

# Up-date on Swedish Nuclear Industry

Kim Dahlbacka

*Customer Account Manager, Finland*



# Westinghouse

- Vendor for 12 reactors in Sweden and two in Finland
- Roughly 1000 employees in Sweden
  - Provides fuel ,services and innovations for the BWR, PWR and VVER markets
  - Formerly Asea-Atom
- Worldwide 12 000 employees
  - Eight AP1000 under construction in China and USA
  - Several AP1000 initiatives in Europe (UK, Bulgaria, and Turkey)

# Swedish NPP Overview

Customer	Reactor Type	Start Year	(Scheduled) End Year	Original Power net output	Current Power net output	Reactor vendor	Owner
				[MW]	[MW]		
Oskarshamn 1	BWR	1972	2017-2019	440	473	ASEA-ATOM	Eon 55%, Fortum 45%
Oskarshamn 2	BWR	1974	Will not start up	580	638	ASEA-ATOM	Eon 55%, Fortum 45%
Oskarshamn 3	BWR	1985	2045	1050	1400	ASEA-ATOM	Eon 55%, Fortum 45%
Ringhals 1	BWR	1976	2020	760	878	ASEA-ATOM	Vattenfall 70%, Eon 30%
Ringhals 2	PWR	1975	2019	820	807	Westinghouse	Vattenfall 70%, Eon 30%
Ringhals 3	PWR	1981	2041	915	1062	Westinghouse	Vattenfall 70%, Eon 30%
Ringhals 4	PWR	1983	2043	915	938	Westinghouse	Vattenfall 70%, Eon 30%
Forsmark 1	BWR	1980	2040	900	984	ASEA-ATOM	Vattenfall 66%, Fortum 22%, Eon 9,5%
Forsmark 2	BWR	1981	2041	900	1120	ASEA-ATOM	Vattenfall 66%, Fortum 22%, Eon 9,5%
Forsmark 3	BWR	1985	2045	1070	1190	ASEA-ATOM	Vattenfall 66%, Fortum 22%, Eon 9,5%
Barsebäck 1	BWR	1975	1999	580	615	ASEA-ATOM	Eon 100 %
Barsebäck 2	BWR	1977	2005	580	615	ASEA-ATOM	Eon 100 %

# Steps and Main Reasons for Closures

- During the spring 2015, the majority owners of Ringhals (Vattenfall) and of Oskarshamn (Eon) communicated their intentions to close their oldest reactors
- During the week of October 12, both companies confirmed these decisions via extraordinary shareholder's meetings:
  - Four reactors are closed before 2020
- Main reasons for closure:
  - Low electricity prices and no indications for higher prices within considerable number of years
  - Increased taxation
    - Based on thermal output
    - Impact larger than fuel and waste fund
  - Considerable amount of investments required (e.g. independent core cooling) in order to operate beyond 2020

# Production

- Electricity production in Sweden in 2014 was 151 TWh
  - Nuclear powers produced 62 TWh
- Capacity factor remained at fairly high level in 2014:
  - 77 % at Ringhals and 90 % at Forsmark

