Fossil-free living within one generation

Sustainability presentation, London

17 May 2019
## Content

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Strategy and Sustainability</td>
<td>8</td>
</tr>
<tr>
<td>Materiality</td>
<td>18</td>
</tr>
<tr>
<td>Footprint</td>
<td>24</td>
</tr>
<tr>
<td>Examples</td>
<td>32</td>
</tr>
</tbody>
</table>
Introduction
This is Vattenfall

Basic facts

- One of Europe’s largest producers of electricity and heat
- 100% owned by the Swedish state
- Main products: electricity, heat, gas and energy services
- Main markets: Sweden, Germany, Netherlands, Denmark and the UK
- About 20,000 employees

Key data

<table>
<thead>
<tr>
<th>SEK bn</th>
<th>FY 2018</th>
<th>FY 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>156.8</td>
<td>135.1</td>
</tr>
<tr>
<td>Underlying operating profit&lt;sup&gt;1&lt;/sup&gt;</td>
<td>19.9</td>
<td>23.2</td>
</tr>
<tr>
<td>Operating profit (EBIT)</td>
<td>17.6</td>
<td>18.5</td>
</tr>
<tr>
<td>Profit for the period</td>
<td>12.0</td>
<td>9.5</td>
</tr>
<tr>
<td>Return on capital employed, %</td>
<td>7.0</td>
<td>7.7</td>
</tr>
<tr>
<td>Return on capital employed excl. items affecting comp., %</td>
<td>7.9</td>
<td>9.6</td>
</tr>
<tr>
<td>Funds from operations/adjusted net debt, %</td>
<td>20.7</td>
<td>21.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TWh</th>
<th>FY 2018</th>
<th>FY 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity generation</td>
<td>130.3</td>
<td>127.3</td>
</tr>
<tr>
<td>Customer sales, electricity</td>
<td>119.2</td>
<td>109.8</td>
</tr>
<tr>
<td>Customer sales, heat</td>
<td>18.3</td>
<td>18.8</td>
</tr>
<tr>
<td>Customer sales, gas</td>
<td>57.2</td>
<td>56.4</td>
</tr>
</tbody>
</table>

1. Operating profit excluding items affecting comparability
2. Operations to be sold to the City of Hamburg. Closing of the transaction is expected in 2019.

Location of our operations and major plants

Wind, Biomass, Hydro, Coal, Solar, Gas, District heating, Country head office, Largest facilities are marked with a circle
The electricity distribution operations are regulated by the Swedish Electricity Act (Ellagen) and the German Energy Industry Act (Energiewirtschaftsgesetz), and are unbundled from Vattenfall's other operations.

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1 The electricity distribution operations are regulated by the Swedish Electricity Act (Ellagen) and the German Energy Industry Act (Energiewirtschaftsgesetz), and are unbundled from Vattenfall’s other operations.
Vattenfall’s value chain

**Production**
- Production from
  - Hydro
  - Nuclear
  - Coal
  - Natural gas
  - Wind
  - Solar
  - Biomass
  - Waste
- Actively phasing out fossil-based production

**Electricity distribution**
- Guarantees secure supply via well-functioning distribution networks and smart network solutions
- Enables customers to feed self-generated electricity into the grid ("prosumers")

**Sales of electricity, heat and gas**
- Sells electricity, heat and gas to consumers and business customers
- Focuses on various price and service models, and gives customers the opportunity to reduce their environmental impact

**District heating**
- Drives the transformation towards fossil-free heating and cooling solutions together with cities and regions
- One of Europe’s largest producers and distributors of district heating

**Energy services & decentralised generation**
- Offers energy services
  - Heat pumps
  - Solar panels
  - Charging solutions for electric vehicles
  - Battery storage
  - Network services
  - Smart meters
- Provides marketplaces and access to marketplaces where customers can buy and sell electricity
Customer centricity and sustainability are key to attracting customers, talent and investors.

Further electrification is a key enabler for reduced CO₂ emissions.

The future energy system will consist of both central and decentralised energy solutions.

The complete energy value chain will be digitalised.

