. The photovoltaic (PV) process converts light energy directly into electricity.

How We Specified

- **All systems were specified to comply with all relevant general national or international standards including ISO, DIN and IEC standards**
- **All solar cells and modules were specified to comply with relevant standards including EN and IEC standards**
- **A minimum of two years' warranty for components had to be supplied by manufacturers.**

How Green is PV?

PV panels are not as efficient as solar thermal heaters, which can convert up to 60% of the sun's energy into heat. PV cells only convert 12% to 15% of the sun's energy into electricity, although some laboratory tests are currently yielding up to 30%.

A number of factors are relevant as to whether PV is a good option for you:

- **Orientation of cells in relation to the sun**
- **Efficiency of system**
- **Size of system**
- **Geographical location**
- **Power requirement.**

Description and Pricing

Descriptions are given to distinguish alternative types of technology used to provide PV electricity. Prices are given for the supply of energy in the form of kilowatt hours produced (kWp).

This enables a comparison to be made in terms of output efficiency between different units supplied.

Photovoltaic cells

A "On Top" Systems

These systems comprise "standard" aluminium framed modules, mounted on a framework just above an existing roof. TLCP use only high quality PV modules sourced from established manufacturers such as Sharp and Kyocera. Different roof mounting systems may be selected to suit different types of roof. Each roof mounting system comprises proven components and is tailored by our experienced installers to suit the roof in question and to provide a secure and weather-tight mounting assembly. These systems can also be mounted in a frame and placed on a flat roof or on the ground.

PRICES: The following example prices are for straightforward fully installed systems including basic mounting systems but excluding access costs where required (e.g. scaffolding) and final connection into the building electrical distribution system. Actual prices will be by quotation taking into account site specific parameters (e.g. type of roof). Prices are quoted per "kilowatt peak" (kWp) of system.

Up to **2kWp** (approx. 16 m²)	from **£5,000** per kWp
2 - 5kWp (approx 40 m²)	from **£4,500** per kWp
Above **5kWp**	from **£4,000** per kWp

B Roof Integrated (Tile Based) systems

PV roof tiles can directly replace conventional roofing materials, providing both electricity and a weather tight roof. PV tiles are typically installed to a new roof or as part of a re-roofing scheme. For example the Redland PV800 and PV80 PV tile systems from Lafarge Roofing have been designed to integrate with a wide range of roof tiles - providing an array with clean lines and an elegant finish. These products do not affect the roofline and are the standard choice in planning sensitive areas or where aesthetics are important.

PRICES: The following example prices are for straightforward fully installed systems including basic mounting systems but excluding access costs where required (e.g. scaffolding) and final connection into the building electrical distribution system. Actual prices will be by quotation taking into account site specific parameters (e.g. type of roof). Prices are quoted per "kilowatt peak" (kWp) of system.

Up to **2kWp** (approx. 16 m²):	from **£6,300** per kWp
2 - 5kWp (approx 40 m²):	from **£5,700** per kWp
above **5kWp**:	from **£5,500** per kWp

Prices are nett, excluding VAT

The Low Carbon Partnership

sundog energy dulas

The Low Carbon Partnership (TLCP) brings together two of the UK's leading and most experienced renewable energy installers (Dulas Ltd and Sundog Energy Ltd).

It provides a high quality in-house installation and maintenance capacity with full UK geographical coverage. In addition, extended capability is available from a network of TLCP accredited partners.

TLCP provides a full system specification and installation service for all types of photovoltaic (PV) system. TLCP partners are fully accredited installers under the Low Carbon Buildings Programme. TLCP is also a "framework supplier" under Phase 2 of the Low Carbon Buildings Programme and is therefore able to offer easy access to grants of up to 50% for renewable energy installations for public and charitable sector organisations.

TLCP has prepared a multi-media teaching resource called "Our Planet" that will be available free of charge to all schools purchasing a photovoltaic system from TLCP. "Our Planet" includes a wide range of information and resources on renewable energy and is designed to be used as part of the National Curriculum.

Schools will also be able to "opt in" to an online renewable energy community linking schools with renewable energy installations elsewhere in the UK and overseas.

For more information on TLCP visit www.tlcp.co.uk

The Low Carbon Partnership

Unit 1, Dyfi Eco Park,
Machynlleth
Powys SY20 8AX.

Telephone: 0845 070 7700
Email: advice@tlcp.org.uk
Web: www.tlcp.co.uk

Working with you every step of the way, we offer a complete range of tailored, integrated solutions, designed for the long term needs of your organisation.

Solar Photovoltaic (PV)

Solar PV panels generate electricity directly from sunlight.

The panels can be installed directly onto or integrated into your roof (if you are building or re-roofing).

Products:

- **Viessmann Vitovolt 300**

Typical product and installation costs:

From £3337, including inverter and isolation unit.

Installation costs will vary depending on the complexity of each individual site.

Case study: St Jerome's C P School

Products installed:

- **Vitosol 300 Solar Thermal Panels**
- **Vitovolt 300 Photovoltaic Panels**
- **Vitodens 200 Condensing Boilers**
- **Vitoset Underfloor Heating System**

St Jerome's Catholic Primary School, in Formby, near Liverpool is a popular school - not just for the high quality of its teaching but as an example of sustainability in school buildings.

Faced with replacing an earlier school that was fire damaged, the Liverpool archdiocese, their architects and designers set about ensuring that the replacement would be as sustainable as possible; an energy-saving school for the future.

The heating is supplied by **Viessmann Vitodens 200** wall hung condensing boilers. These serve the underfloor heating circuits throughout the school and also act as a back-up to the water heating.

The solar water heating is supplied by 6 square metres of **Vitosol solar panels** with a **Vitosolic controller** and **Divicon** controlling the source of thermal input to the two 500 litre **Vitocell storage cylinders.**

This control ensures that heat input is only taken from the boiler when solar energy is not available. Photovoltaic cells generate most of the day to day power needs.

Prices shown are indicative net prices for the base product and associated equipment. E.ON supplies microgeneration products on an 'integrated solutions' basis, whereby they require that installation of the product is carried out by E.ON (or E.ON approved) installers. A 'typical' installation cost is shown but will vary dependent on the requirements at each location. E.ON will only install where the design and site survey shows that the technology achieves the customers aims and goals.

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Web: www.eonenergy.com/sustainableenergy

Solar Green

Solar Green is a leader in the engineering of renewable energy and low carbon systems for the built environment. Solar Green was founded on the experience of it's sister business Fordham Contracting Services, completing it's first Solar Photovoltaic installation for BP over a decade ago.

The company has completed a number of landmark Solar PV projects in the UK including; the installation of 450kW on social housing for Woking Borough Council, the single largest installation of Solar Photovoltaics on housing in the UK and the largest building integrated system for Suffolk County Council's new Ipswich HQ.

Solar Green provides a full turnkey service across the whole of the UK, from initial concept through to securing grant funding, supply, installation and commissioning. This expertise is reflected by the growing number of buildings with systems installed by Solar Green which include; the National Railway Museum, Cambridge County Council, B&Q, RSPB, Derwentside District Council, English Nature, Napier University, Peabody Trust, the NHS and London Boroughs of Camden, Lambeth and Redbridge.

In recognition of it's expertise in this field of renewable energy, Solar Green is fully accredited by; the DTI's Low Carbon Building Programme, Construction line as an Alternative Energy Provider and the local authority Construction HSE scheme CHAS.

Our products

As an independent company we are able to offer the best products chosen from a range of world class manufacturers. For ESPO and it's customers we have selected the Sharp Photovoltaic module world's most popular module made by a manufacturer with over 40 years of experience in this field.

We are able to offer an unrivalled range of solutions for integrating a solar photovoltaic array into a building. The robust but versatile anodised aluminium fixing system we have chosen to meet ESPO's requirements, enables the modules to be mounted as a façade rain screen, shading canopy, free standing array as well as a conventional rooftop system.

