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Genedlaethol
National Trust

Heating the National Trust Potential – It's more than mansions!



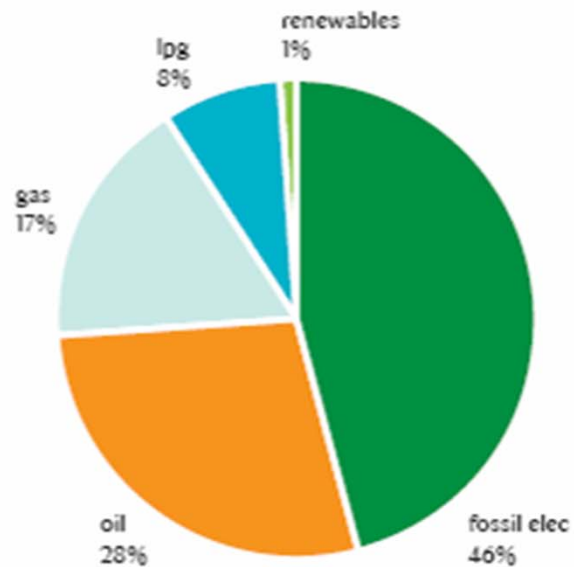
- 88 castles
- 300 mansions
- 2000 agricultural tenants
- 39 villages
- 29,000 buildings
- 3749 oil tanks
- 42,000ha of woodland
- 700 miles of coast





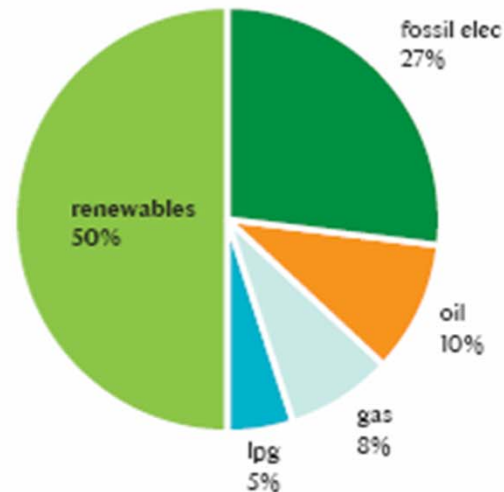
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Energy shift 2008 – 2020



2008

Energy consumption = 86,193 MWh total
(of which c. 99% = fossil fuel)



2020 goal

(after 20% efficiency reductions)
Energy consumption = 68,954 MWh total
(of which 50% = fossil fuel)





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Experience

You name it. We are having a go





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All types, all sizes, all
locations





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Powis Castle

- 27 kw GSHP
- 500m ground collector
- Replaced 37 electric convector heaters
- 20,000kg CO2 reduction
- Powered by 40kw field mounted PV system

