Elektrownia Bełchatów

KWB SA Kopalnia Węgla Brunatnego Bełchatów

POLE

KOPALNIA WĘGLA BRUNATNEGO Turów S.A.

BOT GÓRNICTWO I ENERGETYKA SA

Strategic Assets of the State Treasury

Location of the BOT generation assets in Poland

BOT market share in Poland

- Market share in terms of volume (40,4 TWh);
  - **27,3%**
- Fuel market share within energy industry in terms of volume (358 000 TJ);
  - **23,9%**

2002 data

Zródlo: „Informacja o rynku...” ARE, W-wa 2004

Assets of the BOT Group as of today

BOT Górnictwo i Energetyka S.A.

Mines

1. KWB „Belchatów” S.A.
Lignite mine

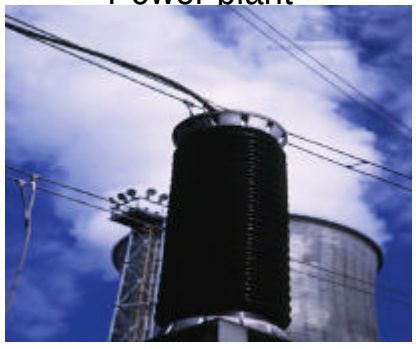
2. KWB „Turów” S.A.
Lignite mine

Power plants

1. Elektrownia „Belchatów” S.A.
Power plant

2. Elektrownia „Opole” S.A.
Power plant

3. Elektrownia Turów S.A.
Power plant



Rationale and strategic aims for „BOT”

- To set up strategic assets, which will guarantee power industry reliability and proper functioning of the energy market in Poland;
- To set up a company, which will successfully compete on the liberalised energy market in Poland and will be able to keep a leader’s position on the market;
- To improve a competitive position of the particular assets, of which BOT Group consists, taking into account Poland’s EU accession;
- To provide a stable basis for a development and modernisation of the generating assets;
- Initial Public Offering of the minority stakes of BOT Górnictwo i Energetyka S.A. in 2006 (at Warsaw Stock Exchange);

Zródlo: „Ocena realizacja i korekta...” MG, W-wa 2002

BOT Group amongst other companies in Poland

Sales revenues (2003)	[billion PLN]
PKN	33,7
TPSA	18,3
PZU S.A. GK	15,4
PSE S.A.	15,3
Metro Group	11,6
Grupa Lotos S.A.	8,4
PGNiG S.A.	8,3
Kompania Weglowa S.A.	7,6
Polskie Huty Stali S.A. GK	7,4
PKO BP S.A.	7,4
Grupa BOT	6,8
PZU Zycie S.A.	6,6

Employment (2003)	['000]
Poczta Polska	100,7
Kompania Weglowa S.A.	76,9
PKP Cargo S.A.	49,3
PKP Polskie Linie Kolejowe S.A.	45,8
TP S.A.	42,6
PKO BP S.A.	36,5
Lasy Panstwowe P.P.	26,8
Katowicki Holding Weglowy S.A.	23,6
Grupa BOT	23,2
PKP Przewozy Regionalne	20,8
Jastrzebska Spólka Weglowa	19,8
Impel S.A. GK	19,1

