HEAT ACADEMY ONLINE

Commercial Opportunities in Heating & Cooling

13th May: 10.00 – 12.00 (CET)

Sara Malmgren
Smart City Sweden

Peter Anderberg
Heat Academy
**AGENDA**

Commercial Opportunities in Heating & Cooling – 13th May, 2020

- **Introduction**
  - Practical Matters
  - Agenda and Speakers
  - Smart City Sweden – Sara Malmgren
  - Heat Academy – Peter Anderberg

- **What’s in Demand**
  - Driving forces and trends
  - Overview of projects in pipe-line – Recap of project presentations made 17th April
  - Highlighting selected markets
    - Nordic Countries – Jesper Baaring, Öresundskraft
    - Belgium – Tom Prinzie, Van Marcke
    - Netherlands – Marc Peters, Darel
  - Deep-dive into the Humber region, UK
    - Invest in North East Lincolnshire – David Robinson
    - North East Lincolnshire City Council – Tony Neul
    - CATCH Training Services – James McIntosh
    - Department for International Trade – James Beal

- **Effective Routes to Markets** – Peter Anderberg
  - Costs, speed, reach and hit-rate
  - CV19; before – during – after
  - HeatNet Global – Process & Partners

- **How to get going? Next step.** – Peter A, Sara M
  - Sign up for individual webinars
  - Up-coming online master classes Heat Academy

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**Up-coming Events**

**Europe**

- Heat Academy Master Classes
  - Why Heat Networks Work – 15th May

**North America**

- Heat Academy Master Classes – Introductory Sessions
  - Getting to Net Zero - Decarbonising Heating and Cooling – Session 1A – 14th May
  - Getting to Net Zero - Decarbonising Heating and Cooling – Session 1B – 21st May

**In Pipeline**

- Heat Academy Master Classes
  - Getting to Net Zero - Decarbonising Heating and Cooling – Belgium
  - Technology session – Digital Solutions in Heating & Cooling

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**Contacts**

- Peter Anderberg – Heat Academy – pa@nordheat.eu
- Sara Malmgren – Smart City Sweden – sara.malmgren@cleantechostergotland.se
SMART CITY SWEDEN

EXPLORE SMART & SUSTAINABLE SOLUTIONS FROM SWEDEN
Smart City Sweden is represented at 6 regional offices around Sweden, from Umeå in the north, to Malmö in the south.

All offices welcome international delegations and offer study visits within the region.
ACTIVITIES
Overview

DECARBONISING HEATING & COOLING
RAPIDLY GROWING MARKET

Peer-to-Peer advisory
Training & Innovation
Market Access & Match Making
EXAMPLES ON CUSTOMERS & PARTNERS

PREPARATION

DECISION

EXECUTION

NORDIC HEAT

Peer-to-Peer Advisory Services – From Vision to Operations

250 PROFESSIONALS FROM 20 MARKETS
PROGRAMME MANAGEMENT CHECKLIST – From Vision to Operations (examples)

- Project Screenings & Positioning
- Project scope and focus
- Heat Sourcing Strategies
- Peer review of feasibility studies and technical design
- Surveillance & maintenance plans
- Specifying requests for feasibility studies
- Technology selection and procurement
- Commercial strategies
- Sales & Communication strategies
- Reviews of Business Plans
- Financial Advice and Due Diligence assistance
- Retrofit and Energy Efficiency
- Design, Specification and Procurement
- Specifying requests for feasibility studies
- Quality control and commissioning
- Training
- Quality control and commissioning
- Ongoing Peer-to-Peer support and exchange programs
- Financial soft-market testing of Heat Network projects
- Financial soft-market testing of Energy-from-Waste projects
- Market research
- Tariff Models & Differentiation strategies
- DPO – Detailed Project Design
- Installation & commissioning
- Operations & maintenance
- Political Strategies
- 3D mapping of ground prior to installation
- Quality systems & Audits
- Environmental Impact analyses
- Up-grading of Energy from Waste facilities

Examples on Services Offered

- Vision & Operations
- Stakeholder Engagement
- Business Case Development
- Legal & Commercial Expertise
- Technical Feasibility
- Design & Specification
- Procurement & Commissioning
- Installation & Operation
- Ongoing Support

NORDIC HEAT
Peer-to-Peer Advisory Services – From Vision to Operations

Peter Anderberg - pa@nordheat.eu / +46 70 56 111 99

NORDIC HEAT
Peer-to-Peer Advisory Services – From Vision to Operations
HEAT ACADEMY
Training & Innovation