We believe your investment in Solar Photovoltaics should provide renewable electricity trouble-free. Therefore we offer a 20 year manufacturers backed warranty on all of our modules.

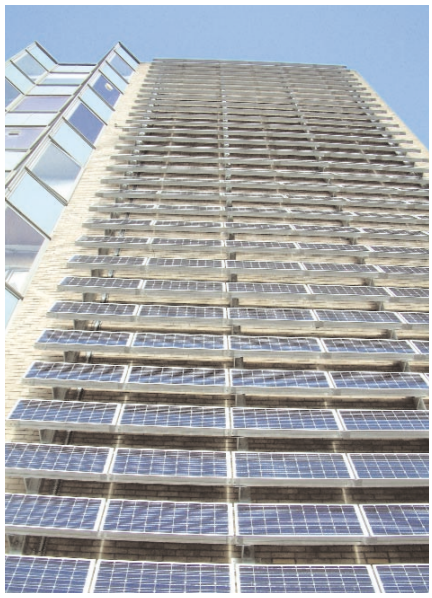
The final cost of the Solar Photovoltaic system is dependent upon a number of factors regarding the building design, however below is an indication of the range of prices for the design, supply and installation of a Solar Photovoltaic system are as follows:

1 - 2kWp (approx. 16 m²):	from **£5300 kWp**
2 - 5kWp (approx 40 m²):	from **£4900 kWp**
5 - 10kWp (approx 80 m²):	from **£4300 kWp**

Prices are nett (excluding VAT), including Carriage and Installation.

Maintenance services are available at additional cost.

NB These are not the only sizes offered by Solar Green, the size of the Solar Photovoltaic system can be tailored to meet your requirements in terms of electricity required, available roof space and available budget.



Solar Green Ltd
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Mark Wilkie
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Wind turbines

Wind turbines: These capture the wind's energy with two or three propeller-like blades, which are mounted on a rotor, to generate electricity.

How We Specified

- Turbines comply with the provisions contained in the Clear Skies initiative criteria for approved suppliers
- Products have been designed in observance of BS EN or equivalent national standards, or have a proven track record of reasonable reliability and a good number of operating wind turbines in the UK
- A minimum of two years' warranty for components had to be supplied by manufacturers.

How Green are Wind Turbines?

Wind turbines typically have a level of efficiency of above 20%. However, this varies considerably depending on wind speed. This is usually at its greatest at about 9 m/s. At high speeds the turbine must waste any energy that the turbine was not designed for. At low wind speeds there is little energy to exploit.

However, the only significant emission from turbines is noise, therefore wind generation can be a green option for purchasers which can also generate useful amounts of power at times of greatest wind speed efficiency. Some exposed locations can be more suitable for turbines than others, as can areas of the country which experience relatively high average wind speeds.

Description and Pricing

Descriptions are given to distinguish alternative types of technology used to provide wind generated electricity.

This enables a comparison to be made in terms of output efficiency between different units supplied.

Units are costed individually and for quantities of 5 and 10.

Ampair turbines

The Ampair 600 is available for grid tie and battery systems. Ampair also manufacture the smaller 100 and 300 turbines and a micro hydro unit. The larger Fortis turbines are available via Ampair – see facing page.

A Ampair 600W battery charge wind turbine

The Ampair 600-24 is a small wind turbine with 1.7m diameter blades that can be used with 24V DC battery systems. This battery charge version includes the turbine 'head' plus the regulator. It also needs an appropriate 24V battery bank to store the energy and suitable 24V loads.

A06 1024E	**A600-24 system**	**each £1753***
		each per 5 £1569*
		each per 10 £1384*

**Turbine prices do not include Site Survey, Mounting Systems or Installation*

B Ampair 600W grid tie wind turbine

The Ampair 600-230 is a small wind turbine with 1.7m diameter blades that can be used to feed power back into the 230V mains electrical supply so that the premises need to purchase less power from the grid. This grid-tie system includes the turbine 'head' plus the necessary G83 inverter. A mounting system and installation services are also required, and monitoring systems are available for educational use.

A0620230E	**A600-230 system**	**each £2763***
		each per 5 £2618*
		each per 10 £2473*

**Turbine prices do not include Site Survey, Mounting Systems or Installation*

C Ampair mounting systems

These six mounting systems suit a variety of situations.

A06 M00E	**BWM: brick wall mount**	**each £400**
A06 M10E	**SFM: steel frame mount**	**each £400**
A06 M50E	**TUM: tilt up mast (8m)**	**each £1850**
A06 M70E	**GM: guyed mast (12m)**	**each £1644**
A06 M20E	**NPRM: non pen roof mount**	**each £800**
A06 M60E	**TPM: telegraph pole mount**	**each £738**

D Ampair monitoring systems

The powerful combination of the Ampair 600 with an anemometer, a wind vane and a data logger brings renewables generation alive. Using a standard network port and internet connection, the logger uploads energy and weather data automatically to the Ampair Net website for sharing of by authorised users, such as teachers, pupils and facilities managers, of performance & CO_2 graphs.

Ampair Net web display

Price includes 3-year website hosting fee.

See www.ampair.com/ampair/ampnet.asp for an example.

ME AN10E	**Data logger set & Ampair Net**	**each £950**
	Data logger set & Ampair Net	**each per 5 £850**

E Ampair installation service

Specialist Ampair-approved contractors should be used. Prices for more complex situations require quotation after a survey.

A06 S00E	**Site survey**	**each £240**
A06 S10E	**Basic install**	**each £600**
A06 S40E	**Complex install**	**each poa**

Clear Skies product WT5033
Clear Skies installer 2142847

Prices are nett (excluding VAT & Carriage)

Ampair 600 on brick wall mount

Ampair 600 on telegraph pole mount

Ampair 600 on tilt up mast

Ampair contact details:

Ampair
Park Farm, West End Lane,
Warfield, Berkshire, RG42 5RH

David Sharman
Telephone: 0845 389 0660
Fax: 01344 303 312
Email: sales@ampair.com
Web: www.ampair.com

Fortis Montana 5kW

Fortis Alize 10kW

Fortis Turbines

Fortis models are available from the Ampair distributor 'The Green Company'.

All models are available as grid tie and battery systems. The prices below relate to grid tie only. Battery system costings are available on request.

A Fortis Montana 5kW grid tie wind turbine

The Fortis Montana 5kW turbine can be used to power larger loads for commercial and residential use. Commercially it has uses as an industrial generator or power supplement and is a common turbine for people wanting to power a whole household (2-3bed house). The 5m diameter grid tie systems include hub, inverter, controller and 15m guyed mast.

AF5.0 230E	**Fortis Montana 5kW**	**each £9433***
		each per 5 £9209*
		each per 10 £8984*

****Turbine prices do not include Site Survey, Foundations, Mounting Systems or Installation***

B Fortis Alize 10kW grid tie wind turbine

The Fortis Alize 10kW turbine can be used to power larger loads for commercial use. It has uses as an industrial generator or power supplement. Grid tie systems include Hub, inverter, controller and a 18m guyed mast.

AF 10 230E	**Alize 10kW**	**each £20060***
		each per 5 £19583*
		each per 10 £19105*

****Turbine prices do not include Site Survey, Foundations, Mounting Systems or Installation***

C Fortis installation service

Specialist Fortis approved installers should be used. These are guidelines prices only, based on a basic install including foundation and labour costs with delivery in the Midlands area. Variables to consider are location, cabling & electrical connection, trenching, geological and topographical issues which can add to cost.

AF S00	**Site survey**	**each £240**
AF S10-5.0	**Montana install**	**each £4850**
AF S10-10	**Alize install**	**each £5550**

D Ampair monitoring systems

The Ampair Net on-line monitoring system and datalogger is also available to suit all the Fortis turbines. See section D of facing page for details.

