



Torbjörn Wahlborg Head of Business Area Generation

Vattenfall Capital Markets Day, Solna, 19 September 2016



FACTS AND FIGURES – BA GENERATION

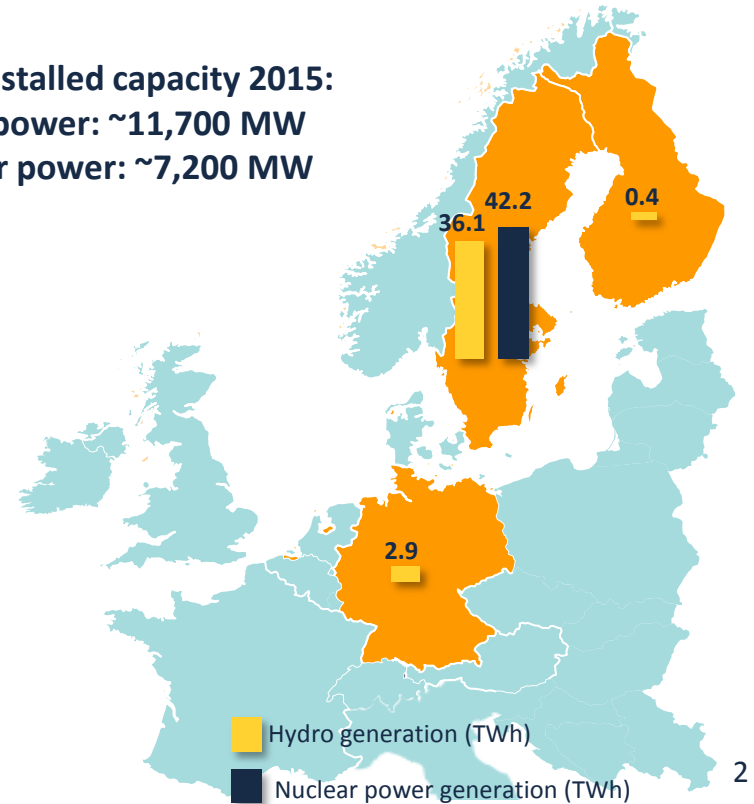
Business Area Generation, which includes Vattenfall's hydro and nuclear power operations, shall provide sufficient and flexible electric power whenever needed

	2015
External net sales (MSEK)*	35,783
EBIT (MSEK)*	-7,699
Underlying EBIT (MSEK)*	12,376
Investments (MSEK)**	12,231
Electricity generation, (TWh)	
- Hydro power	39.5
- Nuclear power	42.2
Number of employees (FTE)	7,700

*Figures relate to the Operating Segment Power Generation including hedges and comprises Generation and Markets Business Areas, but excludes the Mining & Generation unit

** Figure relates to the Operating segment Power Generation, including the Mining & Generation unit

Total installed capacity 2015:
Hydro power: ~11,700 MW
Nuclear power: ~7,200 MW



STRATEGIC DIRECTION OF BA GENERATION



Focus areas

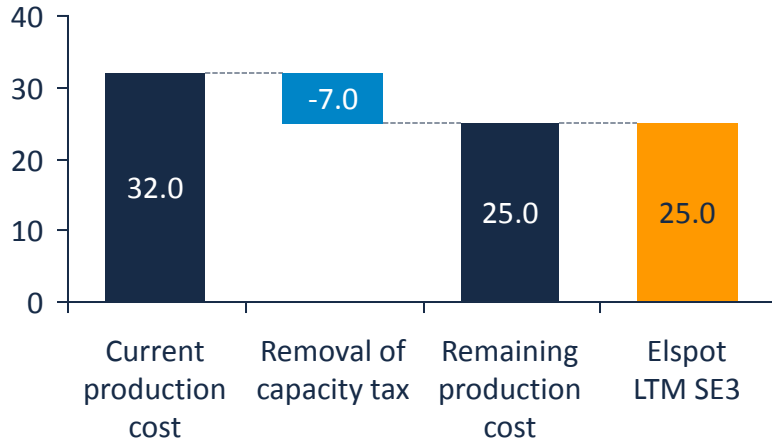
- Maintain safe, reliable, environmentally compatible and efficient generation
- Focus on operational excellence
- Increase flexibility in the power plants
- Secure back-end of nuclear cycle
- Ensure efficient decommissioning and dismantling of the nuclear reactors Vattenfall decided to close

