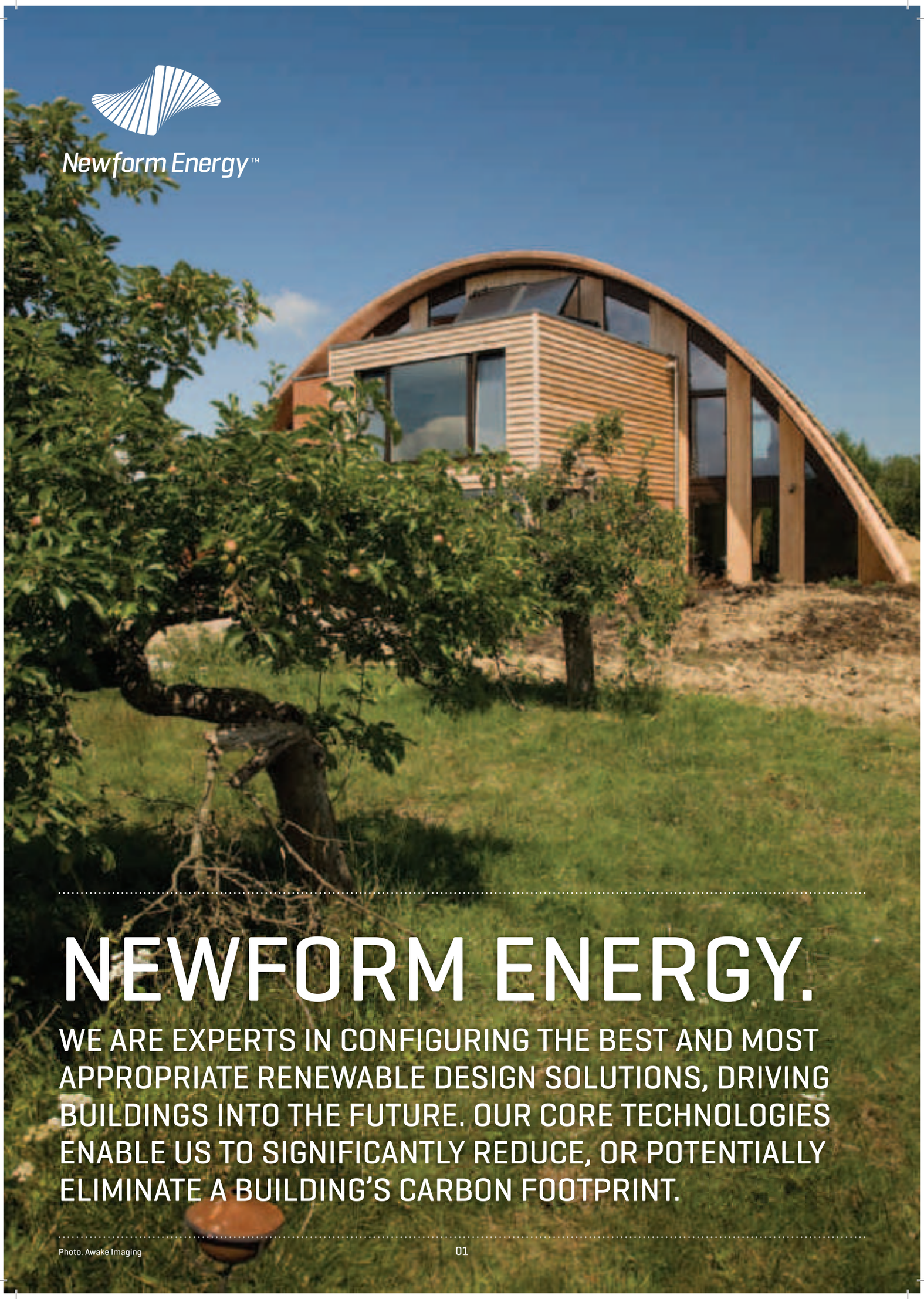

NEWFORM ENERGY.

WE ARE EXPERTS IN CONFIGURING THE BEST AND MOST APPROPRIATE RENEWABLE DESIGN SOLUTIONS, DRIVING BUILDINGS INTO THE FUTURE. OUR CORE TECHNOLOGIES ENABLE US TO SIGNIFICANTLY REDUCE, OR POTENTIALLY ELIMINATE A BUILDING'S CARBON FOOTPRINT.