New competencies, speed in learning and diverse and inclusive teams are critical in the energy transition.

Cost efficiency is a prerequisite for value creation and growth in an increasingly competitive market.
Strategy and Sustainability
Sustainability is the key driver for Vattenfall’s strategic direction

- Increase customer centricity
- Build a sizable position in decentralised energy
- Promote electrification and a climate smart society

- Be an attractive employer
- Developing an engaging and inclusive company culture
- Secure necessary competence (recruitment and continuous learning)

- Grids and market access are links and enablers

- Leading producer of renewable energy
  - Fossil-free within one generation

- First quartile in cost efficiency
  - Digital utility
  - Sustainable value chain

To be balanced
For us sustainability means taking responsibility for coming generations

The **Ownership Policy** defines sustainability:

“a development that meets the needs of today without jeopardising future generations’ ability to meet their needs”

**Vattenfall Sustainability Policy**: 

“For Vattenfall, sustainability means taking responsibility for coming generations by contributing to sustainable development: economically, environmentally and socially.”

*) 2018 version  Part of Vattenfall Management System
## Outcome of our strategic targets for 2018

<table>
<thead>
<tr>
<th>Strategic targets to 2020</th>
<th>FY 2018</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer engagement, Net Promoter Score relative</td>
<td>+1</td>
<td>Continued improvement at lower pace</td>
</tr>
<tr>
<td>(relative customer satisfaction): +2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commissioned new renewables capacity</td>
<td>752 MW</td>
<td>Commissioning of Aberdeen Bay (97 MW), Horns Rev 3 (407 MW) delayed</td>
</tr>
<tr>
<td>2016-2020: ≥2,300 MW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absolute CO$_2$ emissions, pro rata: ≤21 Mtonnes</td>
<td>22.0 MT</td>
<td>Lower CO$_2$ emissions</td>
</tr>
<tr>
<td>Return On Capital Employed (ROCE): ≥8%</td>
<td>7.0%</td>
<td>Lower operating profit</td>
</tr>
<tr>
<td>Lost Time Injury Frequency (LTIF): ≤1.25</td>
<td>1.9</td>
<td>Tragic fatalities in 2018, increased focus needed</td>
</tr>
<tr>
<td>Employee Engagement Index: ≥70%</td>
<td>64%</td>
<td>Stable development, improvement needed</td>
</tr>
</tbody>
</table>
Vattenfall has identified six SDGs that are most relevant for us

Vattenfall’s activities contribute to the UN’s Global Sustainable Development Goals, and we understand that businesses and industries will play a decisive role in the extent to which the SDGs are achieved. Though we impact all goals either directly or indirectly through our supply chain, we have identified the six SDGs that are most relevant for Vattenfall and where we can have the greatest global impact.

<table>
<thead>
<tr>
<th>SDG</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Affordable and Clean Energy</td>
</tr>
<tr>
<td>9</td>
<td>Industry, Innovation and Infrastructure</td>
</tr>
<tr>
<td>11</td>
<td>Sustainable Cities and Communities</td>
</tr>
<tr>
<td>12</td>
<td>Responsible Consumption and Production</td>
</tr>
<tr>
<td>13</td>
<td>Climate Action</td>
</tr>
<tr>
<td>17</td>
<td>Partnerships for the Goals</td>
</tr>
</tbody>
</table>

