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**IEEE POWER ENGINEERING SOCIETY
ENERGY DEVELOPMENT AND POWER GENERATION COMMITTEE**

**PANEL SESSION: MARKET MECHANISMS AND SUPPLY ADEQUACY IN THE
SECOND WAVE OF POWER SECTOR REFORMS IN LATIN AMERICA**

(Luiz Augusto Barroso, Tom Hammons, and Hugh Rudnick)

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Topic: Critical Infrastructure of the Power System

INTRODUCTION

On behalf of the Energy Development and Power Generation Committee, welcome to this Panel Session on Market Mechanisms and Supply Adequacy in the Second Wave of Power Sector Reforms in Latin America

Latin America has emerged in the recent years as one of the most dynamic regions for electricity markets. The region is characterized by high demand growth rates (over 4-5% yearly), strong hydro share (about 60%). In the 1990s the region was one of the world leaders in private investments in the electricity sector. The process of reform of the electricity sectors so far has not reached all countries in the region and has occurred in "waves" in the countries with deregulated markets. The example of Chile was first followed by Argentina in the early 1990s and shortly later by Bolivia and Peru. By the mid-1990s it had spread to Brazil, Colombia, and several Central American countries. While the motivations of power sector reform in developed countries was introduced to facilitate competition as a means to reach the ultimate goal of greater efficiency, the reforms in Latin America had the additional motivation of relieving the government to fund investments in new generation capacity that were required to match predicted load growth.

[#] Document prepared and edited by T J Hammons

The accumulated experience so far has shown many positive aspects, such as a greater efficiency of the private utilities, the positive effect of the eligible consumers as market benchmark and the transparency brought by the regulatory agencies, which provide confidence for investors.

On the other hand, some important difficulties (power crisis, rationings) have appeared, in particular with respect to the security of supply in many countries of the region. A first reason for these supply difficulties is that the economical signal provided by the spot market is too volatile to correctly indicate and stimulate the entrance of new capacity. This is especially true for the countries with a strong hydro-share, where the occurrence of conjuncture favorable hydro conditions can drive downwards the spot prices even if there are structural problems with supply. It has also been observed that in hydro systems the spot price increases substantially only when the system is “too close” from a power crisis, when there is not time anymore to make investments. A second reason is the combination of a strong demand growth but with a large volatility in the growth rates (“stop and go” economies that can be heavily affected by international crisis). This makes the generation activity very risky and makes difficult the closing of “project finance” by the financing institutions for new projects, which ends up constraining the entrance of new capacity.

Due to these difficulties and new conditions, some countries in the region have made adjustments in their regulatory frameworks over the last years aiming at keeping positive aspects of the first stage of their reforms, but correcting the issues that have not worked as expected. Ingredients of this “second generation” include: (i) incentives to forward contracts to induce the entrance of new capacity (the so-called competition “for the market”, instead of “in the market”), (ii) in some countries these contracts need to have physical coverage (ballast), (iii) the use of procurement auctions to incentive efficient contracting and setting up pass-through price, and (iv) the possible complementation of state and market in the expansion of generation and transport.

The Panel will address the design and outcomes of this second generation of power sector reforms in Latin American countries, aiming at identifying the common challenges and the schemes adopted to tackle them such as the use of PPA auctions, strategies to deal with demand uncertainty, capacity expansion and degree of state intervention, among others.

Panelist and titles of their presentations are:

1. Luis V. Sbértoli, SIGLA, Argentina, The State and The Market in The Power Sector Planning (paper 06GM0209)
2. Luiz Augusto Barroso, José Rosenblatt, Bernardo Bezerra, André Resende, and Mario Pereira, Mercados de Energia/PSR, Brazil. Auctions of Contracts and Energy Call Options to Ensure Supply Adequacy in the Second Stage of the Brazilian Power Sector Reform (paper 06GM0205)
3. Hugh Rudnick, Pontificia Universidad Catolica de Chile, Chile and Sebastian Mocarquer, System Engineering Consultants, Santiago, Chile. Contract auctions to assure supply adequacy in an uncertain energy environment. (Paper 06GM1192)
4. Daniel Camac, Víctor Ormeño and Luis Espinoza, Peru. Assuring the efficient development of electricity generation in Peru (paper 06GM0208)
5. Jorge Karacsonyi, Manuel Tinoco, Ricardo Rios and Fernando Montoya. Supply Adequacy Mechanisms and Cross-Border Contracts in the Central American Regional Electricity Market (paper 06GM0207)
6. Marcelino Madrigal, Jaime Millan, Rachel Robboy and Javier Molina, IDB, USA. Financing Challenges for Generation Investments in New Supply Adequacy Mechanisms in Latin America. (Paper 06GM0206).