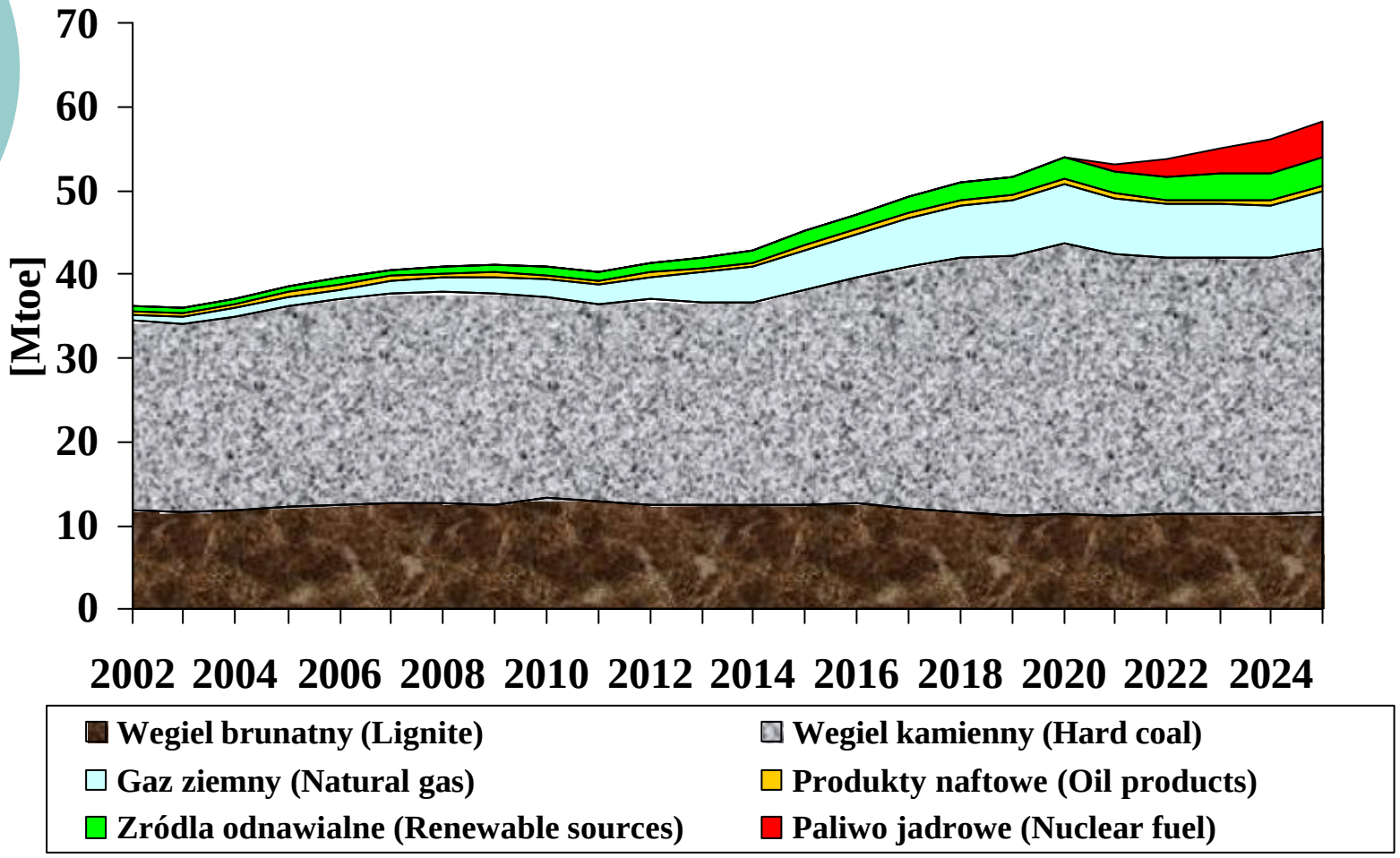
Zródlo: „Lista 500 Polityka...” W-wa 2004

