CI/SfB (56)

thernamic™

Navigating your Renewable Heat Pump Future

1st edition

Vent-Axia®

Introduction

Over the past 250 years, we have seen significant changes in the way we travel, construct our cities, manufacture goods and farm our land. The resulting need for greater energy meant we moved away from harnessing nature's wind and water power, and became reliant on utilising our abundant reserve of fossil fuels. This practice has continued to the current day, not only depleting our fuel reserves but increasing the amount of CO^2 released during these processes.

Unfortunately as a result of this, the UK is no longer fuel rich and from 2004 we became an importer of gas. This has been to satisfy the increasing demand for electricity generation, direct heating and hot water provision to our homes. During the last 20 years it has become apparent that we must adopt a different approach to satisfy this demand.

In 2009 the launch of 'The Low Carbon Transition Plan' by the Government cemented the UK's position at the forefront of a low carbon economic revolution. This has offered the construction industry huge opportunities to contribute to a low carbon future. In order to deliver this, the regulatory framework within which we operate continues to tighten the performance criteria for heating and ventilation products and systems.

The 2010 Building Regulations are just the next in a number of points that plot the path to a zero-carbon goal for the UK. Legislative pressures will therefore continue to build in the years ahead and increase the necessity for renewable equipment and technology to be specified. This will raise the bar in terms of both energy efficiency and reduced carbon emissions.

The world is constantly changing and Vent Axia have always delivered cutting edge technology to our customers. This is why we feel extremely proud that we can bring you our Renewable product portfolio and help shape this renewable revolution. It is with this in mind that we have launched our own range of heat pumps to fulfil the ever-growing demand for renewable technology.

Working alongside nature, Vent-Axia's heat pump products can achieve an efficiency of 400% by moving vast amounts of abundant low-grade heat energy (either in the surrounding air or captured in the ground) into your home. This will create a warm, comfortable living space whilst dramatically reducing the carbon emissions your home produces.

Vent-Axia Firsts

At Vent-Axia we have a history of innovation. When you look at our heritage, it soon becomes clear we have been the First name in Ventilation since our inception

1936 – Maritime engineer Joe Akester invented the unitary extractor fan 'Silent 6' made from Bakelite material. The original products featured DC motors.

1945 – Following the Second World War, Sir Winston Churchill bought two Silent 6 fans for his Chartwell home. A copy of the cheque for £28.19s 8p is in Vent-Axia's reception area at Crawley.

1953 – The 'X type' fan was produced in 4 sizes and the unique 'R type' controller enabled the fans to be reversed for the first time.

1961 – Vent-Axia Standard Range was launched and applications became more varied with the first dedicated models for roof and wall mounting and even a model for commercial and military vehicles.

1975 – The Universal fan range featured the first 'centrifugal' shutter mechanism that allowed the shutters to operate in both directions without pull-cords.

1985 – The T Series' product range featured a patented DC solenoid shutter and offered unique applications like In-Line and Dark Room models. Accessories like the Direct Mount Spigot and wall terminations also enabled the fans to be used with ducting as a complete installation kit.

1985 – Vent-Axia was the first, (in fact the only) fan company to be awarded the Royal Warrant by the Queen for supplying unit ventilation to Royal Households.

1992 – The 16th edition of IEE regulations 'on site guide' was issued and Vent-Axia launched the first Safety Extra Low Voltage fan to meet the requirements for electrical safety in bathrooms.

1994 – The patented LuminAire became the first fan and light combination and its IP57 protection made the unit electrically safe for shower installation.

1997 – Domestic energy efficient ventilation began with the launch of the LoWatt range featuring a DC motor and patented shutter system that used no additional power.

2002 - Commercial fans became energy efficient with LoWatt T Series launched at Interbuild in Birmingham.

2006 – The Sentinel range was developed as the first 'demand' ventilation system with energy efficient EC/DC motors.

2007 – Vent-Axia launched the first complete Lo-Carbon ventilation range featuring Residential Fans, MEV, MVHR and Commercial Energy Efficient products.

2008 – As part of the Sentinel family, Totus Demand Energy Recovery became the first low energy commercial ventilation system with a 90% efficient energy recovery and EC/DC motor.

2009 – Sentinel Kinetic becomes the first Lo-Carbon heat recovery with 90% heat recovery and cooker hood facility.

2010 – Vent-Axia launches Thernamic Heat Pump Range.

By Appointment to H.M. The Queen
Suppliers of Unit Ventilation Equipment
Vent-Axia, Crawley, West Sussex

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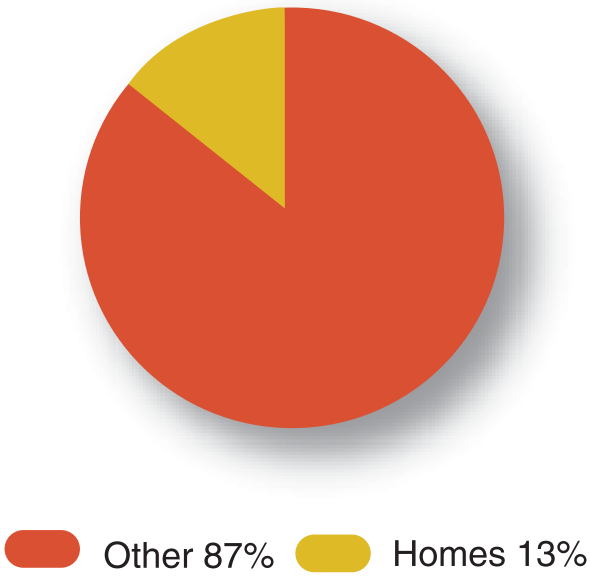
Navigating The Path

Heating our homes and hot water is responsible for 13% of the UK's total greenhouse gases emissions



Source: The UK Low Carbon Transition Plan

Climate Change

'Human induced climate change' is a real issue we all face. Since the start of the Industrial Revolution Carbon Dioxide (CO^2) levels in the atmosphere have gone up by 38%. This is directly linked to our everyday activities such as burning fossil fuels and the clearing of forests around the world.