FOCUS AREAS

HEAT PROVISION

COOLING PROVISION

DISTRIBUTION

ENERGY FROM WASTE

CONNECT & CONTROL

BUILDING EFFICIENCY

OPERATIONS

MINE HEAT

VOCATIONAL TRAINING
With local universities and colleges

PROFESSIONAL TRAINING
>5 000 participants

APPRENTICESHIPS
Exchange programmes

INNOVATION
Collaborative innovation initiatives

CANADA
US
China
India
UAE
# Products & Services

<table>
<thead>
<tr>
<th>Heat Generation</th>
<th>Distribution</th>
<th>Connect &amp; Control</th>
<th>Energy Efficiency</th>
<th>Customer Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware (examples)</strong></td>
<td><strong>Hardware (examples)</strong></td>
<td><strong>Hardware (examples)</strong></td>
<td><strong>Hardware (examples)</strong></td>
<td><strong>Hardware (examples)</strong></td>
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<tr>
<td>Building</td>
<td>Pipes</td>
<td>HIUs</td>
<td>Insulation systems</td>
<td>IT Hardware</td>
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<tr>
<td>Boilers</td>
<td>Fittings</td>
<td>Indoor Piping</td>
<td>Radiators</td>
<td>Billing systems</td>
</tr>
<tr>
<td>Piping</td>
<td>Joints</td>
<td>Electrical components</td>
<td>Windows</td>
<td>IoT solutions</td>
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<tr>
<td>Electrical components</td>
<td>Valves</td>
<td>Metering System</td>
<td>Monitoring &amp; Control</td>
<td>Integration technologies</td>
</tr>
<tr>
<td>Pollution control</td>
<td>Leak detection system</td>
<td>Digital solutions</td>
<td>Digital solutions</td>
<td>Intelligent Heating Pack</td>
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<td><strong>Services (examples)</strong></td>
<td><strong>Services (examples)</strong></td>
<td><strong>Services (examples)</strong></td>
<td><strong>Services (examples)</strong></td>
<td><strong>Services (examples)</strong></td>
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<tr>
<td>Welding</td>
<td>GPR/ 3d mapping</td>
<td>Installation</td>
<td>IoT Hardware</td>
<td><strong>HARDWARE (examples)</strong></td>
</tr>
<tr>
<td>Handling of heavy goods</td>
<td>Civil Works</td>
<td>Civil Works</td>
<td><strong>IT Hardware</strong></td>
<td><strong>IT Hardware</strong></td>
</tr>
<tr>
<td>Logistics &amp; Stock</td>
<td>Installation &amp; Welding</td>
<td>Plumbing</td>
<td>Billing systems</td>
<td><strong>BILLING SYSTEMS</strong></td>
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<tr>
<td>Installation</td>
<td>Logistics &amp; Stock</td>
<td>Welding</td>
<td>Internet connection</td>
<td><strong>INTERNET CONNECTION</strong></td>
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<tr>
<td>Engineering</td>
<td>Leak detection</td>
<td>Surveillance and screening</td>
<td>Mobile solutions</td>
<td><strong>MOBILE SOLUTIONS</strong></td>
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<tr>
<td>Construction</td>
<td>Operations &amp; Maintenance</td>
<td>Construction</td>
<td>CSR support</td>
<td><strong>CSR SUPPORT</strong></td>
</tr>
</tbody>
</table>

## Installation & O&M

### Programme Management

- Quality & Documentation
- Health & Safety
- O&M

**Peter Anderberg** - pa@heatnet.se / +46 70 56 111 99
HEATNET Services

BUYER

SELLER

Match making

300+
20 markets

Market Entry

CANADA
US
UAE

UAE
CANADA
US
UAE
What’s in Demand

Peter Anderberg
Heat Academy
WHAT’S IN DEMAND
Overview

DECARBONISING HEATING & COOLING
RAPIDLY GROWING MARKET
WHAT'S IN DEMAND

Overview

DECARBONISING HEATING & COOLING
RAPIDLY GROWING MARKET

GLOBAL PANDEMIC
ENERGY CRISIS
CLIMATE CRISIS

PROSPECTS FOR YOUNG PEOPLE
JOBS
SOCIAL

FINANCIAL CRISIS
NATURAL RESOURCES

INTERNATIONAL COLLABORATION
ECOLOGICAL CRISIS
WHAT’S IN DEMAND
Overview

UK HEATING SECTOR - 2019
FOSSIL FUELS

PRIMARY ENERGY

CONSUMPTION

CO₂ EMISSIONS

HEAT 48%

ELECTRICITY 13%

TRANSPORT 39%

HEAT 35%

HEAT 35%

UK

USA

CA

NL

IT

CH
OPTIONS & STRATEGIES
Why change unless you have to?
OPTIONS & STRATEGIES
Why change unless you have to?

ORGANIC GROWTH: 1964 - 2019

- Customers: 50
- Trench: 0.5 km
- 500,000 customers
- 600 km

Peter Anderberg - pa@nordheat.eu / +46 70 56 111 99
OPTIONS & STRATEGIES
Why change unless you have to?
MARKET SHARE – HEAT NETWORKS

Market Share: 60%
Fossil Fuel: 3%

HEAT SOURCES

OPTIONS & STRATEGIES
Why change unless you have to?

2012
1975
1971
1964
(time)
OPTIONS & STRATEGIES
Why change unless you have to?

MARKET SHARE

Market Share: 60%
Fossil Fuel: 3%

1964 1971 1975 2012
(time)

END USER CONVENIENCE
SOCIAL WELFARE
ENERGY SECURITY & BoT

COMMERCIAL OPPORTUNITIES
BOOSTING LOCAL ECONOMY
GREEN AGENDA
OPTIONS & STRATEGIES

Zero Carbon Ready

1964
1971
1975
1990
2012
(time)

Zero Carbon Ready 1
Zero Carbon Ready 2
Zero Carbon DONE!
1964
**FOSSIL FUELS >90%**
Energy from Waste
Biomass
Waste Wood
Heat Pumps
Heat
Biogas
Geothermal
Mine Heat
Biomass
Solar Thermal
Energy from Waste
Waste Wood
Sewage Water

