NODA Smart Heating

Intelligent Energy Services

www.noda.se



Market Situation

Almost **50%** of all energy generated in Europe is used for heating or cooling. We need to better manage our use of energy

Within the European Union buildings are responsible for 36% of CO₂



Optimizing energy systems is one of the great challenges of our times

The Energy Efficiency to-do list:

- 1. Focus on thermal energy
- 2. Digitalize the energy sector
- 3. Implement solutions already invented





Why digitalize the energy sector?

- Intelligent energy services generates efficiency and optimization, decrease operational cost and lower the CO₂ emissions.
- Generation, distribution, consumption and storage appliances must communicate to synchronize the energy provision system
- Automated real-time data analysis is a key tool for optimization
- Knowledge and value based services will be part of the offering
- Enables information/ interaction with all value-chain stakeholders
- Invite the consumers, offer new services, and let them be part of the transformation



The energy sector needs to transform, from capacity driven and metering based to need driven and analyze based

NODA – Company facts

- HQ in Karlshamn, Sweden. Offices in Malmö, London and Nürnberg
- Customers in Sweden, Poland, Netherlands, Germany
- Over 1 500 buildings connected and the most prominent energy companies as customers
- A solid background in data science
- Owners: Sixth AP fund, Latour Industries, Sparbankens Näringslivsfond and founders
- Founded in 2005



NODA Smart Heating – Business areas Utilizing the energy reserve for optimization and efficiency

Smart Heat Grid™

Optimizing Heating Systems

Cutting-edge technology for energy companies to design smart district heating grids.

With NODAs data analytics the energy storage in buildings can be utilized in an intelligent manner. A cluster of connected buildings creates a Smart Heat Grid. SHG and SHB can easily be combined

Smart Heat Building™

Energy efficiency in buildings



Powerful system to reduce energy consumption in buildings.

By analyzing and act upon a number of data points we reduce energy consumption and create a better indoor climate.

What does it look like?







NODA Cockpit

NODA Cockpit is a easy-to-use web based service aimed for property owners.

- Indoor temperature for each building
- Energy consumption and savings with NODA technology
- Supply and return temperature
- Etc..

Linckii is an advanced web based system for energy companies and operation staff

- Access to the complete database
- Create own reports
- Combine all kind of data in graphs and tables







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Building on state of the art technical developments and advanced business models

- Control algorithms suited for both existing and new 4th generation DHC networks
- Using market-based multi-agent systems combined with reinforcement learning
- Applying self-learning and self-adaptive control, combining recent developments in model-based multi-agent systems and model-free control ۲
- Creating an add-on to many existing DHC network controllers and SCADA systems

Developing an innovative controller for district heating & cooling (DHC) networks

- Balancing supply and demand in a cluster of heat/cold producers and consumers
- Integrating multiple efficient generation sources (renewable energy sources, waste heat and storage systems)
- Including three control strategies in the controller (peak shaving, market interaction, and cell balancing). Depending on the network, one or more of these strategies can be activated.

Read more: www.storm-dhc.eu



Smart Heat Building

Improved energy efficiency in buildings





References



Our customers are among utilities, building companies and energy service providers.

- E.ON
- Fortum
- Göteborg Energi
- Schäfer
- Mijnwater
- Kalmar Energi
- Riksbyggen
- The Swedish Property Board (SFV)
- University of Warsaw



Networks & Partners

NODA is officially cooperating with a number of leading market actors

- Schneider Electric
- Alfa Laval
- The Swedish Energy Agency
- VITO Energyville
- Business Sweden/ Swedish Trade Council
- Internet of Things and People (Malmö University)
- Arrowhead <u>www.arrowhead.eu</u>
- EU Horizon2020 (4th generation District Energy project) http://storm-dhc.eu/





Contact



NODA Deutschland GmbH

<u>Nürnberg</u>

Flughafenstraße 118 D-90411 Nürnberg

<u>Karlshamn (HQ)</u> Biblioteksgatan 4 SE-37435 Karlshamn

www.noda.se

Mart Kivikas

Managing Director +49 (0)911-37495-65

Mart.Kivikas@noda.se

