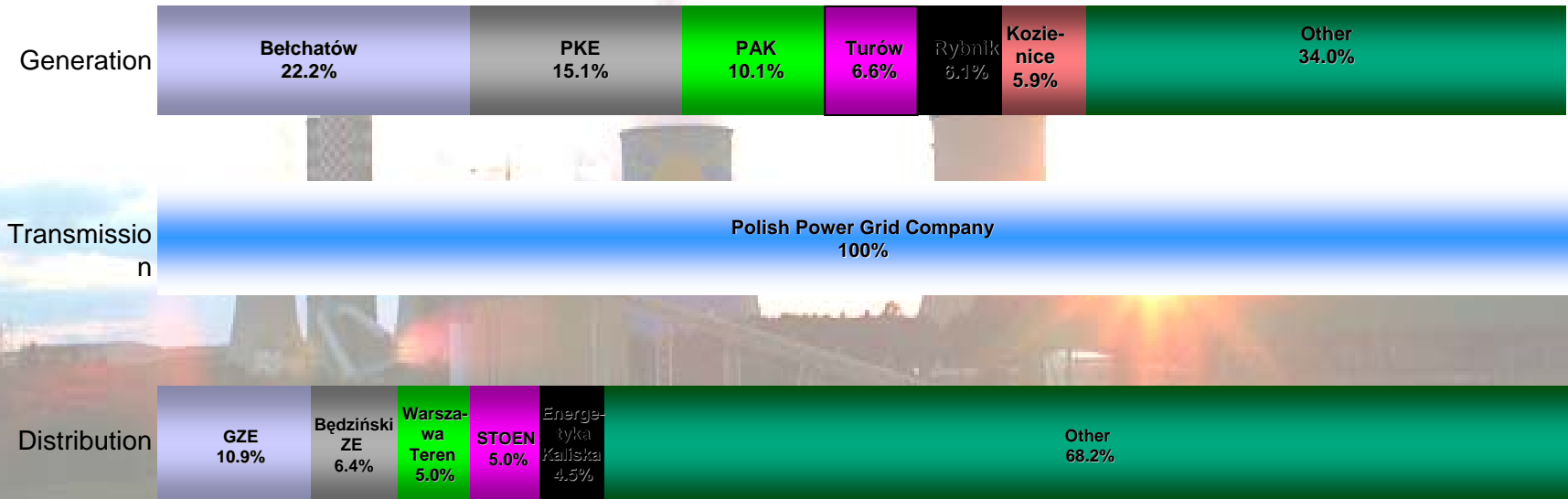






Producers	Gross Electricity Generation	
	GWh	%
Thermal Power Plants	133621,80	97,07%
lignite fired	50556,80	36,73%
hard coal fired	62002,10	45,04%
Heat and Power Plants	19336,20	14,05%
Hydro Power Plants	4032,60	2,93%
pumping plants	1994,50	1,45%
other	2038,10	1,48%
Total	137654,40	100,00%