Panelist will speak for approximately 20 minutes. Each presentation will be discussed immediately following the respective presentation. There will be a further opportunity for discussion of the presentations following the final presentation.

The Panel Session has been organized by Luiz Augusto Barroso (Mercados de Energia/PSRI, Brazil), Tom Hammons (University of Glasgow, UK). and Hugh Rudnick (Pontificia Universidad Catolica de Chile, Chile).

Luiz Augusto Barroso, Tom Hammons and Hugh Rudnick will moderate the Panel Session.

The first presentation has been prepared and will be given by Luis V. Sbértoli, President and CEO of SIGLA, Argentina. It will discuss the State and Market in Latin America in Power Sector Planning.

The final years in the twentieth century has displayed a true revolution in terms of organizational forms of social and economic activities all over the world.

Globalization of financial capital flows has drawn attention to the issues of allocation and productive efficiency, which are currently exerting a virulent influence on all forms of organization and management of countries and enterprises.

Simultaneously, the communication revolution and the Internet have pulled down existing technological and geographic barriers.

"Efficiency" and "controllability" are factors ruling new organization theories, in the first place at the business microeconomic level, and then at a general level of activities including those of the State. In the presentation these issues in the State and Market in Latin America in Power Sector Planning will be discussed and analyzed.

Luis V. Sbértoli has directed and managed technical projects undertaken by SIGLA, an International Consulting firm that is specialized in the energy sector with particular stress in new business and project evaluation both in the public and private fields, for over twenty-five years. He has held several public appointments in Argentina, performing official functions in 1998-1999 as Under Secretary of Energy and in 1989-1991 as National Director of Energy Sector Planning. Presently he is President and CEO of SIGLA, monitoring foreign relations and contract matters on the firm's relations with clients and other joint venture partners.

The second presentation is entitled: Auctions of Contracts and Energy Call Options to Ensure Supply Adequacy in the Second Stage of the Brazilian Power Sector Reform. It has been prepared by Luiz Augusto Barroso, José Rosenblatt, Bernardo Bezerra, André Resende, and Mario Pereira, Mercados de Energia/PSR, Brazil. Luiz Augusto Barroso will present it.

The reform process in the electricity sector of any country has as the main objective the design of a power market capable to induce a reliable and efficient energy supply, translated into adequate tariffs. Brazil started its reform process in 1996, inspired by similar schemes in the electricity sector of more developed countries. However, existence of particularities in the hydroelectric energy market, such as weak spot price signals for system expansion and difficulties to determine benchmark prices, avoided a smooth transition to a fully deregulated market. In 2004, a revisited power sector model was launched. This aimed at alleviating the difficulties of the first model. The core of the new proposals lies on use of the contract obligation and energy supply

auctions as the backbone for efficient contracting and supply adequacy. Supply auctions were held in 2004-2005, with a volume of about 20,000 average MW contracted involving about 60 billion USD in financial transactions. This presentation will discuss the implementation of auctions of energy contracts and call options in Brazil as part of the mechanisms to ensure supply adequacy adopted in the second stage of its power sector reform.

Luiz Augusto Barroso joined PSR/Mercados in 1999, where he has been working and researching on power systems economics, planning and operation, focusing on hydro systems. He has been a speaker on these subjects in Latin America, Europe and US/Canada.

José Rosenblatt has a BSc in EE from PUC/Rio, an MSc in OR from Stanford University and an Executive MBA degree at UFRJ's Economics Institute. He joined PSR in 2000, where he is responsible for regulatory and market studies.

André Guimarães joined PSR in 2003 and is currently involved with auction modeling and expansion planning models.

Bernardo Bezerra joined PSR/Mercados in 2004 and has been working in projects related to gas and electricity integration and pricing of energy call options.

