

IDENTIFYING THE ENVIRONMENTAL ISSUES IN EXTRACTIVE INDUSTRY

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Abstract

The extractive industry is unanimously acknowledged as being a vital sector of any country which owns workable natural resources. The experts claim that this industry is a source of foreign income, of direct foreign investments and it is also the main and sometimes the only energy provider of a country. The activities carried out within the extractive industry of any country provide employment to population and contribute to the public budget by taxes and dues, while the incomes resulted from these activities can be directed towards charity; however, at the same time, there is a certain environmental risk related to each initiative that is being carried out in this industry.

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JEL Classification: Q32, Q56

I. Introduction

The extractive industry activities are widely recognized as having a significant impact upon the population, both from the financial and from the social, cultural and environmental point of view. More and more it has been emphasised the need for minimising negative impacts and promoting positive elements that could control the external threats while also developing the competences of those involved in the process of minimising the unwanted impact.

II. The extractive industry vs. non-renewable resources

Practice indicates the fact that some conflicts of interest frequently occur between the companies that benefit from the extractive industry end products and the environment regulations that attempt to minimise the negative external elements that result from the activity of this industry.

On the one hand, Fiorino (2006) and Press (2007) discuss about the controversial impact that regulations have upon the performance of companies. On the other hand, as an answer to the shareholders' pressure, companies have begun to increasingly integrate the concept of corporate

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social responsibility, while more and more impact studies are subjected to the opinion and judgement of the public (Brake, 2007).

Some references to Porter's work (1991) come to support the idea that well-structured regulations can reduce the negative impact upon the environment and can re-launch the activities which are specific to the extractive industry based on some new, innovative components that should generate both profit and environmental protection. Porter's approach of "win-win" type represents the object of a great number of studies and articles but, unfortunately, some quantitative approaches (Jafe et. al. 2002, Smith & Walsh 2002) based on econometric methods practically invalidate the hypothesis.

Once accepted the fact that the majority of the most serious environmental problems are related to the use of non-renewable natural resources in the production process, we can admit the necessity to discuss some aspects that include (Grimaud & Rouge, 2008): which economic policies allow optimal implementation, what is their impact upon the economy and, in particular, what is their contribution to the technical progress?

In the specialty literature, these aspects have already been discussed and there are two periods that we could consider to be relevant in the evolution of the research.

Throughout the 1990s, most authors tackled partial-balance patterns. Preoccupied with optimal trajectories, Withagen (1994) showed the way in which the current resource consumption should be less if pollution is taken into consideration. Therefore, extraction/ exploitation should be postponed.

Sinclair (1992) demonstrates that an optimal tax on added value in the use of non-renewable resources should be decreasing. This point of view is criticised by Ulph and Ulph (1994) who considers that this result is not thoroughly accurate, especially regarding the environmental regeneration expenses and the extraction costs. Other authors, such as Hoel and Kverndokk (1996) or Tahvonen (1997) take into consideration the possibility to use top non-polluting technologies (*Best Available Technologies - BAT*).

More recently, in the 2000s, the problems caused by the use of non-renewable polluting resources have been placed in the context of general-balance patterns with endogenous increase. Schou (2000, 2002) studies two types of patterns – one based on human resources and the other on research and development, in which pollution caused by the use of non-renewable resources negatively affects both production (2000) and the user/beneficiary (2002). In both cases, he demonstrates that an environmental policy for the implementation of the optimal solutions would not be necessary.

Grimaud and Rouge (2005) discuss about a similar pattern, in which the good performance of the economic and social entities is affected by the level of pollution, without entering the details of the effects of pollution according to the type of activity. Similar to the results obtained by Sinclair (1992), the alterations at the tax level result only in a rent transfer. In this case it is demonstrated the necessity of an environmental policy, in the sense that the optimal tax (add valorem) must be altered according to the impact, in time, of evolution at the level of pollution.

As regarding the environmental issues, they are characterized by profound scientific ignorance, enormous mistakes in taking decisions and market and institutional failures (Bulearca *et. al.*, 2011). Some of these problems, as the ones regarding acid rains, greenhouse effect, ozone layer depletion, acidification of tropical forests and nuclear contamination are irreversible.

Moreover, many of these problems are related one to another, the ad-hoc individual solving of the problems being insufficient, as Smith (1979) said, because they depend of social and political factors that offers inadequate technical solutions.

The main differences between the above-mentioned literature and the work of Grimaud and Rouge (2008) result from the fact that the authors put the question in the context of two different sectors. Actually, they take into consideration an economy in which two inputs are simultaneously used to produce output: a non-renewable and polluting resource on the one hand, such as fossil fuel, and a second, non-polluting, input, materialized under the form of work investment (for a similar type of input, see the work of Smulders and Nooij (2003)). In this case, non-polluting technologies will be

considered for reducing carbon emissions, such as, for instance, solar energy technologies, the authors referring to this type of input as being a work resource. There are three objectives the authors put forward, namely: to compare the trajectory that a decentralised, “laissez faire” type economy might have in reaching the optimum; to study the impact of economic policies (more precisely the elements related to research/development and the political climate) upon the specific balance variables (specifically the route of forest lumbering) and, ultimately, to establish the optimal values of the economic policy instruments. Last but not least, the specialty literature takes into consideration the way in which a society perceives pollution. In recent times, economists have started to pay increasing attention to the aspects that deal with the degradation of the environment from one generation to another. The problem related to the way in which a society not only externalises costs but also transfers them into the future is getting more and more complicated if we take into consideration the effects of such a transfer, materialized in the decrease of the individual future welfare. This injustice that is transferred from one generation to the other is studied from the point of view of the conditions in which it occurs and of the effects that are recorded in case of asymmetrical information, more precisely in the situation in which a generation perceives the level of pollution as being different from the actual level (Schumacher, Zou, 2008).

