

An aerial photograph of a city at sunset. A large yellow crane is visible on the left side, silhouetted against the bright sun. The city features a mix of modern and older buildings, a river with a bridge, and a road with traffic. The sky is filled with soft, grey clouds.

# Vattenfall H1 and Q2 Results 2019

19 July 2019

Magnus Hall, CEO

Anna Borg, CFO



VATTENFALL

# Vattenfall H1 Results 2019

## Opening remarks

- A balanced portfolio stabilised the result for the first half-year
- Underlying EBIT increased slightly by 0.2 SEK bn to 13.3 SEK bn - higher electricity prices benefited nuclear and hydro but were offset by costs for the storm “Alfrida” and a weak contribution from sales
- Profit for the period increased by 0.5 SEK bn to 7.7 SEK bn - mainly due to lower one-off items related to fair value of energy derivatives
- Ringhals 2 back in full operation after replacing a generator
- Construction start for the offshore wind farm Kriegers Flak (605 MW) in Denmark
- Continued repair work and disruption compensation to grid customers following the storm “Alfrida”
- The allowed return for Swedish distribution significantly reduced from 5.85% to 2.16%
- Launch of smart charging solutions for electric vehicles in Amsterdam
- Strong demand when issuing Vattenfall’s first green bond

Post Q2

- Winning bid for the offshore wind farm Hollandse Kust Zuid 3&4 in the Netherlands (~750MW)
- E.ON’s subsidiary PreussenElektra purchased 10 TWh of production rights from Krümmel



# Vattenfall H1 Results 2019

## Overview

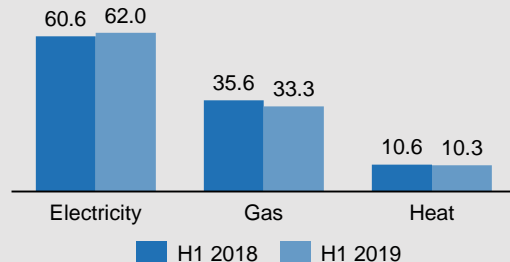
### Result development

SEK bn	H1 2019	H1 2018	Δ
Net Sales	84.2	75.0	+12%
EBITDA	20.1	17.8	+13%
Underlying operating profit (EBIT)	13.3	13.1	+1%
EBIT	11.0	9.8	+13%
Profit for the period	7.7	7.1	+8%

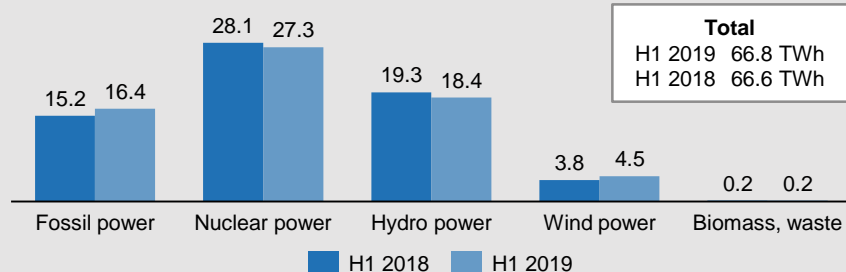
### Financial targets

	H1 2019	H1 2018
Return on capital employed <sup>1</sup> (≥8%)	7.1	7.1
FFO/adjusted net debt <sup>1</sup> (22-27%)	19.2	19.4

### Customer sales (TWh)



### Electricity production (TWh)



<sup>1</sup> Last 12-month values

# Customers & Solutions

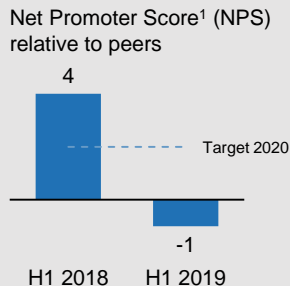
Increased customer base in Germany counterbalanced by higher purchasing costs for electricity and growth activities

## Highlights

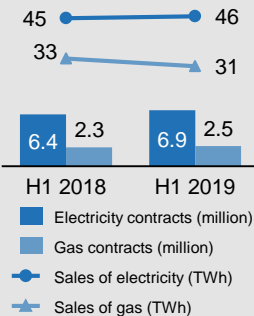
SEK million	H1 2019	H1 2018
Net Sales	46,088	41,644
Underlying operating profit	507	1,213

- Increase in net sales supported by positive price effects. An increased customer base in Germany also contributed positively
- Decrease in underlying operating profit mainly due to growth activities, lower gas consumption (warmer weather) and higher purchasing costs for electricity. The latter will be compensated for by price increases
- Customer base up 4.8% YTD, mainly due to growth in Germany and the acquisition of Delta Energie
- Relative NPS decline caused by the storm Alfrida in the Nordics and price measures carried out in the Netherlands, absolute NPS stayed overall positive
- Launch of intelligent public charging network together with the city of Amsterdam

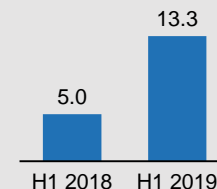
## Key data



## Retail sales development



## Charging points for electric vehicles (thousand)



<sup>1</sup> The target is a positive NPS in absolute terms and +2 compared to Vattenfall's peer competitors to be achieved by 2020.

# Power Generation

Higher prices in the first quarter and a strong trading result contributed positively

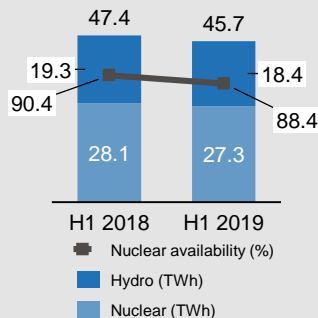
## Highlights

SEK million	H1 2019	H1 2018
Net Sales	53,096	45,551
Underlying operating profit	8,419	6,487

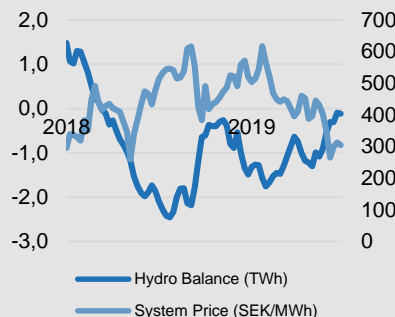
- Net sales increased due to higher electricity prices, positive effect from hedges, internal sales of emission allowances as well as positive currency effects
- Underlying operating profit increased mainly due to higher electricity prices in the first quarter and a strong trading result. Hedging activities limited the impact from lower electricity prices in the second quarter
- Lower production partially due to Ringhals 2 operating at half capacity until the end of April
- Long-term power purchase agreement with Dutch wind farm
- Sale of 10 TWh nuclear production rights to E.ON's subsidiary PreussenElektra in Germany

## Key data

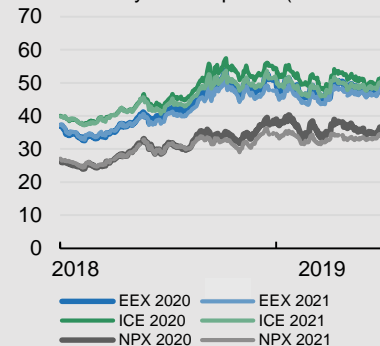
Production and availability



Nordic hydro balance and system price



Electricity futures prices (EUR/MWh)



# Wind

## Positive contribution from newly commissioned wind capacity

### Highlights

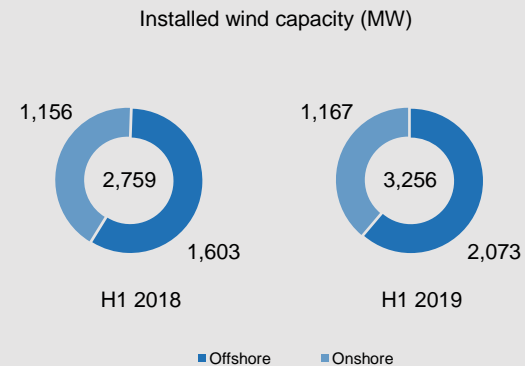
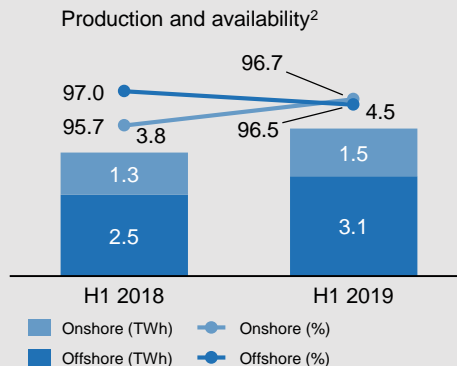
SEK million	H1 2019	H1 2018
Net Sales	6,418	5,569
Underlying operating profit	1,851	1,638

- Net sales and underlying operating profit increased as a result of additional capacity<sup>1</sup>
- Construction of the Kriegers Flak offshore wind farm (605 MW) in Denmark started in May
- Investment decision taken on installation of solar power (38 MW) and battery storage (12 MW) at the Haringvliet onshore wind farm that is presently under construction
- Cooperation with GE to further develop a 12 MW turbine
- Decision to deploy 76 Siemens Gamesa 10 MW turbines in the wind farm Hollandse Kust Zuid 1&2
- Winning bid for Hollandse Kust Zuid 3 and 4 (post quarter end)

<sup>1</sup> Latest capacity additions include Aberdeen Bay (97 MW), Slufterdam (29 MW) and Horns Rev 3 (373 MW of a total of 407 MW).