Photo. Awake Imaging

CROSSWAY

A Grand Designs Project.

Project Description:

An integrated PVT system designed with Pellet Boiler for top up heat, MVHR (Heat Recovery Ventilation) for thermal recovery and heat distribution and, PCM Buffer Storage for excess thermal energy.

Kents first ZERO-CARBON house:

Integrated renewable energy system designed and developed by Newform Energy. A world first project using this particular approach and combination of technologies.

Further Description:

The PVT system also provides a significant electrical contribution to the building. Electrical consumption is further reduced with the help of a domestic voltage optimiser which reduces the energy being used within the building by as much as 10%.

A

B

Photos. Awake Imaging

PROJECT DATA

Crossway / Kent

HYBRID PVT PANELS PRODUCING:

System size 27m² 2.95kW (pk)

ANNUAL OUTPUT (PVT):

ELECTRICAL – 3,408kWh/annum
THERMAL – 12,064kWh/annum

SYSTEM OUTPUTS (with losses)

ELECTRICAL – 2,873kWh/annum.
THERMAL – 9,627kWh/annum.

BUFFER STORAGE:

400lt solar tank + salt PCM store.

EVO AQUA PELLET BOILER USES:

22kg of pellets/annum.

NED AIR 400 MVHR UNIT:

32W fan power on normal setting.
Heat Recovery Efficiency 92%.

GRAND DESIGNS

We are always happy to discuss new projects. Here's how we can help with yours:

Wholesale Supply.

We offer wholesale supply of solar technologies, including PV, PVT, Solar Thermal equipment and associated ancillaries to companies wishing to buy high quality robust solar products. Our volume order policy makes us highly competitive within the market.

Bespoke Design Services.

Newform Energy Ltd are experts in configuring the best and most appropriate renewable solutions. We designs solutions to take buildings into the future. Using our core technologies, Newform Energy is able to significantly reduce, or potentially eliminate a building's carbon footprint.

Holistic Renewable Solutions.

Successfully installing an integrated renewable energy system into any building requires unique specifications and careful design. The age, size and aspect of the building, the location and environment in which it is situated, and the needs of its occupants are equally important factors. We configure finely balanced holistic systems that take these elements, and more, into account, enabling a building to generate, store and use energy in a clean and efficient manner.

Consultancy.

We also act as independent consultants to architects and developers looking to push the boundaries of system design. Our portfolio of current projects includes community wide energy strategies which investigate new and cutting edge technologies appropriate to the delivery of a zero-carbon future. Our integrated and layered approach balances maximum carbon impact with best economic return.

Core Technologies.

Our expertise in the integration of a range of renewable technologies is at the core of our offer. These technologies include PVT (Photovoltaic Thermal) and other solar energy solutions, heat pumps and energy storage technologies, such as Geothermal Heat Storage and phase change materials.

Installation.

We work in close partnership with MCS accredited installers across the country to ensure our clients always have access to available grants and incentives.

What is Photovoltaic Thermal (PVT)?

PVT is a combined technology that produces both electricity and heat by converting the suns energy. Due to the cooling effect of the panel, it is able to produce significantly more electrical energy than conventional PVs, and the heat it produces can be used to offset the buildings heating requirements.

Newform Energy, the perfect partner to assess, develop and deliver, your on site renewable energy needs.

For more information, contact us:

05603 138 089 (9am-6pm)
Email. info@newformenergy.com
Online. www.newformenergy.com

VOLTHER HYBRID PVT COLLECTORS

Newform Energy™

Newform Energy™

VOLTHER – HYBRID PVT SOLAR COLLECTORS.

A VOLTHER HYBRID PVT PANEL IS A SINGLE SOLAR COLLECTOR ABLE TO PRODUCE ELECTRICITY, HEATING AND DOMESTIC HOT WATER. ALL WITH ZERO CO^2.

Photo. Awake Imaging

Photovoltaic Thermal (PVT).

What is a PVT collector?

A PVT collector is the combined assembly of a PV module, for the conversion of electrical energy, with a high efficiency flat-plate solar collector, to convert thermal energy.

Photovoltaics (PV) are semiconductors, and have one drawback - degradation in performance due to temperature. In the UK, on a sunny summer day, when you hope to be making the most of your PV, the outputs will be significantly reduced because of the temperature of the silicon wafer within the PV.