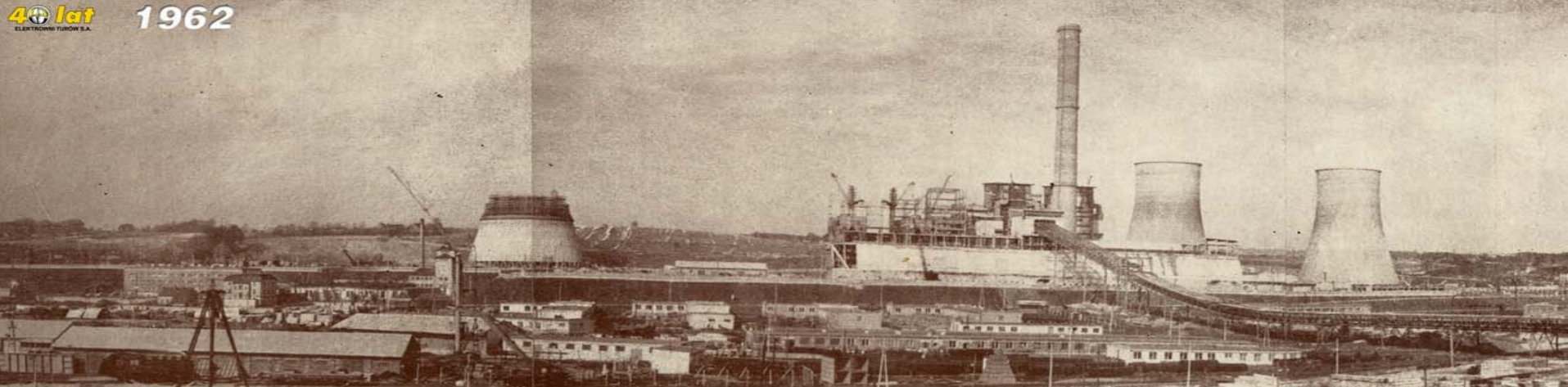
Structure of Polish Electricity Market



•Source: ARE (Energy Market Agency), Polish Power Transmission and Distribution Association

- 16 System Power Plants; 22 Heat & Power Plants
- Most players in the sector are state owned
- Total employment: 120 000

40 lat 1962
ELEKTROWNIA TUROW S.A.



40 lat 1982
ELEKTROWNIA TUROW S.A.



40 lat 2002
ELEKTROWNIA TUROW S.A.