CO^2 – What Is All The Fuss About?

Carbon Dioxide is a 'Greenhouse Gas'; greenhouse gasses which are present in the atmosphere trap some of the Sun's energy warming the Earth. This process is called the greenhouse effect.

Increasing the concentrations of carbon dioxide in our atmosphere effectively traps the radiated heat from the sun in the atmosphere raising the temperature of our planet and contributing to climate change.

The levels of greenhouse gases in the atmosphere can be directly linked to the temperature increase we have seen over the last 100 years. During this period, the earth has warmed by approximately 0.75 °C and the speed at which it is warming will only increase. These days Spring in the UK arrives about 10 days earlier than it did in the 1970s.

In 159 years of records, the 10 hottest years have been over the last 12. The 2003 heat wave in Western Europe responsible for 35,000 deaths (2,000 in the UK) is already twice as likely to happen again next year. By 2040, Europe will consider such a summer to be normal; by 2060 they will consider it cool.

Source: Department of Energy and Climate Change - 10 facts on Climate Science

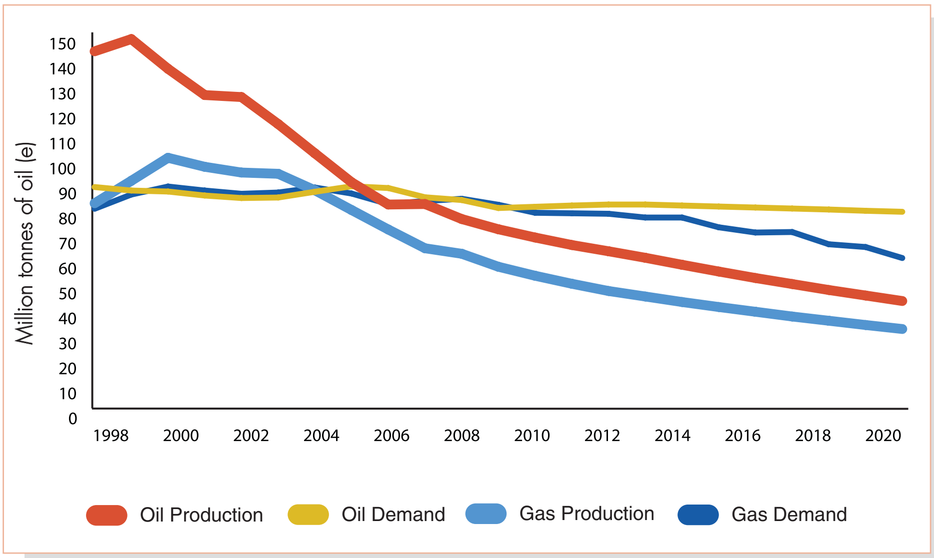
Fuel Security

The UK's reserves of oil and gas are declining, while signicant amounts do still remain, production has hit its peak and is now falling. From 2004 we are no longer self sufficient and have relied on imports which have also led to higher prices due to the volatility of the international energy markets.

The UK has historically been fuel rich making us heavily dependent on our gas reserves. Around a third of UK primary gas consumption is used for heating our homes and providing domestic hot water. 45% of our electricity is generated via gas fired power stations and combining these direct and indirect uses, the residential sector accounts for 60% of our final gas consumption.

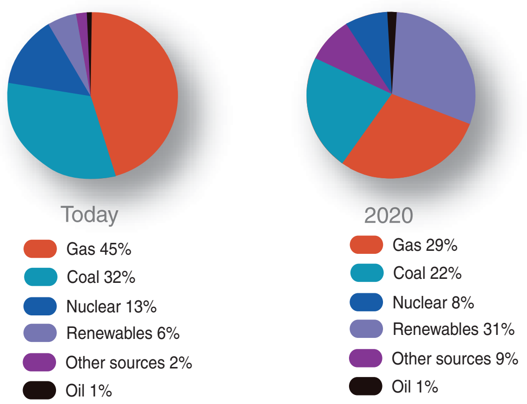
The projected decline in the production of oil and gas, clearly defined in the diagram, below shows that we must act now to fulfil the demand for energy another way. The Governments Low Carbon Transition Plan lays down a route to change the way we currently generate our heat, hot water and electricity. The aim is to substitute gas for a mixture of renewable technologies with a target of 30% of generation to be from renewable energy sources. Vent Axia's heat pump product portfolio can contribute towards the solution to both climate change and fuel security by reducing the carbon emissions and fossil fuel consumption of our homes.

UK Production of oil and gas declining and our dependence on imports increasing



Source: Department of Energy and Climate Change

Around 75% of our electricity is currently generated from gas and coal, renewables will expand to around 30% of our generation by 2020



Source: The UK Low Carbon Transition Plan

Your Low Energy Home

The terms 'low energy house', 'eco-house', 'low carbon house', and 'green building' are increasingly used to describe the future of UK house building. The Governments "Zero Carbon homes" approach will result in radical change to the way buildings are being designed and constructed. By linking building regulations and planning together, the scene is set for all houses built post 2016 to be at the Zero Carbon Standard.

