Solar Package Estimation for:

MCS accreditted Solar Thermal Installation at Perins School

Mr Clive Surry
Senior Community Manager
Mr Phil Burridge
Financial Manager
Perins School
Pound Hill
Alresford
Hampshire
SO24 9BS

Riomay Ltd
Norman House
15 Stephenson Way
Three Bridges
Crawley
West Sussex RH10 1TN

Company Nº 1307807
NIC Solar Thermal 3001
NIC PV 3002
Installer Nº NIC 1162

riomay® renewable energies

Prepared by: Jeremy Jones

Version Nº 1

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Checked by: JJ/ SG

Contact Tel Nº 07970 094 175

Email: jeremyjones@riomay.com

Content: Section

Mr Clive Surry Senior Community Manager
Mr Phil Burridge Financial Manager
Perins School
Pound Hill
Alresford
Hampshire
SO24 9BS

23rd Feb 2012

Dear Clive and Phil,

Re: Perins – Solar Thermal Installation for Sports Hall Showers and School Class Rooms

Following on from a conversation with Phil Kearn at Hydro Heating Solutions Ltd. Please find our full technical submittal for the solar thermal component of this package.

System Overview:

The following equipment will be installed:

- Nº 10 of Riomay Solar Panels DF120 connect to 1,000 litre pre-feed installed and commissioned by others.
- 15kW Fan Coil Heat Sink for use in summer recess on flat roof next to sports hall
- Flow and Return Riser Solar pipe-work will be Copper Tube, brazed to BS EN 13133
- Insulation for external roof solar pipe-work (Mineral Wool - Metal Cladding) by Riomay
- Insulation for riser (Rockwool Foil Wrapped) by Riomay
- Insulation for plant room (Rockwool Foil Wrapped) by Riomay
- Location of solar panels (see suggested drawing)
- Associated solar expansion vessel 100 litres
- Pitched roof mounting installation kit
- Supply and install solar control panel. (Single phase13 amp fused spur by others) Differential Temperature Control (DTC) provided will send fault signal only (BMS controls by others if required).
- Solar Fluid (Solaris PG20)
- Supply and Installation pump sets by Riomay. Standby and duty pump set sized to enable the flow and return circulation within the solar system.
- Thermostatic Blending valve (as advised by boiler manufacturer)
- Supply sensor cable from panel arrays, within riser and across plant-room to DTC.
- AAV and isolation valves
- Supply – Installation - Commissioning

Cost including Builders Discount of 2.5% **£29,950.00 + Vat**

Scaffolding is not included in this cost we would estimate that it would be in the region of between £1,600 and £2.500 Perins may have a preferred contractor that can quote for this. Riomay Ltd would require edge protection where appropriate on the roof and platforms access to manually bring panels onto roof.

Description of Works:

- Riomay Ltd will supply will install 10 DF120 solar panels and connect flow and return pipe-work to 1,000 litre unvented dedicated pre-feed solar cylinder to be supplied and installed and commissioned by others.
- Riomay will install solar panels on pitched roof of sports hall west facing. (Confirmation of roof design /type for strap anchor point location would be helpful) running flow and return pipe-work along the roof to vertical drop at southern end of the building, riser to plant room via sleeve access through wall, penetration and make good by Riomay Ltd. We will install the solar controls and with duty and stand by pump-set. Riomay will commission system once pre-feed cylinder is commissioned. Riomay to install 15kW horizontal fan coil heat sink for use during summer recess position for this unit on roof TBC.

- Site Matrix information see attached details.

Further information and exclusions

This estimate is subject to a technical site survey of the building, plant room and other relevant information. It excludes the following: scaffolding, electrical and water supplies, roof penetration and weathering, by others. Connection of cylinders to DHWS. ~~All solar hot water pipe work insulation unless otherwise specified~~, builders discount unless otherwise stated, craneage, delivery and VAT. NB: Should roof be made from Asbestos, Riomay Ltd can not install panels until these materials have been removed by a specialist and replaced with approved alternative roof structure.

Prices are valid for 30 days from quotation. Payments are strictly 30 days from application. We advise all our clients that we will enforce the imposition of charges for late payment of invoices in accordance with The Late Payment of Commercial Debts Acts (1998)

We are obliged to advise you that it is not possible to predict with any certainty the performance of a Solar system. Our estimates should not in any way be considered as a guarantee of performance.

Riomay is accredited under the Micro-regeneration Scheme and is therefore qualified to install solar thermal systems. Please be aware that solar hot water systems can generate dangerously high water temperatures that exceed 100ºC.

Riomay Ltd endeavours to carry a stock of panel and equipment for our range of technologies. However, on occasion stock levels can run down so we politely remind our customers that some equipment can have a lead in time of up to 12 weeks'

Equipment, parts and installation are provided with a warranty of 12 months from date the installation is completed. Extended warranty for panels is only valid if the system and its components are used and maintained within manufacturers recommendations and to the specified system requirements.

Our installation teams are fully trained in all aspects of Health and Safety on site to safeguard against potential injury to our customers and our staff during the works.

Maintenance

All solar thermal systems require maintenance periodically. Whilst our Ecotube™ panels are virtually maintenance free we recommend visual inspection. We also recommend that the system is checked and maintained as necessary on an annual basis to ensure the ongoing performance of the overall system. This is principally focused on checking the moving parts of the system (e.g. pumps) and the performance of the glycol fluid, which will degrade over a 3-5 year period, affecting the frost protection of the system. An accredited solar system supplier should carry out this maintenance work.

Please call if you have any further questions.

Yours sincerely,

Jeremy Jones
Project Consultant
Riomay Ltd
Direct Line: 07970 094 175

SOLAR WATER HEATING SYSTEM

CONTENTS

SOLAR WATER HEATING SYSTEM

1.1 PERFORMANCE OBJECTIVES

1.2 DESIGN PARAMETERS

The system shall be installed in accordance with all appropriate standards and guides, in particular:

1 British Standards and Codes of Practice
2 HVAC Guides and Good Practice Notes.
3 CIBSE Commissioning Guides.
4 Manufacturer's Instructions.
5 IEE Wiring Regulations
6 Health & Safety Executive Guide Notes
7 CIBSE Recommendations.

1.3 SYSTEM DESCRIPTION

1.3.1 General

The proposed solar system is designed to primarily pre-heat the DHW system. The pre-heated water will be stored in 1-off 1000 litre twin coil cylinder (supplied & installed by others)and the estimated flow temperature of the solar loop will be +10 deg.C above cylinder temp.

The number of solar panels in each array shall be consistent to ensure that pressure drops are uniform across each array. If the solar collector array is interrupted (e.g. obstruction, space for maintenance, etc.) continuity shall be made after the obstruction.

The solar collectors shall be evacuated tube collectors, they shall be installed west facing sports hall roof roofs (i.e. at an incline of approx 15 degrees with the horizontal) and the evacuated tubes shall be rotated so that the receptor incline is 30 degrees with the horizontal.