UK First carbon neutral commercial nursery

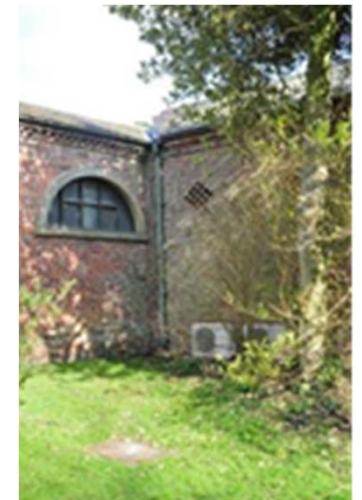




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Erddig Hall

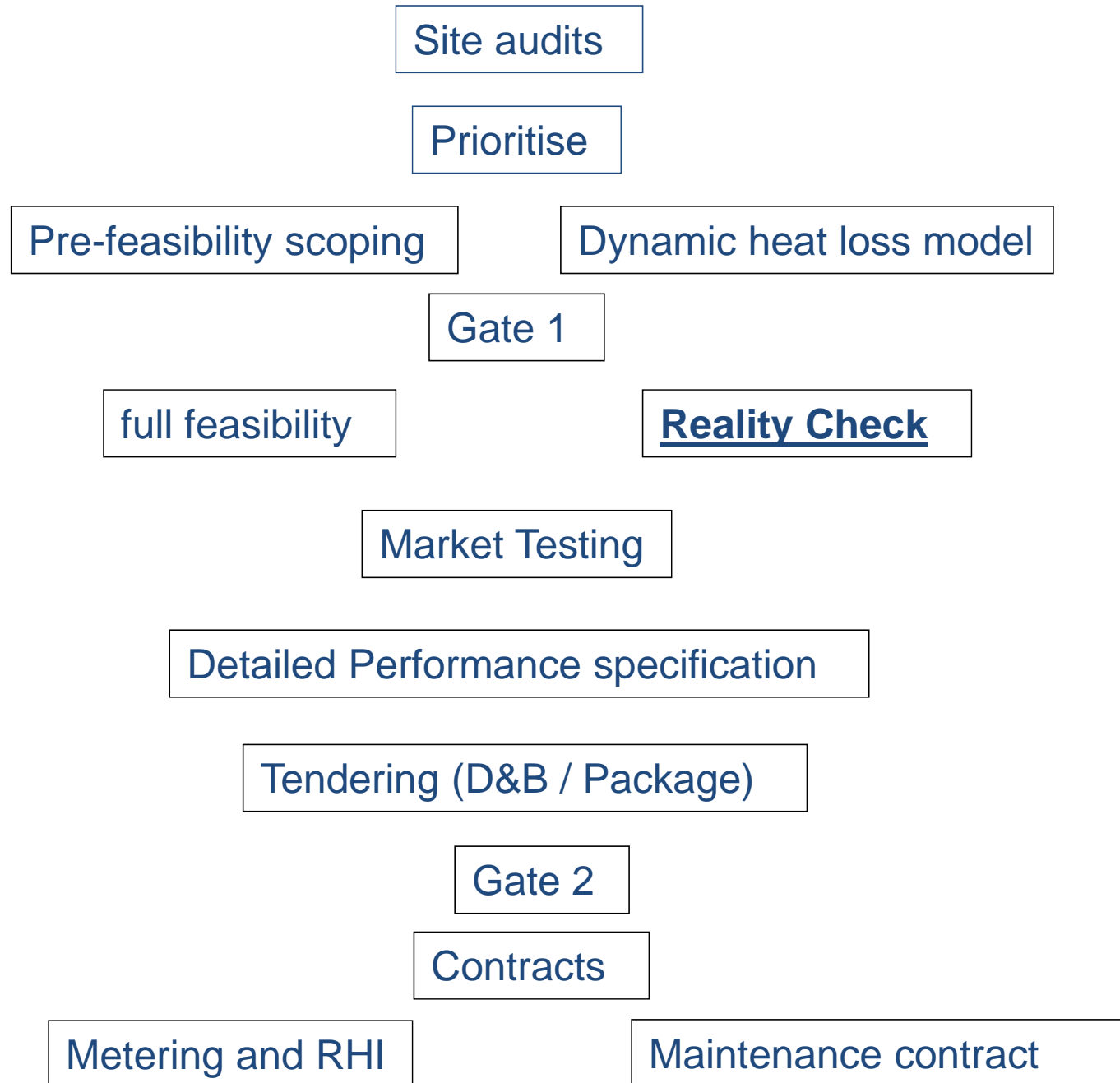
- Restaurant = 16kw ASHP
- Gardens mess room = 8 kW
- CO2 reduction of 56,000kg
- Quick, easy and cost effective





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REI Process





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Plas Newydd – starting point