BOT Group amongst other energy companies in Europe

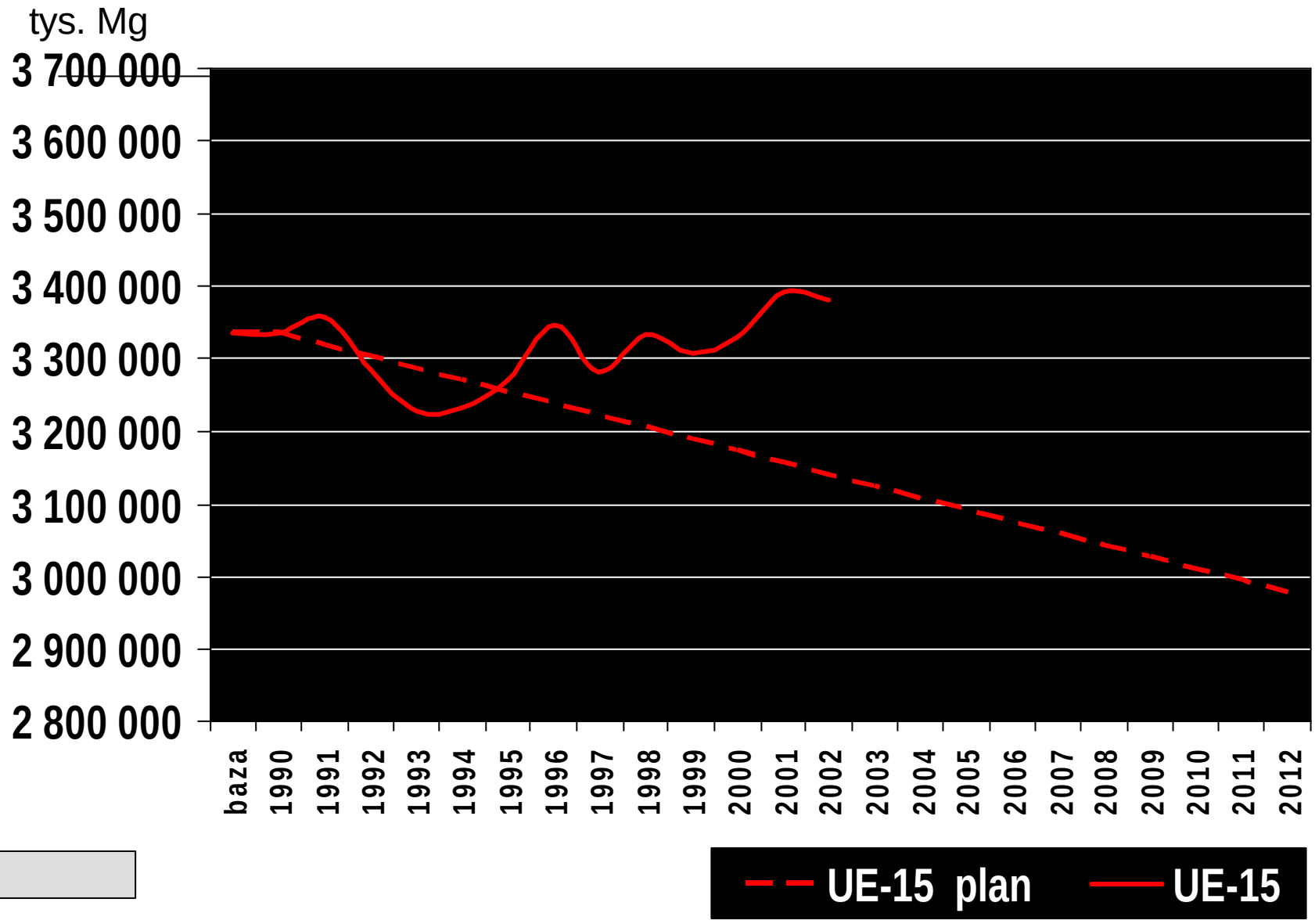
	Capacity installed	Annual output	Employment	Number of customers
	[GW]	[TWh]	['000]	[million]
E.ON	44,3	173,4	56,9	26,0
RWE	42,0	183,5	69,4	17,0
Vattenfall	39,9	158,5	34,3	10,5
CEZ	11,2	54,1	7,7	3,3
BOT	**8,0**	**40,4**	**23,1**	**???**