III. Exploitation of non-renewable resources and the environment

Starting from the correct identification and from the realist highlighting of these aspects, each primary energetic resource has some particularities that individualises its problems, as follows:

a) Coal

Coal is perceived as being an energetic resource with positive, but also negative, valences:

- positive is its contribution to guaranteeing safety of supply and it being part of the diversification of energy sources;
- negative is the impact upon the environment. If the local environmental impact can and will be reduced by means of technological measures and measures to reduce the affected areas, the global impact of the use of coal upon the greenhouse gas emissions still triggers significant concern.

The clean coal processing technologies are increasingly developed in Europe and therefore the efficiency of coal-based power stations has already reached 47% and tends to increase up to 50%. The technologies which trap carbon dioxide from thermal power plants emissions will be widely available in the following 10 years.

However, clean coal costs will still be high in terms of economic efficiency, but they will be compensated by the contribution to the safety of the supply and to the economic stability in case of large price fluctuations on the energetic resource market.

The directives regarding the air quality are those that have an important impact upon the use of coal:

- The directive regarding the integrated prevention and control of pollution; it is the Directive on which the licensing of large power plants in Europe is carried out, as per the environment protection aspect;
- The Directive of large combustion power plants;

- The frame directive regarding the air quality, with its sisters for sulphur dioxide, nitrites, slurries, lead, carbon dioxide, ozone and benzene, as well as other directives under development regarding the limitation of the heavy metal content (nickel, arsenic, cadmium) in the air;
- The Directive regarding the national emission ceilings (NEC), which limits the values of sulphur dioxide, nitrates, hydrogen sulphide and volatile organic components;
- The Directive regarding the ozone layer.

The environmental issues of the coal industry, which are not strictly related to energy, are covered by the directives relating to water treatment plants and water protection.

Although the control of air pollution and the policy of coal usage do not naturally follow the same direction, being even contradictory, a compromise should be reached, compromise that should also take into consideration other objectives of the energy policy, especially those referring to the contribution of coal to guaranteeing resources and competitiveness. There are hopes that the new technologies will be able to reduce, up to one third, the emissions resulted from the use of coal.

b) Oil

The environmental problems that result from the oil industry and from its use for energetic and transportation purposes are related to air quality, water quality, climate changes and fuel quality. Regarding the use of refined products, there are still great differences between the refining level required by the S/M market and that in the Central and Eastern European countries. In the countries that are in the process of adhesion to the EU or that are candidates to the EU, the demand for oil products that have a lower polluting potential is much lower as compared to the EU.

The demand for oil products is and will continue to be increasing. In the EU, forecasts indicate a share of 40% from the total consumption of the oil energetic resources in 2020. Under these conditions, the changes imposed by the environmental protection will determine a clear orientation towards clean oil products.

This will require the development in two directions: a complex of inter-relations between the energy policy and the environmental protection and a comprehensive approach that should take into account, on the one hand, the scientifically-established integrated evaluations and, on the other hand, the targets established for the environmental protection in the durable development context.

For instance, the reduction of the polluting potential of transport fuels might result in an increase in carbon dioxide emissions produced by refineries. That is why a closer collaboration between all the involved factors seems to be the most appropriate way to treat the complexity of the problem.

c) Natural gas

From the environmental point of view, natural gas is considered to be "the gate towards durable development". The impact upon the environment generated by the use of natural gas has a local dimension (particles, smoke), a regional one (acid rains) and a global dimension (greenhouse gases).

The negative impact at all dimensions could be reduced through the use of clean gas, with a low level of sulphur and carbon, through the use of energetic-efficient technologies and through the reduction in energy demand (thermo-insulating technologies in constructions, adapted life styles). Gas technologies match very well those for the development of renewable resources.

Gas fuel is appropriate for technologies which increase energy efficiency, for instance in condensing boilers. Gas burning in power plants has the potential to reduce the carbon dioxide emissions. The use of gas in co-generation will double the power production produced based on gas in the European Union.

However, this situation will also determine derangements and breakdowns in the competition domain, between the old, low-efficient power plants and the new, efficient ones.

IV. Conclusions

On the background of the general characteristics and of the content of the dimensions of durable development at global, regional and national level in the extractive and energetic industry, this development acquires specific connotations stemming especially from the depletion and the non-regeneration of mineral resources that ensure the basis-of-existence for the two industries.

The attempt to decipher these particularities and to highlight the economic implications upon the respective industries allowed the shaping of the following relevant aspects:

The depletion of some of the natural resources imposes their rational exploitation, at a pace that should guarantee their preservation for as long a period as possible.

The pressure upon natural resources could be reduced significantly through a superior valuation of the national capital of such resources.

From the durable development perspective, although the extraction of the mineral resources has significant polluting effects upon the environment in the extractive unit areas, they can nevertheless be significantly reduced by the appropriate organisation of activity and extra-care granted to the environment

The sustainable energetic development can be ensured by means of a policy focused on the efficient use of energy, which follows inter-correlated objectives that aim at increasing production, transport and energy distribution competitiveness, while warranting the safety of supply sources and environmental protection.

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