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Utilities Policy 11 (2003) 143–154

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# Revisiting electricity reform: The case for a sustainable development approach

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Received 29 November 2002; received in revised form 19 March 2003; accepted 16 April 2003

## Abstract

Debates over reform and restructuring of the electricity sector worldwide are typically focused on technical and economic concerns. This paper argues for a wider perspective on electricity reforms, one that explicitly examines social and environmental outcomes. The paper shows how electricity reform in the developing world has been driven primarily by financial concerns. It then examines changes in the electricity sector in the context of larger globalization debates. This framing of the issue sets the stage for a discussion of the social and environmental considerations in electricity reform.

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*Keywords:* Privatization; Electricity; Environment

## 1. Introduction

Over the course of the last decade, the conventional wisdom on the structure and operation of the electricity sector has gone through a dramatic transformation. In both industrialized and developing countries, the perception of electricity as a natural monopoly, best organized as a vertically integrated and often publicly-owned utility, has given way to a model based on competition and private ownership. This transformation is viewed as the logical outcome of technical and economic changes in the sector having to do with changes in scale economies and experimentation with new institutional forms. As a result, debate over electricity restructuring focuses on questions of implementation, such as regulatory reform, institutional design, and sequencing of privatization and sector unbundling (Bacon and Besant-Jones, 2001; Newbery and Green, 1996; Joskow, 1998).

In this article, I suggest that a closer look at how and why electricity reform has been undertaken, particularly in the developing world, argues for broadening the debate beyond the technical and economic concerns that are currently dominant. In particular, I suggest the need for more focused attention on the social and environ-

mental implications of electricity reforms. The argument is organized around four sections. First, I illustrate how the initial state of the electricity sector, and hence the nature of the problem to be solved, differs greatly across the industrialized and developing world. In this section, I also summarize current thinking about electricity reform. Second, I suggest that considerations of finance and an ideological shift toward greater reliance on market mechanisms have been a major driver of electricity restructuring in the developing world. Third, I argue that framing electricity reform around the larger process of economic globalization suggests the need for explicit discussion of how it will serve the public interest, and suggest that the language of sustainable development is appropriate for this purpose. Finally, I examine whether and how electricity reform has implications for broader social and environmental agendas.

## 2. Organization of the electricity sector: From “social compact” to economic efficiency

Until the early 1990s, governments either owned the electricity sector or controlled the sector through regulation. Electricity was considered a textbook natural monopoly (Teplitz-Sembitzky, 1990; Hunt and Shuttleworth, 1996). Governments, it was thought, were best

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able to mobilize the large amounts of capital necessary to develop the sector and bear the long time horizons for recovery of costs. Particularly in developing countries, government leadership in the development and use of electricity was part of a broader “social compact” (World Bank, 1988).

### 2.1. Electricity reform in the industrialized versus the developing world

In the early 1990s, however, this conventional wisdom came under siege. With astonishing rapidity, there was a revolution in thinking about the structure of the industry. In the industrialized world, the promise of the public, vertically integrated, centralized power system was largely realized—people had reliable, affordable power. The problems were those of a mature system and technologies. By the 1970s, however, industrialized countries no longer benefited from the smoothly rising demand curves of the past, undermining the predictable sources of income on which utilities had relied, and affecting the returns from new power projects (Rosenzweig and Voll, 1997). When small, cheap gas turbines became commercially viable, the trends in scale economies that had dominated the industry until this point were dramatically reversed (Hunt and Shuttleworth, 1996).<sup>1</sup> Costs and risk in the sector had increased due to a rising environmental consciousness, a corresponding increase in regulations, and burdensome investment in large power plants, particularly high-capital-cost nuclear units (Patterson, 1999). In short, a virtuous cycle of increasing consumption, growing interconnection, and lower costs driven by scale economies was replaced by a vicious cycle of increasing costs, diminishing productivity, and deteriorating economic performance (de Oliveira, 1997).

Countries began to act on these changed realities. In the 1970s, the United States allowed independent power producers to sell electricity to investor-owned utilities. This was a shift of considerable significance. It demonstrated that independent generators could be integrated into a grid system, and began the unraveling of the conventional wisdom that the utility was a natural monopoly (Hirsh, 1999). In the late 1980s, Chile and the United Kingdom took reform a step further by re-making their sectors around the objective of promoting competition.<sup>2</sup>

<sup>1</sup> Small gas turbines generate electricity that costs about 4 cents per kilowatt-hour compared to 12 cents per kilowatt-hour for power from the nuclear plants completed in the late 1980s (Flavin and Lenssen, 1997). By one estimate, the minimum efficient plant size decreased from 1000 megawatts in the early 1980s to between 50 megawatts and 350 megawatts by the late 1990s (International Energy Agency, 1999).

<sup>2</sup> Motivations in both countries were similar: macroeconomic restructuring based on an ideological predisposition to private ownership and competition; a desire to increase efficiency in the sector; and privatization to stem a drain on public finances (Bacon, 1995; Rosenzweig and Voll, 1997; Patterson, 1999).

This was a radical idea.<sup>3</sup> Before these countries initiated reform, there was near unanimity that transaction costs in the sector and the technical requirements of electricity made competition nearly impossible.<sup>4</sup> To achieve market competition, these countries had to also privatize what had been publicly owned utilities.

The rapid growth and declining costs of communication and information technologies facilitated the development of new control techniques consistent with decentralization, which facilitated competition (Graham and Marvin, 1995; International Energy Agency, 1999). In a few short years, there was a rush to anoint a new conventional wisdom—competition in the power sector was not only possible, but inevitable. This new model represented a shift from a “social compact” to the pursuit of economic efficiency.

At the same time, in the developing world, the record of the vertically integrated public utility approach was mixed, with different types and magnitudes of problems in different countries. For example, the electricity sector in Argentina and South Africa is well-developed and functions relatively well. In Bulgaria, and in much of Central and Eastern Europe, the sector is well-developed but plagued by inefficiencies (Chandler, 2000). For example, energy intensity (the amount of energy required to produce a unit of GDP) in this region is approximately twice as high as in other industrialized countries (Tellam, 2000). In other countries the promise of the public utility model has failed to materialize. Most African countries, for example, provide electricity to less than 20% of their population (Bhagavan, 1999). Those who do have access to electricity are often inadequately served.

In many cases the problems lie less in an inherent weakness in the approach and more in a failure to successfully implement the public utility approach as it was practiced in the north. For example, state-owned monopolies in many countries have allowed subsidies to proliferate, demonstrated a bias in favor of large and visible projects, been prey to bad management, and have placed a strain on government budgets (World Energy Assessment, 2000). In an illustration of electricity as an element of a social contract, subsidized power was also often used to propel forward key sectors of the economy. This approach, while effective, also created powerful constituencies for the continuation of such policies. For

<sup>3</sup> These changes were preceded by a number of measures introduced in the United States in the 1970s to address the changed context, including competition in generation, to boost new technologies, and to promote energy efficiency services aimed at the customer (Flavin and Lenssen, 1997; Patterson, 1999).

<sup>4</sup> Indeed, those who initiated reforms in the United Kingdom admitted that even as they promoted competition, they had no clear idea of how competitive structures should be established (Hunt and Shuttleworth, 1996).

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