

POLISH and UNFC
RESOURCES and RESERVES
CLASSIFICATION

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General procedure of resources and reserves evaluation consists of two steps:

I Resources evaluation based on exploration data

Approved by governmental administrative body

II Preparation of “Deposit development plan” (prefeasibility-feasibility study) with reserve evaluation

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The competent persons authorized by governmental approval are the only one to prepare Geological documentation of deposit.

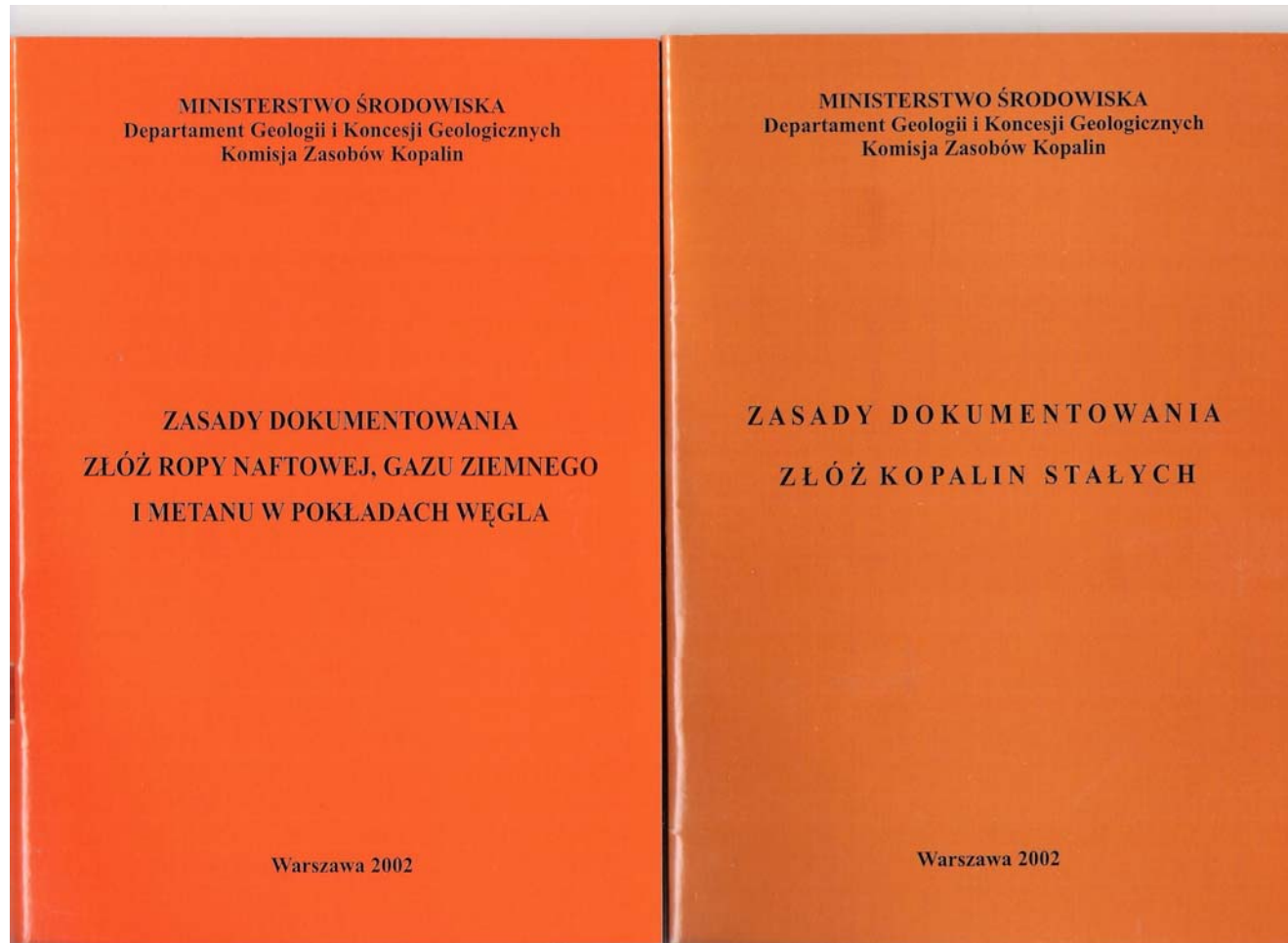
**Exploration results are presented in
“Geological documentation of deposit”**

“Geological documentation” is presented in uniform manner according to the rules prepared by the Commission of Mineral Resources, the advisory body the Ministry of Environment.

