

## ROLE OF COAL IN PRODUCTION OF ENERGY AND SUSTAINABLE DEVELOPMENT INSURANCE

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***Abstract:** In the context of what is reflected by the dualism of "ecosystem-efficiency", the sustainable development, as a process of change, was defined by Brundtland Commission as "development that meet the needs of the present without compromising the ability of future generations to meet their own needs".*

*In the case of mining areas, together with their responsible approach of sustainable development, the efficient use of coal, as the fossil fuel resource for energy production involves orientation towards exploitation - development technologies and to more and more responsible institutions for application and implementation, whose actions must be convergent and to replace the fact that coal mining should use the resources carefully so that mining, as a whole, does not endanger natural life support systems.*

*This paper presents in a unitary and coherent assembly, the place and role of coal mining sector, current principles and criteria taken into account to protect and improve the efficiency of energy generation by coal combustion in power plants and the potential for development of mining areas as current and future concern of national interest.*

**Key words:** carbon, sustainable development, power plant, power system, conventional energy

### 1. INTRODUCTION

Covering the increasing global energy demand has had a serious impact on the environment, along with other human activities, by which we use or abuse of what gives us the world we live in.

Emissions caused by burning fossil fuels produced acid rain and contributed to accentuate the greenhouse effect. This problem, although it received also global approaches - with examples of United Nations various programs, other international treaties such as the Kyoto Protocol, etc., is

influenced by the stage of economic development, in the sense that for the countries with transition economies, as our country, it is important the issue of market competitiveness and the security of power supply, while in developed countries, although these areas have their own importance, energy policy takes into account, in particular the need to reduce environmental impact, requirement that does not absolve either the countries from the first category [1], [2], [3].

World market for power generation will continue to be dominated by fossil fuels,

expected to be about 80% from the power need. Oil, natural gas and shale will remain the main energy resource, representing approx. 35% of necessary, coal accounting 30%. By 2030, nearly two-thirds of the increase of coal supply will come from Asia. Natural gas will represent a quarter of the fuel used for power generation worldwide.

In the European Union, natural gas will represent be the second place of fuel resource after oil, but ahead of coal. Nuclear power and renewable sources will account almost 20% of power delivered in the European Union.

Coal needs will also increase rapidly in the coming years. During 2000 - 2010, annual coal demand growth was 2.5%, it is estimated that by 2030 the annual increase to be 3%, when it will become more competitive than other fuels.

For 2013, hard coal for example, it has been reserved by the Energy Regulatory Authority (ANDRÉ), the quantities of power and the price of MWh accepted on the regulated market from Romania, according to which for the Complexul Energetic Hunedoara (CEH) corresponded to national power consumption predicted at the time, the amount of approx. 309,000 MWh (0.309 TWh), the equivalent of a daily basket of approx. 850 MWh or 20400 MW/day at an average price of 271 USD/MWh.

## 2. CURRENT STATE OF POWER GENERATION BY COAL COMBUSTION

Due to the reduction of power consumption and due to the changing occurred in demand and supply at the level of national power system (NPS), the Government was forced to act for the safety of power system by protecting the conventional power producers respectively coal sector, approving on the 5<sup>th</sup> of April, 2013 a Decision that comes to unblock the situation registered at the level of Oltenia and Hunedoara power complexes concerning the

the share of their participation in 2030 is respective the case of Mintia power plant, as a result of purchasing cessation of hard coal from the Jiu Valley mines, the respective Government Decision provides [2]:

- guaranteed access to transport networks for the power produced by Mintia power plant, that belongs to Hunedoara Power Complex, and ensuring its continuous operation at an average power production of 200 MWh;

- Transelectrica National Company currently transferred from the General Secretariat of the Government (GSG), as transportation and system operator had the obligation to provide priority dispatch for the power produced by power plants, according to the regulations issued by the Regulatory Authority for Energy (RAE);

- to maintain the safety level of the national power system, Hunedoara has the obligation to provide technological system services for the transportation operator and to the system at a power value of at least 400 MWh, under regulations issued by RAE. This will mean an annual power production of at least 3500000 MW (3.5 TW), which will require an appropriate annual hard coal production of 2.5 million tons. Considering the influence of currently applied methods for the hard coal mining, respective the method with undermined coal bed, where sometimes the dilution exceeds the maximum allowable of 15%, and because the current technical equipment of power plants that is obsolete, especially at Mintia power plant, the necessary quantity of hard coal according to the regulatory requirements for the power production may exceed, as a rule, the ratio range of 15-20%, making that the necessary annual production of coal to increase to more than 3 million tons, resulting the need for new working faces and new production capacities for the hard coal extraction.

Considered as the cheapest resource in times of crisis, the market demand for coal is ensured due to the continuing of hard coal extraction from underground of Jiu Valley, with coherent and justified measures taken,

existence of coal stockpiles at power plants. In the case of Hunedoara Power Complex,

renewable based on energy production in wind power plants, solar panels (photovoltaic power plants) and micro hydropower plants. In this regard it was issued and submitted to the public debate the Emergency Government Ordinance referring to the amending and supplementing Law no. 220/2008 for establishing of the system for promoting power production from renewable sources. According to the new EGO, there are provided, inter alia, clarifications regarding the stopping of overcompensation provided by the State for the renewable energy, namely:

- postponement / temporary suspension during 01.07.2013 - 31.12.2016 the granting of a number of green certificates for each 1MWh produced and delivered by the power producers from renewable sources. The recovery of postponed green certificates will start from 01.01.2017 for the hydropower plants and for solar power plants, respective for wind farms from 01/01/2018;
- for a better transparency, in the power invoice sent to the final consumers, the value of green certificates is billed separately from the power tariffs/prices, with the stating of legal basis;