- Partner to keep welfare recipients from having their electricity or heat service disconnected
- Invest to improve grid stability and reliability while keeping costs down and enabling integration of renewable energy sources
- Invest in technologies and solutions to phase out fossil fuels from heating systems and replace fuel in our plants to reduce CO₂
- Enable customers to participate in the energy transition via decentralised solutions like solar power, heat pumps, and microgrids
- Enable cities to reduce their environmental impacts by expanding our district heating networks, developing fossil-free decentralised energy solutions, and expanding our e-mobility initiatives
- Facilitate further integration of renewable energy in electricity and heating networks through our investments in grids and infrastructure
- Create opportunities for partners and consumers to electrify processes using fossil-free electricity and thereby reduce their own emissions.
- Strengthen guidelines for responsible purchasing and human rights policies in our supply chain via our Code of Conduct for Suppliers
- Strive to achieve best-in-class efficiency in all our operations, maximising production while minimising fuel consumption and waste
- Our Environmental Product Declarations and Life Cycle Assessments enable customers to make smart choices.
- Commit to enable a fossil-free life within one generation
- Collaborate with the cities in which we operate to use our industry knowledge and co-develop ambitious yet feasible city-specific climate neutrality roadmaps.
- Form partnerships with energy-intensive industries like cement, refineries, and steel manufacturing to reduce CO₂ emissions
- Construction started on HYBRIT’s pilot plant for manufacturing fossil-free steel in Luleå, Sweden
Vattenfall tackle CO₂ emissions throughout the value chain. We start at home.

- **CO₂ - Suppliers**
  - ~ 5 Mt
  - Transparency on climate footprint (EPD, CDP)
  - Collaboration for requirements on fossil transport

- **CO₂ - Own business**
  - ~ 22 Mt
  - All Business Areas & Staff Functions identify how to contribute to Fossil free within one generation
  - CO₂ roadmap in BA Heat
  - Storage (BMW, Northvolt, power-to-heat)
  - Travels (EV100, EV policy, climate compensate)

- **CO₂ - Customers**
  - ~ 14 Mt
  - Products and services with clear climate footprint (EnvProdDeclaration / LCA, Decentralized solutions incl. solar)
  - Electrification of industries (Hybrit, Boliden, Preem, Cementa)
  - Electrification of transports (InCharge, eRoads, G2V, Volvo)
  - Climate targets together with cities

Vattenfall tackle CO₂ emissions throughout the value chain. We start at home.
Our goal is to ensure social responsibility and sustainability throughout the supply chain

A sustainable supply chain is a competitive advantage

Reducing risk

Reducing cost

Improving reputation

Increased credibility leads to more business opportunities

- Commitment to fossil-free living
- Partnering to decarbonize industry
- Partnering for sustainable supply e.g. WindEurope & Bettercoal
- Increased dialogue with stakeholders e.g. NGO

Internal and external actions and continued focus needed

- Increase internal awareness and buy-in
- Conduct enhanced due diligence on targeted, high-risk suppliers
- Establish process for progress and assessment reporting, measurement and follow up
We put our efforts where we contribute most

Greenhouse gas emissions
Sweden (2017)
53 MtCO$_2$e

64% of the total emissions

Industry
- Iron & Steel
- Cement
- Refineries
- Other

Transports
- Cars
- Heavy trucks
- Other road transports
- Air, railroad, shipping

Other electricity / district heating
- 4

Farming
- 7

Other
- 7

Industry
- 17

Transports
- 17

We put our efforts where we contribute most
Vattenfall is an attractive partner in the energy transition

Examples of partnerships

- Research project for a carbon dioxide-free steel industry
- Cooperation in large scale bio-diesel production
- Study on electrified cement production
- Attract industries to Sweden
- Electrification of mines and smelters
- Support of battery production in northern Sweden
- Northern Europe’s largest charging network for e-vehicles
- Storage projects at a number of wind parks
- Market place for energy sharing

Vattenfall is an attractive partner in the energy transition.
Our value creation increased from SEK 25.4 billion in 2017 to SEK 26.3 billion in 2018*
Materiality
Increased creditability - stakeholders say that Vattenfall is at average or better

Stakeholders from Vattenfall’s markets* has rated the most material** topics***

- Reduce CO₂ and fossil fuel dependency
- Provide affordable energy
- Increase renewable production capacity
- Protect nature and species
- Develop sustainable energy services and solutions
- Minimize non CO₂ emissions
- Safely dispose of nuclear waste
- Provide affordable and stable grid infrastructure

In top 4 of importance for all core markets

Performance is ‘average’ or ‘good’