Where possible the evacuated tubes shall face a direction comprised between south-east and south-west.

Where possible the solar collectors shall not be visible from street level.

Over shading from any obstructions should be avoided. Typically the solar collectors will be located away from any obstruction on the roof (e.g. lift shafts); Solar collectors shall avoid any significant overshadowing from any buildings; Easy access for maintenance should be allowed around the solar collector arrays, especially between the edge of the roof or any obstruction and the closest solar collector. Safety of any operator involved in the maintenance of the solar system will have to be ensured.

1.3.2 Pipework Distribution

The pipework distribution will depend on the final solar collector layout as agreed by Riomay Ltd & the mechanical contractors.

1.3.3 Life expectancy

The Riomay Ltd. solar collectors have a manufacturer's estimated 25 year life expectancy.

1.4 CONTROL REQUIREMENTS

Digital sensors shall compare the heating fluid temperature in the collectors with that in the 1000 litre the singe coil pre-feed cylinders. When the heating fluid temperature in the collectors is sufficiently warmer than in the single coil cylinder the solar pump shall automatically be switched on and the heating fluid will circulate through the sealed system. Once satisfied the solar loop will changeover to the DHW loop and will begin to pre-heat the cylinders until the temperature difference is below the differential temperature (or if it is negative), then the pump is will be turned off to stop the heating medium circulating in the cylinder. This should be done in order to ensure that the system only provides useful energy. The maximum temperature of storage will be set by the user at 65 ^{o}C. Beyond the storage set temperature, no further heating by the solar system should take place.

Minimum temperatures should be managed by frost protection using an anti-freeze fluid. The control requirements shall also be read in conjunction with the relevant sections of this specification

1.5 SCOPE OF WORKS

Riomay Ltd. will include for all necessary tools, labour materials and equipment to design, supply, install, co-ordinate with other contractors, test, commission and set to work a solar water heating system to serve the thermal hot water storage vessels including as a minimum the following:

1) Evacuated tube solar collectors
2) Panel mounting fixings
3) Heating medium
4) Automatic air vents / air separators
5) Valves
6) Pressure gauges
7) Solar circulating pumps
8) Differential controllers and related sensors
9) Any other controls required and related sensors
10) Flow meters
11) All solar pipe work, fittings, valves, supports, steelwork, brackets and fixings on the roof (to the risers)
12) Expansion vessels
13) Design, Installation and schematic drawings
14) Operation and maintenance manuals inc. as fitted drawings, schematics incorporating valve numbers and valve charts.

1.6 SYSTEM COMPONENTS

The following shall form part of the 'solar system':

1.6.1 Solar collectors

The Solar System shall include design, supply, installation and commissioning of solar collectors to maintain the design requirements. Evacuated tube collectors shall be installed. These collectors are different from the flat plate collectors in that the tubes containing the fluid to be heated by the sun are held within a vacuum, and therefore have reduced heat losses.

1.6.2 Flat roof fixings

The Solar System shall include supply, and installation of flat roof fixing for all solar collectors to maintain the design requirements. Flat roof fixings will ensure the solidity of the solar panel installation, whatever the weather conditions (e.g. high velocity wind).

1.6.3 Heating medium

The heating fluid shall be an anti-freeze/water mix specifically designed for solar systems. It will avoid freezing in winter conditions.

1.6.4 Automatic air vents / air separators

The Solar System shall include, supply, installation and commissioning of automatic air vents and/or air separators to maintain the design requirements.

1.6.5 Valves

The Solar System Contractor shall include for the supply, installation and commissioning of valves to maintain the design requirements. Commissioning, regulation and associated isolation valves shall be provided whether or not indicated on the drawings to serve every pump set, main and sub distribution circuits to enable the system to be fully balanced and commissioned. The valves shall be sized in accordance with the requirements but be limited to a pressure drop across the valve of between 1.0 and 3.0kPa.

1.6.6 Pressure gauges

The Solar System shall include supply, installation and commissioning of pressure gauges to maintain the design requirements.

1.6.7 Pumps

Solar Thermal system shall be have pumps that are not selected on a flat head part of the curve and the static head at no flow (closed head valve) shall be at least 20% greater than that at design condition.

No part of the pumps curve shall have a negative gradient.
Pumps shall be suitable for the service temperatures and pressures at which they are to be used.
Non-return valves and isolating valves shall be allowed for, to enable maintenance on the pump.

1.6.8 Differential controllers and related sensors and any other controls required and related sensors

The Solar System shall include design, supply, installation and commissioning of differential controllers and any other controls required, and the related sensors, to maintain the design requirements.

1.6.9 Flow meters

The Solar System shall include supply, installation and commissioning of flow meters to maintain the design requirements.

1.6.10 Pipe work, fittings, supports, steelwork, brackets and fixings on the roof (to the risers) – Solar collector stands on roof to be supplied by others.

The Solar System shall include design, supply, installation and commissioning of all pipe work, fittings , supports, steelwork, brackets and fixings on the roof (to the risers) to maintain the design requirements.

1.6.11 Expansion vessels

The Solar System shall include design, supply, installation and commissioning of a 80 litre solar expansion vessels to maintain the design requirements.

1.6.12 Thermal hot water storage vessels

Single coil cylinder to be supplied and installed by others.

1.7 NOT INCLUDED IN THE SOLAR SYSTEM

Lifting & craneage of plant at site, this is responsibility of purchaser.

Electrical supply to plant room is responsibility of purchaser.

Water supply to plant room is responsibility of purchaser.

Installation & commission of primary cylinder & heat source..

1.8 TESTING AND COMMISSIONING

Pressure test pipework as per client specification.

Test pumps.

Check all pressure/temperature gauges are reading correct values/calibrated.

GENERAL DATA	1	Contractor	
	2	Project	Perrins School
	3	Commercial or Domestic	Domestic
	4	No.of Units (dwellings)	n/a
	5	Swimming Pool Volume (Litres)	n/a
	6	Main Water Storage (Litres)	1,000
	7	Estimated Total Panel Power (kW/hr)	13,520
	8	Estimated Produced Power (kW/hr)	11,190
	9	Gas Carbon Offset (kg)	2597
	10	Required No.of Solar Collectors	10
SOLAR COLLECTOR DETAILS	11	Collector Style	Evacuated Tube
	12	Collector Model	DF120
	13	Collector Length	2923 mm
	14	Collector Width	842 mm
	15	Collector Gross Area	2.461 m²
	16	Aperture Area	1.799 m²
	17	Absorber Area	1.715 m²
	18	Weight Empty	60 kg
	19	Max Operating Pressure	6 bar
	20		
WATER STORAGE DETAILS For reference only	21	Style of Water Storage Cylinders	
	22	Quantity	1
	23	Capacity of Cylinders (litres)	1000
	24	Provisional Dims. of Cylinders (mm)	
	25	Cylinder Manufacturer	
	26	Cylinder Model	
	27		
	28	Secondary Return	
	29	Destratification Pump	
	30	50mm Insulation	
INSTALLATION DETAILS	31	Roof Style	Pitched
	32	Area Required (m2)	30
	33	Estimated Main Solar Riser Size (Ømm)	Ø22
	34	Solar Pump Size (Provisional)	UPSD 25/80
	35	Insulation	By Riomay Contractor
	36	Heat Exchangers	n/a
	37	Solar Diverters	To Fan coil unit VA 300 DN25
	38	Solar Safety Valve	Resol VA300 DN25
	39	Solar Controller	Delta Sol E
	40	Fan Coil Units	1 x 15 kW

