



Suomenoja power plant

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Suomenoja power plant

**Unit 3, CHP
1989**

**Unit 1, CHP
1977**

**Unit 2, HOB
1986**

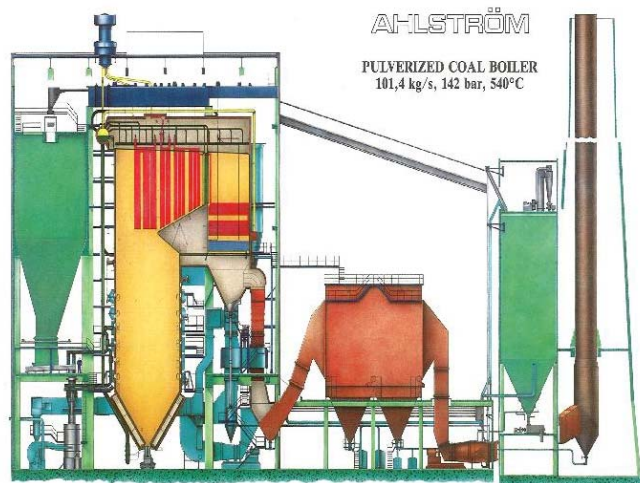


**Unit 4, CHP
2009**

Unit 1, Coal-fired boiler and steam turbine (90 MWe, 150 MWth)

Commercial operation	1977
Steam	101,4 kg/s
Steam pressure	142 bar
Steam temperature	540 C

Emission limits:
SO₂ 230 mg/MJ, NO_x 180 mg/MJ, Dust 50 mg/nm³

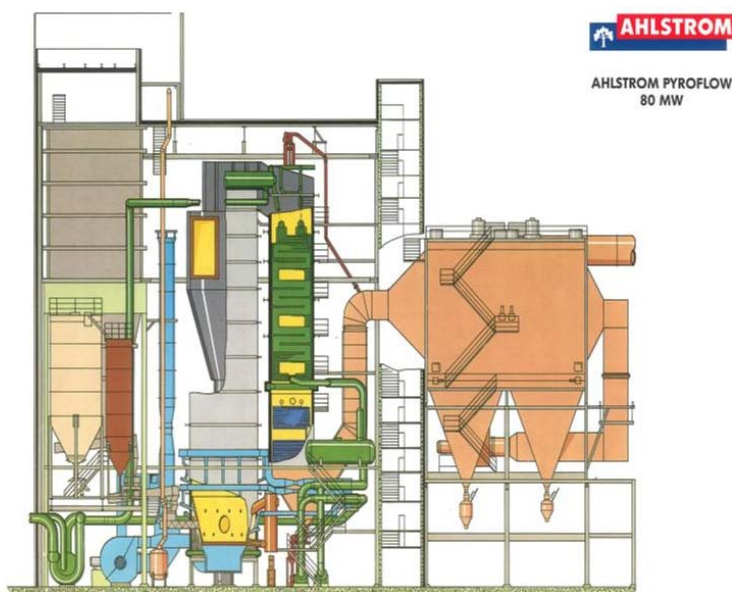


Environmental Investments:

- Desulphuration Plant (Semi-Dry) and additional electrical precipitator 1991
- Low-NO_x Burners + OFA 1994
- New coal mills 1994
- New gas/oil burners 2004
- Low-NO_x burner modernisation 2005

Unit 2, Circulating fluidized bed (CFB) boiler 80 MWth

Commercial operation	1986
Heat output	80 MW
Fuel	Coal
Steam pressure	16 bar
Steam temperature	200 °C

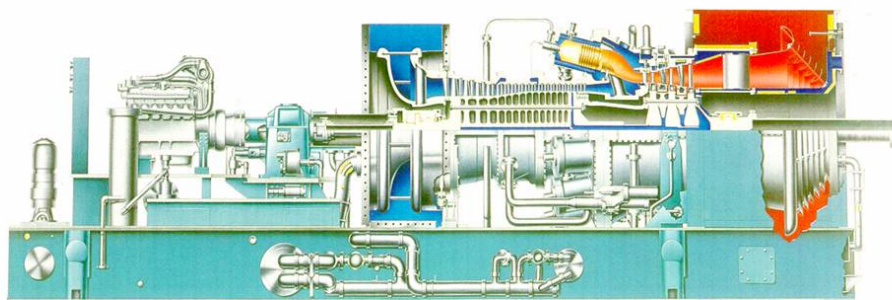


Unit 3, Gas turbine and exhaust gas boiler

Commercial operation	1989
Electricity	45 MWe
Total heat output (with auxiliary burners)	110 MWth

Model Series 6001
Single-Shaft Industrial Gas Turbine

AEG-KANIS
TURBINENFABRIK GMBH



Environmental investments
Steam injection (NO_x reduction) 1995

Emission limits:
NO_x 100 mg/MJ

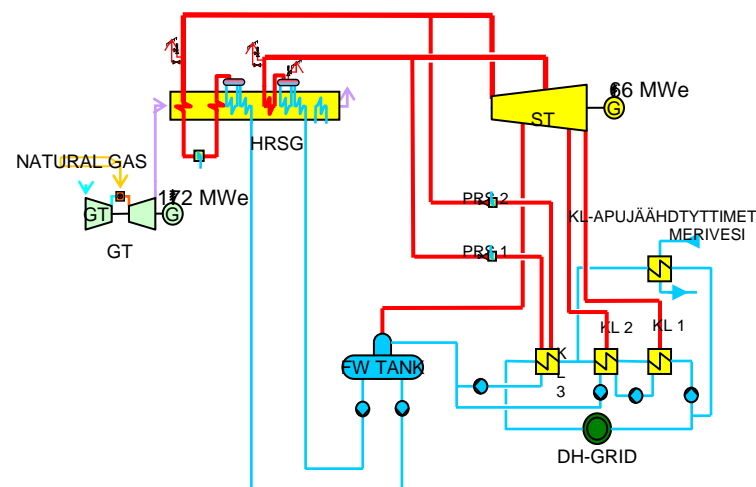
Unit 3, Gas turbine and exhaust gas boiler (234 MWe, 214 MWth)

Combined Cycle Gas Turbine

- gas turbine and steam turbine process => high electrical output/heat output ratio
- (electrical power /district heating power) > 1

CHP-plant

- combined electricity and heat production => high efficiency (>90%)



Espoo CHP investment (CCGT)

- Why new CHP?
 - The share of cogeneration for heat production has decreased to 70% (additional heat demand is fulfilled by heating plants when outdoor temperature $< +10\text{ }^{\circ}\text{C}$)
 - District heating contracted capacity increases in Espoo, Kauniainen ja Kirkkonummi area by about 25-30 MW/a ($-25\text{ }^{\circ}\text{C}$)
- Why CCGT with natural gas?
 - Biomass availability poor in capital area
 - New CCGT replaces coal-based production (coal consumption decreases by $\sim 30\%$)
 - Location in the residential area
 - No need for fuel and fly ash transportation
 - Fuel storage not required
 - Environmental impacts
 - Low or no flue gas emissions (no SO_2 , low NO_x , no dust)
 - CO_2 -emissions lower compared to coal-fired production

Espoo's district heating network