What is a low energy home?

A low energy home is a very well insulated and air tight property which uses very little heat energy. It is not exclusively a new build property as the same measures can be applied to an existing home.

Insulation

Insulating your building reduces the transmitted or conducted heat losses through your walls, windows, doors, floors, ceilings and roofs. Cavity wall and loft insulation are two of the most basic measures and will contribute to huge increases in energy efficiency as well as being a prerequisite to receiving any funding through the renewable heat incentive. (see page 10)

Air tightness

Pressure differentials caused by wind and the internal to external temperature differentials cause warm air to leak through gaps in a house's external envelope. This a major cause of heat loss and improving air tightness in your home reduces the uncontrolled flow of air through gaps and cracks in the external fabric. The higher the air tightness the lower your natural infiltration and heat loss will be.

Air tight properties will have a larger requirement for a mechanical ventilation system and appropriate consideration should therefore be given to assess the correct ventilation strategy for your home. Installing heat recovery products such as our Kinetic Mechanical Ventilation with Heat Recovery (MVHR), will not only provide you with exceptional indoor air quality but will also reduce the heating demand from your home by recovering up to 90% of the heat from the extracted stale air.

What should it feel like inside?

Your low energy home should provide thermal comfort all year round, a healthy living environment with good indoor air quality, free from indoor pollutants.

What can be achieved

The following table describes a semi detached house with a floor area of 150m^2 and the impact that insulation and air tightness has on the heating demand. From left to right (example 1-3) you can see the difference in the buildings heat loss that different technology and materials can have when refurbishing existing buildings. By installing better windows, cavity wall and loft insulation, you can halve the peak heat loss from your home. Example 4 shows the minimum performance levels of the Building regulations 2010 and shows the heat loss as if it were to be built to these regulations.

Building fabric	Example 1 – As built	U value	Example 2	U value	Example 3	U value	Example 4 2010 building regulations	U value
Windows	Single glazed wooden frames	4.8	Double glazed pre *02	3.1	Double glazed post *02	2	Minimum Standards	2
Walls	Unfilled cavity walls	1.6	Filled cavity walls	0.6	Filled cavity walls	0.6	Minimum Standards	0.3
Roof insulation	No roof insulation	2.3	50mm roof insulation	1.5	150mm roof insulation	0.29	Minimum Standards	0.2
Chimneys	1 Open chimney		1 Open chimney		Baffled chimney		No chimney	
Heat Loss kW	15.5		10.3		7.3		6.1	

What is a U value: Walls, windows, doors and roofs all conduct heat, the U value of a material is the measure of heat transfer per unit of area and is measured in W/m^2

Our Renewable Technology

A heat pump is a mover of heat energy. This technology is not new and in fact we all come into contact with it every day of our lives and most homes already rely on this technology

Heat pump technology

If you own a fridge you are familiar with this technology. Have you ever wondered how these products work; how the low temperatures are achieved inside and why the rear of the appliance gets warm?

The simple answer is that the heat is removed from inside your fridge and dumped into your kitchen using a refrigeration cycle.

By definition, a Heat Pump is described as: A machine or device that moves heat from one location (the'source') to another location (the 'sink') using mechanical work.

Stage (1)

The heat transfer medium inside the evaporator (the 'refrigerant') is colder than the heat source 1 2 3 or 4. As the glycol (GSHP)* or outside air (ASHP)* Passes across the first heat exchanger (the evaporator) the liquid refrigerant absorbs the low temperature heat energy and evaporates.

Stage (2)

The vapour then flows to the compressor and is compressed. When compressed the pressure of this vapour is increased and the temperature of the vapour rises, effectively concentrating the heat, elevating the temperature.

Stage (3)

The hot vapour flows to the second heat exchanger (the condenser) where the heat is transferred into the heating distribution system. As this heat energy is transferred, vapour condenses back into a liquid.

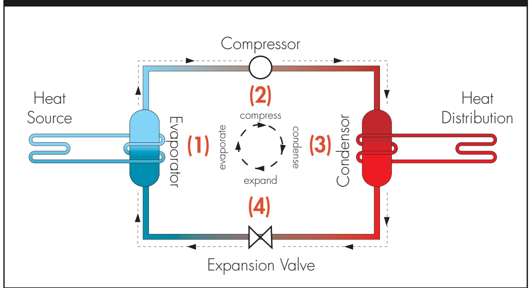
*Ground Source Heat Pump and Air Source Heat Pump.

Stage (4)

The liquid refrigerant then passes through an expansion valve reducing its pressure, this process is the exact reverse of the compression function in stage 2 and temperature decreases ready to start the whole cycle once again.

At Vent Axia we offer a comprehensive range of heat pumps. Our Ground Source Heat Pumps have the capacity to cover any installation from very small domestic homes to large commercial properties with capacities from 4 to 75 kiloWatts. We also supply the Daikin Altherma Air Source Heat Pump range which is available in split, Monobloc or high temperature models,with capacities from 6 to 16 kilowatts.