2018 Materiality Analysis:
>2300 external surveys, ~350 employee surveys, ~40 internal & external interviews

* Denmark, Finland, Germany, Netherlands, Sweden, UK
** A material topic is a topic that reflects a reporting organization’s significant economic, environmental and social impacts; or that substantively influences the assessments and decisions of stakeholders
*** based on importance to stakeholders and significance of impact on the environment, society, or economy
Stakeholders’ expectations

Materiality Matrix
2018 Materiality analysis

Vattenfall’s four strategic objectives
- Leading towards Sustainable Production
- Leading towards Sustainable Consumption
- High Performing Operations
- Empowered and Engaged People

1. Reducing CO2 and fossil dependency
2. Providing affordable energy
3. Increasing renewables
4. Protecting nature and species (biodiversity)
5. Developing new, sustainable heat & electricity services and solutions (incl. digitally)
6. Minimising non-CO2 emissions into air, water and land
7. Safe disposal of nuclear waste
8. Providing affordable and stable grid infrastructure
9. Developing decentral solutions (heat pumps, solar installations, battery storage)
10. Responsible procurement and sourcing of fuels (respecting human rights in the value chain)
11. Providing smart and flexible grid infrastructure for future needs
12. Ensuring efficiency in own operations, including energy/fuel and water use
13. Openness and transparency
14. Ensuring decent work and working conditions, including fair pay and working hours
15. Fair and ethical business practices, including anti-corruption and bribery
16. Ensuring sustainable life-cycle of operations
17. Ensuring occupational safety, health and well-being
18. Sustainability in restructuring, investment decisions
19. Efficient waste management
20. Competence development and retention
21. Employee engagement
22. Promoting diversity and gender equality, including to special groups such as disabled, youth, and immigrant
23. Developing solutions in the field of E-mobility
24. Engaging with local communities (i.e., through dialogue)
25. Supporting good causes, including local sponsorships
26. Transparent tax management

Significance of impact on society, environment, or economy
High

Importance to stakeholders

Materiality Matrix
2018 Materiality analysis

Significance of impact on society, environment, or economy
High

Importance to stakeholders
Top materiality topics order differ in our core countries

<table>
<thead>
<tr>
<th>Topic</th>
<th>Sweden</th>
<th>Germany</th>
<th>Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing CO₂ and fossil dependency</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Providing affordable energy</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Protecting nature and species (biodiversity)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increasing renewables</td>
<td></td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: Responses from Denmark/Finland/UK have been incorporated in group statistics, but are not significant at local level due to limited responses.
Different stakeholders in Sweden stress different materiality topics

<table>
<thead>
<tr>
<th>Topic</th>
<th>BtC</th>
<th>BtB</th>
<th>Employees</th>
<th>General public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing affordable energy</td>
<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Reduce CO2 and fossil dependency</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Protecting nature and species</td>
<td>3</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Fair and ethical business practices*</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competence development and retention</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Ensuring decent work and working conditions</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Responsible sourcing and purchasing*</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Note: Displayed stakeholder groups are those with the highest number of respondents and at aggregate level across all markets. Ranking across stakeholder groups can vary at country level. See ‘analysis per core country’.

* Increasing importance
Vattenfall is ranked high externally - 2018 examples

- EcoVadis: "Gold rating"
- Sustainalytics: "Leader"
- FAR (Swe): "Bästa redovisning av hållbarhet 2017" (Best Sustainability report)
- SBI, B2B (Swe): "Branchbäst inom Energi" (Champion in Energy Industry)
- VVCM (NL): Credit Management of the year
- CDP: Rating A- (leadership level)
- CSR Europe: Ranked as most mature company
Footprint
Our CO$_2$ exposure is dropping and installed renewable capacity is increasing

- **Absolute CO$_2$ emissions, pro rata corresponding to Vattenfall’s share of ownership, including the lignite operations for 2014-2016**
- **Renewable capacity from wind and solar power**
Our CO₂ emissions will continue to drop

Million tons, 1990-2050 (forecast)

A - Deregulation of Europe’s energy markets begins.
B - Vattenfall grows internationally. Acquisitions in Europe including our German Lignite business.
C - Ongoing transition to enable fossil free living within one generation.
Nitrogen oxides (NOx)  Sulphur dioxide (SO$_2$)  Particulate matter (PM)  Hazardous waste are dropping
Vattenfall’s fuel consumption is shifting

