



Hard Coal Reserves and Resources in Poland and Relationship to UNFC-2009

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1. Poland has 3 coal basins of carboniferous age
 - Lower Silesia Basin (totally abandoned)
 - Upper Silesia Basin (main producing center of coal in Poland)
 - Lublin Basin (only 1 mine, but huge)
2. The main role plays Upper Silesia Coal Basin, where the deposits of coal have been extracted from the end of XVII century. This basin is characterized by the greatest number of developed and undeveloped coal deposits and quantity of reserves and resources of steam and coking coal, sporadically anthracite.



Hard coal and lignite deposits in Poland (PGI-NRI)

3. According to main direction of use of the hard coal, it has been classified into 3 main groups:
 - steam (energetic) coal (31-33 and 38 types of old polish coal classification)
 - coking coal (34-37 types of old polish coal classification)
 - anthracite (41, 42 types of old polish coal classification)
4. The relation between Polish and UNFC Classification of reserves and resources has been indicated very well by Marek Nieć at many papers and presentations. We have used it as a one basic point for this presentation.
5. The Polish classification uses hierarchic system of category of reserves and resources.

prognostic 334 and
perspective 344 resources

uneconomic reserves at the known extracted
and undeveloped deposits (32&33)

economic reserves at the extracted
and undeveloped deposits (22&23)

available reserves only at
the extracted and preparing
to extraction deposits (21&31)

extractable – only
at the extracted
deposits (11)

Total geological reserves

Total geological resources of hard coal

Total geological resources = total geological reserves + prognostic and perspective resources

Total geological reserves = economic + uneconomic reserves

Economic reserves = available + unavailable reserves

Available reserves = extractable + losses

Extractable reserves only at developed and/or preparing to extraction deposits

The reserves and resources of hard coal in the Upper Silesia Coal Basin at the end of 2008

Company/category of Polish Classification	Polish classification		UNFC Classification		Remarks
	Steam coal	Coking coal	Steam coal	Coking coal	
A. EXTRACTED DEPOSITS					
1) Coal Company SA - 16 deposits					
number of deposits	16	13			
economic	4 737 927	3 445 812	22 (1,2,3)	22 (1,2,3)	resources
uneconomic			32 (1,2,3)	32 (1,2,3)	resources
available	1 224 293	1 210 307	21 (1,2,3)	21 (1,2,3)	resources
non-available	3 513 634	2 235 505	31 (1,2,3)	31(1,2,3)	resources
extractable	726 240	714 509	11 (1,2,3)	11 (1,2,3)	reserves
2) Katowice Capital Group - 6 deposits					
number of deposits	6	4			
economic	2 263 490	136 101	22 (1,2,3)	22 (1,2,3)	resources
uneconomic			32 (1,2,3)	32 (1,2,3)	resources
available	422 122	6 031	21 (1,2,3)	21 (1,2,3)	resources
non-available	1 841 368	130 070	31 (1,2,3)	31 (1,2,3)	resources
extractable	228 488	18 811	11 (1,2,3)	11 (1,2,3)	reserves
3) Jastrzębska Coal Company SA - 6 deposits					
number of deposits	2	6			
economic	144 710	2 129 252	22 (1,2,3)	22 (1,2,3)	resources
uneconomic			32 (1,2,3)	32 (1,2,3)	resources
available	10 571	293 247	21 (1,2,3)	21 (1,2,3)	resources
non-available	134 139	1 836 005	31 (1,2,3)	31 (1,2,3)	resources
extractable	6 475	177 864	11 (1,2,3)	11 (1,2,3)	reserves