HEAT PUMP REFRIGERANT CYCLE



HEAT SOURCE

1. Horizontal closed ground loops
2. Closed water loops
3. Vertical closed ground loops
4. Outdoor air to ASHP*
5. Solar Collector
6. Heat Recovery Unit

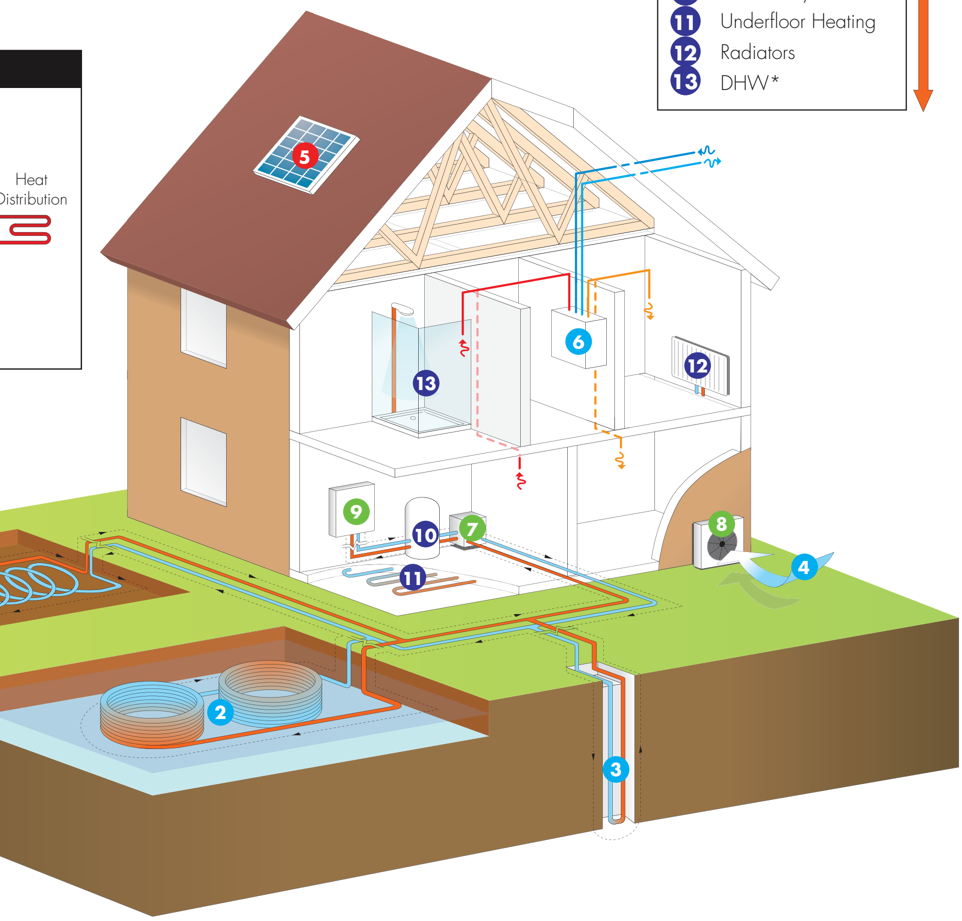
HEAT PUMP SYSTEM

7. GSHP*
8. Outdoor unit
9. Indoor Unit

HEAT DISTRIBUTION

10. DHW* Cylinder
11. Underfloor Heating
12. Radiators
13. DHW*

flow of energy



Vent-Axia®

Building Regulations

Building Regulations

Over recent years legislation has been a driving force behind the development and application of our products. Our objective is to help our customers understand how legislation may influence product selection at design stage and throughout the life of the buildings in which they are installed.

The road towards Zero Carbon homes

Vent-Axia welcomes the publication of the new Approved Documents for Part F and L of the Building Regulations as an essential "step change" and a key stage towards reaching zero carbon homes in 2016.

Released on April 30, the Approved Documents Part F (Means of Ventilation) and Part L (Conservation of Fuel and Power) set out "hugely significant changes". This will drive the adoption of low carbon buildings as an industry standard.

Core to the Government's aim to cut the UK's carbon emissions, Part L's new Target Emission Rate (TER) represents a 25% sweeping improvement over the previous regulations. This is in-line with achieving Code for Sustainable Homes Level 3.

Meanwhile, both Approved Part L and F include a number of detailed major revisions which underpin compliance with stated minimum energy efficiency levels for all ventilation and heat pump systems.

With the launch of Part L's new Domestic Building Services Compliance Guide, heat pump performance levels are highlighted. This applies a minimum coefficient of performances (COP) of 2.2 for heating and 2.0 for domestic hot water.

Vent-Axia's Thernamic and Lo-Carbon™ product ranges provide a comprehensive range of heat pumps and ventilation equipment. Our units offer considerable energy benefits helping meet the new challenge of a 25% carbon reduction over the previous regulation. Our on-going strategy is to ensure that all our products and systems will help deliver lower carbon emissions and energy consumption. This places Vent-Axia at the forefront of the drive for low energy HEVAC products.

SAP 2009

The Standard Assessment Procedure (SAP) is our national energy calculator and plays an ever increasing role in the selection and performance of HEVAC equipment within residential building design.

SAP 2009, introduced from October 2010,will be used to prove compliance with building regulations in England & Wales (Part L) and in Scotland (Section 6). SAP is also used to create Energy Performance Certificates for existing dwellings. For this purpose, SAP 2005 will continue to be used and will be aligned with SAP 2009 during 2011.

Code for sustainable homes

The Code for Sustainable Homes (the Code) is an environmental assessment method for rating and certifying the performance of new homes. This conforms to a national standard for the design and construction of these buildings with a view to encouraging continuous improvement in sustainable home building.

The Code For Sustainable Homes covers nine categories of sustainable design including

- Energy and CO^2 Emissions
- Water
- Materials
- Surface Water Run-off
- Waste
- Pollution
- Heath and Wellbeing
- Management
- Ecology

The Code uses a 1 to 6 star rating system to communicate the overall sustainability performance of a new home. This sets minimum standards for energy use at each level measured in carbon dioxide reduction over the 2006 Building Regulations.