2009

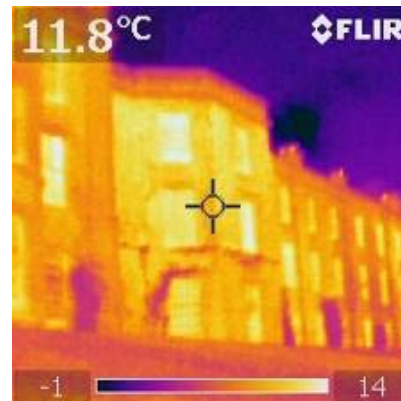
128,000ltrs of oil pa

1,500ltrs p.d. in winter

1,200,000Kwh pa

300,000kwh of
electricity

40 year old boiler





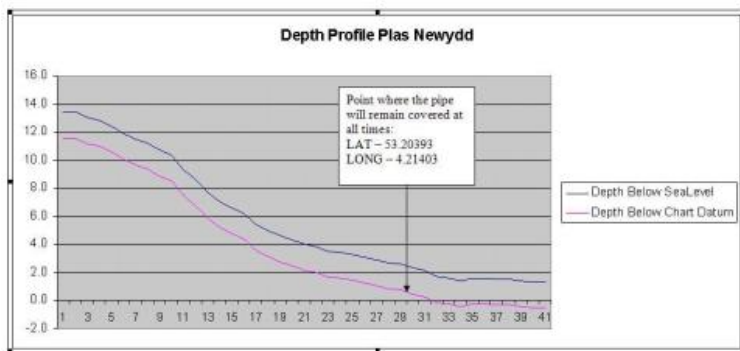
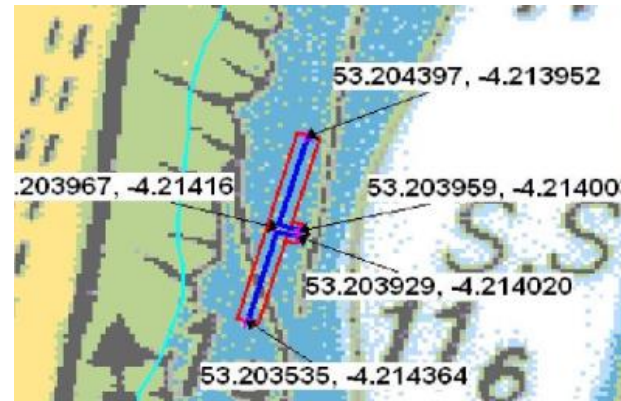
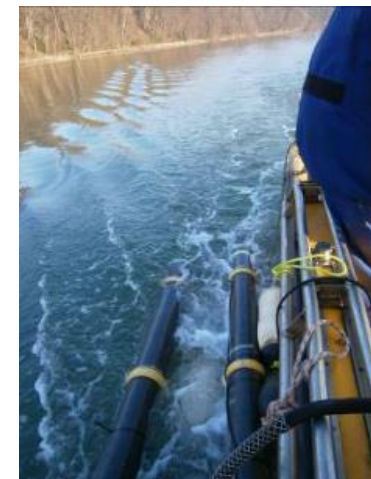
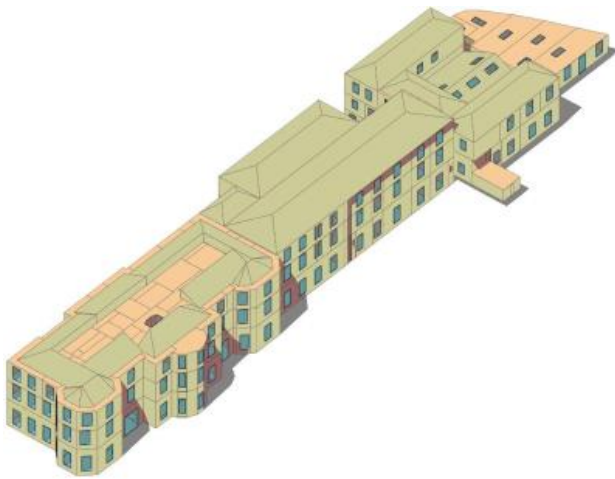
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Marine Source Heat pump -Why?

Outcome?