NOTES:

1) Craneage at site by others
2) Electrical and water supply to plant room by others
3) Panels mounted on flat roof with fins rotated to required angle of incidence
4) Installation & Commissioning of 1000 litre store by others
5) Solar flow / return insulation by Riomay Contractor

No.	By	Date	Revision
A	JP		Original 23rd Feb 2012

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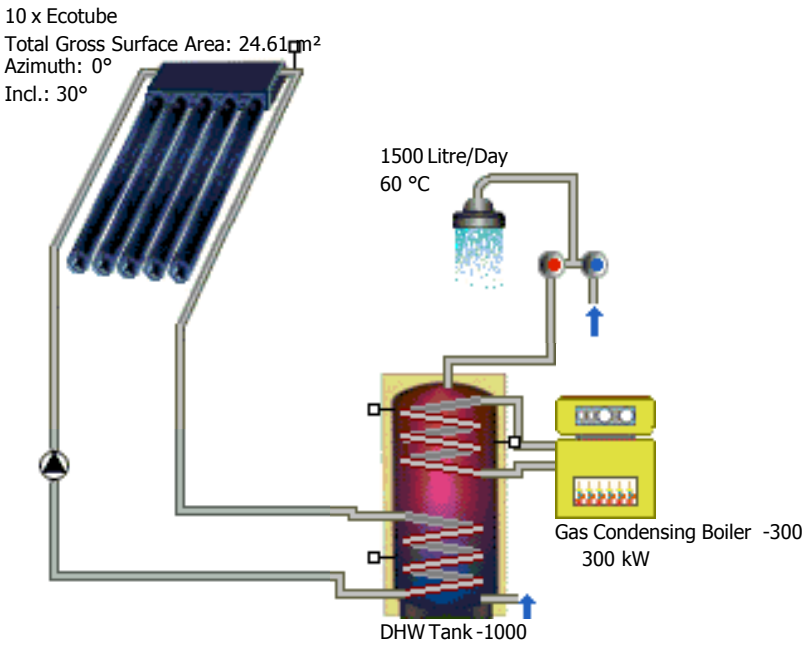
SOLAR THERMAL SYSTEMS

QUOTATION DATA SHEET

Rev.1



Results of Annual Simulation

Installed Collector Power:	17.23 kW	
Installed Gross Solar Surface Area:	24.61 m²	
Collector Surface Area Irradiation (Active Surface):	20.46 MWh	1,137.09 kWh/m²
Energy Produced by Collectors:	13.52 MWh	751.53 kWh/m²
Energy Produced by Collector Loop:	11.19 MWh	621.95 kWh/m²
DHW Heating Energy Supply:	31.65 MWh	
Solar Contribution to DHW:	11.19 MWh	
Energy from Auxiliary Heating:	21.54 MWh	
UK Natural Gas Savings:		**1,284.5 m³**
CO2 Emissions Avoided:		**2,597.19 kg**
DHW Solar Fraction:		**34.2 %**
Fractional Energy Saving (EN 12976):		**34.8 %**
System Efficiency:		**54.7 %**

Basic Data

Climate File

Location:	Winchester
Climate Data Record:	"Winchester"
Total Annual Global Radiation:	998.88 kWh
Latitude:	51.17 °
Longitude:	1.32 °

Domestic Hot Water

Average Daily Consumption:	1500 l
Desired Temperature:	60 °C
Load Profile:	Constant Load
Cold Water Temperature:	February:8 °C / August:12 °C
Circulation:	No

System Components

Collector Loop

Manufacturer:	Riomay Ltd.
Type:	Ecotube
Number:	10.00
Total Gross Surface Area:	24.61 m²
Total Active Solar Surface Area:	17.99 m²
Tilt Angle:	30 °
Azimuth:	0 °

Bivalent (Twin Coil) DHW Tank

Manufacturer:	T*SOL Database
Type:	DHW Tank -1000
Volume:	1000 l

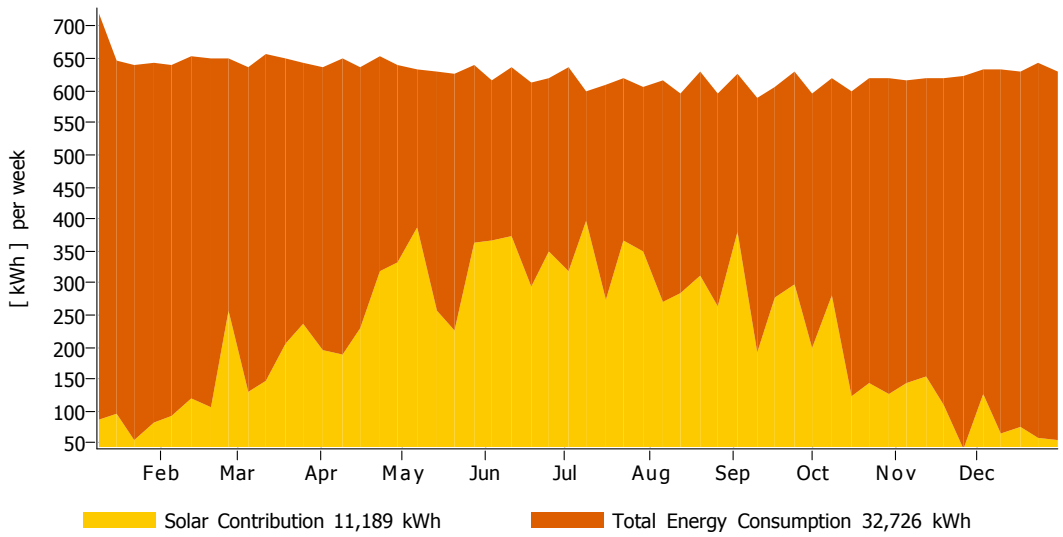
Auxiliary Heating

Manufacturer:	T*SOL Database
Type:	Gas Condensing Boiler -300
Nominal Output:	300 kW