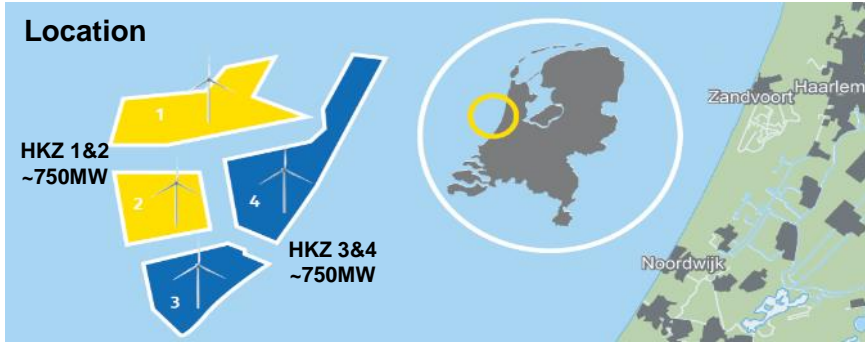
<sup>2</sup> Change of definition to revenue based availability in 2019. Preliminary availability numbers for H1 2019

### Key data



# Vattenfall wins Hollandse Kust Zuid 3 & 4

A combined capacity with HKZ 1 & 2 of 1.5 GW - the largest offshore wind farm in the world, subsidy-free



## Key details on tender

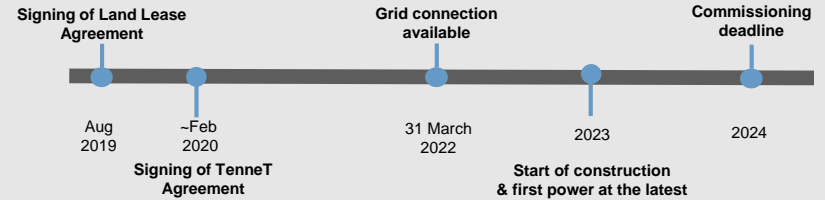
### Selection criteria with highest weighting

- Quality of overview of risks (market, design/construction, operational)
- Quality of mitigating measures

### Applied selection criteria by RVO.nl

- Knowledge and experience
- Quality of the wind farm design
- Capacity of the wind farm
- Social costs

## Timeline<sup>1</sup>



## Key data

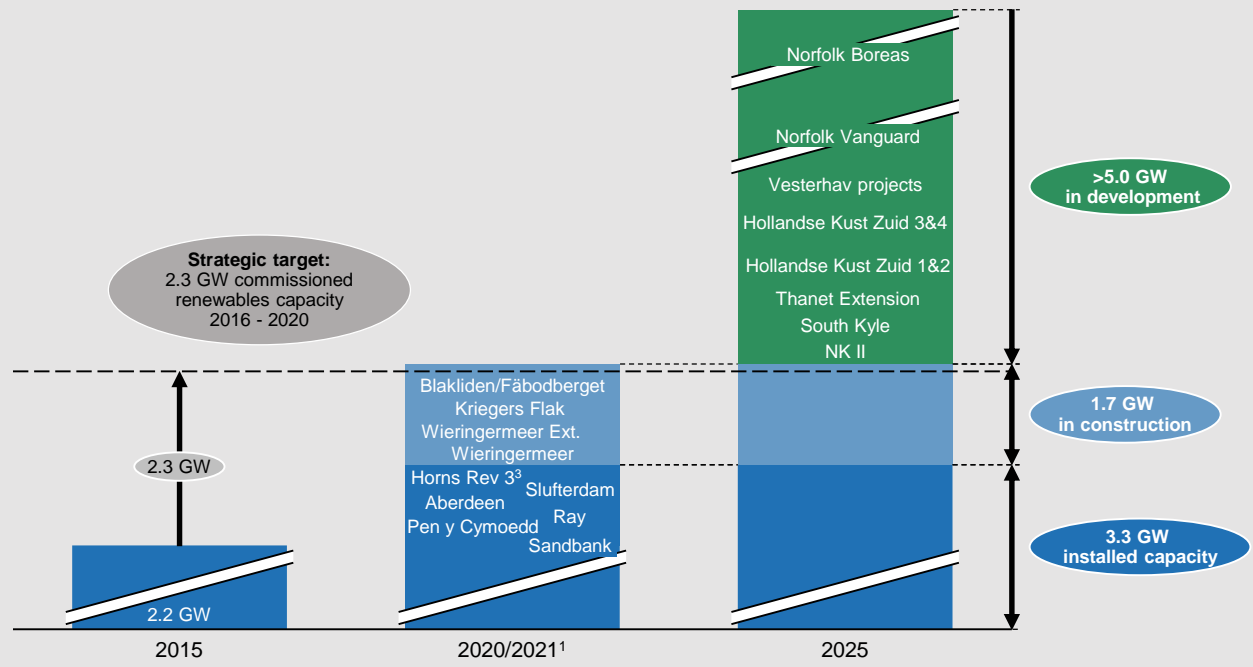
Capacity	740 – 760 MW
Grid connection	Provided by TenneT
Distance from shore	18.5km
Water depth	15-25m
Foundations	Monopiles supplied by Sif
Turbine model	Siemens Gamesa 10MW
Ownership	100% Vattenfall

<sup>1</sup> Assuming irrevocable permit Sept 1st

# A leading role in shaping the renewables industry

Vattenfall is well positioned for continued development of wind, solar and batteries

## Installed capacity, projects in construction and in development (GW)



## In offshore wind, we leverage on our position across the value chain



**Access to projects**  
Financial & technological ability and credibility



**Access to suppliers**  
Latest technology & joint cost-out



**Synergies in operation**  
Geographical & platform cluster



**Maturing organisation**  
Experience and expertise as competitive advantage in a young industry

1) Danish Kriegers Flak expected commissioning 2021  
 2) Blakliden + Fäbodberget expected commissioning 2021/2022  
 3) Horns Rev 3 partly commissioned (373 MW of a total of 407 MW)  
 4) Commissioning expected in 2025-2027



# Heat

## Strong collaboration with local partners

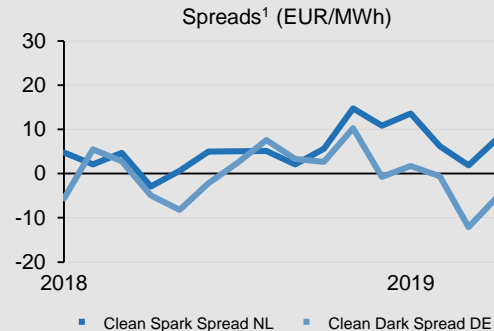
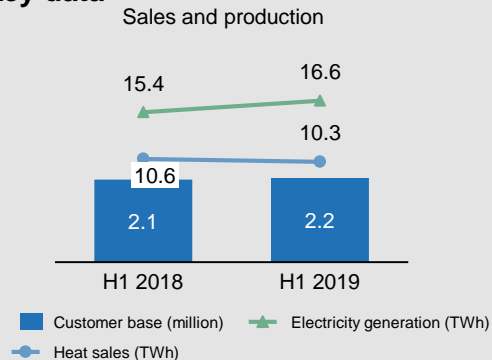
### Highlights

SEK million	H1 2019	H1 2018
Net Sales	17,566	16,124
Underlying operating profit	1,087	1,025

- Net sales increased mainly as a result of higher electricity production driven by higher spreads (margins) and availability for gas fired generation
- Underlying operating profit slightly higher as a result of increased sales partly offset by higher operating expenses due to higher prices on emission allowances and growth activities within Energy Solutions
- Preferred bidder status obtained in district heating project in London
- New district heating/cooling energy agreement in Fyrislund, Sweden with Klövern, ThermoFisher, Fresenius Kabi and Johnson & Johnson
- Partnering with SaltX for storing renewable power in salt with a pilot plant at Reuter in Berlin

<sup>1</sup> CSS NL with 50% efficiency, CDS DE with 38% efficiency

### Key data



# Distribution

Allowed returns in Sweden to be significantly lowered 2020-2023. Vattenfall sees a major challenge to meet customers' expectation of a robust electricity infrastructure in support for electrification.