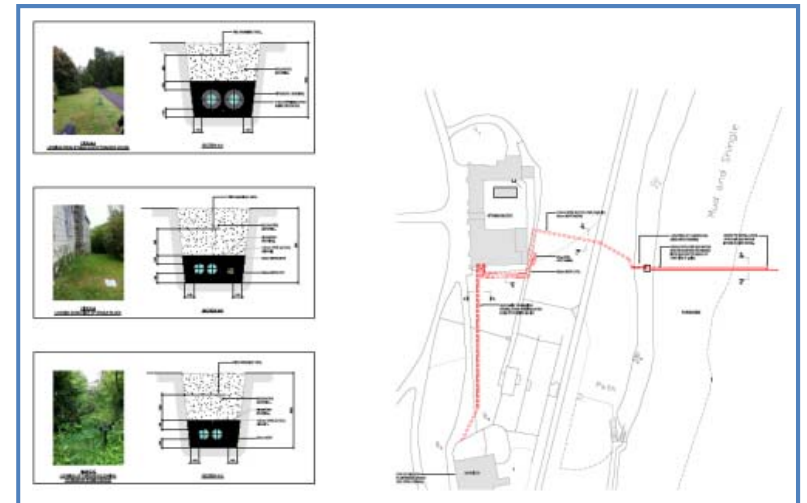
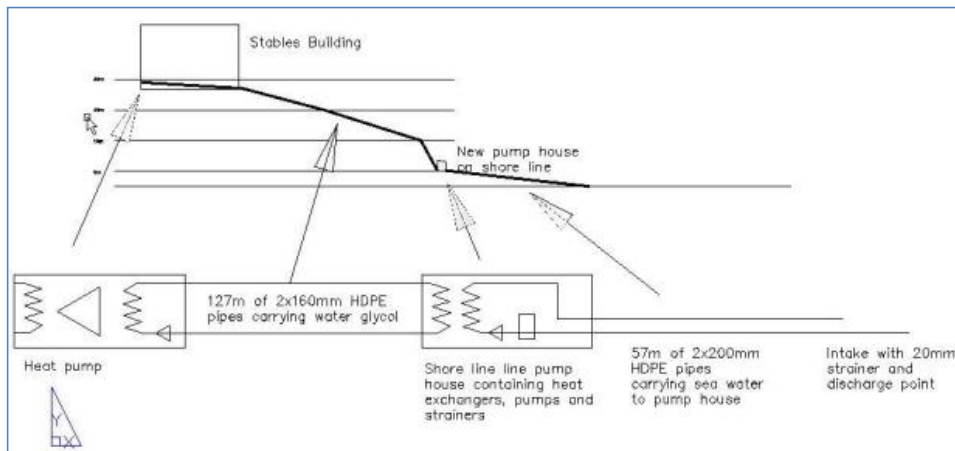
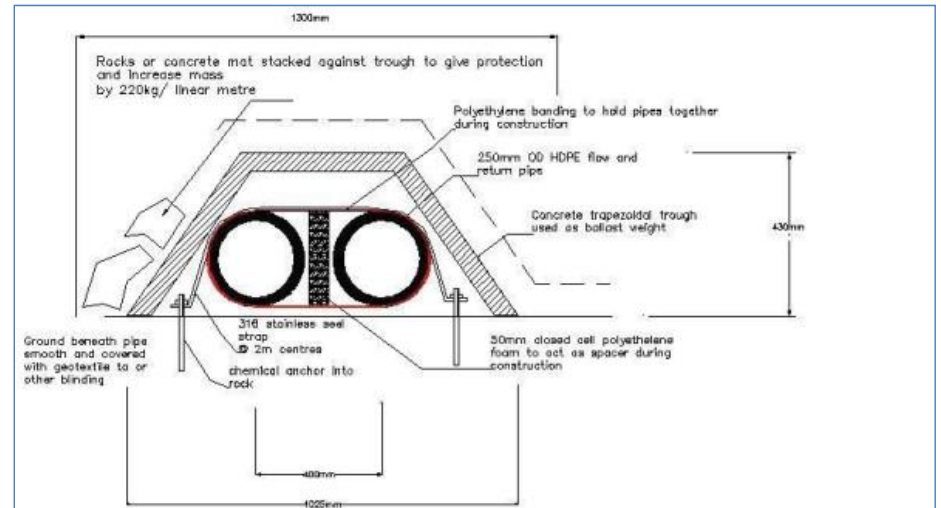
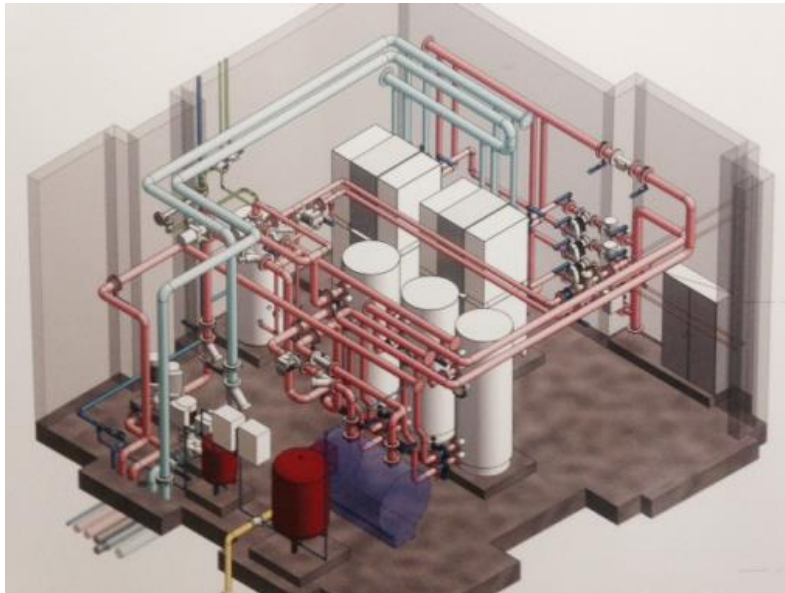
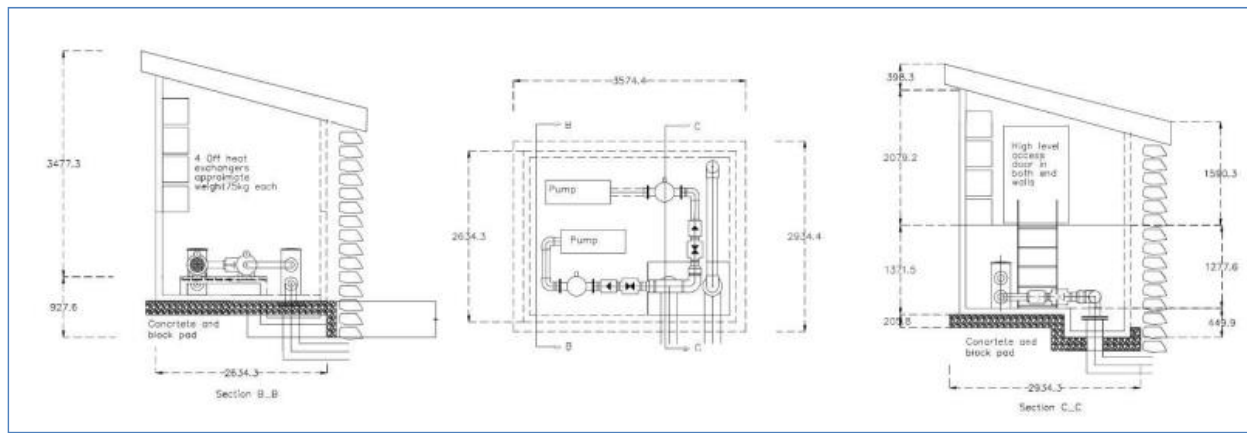
- 80% reduction in carbon emissions (CRC)
- Reduction in servicing costs
- £55,000 cost saving
- 15,000 litres of oil storage removed
- Conservation heating need
 - Exemplar?

