

The Managerial Responsibility in the Durable Development Stage at the Lignite Exploitation from Romania

Maria Daniela ORBAN, *conf.univ.dr.ing.ec.*, Universitatea din Petrosani, Romania

Marius Daniel MARCU, *conf.univ.dr.ing.ec.*, Universitatea din Petrosani, Romania

Abstract: *The sustainable development and environment are in a very interdependence. The target of this stage is to conserve the mineral resources, the energy and the main way is to minimize the waste and the emissions which are released on the environment. As well as any power plant has a negative impact on environment, the thermal power plants together with ones that use solid fuels (lignite, hard coal, brown coal) affect all the environmental elements (air, water, soil, animals and plants). That's why the content of environment protection laws (Directive 2001/80EC) and (H.G. nr.541/2003) which relates the power plants shall be applied all over the board from the power plant design stage to their final implementations.*

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1. Introduction

In the context of ecosystem-ecoefficiency duality, sustainable development of society involves the care of humanity for its actual and future resources. Efficient use of natural, energetic material and informational resources suppose both the responsible approach of the future generations and intensifying of the sustainable economy working for the actual requirements satisfaction of the society.

In nowadays and the future the sustainable development of society target it is given by the management style of natural, energetically and informational resources in report of economically development objectives and assuring a better and better quality of environment.

About of economic development types affect the environment because it is used natural, energetically resources and generate polluted suspensions which deteriorate the environment. But in the same time, there are a lot of ways for different activities to protect or improve the environment. There are measurements of efficiency of using the natural, energetically and informational resources, different management technologies (unpolluted technologies, a good efficiency for transport improvement, etc.).

The decisions above economic development have to take into account the potential pollution and environmental damage costs, as well as the consumption of resources and the value of environmental improvements.

The fundamental criteria of sustainable development are:

- keep the life quality;
- keep the continuous access to the natural resources;
- elude the total deterioration above environment.

The progress of the nation is depending with its ability in using the energetically resources as to emphasis the economic competitively, to protect the environment and to maintain the national security.

The sustainable development idea identifies the strategically objectives:

- the maximization of energetically production for reinforcing national energy and improving the life standards;

- the pollution prevent in aim to reduce the unfavorable impact above environment associated with the production, distribution and energy using;
- keeping the national security through the reducing the vulnerability to the energy market beats.

The energetic management system is based on the following concepts:

- energy management (as measurements made by the costumers for preventing the wastage;
- the reasonable energy using (as the energy using by the customers in a properly style for achievement objectives);
- replacing some energetically types and process with another better adapted (the changes made as a part of energetic politics without economical, technological and ecological reasons).

2. The Technical-Ecologic Interdependence Parameters to the Lignite Using

Chemical and steel plants, waste burning stations and thermal power plants generate a large quantity of SO₂, carbons and nitrogen oxides which produce acids rains, green house and reduce the thickness of ozone layer. The measurements recorded at couple of thermal power plants outline important quantities of toxic oxides. The power plants are main pollution generation due to their technological processes, the nature of processed raw materials, the waste generated, the number of installations and the size of the affected landmass.

After a development period during '67-'87 the thermal power plants with large burning coal installations suffered unexpected decline. The romanian economy was capable of a sustained development program for power plants with capacity over 10.000 MW.

The large burning installations (on coal) from thermal power plants are equipped only with electro filters. The electro filters retain the burning gases powders thus reduce the dust emissions.

Nowadays, there is no thermal power plant equipped to assure sulfa dioxide pollution retain as the emission from power plants using coals are bigger than the limits imposed by environment protection laws.

Reducing the pollution generated is an important objective of strategy in coal burning plants for both medium and long time frame. The energetic grounds C.E. Rovinari and Turceni, Isalnita, Craiova II are the base of the reorganization and restructure of electrical energy production using lignite. The lignite open pits are integrated cost units of energy producers.

In Romania the lignite exploitation is not government subsidized. The average lignite consumption for 2010 is foreseen not to exceed the 2007 level. The lignite calorific power from Romanian pits is about 1600/1800 kcal/kg and this level is lower than in other european countries and has component around: ash 42%; humidity 44%, sulfa contain 1,2%; volatile materials 20%. The efficiency of lignite burning plants is lower than for hard coal or hydrocarbon based installations.

The maximum levels for powder emission allowed by existing legislation for boilers are:

- for solid fuel 100mg/m³;
- for liquid fuel 50mg/m³;
- for natural gases 5mg/m³.

The already existing boilers the following values apply:

- 150mg/m³ for boiler with load between 50-500MWt on solid fuel;
- 100mg/m³ for boiler with load over 500MWt on solid fuel;
- 50mg/m³ for boiler working on liquid fuel;
- 5mg/m³ for boiler working on gases fuel.