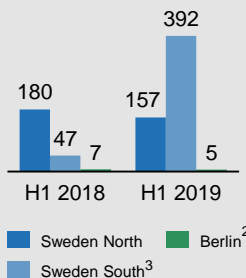
## Highlights

SEK million	H1 2019	H1 2018
Net Sales	11,546	11,421
Underlying operating profit	2,264	3,434

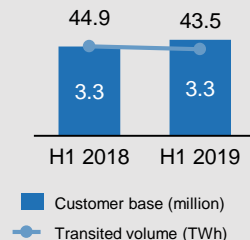
- Net sales increased, mainly due to lower distributed volume in Sweden being compensated by a higher contribution from Germany.
- Underlying operating profit decreased as a result of costs for the storm "Alfrida"
- Outage compensation payment is ongoing and the investment in the region will increase from planned SEK 250 mn to SEK 300 mn
- The Energy Markets Inspectorate has begun making decisions on the revenue frames for 2020-2023 where the allowed WACC has been set at 2.16%
- Collaboration with Microsoft to connect a sustainable data centre in Sweden
- Stromnetz Berlin has appealed the concession award decision

## Key data

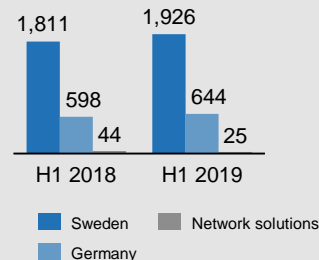
Service level (SAIDI, min)<sup>1</sup>



Customers and volumes



Investments (SEK mn)



<sup>1</sup> City network in Berlin results in lower SAIDI. Vattenfall's Swedish network covers both urban areas and large rural areas.

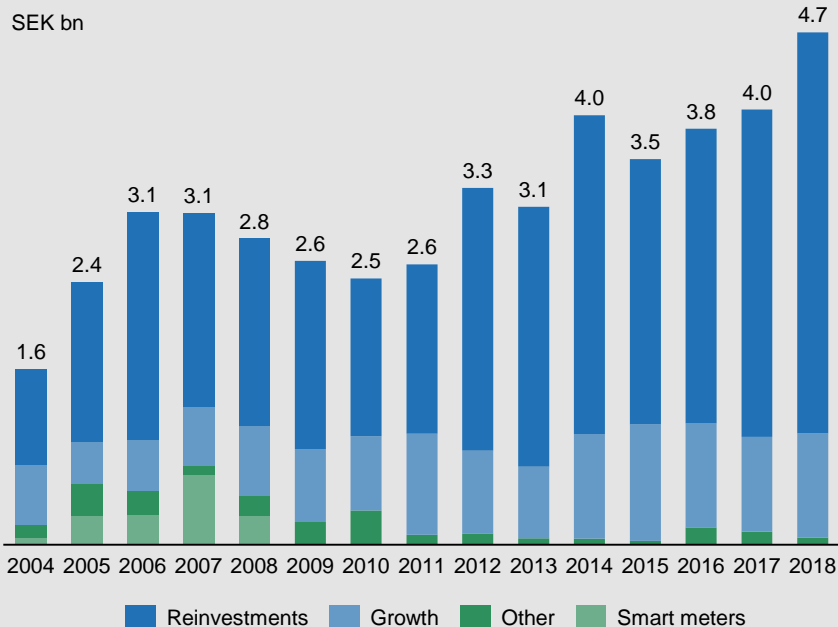
<sup>2</sup> All outages longer than 1 second in medium and low voltage networks are included

<sup>3</sup> Increase driven by "Alfrida"

# We invest in the electricity network to enable a fossil-free future

Continued efforts in Sweden are needed, but challenged by new regulation

## Aggregated Vattenfall network investments amount to over SEK 40 bn in the past 15 years<sup>1</sup>



- Thousands of projects are conducted annually to weather-proof, renew, and modernize the network
- Major projects ongoing with new connections for wind and solar, housing and businesses
- Vattenfall's investments in Swedish distribution accounted for approximately 11% of the energy sector total in 2017<sup>2</sup>
- Roll-out of smart meters constituted large investments during 2004-2008, totalling approx. SEK 1.5 bn

## Situation and the challenge ahead

- The electricity network is crucial to support continued electrification and phase-out of fossil fuels
- Continued high investment levels are needed
- Grid capacity is a growing challenge
- New regulation with lower revenue frames and an allowed return at 2.16% (versus previous 5.85%) does not stimulate investments
- Lower investments are to be expected at a time when they are needed the most

<sup>1</sup>Vattenfall Eldistribution AB, Västerbergslagens Elnät AB, Gotlands Elnät AB

<sup>2</sup>Source: Swedenenergy

Further info: [Vattenfall Eldistribution AB Investment Report 2019](#) (Swedish)

# Financials

Anna Borg, CFO



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# Vattenfall H1 Results 2019

## Financial highlights

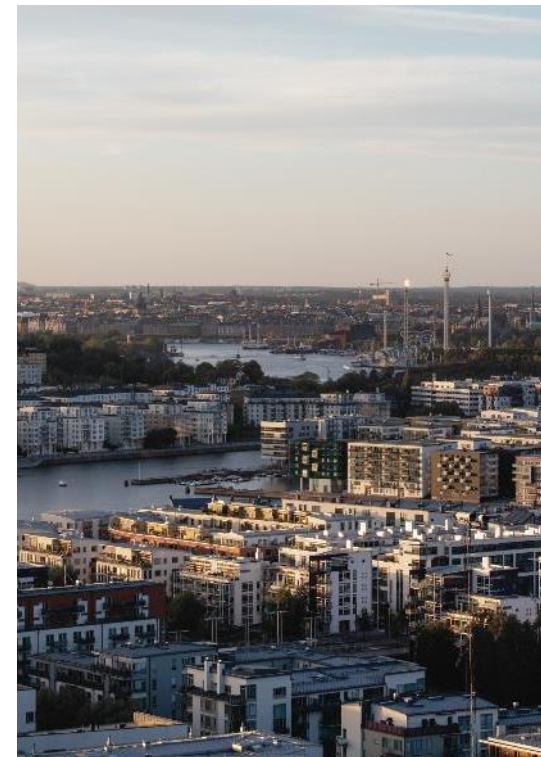
### Key data

SEK bn	H1 2019	H1 2018
Net Sales	84.2	75.0
EBITDA	20.1	17.8
Underlying operating profit (EBIT)	13.3	13.1
EBIT	11.0	9.8
Profit for the period	7.7	7.1
Funds from Operations (FFO)	15.8	12.8
Cash flow operating activities	-1.9	16.5
Net debt	72.5	57.8
Adjusted net debt	137.2	125.2
Adjusted net debt/EBITDA <sup>1</sup> (times)	3.7	3.7
<b>Financial targets</b>		
ROCE <sup>1</sup> (≥8%)	7.1	7.1
FFO/adjusted net debt <sup>1</sup> (22-27%)	19.2	19.4

<sup>1</sup> Last 12-month values

### Key developments

- Net sales increased by SEK 9.2 bn to SEK 84.2 bn mainly attributable to higher spot prices and higher sales in the Nordic countries, Germany and the Netherlands
- Underlying EBIT increased by SEK 0.2 bn mainly due to higher contribution from Power Generation due to higher spot prices in the Nordics and a positive contribution from hedging and trading. This was partly offset costs related to the storm "Alfrida" in Sweden and a lower contribution from Customers & Solutions
- Profit for the period increased by SEK 0.5 bn to SEK 7.7 bn. One-off items, mainly related to unrealised changes in the fair value of energy derivatives, had a less negative impact compared to the first half of 2018.
- ROCE is unchanged at 7.1%, as a higher operating profit is offset by an increase in capital employed
- FFO/Adjusted net debt decreased slightly to 19.2%, mainly as a result of an increase in adjusted net debt mainly due to less available cash and implementation of IFRS 16 which was partly offset by increased FFO as a result of lower paid tax and lower paid interest.

