

ANALYSIS

Environmental valuation for long-term strategic planning — the case of the Brazilian power sector

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Abstract

If not properly dealt with over compatible horizons, environmental issues may cause ventures to incur higher costs and extend over longer implementation periods. Prompted by the uncertainties and risks inherent in these issues, as well as by the need for long-term plans to incorporate sustainable development principles, the Brazilian Power Sector is encouraging the inclusion of environmental aspects as a decision variable right from the start of the planning cycle. The purpose of this paper is to bolster efforts to include in this sector's expansion plans, costs resulting from environmental degradation of the environment. The paper offers an overview of the methodology developed to assess and include in long-term planning for this sector, external environmental costs linked to hydro-power and thermo-power generation. It suggests the use of environmental economic valuation techniques — a practice commonly used to analyze the degradation of natural capital in various countries — as well as assessing projects and programs, adopting the premises and simplifications required for application over the longer term. © 2001 Elsevier Science B.V. All rights reserved.

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1. Introduction

The Productive Sector plays an important role in the quest for sustainability. Eco-efficient production is becoming a reality among enterprises in

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the developed countries, whereby enterprises join forces to maximize their combined economic and environmental results, aimed at the adoption of “cleaner” production processes and technologies, while at the same time maintaining their aggregate productivity. Nevertheless, it is still rare for major enterprises — particularly those in the Public Power Sector in developing nations — to engage in these environmental assessments in the initial phase of setting priorities in their action plans. This was equally true in Brazil, until recently.

When specific projects and programs do include environment variables — through quantification of environmental impacts — it has been shown by experience that they are added at a very advanced phase in the planning cycle, thereby failing to ensure that the most sustainable projects are implemented. Within this context, there is a worldwide trend to expand the concepts and procedures involved in the Environmental Impact Assessment of projects in order to assess their policies, plans and programs, placing environmental issues at the same level as other parameters — economic, financial, technological, market demands, etc. Keenly aware of this requirement and in step with worldwide trends, the Environmental Division of Brazilian Power Utility — ELETROBRÁS, is striving to include social and environmental variables in its strategic long-term plans, thereby guaranteeing the inclusion of the principles of sustainable development when planning its expansion activities.

The Brazilian Power Sector undertakes its planning through a series of studies based on long-term analyses covered by the Brazilian National Electric Power Plan (NEPP). This plan analyzes prospects for development of the electric power market over a 30-year horizon, as well as the availability of primary power generation sources, and trends in technological developments. Based on strategies defined by NEPP, a medium-term plan is drawn up with a 15-year horizon, which is then reviewed on an annual basis during the preparation of the 10-year expansion plans for the sector. In this ongoing structured planning process, expansion strategies are systematically re-assessed and the alternatives reviewed until a decision is reached on venture implementation.

Within this cycle, decisions are based on energy production cost/benefit analysis, while environmental issues are only included when the actions related to a specific project are considered. An exception to this rule is the planning cycle for hydro-power plants, where a methodology has been developed and adopted for considering environmental impacts in the initial stage of the planning process, based on inventory studies of hydrographic basins (CEPEL/PPE/COPPE/UFRJ, 1997), working towards maximizing energy and economic efficiency while minimizing environmental impacts.

As a matter of fact, with the exception of degradation costs, all environmental costs incurred through the implementation of the venture are generally already included in the energy cost/benefit ratings by the sector during its long-term planning. The study undertaken by the Power Sector Coordination Committee for Environmental Activities (COMASE) proposes a social and environmental cost concept tailored to the characteristics of the Brazilian Power Sector, with tools and mechanisms to include these costs in the budget. In turn, this helps to include environmental variables in the long-term planning for this sector. The characteristics of the environmental costs defined for this sector are presented below (ELETROBRÁS/COMASE, 1994):

- *Control costs* are costs incurred by the Power Sector to avoid the total or partial occurrence of social and environmental impacts of a venture.
- *Mitigation costs* are costs incurred by the Power Sector through actions to reduce the consequences of social and environmental impacts caused by a venture.
- *Compensation costs* are costs incurred by the Power Sector through actions which offset social and environmental impacts caused by a venture in situations where reparation is impossible.
- *Monitoring costs* are costs incurred by the Power Sector through monitoring and evaluating social and environmental programs.
- *Institutional costs* are costs incurred by the Power Sector in drawing up the social and environmental studies covering the planning,

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