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ETHICAL ASPECTS IN CODES AND GUIDELINES FOR THE GEOLOGICAL PROPERTIES EVALUATION

Key words: valuation of properties, ethical codes, fair market value, mineral deposits, energy resources

1. Introduction

Modern economy and civilization's development induce grow of utilization of energy resources. One of them is petroleum or natural gas. Their price and quantity on markets affect on individual national economies, regions and world. Biggest companies on petroleum market are supranational corporations, which are able to affect states policy in countries where they're paying taxes. Other factor forming their political power is fact that they employ, even hundred of thousands employees. So actions of mining companies should resist on economic sphere as well as on ethical codes which are socially accepted. The first duty of any ethical professional engineer is to place safety, health and welfare of the public above all. The duty is easy to understand in the usual perspective of engineers relationship to the design of bridges, roads and buildings. The connection to geologist is more difficult to grasp and even harder in relation to mineral evaluation engineers, but the connection is there − by protecting investors and stockholders, by facilitating project financing and by preventing fraud.

Codes and Guidelines for valuation of mineral properties state definitions, standards and rules, which should be applied in fair market value evaluation of mineral deposits. Applied methods should take into consideration costs resulting from market failure as an agent verifying evaluation. In reference to geological object those costs would comprise environment preservation costs, social costs and external factors like law regulations and various charges related to prospecting for and extracting of a deposit. Deposit with its resources is a special kind of assets to the oil-company. Its uniqueness arises from the fact that it is non-renewable and that it is a global, international asset. This is why methodology of deposit's valuation should include consequences of exploitation to the beneficiaries, evaluation of those consequences not only in a direct respect environment, but also for earth's crust. Ethical aspect of deposit's fair value estimation consists in considering exploitation consequences both in present and in the future.

Discussion about necessity of homogeneous creation of classification of fields and elaboration of codes of value of global fields worth lasts from years, in many countries codes of valuations are just in the process of consultation. In Poland environment of estimators and mining enterprises have made code of pricing of field - POLVAL. The author presents main foundation of POLVAL codes, ethical dimension of pricing and estimators procedures.

The mining industry understood that its wealth were flowing not only from the pools and other material values, but also their reputation and human resources. Those immaterial resources began to play greater part in the creation of the new value of the company. Resources extraction and processing is particularly damaging for the natural environment, which makes application of sustainable development rules by mining sector a challenge of 21st century for this industry.

In the first part of article author has presented dynamics of global economy demands for coal, oil and natural gas in years 1980 to 2006 and prediction until 2015. Author in her analysis based on prognosis of consumption of energy resources compiled by Energy Information Administration (EIA) and published in International Energy Annual 2006 (www.eia.doe.gov/iea), World Energy Projections Plus 2009 (www.eia.doe.gov/oiaf/ieo/world.html). Current primary energy consumption in Poland and projections until 2020 was based on Power Policy of Poland until the Year 2020.

2. Forecast of the national demand for fuel and energy

The contemporary economy and the development of civilization followed by increasing utilization of energy sources, have great impact on the environment deterioration. World energy consumption increases from 472 quadrillion Btu in 2006 to 552 quadrillion Btu in 2015 (in 2030 year the projections are 678 quadrillion Btu) (Fig. 1). The energy consumption from 1980 to 2006 increases on average by 11.0% per year.

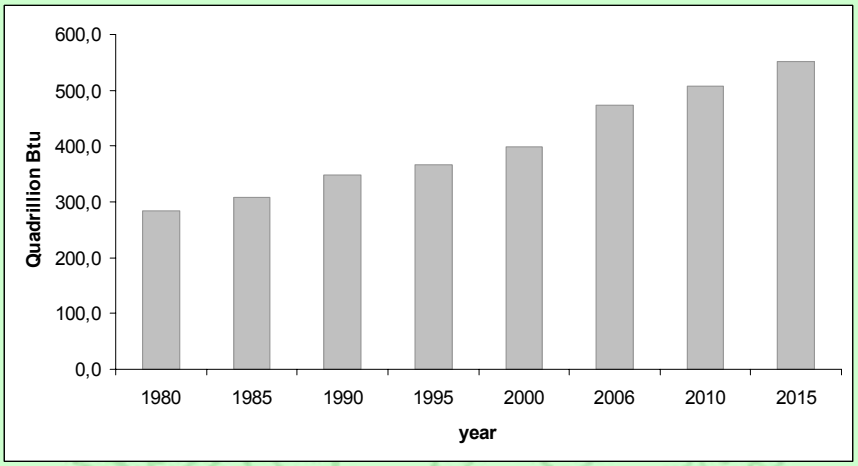

Fig. 1. Word Energy Consumption 1980-2015.
Sources: Energy Information Administration (EIA), International Energy Annual 2006, www.eia.doe.gov/iea; World Energy Projections Plus (2009), www.eia.doe.gov/oiaf/ieo/world.html.