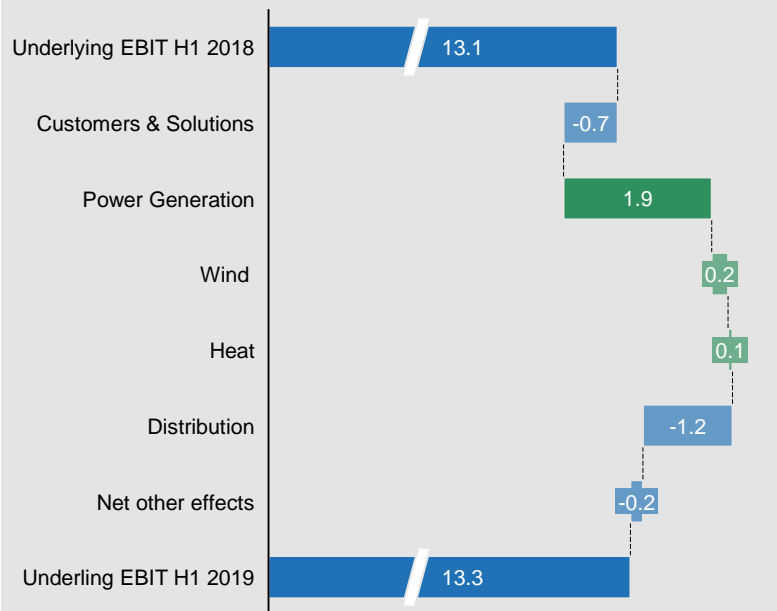


# Development of underlying EBIT H1 2019

Increase from Power Generation offset by lower contribution from Distribution and Customers & Solutions

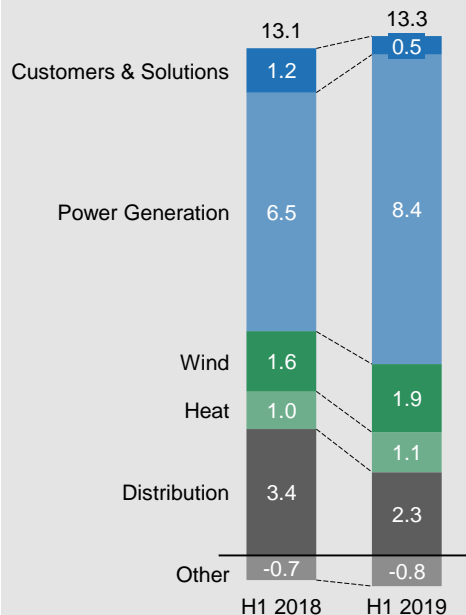
## Change in H1 2019 vs. H1 2018

SEK bn



## Breakdown per operating segment

SEK bn

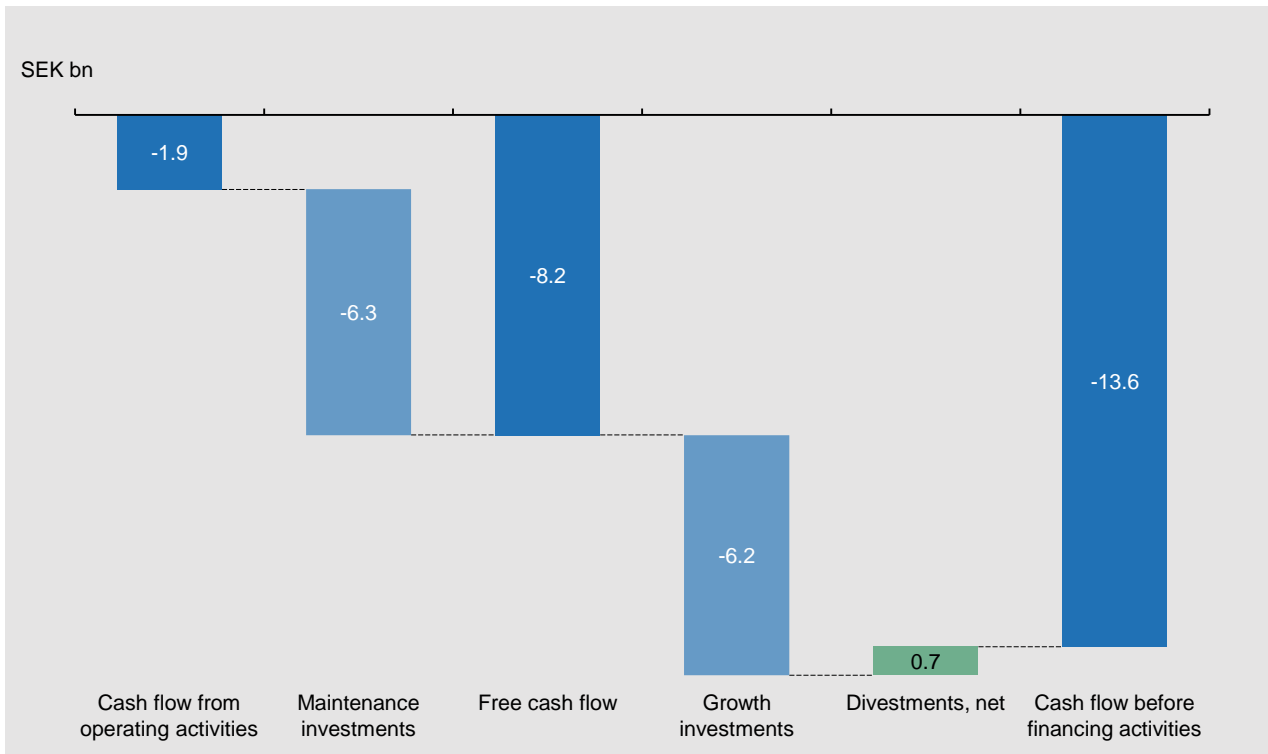


## Highlights

- Customers & Solutions: higher costs for electricity purchases (to be compensated with tariff increases), growth and lower gas sales (warmer weather)
- Power Generation: higher Nordic spot prices and higher realised earnings contribution from the trading operations
- Wind: positive contribution from added capacity
- Heat: Increased electricity generation from condensing power plants driven by improved margins for gas-fired generation and increased availability
- Distribution: Lower distributed volume in Sweden and costs for the storm "Alfrida"

# Cash flow development H1 2019

Operating cash flow negatively impacted by cash flow from changes in working capital



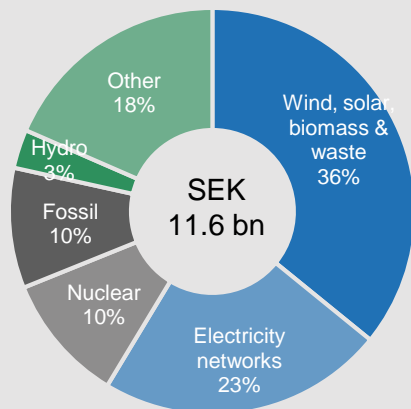
## Highlights

- Cash flow from operating activities at SEK -1.9 bn. FFO increased by SEK 3.1 bn. Negative impact from change in working capital by SEK -17.7 bn, mainly attributable to changes in margin calls (SEK -11.0 bn), changes related to CO<sub>2</sub> emission allowances (SEK -2.7 bn) and cash development of net receivables/ liabilities following seasonality pattern in Customers & Solutions and Heat (SEK -2.2 bn)
- Growth investments mainly in wind

