

# BRINGING HEAT UNDERGROUND



NORDIC HEAT ADVISORY SERVICES

2018-02

PROPOSAL

## TECHNICAL PEER REVIEW

OPTIMISING TECHNICAL DESIGN OF LARGE SCALE  
DISTRICT HEATING SYSTEM

HELSINGBORG – 23 APRIL, 2018

NORDIC HEAT INTERNATIONAL AB  
WATERFRONT BUILDING – STOCKHOLM – SWEDEN  
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FROM VISION TO OPERATIONS IN SUSTAINABLE ENERGY



## PROPOSAL

### TECHNICAL CRITICAL FRIEND SESSION

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#### ACTIVITY

**Execute a peer-to-peer critical friend workshop focusing on the preliminary technical design solution produced by the project team within The Heat Alliance.**

#### OBJECTIVE

Second opinion on technical design with the aim of verifying design and technical assumptions and identifying opportunities for improvements

- Potential risks, challenges and opportunities in technical design
- Opportunities to reduce up-front investment through e.g. right-sizing, standardisation, design, optimising procurement costs, etc.
- Opportunities to minimise Life-Cycle Costs
- Minimising heat losses and other operational costs
- Share experiences from 65 Km regional pipe network installed by Öresundskraft to connect 3 cities in the south of Sweden

#### EXECUTION

Session executed in 3 steps

- 1. Preparation** Study technical design ahead of workshop in The Hague. (NDA to be signed)
- 2. Execution** Run workshop with technical team in The Hague
- 3. Report** Summarise conclusions and recommendations from workshop

#### TEAM & RESOURCES

A team of 3 experts from Nordic Heat will be involved in the workshop.

#### LOCATION

Session to be run at offices of The Heat Alliance in The Hague

## TEAM

### PROPOSED TEAM FROM NORDIC HEAT

#### Lars Inge Persson

Senior Advisor

Strategic Director – Öresundskraft AB  
Formerly Divisional Manager –  
Heating Division – Öresundskraft AB



#### BACKGROUND & EXPERIENCE

- Senior Management positions in ÖRESUNDSKRAFT, a large municipality owned W2E/ district energy operator (Turnover 400 M€ / ROCE 12%)
- In charge of recent €250M investment in W2E plant and €100M investment program in regional district energy network
- Key roles in Swedish District Energy Association

#### Jesper Baaring

Senior Advisor

Programme Director – Large Energy  
Investment Projects –  
Öresundskraft AB



#### BACKGROUND & EXPERIENCE

- Project director of €200M Investment in EfW facility (17 MWe och 58 MWvct)
- Project director of €40M investment in regional energy pipe system connecting 3 cities (60MWv, 65 Km length of trench)
- Project director investment in solar park, wind energy installation (200 GWh) and small scale bio-mass energy centers
- Extensive O&M experience in energy sector

#### Peter Anderberg

Senior Advisor & Team Leader

Founder and CEO – Nordic Heat &  
The Smart City Alliance



#### BACKGROUND & EXPERIENCE

- Senior Management in within in ALSTOM district energy and LOGSTOR
- Various Executive Board positions
- Management Consultant – business planning, commercial strategies and project management – particular focus on energy sector
- Entrepreneur having founded a range of companies in the B2B sector

# DISTRICT ENERGY AND ENERGY FROM WASTE

by Öresundskraft



Öresundskraft is one of Sweden's largest energy companies and it is fully owned by the Council of Helsingborg, which represents the fourth largest population area in Sweden. The company focuses on the sale and distribution of energy (electricity, district heating and cooling, natural gas) as well as broadband networks and alternative fuel. The company is also strongly engaged in environmental protection and has been actively working towards the developments of sustainable energy networks.

Since 2013, the company operates two co-generation plants. The first plant, located in Västerhamn, produces electricity and district heating and cooling. It is fueled by biofuel as well as waste heat from local industries which allows further reduction of the environmental footprint. The plant meets a quarter of the total need for heating in the city.

The second, Filborna, converts assorted waste material into energy in the form of electrical power and district heating. This plant is fitted with state-of-the-art technology for cleaning of exhausts. The aim of the company was to ensure for the future a cost-efficient and sustainable production of electrical power and district heating in the region.



Being connected to the District Energy grid in Helsingborg and in neighboring cities, Filborna has proven the enormous commercial and financial opportunities with W2E. The 200 M€ investment offers an energy yield beyond 98%, and an ROI level well above 10% to its municipal owner. An independent auditing company has made a calculation of the total impact of the W2E and District Energy investments made in Helsingborg. The findings indicate that it has resulted in the creation of 1400 jobs in the region, has increased the direct revenues (taxes and dividends) in the city by 25 M€ and has reduced annual CO2 emissions by 130 000 tonnes, i.e. by 1 tonne per inhabitant. The asset value of the ESCO is estimated to min. €500M.