Clear Skies product WT5033 (Montana)

Clear Skies product WT5037 (Alize)

Clear Skies installer 2142876

Prices are nett (excluding VAT & Carriage)

Products featured on this page are a collaboration between **Ampair** and **Fortis** with their common distributor **'The Green Company'**

Ampair contact details for Fortis products:

The Green Company
Park Farm,
West End Lane, Warfield,
Berkshire, RG42 5RH

Ben Cosh
Telephone: 0800 0787 243
Email: info@the-green-company.com
Web: www.the-green-company.com

A 1.4kW Passaat with 12m mast, 3m span

Grid connected or stand alone, free standing pole or guyed wire. Reliable, silent and maintenance free.

1.4kW Passaat	each **£4,808**
	each per 5 **£4,580**

B 1.8kW Skystream 3.7 with 10m freestanding tower

1.8kW small design wind turbine with low noise levels. Downtream blade feature.

1.8kW Skystream	each **£5,910**

C 2.5kw WES Tulipo5 with 12m steel tube tower

The WES5 2.5kW ***urban turbine*** is a small innovative turbine with specially designed blades and relatively low rotations. Almost no noise or vibrations. Beautiful curves and user-friendly safety features make it suitable for placing near or on top of buildings. Low maintenance and fully automatic.

2.5kW Tulipo5	each **£12,394**

D 3.2kW SW Whisper 500 with 13m guyed tower

3.2kW small design wind turbine. Low cost unit.

3.2kW SW Whisper 500	each **£10,282**

E 5kw Iskra AT5-1 with 12m freestanding tower

5kW small turbine. Optimised blade design with passive pitch control, direct drive to generator without gearbox. High energy output at low windspeed. Low noise. High Aerodynamic efficiency, High Electrical efficiency.

5kW Iskra AT5-1	each **£12,232**

F 5kW Montana with 12m mast, 5m span

Grid connected or stand alone, free standing pole or guyed wire. Reliable, silent and maintenance free.

5kW Montana	each **£10,186**
	each per 5 **£9,690**

Prices shown are indicative, nett prices for the base product and associated equipment alone.

Galliford Try supplies microgeneration products on an 'integrated solutions' basis, whereby they also require to survey, design and install the products.

The cost associated with these services will vary, dependent upon the requirements for each location.

Galliford Try Renewables
Leicester Road,
Wolvey,
Hinckley,
Leicestershire, LE10 3JF

Maxine Arbuthnott
Telephone: 01455 882317
Fax: 01455 222758
Email:maxine.arbuthnott@gallifordtry.co.uk

G 6kW QR5 with 9m mast, helical vertical axis rotor

Mounted on a galvanised steel mast. The system includes a generator, anemometer, accelerometer and peak power tracking hardware.

The QR5 differs from a horizontal axis wind turbine (HAWT) in that it doesn't need to change its orientation to track wind and takes advantage of gusty winds.

6kW QR5	each **£34,904**
	each per 5 **£34,285**
	each per 10 **£33,666**

H 10kW Alize with 18m mast, 7m diameter

Grid connected or stand alone, free standing pole or guyed wire. Reliable, silent and maintenance free.

10kW Alize	each **£21,414**
	each per 5 **£20,359**

J 20kw 204 turbine with 11m guyed tower

Medium to large scale wind turbine capable of returning upwards of 30,000Kw of power per year, designed for large domestic power supply or mid range commercial users, on and off grid options, conical tower option, 220 volt and 440 volt (three phase) option.

20kW 204 Turbine	each **£23,987**

K 80 kW WES 18 Mk1 with 30m steel tube tower

The WES18 mk1, known as the ***'farmer's turbine'***, has the reputation of being durable and reliable. The typical two-bladed rotor has a unique hinge system and a passive blade-angle adjustment. This unique mechanism needs very little maintenance. Over 600 units have been installed at (agricultural) businesses, small communities and at coastal and mountainous sites.

80kW WES 18	each **£114,139**
80kW WES 18 Hybrid W/D	each **£124,951**

L 250 kW WES 30 Mk1 with 30m steel tube tower

An even more powerful bigger brother of the WES 18, this powerhouse can produce, depending on the wind availability, an average of 600.000 kWh/year of reliable and renewable energy. This and its smaller brother can also be used in conjunction with a diesel generator to create an effective hybrid system.

250kW WES 30	each **£222,979**
250kW WES 30 Hybrid W/D	each **£241,180**

Prices shown are indicative, nett prices for the base product and associated equipment alone.

Galliford Try supplies microgeneration products on an 'integrated solutions' basis, whereby they also require to survey, design and install the products.

The cost associated with these services will vary, dependent upon the requirements for each location.

Galliford Try Renewables
Leicester Road,
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GallifordTry

Combined Heat & Power (CHP)

Combined Heat and Power: Sometimes known as cogeneration, is the use of a heat engine or a power station to simultaneously generate both electricity and usable heat.

How We Specified

- All systems had to comply with the electrical interface for domestic cogeneration CEN workshop agreement CWA 1462:2003 and any subsequent or relevant national or international standards which may be made in relation to this form of appliance
- A minimum of two years' warranty for components had to be supplied by manufacturers.

How Green is CHP?

Thermal power plants and heat engines do not convert all of their available energy into electricity. The rest is wasted as heat. CHP allows a much more total use of energy than conventional generation by capturing the excess heat. This can result in a potential energy efficiency level of 70% as against 35% for conventional plant.

Less fuel is used to produce the same amount of energy, thus reducing the demand for coal, petroleum or natural gas.

Description and Pricing

Prices shown are indicative, nett prices, for the base product and associated equipment alone.

Galliford Try supplies microgeneration products only on a 'Total Solutions' basis, whereby they also require to survey, design and install the products.

The cost associated with these services will vary, dependent on the requirements for each location.

Micro CHP is a domestic combined heat and power unit which offers a maximum of 30kW thermal output for space heating and domestic hot water and 1kW of electrical output.

The unit is a heat led device in that when there is a demand in the building, the unit fires up and generates electricity at a rate 1kW per hour. The heat output can modulate down from the maximum output of 30kW to 4kW while still generating electricity.

The electrical output can be used within the dwelling or exported back to the grid for a tariff.

THIS PRODUCT WILL BE AVAILABLE IN 2009.

Dachs Mini-CHP

With more than 17,000 units installed throughout Europe, the Dachs mini-CHP is the market leader.

Its 12.5 kW - 15.5 kW thermal output and 5.5 kW 3-phase electrical output makes it ideal for luxury domestic and commercial applications.

For larger buildings, up to 10 fully communicating multi-module Dachs units can meet varying loads without loss of efficiency. The new Dachs SE condensing package increases overall efficiency to over 90% and incorporates the latest G83/1 grid interface protection, making installation extremely simple.

The user-friendly MS2 controller with its integrated modem allows remote access for output monitoring and system control, giving the end user a complete energy solution.

Dachs Mini-CHP	each **£10,637.00**
	each per10 **£10,357.00**
	each per 20 **£10,077.00**

Galliford Try Renewables
Leicester Road,
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GallifordTry

Heat pumps

Air source heat pump (ASHP)

Ground source heat pumps (GSHP)

Heat pumps: A heat and cooling source using a heat pump to extract heat from either the air or ground and transfer that heat by circulating a refrigerant through a cycle of alternating evaporation and condensation. The cycle can be reversed for cooling.

How We Specified

- Heat pumps comply with the provisions contained in the Clear Skies initiative criteria for approved suppliers
- All pumps are CE marked and indicate compliance with mandatory requirements such as the Low Voltage Directive, Electromagnetic Compatibility Directive, etc.
- A minimum of two years' warranty for components had to be supplied by manufacturers.

How Green are Heat pumps?

Modern systems are very energy efficient. For each kilowatt of electricity used to run the heat pump, three to four kilowatts of heat are delivered to a building. This means also that sources of non-renewable energy are potentially being saved.