Zródlo: „Raporty roczne spólek...” 2002

Forecast of fuel input for electricity generation in Poland



CO_2 Emissions - 1990-2002

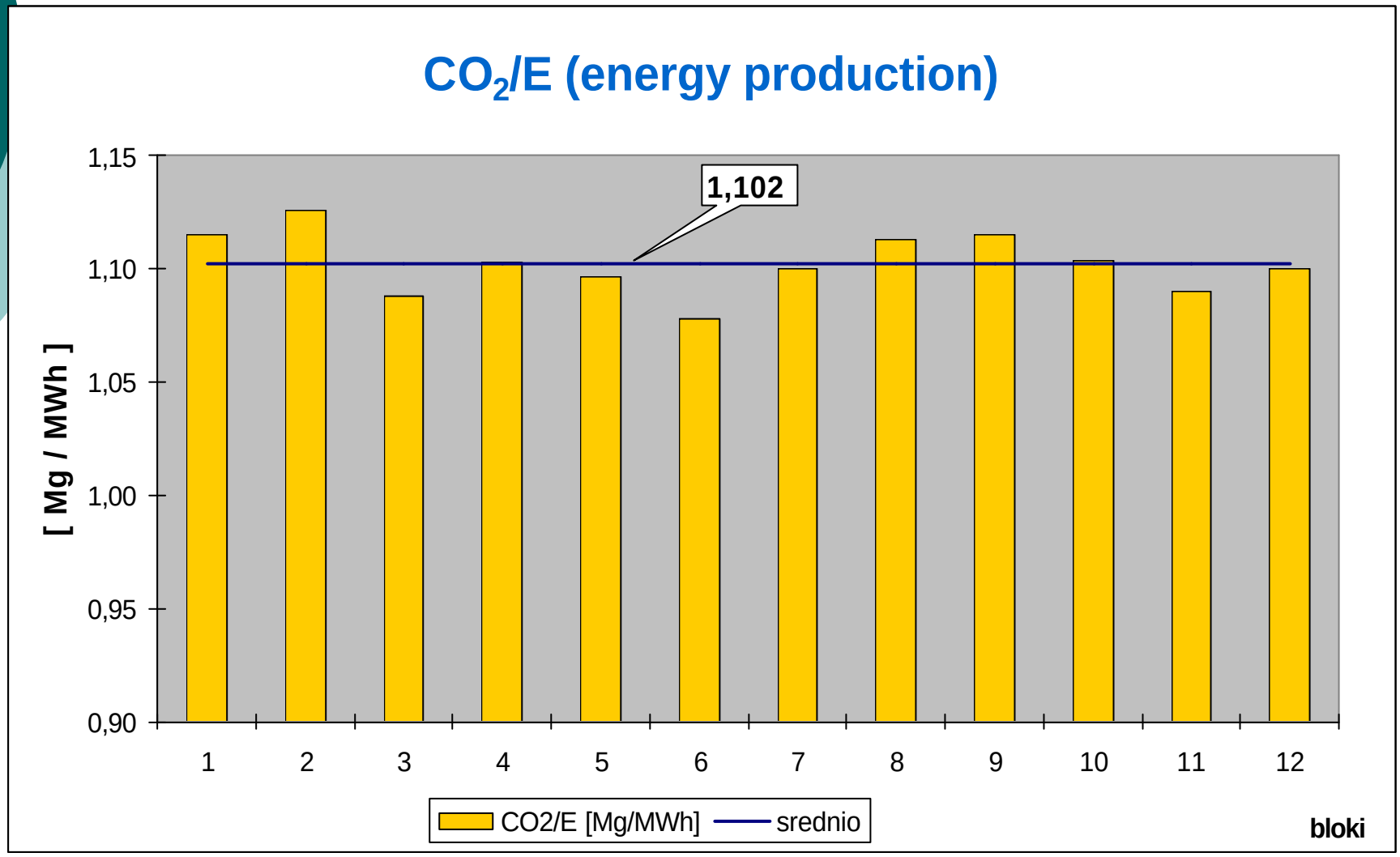


BOT – „lignite based" benchmarks

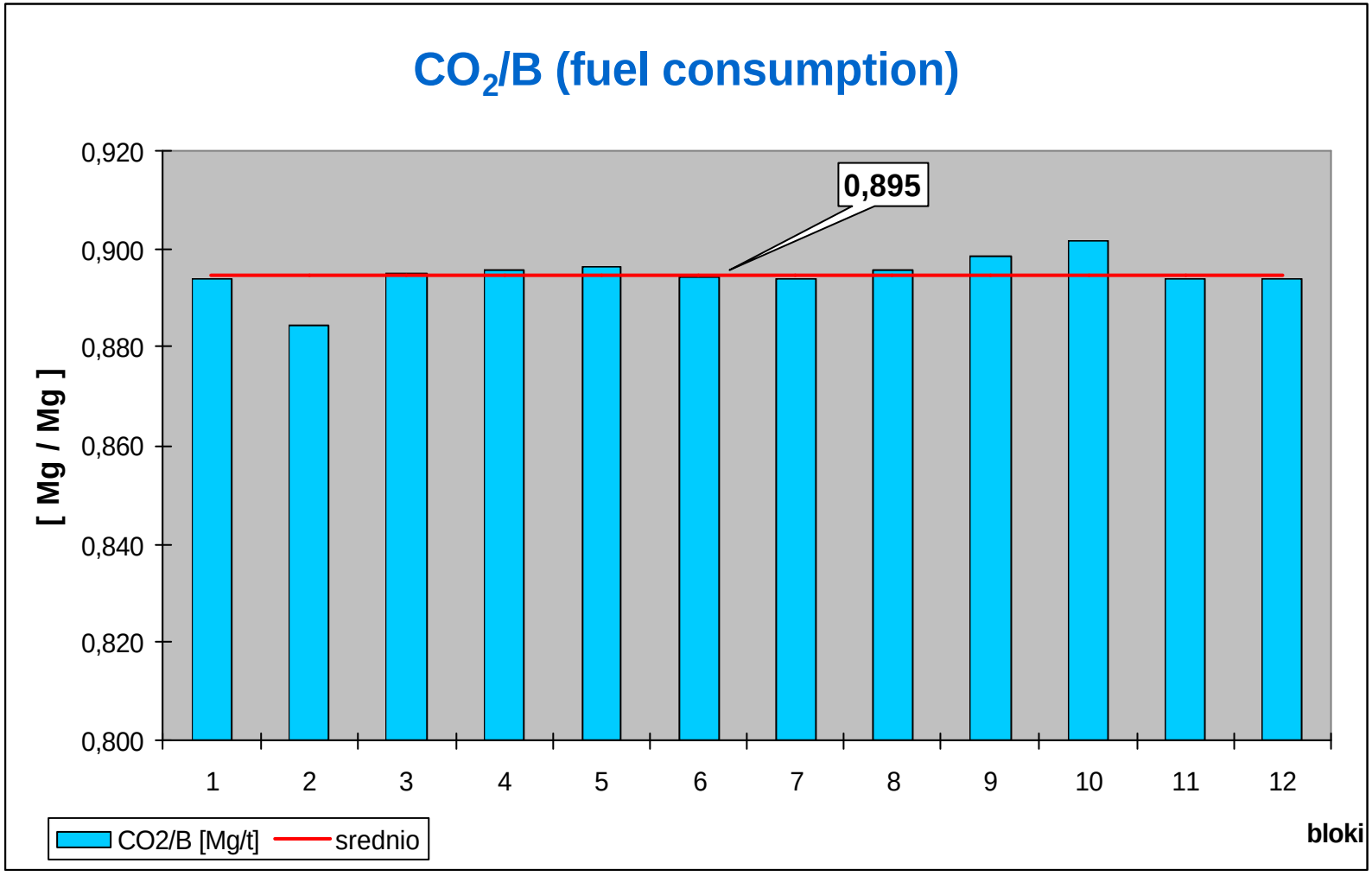
„Benchmark value" depends on:

- specific emissions value for the best available technology in that type of installation;
- fuel quality (Caloric value 8767-10402 kJ/kg),
  (Ash contents 12,0-22,3 %),
  (Sulphur contents 0,32-0,864)%
- plant & installation specific data (Net efficiency: 34,3% 36,4% 33,7%
- utilisation of the installed capacity 70,8% 57,7% 65,4%
- Operator obligations for environmental report preparation on the characteristic features of the installation – BAT demonstration (IPPC Directive);