2020
FOSSIL FUELS <10%

OPTIONS & STRATEGIES
Sweden

Peter Anderberg - pa@nordheat.eu /+46 70 56 111 99

2020
FOSSIL FUELS <10%

Industrial Waste
Heat

Biogas

Geothermal

Mine Heat

Biomass

Solar Thermal

Energy from Waste

Waste Wood

Sewage Water

BACKGROUND
Decarbonising Heating
OPTIONS & STRATEGIES
Sweden

2020
FOSSIL FUELS <10%

Industrial Waste
Heat

Biogas

Geothermal

Mine Heat

Biomass

Solar Thermal

Energy from Waste

Waste Wood

Sewage Water

FOSSIL FUELS <10%

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WHAT’S IN DEMAND

Overview

DECARBONISING HEATING & COOLING
RAPIDLY GROWING MARKET

End User Convenience
Social Welfare
Energy Security & BoT

Commercial Opportunities
Boosting Local Economy
Green Agenda

Overview

CLIMATE CRISIS
END USER CONVENIENCE
COMMERCIAL OPPORTUNITIES
ENERGY SECURITY & BOT

SOCIAL WELFARE
BOOSTING LOCAL ECONOMY
GREEN AGENDA
WHAT’S IN DEMAND
Overview

DECARBONISING HEATING & COOLING
RAPIDLY GROWING MARKET
WHAT’S IN DEMAND
Market Opportunities

DECARBONISING HEATING & COOLING – MAJOR PROJECTS

- **STOKE-ON-TRENT HEAT NETWORK**
  - Value: £55M

- **STOKE-ON-TRENT ENERGY-FROM-WASTE**
  - Value: £50M

- **BRIDGEND MINE HEAT**
  - Value: £20M

- **LONDON LOW-TEMPERATURE DH**
  - Value: tbd

- **SEAHAM MINE HEAT**
  - Value: £20M

- **HULL HEAT NETWORK**
  - Value: £5M

- **GRIMSBY HEAT NETWORK**
  - Value: £5M

- **NOTTINGHAM MINE HEAT**
  - Value: £5M

- **ROTHERHAM BIO-MASS CHP/DH**
  - Value: £10M

- **BARNSLEY HEAT NETWORK**
  - Value: £5M

- **Barnsley HEAT NETWORK**
  - Value: £10M

- **HULL HEAT NETWORK**
  - Value: £10M

EXAMPLE – UK
WHAT’S IN DEMAND
Market Opportunities

Stoke-on-Trent – UK
£50M Heat Network Project
Major investments in Energy Retrofit
Stoke-on-Trent is currently installing a city-wide heat network. By 2025, 18 km of pipes will have been installed, annually distributing close to 50 GWh of heat. Will involve major investments in energy efficiency.

Seaham Garden Village – UK
Delivered by Tolent and Home Group, the garden village will provide 1,500 new homes over 10 years starting in 2020. Heating will be provided by heat pumps connected to an abandoned mine nearby.

Grimsby – UK
Network serving educational facilities, hospital outbuildings, care facilities and residential developments around the Grimsby Institute and Diana Princess of Wales Hospital in Grimsby.

Geneva – SG
€ 80M District Cooling project – Genius
Sourcing and distributing free cooling from Lake Geneva
Geneva – Expansion of district cooling system also involving sourcing of free cooling from a depth of 45m which will provide free cooling at a stable temperature of 6–7°C throughout the year.

New York – US
20 Billion USD Building Energy Retrofit Market
10,000 Buildings need to be retrofitted in 30 years
New York City has enacted a land use requiring a 4% reduction of greenhouse gases by 2030, and 80% in 2050. Non-compliance with this energy efficiency mandate will result in financial penalties.

Toronto – Canada
CAD$+590 Million brown field investment
Waterfront Toronto – The objective for Quayside is to establish a model and new standard for 21st century city-building by delivering sustainable, inclusive, complete communities. Investment to be launched 2021.

WHAT’S IN DEMAND
Market Opportunities

Helsingborg – Sweden
100% fossil free heat network
City of Helsingborg, owner of Öresundskraft, one of Sweden’s largest energy companies. Operates a highly profitable heat network since 1964. Regarded as a frontrunner and reference in the European energy sector.

Lakeview, is a new urban development located outside Toronto. Will become a state of art smart city area housing 17,000 people. Involves e.g. district energy, zero waste housing and vacuum waste disposal.

North East Lincolnshire – UK
£20M brown field investment in Heat Network
First delivery of heat in 2022

New York – US
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Öresundskraft

Patrik Hermansson
Director Strategy & Innovation
April 17, 2020
Öresundskraft AB
A comprehensive communications and energy service company

• 100% owned by City of Helsingborg
• Key data
  » 110 000 customers
  » 381 employees (38% ♀)
  » 2.9 TWh energy sales
  » 320 M€ turnover, 34 M€ EBIT
• Infrastructure
  » Heating Grid, Cooling Grid, Power Grid, Metropolitan Area Network, Gas,
  National EV charging, IoT Connectivity for smart cities
• Energy and service
  » District Heating, District Cooling, Electricity, Energy Efficiency Services,
  Comfort as a Service (CaaS)

Cooperation
Helsingborg

- **Helsingborg fast growing city**
  
  2018  
  145,415 invånare  (+1,5%)

  2026  
  159,000 invånare

  2035  
  175,000 invånare

  2050  
  200,000 invånare

- **1 % Sweden’s CO₂**
  
  » 508,321 ton fossil CO₂ (2017)

- **Limited electric power capacity**
  
  » weaWther dependent production, Find power, in North replace nuclear plants in south
District Heating

- Founded 1965
- 80% market share and a strong brand
- Strong growth in Helsingborg and Ängelholm
- Strong customer relations
- 100% delivery accuracy
- 100% recovered and renewable energy
- Competitive price
- CHP critical for electric system
  - 20% power demand
  - Off-loading electric system
- Data driven business (customer energy data)
District Heating for Tomorrow

• **Balance Sheet**
  » Reinvestments in Power Plants
  » Reinvestements in Heat Grid

• **Heat grid is growing but sales volume fixed**
  » New customers balances energy efficiency
  » Investment

• **Customer involvement**
  » Demand Side management Key

• **Digitalization key resource**

• **District Heating key for achieving climate neutrality 2035**

• **District Heating key for the electrical system**

*You Can't Solve Today's Problems With Yesterday's Solutions*
Dutch Climate Discussions (in Corona Times)

HEAT ACADEMY ONLINE
Decarbonising Heating. Now.