Organization for Economic Cooperation and Development (OECD) member countries - for the most part - have the world's most established energy infrastructures. They account for the largest share of current world energy consumption. The situation will change in the future, however, with more rapid growth energy consumption in non-OECD economies. In 2006, 51% of world energy consumption was in the OECD economies; but in 2015 their share falls to 48% in the reference case. OECD energy use grows slowly, averaging 0.6% per year, as compared with 2.3% per year for the emerging non-OECD economies. China and India are the fastest-growing non-OECD economies, and they will be key world energy consumers in the future. Since 1990, energy consumption as a share of total world energy use has increased significantly in both countries. China and India together accounted for about 10% of the world's total energy consumption in 1990, but in 2006 their combined share was 19%.

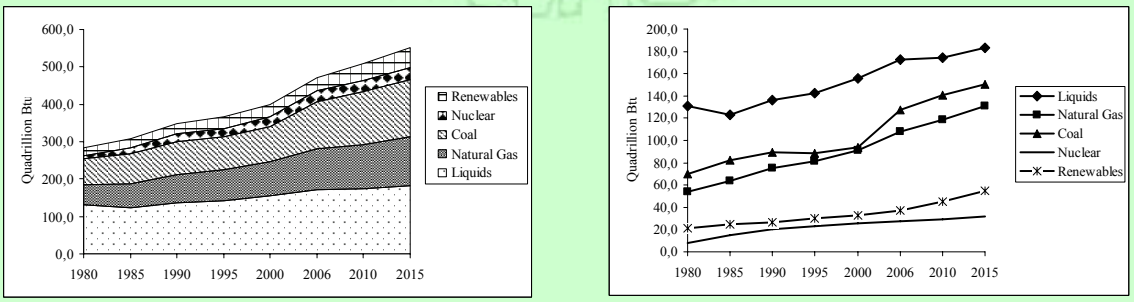

Fig. 2. Structure of world's primary energy consumption and projections, 1980-2015.
Sources: Energy Information Administration (EIA), International Energy Annual 2006, www.eia.doe.gov/iea ; projections: EIA, World Energy Projections Plus (2009), www.eia.doe.gov/oiaf/ieo/world.html

When analyzing the use and projections all energy sources (Fig. 2.):

- liquid fuels are expected to remain the largest source of energy, the liquids share of world marketed energy consumption declines from 36% in 2006 to 33% in 2015;

- natural gas remains an important fuel for electricity generation worldwide, because it is more efficient and less carbon-intensive than other fossil fuels. Total natural gas consumption increases by 1.6 percent per year on average, from 104 trillion cubic feet in 2006 to 153 trillion cubic feet in 2030, and its use in the electric power sector increases by 2.1 percent per year;

- world coal consumption increases by 1.7% per year, growing by 23 quadrillion Btu from 2006 to 2015 and accounts for 27% of total world energy consumption in 2015. In the absence of policies or legislation that would limit the growth of coal use, the United States, China, and India are expected to turn to coal − the three nations together account for 88% of the projected net increase in coal consumption from 2006 to 2030;

- renewable energy sources are the fastest-growing energy source, increasing by an average of 2.9% per year from 2006 to 2015, much of the growth is in hydroelectric power and wind power.

2.1. Energy policy of Poland

The consumption of the primary energy in Poland is forecast until 2020 in tree scenarios. The scenarios differ in the forecast dynamism of macroeconomic phenomena connected with changes in the international environment and in the speed of the development of the Polish economy in the 20-year-long perspective. They are the following:

- survival – the scenario BF – battlefield, there are phenomena typical for a weak world development hindered by political upheaval. The scenario has a clear warning character. In such conditions, the average annual GNP growth rate is ca. 2.3% per year, the country's development at this speed does not allow to make up the developmental gap in relation to better-developed countries;

- references – the scenario CW – conventional wisdom, there is a political stability and the development of the international environment without shocks and sudden changes. In the case of the Polish economy, it means a relatively slow continuation of the process of transformations with the average annual GNP growth rate of 4.0% per year;

- progress-plus – the scenario FO/HM – Forum/Hypermarket, the assumption of an active, efficient policy of the Government. There occur positive economic changes, which results in a development of the world economy, based on competition and partnership, with a much more advantageous access to the capital and modern technologies. The average annual GNP growth rate is ca. 5.5% per year.