In order to obtain maximum benefit in older buildings they need to be well insulated. Regrettably some buildings cannot be made sufficiently energy efficient to use a modern heat distribution system such as low temperature underfloor heating or low temperature radiators.

Description and Pricing

Descriptions are given to distinguish alternative types of technology used to utilise heat energy.

Costings are per unit.

Dimplex heat pumps

Dimplex has been producing innovative heat pumps for nearly 30 years and from its manufacturing plant in Kulmbach, Germany, produces the widest range of heat pumps available in the UK.

The Dimplex brand is well known in the public sector, particularly with local authorities and housing associations where the brand has become synonymous with a commitment to excellence and customer satisfaction.

All applicable heat pumps are registered under the Clear Skies scheme.

Evidence of this can be found by checking on:
www.lowcarbonbuildings.org.uk

Dimplex Approved Heat Pump Installer Partners

In order to ensure the highest levels of quality and to provide peace of mind, Dimplex has established a national network of Approved Heat Pump Installer Partners, all accredited under the Clear Skies scheme and fully trained and experienced in the installation, commissioning and after sales support of Dimplex heat pumps.

Working with Dimplex

All products and installation services are provided through our Approved Installer Partners, backed by full pre and post installation support from Dimplex UK, providing customers with a complete end-to-end solution, including specification, system design, installation, commissioning and after sales support.

Low Carbon Buildings Programme Phase 2 Grant Funding

Dimplex is an appointed Framework Supplier under the Low Carbon Buildings Programme Phase 2.

Under the scheme, Dimplex ground source heat pumps are offered to public sector clients in the UK including local authorities, housing associations, schools, colleges hospitals and other not for profit organisations at pre-agreed prices and subject to grants of 35% of their total installation cost.

Evidence of this can be found at:
www.lowcarbonbuildingsphase2.org.uk.

For an information pack, contact
lcbp@dimplex.co.uk

For further information customers should contact the following individuals within Dimplex:
Sales enquiries: Allen Griffiths,
Business Development Manager 07977 982241

Pre sales technical enquiries: Robert Mack,
Technical Sales Support Manager 01489 773220

Contacts for placing orders:
Products and installation services will be provided by Dimplex Approved Installer Partners, a list of which can be requested from Dimplex.

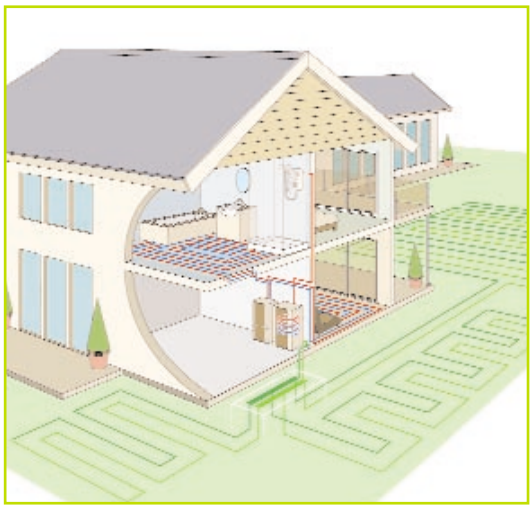
Dimplex UK Ltd.

Millbrook House,
Grange Drive,
Hedge End,
Southampton,
SO30 2DF

Telephone: 0845 6005111
Email: marketing@dimplex.co.uk
Web: www.dimplex.co.uk

Ground Source Heat Pumps (GSHP)

The earth stores an enormous amount of solar energy from both solar radiation and rainfall. To extract this energy, ground collectors consisting of polyethylene pipes are buried in the earth, either horizontally or vertically. A mixture of water and anti freeze is then circulated through the pipe loops, attracting the heat energy and transferring it to the heat pump.



If a large enough land area is available, horizontal ground collectors provide an effective method of extracting heat from the ground.

The land area required is dependent on both the capacity of the heat pump and the heat conductance of the soil in which the pipes are buried.

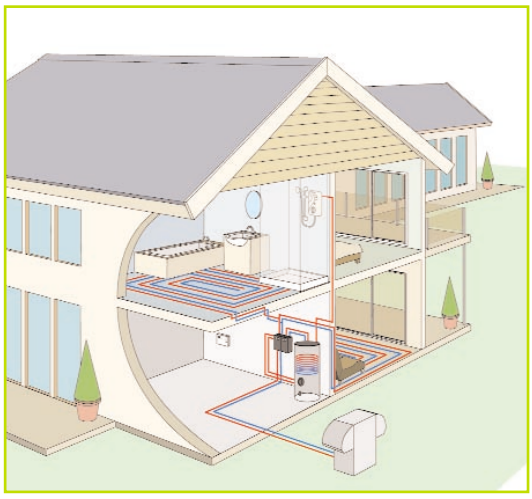
As a space saving alternative to horizontal collectors, ***slinkies*** – consisting of coiled pipes buried in a trench – can be used.

If land space is limited the ground collectors can be installed vertically in a borehole, drilled up to 100m deep in the ground.

Multiple boreholes are commonly used in large installations where very high levels of heat extraction are required.

Air Source Heat Pumps (ASHP)

Even cold air is full of energy and Dimplex air source heat pumps use the freely available heat in the ambient air to provide efficient heating and hot water at air temperatures as low as -25°C.



Because the heat source is abundantly available all around us, air source heat pumps have the advantage of low installation costs and minimal space requirements, while relatively mild winter temperatures in the UK mean excellent levels of efficiency and performance are achieved throughout the year.

Air source heat pumps are suitable for either indoor or outdoor installation.

Dimplex SI Range - GSHP

Dimplex ground source heat pumps are available in an extensive range of model types and capacities, suitable for either domestic or commercial applications.

Dimplex also provide a wide range of ancillary accessories, including hot water storage cylinders, buffer tanks, ground loop circuit and heating system manifolds and other hydraulic accessories.

Single Phase Heat Pumps: SI ME range

Range of 5 models with heating capacities from 5 – 14kW suitable for domestic applications. Variable water heating flow temperatures up to 58°C. Suitable for connection to horizontal, vertical or slinky ground collectors. Typical CoP (B0/W35) 3.8.

SI 9 ME, single phase 9kW	each **£3248.66**
	each per 10 **£3077.68**
	each per 20 **£2735.71**
LCBP Phase 2, subject to further 35% grant	any qty **£2436.49**

SI 9 ME shown for illustrative purposes. Contact Dimplex for prices of other models in range.

Three Phase Heat Pumps: SI TE range

Range of 8 models with heating capacities from 17 – 130kW, single and twin compressor models suitable for schools and other non domestic applications. Variable water heating flow temperatures up to 60°C. Typical CoP (B0/W35) 4.4

SI 24 TE, three phase 24kW	each **£7652.31**
	each per 10 **£7249.55**
	each per 20 **£6444.05**
LCBP Phase 2, subject to further 35% grant	any qty **£5739.23**

SI 24 TE shown for illustrative purposes. Contact Dimplex for prices of other models in range.

High Temperature Heat Pumps: SI TEH range

Range of 2 models with heating capacities 20 and 40kW, twin compressor suitable for schools and other non domestic applications. Variable water heating flow temperatures up to 70°C. Typical CoP (B0/W35) 4.1

SI 40 TEH, three phase 40kW	each **£11109.72**
	each per 10 **£10525.00**
	each per 20 **£9355.55**
LCBP Phase 2, subject to further 35% grant	any qty **£7578.04**

SI 40 TEH shown for illustrative purposes. Contact Dimplex for prices of other models in range.

Dimplex SI Range - GSHP

Dimplex outdoor air source heat pumps are constructed from robust, powder coated metal casings to provide year round protection against the elements. The heat pump is connected to the indoor heating system simply by laying two heat insulated pipes and the electrical connection under the ground.