By: Koen van Eig, partner DAREL
NL climate agreement for built environment – ‘off-the-gas’

*Challenge: connect 7 million houses & 1 million buildings to a renewable heat source*

- Built environment: district-by-district transformation of energy supply of 7 million houses and 1 million buildings
  - District approach, municipalities and stakeholders to develop heat transition vision by 2021
  - Tax increase gas, tax reduction electricity insulation and sustainable heating, standards utility buildings & housing
  - Cost reduction insulation, increase sustainable heating options e.g. upscaling geothermal 50/200 PJ in 2030/2050 and application aquathermal 80-120PJ in 2050
  - Flying start: new build beyond 2022 to be 100% gas free, housing corporation to transform 102K houses by 2021 and 1.5 mln houses by 2030
  - Heat fund for private house owners
## NL district heat networks SWOT

The NL energy policy – the transformation of the built environment and industry to a renewable heat supply is a tremendous opportunity for renewable heat sources that may outweigh the threats and weaknesses of DHN's

<table>
<thead>
<tr>
<th>□ Strengths</th>
<th>□ Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Re-use waste heat, application CHP</td>
<td>- NL energy policy – transformation to renewable heat supply of built environment and industry</td>
</tr>
<tr>
<td>- Flexibility to connect to various heat sources, lower dependency on natural gas</td>
<td>- NL densely clustered built environment</td>
</tr>
<tr>
<td>- Heat instantly available, no individual boilers required</td>
<td>- Potential of utilising waste heat</td>
</tr>
<tr>
<td></td>
<td>- Upscaling potential, modular expansion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>□ Weaknesses</th>
<th>□ Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Long-term match between supply &amp; demand</td>
<td>- Low space availability, existing gas networks</td>
</tr>
<tr>
<td>- High capital costs, long payback</td>
<td>- Energy savings measures will lower heat demand</td>
</tr>
<tr>
<td>- Heat losses in distribution network</td>
<td>- Alternative options for household heating systems</td>
</tr>
<tr>
<td>- No flexibility for user to choose own heat supply, higher heat price than gas heating</td>
<td></td>
</tr>
</tbody>
</table>
District Heating - Belgium

Tom Prinzie

warmtenetwerk
Vlaanderen
Missie Warmtenetwerk Vlaanderen

- Vanuit Warmtenetwerk Nederland een Vlaamse uitbouw
- Breed platform voor alle actoren betrokken bij collectieve warmte
- Stimuleren van gebruik collectieve warmte- (en koude)netten
- Kennisoverdracht en adviseren regelgeving
België = 3 gewesten (WNVL focus op Vlaanderen)
**België (Vlaanderen) en warmtenetten 2019:**

Warmtenetten zijn wereldwijd op relatief kleine schaal geïntegreerd in de bebouwde omgeving. Enkele voorbeelden:

<table>
<thead>
<tr>
<th><strong>LAND</strong></th>
<th><strong>AANTAL NETTEN</strong></th>
<th><strong>TOT.GEINSTALL VERMOGEN</strong></th>
<th><strong>GEM. vermogen/net</strong></th>
<th><strong>TOT.afstand</strong></th>
<th><strong>MW/k</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>7</td>
<td>115 MW</td>
<td>16 MW/net</td>
<td>50 km</td>
<td>2</td>
</tr>
<tr>
<td>France</td>
<td>350</td>
<td>18,500 MW</td>
<td>53 MW/net</td>
<td>2,600 km</td>
<td>7</td>
</tr>
<tr>
<td>Germany</td>
<td>500</td>
<td>35,000 MW</td>
<td>70 MW/net</td>
<td>9,700 km</td>
<td>4</td>
</tr>
<tr>
<td>Denmark</td>
<td>360</td>
<td>15,000 MW</td>
<td>41 MW/net</td>
<td>17,000 km</td>
<td>1</td>
</tr>
<tr>
<td>Sweden</td>
<td>300</td>
<td>26,000 MW</td>
<td>86 MW/net</td>
<td>7,500 km</td>
<td>3</td>
</tr>
<tr>
<td>New York (US)</td>
<td>1</td>
<td>6000 MW</td>
<td>6000 MW/net</td>
<td>200 km</td>
<td>30</td>
</tr>
</tbody>
</table>

Tabel 5: overzicht van de warmtenetten met kengetallen in het buitenland

*Bron: stadscoördinaten © by Stefan Helders www.world-gazetteer.com; NUTS-data © EuroGeo-graphics for the administrative boundries*
Adieu stookolie: koninklijk domein in Laken wordt straks verwarmd dankzij afval
Een warm netwerk ;)
Er wordt via een trekking diverse opties dichtbij mogelijkheden naar oplosingen gezocht. Elke uitbreidingsmogelijkheid is om nog hubs bij te creëren. Er zijn mogelijkheden van bestaande gebouwen tot nieuwe realisaties, maar er wordt ook gekeken naar de omliggende regio waarbij andere warmtebronnen en afnemers worden geïntegreerd.
## Heat Interface Units (HIU)