LIGNITE

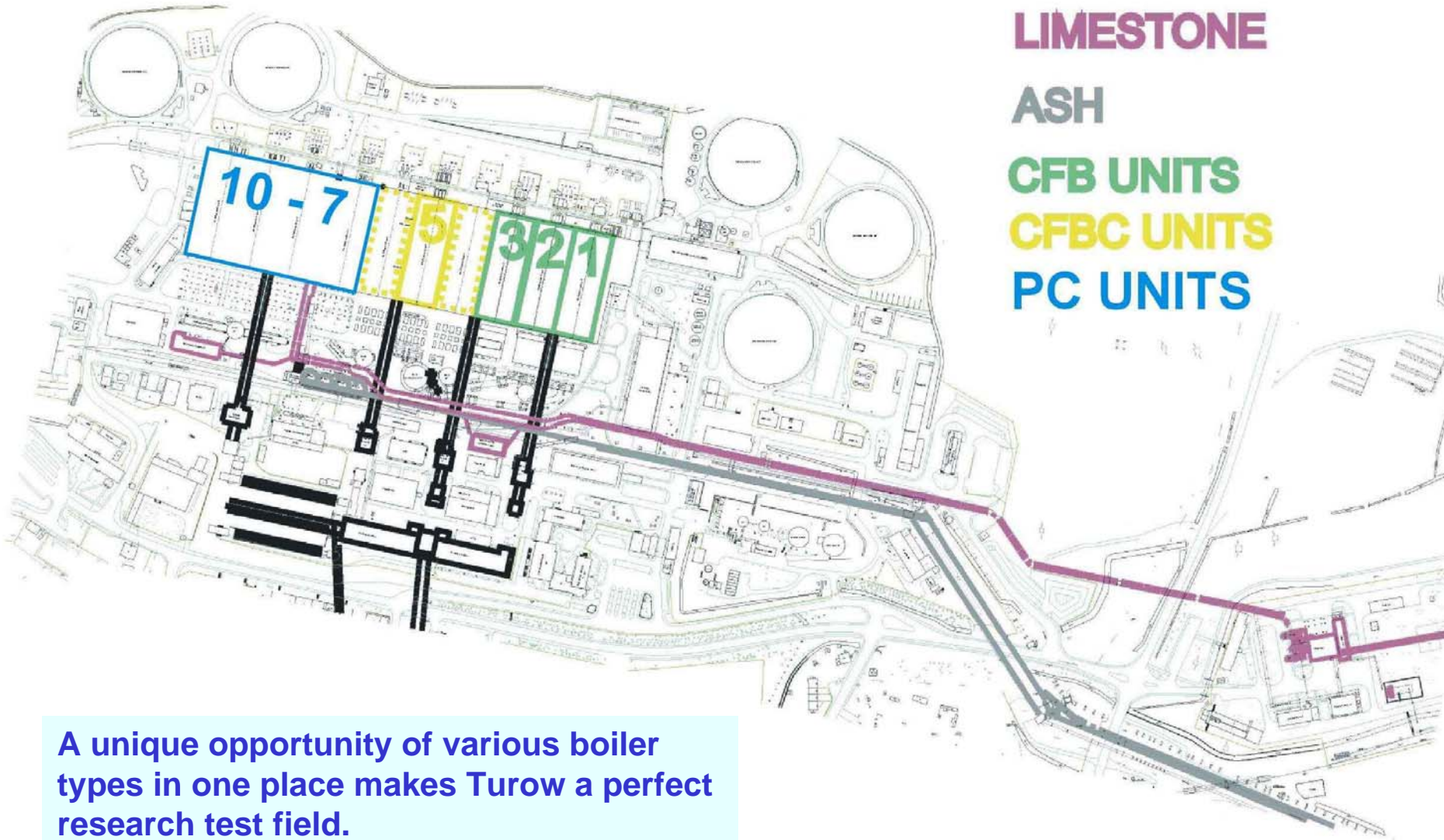
LIMESTONE

ASH

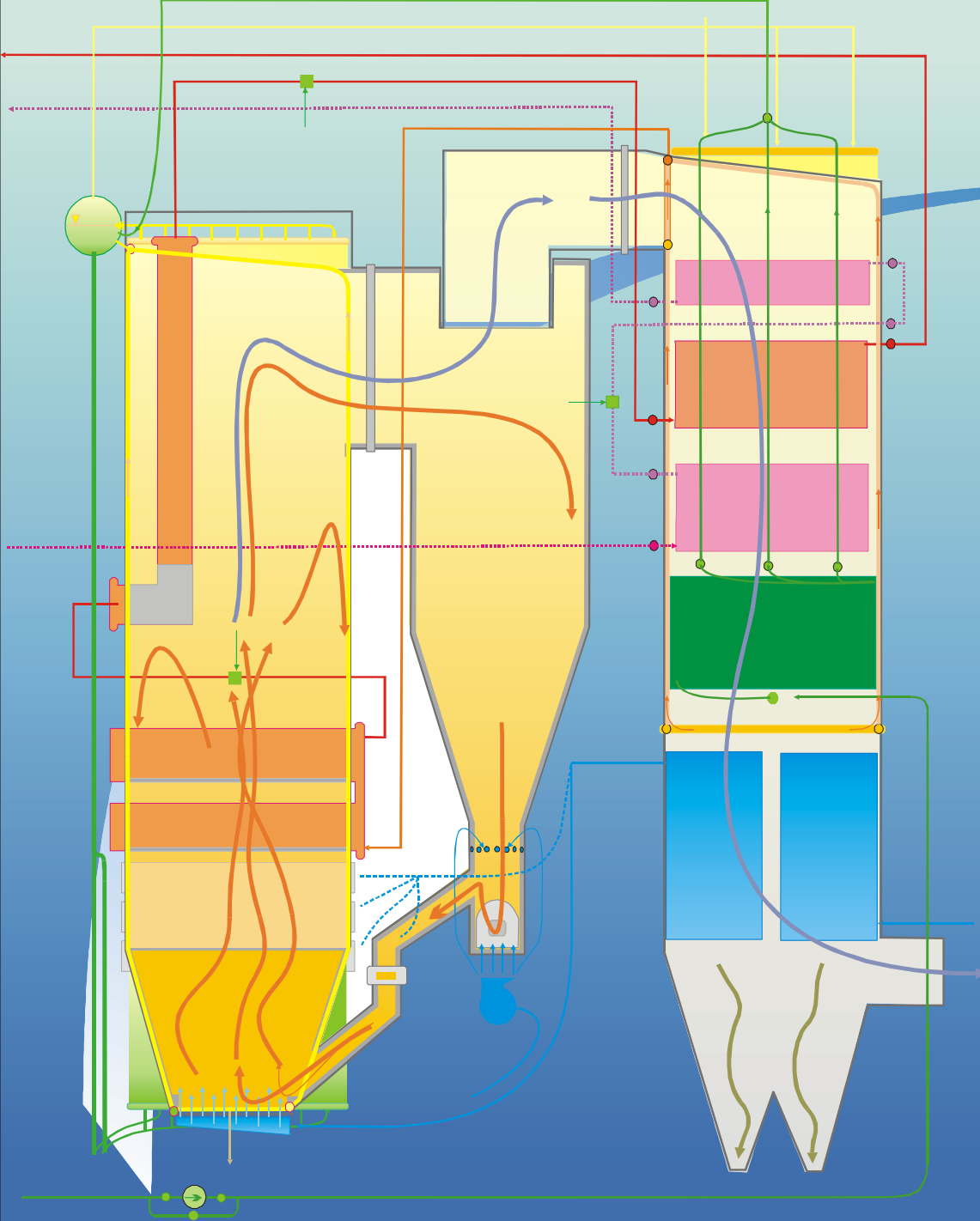
CFB UNITS

CFBC UNITS

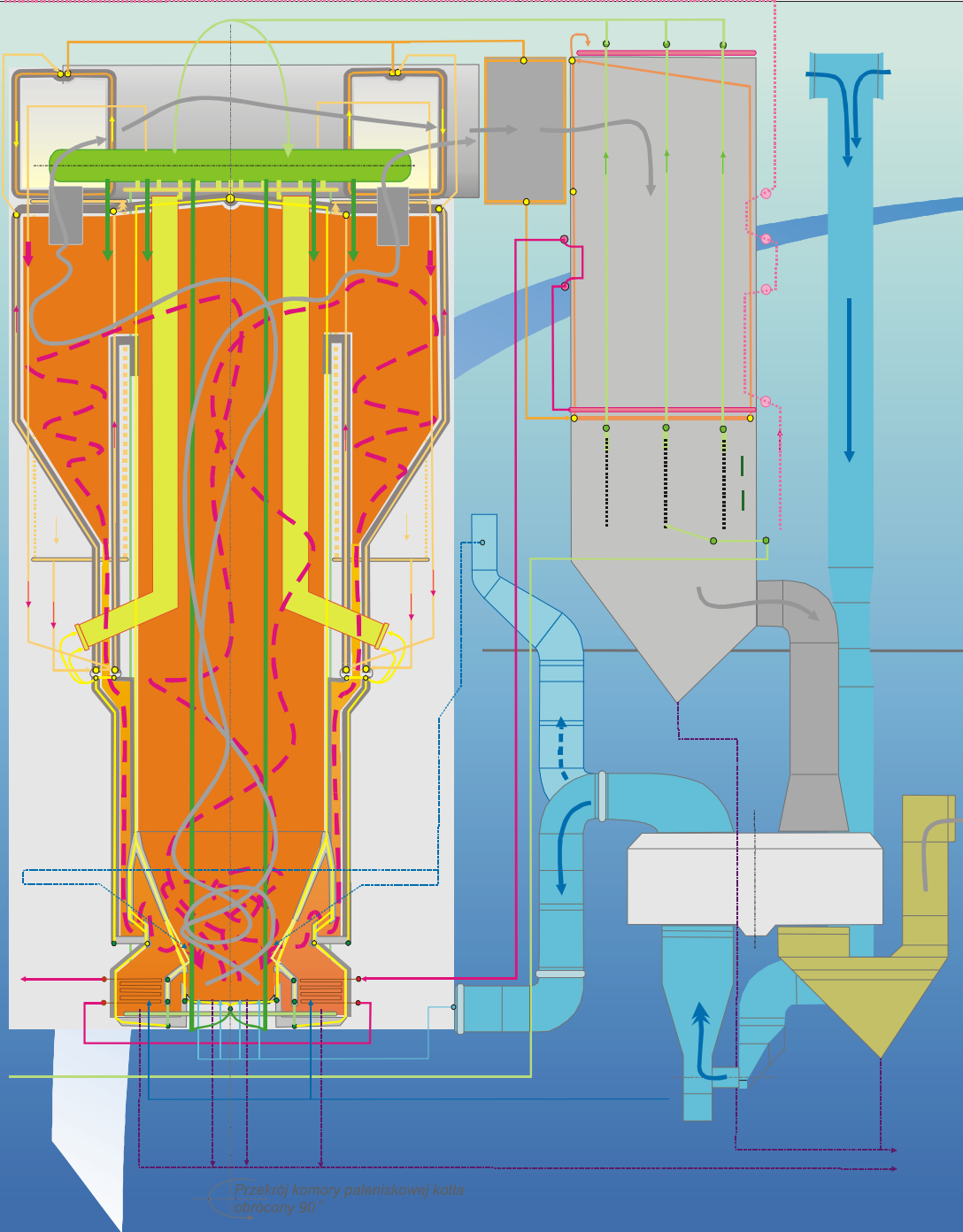
PC UNITS



A unique opportunity of various boiler types in one place makes Turow a perfect research test field.



Units 1 - 2 - 3
Circulating Fluidized
Bed Boilers CFB-670
with Hot Cyclones
steam capacity 670 t/h
steam temperature
 $t = 540/540 \text{ }^\circ\text{C}$
steam pressure
 $p = 13,17 / 2,45 \text{ MPa}$
efficiency $\eta = 90\%$
Power rating: 235 MWe