Integrated Outdoor Air Source Heat Pumps – LA MR range

Range of 3 models with heating capacities from 6 – 10kW, single phase suitable for domestic applications. Integrated system components including circulating pump, hydraulic accessories and immersion heater. Variable flow temperatures up to 60°C. Typical CoP (A7/W35) 3.3.

LA 8 MR, single phase, 8kW integrated	each **£3560.93**
	each per 10 **£3373.51**
	each per 20 **£2998.68**

LA 8 MR shown for illustrative purposes. Contact Dimplex for prices of other models in range.

A Outdoor Air Source Heat Pumps – LA MS range

Range of 2 models with heating capacities of 11 and 16kW, single phase suitable for domestic applications. High levels of acoustic insulation minimise noise emissions. Variable flow temperatures up to 55°C. Typical CoP (A7/W35) 3.9.

LA 11 MS, single phase 11kW	each **£5296.59**
	each per 10 **£5017.82**
	each per 20 **£4460.29**

LA 11 MS shown for illustrative purposes. Contact Dimplex for prices of other models in range.

A Outdoor Air Source Heat Pumps – LA AS range

Range of 4 models with heating capacities from 20 – 28kW, three phase suitable for schools and other non domestic applications. Twin compressors. Variable flow temperatures up to 55°C. Typical CoP (A7/W35) 3.3.

LA 20 AS, three phase 20 kW	each **£7239.10**
	each per 10 **£6858.09**
	each per 20 **£6096.08**

LA 20 AS shown for illustrative purposes. Contact Dimplex for prices of other models in range

Prices are supply only, including Carriage. Dimplex only supply heat pumps to and for installation by Dimplex approved Heat Pump Installer Partners.

Dimplex

Borehole Ground Source Heat Pumps

A GSHP Space heating only

When linked to underfloor in a well-insulated building these ground source heat pumps can produce 4kW of heat for every 1kW of electrical input, reducing running costs and CO_2 emissions. UK designed and manufactured the units come complete with matched antifreeze and manifolds. Prices do not include drilling or piping as this will be done by others.

kW	power supply phase	price 1 off	price>10 off
4	single/three	£3048.56	£2888.11
6	single/three	£3525.48	£3339.93
8	single/three	£3715.52	£3519.97
10	single/three	£3945.40	£3737.75
12	single/three	£5881.44	£5571.89
16	single/three	£6067.68	£5748.33
20	single/three	£6297.60	£5966.15
24	three	£6622.32	£6273.78
28	three	£6899.76	£6536.61
32	three	£7177.28	£6799.53

Reverse cycle option to provide cooling as well as heating.

kW range	Additional cost
4-10	£495.00
12-32	£895.00

Plantroom modules
(excluding ground and load water pumps)

kW	power supply phase	price 1 off	price>10 off
20	three	£4967.60	£4706.15
25	three	£5387.50	£5103.95
30	three	£6290.10	£5959.04
40	three	£7358.00	£6970.74
50	three	£8028.50	£7605.95
60	three	£8892.00	£8424.00
75	three	£10246.50	£9707.21

Larger load requirements can be met with multiple units

Plantrooms with reverse cycle option to provide cooling as well as heating.

kW range	Additional cost
All units	£1000.00

Space heating + domestic hot water models

Units fitted with DHW option and provided with a larger manifold and more antifreeze.

Note: during DHW production there is a reduction in the efficiency of the unit and there might be a requirement to increase the number of boreholes.

Prices do not include drilling or piping as this will be done by others.

kW	power supply phase	price 1 off	price>10 off
4	single/three	£3256.56	£3085.16
6	single/three	£3733.48	£3536.98
8	single/three	£3923.52	£3717.02
10	single/three	£4153.40	£3934.80
12	single/three	£6089.44	£5768.94
16	single/three	£6275.68	£5945.38
20	single/three	£6505.60	£6163.20
24	three	£6830.32	£6470.83
28	three	£7107.76	£6733.67
32	three	£7385.28	£6996.58

Reverse cycle option to provide cooling as well as heating.

kW range	Additional cost
4-10	£495
12-32	£895

Prices are nett (excluding VAT & Carriage), supply only.

kensaheatpumps

IEC ISO 9001 UKAS QUALITY MANAGEMENT

GSHP association MEMBER

Case Study: Hevington School Norfolk 2003

Norfolk County Council chose Hevington School as the showcase site for its ***"Pioneering Classroom of the Future"***. The building is **low energy** highly insulated with a **wet** underfloor heating system throughout connected to a **Kensa 28kW Compact GSHP.** Hot water heating is by solar panels, and water is supplied primarily by the rainwater recovery system.

Six trenches, each 50m long were dug 2m deep to hold the **slinkies**, which are buried under the schools playing field.

The slinkies connect to the heat pump via a manifold located on the outside of the plant room.

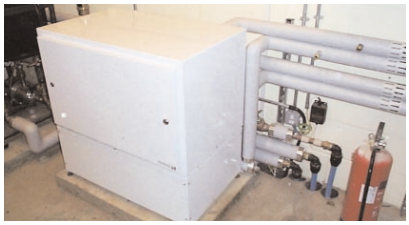
At the heart of the heat pumps is the first British application of new dedicated heat pump **scroll compressor technology** developed by Copeland, and manufactured in Cookstown, Northern Ireland. These scrolls are capable of working over a wider operating envelope than traditional compressors, and are between **8% and 12% more efficient.**

Case Study: Grad Ruan School Cornwall 2004

The extension to this school has been highly insulated with a wet underfloor heating system throughout with plenty of really good quality insulation underneath.

Two 70 metre deep closed loop boreholes provide the heat source which are connected to an 8kW Compact Kensa heat pump.

Domestic hot water heating is via solar panels. **Total Cost: £6,400**



Kensa Engineering Ltd.
Mount Wellington,
Chacewater,
Truro,
Cornwall TR4 8RJ

John Barker-Brown
Telephone: 01872 862140
Fax: 01872 862440
Email: info@kensaengineering.com
Web: www.kensaengineering.com

Ground Source Heat Pumps

Case Study:

Cotswold Water Park

November 2000

28kW Heat Pump

Used as Dr David Bellamy's base, this new office and visitor reception building is heated using renewable energy from an adjacent lake, which also provides cooling in summer. Six ***Kensa Sinky Pond Mats*** are sunk into the lake and connected to a number of heat pumps. Like all heat pump installations, there is no pollution or emissions of any kind on site.

"This building provides a glimpse into the future of environmentally friendly heating and cooling in the UK" said David Bellamy at the opening.

No servicing or maintenance of the system is ever required. The total cost of the heat pump system was around £13,000.

Shown below is one of Kensa's Engineers preparing the Slinky Pond Mats for installation and a view of the waterfront location of the offices.