<table>
<thead>
<tr>
<th>Estimate market</th>
<th>HI U</th>
<th>19/08/2019</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>01/01 to 30/06</td>
<td>01/01 to 31/12</td>
</tr>
<tr>
<td>2015</td>
<td>2000</td>
<td>xxxxxxx</td>
</tr>
<tr>
<td>Total units</td>
<td>2000</td>
<td>1,00</td>
</tr>
<tr>
<td>2016</td>
<td>var 15/16</td>
<td>var 15/16</td>
</tr>
<tr>
<td>Total units</td>
<td>1900</td>
<td>0,95</td>
</tr>
<tr>
<td>2017</td>
<td>var 16/17</td>
<td>var 16/17</td>
</tr>
<tr>
<td>Total units</td>
<td>2700</td>
<td>1,42</td>
</tr>
<tr>
<td>2018</td>
<td>var 17/18</td>
<td>var 17/18</td>
</tr>
<tr>
<td>Total units</td>
<td>3200</td>
<td>1,19</td>
</tr>
<tr>
<td>2019</td>
<td>var 18/19</td>
<td>var 18/17</td>
</tr>
<tr>
<td>Total units</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2020</td>
<td>var 19/20</td>
<td>var 19/20</td>
</tr>
<tr>
<td>Total units</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Bron: ATTB
Bedankt voor uw aandacht

Tom Prinzie - tprinzie@vanmarcke.be
UK
Humber

Dave Robinson
Invest North East
Lincolnshire
Invest in North East Lincolnshire
Grimsby · Cleethorpes · Immingham
David Robinson – Lead Investment Officer
Tony Neul – Assistant Director Energy & Environmental Policy
Why North East Lincolnshire?

**Infrastructure**
- Port of Grimsby is home to one of the UK’s largest fish markets.
- 3.5 million cubic metres of public cold stores, one of the largest concentrations in Europe.
- Port of Grimsby Border Inspection Post handles a range of imported products of animal origin from all over the world.
- Investments totally over £12m into a £5m Marine Control Centre and a £1.85m 200 tonne boat hoist for fast turnaround vessel servicing.
- Immingham is capable of handling major vessels up to 366m length and offers a range of specialist cranes and handling equipment, including 14 x 100-tonne capacity mobile harbour cranes.

**Connectivity**
- 90,000 people within a 15 minute catchment and 350,000 within a 45 minute drive.
- Direct access to the Ports of Grimsby and Immingham, providing extensive fast and frequent ro-ro and lo-lo sea freight connections to European and global markets.
- Less than 20 minutes drive to Humberside International Airport providing services to Aberdeen Airport 6 days per week, and 3 daily hub-feeder services to Schiphol, Amsterdam.
- Central UK location (north-south), providing fast motorway access to the M180, M18, M62 and M1/A1 via the A180.
- All of England’s major conurbations are accessible in less than 4.5 hours by HGV (i.e. one driver shift).
- Top 5% in the UK for broadband speeds.

**Sites and Premises**
- Specialist sites and premises including port-adjacent and on-port property solutions.
- Europarc - Grimsby’s flagship business park, and Food Enterprise Zone (FEZ) with outline planning on 47 acres.
- 7 Enterprise Zone sites totally 200ha offering Business Rate Discount and Enhanced Capital Allowances.
- Competitive land values offering land cost savings of 30% or more versus alternative industrial locations in the UK.

**Skills**
- Wages in the area are more than 15% below the Great Britain average.
- More process plant and machinery operatives than any key UK competitor food location and more than twice the Great Britain average.
- A higher percentage of the workforce engaged in the repair and installation of machinery and equipment than competitor port locations, and more than 4 x the Great Britain average.
- One of the UK’s largest manufacturing labour forces and almost twice the Great Britain average.
- A higher percentage of the workforce engaged in transport and storage occupations than any key UK competitor food or seafood location.

**Invest North East Lincolnshire**
Key Facts

- Home to the UK’s largest Port – the Port of Immingham
- The food industry is worth more than £2.5bn to North East Lincolnshire
- 50+ years of process industries in North East Lincolnshire
- North East Lincolnshire attracts more than 10 million visitors annually
- UK centre for offshore wind operations and maintenance
- North East Lincolnshire is 1 of only 26 Housing Zones in the UK

Invest North East Lincolnshire
Investing £42m into the SHIIP (South Humber Industrial Investment Programme) to enable development on 6 Enterprise Zone sites within the UK’s largest Port complex.
Enterprise Zones

The Humber is the UK’s largest Enterprise Zone. North East Lincolnshire has 189ha of Enterprise Zone across 6 sites.

- Enhanced Capital Allowances* up to €125m per investment project
- Up to 100% Business Rate Discount** worth up to £275,00 per business over a 5 year period
- South Humber Industrial Investment Programme (SHIIP) £42m infrastructure intervention
- Additional funding and grant opportunities

*On sites where Enhanced Capital Allowances are available, businesses have until 31st March 2021 to make their investment.
**Businesses need to have located onto the Zone before 31st March 2021 to qualify.
Mitigation Zones

- Planning Approved
- Sites Secured
- Work completed
- Plan is to produce 122 hectares of mitigation land
- 40ha produced already on Cress Marsh site
- In negotiation with landowners for other sites.
- Will enable development of all development land once complete.
Port Connector Road

- ‘New’ road joining Moody Lane to Hobson Way
- Planning Approved
- Works started in March 2019
- Due to complete in 16 months.
- Will deliver the upgrade of 1.5Km of un-adopted road and the construction of 1Km of new road.
Stallingborough Interchange

- 64 Ha Enterprise Zone
- Investors can benefit from Enhanced Capital Allowances
- Planning Approved for B1, B2 and B8 development
- Infrastructure works ongoing.
- Currently working with a number of interested parties.
£170m waste-to-energy plant plan revealed for Immingham

- Based on the Queens Road EZ site
- 49.5 MW RDF Power Station
- Planning Approved
- Construction to start late 2020.
• Based on the Immingham Rail Freight site.
• 20mw RDF Power Plant
• Planning Approved
• Additional 2x20mw facilities in planning.
Engie Energy Park

• 47 hectare site immediately to the west of the Stallingborough EZ
• 50Mw solar farm & battery storage facility.
• Planning in process.
EPUKi

- 49.9 MW RDF to Power facility
- Adjacent to existing South Humber Bank Gas fired facility
- Local Planning approved
- National planning in process for further expansion.
Great Coates Energy

- Based on the Humber Gate EZ site
- 18 MW RDF to Power facility
- Planning approved.
- Construction to start late 2020.
- Opened private wire discussions
Velocys: How the Humber could be home to high-growth green jet-fuel refining

By Grimsby Telegraph | Posted: 20 DEC 2018

The South Humber Bank could soon welcome a refinery dedicated to producing green jet fuel for UK flag carrier British Airways. Business editor David Lister met the team heading up the huge development, first unveiled yesterday.