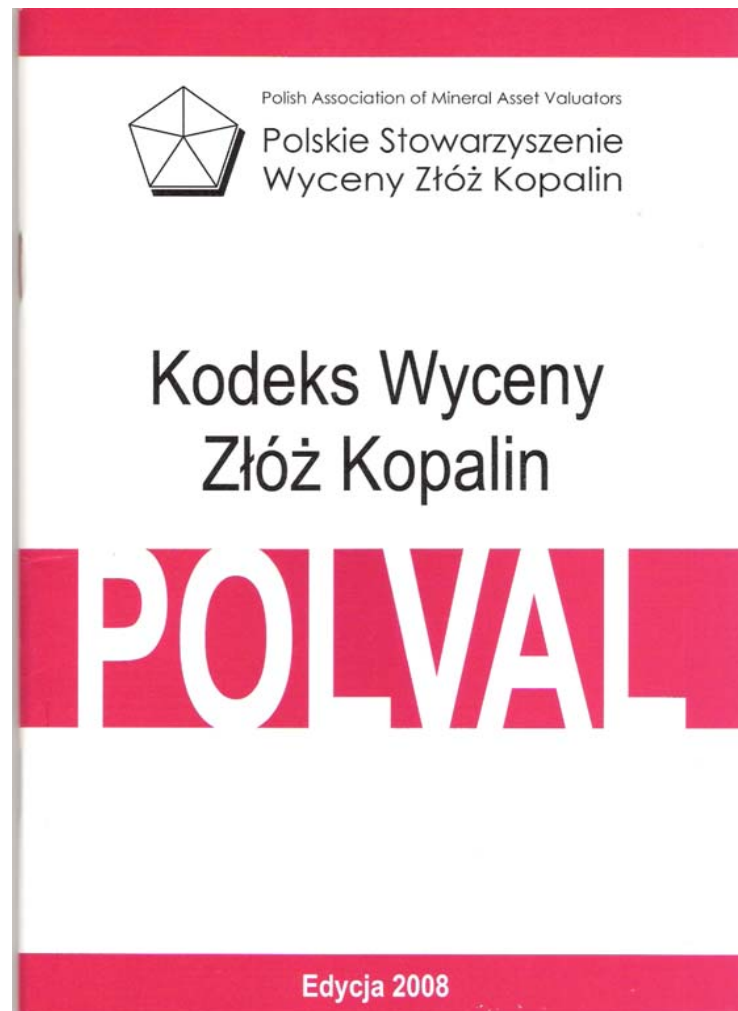
Guidelines for resources evaluation

Hydrocarbons

Solid mineral commodities

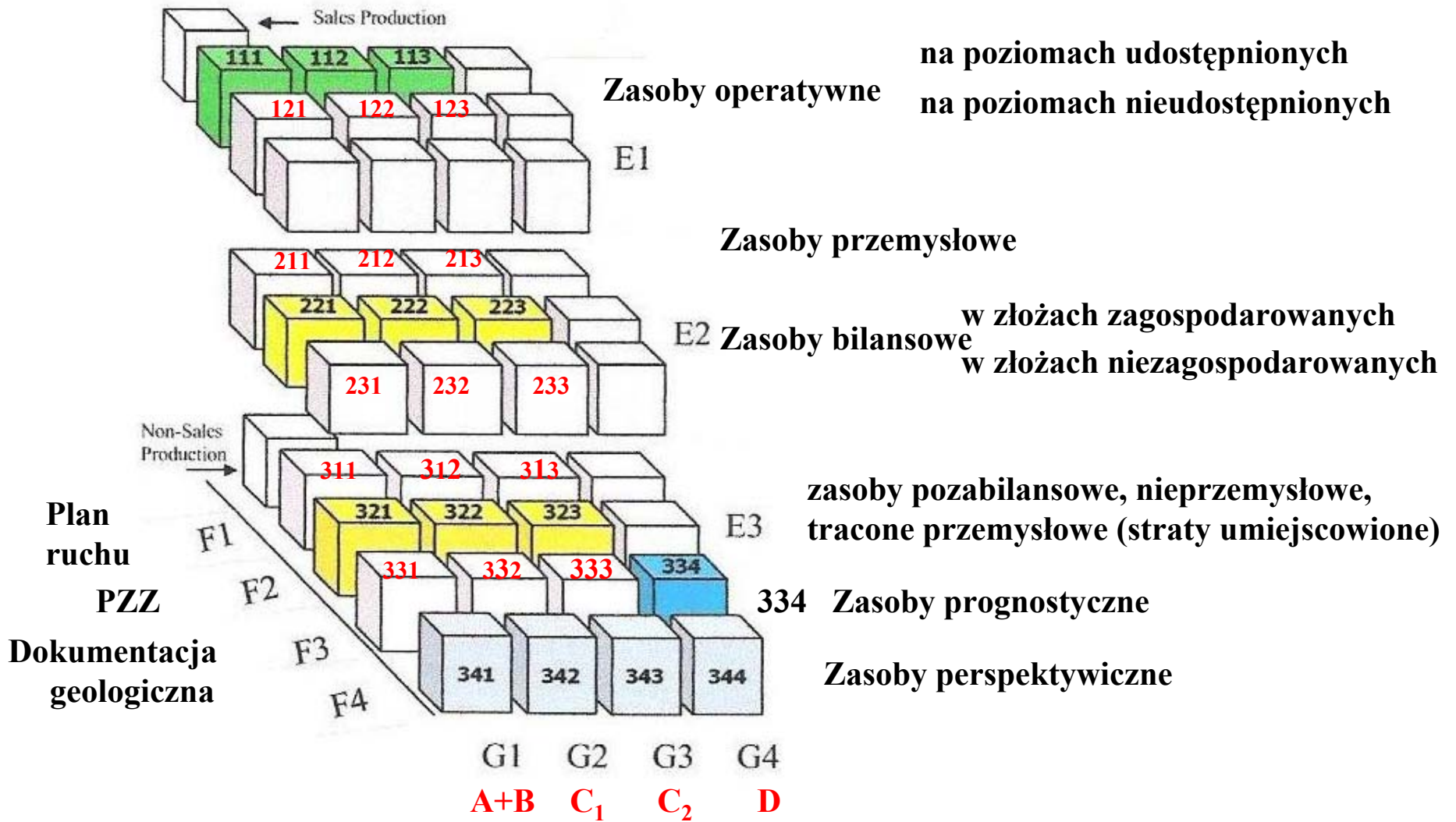


Resources /reserves valuation standards



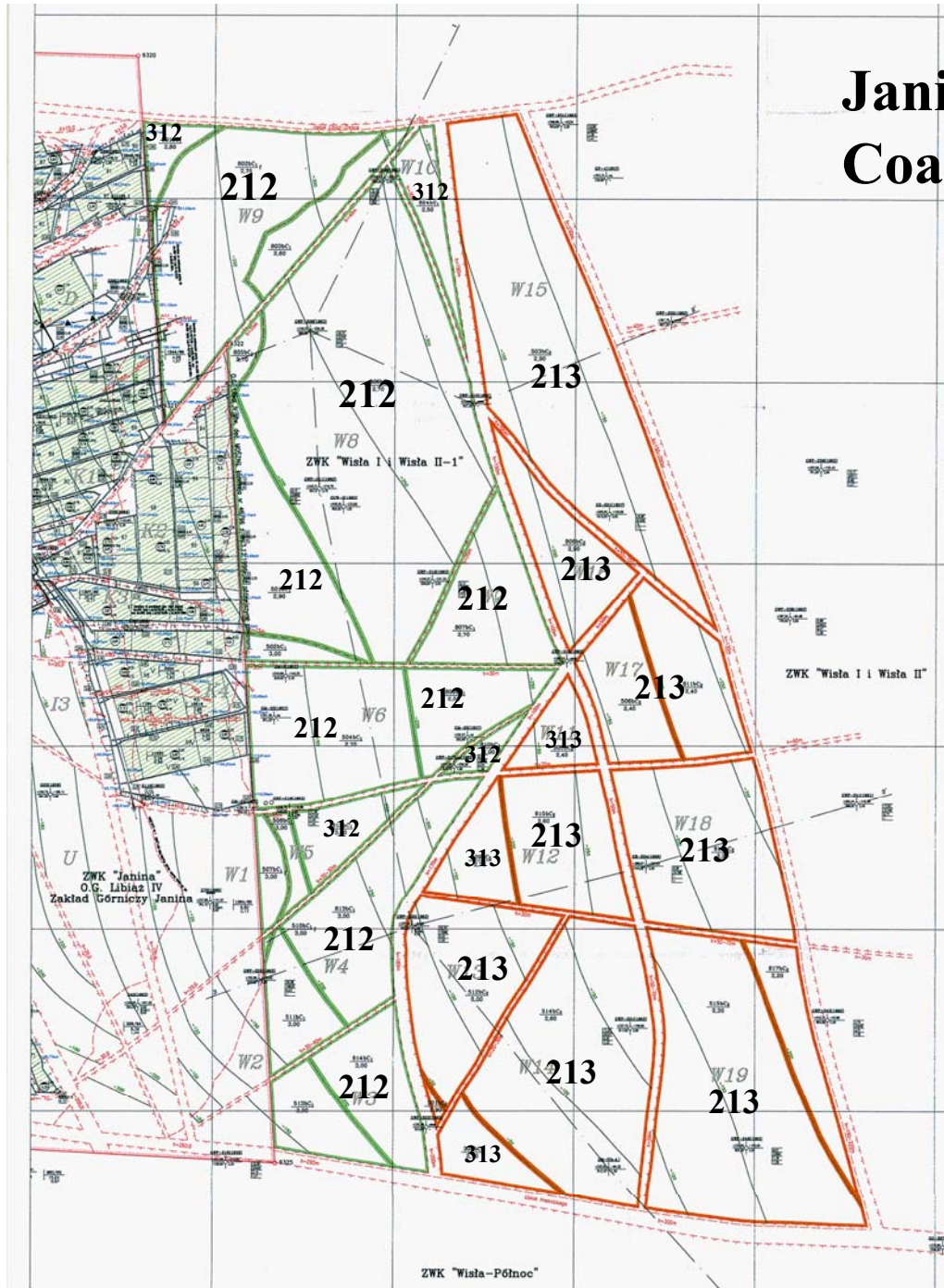
**The general rules of classification of
resources and reserves in Poland are
concordant with the
United Nations Framework Classification
(UNFC)**



Polish classification in the UNFC framework



Polish classification		JORC Code CRIRSCO	PRMS (zasoby wydobywalne)	UNFC 2008		
				Geological report		Feasibility study
				Deposits licensed for mining	Deposits not licensed for mining	
prognostic resources D		Prospecting results	Prospective resources Low, Best, High	2 3 4, 3 3 4		