The Code entered a period of consultation in December 2009, closing in March 2010. Significant changes within the energy section of the Code are expected as this on-going consultation aims to seek agreement to change the Code to align with changes to Part L and the proposed approach to adopting the 2016 definition of zero carbon.

Funding

Renewable Heat Incentive

The RHI has been designed to promote and increase the use of renewable technology, in line with the Government's goal of generating 15% of the UK's energy demand from renewable sources, by 2020.

The RHI as defined in the Renewable Energy Strategy (released on 15th July 2009), will provide Clean Energy Cash-back payments for technology such as air, water, ground-source heat pumps, solar thermal, biomass boilers and renewable combined heat and power.

The RHI will launch in April 2011. However, all renewable MCS* accredited heating devices that have been installed by an MCS accredited engineer from the 15th July 2009 will qualify for the Clean Energy Cash back payments.

The RHI will be open to individuals, community groups, and businesses and will subsidise costs associated with fitting renewable heating technologies, when compared to more conventional types.

Payments will be determined based on a deemed heat demand for the property. These will be calculated for small installations by using the outputs from SAP or EPCs as the basis for the calculation tool.

The table to the right sets out the proposed tariff levels to apply from the start of the RHI in April 2011.

To avoid misuse of this scheme, small scale installations under 45 kW will be deemed (estimated) rather than metered. This is to ensure that people will not generate waste heat and be rewarded. It will also be a requirement that the property has cavity wall insulation and 125mm of loft insulation fitted to claim the payments.

As you can see from the table, the indicated tariff for air and ground source heat pumps are 7p and 7.5p per kWh of heat delivered.

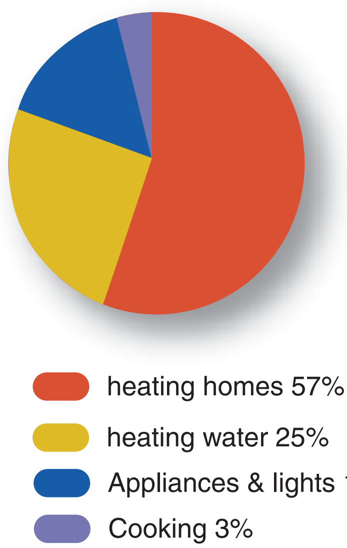
Although the exact RHI payment calculation tool has not been defined, we can make some assumptions to give an indication of the Clean Energy Cash-back received for an individual building.

*Micro Generation Certification Scheme

We can use the following formula (see graph to the right), to work out annual heat demand based on the breakdown of the typical energy use in domestic properties, the floor area and the Energy used (stated in the EPC)

Small installations

Technology	Scale	Proposed tariff (pence/ kWh	Deemed or metered	Tariff lifetime (years)
Solid biomass	Up to 45 kW	9	Deemed	15
Bioliquids (7)	Up to 45 kW	6.5	Deemed	15
Biogas on-site combustion (5)	Up to 45 kW	5.5	Deemed	10
Ground source heat pumps (8) (9)	Up to 45 kW	7	Deemed	23
Air source heat pumps (9)	Up to 45 kW	7.5	Deemed	18
Solar thermal	Up to 20 kW	18	Deemed	20



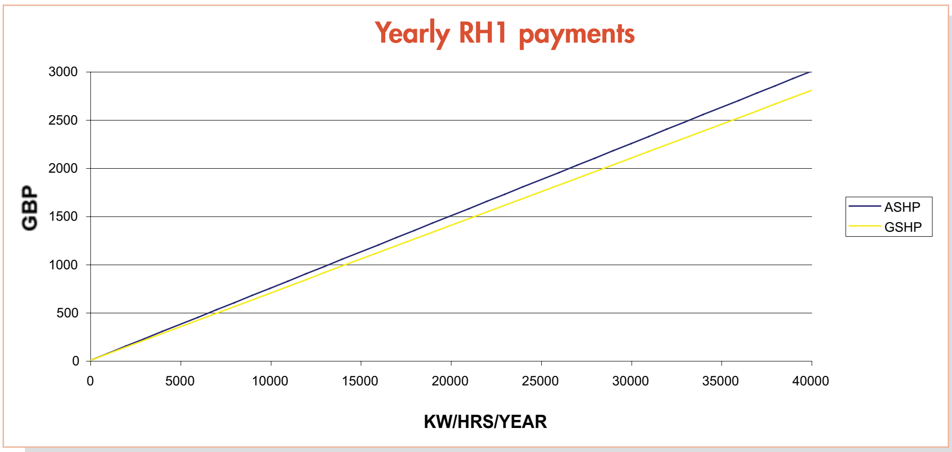
Source: The UK Low Carbon Transition Plan

The energy that households use to heat their homes and water accounts for over 80% of the total household energy use.

Clean Energy Cash-back Calculator

To give the level of payment indicated in the RHI consultation, we have created our clean energy cash back calculator. Using information provided on an EPC certificate (floor area and Energy use) with information of the energy consumption within our homes, we can derive the Annual heat demand for your property in kW/h's needed to define the RHI payment. The boxes to the right include the worked example but space has been left for you to input your own. Example; a mid terrace house with a floor area of $72m^2$ with an energy use of $254kWh/m^2$ would have an annual deemed energy use of 15,000 kW/h (rounded). Using the graph below and the tarrif table you can see that the RHI payment will be £1050per annum; £24,150 over the lifetime of the tariff for a ground source heat pump.

