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VATTENFALL

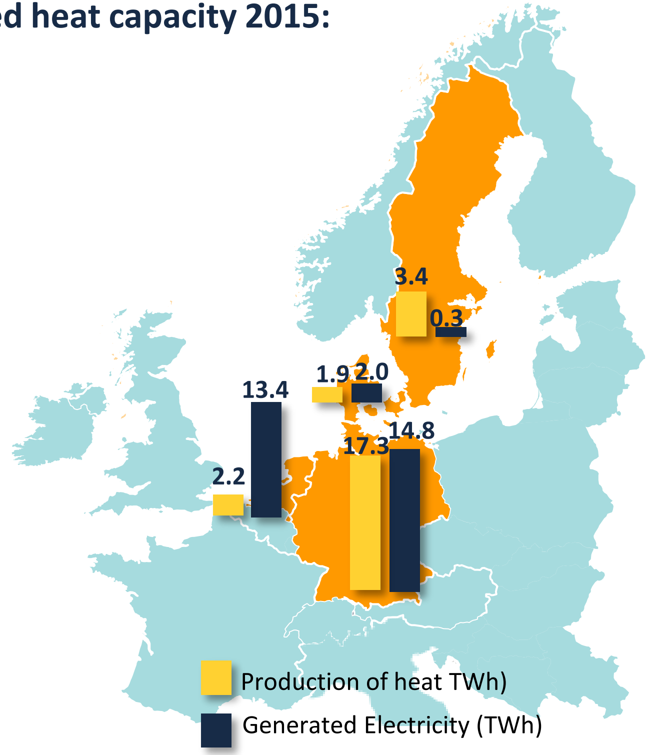
FACTS AND FIGURES – BA HEAT

Business Area Heat, covers Vattenfall's heat operations, including all thermal operations (except lignite), and aims to be the partner of choice for customers and communities

	2015*
External net sales (MSEK)	14,356
EBIT (MSEK)**	-2,555
Underlying EBIT (MSEK)**	1,759
Investments (MSEK)	6,532
Sales of heat (TWh)	22.6
District heating networks (km)	~5,900
Number of employees (FTE)	~4,200

* 2015 figures include Nordjylland combined heat and power plant in Denmark, which has been divested
** The value has been recalculated due to the reclassification of the lignite operations as discontinued operations

Total installed heat capacity 2015: 13,455 MW

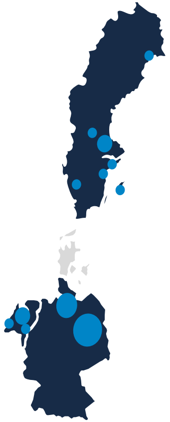


TWO QUITE DIFFERENT BUSINESSES

The heat business offers profitable growth whereas the condensing business is under pressure due to the weak wholesale price development

Heat Business

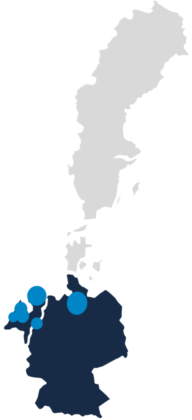
Long term heat customer contracts and positive regulation protect from weak wholesale markets



- DH AA-Diemen
- DH WPW
- DH Rotterdam
- DH Arnhem Nijmegen
- Heat Sweden
- DH Hamburg
- DH Berlin
- Decentral B + HH

Condensing Business

Full exposure towards wholesale markets (except Velsen)



- Epe
- Eemshaven
- Hemweg 8
- Hemweg 9
- Velsen
- Moorburg

HEAT IS AN ATTRACTIVE BUSINESS FOR VATTENFALL

- Europe’s **largest Heat supplier** offering sustainable heat solutions …

- **Serving Europe’s growth powerhouses** (Berlin, Amsterdam, Hamburg, Uppsala, …)

- **Less than 1% p.a. customer churn** of our **>2 m end customer base** …

- **Substantial political support from our partners to grow and expand** our presence

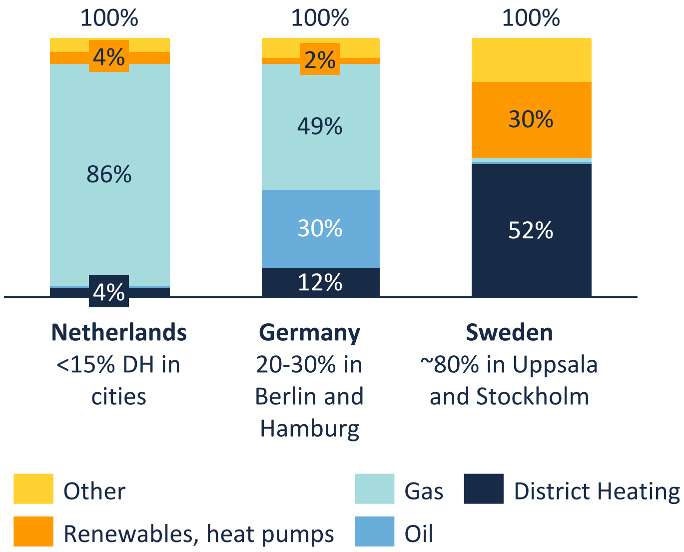
- **9% ROCE** …

- … combined with a sustainability and **CO_2 neutrality** target

PROFITABLE GROWTH POTENTIAL

Building insulation causes decreasing overall heat demand (TWh). District heating is expected to compensate these house-specific losses by connecting new (mostly larger) buildings and increasing sold billing capacity (MW). De-central provides attractive growth as old small oil/gas boilers are replaced.