FROM one of Britain’s most prestigious academic institutions to its industrial heartland, a pioneering 20-year journey to lower aviation’s harmful emissions looks set to come to Hullingborough.

• To be based at the 45 Hectare Moody Lane EZ site.
• Bio-Refinery facility
• Produce green jet fuel from waste.
• Close to finishing planning process.
• Final investment decision by close of 2020.

Invest North East Lincolnshire
Meet The Team

David Robinson
Lead Investment Officer
David@InvestNEL.co.uk
01472 324605

Maggie Campbell
Lead Investment Officer
Margaret.Campbell@nelincs.gov.uk
01472 324461

Rachael Markham
Lead Investment Officer
Rachael@InvestNEL.co.uk
01472 324698

Relocating here will be a smooth process, your single point of contact will support you with your investment every step of the way from property/land searches to funding advice and borough tours - it’s all part of our free service.
UK
Humber

Tony Neul
North East Lincolnshire
City Council
Energy
An emerging vision for North East Lincolnshire
Energy balance results for NE Lincolnshire
- current status according to consumer groups and energy sources -

**Energy Balance NE Lincolnshire 2017**

- **Electricity**: 19%, 0.82 m MWh
- **Heat**: 63%, 2.73 m MWh
- **Transport**: 18%, 0.78 m MWh
Energy balance results for NE Lincolnshire
- Comparison of heat consumption and production 2017 -

In 2017, 10% of the heat requirement was covered by renewable heat

<table>
<thead>
<tr>
<th>Total Heat Consumption</th>
<th>Renewable Heat Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic: 906,000 MWh/a</td>
<td>Manufactured Fuels: 285,000 MWh/a</td>
</tr>
<tr>
<td>Industrial &amp; Commercial: 1,828,000 MWh/a</td>
<td></td>
</tr>
<tr>
<td>Public Sector: 272 MWh/a</td>
<td></td>
</tr>
</tbody>
</table>

Manufactured Fuels also include non-renewable energies such as coal and coke (better data quality not available)
Energy balance results for NE Lincolnshire
- Comparison of electricity consumption and production 2017 -

In 2017, approximately 3.7% more electricity was produced by renewable energies than consumed.

**Total Electricity Consumption: 822,800 MWh/a**
- **Domestic**: 245,000 MWh/a
- **Industrial & Commercial**: 577,000 MWh/a
- **Public Sector**: 800 MWh/a

**Renewable Electricity Production: 854,000 MWh/a**
- **Wind on- & offshore**: 785,000 MWh/a
- **Photovoltaics**: 47,000 MWh/a
- **Sewage & Landfill Gas**: 22,000 MWh/a
<table>
<thead>
<tr>
<th></th>
<th>unit</th>
<th>Base case</th>
<th>Peak-adjusted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total CAPEX (full scheme)</td>
<td>£m</td>
<td>19.3</td>
<td>19.2</td>
</tr>
<tr>
<td>Total REPEX (full scheme)</td>
<td>£m</td>
<td>8.3</td>
<td>8.4</td>
</tr>
<tr>
<td>Total OPEX (full scheme)</td>
<td>£m/yr.</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Annual revenue (full scheme)</td>
<td>£m/yr.</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Gross margin (full scheme)</td>
<td>£m/yr.</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>Consumer heat tariff costs (full scheme)</td>
<td>£/MWh</td>
<td>90.2</td>
<td>89.6</td>
</tr>
<tr>
<td>Total connection fees</td>
<td>£m</td>
<td>2.8</td>
<td>3.0</td>
</tr>
<tr>
<td>NPV (25 yr @ 3.5 %)</td>
<td>£m</td>
<td>-3.3</td>
<td>-2.7</td>
</tr>
<tr>
<td>IRR (25 yr)</td>
<td>%</td>
<td>1.8 %</td>
<td>2.1 %</td>
</tr>
<tr>
<td>Social IRR (25 yr)</td>
<td>%</td>
<td>2.2 %</td>
<td>2.5 %</td>
</tr>
<tr>
<td>LCOE (25 yr)</td>
<td>£/MWh</td>
<td>145.4</td>
<td>139.0</td>
</tr>
</tbody>
</table>
**GIFHE(peak) FES**

**Project Sponsor:** North East Lincs Healthcare

**Network Map:**

**Summary forecast financial information:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Year</th>
<th>Project (P)</th>
<th>Capacity (100)</th>
<th>Capacity (100)</th>
<th>Capacity (100)</th>
<th>Capacity (100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing</td>
<td>2020</td>
<td>50.0%</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>RD</td>
<td>2022</td>
<td>2022</td>
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</table>

**Project Stage Details:**

<table>
<thead>
<tr>
<th>LA Name</th>
<th>North East Lincs Healthcare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Name</td>
<td>Tony Neul</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:tony.neul@nelincs.gov.uk">tony.neul@nelincs.gov.uk</a></td>
</tr>
</tbody>
</table>

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**Technical Information:**

**Project energy source:**

- **CHP = Gas**

**Project Description:**

- Heat network serving educational facilities, hospital buildings, new facilities, and expansion developments around the University Institute of Further and Higher Education (Campion and Diane Fennell of the Rebecca Institute in Grantham).