Anticipated economic („balance”) resources	C ₂ C ₁ A+B	Resources Inferred Indicated Measured	Contingent resources Low, Best,, High	2 2 3 2 2 2 2 2 1	2 3 3 2 3 2 2 3 1	
Anticipated subeconomic („subbalance”) resources	C ₂ C ₁ A+B			3 2 3 3 2 2 3 2 1	3 3 3 3 3 2 3 3 1	3 1 3 3 1 2 3 1 1
„Not industrial” subeconomic resources	C ₂ C ₁ A+B					3 1 3 3 1 2 3 1 1
„Industrial” economic resources	C ₂ C ₁ A+B					2 1 3 2 1 2 2 1 1
Extractable resources	C ₂ C ₁ A+B					1 1 3 1 1 2 1 1 1
Mineable reserves C ₂ C ₁ A+B		Reserves Probable Proved	Reserves Proved, Probable, Possible			

Janina coal mine Coal seam 209



-  Category C₂
-  Category C₁

**Proposal of subdivision of
G axis
experienced in Poland since
several years**

CONFIDENCE OF ESTIMATES

Depends on:

1. **not measurable factors such as data on geological structure of deposit, its boundaries, hydrogeological, geotechnical features etc.** which degree of knowledge increases with the advancement of prospecting/exploration,
2. **accuracy of resources/reserves quantity evaluation**

The both

criteria of subdivision should be combined i.e. the prospecting/exploration stages and confidence (accuracy) of resources/reserves quantity estimates at each stage

Degree of knowledge of deposit features is expressed by subdivision to prospecting/exploration stages, and resources presented as inferred, indicated or measured quantity respectively.