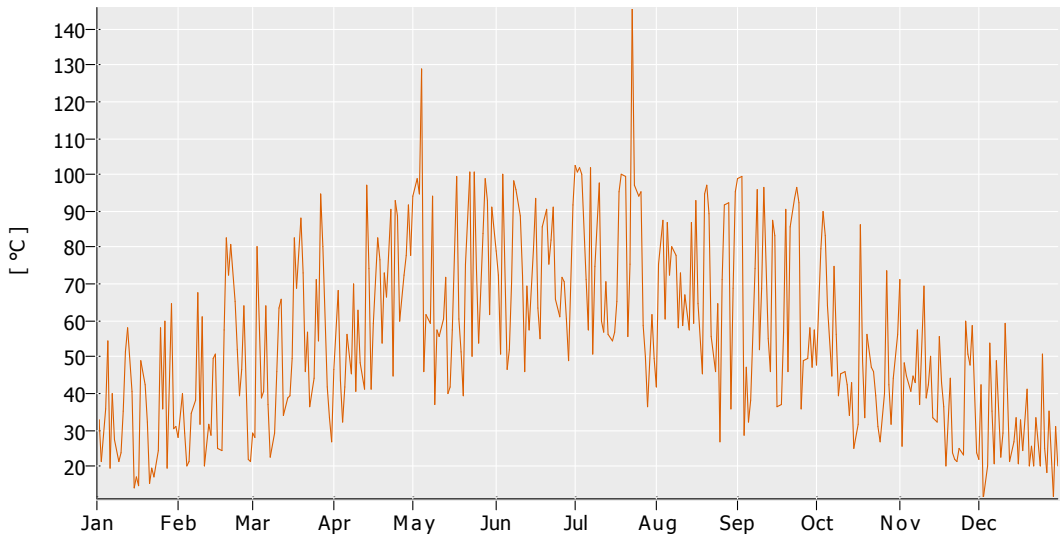
Legend

Original T*SOL Database
With Test Report
Solar Keymark

Solar Energy Consumption as Percentage of Total Consumption

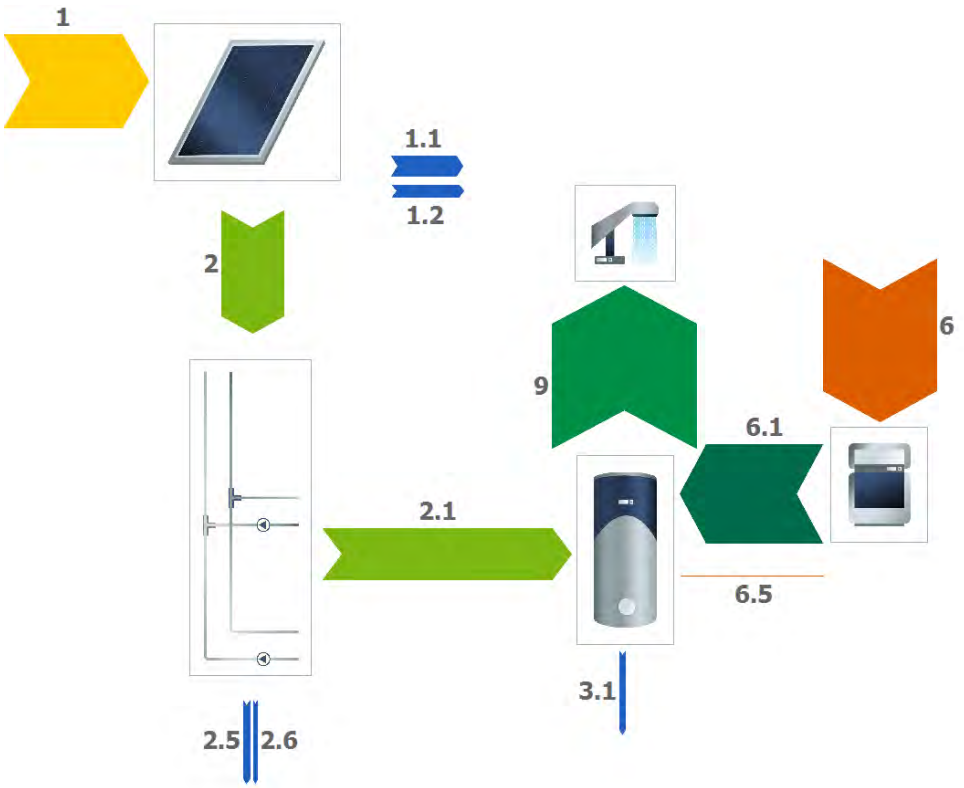


Daily Maximum Collector Temperature



These calculations were carried out by T*SOL Pro 4.5 - the Simulation Programme for Solar Thermal Heating Systems. The results are determined by a mathematical model calculation with variable time steps of up to 6 minutes. Actual yields can deviate from these values due to fluctuations in climate, consumption and other factors.The system schematic diagram above does not represent and cannot replace a full technical drawing of the solar system.

Energy Balance Schematic



Legend

1	Collector Surface Area Irradiation (Active Surface)	20,456 kWh
1.1	Optical Collector Losses	4,375 kWh
1.2	Thermal Collector Losses	2,562 kWh
2	Energy from Collector Array	13,520 kWh
2.1	Solar Energy to Storage Tank	11,189 kWh
2.5	Internal Piping Losses	1,459 kWh
2.6	External Piping Losses	872 kWh
3.1	Tank Losses	1,084 kWh
6	Final Energy	25,054 kWh
6.1	Supplementary Energy to Tank	21,537 kWh
6.5	Heating Element	0 kWh
9	DHW Energy from Tank	32 MWh

Glossary

1 Collector Surface Area Irradiation (Active Surface)
Energy Irradiated onto Tilted Collector Area (Active Solar Surface)

1.1 Optical Collector Losses
Reflection and Other Losses

1.2 Thermal Collector Losses
Heat Conduction and Other Losses

2 Energy from Collector Array
Energy Output at Collector Array Outlet (i.e. Before the Piping)

2.1 Solar Energy to Storage Tank
Energy from Collector Loop to Storage Tank (Minus Piping Losses)

2.5 Internal Piping Losses
Internal Piping Losses

2.6 External Piping Losses
External Piping Losses

3.1 Tank Losses
Heat Losses via Surface Area

6 Final Energy
Final Energy Current into System. This can flow in as natural gas, oil or electricity (not including solar energy) taking efficiency levels into account

6.1 Supplementary Energy to Tank
Supplementary Energy (e.g. Boiler) to Tank

6.5 Heating Element
Energy from Heating Element

9 DHW Energy from Tank
Heat for DHW Appliances from Tank (Exluding Circulation)

SPF Solartechnik Prüfung Forschung

C939

Solar Collector Factsheet
Riomay Ecotube

Model	Ecotube
Type	Evacuated tube collector
Manufacturer	Riomay Ltd
Address	15a Maple Road
	GB-BN23 6NY Eastbourne
Telephone	+44 1323 648641
Fax	+44 1323 720682
Email	tonybook@riomay.com
Internet	**www.riomay.com**
Test date	06.2007