Energy use (kWh/m^2)		Floor area (m^2)		Energy used in Heating and hot water generation (%)		Annual heat demand (kW/h)
254	X	72	X	82%	=	15,000



Consultation on the Government Renewable Heat Incentive closed on the 26th of April. Full details of how this scheme will be delivered, and the exact payment calculation method, are anticipated before the end of 2010. Using the above formula in no way guarantees the payment level correct to the finalised RHI document.

Carbon Emissions Reduction Target (CERT)

The Carbon Emissions Reduction Target (CERT) is the third three-year phase of an obligation met by energy suppliers. It requires all domestic energy suppliers, with a customer base in excess of 50,000, to make savings in the amount of CO^2 emitted by householders. Under CERT, energy suppliers are required to deliver measures that will provide overall lifetime carbon dioxide savings of 185 $MtCO^2$ – equivalent to the emissions from 1 million homes each year. It is expected to require energy suppliers to invest around £3.2bn in order for them to meet their obligation. CERT requires suppliers to focus at least 40 per cent of their activity on a 'Priority Group' of vulnerable and low-income households (including those in receipt of eligible benefits and pensioners over the age of 70) by increasing the energy efficiency of these households.

Community Energy Saving Programme (CESP)

The CESP targets households across Great Britain in areas of low income, to improve energy efficiency standards and reduce fuel bills. It promotes a 'whole house' approach i.e. a package of energy efficiency measures best suited to the individual property. The programme has adopted a house by house, street-by-street approach delivered through the development of community-based partnerships between Local Authorities (LAs), community groups and energy companies. The CESP is funded by an obligation met by energy suppliers and electricity generators. It is expected to deliver up to £350m of efficiency measures including renewable technology (such as our heat pumps) across 4500 areas. For more information and to find if your area is eligible then please contact the Heat Pump team at Vent-Axia.

Vent Axia can help you receive CERT and CESP funding for your Ground Source Heat Pump purchases. For more information please contact our Heat Pump team.

Product Introduction

Vent-Axia's Thernamic™ Ground Source Heat Pumps are designed to provide space heating, cooling and domestic hot water. The product range includes single phase units from 4 to 24KW and three phase units from 4 to 30KW. A high temperature series is also available from 4 to 20KW which is capable of heating at temperatures up to 65 °C negating the need to use direct-acting emersion heater, whilst still meeting the cylinder pasteurisation temperatures. A range of commercial units are also available in three phase from 20 to 75KW and are capable of bolting together to provide higher system capacities. To provide a comprehensive package for specifiers and installers, Vent-Axia will provide all the accessories that are required for the installation of its ground source heat pumps. This includes manifolds, ground collectors, cylinders, buffer vessels and glycol. All the Vent-Axia Thernamic™ products will be MCS accredited and eligible for the RHI payments when the scheme is launched in April 2011.

Low Temperature

Description	Thermal Output	COP to EN14511	Power supply rating	Typical running current	Typical starting current	Power supply cable size	Power input*	Nominal dry weight	Dimensions	Connection size
Thernamic	kW (0/50)	0/35 (0/50)	Amps	Amps	Amps	Mm	kW	Kg	HxWxD	mm OD
Single Phase										
GS 4 1PH	5.2 (4.7)	3.94 (2.46)	16	7 (10)	25	2.5	1.5 (2.1)	85	900x550x570	28
GS 6 1PH	6.4 (5.9)	3.91 (2.66)	25	10 (12)	30	2.5	1.9 (2.5)	90	900x550x570	28
GS 8 1PH	8.7 (8.1)	4.04 2.68	25	13 (16)	30	2.5	2.4 (3.3)	95	900x550x570	28
GS 10 1PH	10.1 (9.3)	4.07 (2.62)	32	13 (18)	30	4.0	2.7 (3.8)	100	900x550x570	28
GS 12 1PH	12.5 (11.5)	3.97 (2.69)	32	17 (22)	40	4.0	3.4 (4.6)	110	900x550x570	28
Three Phase										
GS 4 3PH	5 (4.7)	4.10 (2.59)	16	3 (4)	23	2.5	1.4 (2.0)	85	900x550x570	28
GS 6 3PH	6.2 (5.7)	4.18 (2.69)	16	4.5 (5)	30	2.5	1.8 (2.4)	90	900x550x570	28
GS 8 3PH	8.8 (8)	4.28 (2.73)	16	5 (6)	36	2.5	2.3 (3.2)	95	900x550x570	28
GS 10 3PH	10.1 (9.3)	4.24 (2.70)	16	6 (7)	41	2.5	2.6 (3.7)	100	900x550x570	28
GS 12 3PH	12.4 (11.5)	4.21 (2.75)	16	7 (9)	51	2.5	3.2 (4.5)	105	900x550x570	28

COP is to EN14511 test conditions, 0 deg C from the ground, 35 deg C flow to the underfloor. The figures in parentheses are values obtained at 0 degC, 50 deg flow to the heating system.Power input includes the power consumption of both inbuilt water pumps.