Kensa Engineering Ltd.
Mount Wellington,
Chacewater,
Truro,
Cornwall TR4 8RJ

John Barker-Brown
Telephone: 01872 862140
Fax: 01872 862440
Email: info@kensaengineering.com
Web: www.kensaengineering.com

A GSHP(Space heating only)

When linked to underfloor in a well-insulated building these ground source heat pumps can produce 4kW of heat for every 1kW of electrical input, reducing running costs and CO_2 emissions.
UK designed and manufactured the units come complete with matched ground arrays (spiral or horizontal), antifreeze and manifolds.

kW	power supply phase	price 1 off	price>10 off
4	single/three	£3420.96	£3240.91
6	single/three	£4116.36	£3899.71
8	single/three	£4401.36	£4169.71
10	single/three	£4745.30	£4495.55
12	single/three	£6763.08	£6407.13
16	single/three	£7380.64	£6992.19
20	single/three	£7838.40	£7425.85
24	three	£8592.72	£8140.47
28	three	£9240.56	£8754.21
32	three	£9947.52	£9423.97

Reverse cycle option to provide cooling as well as heating.

kW range	Additional cost
4-10	£495.00
12-32	£895.00

B Plantroom modules
(excluding ground and load water pumps)

kW	power supply phase	price 1 off	price>10 off
20	three	£6508.40	£6165.85
25	three	£7357.75	£6970.50
30	three	£8710.50	£8252.05
40	three	£10460.80	£9910.23
50	three	£11910.00	£11283.16
60	three	£13573.80	£12859.39
75	three	£16157.25	£15306.87

Larger load requirements can be met with multiple units

Plantrooms with reverse cycle option to provide cooling as well as heating.

kW range	Additional cost
All units	£1000.00

Space heating + domestic hot water models

Units fitted with DHW option and provided with an additional ground array, larger manifold and more antifreeze. *Note: during DHW production there is a reduction in the efficiency of the unit.*

kW	power supply phase	price 1 off	price>10 off
4	single/three	£4134.36	£3916.76
6	single/three	£4734.76	£4485.56
8	single/three	£5043.16	£4777.73
10	single/three	£5477.70	£5189.40
12	single/three	£7438.48	£7046.98
16	single/three	£8037.04	£7614.04
20	single/three	£8551.80	£8101.71
24	three	£9258.62	£8771.32
28	three	£9892.00	£9371.37
32	three	£10708.42	£10144.82

Reverse cycle option to provide cooling as well as heating.

kW range	Additional cost
4-10	£495
12-32	£895

Prices are nett (excluding VAT & Carriage), supply only.

kensaheatpumps

GSHP association MEMBER

With over 30 years experience, our award winning products are purpose designed for energy efficient use in UK housing applications.

Delivering DHW at 65C, units are controlled by familiar standard DHW programmer giving space heating at between 35°C - 55°C and over 400% efficiency with radiators or underfloor heating systems.

A Ground Source Heat Pumps

A typical unit will produce 4kW of heat for every 1kW used to operate the heat pump giving a coefficient of performance (COP) of 400%, which compared with an electric resistance heater (100%) or a boiler (85%) is by far the most effective heating option, which is also virtually maintenance free. A Calorex heat pump installed in the home as the sole source of heating and hot water can reduce CO_2 emissions to **zero** from the dwelling.

Prices vary dependant upon the size and type of system installed. (Further discounts available on multiples of 10 and 20 units.)

Ground Source: **from £2565 to £3669**

Prices are nett, supply only (excluding Carriage & VAT). Installation and Maintenance services are available at andditional cost.

B Air Source Heat Pumps

A Calorex Heatseeker is designed to be stand alone (monovalent) incorporated into a new build or to be (bivalent) providing say 80% of annual heating requirement with the existing boiler integrated to deliver the balance (20%) on the coldest days. This allows the system to be retro-fitted with an ability to balance the initial capital cost with the benefit of reduced running costs, significantly reducing the payback periods against retro-fitting ground source HP monovalent systems.

Prices vary dependant upon the size and type of system installed. (Further discounts available on multiples of 10 and 20 units.)

Air Source: **from £2460 to £3824**

Prices are nett, supply only, (excluding Carriage & VAT). Installation and Maintenance services are available at additional cost.

WRAS APPROVED PRODUCT

CE and WRAS Certified

Domestic Heating Case Study:

Westlea Housing Association takes a pro-active role in designing energy efficient and environmentally friendly homes.

By designing houses with high levels of insulation they were able to reduce heating loads to around 5kW for each of the six houses at their new development at Withybed near Bushton in Wiltshire.

Each property was fitted with a 5 kilowatt Calorex ground source heat pump to work in conjunction with a wet under floor heating system. The Calorex units are unique in that they have a dual control mode that delivers either a high temperature output of up to 65°C when heating domestic hot water or 35°C – 55°C when providing space heating to under floor or radiator based systems.

This means that the total requirements for both space and water heating can be provided without recourse to the use of expensive top-up devices such as immersion heaters for example.

With almost 75% of the usable energy being drawn from the ground this means that for every 4kW of energy required in the home, only 1kW of energy is required to run the heat pump. Based on current prices, the tenants should save between £100 to £200 per annum on fuel costs.

Westlea Housing Association will save on maintenance costs as GSHPs do not require costly annual servicing or maintenance checks.

Facts:

Heat Pump: 1 x Calorex 5000DT GSHP

Ground Loop Earth Energy - 2 x 50 metre deep boreholes

Distribution System: Wet under floor

Client: Westlea Housing Association

Commissioned June 2004

calorex®

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The Causeway, Maldon,
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Web: www.calorex.com

Glenn Harrison
National Specification Manager
Telephone: 01621 856611
Fax: 01621 850871
Email glenn.harrison@calorex.com

Working with you every step of the way, we offer a complete range of tailored, integrated solutions, designed for the long term needs of your organisation.

As we are a framework supplier on the Low Carbon Buildings Programme, Phase 2, when bought through us, some microgeneration technologies are eligible for grants of up to 35% off the overall equipment.

Ground Source Heat Pumps

We offer a range of heat pumps suitable for schools, public buildings and homes. The installation covers the drilling of bore holes, installation of the ground loop and installation of the heat pump module ready for connection to the heating system.

Products

- **Viessmann Vitocal 200**
- **Viessmann Vitocal 300**
- **Viessmann Vitocal 350**
- **Calorex 3.5Kw**
- **Calorex 5Kw**

Typical product and installation costs:

Unit cost: From **£3125 to £7261**

Installation costs will vary depending on the complexity of each individual site.

For example, a typical large comprehensive school with reasonable ground conditions would cost approximately **£20,000** plus the unit cost (up to **£7,261**).

Case study: Rhydyfelin Child Centre

Products Installed:

- **Vitocal 300 Ground Source Heat Pumps**
- **Vitosol 300 Solar Thermal Panels**
- **Vitovolt 300 Photovoltaic Panels**
- **Vitodens 300 Condensing Boiler**
- **Vitocell 500 Dual Coil Cylinder**
- **Vitovent Ventilation/Heat recovery System**
- **Vitoset Underfloor Heating System**

The Integrated Centre at Rhydyfelin benefits from a range of renewable energy technologies, including two Vitocol 300 ground source heat pumps which provide the energy for an underfloor heating system. Along with Photovoltaic panels and solar thermal panels the Centre's annual gas bill fell to just £660 and the CO_2 emission savings (based on gas) are 8200kg per annum.

The energy use per m^2 is now less than 100kWh.

Prices shown are indicative net prices for the base product and associated equipment. E.ON supplies microgeneration products on an 'integrated solutions' basis, whereby they require that installation of the product is carried out by E.ON (or E.ON approved) installers. A 'typical' installation cost is shown but will vary dependent on the requirements at each location. E.ON will only install where the design and site survey shows that the technology achieves the customers aims and goals.

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Colin Grenville
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Email: lcbpp2@eon-uk.com
Web: www.eonenergy.com/sustainableenergy

Ground Source Heat Pumps (GSHP)

The Earth stores an enormous amount of solar energy from both solar radiation and rainfall.

To extract this energy, ground collectors consisting of flexible polyethylene pipes are buried in the ground, depending upon the soil types and available land either horizontal or vertical pipes are buried. A mixture of water and anti-freeze is then circulated through the pipe loops, attracting the heat energy and transferring it to the heat pump.

Where space is limited the best option is to use vertical coiled pipes called ***slinkies***, buried in a trench.

A Baxi Geoflo

The Baxi Geoflo Ground Source Heat Pump System taps into the natural heat from the earth and converts this to usable household heat.

The Baxi Geoflo consists of a Heat pump, ground collectors (called slinkies) and a manifold and is particularly well suited to underfloor heating systems in well insulated properties.

They have a benefit of being relatively easy to install and maintain, are a clean efficient form of renewable energy with a minimal impact on the environment.