NUCLEAR POWER – OPERATIONAL EXCELLENCE IN FOCUS

Even excluding the capacity tax, the production cost needs to be lowered further

Still need to improve our competitiveness in order to provide a sustainable return

öre/kWh



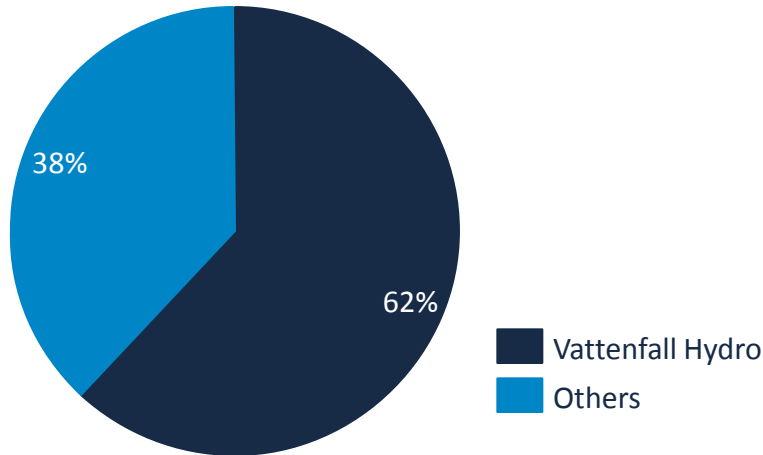
To be achieved by

- Leaner O&M organisation
- Higher availability
- Lower procurement and fuel cost
- Lower investments
- Secured back-end cost

HYDRO POWER – LOW MARGINAL COST AND HIGH FLEXIBILITY

Hydro power is the backbone in the Swedish energy system and is able to provide back-up of weather dependent supply in a system with high volatility