By regulating panel temperature using a fluid cooling system, a balance can be produced, trading off between PV efficiency and thermal output. Using this principle, it is possible to obtain a higher electrical yield, coupled with enough free heat to offset a low energy building's annual heating requirements.

Volther Hybrid PVT is a step-change technology that maximises the energy return from a given area. A finely balanced solution that optimises efficiency, saves space and money.

What are the benefits of PVT?

PVT is a hybrid technology that combines monocrystalline photovoltaics and a high efficiency solar thermal collector. The benefits are vast:

- A simple low cost, low maintenance energy solution able to facilitate the governments zero-carbon strategy.
- Higher output efficiency at lower temperatures than the equivalent monocrystalline PV.
- Space saving, only one panel is required to produce both heat and electricity.
- Greatly improved paybacks over the combination of traditional PV and Solar Thermal technologies.
- Low maintenance, unlike other renewable sources of energy. Virtually fit and forget.
- Provides opportunities to most residential and light commercial low energy buildings to reach zero-carbon.

What can be achieved with a PVT collector?

PVT collectors allow you to setup a 'total solar energy system' for both electrical and thermal energy generation. And because of its cooling effect on the PV module, this system has a higher efficiency at a much lower cost when compared to separate systems.

In combination with Geothermal Storage*, this system can be used to take low energy buildings to, or near to Zero-Carbon.

For more information, contact us:

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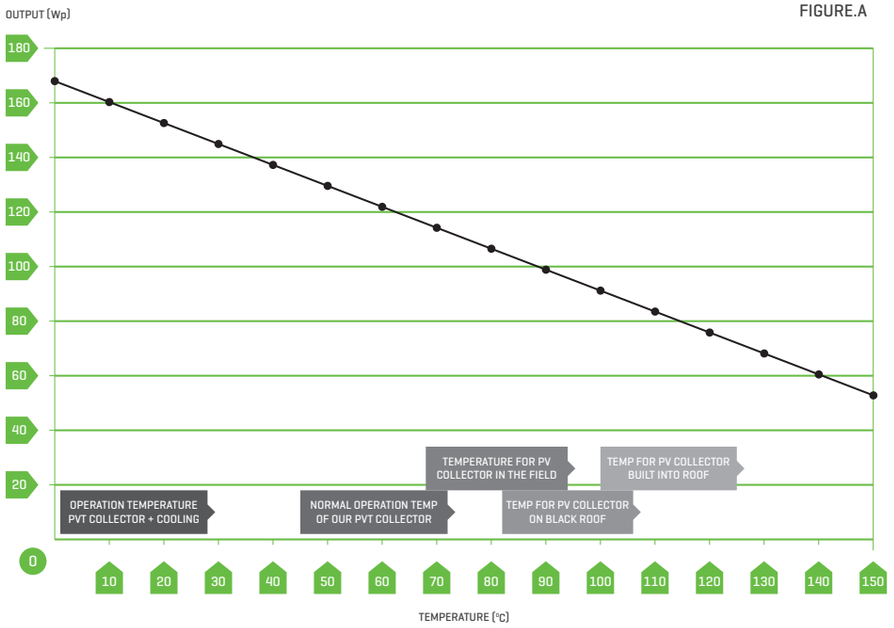
* Geothermal Heat Storage is a means of storing thermal energy in the ground. The heat obtained from Solar Thermal, or PVT panels during summer months is stored deep in the ground where it can be extracted during winter months when there's not enough solar energy to adequately provide heat to a building.

Effective PV Performance / Operation Temperature.

FIGURE.A



PV Performance / Operation Temp.

All photovoltaics are tested under standard test conditions. For example, at an irradiance level of 1000W/m² and a temperature of 24°C. PV performance and temperature are inextricably linked. For every 1°C rise temperature there is a drop of 0.5% of electrical output.

When under direct sunlight, the temperature of a standard PV module may be as much 110°C , resulting in a 43% loss in efficiency due to heat, leading to a subsequent reduction in annual performance.

See – FIGURE.A

Source ISPA & IEA. Produced for Nord West Europe.

The benefits of cooling a PV module.

If the PV module can be actively cooled, reducing it's nominal temperature closer to that of standard test conditions, the overall annual output of the module will be improved. A Volther Hybrid PVT panel, stabilised at an average of 45°C, will produce roughly 20% more output over a 12 month period (when compared to a PV system with the same peak output).