Baxi Geoflo GSHPs

4Kw	each **£5690**	6Kw	each **£6949**	8Kw	each **£7452**
10Kw	each **£8006**	12Kw	each **£11,280**	16Kw	each **£12,487**
20Kw	each **£14,099**				

Additional discounts are available for 10 and 20 unit purchases

AIR SOURCE HEAT PUMPS (ASHP) ARE ALSO AVAILABLE EARLY 2008

Prices shown are indicative, nett prices for the base product and associated equipment alone. Galliford Try supplies microgeneration products on an 'integrated solutions' basis, whereby they also require to survey, design and install the products.

The cost associated with these services will vary, dependent upon the requirements for each location.

Biomass Boilers

B Baxi biomass boilers

Biomass boilers provide a carbon neutral solution to heating, which counteracts any CO_2. emitted during the combustion process by the amount absorbed while the natural fuels are growing.

The Baxi range of biomass boilers can burn naturally based biomass fuels and consists of the Multi-Heat, which burns wood pellets, wood chips and even grain and corn; and the Solo Innova log burning boiler.

The boilers can extract sufficient energy from these fuels to provide efficient heating and hot water storage via a storage cylinder.

Baxi Multi-Heat

15Kw (200L hopper)	each **£4485.79**
25Kw (360L hopper)	each **£5241.44**
40Kw (360L hopper)	each **£5578.78**

Also available with larger hopper size on request.
Further discounts are available for purchase of 10 units

Baxi Solo Innova

20Kw	each **£3237.18**
30Kw	each **£3685.82**
50Kw	each **£4534.20**

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The cost associated with these services will vary, dependent upon the requirements for each location.

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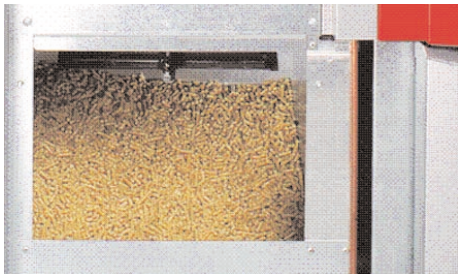
GallifordTry

Biomass boilers



Biomass boilers: boilers which produce hot water for the purpose of space heating and hot water. They are specifically designed to burn wood chips, logs, pellets, short rotation willow coppice, miscanthus or other clean biomass materials.

How We Specified

- Boilers are recognised products bearing a CE marking and accompanied by a Certificate of Conformity
- Boilers must either achieve a Class 1 or Class 2 EN standard rating dependant upon size, or reach a thermal efficiency of at least 80% if in excess of 300kW
- A minimum of two years' warranty for components had to be supplied by manufacturers.

How Green are Biomass boilers?

Greenhouse gases have a high impact on climate change or global warming. Carbon dioxide (CO_2), a main contributor to greenhouse gas, is produced every time we use energy from fossil fuels such as oil, coal and natural gas. When burnt, wood puts back into the atmosphere the CO_2 which is absorbed when it grows. Wood will typically reduce CO_2 emissions by 90% compared with heating oil, after processing and transportation. Woodfuel is 'carbon neutral', leading to reductions in emissions of CO_2 by offsetting the use of fossil fuels. In addition, these boilers can in some cases utilise products such as waste timber which would otherwise be transported to landfill.

Over the past 30 years the efficiency of biomass boilers has risen from as low as 60% to nearer 90%.

Variations in efficiency will occur dependant upon the fuel utilised. For instance, wood burning boilers will operate at lower efficiency if wood pellets have a relatively high water content.

Description and Pricing

Descriptions are given to distinguish alternative types of technology used to utilise biomass materials for heat energy.

Costings cover a range of quantities (typically from individual units to 20 units.

Wood Heating (Biomass) Solutions

Econergy Ltd is the UK's premier wood energy company providing cost effective reliable wood heating solutions based on well-tried Continental designs. Wood heating is developing rapidly in this country in response to higher fossil fuel prices and calls for action to reduce the causes of climate change.

We deliver a full range of proven reliable high efficiency products and systems including:

Large-scale (100kW–10MW) wood-chip and pellet boilers
for district heating, country houses, commercial developments and the public sector. Our dedicated in-house engineering team installs these.

Small-scale and domestic boilers to 110kW for logs, pellets or wood-chips
supplied and installed via our network of accredited distributors.

Econergy Ltd can offer a nationwide service for:

- Project scoping and outline proposals with payback and emission reduction figures
- Detailed designs including specifications, schematic diagrams and control solutions
- Energy services packages
- Project management, supply from a range of manufacturers and installation
- Full service backup including remote monitoring and servicing contracts
- Advice and training on, or provision of, wood fuel supplies including chip and pellets.

Brochures can be downloaded at:
www.econergy.ltd.uk

Prices are supply only, including carriage. Econergy supply heat pumps for installation by Econergy Installation Teams.

1% discount off on every additional boiler ordered on the same purchase order, with the same delivery address and same boiler type - maximum ten boilers.

econergy

A Froling FHG 3000 Log Boiler

- A lower cost automatic solution for those with access to logs
- Models from 20kW to 70kW, modulating to 30% at 92% efficiency
- Used in conjunction with a buffer tank for loading once per day

Froling FHG 3000 Log Boiler
from **£5,389** to **£7,226**

A

B Froling P2 Pellet Boiler

- A premium fully automatic solution from 10kW to 25kW
- Auto lighting, tube cleaning, ash extraction and Lambda control
- Award winning EN 303-5 approved design with 93% efficiency

Froling P2 Pellet Boiler
(available soon - prices on request)

B

C KWB USP Easyfire Pellet Boiler

- A high quality automatic pellet solution from 10kW to 30kW
- Auto lighting, tube cleaning, ash extraction, up to 94.9% efficiency
- The KWB Easyfire was the class winner out of 10 leading pellet boilers in the German magazine Stiftung Wahrung Test (2006)

KWB USP Easyfire Pellet
from **£5,811** to **£6,878**

C

KWB USV Multifire Woodchip or Pellet Boiler

D

- A high quality fully automatic pellet or wood chip solution from 15kW to 100kW with up to 92.6% efficiency
- Quick delivery and ease of installation

Multifire Woodchip/Pellet
from **£10,772** to **£15,387**

D

Econergy Ltd
Unit 8 & 9, St Georges Tower,
Hatley, St George,
Sandy,
Bedfordshire, SG19 3SH

Mike Webb
Telephone: 0870 0545 554
Fax: 0870 0545 553
Email: sales@econergy.ltd.uk
Web: www.econergy.ltd.uk

A Froling Turbomatic Woodchip or Pellet Boiler

- A premium product offering fully automatic pellet or wood chip solutions from 28kW to 110kW at high efficiency
- Produced by the leading Austrian manufacturer

Froling Turbomatic
from **£11,260** to **£16,714**

A

B Energy Cabin and Heat Box

- A modular solution offering combined pellet boiler with or without solar panels from 10 kW to 300kW
- Stylish larch clad combined boiler house and fuel store
- Fully factory fitted with buffer, pumps etc. ready for connection

Energy Cabin/Heat box
from **£19,196** to **£110,908**

B

C KWB TDS Powerfire Woodchip or Pellet Boiler

- 150kW, 300kW (available soon)
- Price competitive, high quality, fully automatic
- Compact high performance up to 93% efficient at part load

KWB TDS Powerfire
from **£26,517** to **£27,780**

C

D Froling Turbomat Woodchip or Pellet Boiler

- 150kW to 500kW
- Fully automatic modulating to 30% at up to 95% efficiency
- The leading high volume premium quality boiler

Froling Turbomat
from **£31,425** to **£73,322**

D

E Froling Lambdamat Woodchip Boiler

- 750kW to1000kW
- Stepped moving grate for reliable operation
- Tolerant to wet low grade fuel

Froling Lambdamat
from **£72,789** to **£122,520**

E

Prices are supply only, including Carriage.
Econergy supply heat pumps for installation by Econergy Installation Teams.