Well developed countries budget important funds for research of the process towards development of performing technologies which would reduce such pollution.

3. The Negative Impact above Environmental at the C.E.Rovinari And Turceni

3.1. The diminution of powder emission

The large coal burning installations about 1035 t/h was equipped with electro filters where the level of pollution emissions is shown in the below table (table 1).

Table1

C.E.	U.M	ROVINARI				TURCENI	
		Group 3		Group 6		Group 1	
		test 1	test 2	test 1	test 2	test 1	test 2
CO ₂	%	16,9	10,25	12,9-13,6	13,7-14,3	10,4	10,2-11
CO	mg/m ³	124	90	90-520	77-215	49-66	110
SO ₂	mg/m ³	2291	2571-1675	5233-5877	3602-3877	4314-4438	4327-4521
NO _x	mg/m ³	132	190-204	273-324	325-337	451-462	440

It can notice that the emissions have bigger values than the imposed values by the Directive 2001/80EC or H.G 541/2003. To reduce these emissions levels the electric filters was reliable and modernized following the neuniform distribution influence of gases speed above the electrostatic undusting efficiency; the optimization of friction state in electrostatic undusting technology, etc. The pollution emissions levels were reduced applying these ideas.

3.2. The lignite open pits – important elements in the environment pollution

About ninety percent from the global lignite deposits from Romania are in the Oltenia basin where are the Rovinari, Motru, Jilt, Berbesti and Husnicioara open pits. The lignite is used for obtaining the thermal agent for heating some important cities and a small part is using for family consumption.

The lignite weight in Romania is from one to eight meters. Over 80% from lignite deposits are exploited in open pits and 15%-20% are exploited in ground mines.

The lignite open pits from Oltenia are equipped with technologies in continuous flux characterized by:

- the lignite deposits are excavated by bucket wheel excavators (BWE) with the following capacities 470 l, 1300 l, 1400 l, 2000 l and productivity about 1680 m³/h - 6500 m³/h;
- the belt conveyer has the productivity about 1400 -12500 m³/h ;
- the laying down machines have capacity about 2500 -12500 m³/h.

The biggest affected surfaces from mining industry in Oltenia are in Rovinari, Jilt, Motru basins. As well as in Oltenia, in the other lignite open pits from Romania are existing affected and erosion surfaces by the mining industry but the percent is about 10% from occupied and damaged surfaces in Oltenia. From the global agriculture surface affected by mining industry about 25% represent pastures and about 55% represent orchards and vines. From the surfaces belong to mining industry, 68% was destined for work fronts (deposits and sterile) and 32% was for social building, roads, access ways, etc.

There even appeared geomechanical phenomena like settles, ground slips, quantities and quality changes in water surfaces and in the air quality. The lignite open pits exploitation affects all the environment elements, especially soil, which determines the territorial reliability in places where the open pits are in development.

From the beginning of lignite exploitation to nowadays about 8068 ha was fitting out as 7265 ha for agriculture destination and 803 ha for silviculture activity. From these surfaces only 2980 ha are in the Oltenia basin where 1900 ha represents agriculture surface and 1035 ha represent silviculture surface.

The surface reliability is based on the fundamental principles as global ecologic reliability, economical principle, the minimum dimension principle and the respecting of tradition principle.

Compeering with ground mining activity the open pits activity offers the environment improvement opportunities through fitting out and optimal integration of sterile deposits in the zonal landscape.

In the future the lignite open pits from Oltenia basin will be affected by changes in geometry surfaces due to change in exploitation methods using inside sterile deposit. In the same time some open pits will be shut due to be out of mining deposits and the production will be in few big open pits.

After 2010 a large surface remains out of the economic circuit which determines to find financial funds to reliability the damaged surface.

4. Conclusions

The decisions above economic development have to take into account the potential pollution and environmental damage costs, as well as the consumption of resources and the value of environmental improvements.

As well as any power plant has a negative impact on environment, the thermal power plants together with ones that use solid fuels (lignite, hard coal, brown coal) affect all the environmental elements (air, water, soil, animals and plants). The biggest affected surfaces from mining industry in Oltenia are in Rovinari, Jilt, Motru basins. As well as in Oltenia, in the other lignite open pits from Romania are existing affected and erosion surfaces by the mining industry. The reliability of environment problems represents an important activity for Romanian govern.

5. References

1. Orban M, Popescu C. *Some problems about environment protection at the energetical grounds C.E.Rovinari and C.E.Turceni, Conferinta Nationala de Energetica Industriala, CNEI 2005, Bacau;*
2. Zaman Gheorghe, s.a *Criteria si principii ale dezvoltarii durabile din punctul de vedere al resurselor acestuia, Buletin AGIR nr.1/2007.*