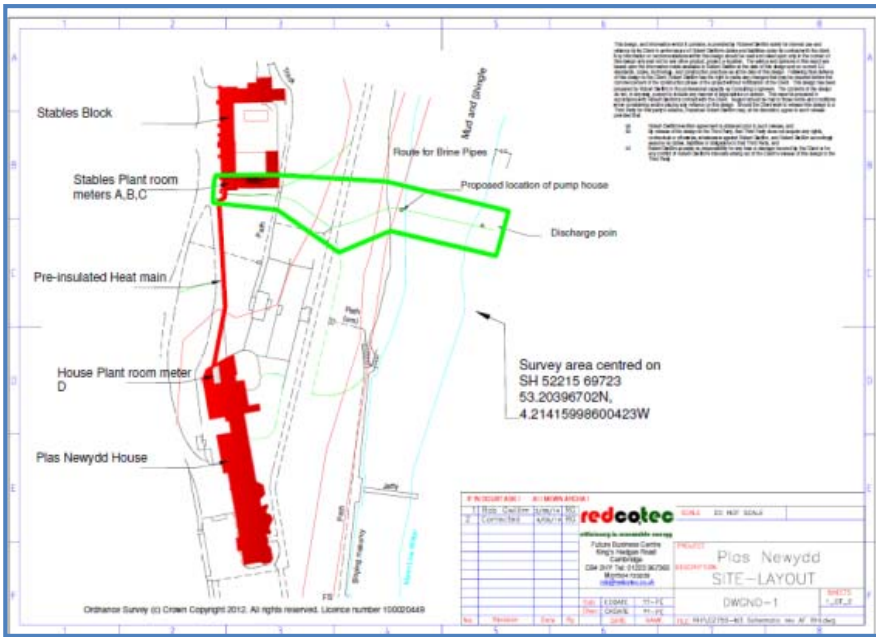


- Consultation
- Building heat modelling
- Lowering load (40% less)
- Heat pump design
- Sea temp data and tidal flow
- PV system
- Sea bed seismic survey
- Pipe or coil



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Flood Consequences Assessment

Plas Newydd Marine Source Heat Pump Project - Pumphouse
Llanfairpwll, Anglesey. LL61 6DQ



Flood Consequences Assessment – Plas Newydd Marine Source Heat Pump Project
Dated: 0th July 2013
Author: P.Southall



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Head of Planning Service
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Mrs Emma Plunkett-Dillon
c/o Mr Paul Southall
National Trust
Penrhyn Castle
Bangor
Gwynedd
LL57 4HN

Dear Sir/Madam,

DEODD CYNLLUNIO GWLAD A THREF 1990

RHYBUDD PENDERFYNIAD

Darlunwch yr amodau isod yn ofalus iawn rhag oho, a fethu cynhyrfurto a oho, y bydd hynny'n genned eich caniatad cynllunio'n annwyl.

Cais llawen i osod pump gwers 300kw a choddi y pump yn i Full application for the installation of a 300kW heat pump and the erection of a pump house at Plas Newydd, Llanfairpwll

Mae eich cais wedi cael ei ystyried gan y Cyngor yn unol a'i awdurdod dan y Ddeddf uchod, a rhoddyd CANIATAD gyda'r amodau canlynol:-

NOTICE OF DECISION

Please read the conditions listed below carefully as failure to comply may invalidate your planning permission.

Your application has been considered by the Council in pursuance of its powers under the above mentioned Act and permission has been APPROVED subject to the following conditions:-

(01) Rhaid cychwyn ar y datblygiad yr ymwna'r caniatad hwn a fo o leun pum mlynedd i ddyddiad y caniatad hwn.

(01) The development to which this permission relates shall be begun not later than the expiration of five years beginning with the date of this permission.

Rheswm: Ufuddhau i angherion Deddf Cynllunio Gwlad a Thref 1990.

Reason: To comply with the requirements of the Town and Country Planning Act 1990.

(02) Dylai lefel y slab gael ei gosod o leiaf 3.4m AOD a dylai mesurau atal llifogydd gael eu hymgorffori hyd at lefel o 1.4m uwchben y slab.

(02) Slab level should be set a minimum of 3.4m AOD and flood proofing measures incorporated up to a level of 1.4m above slab.

Rheswm: Lleihau dfford llifogydd fr cymryd yn y dyfodol.

Reason: To reduce future flood damage to the proposal.

(03) Ni fydd unrhyw waith datblygu'n cychwyn hyd oni fydd manylion llawen am y ty pump arfaethedig ac unrhyw waith depar cysylltiedig wedi cael eu cyflwyno i'r awdurdod cynllunio lleol a'u cymeradwyo'n ysgrifenedig ganddo a bydd y gwaith yn cael ei wneud yn unol a'r cynllun fet a'i cafwdd ei gymeradwyo.

(03) No development shall commence until full details of the proposed pump house and any associated ground works have been submitted to and approved in writing by the local planning authority and the works shall be carried out in accordance with the scheme as approved.

