



## NATURAL POWER IS HELPING THE UK TO MEET THE CHALLENGE OF LOWERING GREENHOUSE GAS EMISSIONS AND DECARBONISING HEAT

Natural Power is helping the UK to meet the challenge of lowering greenhouse gas emissions and decarbonising heat.

Heat networks are an efficient method to dispatch low carbon heat, and can be employed at large-scale to towns and cities. They use proven technology and are widely employed in continental Europe where over 50% of residents in Sweden, Denmark and Finland receive heat via heat networks, In the UK heat networks supply only 2% of heat demand.

9% of UK heat demand (42 TWh) could be supplied via networks by 2030, rising to 18% of heat demand (81 TWh) by 2050. It is predicted that investment of around £20bn will be required to meet the 2030 projection.

### WHY NATURAL POWER?

- **We are different.** We listen. We seek to understand your unique circumstances, the challenges you face and your objectives. We deliver solutions that are right for you.
- **We know renewables.** Our company has more than two decades of experience in renewable energy. We assess projects. We build systems. We operate assets.
- **We are trusted advisors.** Our renewable energy experts are dedicated to delivering high value, cost-effective and reliable solutions that deliver maximum carbon benefit.



## OUR PEOPLE

Our team will support you through the key stages of your renewable energy project. A selection of our key staff is described below and their expertise in the project lifecycle summarised in the following table:

KEY SENIOR STAFF	ROLE	ENERGY MASTER PLANNING & FEASIBILITY (TECHNO-ECONOMIC)	LOAD & DEMAND ANALYSIS	PLANNING / CONSENTING	CONCEPT DESIGN	OWNER'S REQUIREMENTS, TENDER PREPARATION & MANAGEMENT	OWNER'S ENGINEER / PROJECT MANAGEMENT	ASSET MANAGEMENT	DUE DILIGENCE
Andy Yuill	Senior Renewable Heat Manager	X	X	X	X	X	X		X
Steve Smith	Senior Renewable Heat Engineer	X	X	X	X	X	X		X
Guy Milligan	Senior Renewable Heat Engineer	X	X	X	X	X			X
John Paterson	Senior Electrical Engineer	X			X	X			X
Euan Hutchison	Principal, Planning & Environment			X					X
Chris Robinson	Head of Environment			X					X
Ken Taylor	Construction Project Manager					X	X		X
Stuart Egan	Head of Site Operations							X	X
John Cole	Thermal Asset Manager				X	X	X	X	X

## KEY TEAM MEMBERS



### ANDY YUILL

Andy is experienced in process engineering, project design and delivery of district heating and renewable heat systems. Andy has a Masters Degree in Manufacturing Engineering and a Masters of Science with distinction in Sustainable Energy Systems. He is a CIBSE-registered Heat Networks Consultant and has been responsible for the design, installation and commissioning of district heating and renewable heat systems, as well as conducting feasibility studies for bioenergy and large heat networks.



### GUY MILLIGAN

Guy is a CIBSE-registered heat networks consultant with 10 years' project delivery and operational experience. Guy helped establish a renewable energy supply company that built, owns and operates community-scale heat networks including Hill of Banchory, one of the largest privately owned biomass heat networks in Scotland. Guy has worked on various feasibility studies, including the potential for deep geothermal energy in district heating.



### STEVE SMITH

Steve is a CIBSE-registered Heat Networks Consultant with extensive practical experience of district heating. He has been involved at all stages of projects; options appraisals and analysis, feasibility, development and construction. Steve worked on the team that delivered the three original University of Edinburgh CHP and district heating schemes; and the University of Aberdeen's Old Aberdeen campus scheme.



### EUAN HUTCHISON

Euan is a principal consultant in Natural Power's Planning and Development Team. As a qualified Planner with 15 years' experience, Euan has led planning submissions for a range of renewable heat projects, including; a 6.5MWth woodchip boiler, an 800kWth district heating scheme, and a 50MWth straw-fired CHP plant. Prior to joining Natural Power Euan was a team leader in the development plan team at Dumfries & Galloway Council, and worked with developers to prepare and implement master plans for key development sites across the region.