## FAST FACTS

- Main office in Helsingborg
- Owned entirely by the municipality
- Annual turnover SEK2639 M
- 370 employees
- Total energy volume distributed: 3479 GWh
  - Electrical power 2118 GWh
  - District heating 1061 GWh
  - District cooling 11 GWh
  - Gas 289 GWh
- Certified for sustainable operation and quality according to the ISO 14001 and ISO 9001 standards

## ORGANIC GROWTH: STEP-BY-STEP, BY-STEP....



# BACKGROUND

## INTRODUCTION

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**THE HEAT ALLIANCE** – A MULTI-STAKEHOLDER INITIATIVE AIMING TO EXPLORE THE OPPORTUNITIES TO SUPPLY WASTE HEAT FROM THE PORT OF ROTTERDAM TO THE CITIES OF THE HAGUE AND LEIDEN.

- GASUNIE (G) has a strategic objective to diversify into the district energy sector, an area in which its unique competence and experience from the gas transmission would be highly valuable
- THE PORT OF ROTTERDAM (PoR) has defined a strategy to reinforce its competitive position in retaining and developing current activities and attracting new companies and investments in up-coming decades
- Having compatible objectives, G and PoR have launched a joint project – THE HEAT ALLIANCE - with the mission to assess the opportunities to install a large scale district energy transmission pipeline, thereby utilising the significant sources of waste heat from various industrial activities in the port area. Other partners to this alliance are Eneco and Warmtebedrijf Rotterdam.
- The overall aim of The Heat Alliance is to install a long-term commercially viable and technically reliable district heating pipeline connecting the Port of Rotterdam with The Hague, Leiden and other areas in this densely populated region.
- During the past 12 months a joint project team has developed a business plan and technical design detailing strategy, target markets, CAPEX, OPEX and revenue projections, as well as a proposal on how to execute this investment programme.

### CURRENT PRIORITIES

- A preliminary business plan has been developed and presented to the project board.
- The next step is to make a review of the business plan and technical design in order to verify financial model and business case, as well as to identify opportunities to optimise costs, revenues and risks.

**NORDIC HEAT** – A PEER-TO-PEER TRAINING & ADVISORY PLATFORM PROVIDING OPPORTUNITIES TO EXCHANGE OPERATIONAL KNOW-HOW, EXPERIENCES AND INNOVATIONS IN DISTRICT ENERGY AND EFW.

- NORDIC HEAT is an independent peer-to-peer training , advisory, resource pooling and business innovation platform aiming to support the development of District Energy, Energy from Waste (EfW) and Waste Management solutions in Europe and beyond.
- Founded in 2014 by a group of municipality owned energy operators in Sweden, all with more than 50 years of experience in installing and operating profitable district energy schemes in a deregulated energy market.
- The role of Nordic Heat is to assist project teams in securing the swift implementation of high performing, reliable and competitive district energy solutions while minimising investment levels, operational costs and risks. A wider objective is to optimising the commercial, social, environmental and political benefits of investments in sustainable energy.

### PROPOSAL

- Following a study visit to Sweden and various meetings, NORDIC HEAT has been asked to present a proposal involving THE HEAT ALLIANCE into a process involving structured exchange of competencies and experiences with the aim of optimising business planning, design, procurement and installation of large scale district heating systems.
- This document constitutes a draft proposal on how to establish a co-operation with other relevant Nordic Heat partners in the process of reviewing the business plan and design.

# NORDIC HEAT APPROACH

## PROGRAMME MANAGEMENT & PHILOSOPHY

**PROGRAMME MANAGEMENT** – A STRUCTURED AND WELL PROVEN APPROACH FOR IMPLEMENTING DISTRICT ENERGY SYSTEMS

NORDIC HEAT has developed a systematic and well proven strategy for implementing district energy solutions. The approach is based upon experiences and competences gathered during more than a half-century of operations.

The approach consists of 13 separate steps, each involving a series of clearly defined activities. The overall aim is to secure swift implementation of reliable and competitive district energy solutions while minimising investment levels, operational costs and risks.