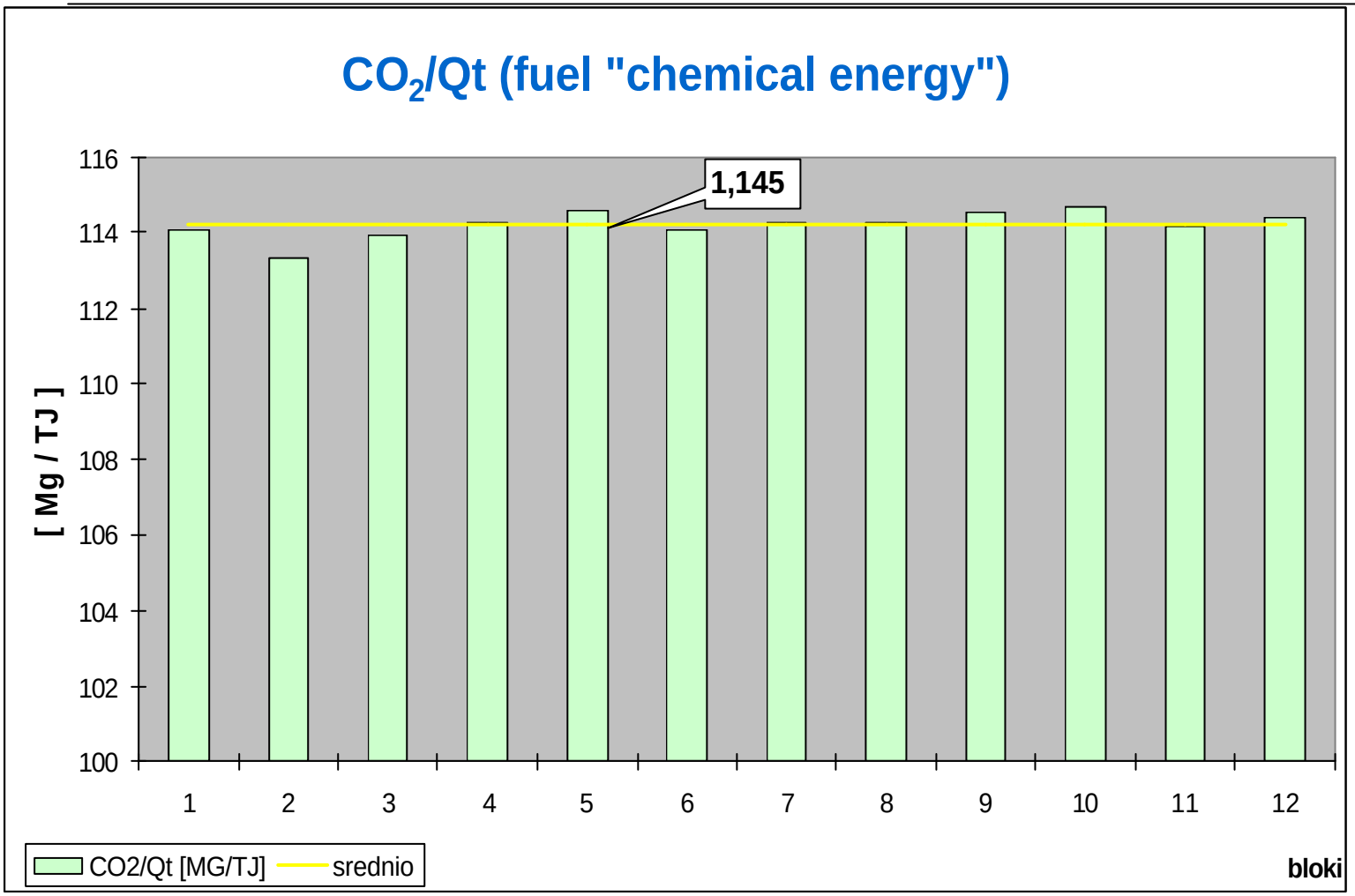
BOT – „lignite based” benchmarks



BOT – „lignite based” benchmarks



BOT – „lignite based” benchmarks



BOT – „lignite based” benchmarks

- Right after modernisation finalisation CFBC units:
  - CFB-670 (Units # 1-3)
    950÷980 gCO_2/kWh
  - CFB OF 697 „COMPACT” (Units # 4-6)
    950÷980 gCO_2/kWh
- „existing units” (# 8-10 no modernisation):
  1200÷1240) gCO_2/kWh
- above mentioned power generation units based on lignite & follows BAT (description made based on IPPC requirements included in Integrated

BOT – „lignite based” benchmarks
Conclusions:

- CO_2 emissions allocation based on benchmarks metodology could be very dengerous for lignite based units, because of impossible fuel composition prediction;
- Scale of problem rise up, because there is no way for „better quality fuel” delivery (straight connections between power plant & mine) via belt conveyors;
- 340-750 g CO_2/kWh – can’t be treated as „European common reference benchmark”;

BOT – „lignite based" benchmarks
Conclusions:

- Considered (above mentioned) benchmark values (source: Germany) can't be achieved by the existing units, also for this, right after moderniosation finalisation process;
- CO_2 emissions „new allocations" will be most important determinant for production level in the power generation sector for the next few years;
- Fuel (lignite) quality flouctuation has straigt & most important connection with CO_2 emissions levels (compared with generation efficiency & burning process);

BOT – „lignite based” benchmarks
Conclusions:

- Site / installation load factors have to be one of the impotrant factors during „banchmarks methodology” processing;
- More pressure on „..all sectors equal treating difficulties...” – necessary;
- Differntiation by process to be considered in power generation sctor;

P.S. !!!!

LCP DIRECTIVE:

REQUIREMENTS for existing power plants, capacity > 500 MWt !!!