- **TWh**
  - 2014: 16 Gas, 35 Hard coal, 32 Lignite, 154 Other
  - 2018: 7 Gas, 41 Hard coal, 39 Lignite, 7 Other
We are climbing in all CSR ratings e.g. MSCI
In CSR Europe’s 2019 assessment Vattenfall came out as the most mature company

*) Best in Class calculated without Vattenfall data
Our milestones towards fossil-free living within one generation

- **2019**: Entirely coal-free operations in the Netherlands.
- **2020**: Fossil-free energy solutions available for all our customers.
- **2023**: More renewable generation enabled by 600 MW of additional flexible hydro capacity.
- **2025**: We generate fossil-free energy to power more than 30 million homes. We pilot 100 MW of green hydrogen gas production from fossil-free electricity.
- **2030**: Coal is phased out from all our heat production. Fossil-free Nordic electricity generation.
- **2035**: More milestones under development…

Entirely coal-free operations in the Netherlands.

Fossil-free energy solutions available for all our customers.

More renewable generation enabled by 600 MW of additional flexible hydro capacity.

We generate fossil-free energy to power more than 30 million homes. We pilot 100 MW of green hydrogen gas production from fossil-free electricity.

Coal is phased out from all our heat production. Fossil-free Nordic electricity generation.

More milestones under development…
Examples
Sustainability at Vattenfall - Environmental examples

- Managing a **scientific research program** to understand the environmental impacts of offshore wind in the Aberdeen Bay (Scotland)

- Tracking **golden eagles** using GPS to improve impact assessment and siting of wind farms

- Industry project DEPONS and GESCHA study looking at impacts on **porpoise** connected to offshore windfarms

- Voluntary **preservation areas** in Vuollerim and in Älvkarleby

- Access granted to city substations in Berlin to **beekeepers**

- **Vattenkraftens Miljöfond** to meet strengthened environmental demands - 8 Swedish hydro power companies fund raising with 10BSEK over 20 year

- In river Elbe ~300,000 fish per year move up the **fish ladder** built by Vattenfall

- **Test facility** for studying the behaviour of fish in running water and around power plants at the Vattenfall R&D Centre

- "**Eels on wheel**" – lorry transportation of eels to avoid turbines

- **Frog hotel** and ponds built in Forsmark for the pool frog (on the national endangered species list)
Sustainability at Vattenfall - Social examples

- On-site enhanced **due diligence** to identify possible human rights risks in coal procurement in Colombia

- A **Human Rights Action plan** developed – 11 steps to 2022

- **Health & Safety** e-learnings, trainings, monthly dialogues

- Launch of **Nuon Verlicht**, a service that allows consumers who are under judicial control to purchase electricity and gas at a competitive rate without a deposit

- **Diversity** aspects translated in the “recruiters handbook” for job ads and interview guidelines

- Our goal is to have the same **gender balance** in management positions as in the company as a whole

- Participation in the “**100 club**” – offering work practice to people not yet fully established in their new country

- Passing on **used computers, left over furniture’s etc** to charity organisations
Sustainability at Vattenfall - Governance examples

• The **6 Group strategic targets** are sustainability targets

• The overarching Sustainability Policy and complementary **policies** e.g. Human rights, Environmental, Code of Conduct for Suppliers are adopted by the Board of Directors and revised every other year

• **Code of Conduct and Integrity** re-written with mandatory training on-going

• **Diversity** aspects translated in the “recruiters handbook” for job ads and interview guidelines

• Establishment of a **procurement roadmap** to align due diligence requirements and increase transparency around sourcing

• All suppliers in High Risk Countries undergo a **CSR audit**

• **Signatory** of a number of initiatives like UN Global Compact, New Deal for Europe, etc

• **Partnering up** for sustainable supply e.g. WindEurope, Bettercoal, Sustainable Biomass Program, with joint requirements or Code of Conduct