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PVT collector types and selecting the right product.

What are the product differences?

There are two types of Volther PVT collector, PowerTherm and PowerVolt. The project will determine the correct panel selection.

What is PowerTherm?

The PowerTherm collector has been developed to maximise on the thermal return of the panel, making it an enhanced thermal collector capable of electrical production.

The peak outputs of this panel are 155/610 watts electrical/thermal respectively.

It will produce roughly 80% of the output of the equivalent area of solar thermal and it also produces electricity. Perfect if your project has restricted space, and you are looking to maximise the energy return.

Ideal for use with swimming pools, the collector operates at lower temperatures, supplying year round heat to the pool and the electrical energy needed to offset the running of the pools equipment.

In conjunction with ground source heat pumps, excess summer energy is fed into the ground which is recovered during colder periods to heat a building. PVT is capable of producing a zero-carbon building as part of an integrated solution in a low energy build.

What is PowerVolt?

The PowerVolt collector has been developed to maximise on the electrical return of the panel, making it an enhanced PV collector, capable of producing a reasonable amount of heat production in the summer.

The peak outputs of this panel are 175/460 watts electrical/thermal respectively.

When correctly installed the collector will produce roughly 30% more electricity than conventional PVs and provide a contribution to the thermal requirements of a building.

This is perfect for customers wishing to maximise on the electrical energy returns from a given area.

Any UK houses with 16m² or more of available south facing roof area, can use the PowerVolt panel to produce the equivalent annual output of 20.8m² of conventional monocrystalline photovoltaics.

The same area of PowerVolt collectors will offset around the same amount of thermal energy as 4.2m² of conventional solar thermal collectors, meaning using separate systems over 25m² of roof area would be required to produce the same thermal and electrical energy.

In addition, the PowerVolt collector has numerous commercial applications and when actively cooled can produce impressive electrical energy outputs.

Life Expectancy and Warranty?

Our PowerVolt and PowerTherm collectors come with a 10 year manufacturers warranty, and a guaranteed output of at least 80% after 20 years.

	VOLTHER HYBRID COLLECTORS POWERVOLT W 175 / 460	VOLTHER HYBRID COLLECTORS POWERTHERM M 155 / 680
Dimensions	828 x 1655 x 90mm	860 x 1660 x 105mm
Weight	24.4kg.	34.4kg.
Liquid Content	1.2Lt.	1.2Lt.
PV Efficiency (STC)	17.5%	11.5%
Ratio (e/th) at 60C	1:1	1:3
Absorber Panel	Mono-Crystalline	Mono-Crystalline
Number of Cells	72	72
Cells Dimensions	125 x 125mm	125 x 125mm
WP (W) Nominal Power	175	155
Imp (A) Nominal Current	4.93	4.93
Isc (V) Short Circuit Current	5.2	5.2
Vmp (V) Nominal Current	35.3	31.6
Voc (V) Ope Circuit Voltage	44.2	44.2
Heat Exchanger	Copper Strip	Copper Strip
Internal Piping	Copper	Copper
Flow (L/H)	65	65
Test Pressure Bar	20	20
Operating Pressure Bar	10	10
Cover Glass Hardened	Low Iron Tempered Glass	Modul Glass 4mm
Sealing	EPDM & Silicon	EPDM & Silicon
Maximum Temperature	<110°C	<110°C
Housing	Aluminium	Aluminium
Rear Side	Aluminium	Aluminium
Product Warranty	10yrs	10yrs
Quality Guarantee	90% < 10yrs	90% < 10yrs
	80% < 20yrs	80% < 20yrs

	RADIATION △T = 10°C	1000 Q = 55 1/h/m²	W/m²	n
POWERTHERM	T out	Wth/m²	We/m²	W/m²
	10°C	>680	161.3	>83%
	20°C	680	153.8	82%
	40°C	557	138.8	68%
	60°C	475	123.8	58%
	80°C	370	108.8	46%

	RADIATION △T = 10°C	1000 Q = 55 1/h/m²	W/m²	n
POWERVOLT	T out	Wth/m²	We/m²	W/m²
	10°C	>600	178.7	>77%
	20°C	510	171.2	68%
	40°C	317	156.2	47%
	60°C	113	141.2	25%
	80°C	-71	126.2	6%