RAE monitors biannually the producers that are the beneficiaries of green certificates promotion system and prepares and publishes on its website a biannually monitoring report within 90 days from the end the monitoring period. There are also analyzed some issues related to efficiency measures for overall activity of hard coal mining from Jiu Valley, whose implementation is directly influenced by the investment act possible to be decided at the level of Mining Division Branch, respective the decision-maker's ability to ensure the growth and maintaining of the hard coal selling price at 90-95 lei/Gcal of coal.

including the reduction of facilities granted to unconventional resources, respectively

### **3. ASSERTIONS CONCERNING THE DEVELOPMENT POTENTIAL MINING AREAS - CURRENT AND FUTURE CONCERN OF NATIONAL INTEREST**

Analysis of the potential for socio-economic rehabilitation and development of mining areas, indicate that the priority in this context is to review the place and role of coal mining sector and industrial policy as the factor of first importance in the effort toward removing regional economy form the crisis state and its entry on the sustainability pathways.

In comparison with the analysis result for the overall national economy, the main reasons for such an option are [2,3]:

- the absence of power strategy on medium and long term, with goals in coal mining and recovery through energy production in power plants, as a component of the regional economic strategy and respective the national economy during the period 2014-2020;
- the unfavorable impact of Romanian deindustrialization during transition to the market economy, which could not be counterbalanced by conversion processes, by restructuring and by refurbishment of industrial enterprises that were developed in the period before 1989, which provided a large part of their production on a more extensive and continuous foundation than at present, by Romanian exports to developed countries with market economies or to countries in development stage;
- the inflow of direct foreign investment in Romanian economy, reprehensible for local and zonal economy of Jiu Valley proved to be a factor that couldn't contribute to the further growth neither to the diversification of

necessary products, but it was a factor that on the addition to advantages, provoked a number of disadvantages, taking into account the competition faced by domestic power production, mainly in the sector of renewable resources. In this case, the large investments made didn't constantly cover the unconventional energy demand trend on the regulated market of the country, although the existence of this sector continues to be backed by excessive overcompensation from the state budget.

As an alternative to the economic decline registered by Romania and particularly in the mining areas, industry, particularly the manufacturing, along with agriculture, proved to be industries with the greatest potential to restore and to get out of the crisis by registering a surplus of the trade balance unlike the services sector, especially those of a speculative nature, that contributed the most to the increase of the trade balance deficit.

As shown by the experience of developed or emerging countries that went through similar transformation processes, the transition from a state of economic and social development to another more advanced, could not be achieved only through industrialization, which means, in the case of Romania the need for immediate re-industrialization. The process is considered to be the basis of third state, i.e. the division of nations according to the riches of development, this process is a permanent support for the generation and dissemination of scientific and technological research, development and innovation, and for the effectively accession to national and international spheres of value, to the creation and development of various professional organizations, accepted as clusters and industrial and technology parks [4], [5].

- the processes of consistent increase of material production and human capital as leading factors to income generation and sustainable long-term profits that can not be achieved, as shown by the experience of developed countries, only in conditions of

manufacturing for the various technologies, alternative, including those related to power generation, steel etc.), even if revenue growth was more profound for services. Industry analysts view is that only by applying this policy the revive of lucrative sector can be done directly in relation with the real economy of an area or region, and also the spheres of taxation and trade, which if don't support the real economy it risks to expand into failure of the financial system, considered as the epicenter of the current international economic crisis;

- most economists from developed and developing countries, decided to reconsider industrial policies by promoting public - private partnership and state intervention in the economy or in the power production by using the conventional resources - coal, with the option to define hard coal as a strategic resource of national interest, where the market failures and price liberalization in Romania have been and will be increasingly obvious in both economic and especially social spheres.

The concerted government actions and public-private partnerships, from ever more present in the strategy projects that are currently configured represent the most appropriate solutions to clarify the reorganization and stabilization processes of the coal mining sector, the promotion of new technologies and development of related infrastructure, without excluding a temporary protection system for the implementing of new structures, with the allocation of appropriate investments for the achievement of intended purpose. All these solutions involve the permanent investment allocation in infrastructure development; they need to be materialized using comparative and competitive advantages of each branch of the power generation sector, under conditions of full transparency and social responsibility.

For the success of demarche for the involved mining areas rehabilitation and development, will have to be continued the series of meetings to debate the issues

production growth of manufacturing industries (automotive industry, equipment conventional power production to NPS, given that the sector was placed until now in a secondary place of concerns and priorities, especially due to misunderstanding of its profitability related to the continuity in rhythmic power production with relatively low costs.

We will have to give also the proper importance to protect the coal industry against competition, which is not always justified with domestic production of alternative power, including against external shocks caused by coal imports. However, in the globalization context, we must revive the expression *by ourselves*, thus by putting to its rightful place the efficient exports and substitution of competitive and non-competitive imports, including through cooperation with external factors to the development of alternative industries, technology transfer and by specialization of sustainable and inclusive intelligence.

This kind of meetings and open debates about development and welfare of the area where we live together, should be strengthened and repeated, in order to provide to the decision makers landmarks and founding elements used to establish the strategies and policies that need to be outlined and completed as soon as possible, considering the coal mining sector as one of the most important in production conventional power, if not even the most important one.

dedicated to the reconsidering of coal mining sector economic importance, for use in

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