The Programme Management strategy must secure six core success criteria

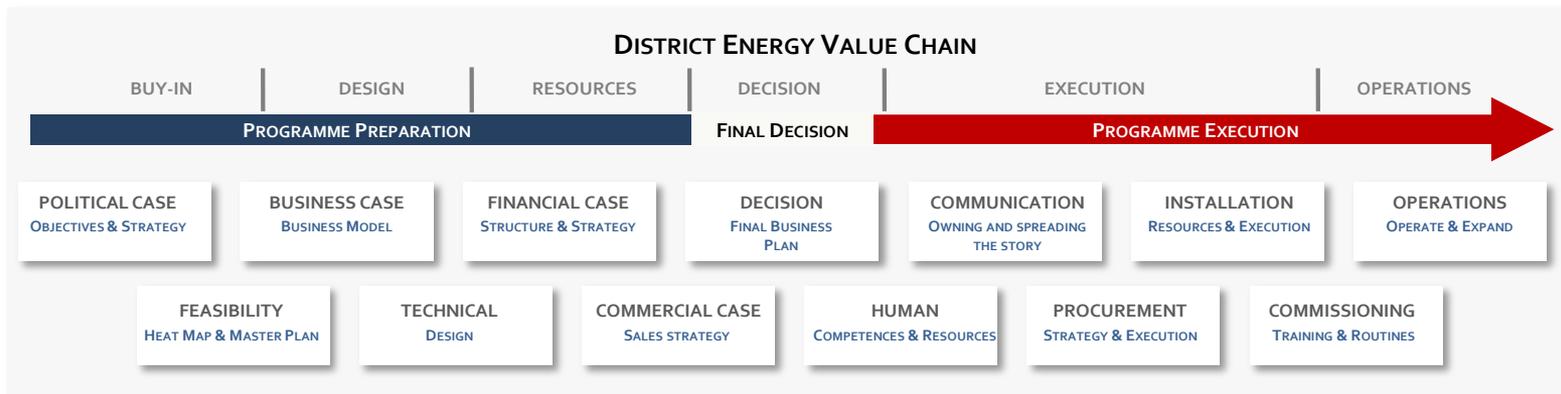
- **Buy-in** – all key stakeholders to share and support vision
- **Design** – specify solutions to optimise benefits vs. risks
- **Resources** – financing, team & partners, know-how
- **Decision** – provide complete set of facts to enable decision
- **Execution** – secure implementation on time and on budget
- **Operations** – commissioning, training, development

**OUR PHILOSOPHY** – A HANDS-ON AND RESULT ORIENTED MIND-SET – HAVE IT DONE NOW – THERE IS NO TIME TO WASTE

NORDIC HEAT has been created by operators, for operators. All with the mission to get things done, swiftly and according to plans and objectives. Visions and ambitions are irrelevant unless they are followed by practical input and real output. This is the attitude we require from all members in our team, as well as our external partners. All in all our network consists of 250 highly experienced and hands-on professionals across 20 countries.

The role of Nordic Heat is to assist project teams in securing the swift implementation of high performing, reliable and competitive district energy solutions while minimising investment levels. We also seek to optimising the commercial, social, environmental and political opportunities and benefits.

Nordic Heat is not a traditional technology and engineering consultancy firm. Our role is rather that of a colleague bringing in experiences and innovations. We sit next to the project team throughout the programme, providing hands-on advice and assistance, and a platform for mutual exchange of experience.