FORM OF AGREEMENT		CONTENTS	
Clause		Heading	
1	INTERPRETATION		
2	THE CONTRACT		
3	THE WORKS		
4	CONDITIONS OF CONTRACT		
5	CONSIDERATION		
6	PAYMENT		
7	LAW AND JURISDICTION		
	Schedule 1 - Contract Date		
	Part 1 - Data provided by the Employer		
	Part 2 - Data provided by the Contractor		
	Schedule 2 - Works Information		
	Appendix 1 - Not Used		
	Appendix 2 - Form of Subcontractor's Colateral Wa		
	Appendix 3 - Form of Performance Bond		
	Appendix 4 - Not Used		
	Schedule 3 - Site Information		
	Schedule 4 - Activity Schedule		

Risk Assessment on the impact of the Heat pump system at Plas Newydd on the Menai Strait SAC.

System description

The heat pump system at Plas Newydd extracts sea water from the Menai Strait at a point approximately 48m from the high water line on the Ynys Mon shore of the strait. The water passes through a 10mm filter to prevent fish entering the pipe. The water then travels to a pump house on the shore line where it passes through the pump and a fine filter before the titanium heat exchanger. In the heat exchanger the water temperature is dropped by 4.6°C before being returned back the Strait at point approximately 5m from the intake.

The flow rate is determined by the heat requirement of the building see Appendix 1 for calculation. The maximum design flow rate of the sea water is 41.65 m³/hr. The flow rate is measured by an ultrasonic flow meter which sends a signal back to the control system which in turn controls the pump speed. In this way the control system ensures that the flow does not exceed the design maximum.

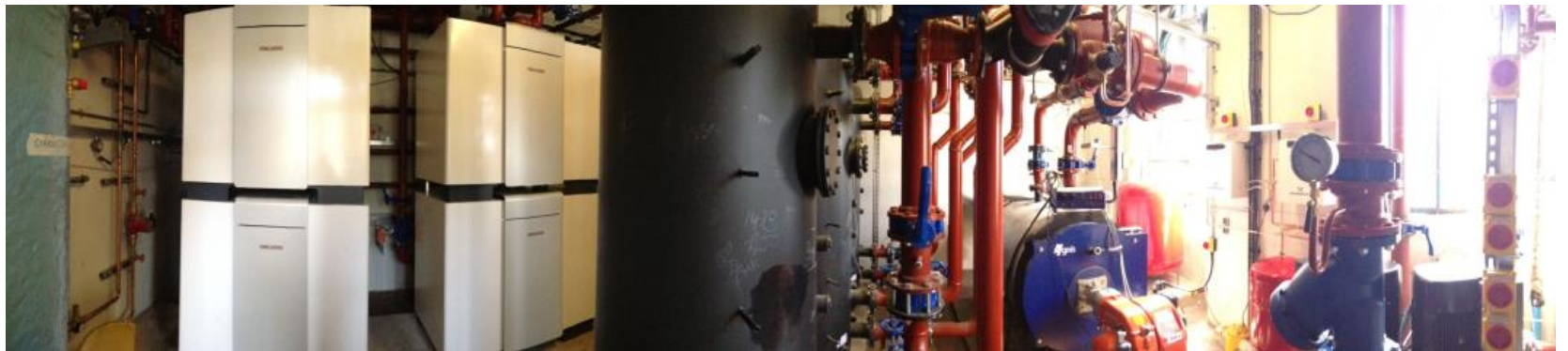
The heat gained from the sea water is then transferred by a water glycol circuit on the secondary side of the heat exchanger to the heat pumps located in the Stables building. Pressure in the secondary system is maintained by a pressurisation unit which ensures that in the event of a leak the pressurisation unit will shut down.

Location of discharge

To avoid contamination of the site by bringing vessels from other sea areas the intake and discharge were laid by manual handling. This coupled with the requirement to maintain a reasonable distance between the intake and discharge points has resulted in the discharge being at the Mean Low Water Springs height. As the discharge is uncontaminated sea water this results in no risk to the environment.