# Capital expenditures

Renewables and networks accounted for the majority of investments

Investments per category, H1 2019



Detailed overview of investments, H1 2019

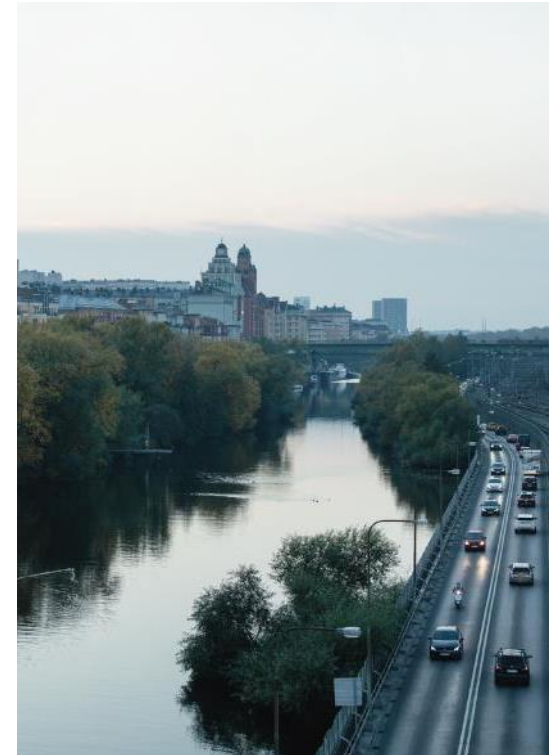
SEK bn	H1 2019	H1 2018	Δ	Q2 2019	Q2 2018	Δ
Hydro	0.4	0.4	-18%	0.2	0.3	-28%
Nuclear	1.2	1.0	+15%	0.6	0.6	+10%
Fossil	1.1	1.3	-12%	0.8	0.6	+24%
Wind, solar, biomass & waste	4.2	2.7	+54%	2.6	1.9	+33%
Electricity networks	2.6	2.5	+8%	1.6	1.4	+16%
Other <sup>1</sup>	2.1	0.7	+211%	0.8	0.7	+28%
<b>Total</b>	<b>11.6</b>	<b>8.6</b>		<b>6.6</b>	<b>5.4</b>	

<sup>1</sup> Investments mainly related to the acquisition of shares (Delta Energie) and other equipment



# Overview of key figures H1 and Q2 2019

Amounts in SEK bn unless indicated otherwise	H1 2019	H1 2018	Q2 2019	Q2 2018
Net sales	84.2	75.0	34.7	31.2
EBITDA	20.1	17.8	7.5	6.9
EBIT	11.0	9.8	2.9	2.8
Underlying operating profit (EBIT)	13.3	13.1	3.6	3.8
Profit for the period	7.7	7.1	1.3	3.0
Electricity generation (TWh)	66.8	66.6	30.9	29.4
Sales of electricity (TWh)	87.8	86.0	42.4	36.2
- of which, customer sales (TWh)	62.0	60.6	29.7	28.5
Sales of heat (TWh)	10.3	10.6	3.1	2.4
Sales of gas (TWh)	33.3	35.6	9.0	8.7
Return on capital employed ( $\geq 8\%$ )	7.1 <sup>1</sup>	7.1 <sup>1</sup>	7.1 <sup>1</sup>	7.1 <sup>1</sup>
FFO/adjusted net debt (22-27%)	19.2 <sup>1</sup>	19.4 <sup>1</sup>	19.2 <sup>1</sup>	19.4 <sup>1</sup>



<sup>1</sup> Last 12-month values

# High interest in the issuance of Vattenfall's first green bond

EUR 500 million earmarked for investments in renewable energy and climate-smart solutions

## Scope and background





- Vattenfall's first green bond and the first corporate bond under the EMTN framework ever issued under Swedish law and listed in Stockholm
- Issuance of a green bond articulates Vattenfall's sustainability commitment also in our funding
- Vattenfall has repaid two outstanding bonds that have matured in June 2018 and January 2019.

## Terms

- Senior green bond, EUR 500 mn, 7-year
- Coupon: 0.5%
- Yield: 0.55%
- Rating: S&P BBB+/ Moody's A3
- Maturity Date: 24 June 2026

## Prerequisites and investment categories

Green Bond net proceeds earmarked for projects defined in our Green Bond Framework (top-rated, dark green shading by Cicero) with the following categories:

	Renewable energy and related infrastructure
	Energy efficiency
	Electrification of transport and heating
	Industry projects

## Supporting banks

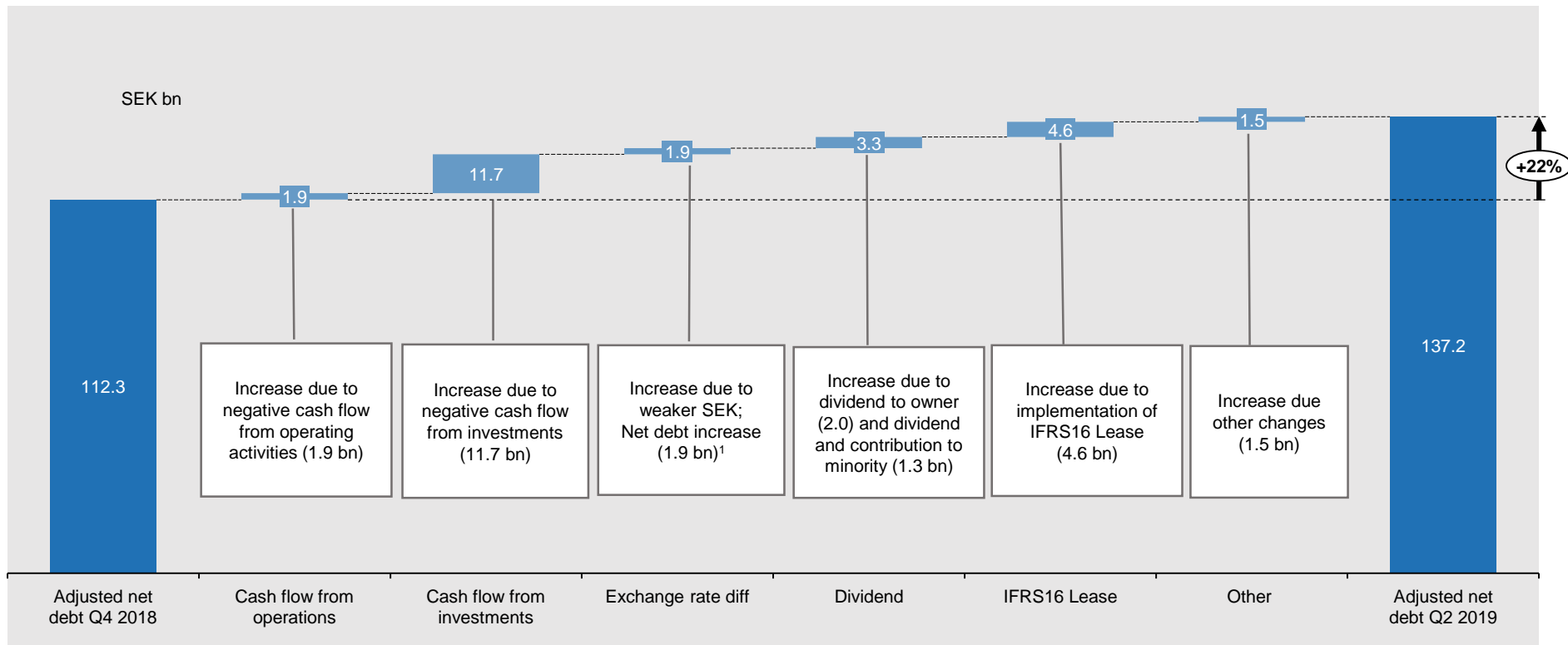


# Appendix



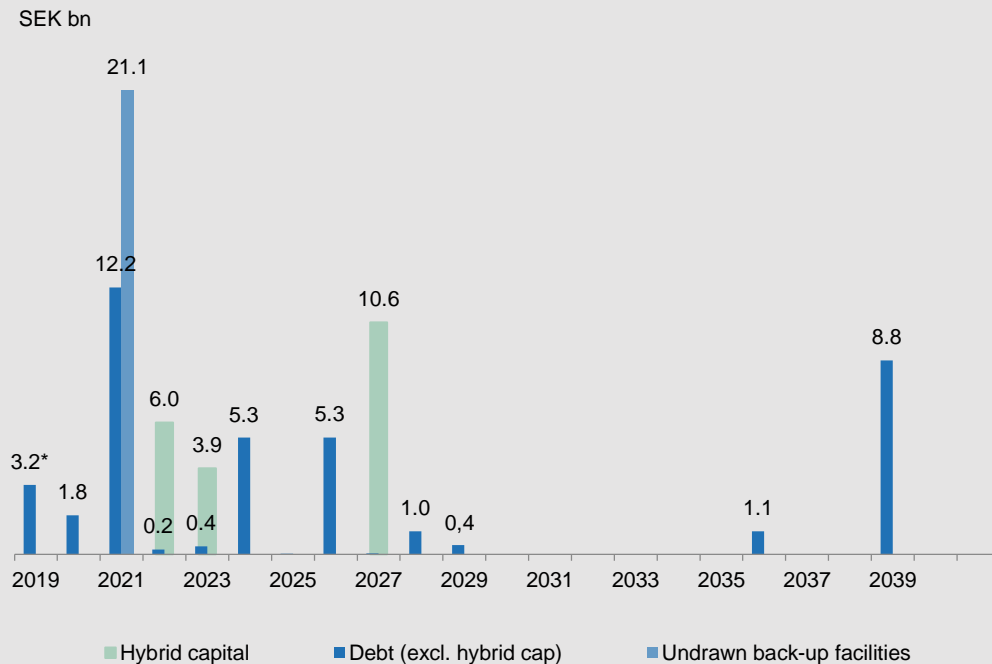
# Development of adjusted net debt YTD 2019