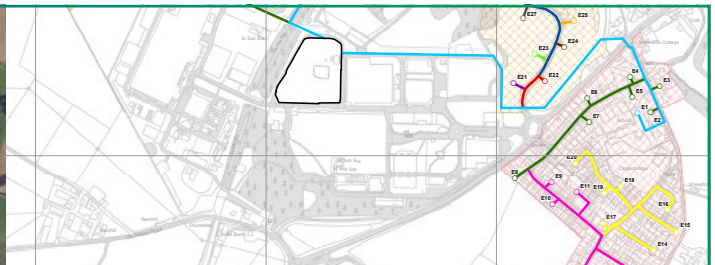
## SELECTED HEAT NETWORK EXPERIENCE

CLIENT	COUNTRY	PROJECT	SERVICE
Client confidential	England	Governance of 40MWe biomass CHP plant and associated 2MWth heat network	Governance of heat network, including operation & maintenance, heat off taker interfaces and capital expenditure for network extension
Client Confidential	Scotland	Heat network feasibility study supplied	Technical feasibility of heat network incorporating CHP generation and distribution from a 6km geothermal well
Dumfries & Galloway Council	Scotland	Energy masterplanning and heat network feasibility study	Regional level heat mapping and opportunity assessment. Feasibility study of heat network opportunity at Cargenbridge, Dumfries. High level heat and supply analysis for potential network in Dumfries
Midlothian Council	Scotland	District heating strategic support (via Zero Waste Scotland)	Production of GIS heat maps, pre-feasibility techno-economic analysis of preferred options, policy development, capacity building through training and knowledge dissemination
East Dunbartonshire Council	Scotland	District heating strategic support (Zero Waste Scotland)	Production of GIS heat maps, appraisal methodology for shared borehole / ground source heat pump, techno-economic analysis of options, policy development, council training and knowledge dissemination
Stirling Council	Scotland	Heat off take appraisal of connections to proposed heat network	Detailed demand analysis, modelling and profiling of buildings proposed for connection to new council network in Stirling
Strathallan School	Scotland	800 kWth wood chips boiler and heat network for private school campus	Feasibility, design, specification and tendering. Construction owner's engineer and post-handover technical support.
Client confidential	UK	District heating market primer study	UK district heating market analysis and technology appraisal





## ENERGY MASTER PLANNING



**PROJECT** DISTRICT HEATING STRATEGIES TO LOCAL AUTHORITIES - SCOTLAND

**CLIENT** ZERO WASTE SCOTLAND (ZWS)

### PROJECT DESCRIPTION

ZWS is funded by Scottish Government to reduce waste and deliver energy efficient systems in Scotland. Natural Power is currently employed by ZWS to assist Scottish local authorities in developing strategies for district heating

### SERVICES PROVIDED

Analyse heat demand and supply within local authority regions and produce geospatial heat maps. Conduct techno-economic appraisal of preferred heat network

opportunities. Assess local authority policies and advise on new policies to support district heating development

### ADDED VALUE

Capacity building by working closely with local authority staff and providing training and knowledge dissemination. Interactive workshops with the local authority to discuss district heating opportunities, objectives and priorities. Techno-economic assessments of preferred options



## FEASIBILITY STUDY

**PROJECT** DISTRICT HEATING FEASIBILITY STUDY

**CLIENT** CONFIDENTIAL

### PROJECT DESCRIPTION

Natural Power conducted a technical feasibility study of a heat network incorporating combined heat and power generation and distribution from a 6km ultra-deep geothermal well in a major UK city centre location.

### SERVICES PROVIDED

Natural Power assessed energy loads, produced network demand profiles, determined energy supply capacities and

produced a concept design for the energy centre, district heating and electricity distribution.

### ADDED VALUE

Ultra-deep geothermal energy is highly innovative but undeveloped in the UK. The proposed site presented many challenges and constraints, and the study provided the client with essential understanding of the technology, and its viability, to inform further work.

## ABOUT NATURAL POWER

Natural Power is a leading independent renewable energy consultancy with experience throughout the development, construction and operational cycles. Established in 1995, we have over 360 staff based in 11 offices across the globe.



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**GUY MILLIGAN**

SENIOR RENEWABLE HEAT ENGINEER

FOR FULL DETAILS ON OUR ISO AND OTHER CERTIFICATIONS, PLEASE VISIT: [naturalpower.com/company](http://naturalpower.com/company)

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