**Accuracy of resources/reserves data are
expressed as possible error limits of its
estimates**

**(calculated with the use of simple probabilistic,
geostatistic or Monte Carlo method).**

Stage of prospecting/exploration	UNFC	CRIRSCO	POLAND		
			Resources/reserves categories	admissible error limit for resources/reserves (at 0,9 confidence level)	
Reconnaissance	G4		D		>40%
Prospecting	G3	Inferred	C	C ₂	30-40%
General exploration	G2	Indicated/probable		C ₁	20-30%
Detailed exploration and exploitation planning	G1	Measured/proved	B		10-20 %
			A		<10%

The “low” (proved), “best” (probable) or “high” (possible) resources/reserves quantity

used for petroleum resources/reserves represent amounts estimated with 90 %, 50% and 10 % probability of existence.

They can be evaluated at any stage of prospecting/exploration.

In Poland we subdivide petroleum/gas resources according to the stage of geological knowledge of deposit into four categories D, C, B, A and at each stage proved (low), probable (best) and possible (high) quantities are evaluated. The probable (best) quantity is officially reported.

The same approach may be used for solid mineral commodities, however in that case only probable (best) quantities are calculated and reported

Proposed subdivision of G axis:

- G1** –Quantities associated with a known deposit which **geological features** are recognized with the high level of confidence
 - G 1.1** proved amounts estimated so, that is at least 90 % probability that quantities existing will equal or exceed this estimate
 - G 1.2** probable amounts estimated so, that is at least 50% probability that quantities existing will equal or exceed this estimate
 - G1.3** possible amounts estimated so, that is at least 10 % probability that quantities existing will equal or exceed this estimate

G2 - Quantities associated with a known deposit which geological features are recognized with the moderate level of confidence can be subdivided to

**G2.1, G2.2 and G2.3
(low, best and high respectively)**

Subdivision of G3 and G4 to G 3.1, G 3.2, G 3.3 and G 4.1, G4.2 and G 4.3 is possible in some cases but could be not recommended

In the case of solid minerals the “best” estimates is commonly used.

CALKOWITA OBJĘTOŚĆ POROWA TOTAL PORE VOLUME	STWIERDZONA OBJĘTOŚĆ POROWA DISCOVERED PORE VOLUME	KOMERCYJNA POJEMNOŚĆ SKŁADOWANIA COMMERCIAL STORAGE CAPACITY	OPERACYJNA POJEMNOŚĆ SKŁADOWANIA OPERATIONAL STORAGE CAPACITY		
			Stwierdzona <i>proved</i>	stwierdzona i prawdopodobna <i>proved and probable</i>	stwierdzona, prawdopodobna i możliwa <i>proved, probable and possible</i>
	TEORETYCZNA I NIEUDOKUMENTOWANA OBJĘTOŚĆ POROWA UNDISCOVERED PORE VOLUME	SUB-KOMERCYJNA POJEMNOŚĆ SKŁADOWANIA SUB-COMMERCIAL STORAGE CAPACITY	WARUNKOWA POJEMNOŚĆ SKŁADOWANIA CONTINGENT STORAGE CAPACITY		
			niskie oszacowanie <i>low estimate</i>	optymalne oszacowanie <i>best estimate</i>	wysokie oszacowanie <i>high estimate</i>
	MOŻE BYĆ W PRZYSZŁOŚCI KOMERCYJNA	PERSPEKTYWICZNA POJEMNOŚĆ SKŁADOWANIA PROSPECTIVE STORAGE CAPACITY	niskie oszacowanie <i>low estimate</i>	optymalne oszacowanie <i>best estimate</i>	wysokie oszacowanie <i>high estimate</i>

←————— Zakres niepewności —————→