Adjusted net debt increase mainly due to negative cash flow from investments and operating activities



<sup>1</sup> SEK weakened against EUR (from 10.25 to 10.56); translation of EUR denominated net debt into SEK leads to increase in Adjusted net debt

# Debt maturity profile<sup>1</sup>



\* Short term debt are excluded (Repo, ECP and SCP) (16,8) <sup>1</sup> Commercial paper (ECP) Loans from associated companies, minority owners, margin calls received (CSA) and valuation at fair value are excluded and currency derivatives for hedging debt in foreign currency are included

	30 Jun. 2019	31 Dec. 2018
Duration (years)	4.9	4.4
Average time to maturity (years)	6.7	6.4
Average interest rate (%)	4.2	4.5
Net debt (SEK bn)	72.5	47.7
Available group liquidity (MSEK)	23.2	34.5
Undrawn committed credit facilities (MSEK)	21.1	20.5

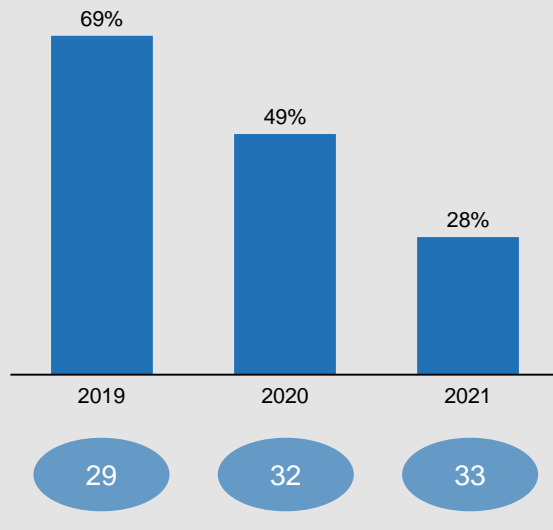
## Cumulative maturities excl. undrawn back-up facilities

	2019-2021	2022-2024	From 2025
Debt incl. hybrid capital	17.1	15.8	27.3
<i>% of total</i>	28%	26%	45%

# Price hedging

Vattenfall continuously hedges its future electricity generation through sales in the forward and futures markets. Spot prices therefore have only a limited impact on Vattenfall's earnings in the near term

Estimated Nordic<sup>1</sup> hedge ratio (%) and indicative prices



Sensitivity analysis – Continental<sup>2</sup> portfolio

Market quoted	+/- 10% price impact on future profit before tax, MSEK <sup>3</sup>			Observed yearly volatility
	2019	2020	2021	
Electricity	+/- 1,387	+/- 1,921	+/- 1,950	19% - 25%
Coal	-/+ 167	-/+ 188	-/+ 170	21% - 26%
Gas	-/+ 661	-/+ 885	-/+ 822	18% - 21%
CO <sub>2</sub>	-/+ 401	-/+ 557	-/+ 610	46% - 50%

<sup>1</sup> Nordic: SE, DK, NO, FI

<sup>2</sup> Continental: DE, NL, UK

<sup>3</sup> The denotation +/- entails that a higher price affects operating profit favorably, and +/- vice versa

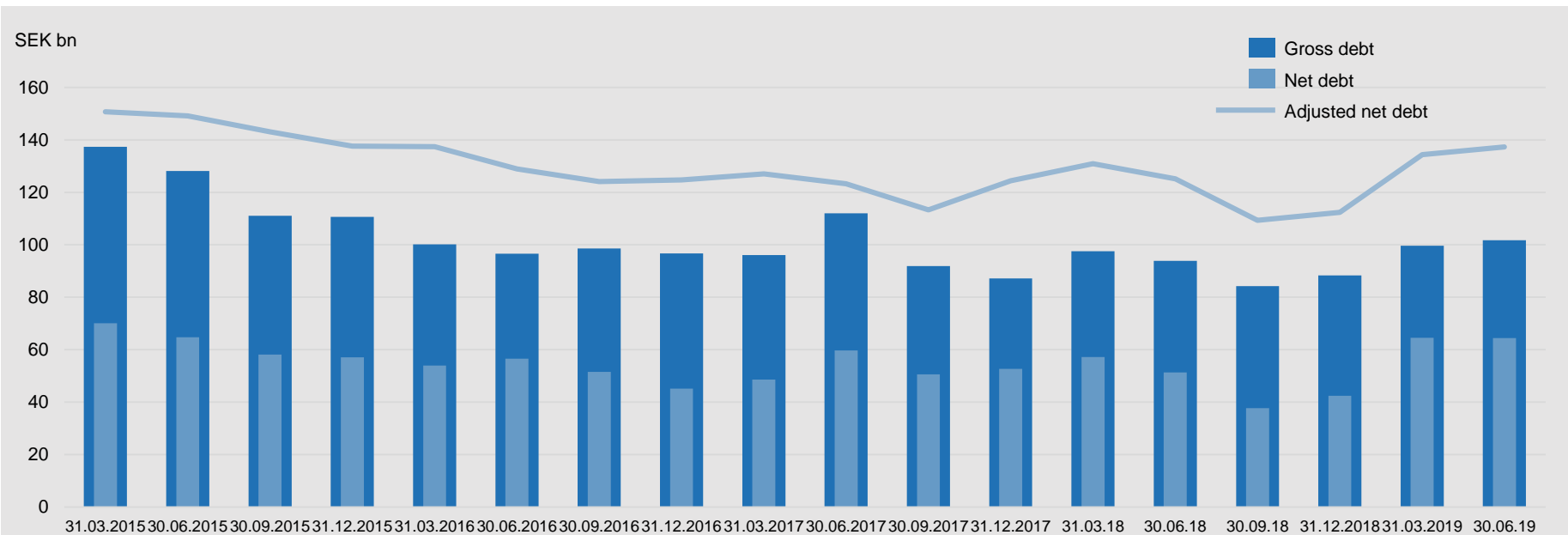
# Liquidity position

<b>Group liquidity</b>	<b>SEK bn</b>	<b>Committed credit facilities</b>	<b>Facility size, EUR bn</b>	<b>SEK bn</b>
Cash and cash equivalents	11.7	RCF (maturity Dec 2021)	2.0	21.1
Short term investments	17.3	Total undrawn		21.1
<b>Reported cash, cash equivalents &amp; short term investments</b>	<b>29.0</b>	<b>Debt maturities<sup>2</sup></b>		<b>SEK bn</b>
Unavailable liquidity <sup>1</sup>	-5.8	Within 90 days		0.8
<b>Available liquidity</b>	<b>23.2</b>	Within 180 days		3.2

<sup>1</sup> German nuclear "Solidarvereinbarung" 2.4 SEK bn, Margin calls paid (CSA) 2.5 SEK bn, Insurance "Provisions for claims outstanding" 0.8 SEK bn