☑ Performance test EN12975:2006
☐ Quality test EN12975:2006

Dimensions

Total length	2.923 m
Total width	0.842 m
Gross area	2.461 m²
Aperture area	1.799 m²
Absorber area	1.715 m²
Weight empty	60 kg

Technical data

Minimum flowrate	50 l/h
Nominal flowrate	100 l/h
Maximum flowrate	200 l/h
Fluid content	1.7 l
Maximum operating pressure	6 bar
Stagnation temperature	– °C

Types of mounting

☑ Construction for sloping roof
☐ Integration into sloping roof
☑ On flat roof with stand
☑ Facade

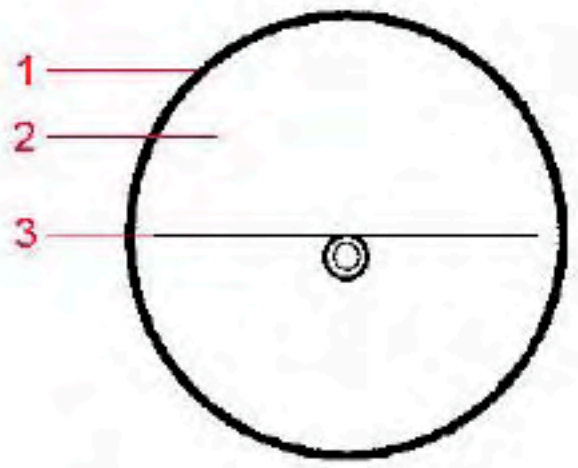
Further information

☑ Units in different sizes available
☐ Glazing replaceable

Hydraulic connection

Copper pipe, nominal diameter 22 mm

Construction

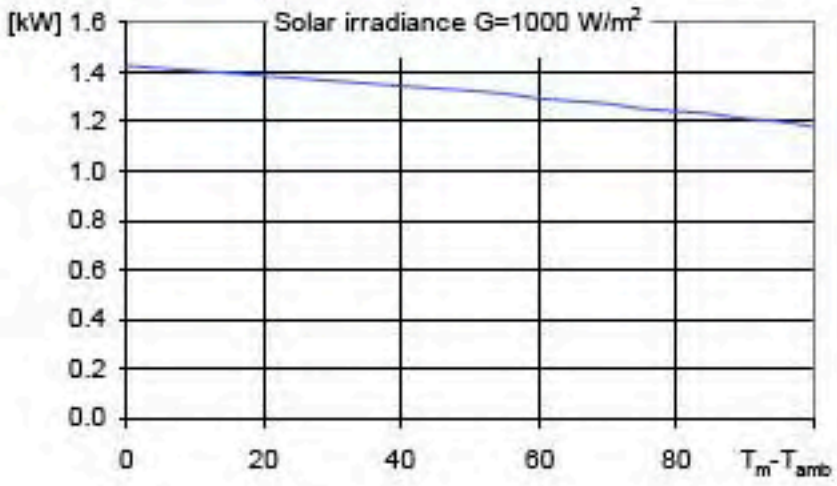


1 Glazing
2 Vacuum
3 Absorber

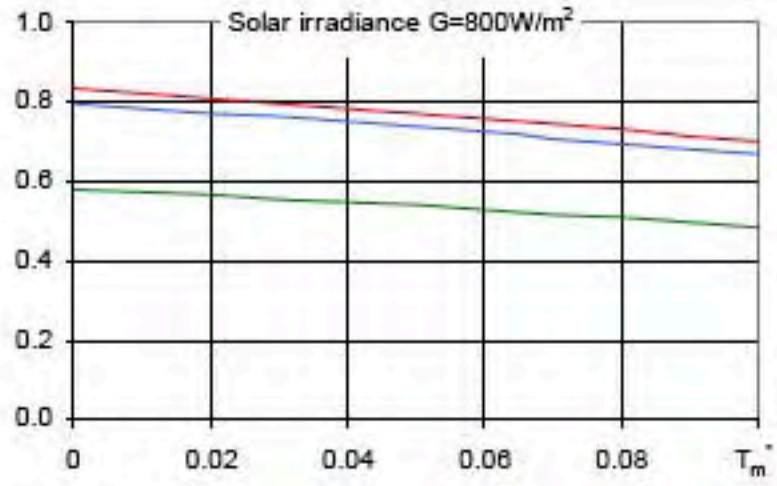
SPF Solartechnik Prüfung Forschung

C939

Peak Power per collector unit W_{peak}



Relative efficiency η

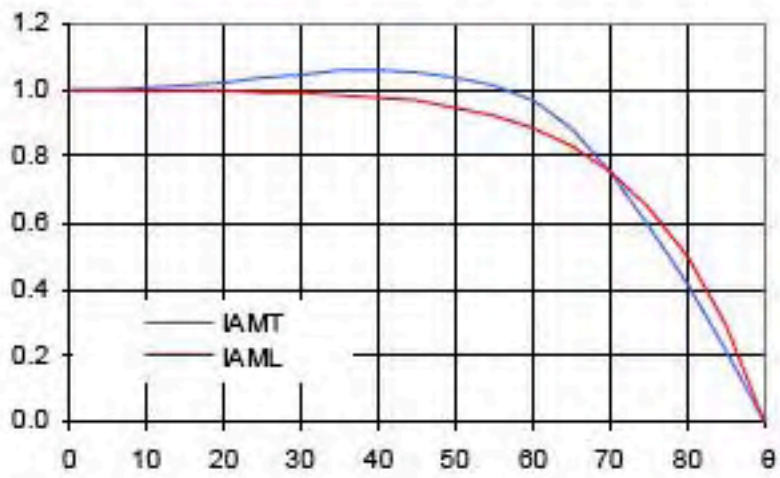


Peak Power W_{peak}	1429 W
Thermal capacity*	4.0 kJ/K
Flowrate during test	150 l/h
Fluid for test	Water-Glycol 33.3%

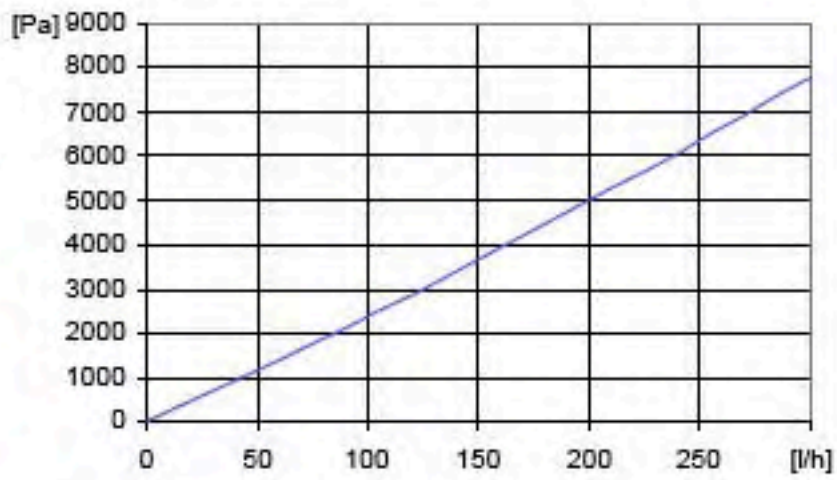
Reference	**Gross**	**Aperture**	**Absorber**
η_0	0.580	0.794	0.833
a_1 [$WK^{-1}m^{-2}$]	0.75	1.02	1.07
a_2 [$WK^{-2}m^{-2}$]	0.0024	0.0032	0.0034