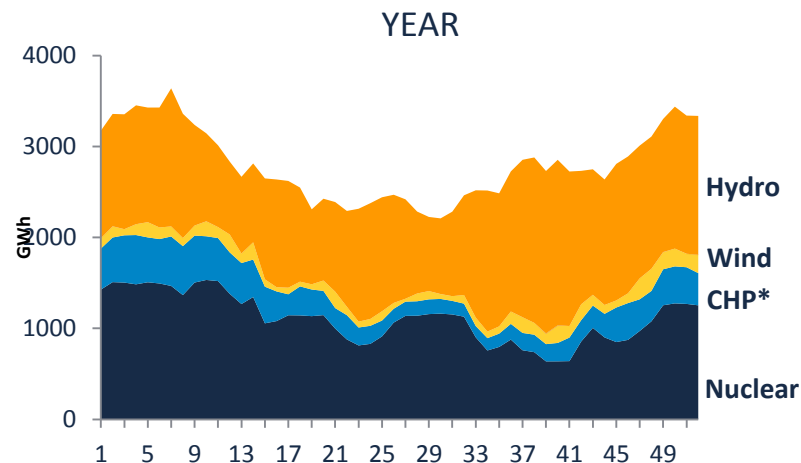
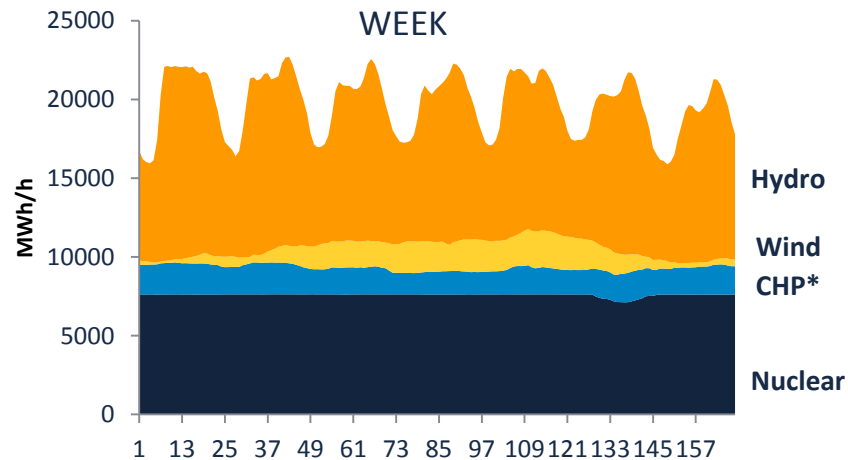
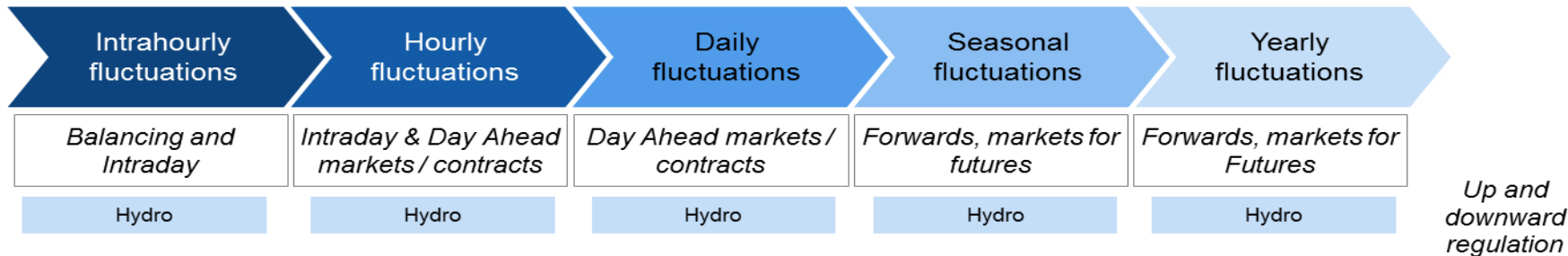
Vattenfall Hydro's share of balancing market and ancillary services since 2012



Central role in the energy system long term

Large scale flexible production such as hydro power will become even more important as back up to match demand and supply with a growing share of renewable production

FLEXIBLE HYDRO POWER AS BACK UP OF WEATHER DEPENDENT SUPPLY



HYDRO POWER

Vattenfall's 10 largest hydro power plants

Country	Hydro power plant	Ownership (%)	Installed capacity (MW)	Commissioned (year)
Sweden	Harsprånget	100	977	1951
	Stornorrfors	75	590	1958
	Porjus	100	465	1975
	Letsi	100	456	1967
	Messaure	100	442	1963
	Ligga	100	324	1954
	Ritseml	100	320	1927
	Vietas	100	320	1971
Germany	Goldisthal ¹	100	1,060	2003
	Markersbach ¹	100	1,046	1979

1) Pumped storage power plant

Ongoing investment projects

Country	Hydro power plant	Completion (year)	Installed capacity (MW)	Total investment (MSEK)
Sweden	Akkats	2016	150 (replacement)	1,160

NUCLEAR POWER

Vattenfall's nuclear power plants – total installed capacity pro rata 2015: 5,206 MW

Country	Nuclear power reactor	Ownership (%)	Installed capacity (MW)	Commissioned (year)
Sweden	Ringhals 1	70.4	881	1976
	Ringhals 2	70.4	865	1975
	Ringhals 3	70.4	1,047	1981
	Ringhals 4	70.4	940	1983
	Forsmark 1	66.0	987	1980
	Forsmark 2	66.0	1,000	1981
	Forsmark 3	66.0	1,170	1985
Germany	Krümmel	50.0	1,346 ¹	1984
	Brunsbüttel	66.7	771 ¹	1977
	Brokdorf	20.0	1,370	1986

1) Nuclear power plants Krümmel and Brunsbüttel are non-operational and under decommissioning.