<sup>2</sup> Excluding loans from minority owners and associated companies

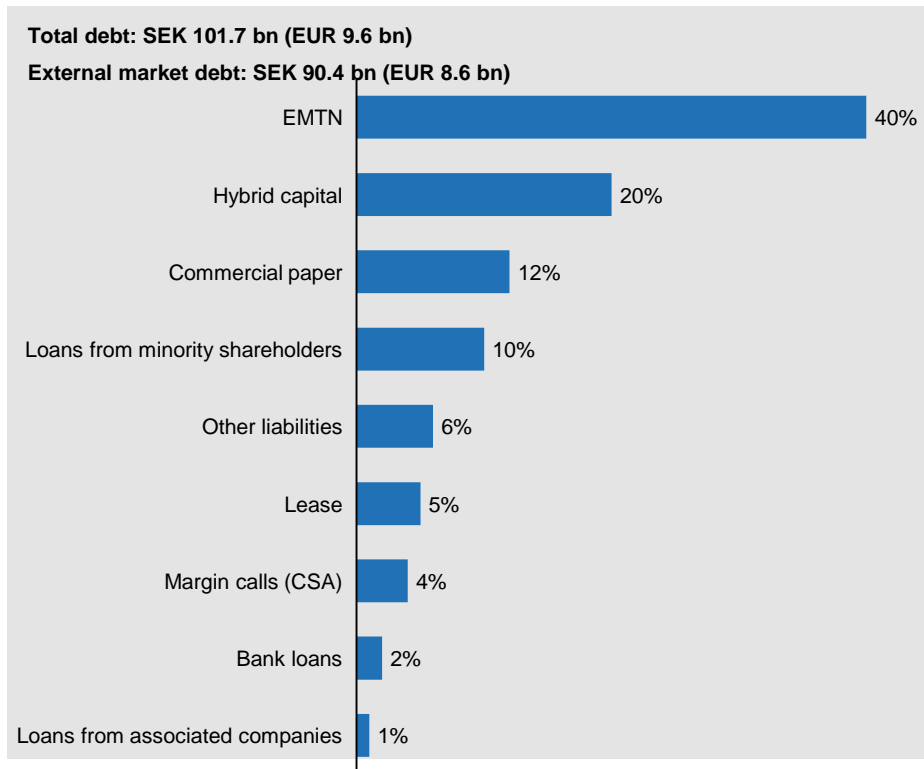
# Debt development



Net debt increased by SEK 24.7 bn compared with the level at 31 Dec. 2018. Adjusted net debt increased to SEK 137.2 bn, SEK 24.9 bn higher compared with the level at 31 December 2018. For the calculation of adjusted net debt, see slide 26.



# Breakdown of gross debt



Debt issuing programmes	Size (EUR bn)	Utilization (EUR bn)
EUR 10bn Euro MTN	10.0	3.5
EUR 2bn Euro CP	2.0	1.2
SEK 15bn Domestic CP	1.4	0.2
<b>Total</b>	<b>13.4</b>	<b>4.9</b>

- All public debt is issued by Vattenfall AB
- The main part of debt portfolio has no currency exposure that has an impact on the income statement. Debt in foreign currency is either swapped to SEK or booked as hedge against net foreign investments.
- No structural subordination

<sup>1</sup> EMTN= Euro Medium Term Notes

# Reported and adjusted net debt

Reported net debt (SEK bn)	30 Jun. 2019	31 Dec. 2018	Adjusted net debt (SEK bn)	30 Jun. 2019	31 Dec. 2018
Hybrid capital	-20.3	-19.8	Total interest-bearing liabilities	<b>-101.7</b>	-88.3
Bond issues and commercial papers and liabilities to credit institutions	-54.7	-50.3	50% of Hybrid capital	10.1	9.9
Liabilities to associated companies	-0.7	-0.5	Present value of pension obligations	-44.6	-39.7
Liabilities to minority shareholders	-10.6	-10.4	Wind & other environmental provisions	-8.1	-7.7
Lease liabilities	-4.8	0.0	Provisions for nuclear power (net)	-30.2	-31.9
Other liabilities	-10.7	-7.2	Margin calls received	4.2	3.4
<b>Total interest-bearing liabilities</b>	<b>-101.7</b>	<b>-88.3</b>	Liabilities to minority owners due to consortium agreements	10.6	9.2
Reported cash, cash equivalents & short-term investments	29.0	40.1	Adjustment related to assets/liabilities held for sale	-0.8	-1.7
Loans to minority owners of foreign subsidiaries	0.3	0.5	<b>= Adjusted gross debt</b>	<b>-160.5</b>	<b>-146.8</b>
<b>Net debt</b>	<b>-72.5</b>	<b>-47.7</b>	Reported cash, cash equivalents & short-term investments	29.0	40.1
			Unavailable liquidity	-5.8	-5.6
			<b>= Adjusted cash, cash equivalents &amp; short-term investments</b>	<b>23.2</b>	<b>34.5</b>
			<b>= Adjusted net debt</b>	<b>-137.2</b>	<b>-112.3</b>

# Nuclear provisions

Reactor	Net capacity (MW)	Start (year)	Vattenfall share (%)	Vattenfall provisions, SEK bn (IFRS accounting)	Vattenfall provisions, SEK bn (pro rata)	Sw nuclear waste fund SEK bn (Vattenfall pro rata share)
Ringhals 1	879	1976	70.4			
Ringhals 2	809	1975	70.4			
Ringhals 3	1,070	1981	70.4			
Ringhals 4	942	1983	70.4	<b>Total Ringhals: 30.8</b>	<b>Total Ringhals: 30.8<sup>1</sup></b>	
Forsmark 1	984	1980	66.0			
Forsmark 2	1,120	1981	66.0			
Forsmark 3	1,170	1985	66.0	<b>Total Forsmark: 26.6</b>	<b>Total Forsmark: 17.6</b>	
<b>Total Sweden</b>	<b>6,974</b>	<b>-</b>		<b>60.1<sup>2</sup></b>	<b>50.0<sup>2</sup></b>	<b>38.3<sup>3</sup></b>
Brunsbüttel	771	1977	66.7	11.4	7.6	
Brokdorf	1,410	1986	20.0	0	3.6	
Krümmel	1,346	1984	50.0	7.1	7.1	
Stade <sup>4</sup>	640	1972	33.3	0	1.0	
<b>Total Germany</b>	<b>4,167</b>	<b>-</b>	<b>-</b>	<b>18.4</b>	<b>19.2</b>	
<b>Total SE &amp; DE</b>	<b>11,141</b>			<b>78.5</b>	<b>69.2</b>	

<sup>1</sup> Vattenfall has 100% liability for Ringhals decommissioning, while owning only 70.4%

<sup>2</sup> Total provisions in Sweden (IFRS accounting) include provisions of SEK 0.4 bn (pro rata SEK 0.2 bn considering share in Studsviksfonden) related to Ågesta, and SEK 2.3 bn (pro rata SEK 0.9 bn considering share in Studsviksfonden) related to SVAFO

<sup>3</sup> Vattenfall's share of the Nuclear Waste Fund. IFRS consolidated value is SEK 45.7 bn.

<sup>4</sup> Stade is being dismantled

# Impairment history 2009 – 2019

SEK bn		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	H1 2019	Total
The Netherlands	Thermal assets		4.3 <sup>1</sup>	0.4 <sup>2</sup>	8.6 <sup>2</sup>	14.7	2.6		2.8				33.4
	Trading					6.5 <sup>1</sup>	10.0 <sup>1</sup>		0.7				17.2
	Other	1.2	1.2			1.5 <sup>2</sup>	1.9				0.1		5.9
Germany	Thermal assets			0.3		4.3	5.7	19.2	26.1				55.6
	Nuclear assets			10.5									10.5
	Transmission		5.1										5.1
	Other					0.1	1.1	0.3	2.3	0.4			4.2
The Nordic Countries	Renewable assets						1.4		0.1				1.5
	Thermal assets	4.1				3.0		0.1					7.2
	Nuclear assets							17.0	0.4				17.4
	Other								0.3				0.3
UK	Renewable assets						1.1	0.2					1.3
Not allocated		0.2	0.5	0.1									0.8
Impairment Liberia					1.3								1.3
Impairments; shares in Enea S.A. Poland					2.4								2.4
Impairments; shares in Brokdorf and Stade									1.1				1.1
<b>Impairments</b>		<b>5.5</b>	<b>11.1</b>	<b>11.3</b>	<b>12.3</b>	<b>30.1</b>	<b>23.8</b>	<b>36.8</b>	<b>33.8</b>	<b>0.4</b>	<b>0.1</b>	<b>0.0</b>	<b>165.2</b>
Reversed impairment losses		-1.3	-1.3	-0.4	0.0	0.0	0.0	-0.5	-0.9	0.0	0.0	0.0	-4.4
<b>Impairments (net)</b>		<b>4.2</b>	<b>9.8</b>	<b>10.9</b>	<b>12.3</b>	<b>30.1</b>	<b>23.8</b>	<b>36.3</b>	<b>32.9</b>	<b>0.4</b>	<b>0.1</b>	<b>0.0</b>	<b>160.8</b>