The reserves and resources of hard coal in the Upper Silesia Coal Basin

Company/category of Polish Classification	Polish classification		UNFC Classification		Remarks
	Steam coal	Coking coal	Steam coal	Coking coal	
4) Southern Coal Company of Tauron Group - 2 deposits					
number of deposits	2	0			
economic	2 150 840	-	22 (1,2,3)	22 (1,2,3)	resources
uneconomic		-	32 (1,2,3)	32 (1,2,3)	resources
available	629 942	-	21 (1,2,3)	21 (1,2,3)	resources
non-available	1 520 898	-	31 (1,2,3)	31 (1,2,3)	resources
extractable	127 320	-	11 (1,2,3)	11 (1,2,3)	reserves
5) ZG Siltech Ltd. - 1 deposit					
number of deposits	1	1			
economic	8 682	1 154	22 (1,2,3)	22 (1,2,3)	resources
uneconomic		-	32 (1,2,3)	32 (1,2,3)	resources
available	6 916	-	21 (1,2,3)	21 (1,2,3)	resources
non-available	1 766	-	31 (1,2,3)	31 (1,2,3)	resources
extractable	2 033	-	11 (1,2,3)	11 (1,2,3)	reserves
TOTAL OF EXTRACTED DEPOSITS - 31 deposits					
number of deposits	27	24			
economic	9 305 649	5 712 319	22 (1,2,3)	22 (1,2,3)	resources
uneconomic			32 (1,2,3)	32 (1,2,3)	resources
available	2 293 844	1 509 585	21 (1,2,3)	21 (1,2,3)	resources
non-available	7 011 805	4 201 580	31 (1,2,3)	31 (1,2,3)	resources
extractable	1 090 556	911 184	11 (1,2,3)	11 (1,2,3)	reserves

The reserves and resources of hard coal in the Upper Silesia Coal Basin

Company/category of Polish Classification	Polish classification		UNFC Classification		Remarks
	Steam coal	Coking coal	Steam coal	Coking coal	
B. KNOWN UNDEVELOPED DEPOSITS - 41					
number of deposits	38	21			
economic	13 194 686	4 512 664	23 (1,2,3)	23 (1,2,3)	resources
C. NOT WELL KNOWN UNDEVELOPED DEPOSITS					
prognostic - 23 deposits					
number of deposits	14	17			
resources	4 276 491	3 784 117	334	334	resources
perspective - 18 deposits					
number of deposits	11	13			
resources	14 880 369	2 592 073	344	344	resources

6. In the UNFC Classification the definition of reserves is used only to the group 11, but for the rest definition of resources is used. According to UNFC Classification in the Upper Silesia Coal Basin Poland has **reserves** of:

1 091 Mt of steam coal (11)

911 Mt of coking coal (11)

but the **resources** are as followed:

2 294 Mt of steam coal (21)

1 509 Mt of coking coal (21)

9 306 Mt of steam coal (22)

5 712 Mt of coking coal (22)

13 195 Mt of steam coal (23)

4 513 Mt of coking coal (23)

developed/extracted
deposits

undeveloped deposits

HARD COAL – basic definition of the deposits

	resources	reserves
Depth	1000 m (1250 m)	1000 (1250)
Thickness	min. 1.0 m (economic) 0.6 m (uneconomic)	min. 1.5 m
Calorific value	min. 15.0 MJ/kg (Poland)/17.5 MJ/kg (W Europe)	
Sulphur content	max. 2%	

COAL CLASSIFICATION

1) LIGNITE

calorific value 6.3 – 12.5 MJ/kg/15 MJ/kg (Poland)/ ≥ 17.5 MJ/kg (W Europe)

2) STEAM COAL

calorific value 12.5/15.0 MJ/kg (Poland)/ 17.5 MJ/kg (W Europe)