A drop in the consumption of the primary energy is forecast in all scenarios (Fig. 3). All scenarios predict a drop in the demand for hard coal, down to the level of 83.5 mln tones in the "survival" scenario and ca. 82 mln tones in the "reference" and "progress-plus" scenarios in 2020. All three scenarios predict the extraction of the brown coal in the stable level of ca. 65 mln tones per year.

The demand for the earth gas increases considerably mainly in the electric power generation and the communal heating. The increase is smaller in other sectors of the economy. The earth gas becomes competitive for the coal due to a high efficiency in the conversion, a smaller unit emission of CO2, SO2 and dusts. The demand increases up to the level of 26 billion m3 in the survival scenario, 29 billion m3 in the reference scenario, and 28 billion m3 in the progress-plus scenario.

The demand for crude oil and oil products increases. The existing reloading and transportation capacities considerably exceed present needs of the Polish refineries. The infrastructure offers a possibility of an alternative supply of the oil both towards the east (Przyjaźń pipeline) and by sea. An increase in the consumption of liquid fuels generates a demand for crude oil (and derivative carriers) up to the level of 21 mln tones in the survival scenario, up to 28 mln tones in the progress-plus scenario in the year 2020.

There takes place a stabilization of the participation of the renewable energy in the level of ca. 5-6.5%, in spite of an increase from the level of 5.5 Mtoe in 1997 up to 5.9 Mtoe in 2020 in the survival scenario and up to 7.7 Mtoe in the progress-plus scenario.

Poland's energy security will be based on domestic fuel and energy resources, especially hard coal and lignite. This will ensure independence from the production of electricity and, in large part, heat from external sources of supply. In the area of oil, gas and liquid fuels the prediction assumes diversification, which now applies not only to supply sources, but also to production technologies. All available technologies to produce energy from coal will be utilized, provided that they reduce air pollution. A new field of activity is the introduction of nuclear power in Poland. In addition to the advantages in terms of zero CO2 emissions, this method of energy production will improve Poland's energy mix, provide independence from the traditional sources of energy supply, and thus enhance Poland's energy security.

The priorities of "Poland's Energy Policy until 2030", developed by the Ministry of Economy, are the following:
- improve energy efficiency,
- increase security of supply and developing competitive markets for fuels and energy,
- introduce nuclear power,
- increase the use of renewable sources,
- reduce the impact of energy on the environment.