*) Specific thermal capacity C of the collector without fluid, determined according to 6.1.6.2 of EN12975-2:2006

Incident angle modifier IAM



Pressure drop Δp



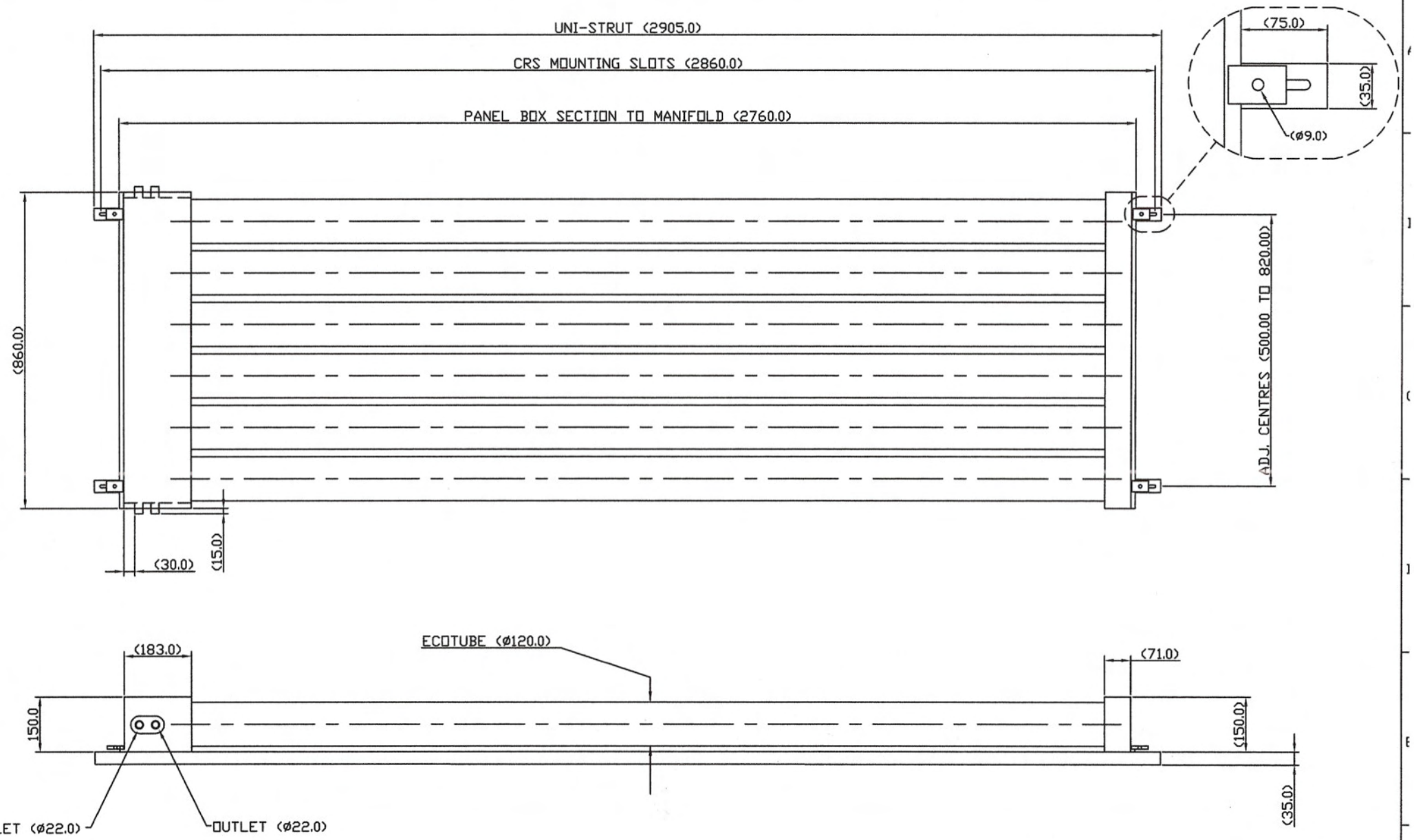
K1, transversal IAM at 50°	1.04
K2, longitudinal IAM at 50°	0.95

Pressure drop at nominal flowrate
Δp = 2380 Pa (T=20°C)

SPF Simulation of systems using Polysun

Short description of the system	**Surface demand** Number of collectors**	**Solar yield****
Domestic hot water: Fss* = 60% Tank 450 l, collector inclination 45°, Daily energy demand 10 kWh (4-6 persons) Energy demand of the reference system 4200 kWh/year	3.59 m² 2.0 collectors	712 kWh/m²
Water pre-heating: Fss* = 25% 2 Tanks: 1500 l & 2500 l, collector inclination 30°, Domestic hot water consumption 10'000 l/day (200 persons) Daily heat losses (circulation and tanks) 60 kWh, Energy demand of the reference system 191'700 kWh/year	54.1 m² 30.1 collectors	888 kWh/m²
Space heating system: Fss* = 25% Combined storage1200 l, collector inclination 45°, Daily energy demand 10 kWh (4-6 persons), Building 200 m², moderately heavy construction, well insulated, Heating power demand 5.8 kW (ambient temperature -8°C), Energy demand space heating 12140 kWh/year, Energy demand of the reference system 16340 kWh/year	9.3 m² 5.1 collectors	597 kWh/m²

*) Fractional solar savings: Proportion of the final energy that, thanks to the solar system, can be saved compared to a reference system.
**) Surface demand and solar yield are given with respect to the aperture area.



REV.	DESCRIPTION	DATE
00	FIRST ISSUE	09.05.08

THIRD ANGLE PROJECTION

DRAWN	J.S.H.
DATE	09.05.08
CHKD.	JFP
APPD.	TB
SCALE:	1:10

RIOMAY LTD.

DWG NO. 0003.GA00 REV. 00

TITLE: RIOMAY SOLAR PANEL (ECOTUBE) GENERAL ASSEMBLY

APPLICATION SOFTWARE: AUTOCAD LITE 2007

A3 BORDER

DIN CERTCO

Gesellschaft für Konformitätsbewertung mbH

CERTIFICATE

The company

R/Z - Solartechnik
Friedrich-von-Teck-Str. 20
89420 Höchstädt
GERMANY

with its production site in

Beijing

hereby receives the confirmation that the product/s

Solar collectors

of the type

DF 120-6

conforms to

DIN EN 12975-1:2006-06
DIN EN 12975-2:2006-06
Specific CEN KEYMARK Scheme Rules for Solar Thermal Products version 10.07 (Edition: 2009-02)

and is granted the licence to use the marks

in conjunction with the Registration No. below.