# NORDIC HEAT APPROACH

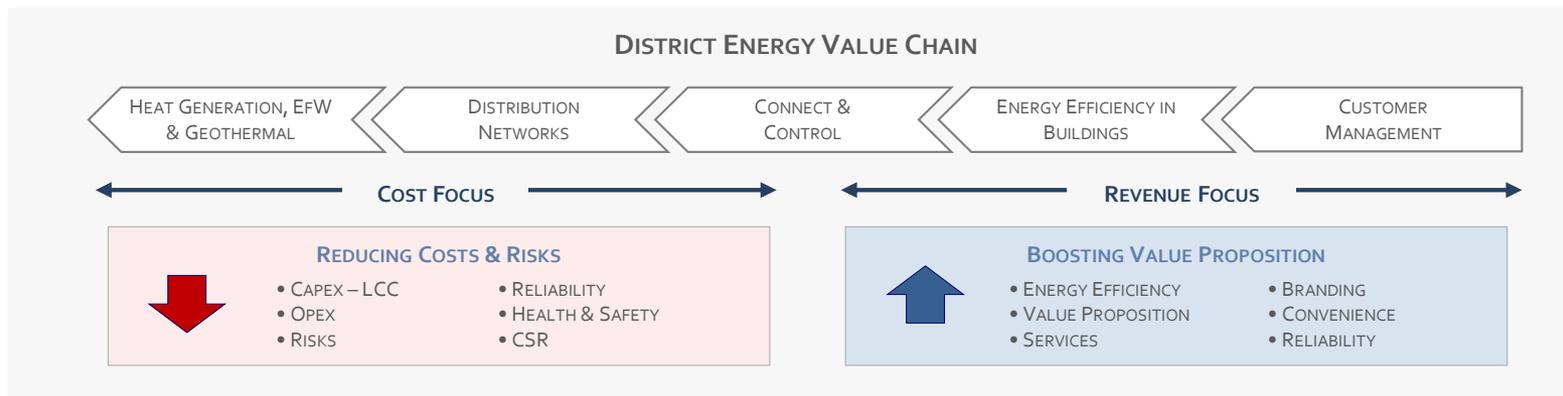
## OBJECTIVE & METHODOLOGY

**OVERALL OBJECTIVE** – SECURING THE SHORT AND LONG-TERM COMPETITIVENESS OF DISTRICT ENERGY SYSTEMS BY MINIMIZING INVESTMENTS AND RISKS, WHILE OPTIMIZING THE VALUE PROPOSITION AND REVENUES.

- Implementing large scale district energy systems is a complex multi-stakeholder endeavour involving significant investments and risks. It may also involve some major temporary disturbances during the installation process.
- A fundamental requirement when being implemented in a non-regulated market, is to secure the ability of district heating to offer a short and long term competitive value proposition vs. alternative heating solutions.
- Individual gas boilers, currently the dominating heating source in Netherlands, currently benefits from very low market prices of gas.
- In order to become a realistic alternative to gas, district heating must at least match, if not undercut, current heating costs, while at the same time providing a stronger overall value proposition.

**METHODOLOGY** – NORDIC HEAT HAS DEVELOPED A STRUCTURED APPROACH AIMING TO SYSTEMATICALLY REVIEW EXISTING FEASIBILITY STUDIES AND BUSINESS PLANS WITH THE AIM OF IDENTIFYING OPPORTUNITIES TO EXPLORE, AND THREATS TO MANAGE.

- The review and exchange process offered by Nordic Heat, follows a structured model which has been applied on multiple cases, and that is regularly up-dated.
- The aim is to break down the value chain into five core blocks, starting from the demand side, and step by step move onwards towards the supply of heat.
- Depending on the focus of the brief, all or specifically targeted blocks are analysed both in terms of costs-risks revenues-opportunity.
- The wide network of energy operators and other key partners involved in the Nordic Heat network ensures access to the most recent bench mark figures, e.g. in terms of cost for procurement, installation and O&M, as well as access to alternative tariff models, design solutions, standards, business models, innovations, etc.



# NORDIC HEAT INTERNATIONAL AB

## PRESENTATION

### MISSION

The role of Nordic Heat is to assist project teams in securing the swift implementation of high performing, reliable and competitive waste management solutions while minimising investment levels, operational costs and risks. In this process we also seek to optimising the commercial, social, environmental and political opportunities and benefits.

Also to actively facilitating efficient exchange of competences, experiences and new innovative technologies and practices, thereby strengthening the overall competitiveness of the sector.

### SERVICES

- **ACADEMY** – Master Classes and Vocational training
- **ADVICE** – peer-to-peer advisory services
- **INNOVATION** – facilitating cooperation to increase scope and pace in technical and commercial innovation
- **POOLING** – pooling of resources and competences in commissioning, operations and maintenance

### REVENUE MODEL

Fees and sponsorships.

Not-for-profit activity, margins to secure further development and growth and long-term sustainability of operations.

### BACKGROUND

NORDIC HEAT is an independent peer-to-peer training , advisory, resource pooling and business innovation service aiming to support the development of District Energy, Energy from Waste (EfW) and Waste Management solutions in Europe and beyond.

Founded in 2014 by a group of municipality owned energy operators in Sweden, all with more than 50 years of experience in installing and operating profitable district energy schemes in a deregulated energy market.

## PEER-TO-PEER TRAINING, ADVISORY & SUPPORT SERVICES

IN DISTRICT ENERGY & ENERGY-FROM-WASTE

|         |               |            |
|---------|---------------|------------|
| ACADEMY | <b>NORDIC</b> | ADVICE     |
| POOLING | <b>HEAT</b>   | INNOVATION |

PEER-TO-PEER • PUBLIC TO PUBLIC • NOT FOR PROFIT

### MARKET PRESENCE

ACTIVE MARKETS 2017



LOCAL COMPANIES

| 2015   | 2018   | 2019  |
|--|--|---|
| <br> | <br><br><br> | <br><br> |

### STRATEGIC PARTNERS

ENERGY OPERATORS



INDUSTRY ORGANISATIONS



PUBLIC INSTITUTIONS



### CONTACT

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