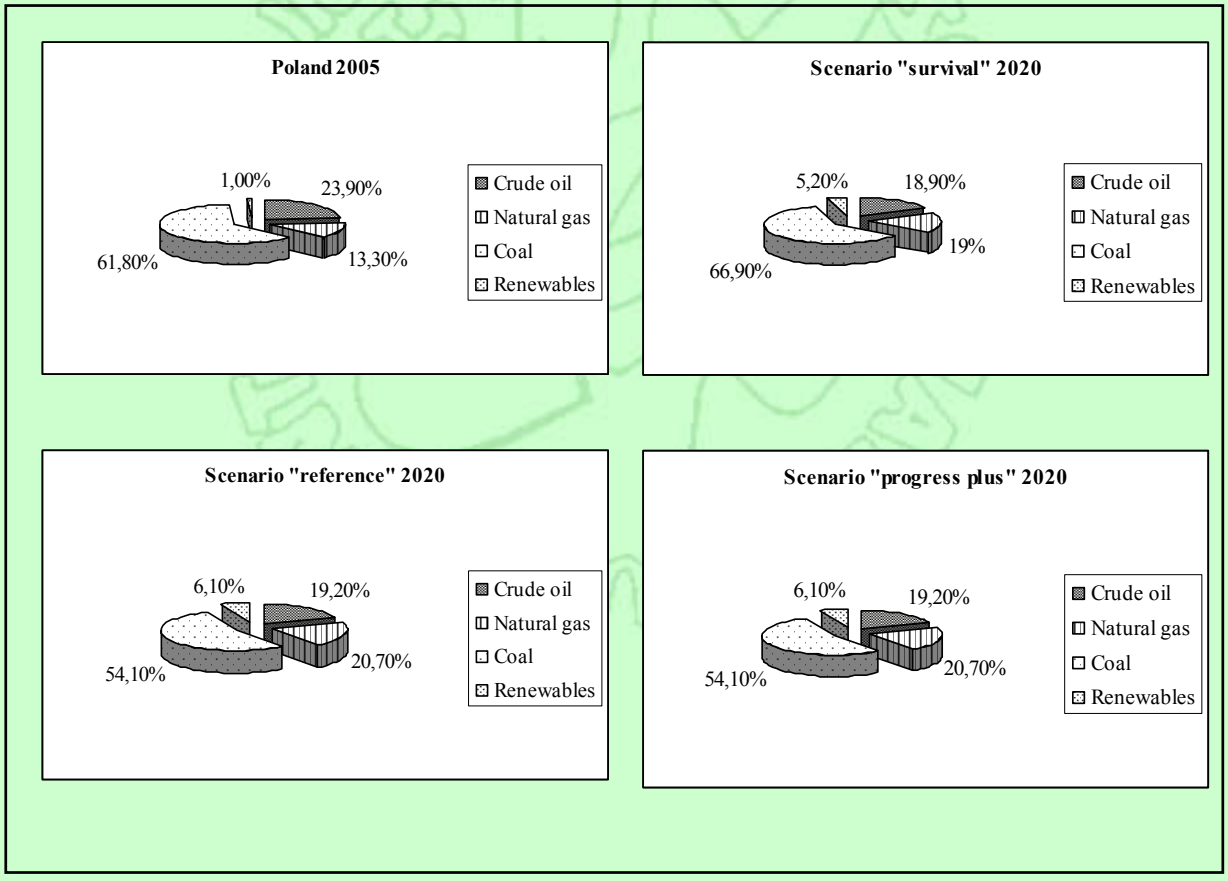

Fig. 3. Structure of primary energy consumption in Poland in 2005 and projections of primary energy consumption for three scenarios.
Source: BP Statistical Review of Word Energy (www.bp.com); Energy Policy of Poland until 2025 - Document Adopted by the Council of Ministers on 4 January 2005; Assumptions on Energy Policy Until 2020 in Poland.

3. Fair value of the deposit – review of standards and principles

Economy development depends on energy security (on access to energy resources) – as it results form prognosis presented in chapter 2. Globalization processes affect all aspects of economical activities, including geology and mining – the largest mining companies are multinational corporations. Globalization of the mining sector as well as examples of spectacular scandals connected with incompetent or biased valuation of resources have forced the unification of principles and standards of valuation, competence and reliability of resources valuators.

In the countries where mining industry is well-developed, the principles of resources estimation have been presented in specially prepared valuation codes. These codes include also standards of assessments and certification of qualified valuators. These principles and standards present high ethical and quality standards for valuators. Independent professional societies guarantee the observation of the standards.
The first code of resources valuation appeared in Australia in 1995. Australian Code for the Technical Assessment and Valuation of Mineral and Petroleum Assets and Securities for Independent Expert Reports – also known as VALMIN Code, is the best-known standard of resources valuation. The original idea of the authors was to prepare such a document, which would standardize the valuation of mining and geological assets of mining and prospecting companies in order to secure their properties and rights under Australian law on joint-stock companies and to protect the rights of the investors in securities of mining and geological companies operating on Australian financial market. The document proved to be of a more universal character than it was originally planned and is used by the resources valuators, who are members of Australasian Institute of Mining and Metallurgy. Members of AusIMM, who prepare reports on mineral, gas and oil resources valuation in accordance with the Australian Companies Act, must follow the VALMIN Code. Also, organizations and entities such as Australian Stock Exchange, Australian Securities & Investment Commission, Australian Institute of Chartered Accountants and Australian Institute of Company Directors.

Canadian Standards and Guidelines for Valuation of Mineral Properties – CIMVAL Code was elaborated by CIMVAL Committee and introduced in 2003. CIMVAL principles are similar to VALMIN ones – full information about the valued object must be made public and accessible. The valuation must be performed by the qualified valuator, who is a member of and independent, self-governing professional organization and has enough experience in valuation of mining and geological assets. The valuator is free to choose from three methodological approaches to valuation: income, sales comparison and cost ones. A detailed analysis and justification of the choice is required. All basic data on the property must be – according to National Instrument 43-101 (NI 43-101) – verified by one or several technical persons. NI 43-101 specifies the principles of presenting business information in Canada and standards which are valid for all companies present at the stock exchange in Toronto (TSX Venture Exchange).