Residential heat market structure



Sweden – mature DH market

- Good and stable profitability
- Little competition (no gas grid)
- Moderate organic growth potential

Netherlands – young DH market

- Existing regulation represents an obstacle for leveraging large growth potential
- Selected profitable growth opportunities available for waste based DH

Germany – developing DH market

- Favorable support schemes for gas CHP/DH
- Large profitable growth opportunities to displace decentral oil and gas boilers with district heating and decentral solutions

DISTRICT HEATING - AN ATTRACTIVE BUSINESS WITH GOOD POLITICAL SUPPORT

District heating is a stable and attractive business to Vattenfall…

- Fits well into the future energy system, if based on flexible and low emitting heat generation
  - Wanted by political stakeholders in Germany, Netherlands and Sweden
  - Seen as a key technology to reduce CO_2 and achieve climate neutrality
  - Offers high potential to link electricity and heat markets with PtH, heat storages and flexible CHP
- Large customer growth potential, if the right product is in place
- Heat business is situated in growing metropolis (at least partially compensating for isolation)
- Robust against wholesale electricity markets
  - (Semi-) regulated business
  - Long term customer contracts
  - Revenue share from wholesale markets: Heat Sweden <10%, Heat GE <30%, Heat NL ~40%

… with an attractive support scheme in Germany until 2022

- Stimulation of investments towards low carbon, high efficiency and flexibility
- Upcoming CHP law (draft): CHP-subsidies for the first 30.000h of operation if project installed/finished by end of 2022, e.g.:
  - CCGT Lichterfelde: ~270 MEUR total subsidies (78% of Capex)
  - CCGT Marzahn: ~250 MEUR total subsidies (78% of Capex)
  - Several other profitable investment opportunities in Berlin and Hamburg
- Heat grid investments receive up to 40% (max. 20 MEUR/project)
- Heat storage investments receive up to 30% (max. 10 MEUR/project)
- These investments help achieving a district heating product quality (PEF, CO_2) that ensures customer/market success – non compliance will result in a competitive disadvantage

COMMUNITY PARTNER

Business Area Heat provides heat for comfort and shall be a partner of choice for customers and communities

Market and Stakeholders Opportunities & Risks

Good fit of district heating into energy system

- District heating is an attractive technology to regulators – key attribute for business success
- Support schemes for gas CHP, heat storages and grids offer large business opportunities; But: risk that non-compliance will result in (cost) burden

Profitable heat customer growth opportunities

- Attractive existing heat product proposition to customers
- Emerging product/service opportunities (e.g. digitalization)

Poor wholesale electricity market outlook sets condensing portfolio in a weak position

1. Connect with stakeholders and customers
2. Create profitable growth with customers
3. Shape a sustainable portfolio
4. Improve operational & financial performance
5. Develop our team and culture

Internal Challenges

9% ROCE; healthy Cash Flow

- Heat portfolio very well positioned to deliver on financial targets
- Condensing portfolio with challenged profitability

Balance Group Capex reduction targets with:

- Profitable Heat growth opportunities
- Needed system availability for profitable and safe operation

Shape sustainable business:

- environmentally friendly
- accepted by society
- sound financial performance
- Right people, competences and culture

BA HEAT'S LARGEST POWER PLANTS

CHP and heat plants	Country	Type	Installed capacity (MWth)	Installed capacity (MWel)	Fuel
Reuter West (Berlin)	GER	CHP	758	564	Hard coal
Diemen 33+34	NL	CHP	440	689	Gas
Mitte (Berlin)	GER	CHP	670	444	Gas
Lichterfelde[1] (Berlin)	GER	CHP	843	432	Gas
Uppsala	SWE	CHP	856	130	Biomass, waste, peat

1) A new gas-fired CHP plant is under construction, which will replace the older facility. See below ongoing investment project. Thermal capacity includes already new built HOB´s.

Other plants	Country	Type	Installed capacity (MWth)	Installed capacity (MWel)	Fuel
Moorburg (Hamburg)	GER	Electricity	-	1,548	Hard coal
Magnum	NL	Electricity	-	1,311	Gas
Hemweg 8+9	NL	Electricity	-	1,070	Hard coal + gas
Velsen	NL	Electricity	-	978	Gas

Ongoing investment projects	Country	Type	Installed capacity (MWth)	Installed capacity (MWel)	Fuel
Lichterfelde (Berlin), under constr.	GER	CHP	222	300	Gas