“Installation of a marine source heat pump in an area of high nature, landscape and heritage value on Anglesey, Wales”

Dr Angela Cott    National Trust, UK
715 km² low-lying island max 220 m
70,000 population 70% Welsh 1st
Tourism, agriculture, port, industry
Energy 3 wind farms, > 20 off-shore wind turbines
Anglesey Energy Island Project - first tidal flow turbine, new nuclear reactor

UK and European designations for landscape, heritage and biodiversity
Coast and its hinterland (33% island) is an ‘Area of Outstanding Natural Beauty’
Climate change, coastal erosion, sea level rise – National Trust committed to reducing dependence on fossil fuels
Plas Newydd, Ynys Mon  (New House, Anglesey)
Objectives
Reduce dependence on oil and carbon emissions (National Trust pledge)
Reduce cost of heating mansion
Remove pollution risk of storing oil close to sea
Provide better conservation heating for 18th century mansion

Solution
Reduce energy consumption - roof insulation, energy efficient lighting, draught proofing windows and doors, secondary glazing and staff energy training
Generate renewable energy - Marine source heat pump 300kW, PV panels 50kW

Timeline
2009 energy efficiency measures
2010 decision to implement a renewable energy project
2011 installation of PV panels
2013 installation of marine source heat pump

Cost & Financing Marine Source Heat Pump
€693,600 financed by National Trust Renewable Energy Investment
MPAs facing pollution in the Mediterranean: thinking beyond boundaries

28 Nov / 1st Dec 2017 - Izola, Slovenia
Mise en œuvre et acteurs impliqués
Implementation and actors involved

Actors involved National Trust, Bangor School of Oceanographic Sciences, Royal National Lifeboat Institution (RNLI), Carbon Trust Designers, suppliers and

Regulatory authorities

**Environment Agency** - Discharge permit + method statement approval

**Crown Estates** - temporary works licence + easement for position on Menai Straits

**Countryside Council of Wales** (Natural Resources Wales) ecological & landscape permissions + temporary works licence + method statement approval

**Anglesey Council** - statutory planning and listed building consent

**Navigation authority** for implication of using the straits, + updating of coastal navigation charts and almanacs Welsh Government Marine License temporary works licence and licence to leave pipes in the sea

**DEFRA** - Food and Environment Protection Act 1985 (FEPA) license

**Cadw** approval for working within a historic listed environment

**District Energy Network Operator** agreement to install and upgrade voltage management for the heat pumps within their substation

Implementation and funding – 100% NT but business case based on RHI

Cooperation framework – contracts and informal partnerships
Initial investment into building energy efficiency reduced size of heat pump needed from 700Kw to 300Kw
Net annual savings of CO₂ emissions is 165 tonnes / year
Highly designated site can play part in delivering a fossil-free future
100% property and tenants heating and hot water provided (626 MWH)
Easy to operate (but training of staff important)
Fast installation (16 weeks)
£40000 cost saving each year
£44000 income (government energy incentive)
Payback period of less than 7 years (depreciated over 20 years)
Many island and coastal communities have learnt from project
Ensure resources for upkeep & maintenance maintained
Retain commitment and knowledge of staff
Enseignements
Lessons learned

Les points positifs / The positive points

• Time was allowed for 16 statutory permits so did not cause delays
• Project team small and dedicated, intimate knowledge of place, personalities and statutory bodies
• Concise tender documentation and contracts led to success
• Vital evidence base provided by external partners

Les points négatifs / The negative points

• Needed longer lead time for legal and contractor discussions – delays
• Internal capacity stretched at times and caused delays e.g. legal team
• Go ‘higher up’ if encounter ‘blockers’ - Crown Estate difficult initially
• People meddle if possible to do it – all plant now tamper proof
• Uncertainty due to unique combination of circumstances - extreme tenacity required
Merci pour votre attention

Thank you for your attention

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