The draft of South African Code for the Valuation of Mineral Assets – SAMVAL Code was prepared by a special Working Group of Committee SAMVAL, working under South African Institute of Mining and Metallurgy. The draft is currently being discussed by specialists. Contrary to other codes, the tree approaches to assets valuation: income, sales comparison and cost have been described in the Code in detail.

The American Project, worked out by Mining and Metallurgical Society of America under the name of Code for Technical Assessment and/or Valuation of Mineral Properties for Independent Export Reports (US Minval Code) has not been introduces yet, mainly because of lack of compatibility with both the standards of Uniform Standards of Professional Appraisal Practice, American Appraisal Foundation, and the standard of Uniform Appraisal Standards for Federal Land Acquisitions, the latter playing an important role in valuation of geological and mining assets. In USA National Society of Professional Engineers is active in promoting codes of ethics for engineers, ethical principles in the mineral property valuation through workshops and publications (www.nspe_org/ethics/shl-code.aspniee.org, www.onlineethics.org).

3.1. Polish code for mineral assets valuation

The Polish Code for Mineral Assets Valuation (called POLVAL) was worked out by the Special Committee of the Association of Mineral Assets Valuation for POLVAL Code – the author of this article was a member of this committee. After consultations with mining specialists, the Code was approved by the Polish Association of Mineral Assets Valuation (PAMAV) in May 2008. PAMAV is a non-governmental organization of assets valuation specialists and its task is to watch valuation principles. Within PAMAV there is Ethical Committee, whose task is to observe ethical principles of the mineral property valuator. These principles form an integral part of POLVAL.

Why POLVAL appeared:

- Lack of uniform principles, which could determine in detail resources valuation rules, criteria of qualification and responsibility of valuators in terms of assessing the size and quality of mineral assets and their valuation.

- Resources valuation is often done by laymen and the results are often biased. According to Polish Geological and Mining Law mineral resources, which are not a part of land property belong to State Treasury and that means the state is the owner of those assets, which cannot be surface-mined. Surface-mined assets belong to the land – the asset belongs to the owner of the land property. Such resources are valued by real estate appraisers, who have no suitable qualifications whatsoever. European Valuation Standards suggest that assets valuation is a separate task from real estate valuation. Item 5.02.02 states clearly that if the real estate appraiser has not enough knowledge and skills needed for the correct evaluation, then they should either refuse to do it or ask a specialist.

- The Code was made to value assets by specialists who have suitable qualifications and to make valuation reports credible, clear-cut and contain all the necessary data.

- The aim of POLVAL Code is to group basic standards and guidelines into one document, which will be useful for mineral assets valuators in professional assets valuation.

- The Code introduces a new idea of mining and geological assets into Polish professional terminology.

- Polish specialists in assets valuation have not had an independent, self-governing professional organization so far. The mission of Polish Association of Mineral Assets Valuation is the elaboration, modification and dissemination of POLVAL and training many professional valuators of assets and mining companies.

3.1.1. Ethical principles of the mineral property valuator in POLVAL

Within PAMAV there is Ethical Committee, whose task is to observe ethical principles of the mineral property valuator (MPV). These principles form an integral part of POLVAL.

The MPV should follow the following basic principles:

- MPV must be objective and independent. That means they and their experts cannot have any financial (or other) connections with: 1) client, 2) owners or shareholders (or parties connected) of the valued asset, 3) any party of the transaction if one company is going to take over another, - they cannot either: 4) posses any shares or any assets being valued, 5) bear any material or non-material benefits except the payment for the service. - It is unacceptable to make the valuator's fee and their further work conditional on the valuation result or a success or failure of the transaction, for which the valuation was made.

- MPV, who acts as public confidence person, should be honest, reliable, accurate, impartial and professional.

- MPV is obliged to update their knowledge continuously and to make sure they use the latest scientific and practical achievements in their valuation activities. MPV should not undertake these activities, which would go beyond their knowledge and competence.

- MPV is obliged to refrain from any activities being unfair business practices, promotion or advertising, especially they should not offer lower prices for their services than any other MPV.

