MORE THAN EVER, THE developing world faces important challenges in the provision of energy to fuel economic development and reduce long-standing poverty. Specifically, a supply of reliable and affordable electrical energy as a tool to support economic growth and provide better life conditions is at the center of concern. This is especially the case in such rapidly developing countries as China, Brazil, and India, where rates of 10–15% demand growth per year are common. But it is even more crucial in an impoverished continent such as Africa, where electric energy shortfalls become bottlenecks for progress and energy poverty is synonymous with the poverty of people. (Africa consumes approximately 3% of the world’s electricity but accounts for more than 13% of its population).

This issue of IEEE Power & Energy Magazine integrates articles that describe the specific challenges faced in the developing world related to energy and electricity supply. The articles provide background on generation supply and transmission interconnections in the geographic areas covered while assessing the reform processes taking place.

The driving force behind sector reform in the developing world is not only the belief that competitive markets make the power industry more efficient. With major macroeconomic turmoil and rocketing fuel prices, the push for restructuring comes from governments looking for means to attract sustained private investment in electric power, thus allowing public funds to be used for urgent social needs such as education and health care.

Over US$100 billion was required from 1992 to 2004 for investment in the electric power sector in Latin America, a subcontinent that led the world in power sector reform in the 1980s and that has served as a reference elsewhere. Governments are realizing that private investment will only be attracted if risk is mitigated by the development of stable political and business environments with transparent and nondiscriminatory regulatory frameworks that prevent political intervention.

Still, the challenge to lower cost is by no means secondary to the reform process of transforming often inefficient state-owned electric utilities into commercially viable entities that can expand installations to serve an increasing number of customers and rapidly growing demand. The need is to reduce high losses, electricity theft, poor service and power shortages, under- and overinvestment, corruption, and fraud. Also, the opportunities provided by advances in new generation and transmission technologies are present to allow the unbundling, liberalization, and privatization of these utilities.

While the developed world, essentially the United States and the European Community, is focused on energy security, energy efficiency, and associated environmental control, the needs of the developing world are more basic, and its primary challenge is to ensure
sufficient capacity and investment to reliably serve growing economies.

**In This Issue**

Authors from industry, consulting, and academia from all over the world assembled to produce four articles with independent views on the central theme of electric energy supply in Africa, China, India, and South America.

The first article, by Bai K. Blyden and Innocent E. Davidson, summarizes the concerted effort of the past 20 years by African countries to formulate strategies that address the regional social economic crisis and developmental challenges. It illustrates the efforts currently underway and those being planned throughout the continent in the electric power sector and reviews the strategies leading to phased development of an integrated African grid.

Felix F. Wu and Shuti Fu in our second article describe recent developments in China. The momentous growth in electricity consumption has created tremendous challenges for sustainable development. Current reliance on coal as the major source of electric generation has to be diversified into other resources, including hydro, nuclear, and renewables. The rapid expansion of the transmission network with high-voltage interconnections to supply energy from distant sources is making China’s electrical system the most complex in the world.

The third article, by Ram Ganesh Yadav, Anjan Roy, Shrikrishna A. Khaparde, and Polgani Pentayya, details how the government of India, with a population of over 1 billion, aims to add over 100 GW of capacity by the year 2012 to meet the stated target of 1,000 KWh per capita electricity consumption; emphasis is given to the development of hydro potential and the forming of a national grid.

Finally, the article by Hugh Rudnick, Luiz Augusto Barroso, Carlos Skerk, and Adrián Blanco concentrates on developments in three South American countries: the giant Brazil, the economically troubled Argentina, and the pioneer of electricity reform, Chile. While Brazil and Chile progress into a second stage of reform with public market auctions in a private environment, Argentina is taking a backward step towards significant state intervention similar to the country’s situation prior to reform. In support of the belief that regional reforms have produced positive results, experts from these three countries are advising both China and Africa on deregulation approaches.

Supplying energy to the developing world is not only a vital objective of the countries involved but also becomes the challenge of the developed world. In a global society where economics ties us together, all countries share the interest of developing new energy technologies and improving existing ones in anticipation of a menacing future.