DIRECTIVE LCP: REQUIREMENTS for existing power plants, capacity > 500 MWt

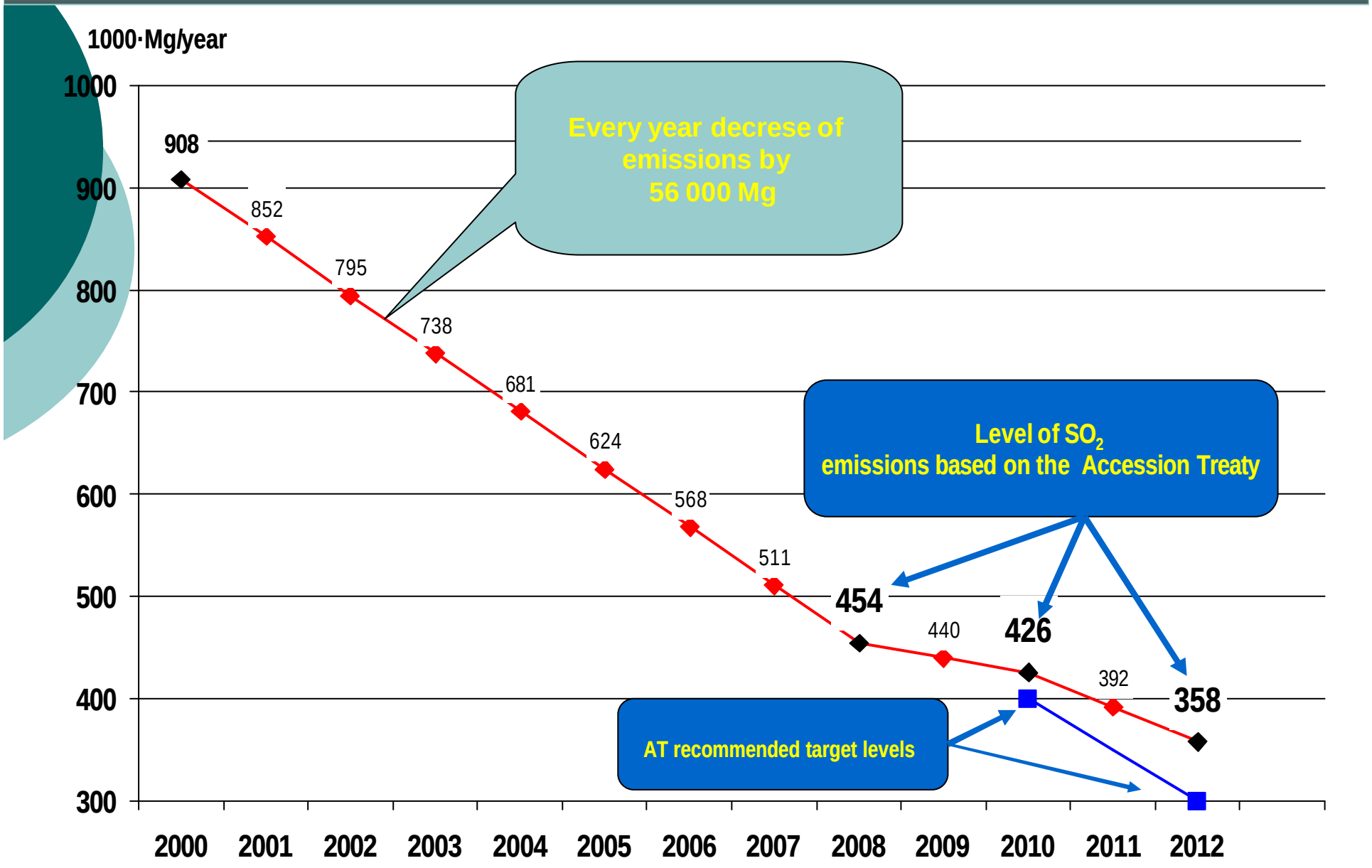
1.01.2008

- SO_2 – 400 mg/Nm^3
- NO_x – 500 mg/Nm^3
- Ash – 100 mg/Nm^3 (50*)

1.01.2016

- NO_x – 200 mg/Nm^3,

Schedule of decreasing SO_2 emissions for LCP plants



SO2 limits for large combustion plants:

- Poland is to decrese the emission from its power industry and it should reach the following levels in **‘000 tonnes p.a.** : 454 in 2008, 400 in 2010, and 300 in 2012 respectively;

- Emission from the power industry is not allowed to be higher than in **‘000 tonnes p.a.** : 454 in 2008, 426 in 2010, and 358 in 2012 respectively.

Address of the company

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