Przekrój komory paleniskowej kotła
obrócony 90°

Units 4 - 5 - 6 Compact Boiler with Circulating Fluidized Bed

steam capacity 704 t/h

steam temperature

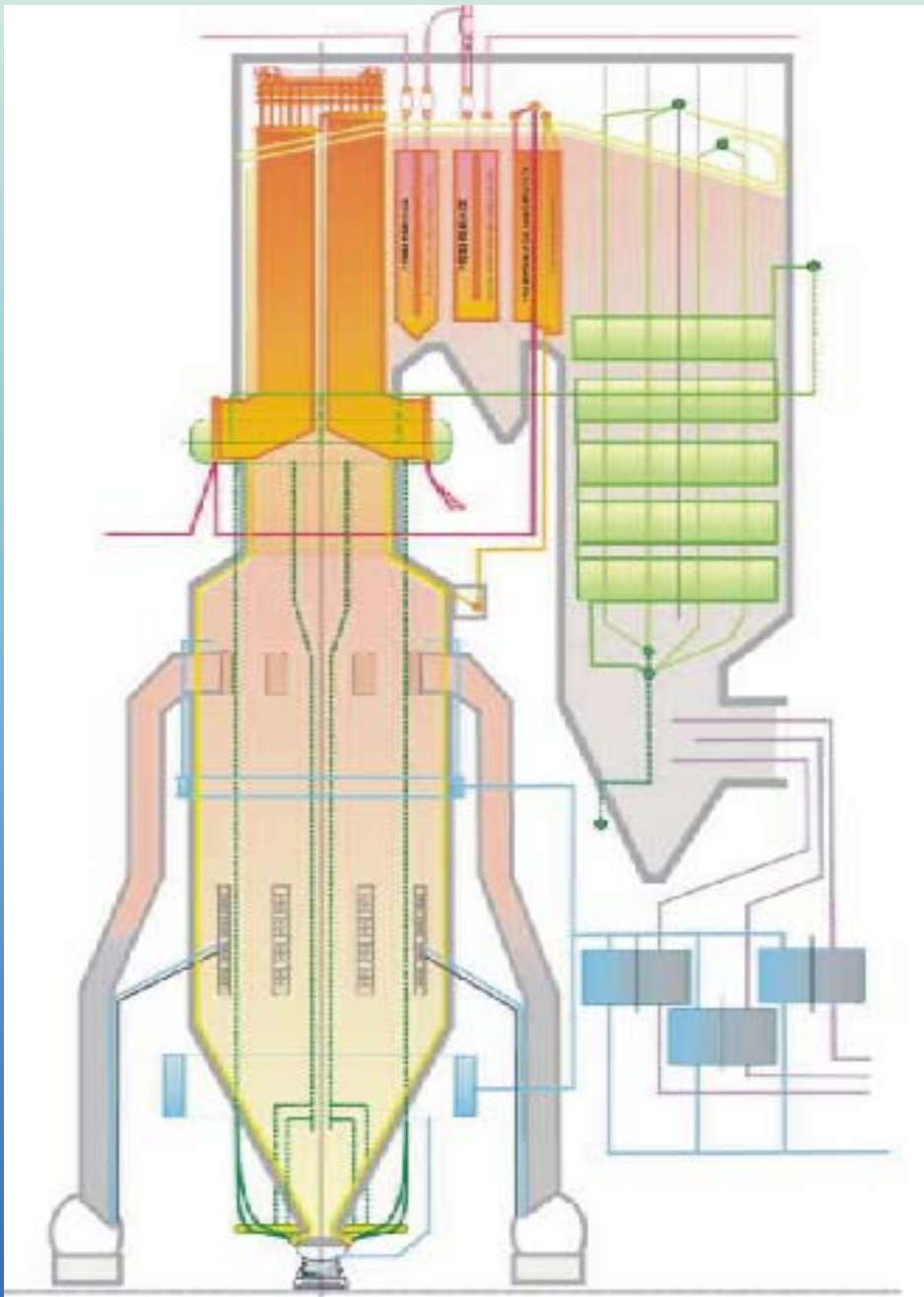
$t = 565/565 \text{ } ^\circ\text{C}$

steam pressure

$p = 16,65 / 3,85 \text{ MPa}$

efficiency $\eta = 91\%$

Power rating: 260 MWe



Units 8 - 9 - 10
Pulverized Coal Boiler
steam capacity 650 t/h
steam temperature
 $t = 540/540 \text{ } ^\circ\text{C}$
steam pressure
 $p = 13,5 / 2,4 \text{ MPa}$
efficiency $\eta = 85,5\%$

BOILER TYPE 	<i>K 1 - 3</i>	<i>K 4 - 6</i>	<i>K 8 - 10</i>
	<i>CFB 670</i>	<i>compact</i>	<i>OP 650 b</i>
Power output (electric) [MW]	235	260	206
Live steam			
- mass flow [kg/s]	185,4	195,5	180,5
- pressure [MPa]	13,17	16,65	13,5
- temperature [°C]	540	565	540
Reheat steam			
- mass flow [kg/s]	165,5	180,7	162,5
- pressure [MPa]	2,45	3,85	2,4
- temperature [°C]	540	565	540
Feed water			
- temperature [°C]	242	250	240
Flue gas (stack)			
- temperature [°C]	157	130	160
Lignite mass flow [kg/s]	71,3	73,7	68,1
Limestone mass flow [kg/s]	3,8	4,0	5,6
Efficiency (η) [%]	90	91	85,5
Emissions limits at O₂ =6% (Polish standards)			
	limits / performance	limits / designed	limits/ performance, units 8 ÷ 10
NO_x [mg/Nm³]	400 / 260 ÷ 370	400 / 371	450 / 280 ÷ 390
SO₂ [mg/Nm³]	400 / 30 ÷ 270	400 / 347	2500 / 1150
CO [mg/Nm³]	200 / traces	200 / 150	250 / ~ 15
dust [mg/Nm³]	200 / = 50	200 / 50	225 / ~ 22

Power Units Lifetime Expectation

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1													2035
2													2035
3													2035
4		01-10-2003											2035
5	20-03-2003												2035
6	01-03-2002			01-02-2005									2035
7		01-07-2003											
8									01-01-2010				
9											01-01-2012		
10												01-01-2013	