1% discount off on every additional boiler ordered on the same purchase order, with the same delivery address and same boiler type - maximum ten boilers.

Case Study: Wood fuel heating at Sheffield Road Flats, Barnsley

Above; One of the blocks of flats

Right; Fröling Turbomat fully automated wood fuelled boilers

In 2005 wood heating was installed by Econergy to provide community district heating for three tower blocks with a total of 166 flats. Barnsley Metropolitan Borough Council has adopted a policy of positive preference for biomass heating and intends to apply wood heating throughout their building portfolio where space and access permits.

Two Froling Turbomat wood boilers of 150kW and 320kW were installed. Operating in parallel they provide a high degree of turn down with a total output of 470kW. The fully automated boilers are 90+% efficient taking woodchip at up to 50% moisture content. Heat meters were installed in the flats for the tenants to purchase their hot water and heat. The combination of biomass heating and improved insulation has enabled the council to substantially reduce the heating bills and there-by address fuel poverty objectives.

Woodfuel reception, storage and transfer

The brick boiler house and woodfuel storage bunkers with hydraulic lids were constructed on the outside of one of the three blocks of flats. Woodchip is delivered into the storage bunkers using a using a high "scissor lift" fuel trailer. Well specified woodfuel reception, storage and transfer is vital to the smooth operation of any wood fuelled boiler installation.

Above: Woodfuel storage bunkers with hydraulic lids. Fuel is delivered into the bunker using a high "scissor lift" fuel trailer.

The key challenges are usually:

- **ensuring good access for a suitable delivery vehicle**
- **transferring the fuel from the delivery vehicle to the store in a reasonably short amount of time**
- **maximising the useful volume of fuel store (i.e. making sure that it is filled up).**

Operation

Econergy now acts as an Energy Service Company (ESCo). Econergy is contracted to deliver heat at a given price and is responsible for boiler operation, maintenance and fuel supply.

Annual consumption is a estimated to be around 500 tonnes. To meet the woodfuel demand Econergy has also facilitated the set-up of local fuel supply company, Silvapower.

Carbon Saving

The displacement of gas heating saves approximately 300 tonnes of CO_2 emissions per year.

Funding

The wood boiler and fuel supply infrastructure investments have been co-funded by the Council, Yorkshire Forward and the Bioenergy Capital grant funds

Award Winning

Barnsley Metropolitan Borough Council won first prize in the 2006 Ashden Sustainable Energy Awards for the successful roll-out of its biomass

Brochures and more case studies can be downloaded at:

www.econergy.ltd.uk

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Web: www.econergy.ltd.uk

econergy

The Baxi biomass boilers extract their energy from naturally based biomass fuels such as wood pellet, wood chips, logs and even grain and corn.

These give sufficient energy to provide efficient hot water and heating within a property or as part of a communal heating system.

A Willow Solid Fuel Stove

Traditional style solid fuel burning stove
Airwash system to keep the glass clean
Top or rear fitting flue option
4" Flue collar, 5" adaptor available
Maximum heat output 4.0kW

Product Dimensions:
Height 455mm, Width 350mm, Depth 345mm

Prices:

Willow Solid Fuel Stove	*each*
each	**£251.38**
per 10	**£236.59**

B Arden Multifuel Stove

Traditional style wood and coal burning stove
Double window design allows flames to be clearly visible
Airwash system to keep the glass clean
Top or rear fitting flue option
4" Flue collar, 5" adaptor available
Maximum heat output 5.0kW

Product Dimensions:
Height 537mm, Width 405mm, Depth 345mm

Arden Multifuel Stove	*each*
each	**£362.84**
per 10	**£336.92**

C Hamlet Solid Fuel Stove

Traditional style 2-door large solid fuel stove
Burns wood, solid fuel and peat
Top or rear fitting flue option
Airwash system to keep the glass clean
Patented multi fuel grate
Maximum output 7.0kW

Product Dimensions:
Height 535mm, Width 485mm, Depth 362mm

Hamlet Solid Fuel Stove	*each*
each	**£476.21**
per 10	**£444.46**

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Case study: Nursing Home

A nursing home in Co Tipperary Ireland replaced 2 x 50kW LPG Gas Boilers with 2 x 50kW Woodpecker Pellet Boilers.

Mr Paddy Fitzgerald, proprietor of the nursing home confirms that he is now saving €1,000 (£670) per month on his fuel bills and has installed a 17 tonne silo with automatic feeder to enable him to purchase the pellets in bulk.

Ecofirst Ltd.
The Tithe Office
Abbey Manor Business Centre
Preston Road, Yeovil
Somerset BA20 2FJ

Aidan Morris
Managing Director
Telephone: 01935 848561
Fax: 01935 848544
Email: aidan@ecofirst.net
Web: www.ecofirst.net

Customers wishing to purchase products should call David Riste on 01935 848579

Gerkross Biomass boiler

Features:

- **Models ranging from 20 – 50kW**
- **Modulating burner output**
- **Automatic feed from hopper**
- **Automatic ignition**
- **Easy to use and clean**

System contents:

- **Boiler with integrated hopper and feed system**
- **3 tonne hopper available separately**

Accreditation:

- **Clear Skies Product Code: BWFB7073**

20kW Gerkross boiler	each	**£3139.80**
	per 10	**£3073.60**
	per 20	**£3007.60**
50kW Gerkross boiler	each	**£3795.00**
	per 10	**£3715.00**
	per 20	**£3635.00**

Prices are nett, supply only, including Carriage (excluding VAT)

ecofirst
The Energy Saving Experts

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Biomass Boilers

Biomass boilers burn environmentally friendly wood pellets, producing energy from a carbon neutral source. Unlike some renewable energy heating systems, a biomass boiler does not require a back-up from electrical energy or fossil fuels.

Products

- **Viessmann Vitolig 300**

Typical product and installation costs:

Unit cost: **£6571** depending on the range of operation.

Feed hoppers vary from **£1313 to £1643**

Installation costs: Installation costs will vary depending on the complexity of each individual site.

For example, a small primary school with good access, simple ex-coal conversion and an existing fuel storage building would cost approximately **£2,900** plus the unit cost.

Case Study: Modern Heating Systems

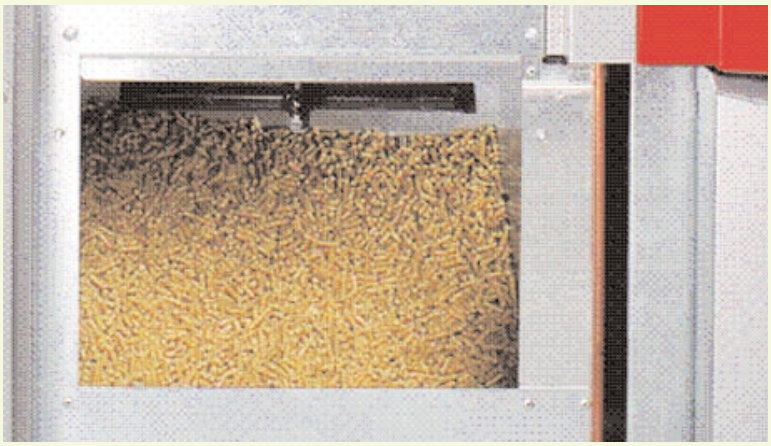
Products installed:

- **26kW Vitolig 300 Biomass Boiler**
- **Vitoset Wood Pellet Silo**

Modern Heating Systems installed a Viessmann Vitolig boiler to heat their Renewable Energy Showroom.

The boiler burns environmentally friendly wood pellets.

Modern Heating Systems are expecting their fuel bill to be at least 50% cheaper than if they had installed an oil boiler.



Wood pellets are clean and easy to handle and can be easily stored in 25kg sacks

Feed hoppers for wood pellets are also available.

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