Thernamic Range

Description	Thermal Output	COP to EN14511	Power supply rating	Typical running current	Typical starting current	Power supply cable size	Power input*	Nominal dry weight	Dimensions	Connection size
High Temperature										
Thernamic	kW 0/35 (0/65)	0/35 (0/65)	Amps	Amps	Amps	Mm	kW	Kg	HxWxD	mm OD
Single Phase										
GS 3.5 1PH HT	3.5 (3)	3.86 (1.93)	16	6 (7)	25	2.5	1.1 (1.8)	85	900x550x570	28
GS 4.3 1PH HT	4.3 (4)	3.87 (1.99)	25	8.4 (10)	30	2.5	1.4 (2.4)	90	900x550x570	28 (4)
GS 6 1PH HT	6.2 (5)	4.08 (2.00)	25	11 (14)	30	2.5	1.8 (3.0)	95	900x550x570	28
GS 7 1PH HT	7 (6)	4.05 (2.10)	32	10 (14)	30	4.0	2.0 (3.2)	100	900x550x570	28
Three Phase										
GS 3.5 3PH HT	3.5 (3)	3.75 (1.87)	25	3 (6)	24	2.5	1.1 (1.8)	85	900x550x570	28
GS 4.5 3PH HT	4.5 (4)	4.13 (2.04)	16	4 (7)	32	2.5	1.4 (2.3)	90	900x550x570	28
GS 6.3 3PH HT	6 (5)	4.30 (2.04)	25	5 (8)	32	2.5	1.7 (2.8)	95	900x550x570	28
GS 7.3 3PH HT	7 (6)	4.30 (2.21)	25	5 (9.5)	44	2.5	1.9 (3.0)	100	900x550x570	28
GS 8.5 3PH HT	8.5 (7)	4.36 (2.20)	25	6.5 (12)	55	2.5	2.3 (3.7)	105	900x550x570	28
GS 10 3PH HT	10 (8.5)	4.32 (2.18)	25	7.3 (14)	64	2.5	2.7 (4.4)	110	900x550x570	28

COP is to EN14511 test conditions, 0 deg C from the ground, 35 deg C flow to the heating system and 0 deg C from the ground, 65 deg C to the heating system. The figures in parentheses are values obtained at 0 deg C, 65 deg flow to the heating system.Power input includes the power consumption of both inbuilt water pumps.

Vent-Axia

Thernamic High Capacity Range

Low Temperature CC										
Description	Thermal Output	COP to EN14511	Power supply rating	Typical running current	Typical starting current	Power supply cable size	Power input*	Nominal dry weight	Dimensions	Connection size
Thernamic	kW 0/35 (0/50)	0/35 (0/50)	Amps	Amps	Amps	Mm	kW	Kg	HxWxD	mm OD
Single Phase										
GS 12 1PH CC	12.8 (11.8)	4.00 (2.66)	40	19 (24)	40	2.5	3.6 (4.8)	165	900x900x570	28
GS 16 1PH CC	17.4 (16.2)	4.04 (2.68)	63	26 (32)	43	4.0	4.8 (6.6)	167	900x900x570	50
GS 20 1PH CC	20.2 (18.6)	4.07 (2.62)	63	26 (35)	43	6.0	5.4 (7.6)	170	900x900x570	50
GS 24 1PH CC	25 (23)	3.97 (2.69)	63	34 (43)	47	6.0	6.8 (9.2)	180	900x900x570	50
Three Phase										
GS 12 3PH CC	12.4 (11.4)	4.04 (2.69)	25	8 (10)	60	2.5	3.4 (4.6)	165	900x900x570	28
GS 16 3PH CC	17.6 (16)	4.28 (2.73)	25	10 (13)	77	2.5	4.6 (6.4)	167	900x900x570	50
GS 20 3PH CC	20.2 (18.6)	4.24 (2.70)	25	12 (14)	88	4	5.2 (7.4)	170	900x900x570	50
GS 24 3PH CC	24.8 (23)	4.21 (2.75)	32	15 (18)	109	4	6.4 (9.0)	180	900x900x570	50
GS 30 3PH CC	29.6 (27.4)	4.17 (2.72)	32	17 (21)	126	4	7.4 (10.6)	185	900x900x570	50

COP is to EN14511 test conditions, 0 deg C from the ground, 35 deg C flow to the underfloor. The figures in parentheses are values obtained at 0 deg C, 50 deg flow to the heating system. Power input includes the power consumption of both inbuilt water pumps.

Description	Thermal Output EN14511	COP to rating	Power supply current	Typical running current	Typical starting cable size	Power supply	Power input*	Nominal dry weight	Dimensions	Connection size
High Temperature CC										
Thernamic	kW 0/35 (0/50)	0/35 (0/65)	Amps	Amps	Amps	Mm	kW	Kg	HxWxD	mm OD
Single Phase										
GS 12 1PH CC HT	12.4 (10.5)	4.04 (2.00)	16	3 (6)	24	2.5	1.1 (1.8)	85	900x900x570	28
Three Phase										
GS 12 3PH CC HT	12 (10)	4.25 (2.04)	32	8 (10)	60	2.5	3.2 (5.4)	165	900x900x570	28
GS 17 3PH CC HT	17 (14)	4.37 (2.20)	32	10 (13)	77	2.5	4.3 (7.1)	167	900x900x570	50
GS 20 3PH CC HT	20 (17)	4.34 (2.18)	32	12 (14)	88	4.0	5.1 (8.5)	170	900x900x570	50

COP is to EN14511 test conditions, 0 deg C from the ground, 35 deg C flow to the heating system and 0 deg C from the ground, 65 deg C to the heating system.
The figures in parentheses are values obtained at 0 deg C, 65 deg flow to the heating system. Power input includes the power consumption of both inbuilt water pumps.