Registration No.: 011-7S684 R

This Certificate is valid until 2014-02-28.

Deutscher Akkreditierungs Rat
DAR
DAP-ZE-2460.00
See annex for further information.

DIN CERTCO Gesellschaft für Konformitätsbewertung mbH
Alboinstraße 56, 12103 Berlin

GESELLSCHAFT FÜR KONFORMITÄTSBEWERTUNG MBH
DIN CERTCO

2009-02-12

Dipl.-Ing. Dipl.-Wi.-Ing. Sören Scholz
- Head of Certification Body -

Annex

to the Certificate with Registration No. 011-7S684 R, dated 2009-02-12

Technical data

See data sheet, part of the test report of 2009-02-11

Note(s):

- The freeze resistance test according to DIN EN 12975-2, clause 5.8 was not necessary. According to the manufacturerer's declaration, the certified solar collectors may be used in frost exposed areas only in combination with appopriate frost protection mixtures.

- The optional impact resistance test according to DIN EN 12975-2, clause 5.10 was not carried out.

Testing laboratory / Inspection body

Institut für Solartechnik SPF
Hochschule für Technik
Rapperswil
Oberseestrasse 10
8640 RAPPERSWIL
SCHWEIZ

Test report(s)

No. C953LPEN, No. C953QPEN dated 2009-02-11

Integrated Renewable Energy Solutions

Riomay® Ltd are one of the UK's leading designers, suppliers and installers of integrated renewable energy solutions.

Meeting your target for sustainability

www.riomay.com

riomay® renewable energies

Delivering cost effective solutions...

Support from concept to completion

Riomay® Ltd provides a full range of renewable energy solutions. We offer support from concept to completion on all your commercial projects to achieve specific codes or other requirements.

- Recognised as installer of the year*
- Full technical CAD design team with rapid response to first level enquiries
- Our track record is 'second to none' including the design and installation of some of Europe's largest projects
- We select from the highest performing technologies and aren't tied to any brand
- Highly innovative and versatile in meeting your technical design requirements
- Full service offering; Design, Supply, Installation and Commissioning.

*(Renewable Energy Association 2008)

Solar Thermal

Riomay® Ltd has been at the forefront of the solar thermal industry for over 33 years. We provide full service solutions to major solar thermal projects throughout the UK and abroad. This includes technical design, supply, installation, testing and commissioning. The Riomay® brand stands for quality and performance with its solar panels leading the market by generating an impressive 888kWh/sqm²/year. (ref: Swiss Test Station - SPF Laboratories)

Solar Photovoltaic (PV)

We will tailor a PV solution to your project's specific requirements. We offer a full range of collectors, varying in size and power output, ensuring the most cost-effective design to meet your needs. We provide PV panel output from 150Wp to 310Wp with a full range of inverters and roof mounting options.

Riomay® Ltd Accreditations

Riomay® Ltd is accredited by The Department of Energy and Climate Change (DECC) under MSC001 Certificate number NIC 1162.
The following funding options may be available:

Feed in Tariff Scheme (FITs Scheme)
The FITs Scheme has been introduced to encourage take up of PV solar technology. Early adopters of the scheme will get higher feed-in tariff rates than those embracing the technology at a later date.

Renewable Heat Incentive (RHI) from April 2011
A forthcoming UK subsidy for renewable heat for solar thermal systems will reward low-carbon heat sources, and is planned to be in introduced in April 2011.

Riomay® Ltd renewable energies is one of the UK's leading suppliers and installers of some of the world's most advanced solar power systems. Riomay® Ltd has installed solar power systems to over 6,500 dwellings throughout the UK and Europe reducing the carbon footprint of homes, offices, hospitals, prisons, leisure centres, swimming pools, schools and businesses from Inverness to Gibraltar, in Ireland and in Europe.

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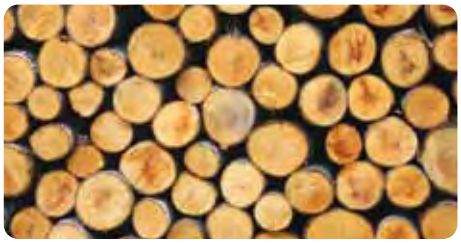
...whilst meeting your targets

Heat Pump Technologies

Riomay® Ltd provides a full range of high performance air and ground source heat pump technologies. Our projects include systems for new build units, from bespoke domestic systems to major installations requiring industrial depth bore holes. With access to thermal response testing and full geothermal system design, we're ready to help you achieve your requirements.

Rainwater Harvesting

Rainwater harvesting is a simple and effective way of storing and recycling rain water. Our products cater for individual dwellings, district systems and large commercial projects. Rainwater harvesting systems reduce running costs and may contribute towards carbon legislation targets. It may also help to attain points under the code for sustainable homes.



Bio-Mass

Our Bio-Mass systems economically supply space and water heating for individual dwellings through to district heating systems and large commercial projects. Our systems run on multiple fuel types. Output energy ranges from 8kW to over 10mW, producing low pressure hot water or steam. They can also be successfully deployed to power steam turbines for CHP units.

Wind Turbines

Our wind turbine systems generate electricity by harnessing the power of the wind. We provide a cost effective energy source for residential, community, and industrial use. We have a full range of both horizontal and vertical axis wind turbines with yields from 1.5kW to large scale 2.5mW installations.

Did you know?

- Some Bio-mass fuels can yield a kW an hour for less than 1 pence.
- 7sqm of photovoltaic panel yields between 800 to 1,000 kWh per annum – enough energy for cooking in an average household for the year. It will also earn approximately £400 from the FITs scheme.
- When we burn fossil fuels, we release solar energy that was absorbed by plants millions of years ago. This was locked beneath the ground in coal, oil or natural gas. So all these fuels are just solar energy, repackaged. Repackaging is inefficient and expensive, as every fuel bill shows.
- The solar energy received by the earth in just 30 minutes is the equivalent to the energy used by the entire human population in a year.
- Solar energy is the fuel that powers all life on earth. Green plants use it to turn raw chemicals into the carbohydrates and proteins that feed animals – and us - transforming the planet into a solar-powered world.
- Solar power is still a viable option even in a northern climate. On a sunny summer day parts of the UK experience levels of solar energy equal to 60 per cent of those as the equator.

Further information

We have worked with many customers throughout the UK and abroad including...