<sup>1</sup> Impairment of goodwill

<sup>2</sup> Impairment of assets and goodwill

# Wind - Installed capacity (MW<sup>1</sup>) Q2 2019

	Solar	Onshore	Offshore	Total
United Kingdom	5	391	687	1,083
Denmark	0	243	532	775
The Netherlands	8	269	108	386
Sweden	0	244	110	355
Germany	3	19	636	658
<b>Total (MW)</b>	<b>17</b>	<b>1,167</b>	<b>2,073</b>	<b>3,256</b>

United Kingdom – ROC scheme	
■ Thanet	300
■ Ormonde (51%)	150
■ Aberdeen	97
■ Kentish Flats	90
■ Kentish Flats Extension	50
■ Pen Y Cymoedd	228
■ Ray	54
■ Edinbane	41
■ Clashindarroch	37
■ Swinford	22
■ Parc Cynog	4
■ PV@Cynog	5
■ Pendine	5
<b>Installed capacity (MW)</b>	<b>1,083</b>

Denmark – FIT scheme	
■ Horns Rev 1 (60%)	158
■ Horns Rev 3 <sup>2</sup>	374
■ Klim (98%)	67
■ Nørrekær Enge 1 (99%)	30
■ Rejsby Hede	23
■ Hagesholm	23
■ Nørre Økse Sø	17
■ Tjæreborg Enge	17
■ Hollandsbjerg	17
■ Bajlum (89%)	15
■ DræbyFed	9
■ Ryå	8
■ Ejsing (97%)	7
■ Nordjyllandsværket	6
■ Lyngmose	5
<b>Installed capacity (MW)</b>	<b>775</b>

The Netherlands – MEP/SDE(+)	
■ NoordzeeWind (50%)	108
■ Princess Alexia	122
■ Slufterdam	29
■ Eemmeerdijk	17
■ Irene Vorrink	17
■ Jaap Rodenburg	17
■ Windpoort (40%)	13
■ Hoofdplaatpolder (70%)	10
■ Reyndersweg (50%)	9
■ Echteld	8
■ De Bjirmen	6
■ Oom Kees (12%)	6
■ Oudendijk	5
■ Mariapolder	5
■ Hiddum Houw	4
■ Eemshaven	6
■ Velsen	2
■ Enkhuizen	2
■ Decentral Solar installations	0
<b>Installed capacity (MW)</b>	<b>386</b>

Sweden – certificate scheme	
■ Lillgrund	110
■ Stor-Rotliden	78
■ Högabjär-Kärsås (50%)	38
■ Höge Våg (50%)	37
■ Hjuleberg (50%)	36
■ Juktan (50%)	29
■ Östra Herrestad	16
■ Näsudden	10
<b>Installed capacity (MW)</b>	<b>355</b>

Germany – EEG scheme	
■ DanTysk (51%)	288
■ Sandbank (51%)	288
■ alpha ventus (26%)	60
■ Jänschwalde	12
■ Westküste (20%)	7
■ Decentral Solar installations	3
<b>Installed capacity (MW)</b>	<b>658</b>

<sup>1</sup> Capacity in operation: total capacity of the wind farms that Vattenfall has an ownership in. Minority shares included as 100%

<sup>2</sup> Horns Rev 3 commissioning ongoing, as per Q2 2019 45 turbines operational.

# Pipeline of key wind farms in our 5 core countries

	Country	Name	Capacity (MW)	Support scheme	Awarded	Duration of support	Ownership (%)	Commissioning	Current status
Construction	DK	Horns Rev 3	407	FIT	X	50,000hrs	100	2019	Finalizing construction
	DK	Kriegers Flak	605	FIT	X	50,000hrs	100	2021	Under construction
	NL	Wieringermeer	185	SDE+	X	15 yrs	100	2019/2020	Under construction
	NL	Wieringermeer ext.	118	SDE+	X	15 yrs	100	2020	Under construction
	NL	Moerdijk	27	SDE+	X	15 yrs	100	2020	Under construction
	NL	Haringvliet	22	SDE+	X	15 yrs	100	2020	Under construction
	SE	Blakliden + Fäbodberget	353	Certs	N/A	-	30	2021/2022	Under construction
	<b>Total 1,717 MW</b>								
	Country	Name	Capacity (MW)	Support scheme	Awarded	Duration of support	Ownership (%)	Commissioning	Current status
Development	NL	Nieuwe Hemweg	~15	SDE+	X	15 yrs	100	2020	Procurement
	UK	South Kyle	~200	-	N/A	-	100	2022	Procurement
	DK	NK II	~150	-	N/A	-	100	2021	Permitting phase
	DK	Nørre Økse Sø	~50	-	N/A	-	80%	2021	Permitting phase
	NL	Hollandse Kust Zuid 1 & 2	~750	-	X	-	100	2022	Procurement
	NL	Hollandse Kust Zuid 3 & 4	~750	-	X	-	100	2023	Permit awarded
	DK	Vesterhav projects	344	FIT	X	50,000hrs	100	2023	Procurement & Consenting
	UK	Thanet Extension	272	CFD		15 yrs	100	2022	Early planning, application for a Development Consent Order submitted
	UK	Norfolk Vanguard	1,800	CFD		15 yrs	100	2025	Early planning, application for a Development Consent Order submitted
	UK	Norfolk Boreas	1,800	CFD		15 yrs	100	2026	Early planning, application for a Development Consent Order submitted
<b>Total &gt;5GW</b>									

Offshore

Onshore

# Solar & batteries

Large scale solar & batteries pipeline under construction

	Country	Name	Capacity (MW)	Support scheme	Awarded	Duration of support	Ownership (%)	Commissioning	Current status
Large Scale Solar	NL	Velsen	2.3	SDE+	X	15 full-load yrs	100	2018	Handover to O&M delivery
	NL	Eemshaven	5.7	SDE+	X	15 full-load yrs	100	2019	Commissioning phase
	NL	Hemweg	2.0	SDE+	X	15 full-load yrs	100	2019	Construction phase
	NL	Coevorden	6.5	SDE+	X	15 full-load yrs	100	2019	Construction phase
	NL	Haringvliet	37,9	SDE+	X	15 full-load yrs	100	2020	Pre-construction phase
<b>Total 54,4 MW</b>									
	Country	Name	Capacity (MW)	Support scheme	Awarded	Duration of support	Ownership (%)	Commissioning	Current status
Decentral solar Commissioned	DE	Tenant electricity/ Mieterstrom	0.9	EEG (small scale)	X	20 years	100	2018 / 2019	Program finalized
	DE	PV@VF sites	1,1	EEG (small scale)	X	20 years	100	2019	
	DE	B2B customers – direct sale	0.4	EEG / own consumption	X	20 years	0	2019	Program finalized
	NL	B2B customers – direct sale / Leasing	2.2	SDE+		15 Full-load yrs	0	2019	
<b>Total 4,6 MW</b>									
	Country	Name	Capacity (MW)	Support scheme	Awarded	Duration of support	Ownership (%)	Commissioning	Current status
Decentral solar Construction	DE	PV@VF sites	6.7	EEG	X	20 years	100	2020	
	NL	Direct sale	10.9	SDE+	X	15 Full-load yrs	0	2019	
<b>Total 17,6 MW</b>									

# Solar & batteries

Large scale solar & batteries pipeline under construction

Country	Name	Capacity (MW)	Support scheme	Awarded	Duration of support	Ownership (%)	Commissioning	Current status
DE	NEW 4.0	1	Funding in R&D operation and FCR	Weekly for PFC	1-3 yrs funding 4-15 yrs FCR	100	2018	Operating
DE	Jungheinrich	1	No support scheme → Peak shaving			100	2018	Operating
SWE	Åre	1	No support scheme → Peak shaving			0	2019	Operating
UK	Battery @ PyC	22	EFR and CM	X	1-4 yrs EFR 5-15 CM	100	2019	Handover to O&M delivery
NL	Battery @ Alexia	3	FCR	weekly	15 years	100	2019	Commissioning phase
DE	Hafenbatterie	1	Cooperation with BMW and Bosch, FCR	weekly		100	2019	Commissioning phase
SWE	Networks	1	No support scheme			0	2019	Contracts signed
NL	E-Mobility	0.25	No support scheme			0	2019	Contracts signed
NL	Battery @ Haringvliet	12	FCR			100	2020	Contracts signed
<b>Total 42 MW</b>								

Batteries

PFC – Primary Frequency Control

FCR - Frequency Response Regulation

CM – Capacity Mechanism

EFR – Enhanced Frequency response