Thernamic Plant Room Range

Plant Room Modules

Description	Thermal Output	COP to EN14511	Power supply rating	Typical running current	Typical starting current	Power supply cable size	Power input*	Nominal dry weight	Dimensions	Connection size
Thernamic	kW 0/35 (0/50)	0/35 (0/50)	Amps	Amps	Amps	Mm	kW	Kg	HxWxD	mm OD
Three Phase										
GS 20 PL 3PH	21.6 (20)	4.23 (2.68)	30	11	123	4	5 (7.4)	180	1750x800x900	DN40
GS 25 PL 3PH	26.4 (24)	4.01 (2.92)	30	13	127	4	6.4 (8.1)	200	1750x800x900	DN40
GS 30 PL 3PH	32.5 (29.5)	4.18 (2.87)	30	14	167	4	7.5 (10.1)	250	1750x800x900	DN40
GS 40 PL 3PH	39.4 (36.2)	4.11 (2.83)	40	17	198	6	9.1 (12.5)	280	1750x800x900	DN40
GS 50 PL 3PH	49.5 (45.7)	4.03 (2.54)	50	22	225	10	11.6 (17.6)	300	1750x800x900	DN40
GS 60 PL 3PH	61.8 (56.3)	4.07 (2.52)	60	28	272	10	14.5 (22)	330	1750x800x900	DN40
GS 75 PL 3PH	75.6 (68)	4.05 (2.56)	70	32	310	16	17.3 (25.9)	380	1750x800x900	DN40

COP is to EN14511 test conditions, 0 deg C from the ground, 35 deg C flow to the underfloor. The figures in parentheses are values obtained at 0 deg C, 50 deg flow to the heating system. Power input excludes the power consumption of external water pumps.

Accessories

Ground collector

Thernamic GC 30
Thernamic GC 40
Thernamic GC 50

Ground collector Manifolds

Thernamic M 1 U
Thernamic M 2 U
Thernamic M 3 U
Thernamic M 4 R
Thernamic M 4 L
Thernamic M 5 R
Thernamic M 5 L
Thernamic M 6 R
Thernamic M 6 L
Thernamic M 7 R
Thernamic M 7 L

Antifreeze

Thernamic AF 25

Vent-Axia

Cylinders

Our cylinders exceed the heat loss requirement in Part L of the Building Regulations and with the safety kit, provided conform to all requirements in Part G.

Our range is manufactured from stainless steel, operate at 3 bars to provide high flow rates for fast bath filling and power showers and come with a 25 year guarantee.

Large surface area coils give maximum heat recovery with twin coil systems available to utilise multiple heat sources.

Technical Specification

Code	Vol Litres	Size Dia x Hgt mm	Solar Coil Area m^2	Heat Pump Coil Area m^2	kW Rating	Hp Coil Ex Vessel Capacity	Heat Pump kWh/24hrs at 50 Deg C	Weight Empty Kg
HP150 Single Coil	150	575 x 1083		2	54	12 Litres	1.49	44
HP215 Single Coil	215	575 x 1485		3	81	12 Litres	1.70	54
HP255 Single Coil	255	575 x 1750		3	81	12 Litres	1.80	57
HP305-3 Single Coil	305	575 x 2023		3	81	19 Litres	1.95	61
HP305-4 Single Coil	305	575 x 2023		4	108	19 Litres	1.95	63
HP400-3 Single Coil	400	750 x 1630		3	81	35 Litres	2.25	85
HP400-4 Single Coil	400	750 x 1630		4	108	35 Litres	2.25	89
HP500-3 Single Coil	500	750 x 1780		3	81	35 Litres	2.60	101
HP500-4 Single Coil	500	750 x 1780		4	108	35 Litres	2.60	105
HPS215 Twin Coil	215	575 x 1485	1.10	2	54	12 Litres	1.70	47
HPS255 Twin Coil	255	575 x 1750	1.10	2	54	12 Litres	1.80	58
HPS305-2 Twin Coil	305	575 x 2023	1.10	2	54	19 Litres	1.95	62
HPS305-3 Twin Coil	305	575 x 2023	1.10	3	81	19 Litres	1.95	64
HPS400-3 Twin Coil	400	750 x 1630	2.00	3	81	35 Litres	2.25	93
HPS400-4Twin Coil	400	750 x 1630	2.00	4	108	35 Litres	2.25	97
HPS500 Twin Coil	500	750 x 1780	2.00	4	81	35 Litres	2.60	114

Notes

By Appointment to H.M. The Queen
Suppliers of Unit Ventilation Equipment
Vent-Axia, Crawley, West Sussex

Vent-Axia®

VENT-AXIA CONTACT NUMBERS

Free technical, installation and sales advice is available

Heat Pump Team
Domestic & Commercial

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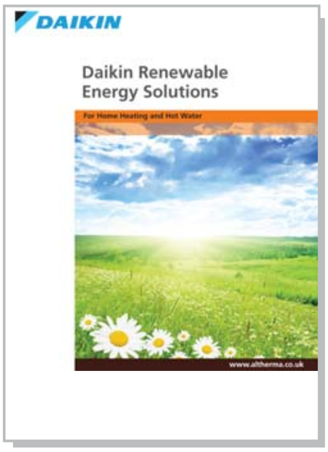
Sales Fax:	01293 565169
Tech Support Tel:	01293 441523
Tech Support Fax:	01293 539209
Web:	www.vent-axia.com
Email:	sales@vent-axia.com



Supply & Service

All sales made by Vent-Axia Limited are made only upon the terms of the Company's Conditions of Sale, a copy of which may be obtained on request. As part of the policy of continuous product improvement Vent-Axia reserves the right to alter specifications without notice.

ISO9001

BSI

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