15.0/17.5 – 23.9 MJ/kg subbituminous coal

23.9 – 29.3 MJ/kg hard steam coal

but 25.1 – 26.0 MJ/kg standard steam coal on market

≤ 12 % of ash

≤ 1 % of total sulphur

≤ 8 % of moisture

3) COKING COAL

29.3 – 35.1 MJ/kg calorific value

≤ 6.9 % of ash

≤ 0.7 % of total sulphur

≤ 8.0 % of moisture

≤ 8.0 % of volatiles

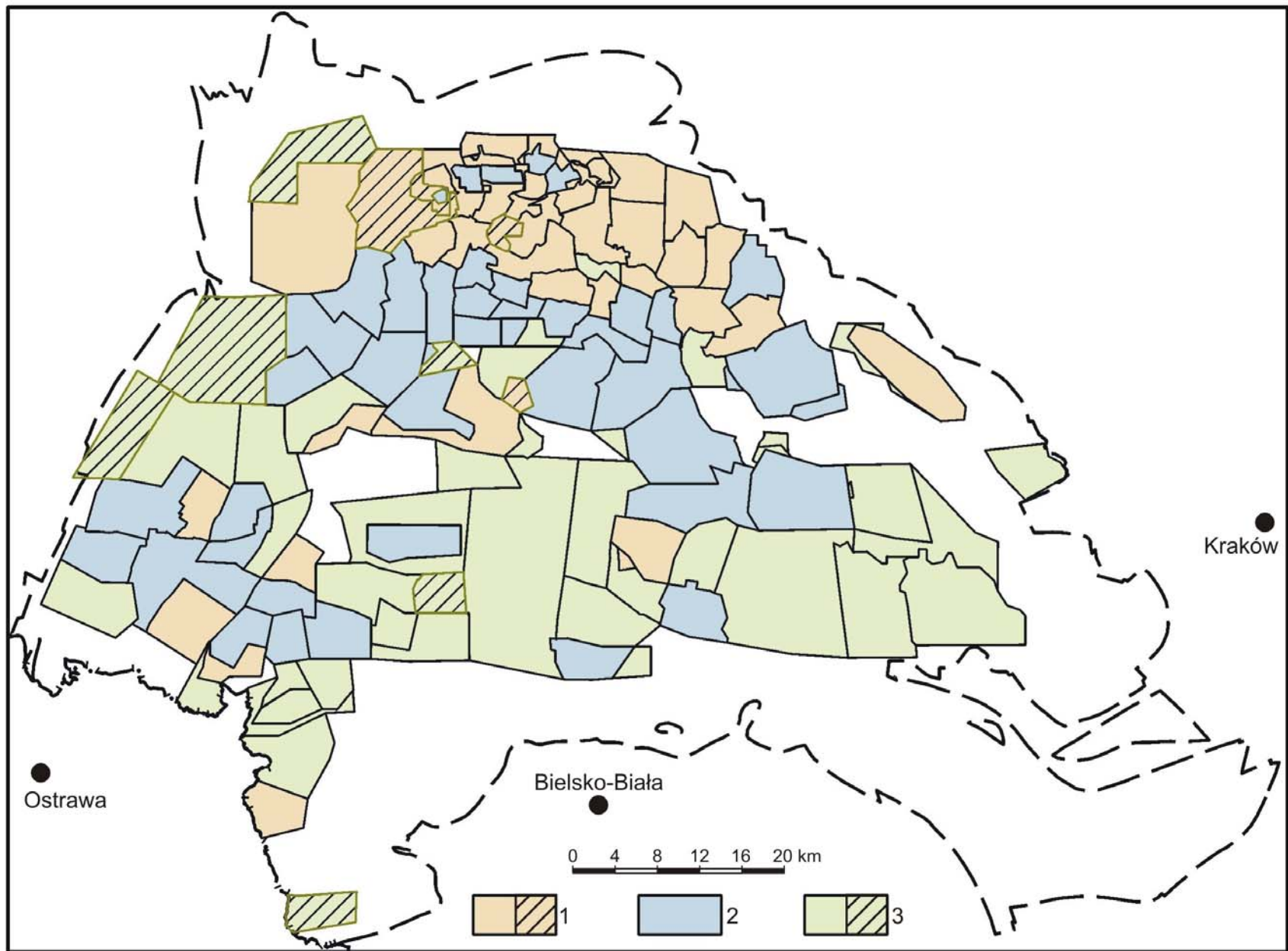
4) ANTHRACITE

≥ 35.1 MJ/kg calorific value

≤ 5.6 % of ash

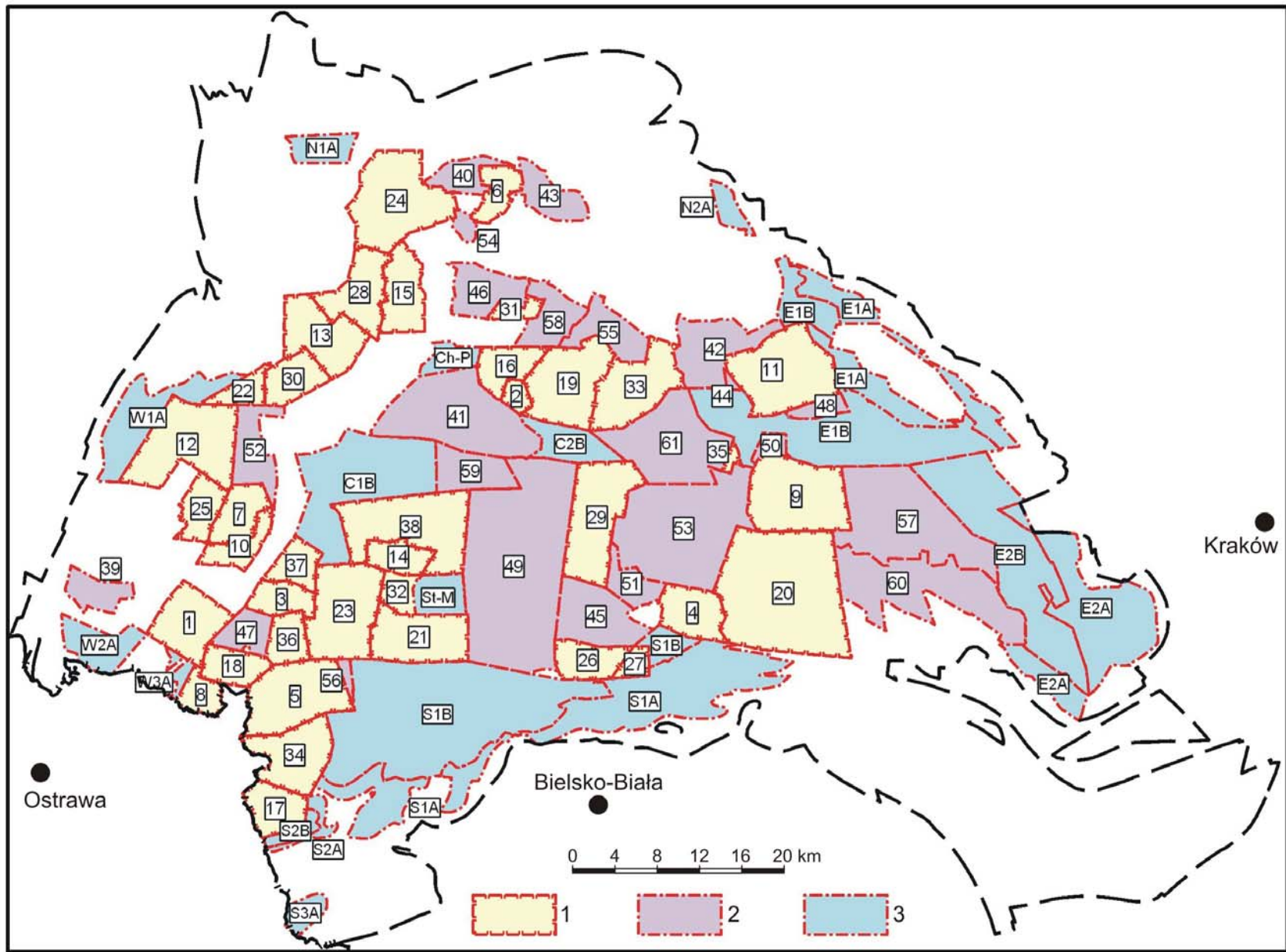
≤ 0.9 % of total sulphur

≤ 7.9 % of volatiles



Known coal deposits in the Upper Silesia Coal Basin (J. Jureczka et al 2010)

1 –abandoned deposits, 2 – extracted deposits, 3 – undeveloped deposits



Areas of the prognostic and perspective resources at the Upper Silesia Coal Basin (J. Jureczka et al. 2010)

1 – prognostic resources, 2 – perspective resources below 1000 m In the areas of known deposits

3 – perspective resources outside of the known deposits