4. Global extractive industries valuation standard

Specialists in assets valuation form many countries working within the framework of International Valuation Standards Committee form Extractive Industries Task Force. Within International Valuation Standards for mining industry occupy only a small part, but their appearance is indispensable.
More and more people from mining industry opt for a uniform valuation standard, valid for all the global economy (Ellis T. R., 2008).
The following are the most important conditions for a uniform global standard of assets valuation:

- ✓ globalization of the mining sector,
- ✓ valuators of mining and geological assets come from different countries,
- ✓ 150 world countries need valuation standards (unification of procedures and principles),
- ✓ uniform stock exchange reporting,
- ✓ safety in raw materials, investors and creditors markets,
- ✓ reduction of 200 assets classification systems,
- ✓ unification of assets classification, i.e. harmonization of Petroleum Resources Management System– United Nations Framework Classification – Combined Reserves International Reporting Standards Committee – Classification of Assets of the Russian Federation – Classification System - of Assets of Saudi Arabia,
- ✓ unification of certificates for valuators,
- ✓ globalisation of capital markets.

4. Summary

- Prognosis of global economy development established further increase of consumption of non-renewable energy resources like coal, oil or natural gas. Transparent and ethical estimation of these resources and their value is one of the main economical factors, which includes assumption of prognosis.

- Content-related conditions for creating a global standard of assets valuation – globalization of the mining sector, security of the raw materials market, reduction of 200 classification systems, globalization of capital markets.

- Ethical conditions for creating a global standard of assets valuation – the deposit and its resources is a unique asset of the mining company. This uniqueness is caused by the fact that it is non-renewable and it is a global and international property. Therefore, the methodology of assets valuation should consider mining consequences and the estimation of these consequences not only for direct environment but also for the earth's crust.

- The lack of uniform regulations, which would define assets valuation principles, qualification criteria and valuators responsibility in terms of assessing the size and quality of mineral assets and their valuation was the condition for creating the Polish Code for Mineral Assets Valuation. The present regulations do not explain clearly valuation principles and competences of the people who valuate the assets.

- Mining and raw materials processing companies are the most harmful economic entities for the environment. Mining of deposits and products themselves are the source of harm. Therefore, the sector will still be attacked by international ecological organizations – it has to diminish the degradation it causes and it must try to repair what has been already destroyed.

Bibliography

1. American Petroleum Institute, 2003 – U.S. Oil and Natural Gas Industry's Environmental Expenditure.
2. Australasian Institute of Mining & Metallurgy (AusIMM), 2005 – Code and Guidelines for Technical Assessment and/or Valuation of Mineral and Petroleum Assets and Mineral and petroleum Securities for Independent Expert Reports (VALMIN Code), http://www.aig.org.au/files/valmin_122005.pdf.
3. BP Statistical Review of World Energy, 2007 – www.bp.com.
4. CIMVal, 2003 – Standards and Guidelines for Valuation of Mineral Properties, CIM Special Committee on Valuation of Mineral Properties, Canadian Institute of Mining, Metallurgy and Petroleum, Final version, http://www.cim.org/committes/CIMVal_Final_Standards.pdf.
5. Ellis T.R, 2008 – International Trends in Standards and Regulations for Valuation of Mining Industry Properties and Projects, [in] Economic Evaluation and Risk Analysis of Mineral Projects, International Mining Forum 2008, Taylor&Francis/Balkema, London
6. Energy Information Administration, U.S. Department of Energy, www.eia.doe.gov/oiaf/ieo/index.html
7. Hicman T.S., Mistrot G.A., Wines G.B., 1984 – The professional Engineer's Professional Responsibility. J. of Petroleum Technology, p. 43-46.
8. Polish Ministry of Economy and Labour, 2004 – Energy Policy of Poland until 2025, Document Adopted by the Council of Ministers on 4 January 2005. Energy Policy Team, Warsaw.
9. Polish Ministry of Economy, 2000 – Assumptions on Energy Policy Until 2020. (Zalozenia Polityki Energetycznej do Roku 2020). Warsaw.
10. Energy Information Administration, 2006 - International Energy Annual 2006, www.eia.doe.gov/iea.
11. Energy Information Administration, 2009 - World Energy Projections Plus. www.eia.doe.gov/oiaf/ieo/world.html.
12. Worldwide Look at Reserves and Production, 2008 - Oil *and Gas Journal*, Vol. 106, No. 48 (December 22, 2008), pp. 23-24.