**Energy needs of the population:**

- Energy needs are proposed to be based on the National Grid Electricity Consumption Database to meet the needs of the educational facilities and hospital buildings. The energy needs are proposed to satisfy the CHP to receive a significant energy savings. The energy saved would come from the electricity grid (energy) grid before the provision of the heat supplier's area (gas CHP).

**Construction of existing structures:**

- Construction of existing structures is phased to allow for a total of 1,000 new residential developments connected as they are built. The heat is proposed to originate from the existing grid of the current and future projects. This will allow for a phased and flexible approach. A potential major benefit of the project within the next few years will enable significant expansion.
Our Capabilities

Leading industry-led membership, skills development and competency assurance organisation
Our Board

Led by industry

Singleton Birch

TRONOX

NOVARTIS

PHILLIPS 66

TOTAL

YARA

bp

On Line Design

Solenis

INEOS

ABP

BOC

Centrica Storage

ENGIE Fabricom

Worley

North Lincolnshire Council

North East Lincolnshire Council

East Riding of Yorkshire Council

University of Hull

University of Lincoln

CATCH
<table>
<thead>
<tr>
<th>Our Members</th>
</tr>
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</table>

**CATCH Core Member Companies**

<table>
<thead>
<tr>
<th>Air Products</th>
<th>Esseco</th>
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<tr>
<td>Airedale</td>
<td>Greenenergy</td>
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<tr>
<td>Anglian Water</td>
<td>Ineos</td>
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<tr>
<td>Associated British Ports (ABP)</td>
<td>Inter Terminals</td>
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<tr>
<td>Associated Petroleum Terminals (APT)</td>
<td>Jacobs Field Services</td>
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<tr>
<td>BOC Gases</td>
<td>Knauf</td>
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<td>BP Chemicals</td>
<td>Lenzing Fibers</td>
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<td>British Rema</td>
<td>Lubrizol</td>
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<tr>
<td>British Steel</td>
<td>Nippon Gohsei</td>
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<tr>
<td>Centrica Energy</td>
<td>North Lincolnshire Council</td>
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<td>Centrica Storage</td>
<td>North East Lincolnshire Council</td>
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<tr>
<td>Croda</td>
<td>Novartis Grimsby</td>
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<tr>
<td>Dr Reddy’s</td>
<td>Nufarm</td>
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<td>East Riding of Yorkshire Council</td>
<td>Oil &amp; Pipelines Agency</td>
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<td>ENGIE Fabricom</td>
<td>On Line Group</td>
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<td>EON</td>
<td>Phillips 66</td>
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<td>EP UK</td>
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<td>PX</td>
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<td>Singleton Birch</td>
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<td>Solenis</td>
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<td>Scottish &amp; Southern Energy (SSE)</td>
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<td>Synergy Health</td>
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<td>Synthomer</td>
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<tr>
<td></td>
<td>TOTAL Lindsey Oil Refinery</td>
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<td>Tronox</td>
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<td>Vickers Labs</td>
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<td>Victrex</td>
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<td>Vivergo fuels</td>
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<td></td>
<td>University of Bradford</td>
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<td>University of Hull</td>
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<td>University of Lincoln</td>
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<td></td>
<td>Yara</td>
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</table>
CATCH Engineering Training Partnership

- Overarching brand for all engineering activities
- Yorkshire and the Humber coverage
- Go to brand for schools and young people (Engineering Academy)
- Developing and maintaining employer partnerships across the region
- Key themes include Industry 4.0 and Green Engineering
- Dedicated Facilities
Our work in Clean Growth

• Developed employer and stakeholder network group for industrial decarbonisation
• Won £100k bid with Humber Local Enterprise Partnership to start work on a roadmap to support the Humber’s plans to decarbonise the region
• Collaborating with Local authorities, key employers and Heat Academy to develop a model for the Humber region
• Launched Refrigeration Air Conditioning and Heat Pump Engineering Technician Apprenticeship programme
• Developing heat pump based training courses to upskill existing staff to meet future demand
Heat from Waste

James Beal

Specialist, DIT May 2020
COVID-19 support

- **Workforce Support** – covering the Coronavirus Job Retention Scheme
- **Business Support** - support for self-employed staff, Business Rates relief, Business support grant funds (e.g. Small Business Grant Fund)
- **Tax Support** - paying Tax (e.g. Time to pay scheme)
- **Access to Finance via loan schemes** – the Coronavirus Business Interruption Loan Scheme (CBILS) and the Coronavirus Large Business Interruption Loan Scheme (CLBILS)
- **Future Fund** – supporting Scale-Ups and Start-Ups
- **Coronavirus Bounce Back Loan**

[https://www.businesssupport.gov.uk/](https://www.businesssupport.gov.uk/)
Heat Networks Opportunity

• Budget announced (now over £½ billion):-
  • further year of HNIP support
  • New £270m Green Heat Network Fund
  • Levy on gas

• Uk largest heat network opportunity in EU

• HNDU / HNIP pipeline remains strong, over £1.3b

• Triple Point delivering HNIP investment
Triple Point / HNIP invested £40m so far

Round 1

• Barking Town Centre Strategic Distribution Energy Scheme (Funding Award: £5m)
• Bristol Redcliffe Heat Network (Funding Award: £3.6m)
• Leeds City Council (Funding Award: £2.4m)
• Veolia: South East London Combined Heat and Power Heat Network (Funding Award: £5.5m)

Round 2

• Peel Energy, part of Peel L&P: Liverpool Waters Heating Network (Funding Award: £1.3m)
• Bristol City Council: Old Market Heat Network (Funding Award: £6.59m)
• Energetik: Meridian Water Heat Network (Funding Award: £14.76m)

Also check out the triple point website for draft contracts
Triple Point / HNIP Funded

- Annual heat delivered: 450 GWh
- Network trench length of: 24.3km
- 30,900 homes connected
- Total funding award to date of just over £40m
- Total CAPEX of funded projects: £124.3m
- 154,300 tCO2e emissions saved over 15 years = 411,500 trees planted
Where are the energy solutions of tomorrow a reality today?