Housing Groups
Anglian
CDHA
Circle 33
Downland HA
Habinteg HA
North British HA
Orbit
Quaker HA
The Guinness Trust
Thames Housing
Westlea Housing

Developers / M&E Contractors
Ardmore
Barratt Homes
Berkeley Homes
Galliford Try
Higgins Construction
Hopkins
Keir
Laings Construction
Linden Homes
LJJ
McAlpine
Metnor
Monaghan & Horrel
NG Bailey
ROK
Sparks Mechanical
Skanska
St George
Willmott Dixon
Wimpey

Local Authorities
Aberdeen City Council
Angus Council
Ballymena Council
Bedfordshire
Bridgnorth District Council
Dundee City Council
East Sussex County Council
Eden Court Theatre
Fife Council
Haringey
Inverness City Council
Leicester City Council
London Borough of Islington
London Borough of Ealing
London Borough of Merton
Sevenoaks Council
Stratford on Avon
The Corporation of London
Warwickshire Council

HM Prisons
Askham Grange
Cardiff
Prescoed

Educational Projects
Bexley High School
Bridge of Don Academy, Haringey
CEREB - London South Bank University
Haringey 6th Form College
Harris Boys School, Dulwich
Khalsa School, Ealing
Marston Vale, Bedford
Norfolk Educational Authority
Oxfordshire University Press
Six local schools in Wimbledon
St John's RC School, Dundee
University of Brighton
Wallands School, East Sussex
Whitmore School, Harrow

Other
Arsenal FC Highbury Square
British Airports Authority Gatwick
Caravan Club of Great Britain
Commercial Swimming Pools for local authorities
Centre, Creggan, NI
Kirklees Energy Centre
La Manga Club, Cartagena
Leicester Energy Centre
Merton Fire Control Centre
Ministry of Defence
Midland Electric Board Oxford
Norfolk NHS Trust
RAF Gibraltar
Renew NI, Belfast
Rutherford Appleton Laboratory
SEEDA
TV Energy
The London Fire Brigade
University Press - Oxford

Private Clients
1000s all over the UK and parts of Europe
The Royal Household, Windsor Castle

Consultancies
Atkins
Brinson Staniland
Broadway Malyan
Buro Happold
Cameron Taylor
Crofton Design
Dearle Henderson
ECSC
EIC Ltd
Faber Maunsell
Galileo Energy
Gifford Ltd
HBS
Hoare Lea
Hulley & Kirkwood
Max Fordham
Mott MacDonald
Mouchel
Ove Arup
RMJM
Silcock Dawson
Wallis Whittle & Partners
Working Environments
Whitecode

Riomay® Ltd has continually been recognised for its many successes and contributions to the renewable energy industry. Riomay® Ltd is also an MCS accredited installer.

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Case study:
Solar PV Installation at Wire Belt, Kent - 98.7kWp

Technical details

Panel: 420 Moser Baer 235W

Inverter: Eltekvalvere 100 kWp

System Size: 98.7kWp

CO_2 Reduction: 47,115 kg p.a.

Energy generation: 82,972 kWh p.a

Estimated Investment Return

Internal Rate of Return (IRR)
15.7%

Return on investment (ROI)
Year 1 – 11.5%
Year 5 – 14.4%
Year 10 – 18.1%
Year 15 – 23.0%
Year 20 – 29.0%
Year 25 - 46.3%

Assumptions

RPI – term average 2.5%
Electricity price inflation 6%
% of electricity used 50%
Assumed residual value £27,795

In July 2011 Riomay Renewable Energies undertook the design and installation of a Solar PV system for Wire Belt, one of the UK's leading manufacturers of stainless steel conveyor belts.

This is one of the largest PV installations of its kind in the south of England. The renewable energy system covers the roof of the Wire Belt factory, based in Sittingbourne,

Wire Belt's motivation was to reduce their energy costs and achieve a strong financial return on their investment, whilst at the same time making a notable improvement to the environment.

Riomay designed the PV system, planned the project and installed the system. The whole project was delivered within just 4 weeks with no disruption to the company.

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Case study:
134kWp, PV Installation, Upwell Park Retirement Complex, March, Cambridge

Technical detail:

Panel Model: 8 x ZNShine 250W/ dwelling

Inverter Model: Sunnyboy SB2000HF

System Size: 2kWp/dwelling

Annual Output: 1,800kWh per annum/dwelling

Total project CO_2 Reduction: 67,777 $C0_2$ saving per annum

Total project kWh energy generation: 126,600 kWh per annum

In July 2011, Riomay Renewable Energies undertook the design and installation of Solar PV systems on the 67 retirement homes located in a retirement home in March, Cambridgeshire. The 2kWp system on each of these properties consisted of 8 ZNShine 250W panels.
The client's motivations were to contribute to the reduction of each home's energy consumption and to create enough solar energy to cover the lighting and cooking for each dwelling.
Our design team delivered a system that integrated well across the roof and achieved a strong return on investment for the care home operator. The care home owners have elected to pass on the electricity savings onto the residents save ing hundreds of pounds on their fuel bills each year.

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Case study:
Arsenal Highbury Stadium

The Project:
Highbury Stadium

The Client:
The client: Arsenal FC via Sir Robert Mac Alpine

System Commissioned:
October 2008

Technical detail:
Panel Model: 240 x Riomay DF120 solar collectors

System Size: 350,000kw

Annual Output: 327,600Whs

Total project Gas Co_2 Reduction: 62,244 kg carbon per annum

Electricity Co_2 displacement savings: 140,868kg carbon p/a

Overview:

Riomay designed, installed and commissioned a solar thermal preheat system to support 711 apartments.

The system provides residents of the apartments with an environmentally efficient supply of hot water for around 40 weeks of the year, in conjunction with a CHP plant and gas fired boilers.

The system preheats 56,000 litres of stored water in 7 bespoke 8,000 litre calorifiers.

Background:

Riomay Renewable Energies was recognised as 'Installer of theYear' by the Renewable Energy Association (REA) in July 2008.

The company has been designing, installing and commissioning solar systems for over 30 years. Its solar panels consist of 6 evacuated glass tubes and are manufactured to Riomay® Ltd's own design patent.
Our panel performance leads the market in independent tests conducted in Switzerland (spf.ch) by generating 888kWh per m^2 of collector.

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Case study:
Fire Control Centre, Merton

The Project:
SOLAR THERMAL SYSTEM for Fire Control Centre Merton South London

The Client:
SKANSKA In association with HANNAN ASSOCIATES

System Commissioned:
Spring 2010

Technical detail:
Panel Model: Riomay DF120

15 N° x Evacuated tube collectors to 2 N° X 1,500 litre Twin Coil Cylinders

Annual Output: 20,475kWh p/a

Overview:

Hannan Associates invited Riomay® to work on the initial design for the final FCC operations centre.
A government contract run by SKANSKA

The overall design specification was based on rigorous specifications to meet with the buildings stringent security requirements. This building was designated to be used as the control hub for coordinating security for the 2012 Olympics

Background:

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