Environmental management of electrical energy systems: Problems and perspectives

F. Araujo[*a], P. Adissi[b], S. Marques Filho[c]
[a]Politechnic School of the University of Pernambuco, Rua Prof. Francisco Figueiredo, 84, Recife, Pernambuco, Brasil. 50.830-050
Fax: +55-81-3228.0213; araujo_recife@uol.com.br
[b]Federal University of Paraíba, Brazil; [c]Federal University of Rio Grande do Norte, Brazil

In the last decades, the model of Brazilian development was characterized by the economic growth through a fast industrialization. One of the main government strategies, in that period, consisted of the supply of necessary infrastructure to the industrial activity, mainly in the transport sections, telecommunication and energy. The transmission systems had a fundamental part in that process, as elements distributors of electricity for the attending to the needs of the industry and the urbanization. The attenuation of the eventual environmental effects and social negatives of enterprises of the electric section are constituted, now, in a government concern, as it indicates the legal demand of the Environmental Impact Assessment (EIA) for the accomplishment of this type activity.

The transmission systems of electric energy had a fundamental part in model of Brazilian development, as elements distributors of electricity for the attending to the needs of the industry and the urbanization.The economic sequence of the power plant and transmission works are established starting from supply approaches and physical viability of implantation, including the evaluation of the environmental subjects.

It is worthwhile to remember that, in the next years (1999/2008), they should be incorporated to the regional, interlinked and isolated systems, about 50.000 Km of transmission line and about 96.000 MVA in substations. The installed capacity should grow of 61.300 MW for 104.600 MW. This reinforcement will demand, in the first years, total investments of the order of U$ 4,7 billion a year.[1] On the other hand, the Laws 8.987/95 (Public Service) and 9.074/95 (Electric Section), that regulate Art. 175 of the Federal Constitution, they started to demand that the concession of public services and of electric energy it should be granted by means of bidding.

With those laws, the planning studies start to indicate the sequence of works under the optics of the economy, without defining before, which the concessionary that will be responsible for the implantation and administration of the enterprise. Thus, several agents can participate and compete for the generation works and commercialization of electric energy, before monopoly of the concessionary of public service.

The crisis of petroleum, 1973, showed an extremely dependent country of imported petroleum. The Brazilian energy model was redirected in the sense of the substitution of the petroleum for other sources of energy. Among the considered alternative sources, the hidroelectric acquired great importance, for the multiple possibilities of its use in substitution to the petroleum.

The strategy of concentration of large investments in a small number of projects, in a situation of shortage of financial resources, limits the development options. This link is characteristic of the countries of the Third World. The success in the implantation of the great projects becomes decisive for them to reach the objectives of the development; the flaws and difficulties in its implantation can have consequences that surpass the restricted field of the sectorial objectives, affecting the economic and social process globally.

The implantation of great projects of the electric section, for its scale, also has an enormous influence in the areas where they are implanted, supplying the infrastructure to the introduction of new productive activities. These projects have been a source of significant ecological and social alterations, that can represent many limitations as new possibilities for the development.[2]

The attenuation of the eventual environmental effects and social negatives of enterprises of the electric section are constituted, now, in a government concern, as it indicates the legal demand of the Environmental Impact Assessment (EIA) for the accomplishment of this type activity.

On one side, the application of EIA is justified for the need of protecting extremely voluminous and strategic investments for the national development, of unexpected risks that could commit its viability. For example to strong erosion in the dam of Anchicaya (Colombia), caused by not considering the capacity of the modified ecosystems to support certain occupation types. The deforesting and the intensive use of the soil in the basin of contribution of the reservoir provoked enormous environmental impact. The shipment and the sedimentation of those solids implied in the colmatation of the reservoir in just twelve years, in a project whose operation was foreseen for a 50 year period .[3]

Besides, the development possibilities for the projects of the electric section have not been explored conveniently. Now, the regional companies of the electric section have been acting according to sectorial objectives limited to the production and transmission of energy. However, the recognition of the strategic importance of the implantation of the great enterprises in the development context, places new challenges and responsibilities for its entrepreneurs, in the sense of the effective integration of those projects to the strategies of local and regional development.

This vision has influence on the conception and the management of projects of the electric section. Instead of concentrating in a primary purpose of production and transmission of energy, these projects should be conceived in the sense of to integrate and to explore the possibilities of multiple uses of the natural resources of the area. This includes a larger emphasis potentially in the exploration of the opportunities created by the accomplishment of the project, implantation of new economic activities (for example sailing, industry, tourism, etc.), support to existent productive activities (for example irrigation, fish) and infrastructure implantation (for example traffic system). Those activities can be constituted in new sources of income and employment for the local communities.

Thus, the environmental management acquires a growing importance in the cycle of the project, instead of limiting to the attenuation of the eventual negative effects of its implantation. Its objectives start to include the identification and the promotion of the development made possibile for the project. In that context, the Environmental Study of Impact is not constituted in mere formal demand, but it becomes one of the main available planning instruments for the accomplishment of these objectives.

In this perspective, they will be discussed to follow the main aspects linked to the accomplishment of the environmental and proposed evaluation some strategic vision for its use for the companies of the electric section, focusing the main conceptual, methodological aspects, organizations and institutional.

References

[1] ELETROBRAS, **Planning 1999/2008**. 2000. http://www.eletrobras.gov.br . Research date: Apr, 24th, 2000.
[2] GOLDSMITH, E. AND HLIDYARD, N. (ed.) –The social and environmental effect of large dams, **Wadebridge Ecológical Contre,** Corwall, UK, 1985.
[3] ALLEN, R.N.–The Anchicaya hi\ydroelectric project in Colombla: Desing and Sedimentation Problems, in Farvar & Milton (ed.): **"The Careless Technology", Natural The History Press**, New York, 1972.