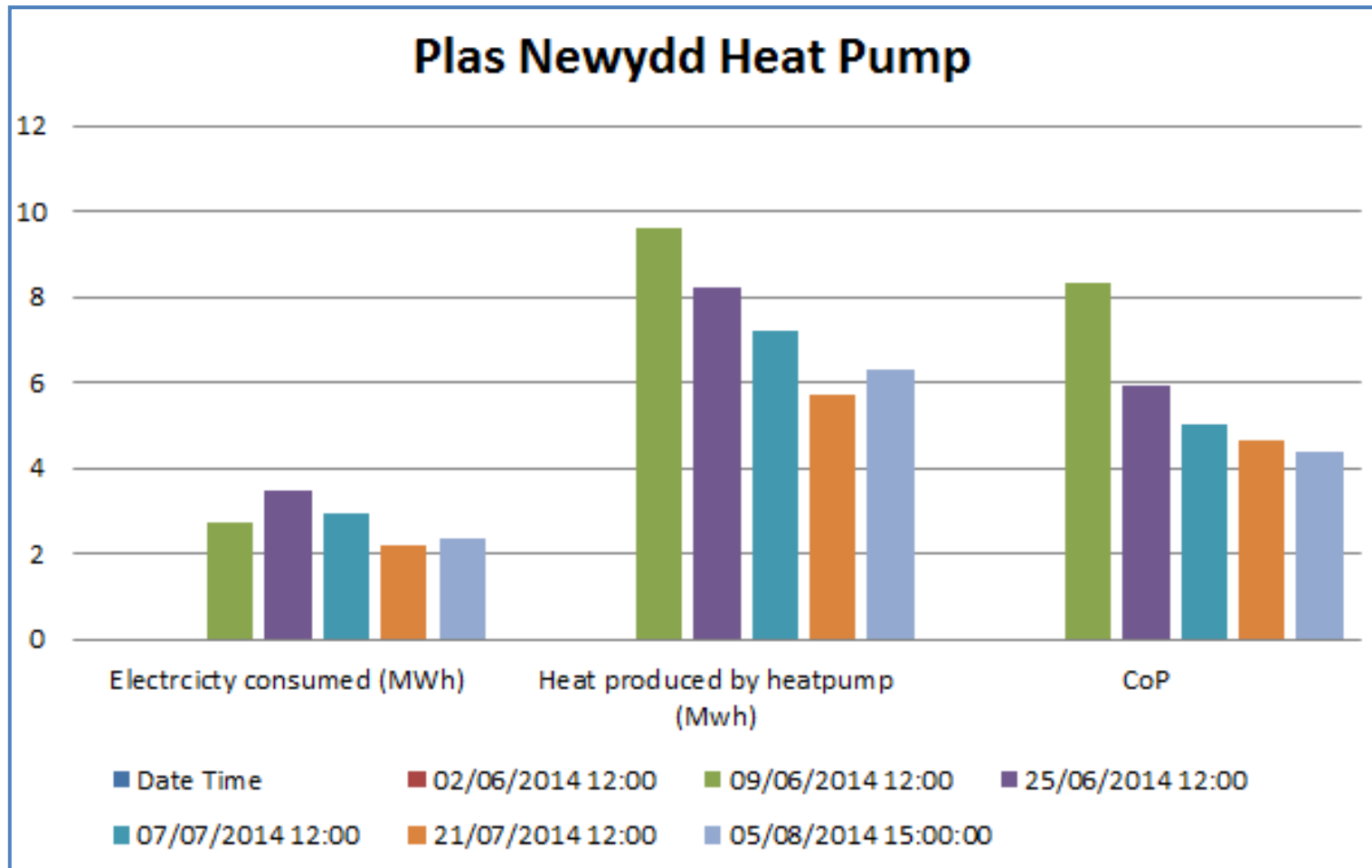
Ref: SL07
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Average Cop = 4.69

Average SPF = 2.7



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www.ntenvironmentalwork.net

National Trust Going Green

Fit for the Future: "The way to get started is to quit talking and begin doing." Walt Disney



Home | Fit4Future | NT Area | Snowdon Hydro | THE TEAM

← Marine Source Heat Pump is finished. But how efficient is it?

Plas Newydd Marine Source Heat pump working. Press Tsunami of Interest →

Fetling is us. Plas Newydd Marine Source heat finished and doing what it said on the box.

Posted on [May 22, 2014](#) by [Kath Jones](#)



Obi Wan with his young Padawan. Sorry I mean Rob and Paul getting to understand the way of the force...sorry there I go again I mean the heat pump performance (see Star Wars) The insulation on all that pretty pipe work was going in today

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WALES
AWARDS
2014**



— WINNER —

