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CLASSIFICATION AND PROTECTION OF HARD COAL DEPOSIT RESOURCES IN POLAND

The paper presents some methods used to document and classify mineral resources in Poland basing on the deposits of hard coal. Furthermore, Polish classification of the resources is compared with United Nations Framework Classification for Energy and Mineral Resources (UNFC), and a legal method of protecting deposit resources is also presented.

Рассматриваются методы документирования и классификации полезных ископаемых Польши на примере месторождений каменного угля. Приводится сравнение польской системы классификации с базовой классификацией ООН в области энергоресурсов и минерального сырья (United Nations Framework Classification for Energy and Mineral Resources (UNFC)), а также описывается законодательный способ защиты запасов месторождений.

1. Introduction

Protection of mineral deposit resources is an essential prerequisite for rational management of mineral deposits no matter where such deposits are situated or whether the country is rich or poor in natural resources. Protection of resources, including power resources which have over the last few years increased dramatically in market price aspect, is a logical consequence of good judgment combined with «think globally act locally» principle, both leading to well-balanced development.

Since 1989 i.e. transformation in system of government and that of economy, a remarkable loss in geological resources has been noted in Poland. Over $23 \cdot 10^9$ Mg of geological resources, nearly $25 \cdot 10^9$ Mg of balance resources and over $12 \cdot 10^9$ Mg of industrial reserves are gone.

The first reason for such remarkable losses was a change in criteria of economic usefulness introduced together with free market economy. An indirect reason could be connected with wrong application of legal regulations which were not strict or clear enough to protect the remaining resources of many mines which went into liquidation.

The paper presents some methods used to document and classify mineral resources in Poland basing on the deposits of hard coal. Furthermore, Polish classification of the resources is compared with United Nations Framework Classification for Energy and Mineral Resources (UNFC), and a legal method of protecting deposit resources is also presented.

2. Polish classification of hard coal resources

The fundamental legal act to regulate issues connected with mineral deposits in Poland, including their protection, is Geologic and Mining Law of 4 February 1994.

Results of geological exploration are contained in geological documents to show the limits, resources and geological conditions of the deposit. The documents are made basing on the classification of mineral deposit resources as set out in the Regulation issued by Minister of Environment. Pursuant to this Regulation, Geological Documentation on mineral deposits should be made according to respective survey category and for balance resources vs. out-of-balance resources or so-called geological resources, the latter being the total amount of the mineral within its deposit limits. Survey of the deposit or a part of it is performed according to strictly specified principles in category A and B (detailed survey), C_1 (preliminary survey), C_2 and D (search).

The resources are classified as those of balance type using so-called balanceability criteria as set forth in respective Regulation issued by Minister of Environment. These criteria are defined as parameters that decide whether mi-

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ning of the deposit or a part thereof could be economically profitable. Deposit or a part thereof is considered economically useful or useless basing on such natural parameters as depth and thickness of the coal seams and its quality i.e. calorific value or sulphur content. Economic evaluation is not included in this stage of documentation, unlike in many other international classifications, for example United Nation Framework Classification (UNFC).

Resources which do not meet balanceability criteria are considered as out-of-balance resources, but it is assumed that they may be workable in the future in result of a progress in technology, economic changes etc.

Balance resources are divided, according to respective regulations, into industrial reserves and non-industrial resources. Industrial reserves are defined as those situated in places where mining can be profitable from both technical and economic points of view. This means in practice that economic profitability is only possible to evaluate during Deposit Management Program preparation stage. Such evaluation is carried out by a specific company basing on industrial criteria, in other words the requirements which must be met in order to make mining of the deposit technically possible and economically profitable in accordance with a specific Deposit Management Program.

Among industrial reserves there is also a group called operating reserves, these being described in Records of Resources as resources intended for mining but reduced by losses expected in connection with the planned mining method.

On the other hand, non-industrial resources are those where mining can only be profitable if technical, economic or legal changes are introduced, also with reference to environment protection requirements.

Before 2001, Polish legal regulations required that so-called group «b» out-of-balance resources should be made to include resources which met the balanceability criteria although their mining was not possible at that time for technical or economic reasons. The criteria were similar to those used for classification of non-industrial resources. After 2001 this group of resources was not maintained any longer. Before 2001, out-of-balance resources meeting the balanceability criteria were classified as group «a» resources.

3. Comparison between United Nations Framework Classification for Energy and Mineral Resources and Polish Classification for Coal Resources

United Nations Framework Classification for Energy and Mineral Resources (UNFC) is derived from classification used by German geological services.

There are three criteria used to divide the resources under this classification: economic evaluation (E – Economic), evaluation of the degree of preparation for deposit management (F – Feasibility), evaluation of the degree of geological survey (G – Geology). If the criteria are shown by three axes (x,y,z), the resources can be classified in three-dimensional form. Each criterion is also shown in a three-or four-degree scale ($E_{1,2,3}$, $F_{1,2,3}$, $G_{1,2,3,4}$), thus enabling to present the resource classification in the form of a three-letter code.

Criteria accepted by UNFC to evaluate the degree of preparation for deposit management (Feasibility Axis) have Polish equivalents (in the form of documentation): Geological (opportunity) study – Geological Documentation, Prefeasibility study – Deposit Management Program, Feasibility study and Mining report – Record of Resources, Mining Plan.

Polish terms have also been assigned to match Evaluation of geological degree of deposit exploration (Geological axis): Detailed exploration – Deposit survey category A and B, General exploration – C_1, Prospecting – C_2 and D.

However, it is very difficult to express all Polish groups of resources in terms of UNFC classification, the reasons being that there is no economic evaluation of deposits in Polish classification and there are different definitions of resources. Industrial reserves are defined as reserves (111,121,122), whereas operating reserves are equivalent to the reserves marked with symbol 111. Non-industrial resources or non-industrial plus out-of-balance resources are equivalent to the so-called remaining resources marked with symbols 211,221,222. However, there is some doubt about including out-of-balance resources in this group as they are not

made during prefeasibility study stage (Deposit Management Program). Geological resources (both balance and out-of-balance types) are marked as 331, whereas geological resources – as 333.

4. Summing-up

There is no doubt that all mineral deposits in Poland are legally under protection. And so are resources of such deposits. Significant losses in hard coal resources had a strong connection with changes in criteria of economic usefulness introduced together with free market economy. An indirect reason why such unfortunate situation occurred could be connected with wrong application of legal regulations.

Methods of classification used in Geological documentation for Polish hard coal resources, and also balanceability criteria, have been changed many times over the past several years. Division into industrial reserves and non-industrial resources is no longer used now (in classification of mineral deposit). Amount of survey categories has been reduced by category E i.e. the so-called perspective resources. Balanceability criteria have been greatly simplified, being used in the same way for power coal and coking coal. Furthermore, they do not include ash content any more.

Comparison between Polish classification of resources and international classification of resources (UNFC) shows that in spite of a few successful attempts to match the two classifications, it is still not easy to express all Polish categories of resources in accordance with UNFC classification. The reasons may be that there are discrepancies in definitions of resources whereas no economic evaluation of deposit management is included in Polish classification.

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