We’re the UK and we’re ready to trade with you at great.gov.uk

INVEST IN GREAT
Effective Routes to Market

Peter Anderberg
Heat Academy
DECARBONISING HEATING & COOLING
RAPIDLY GROWING MARKET

ENABLING BUSINESS
Costs – Speed – Hit Rate
CO₂

Humber
£800m

Wind ✓

2* Heat Networks !

EfW !

Retrofit !

Hospital !

Waste to Value !
£800m
2* Heat Networks!
EfW! Retrofit!
Hospital!
Waste to Value!
£800m
2* Heat Networks!
EfW! Retrofit!
Hospital!
Waste to Value!

Market Entry
Training

Humber

HEATNET Services

pa@heatnet.se

HEATNET GLOBAL

Sellar

Invest North East Lincolnshire

CATCH

HEAT ACADEMY INTERNATIONAL

CANADA
US
UAE
£800m
2* Heat Networks!
EfW! Retrofit!
Hospital!
Waste to Value!

Market Entry

Match making

Humber

HEATNET
Services

HEATNET GLOBAL

SENDER

CANADA
US
UAE

pa@heatnet.se
HEATNET Services

BUYER

Market Entry

SELLER

300+
20 markets

Match making

Peter Anderberg - pa@heatnet.se / +46 70 56 111 99

pa@heatnet.se
HEATNET Services

BUYER

SELLER

300+ professionals
20 markets

ENABLING BUSINESS
Costs – Speed – Hit Rate

pa@heatnet.se

Peter Anderberg - pa@heatnet.se (+46) 70 56 111 99
UP-COMING EVENTS
Reference Cases

HEAT ACADEMY ONLINE

Getting to Net Zero:
Decarbonizing Heating and Cooling

Session 1A - Thursday May 19th, 10:00 to 11:30 (EDT)
Session 1B - Thursday May 26th, 10:00 to 11:30 (EDT)

Buildings are the major source of greenhouse gas emissions in the Greater Toronto and Hamilton Area. In order to respond to the climate emergency and get net-zero ready, we must decarbonize heating and cooling. Thermal networks, also referred to as district energy systems, will be a critical component in making this possible. You are invited to the first in a series of online master classes offered by Heat Academy. These classes build on the highly successful workshops held by Business Sweden in February 2023. The first master class will address thermal networks - what they are, their benefits, and examples of thermal networks in practice. The session is organized in collaboration with the City of Mississauga, Markham District Energy, and Business Sweden.

The sessions will involve speakers with long practical experience in developing and implementing strategies to decarbonize heating and cooling in North America and in Europe.

Chellina Krijger, Business Sweden
Peter Andenberg, Nordic Heat Academy
Boo Anner, Markham District Energy
Hannah Stanwick, Shenkar College
Fernando Coyle, City of Toronto
Lars Henriksson, Honorary Consul General, Sweden

To register, please send a mail to Peter Andenberg (pa@nordheat.eu)

The sessions are offered free of charge.

The master classes are designed for decision makers and other key professionals currently engaged in developing and implementing strategies to respond to the climate emergency – politicians, business managers, property managers, engineers and suppliers as well as architects, urban planners and consultants – but are open to everyone having an interest in these topics.

HEAT ACADEMY INTERNATIONAL

INVITATION – HEAT ACADEMY ONLINE

Decarbonizing Heating, Now.
Why Heat Networks Work

Friday 19th May, 10:00 to 11:30 (UK time)

Decarbonizing heating is a top priority to reduce CO₂ emissions by 50% by 2050 and to hit net-zero emissions by 2060. Heat networks will be a critical component in making this possible.

District Energy is a key component in strategies of decarbonizing heating and cooling. Ashar Ali will explain how and why property owners and managers will benefit from the discussion & how and when to connect buildings to the grid.

Converting a large asset, public or commercial, from gas solution to heat network is a major step. For many stakeholders it may be attractive in terms of decarbonisation, energy use and financial performance. Before taking a final decision it is critical to thoroughly informed all aspects of a system and how to manage it.

Topics to be addressed:
- How do the heating systems integrate?
- Whole systems, from buildings
- What does it mean to be connected – financial and commercially?
- What are the broader benefits to the community?

The session will consist of presentations and panel discussion, and will involve participants with long experience in heat networks both in and abroad – operators, developers and property managers.

To register, please send a mail to Peter Andenberg (pa@nordheat.eu)

The session is offered free of charge.

The sessions are designed for decision makers, property owners and managers, teams involved in implementing, maintaining and operating heat networks, stakeholders, architects, urban planners and consultants – but are open to everyone having an interest in these topics.
UP-COMING EVENTS
Reference Cases

INVITATION – HEAT ACADEMY ONLINE
Digital Solutions in Heating and Cooling
Make Heat Networks Fly

1974 747 2020

BELGIUM
THE NETHERLANDS
SWITZERLAND
CANADA
UNITED STATES
OPTIONS & STRATEGIES

Crises generates opportunities

Peter Anderberg - pa@nordheat.eu / +46 70 56 111 99