Mario Veiga Pereira is the president of PSR/Mercados. He is currently engaged in regulatory studies and development of new methodologies and tools for risk management in energy markets. Previously he was a project manager at EPRI's PSPO program and research coordinator at Cepel, where he developed methodologies and software for expansion planning, and hydrothermal scheduling. He was a recipient of the Franz Edelman Award for Management Science Achievement, granted by ORSA/TIMS for his work on stochastic optimization applied to hydro scheduling.

Hugh Rudnick, Pontificia Universidad Catolica de Chile, Chile and Sebastian Mocarquer, Syste Engineering Consultants, Santiago, Chile has prepared the third presentation. It is on contract auctions to assure supply adequacy in an uncertain energy environment. Hugh Rudnick will present it.

The presentation will review solutions being explored to face the supply problems in the Chilean electricity market over recent years, given unexpected restrictions in natural gas transfers from Argentina. Investment in generation came to a stall, given uncertainties in natural gas supply and the risk to contract with distributors at regulated prices. A change of law was introduced incorporating market-oriented schemes that aim at transferring market expected long-term prices to final consumers, replacing the action of the regulator. An auction scheme was introduced and distributors will make a first call for bids at mid 2006. This will be reviewed in the presentation.

Hugh Rudnick, an IEEE Fellow, is with the Catholic University of Chile, Santiago, Chile and also with Syste Engineering Consultants, which specializes in power-gas system planning and operations issues. His research activities focus on the economic operation, planning, and regulation of electric power systems that specializes in power-gas system planning and operations. He has been a consultant with utilities and

regulators in different countries, the United Nations and the World Bank, mainly on the design of deregulation schemes and transmission and distribution open access tariffs.

The fourth presentation is about assuring the efficient development of electricity generation in Peru. Daniel Camac, Víctor Ormeño and Luis Espinoza, Peru have prepared it.

This presentation discusses the reform being proposed to the electric regulatory framework for wholesale transactions in Peru. It represents an effort to solve some problems with the electricity market, particularly the perception that investment in new generation resources is, or may in the future be, inadequate.

The next presentation is entitled Supply Adequacy Mechanisms and Cross-Border Contracts in the Central American Regional Electricity Market Supply Adequacy Mechanisms and Cross-Border Contracts in the Central American Regional Electricity Market. Jorge Karacsonyi, Manuel Tinoco, Ricardo Ríos and Fernando Montoya have prepared it. Jorge Karacsonyi, Partner and Executive Consultant, Mercados Energeticos, Madrid, Spain, will present it

This presentation discusses the mechanisms to support generation supply adequacy that have been implemented in the countries of the Central American region and the lessons learned from this experience. Also covered will be the role of the Regional Market – which is being implemented- in support of supply contracts across borders through "firm" transmission rights and its contribution to an increased efficiency of the existing supply adequacy mechanisms.

Jorge Karacsonyi is a Partner with Mercados Energéticos. He has experience as a consultant in electricity markets design and simulation in 25 countries in America, Africa, Asia and Europe. He is Professor of Transmission Regulation and Planning for the postgraduate Electricity Markets course in Buenos Aires Institute of Technology.

Manuel Tinoco has developed computer models for planning and operation of power systems, and has experience in several countries in market and transmission pricing design for national and regional markets. He currently works for SNC-Lavalin in Montreal.

Ricardo Ríos has worked for Instituto de Investigaciones Eléctricas (Mexico), for the National Grid Company (England), for the Comisión Reguladora de Energía (Mexico) and for the SIEPAC Project Executive Unit.

Fernando Montoya has experience in generation planning and tariffs from his work at the Instituto Costarricense de Electricidad (ICE). Here, he headed the planning department. He has worked with the Latin American Energy Organization (OLADE) where he directed the SUPER/OLADE-BID

project. He currently works for SNC-Lavalin in Montreal as a generation planner and tariff specialist.

The final presentation is entitled: Financing Challenges for Generation Investments in New Supply Adequacy Mechanisms in Latin America. It has been prepared by Marcelino Madrigal, Jaime Millan, Rachel Robboy and Javier Molina, Inter American Development Bank (Infrastructure Specialist (Energy) – IDB), Washington DC. Marcelino Madrigal will present it.

The mid 1990's wave of generation investment flows in newly created electricity markets for power generation lost momentum in recent years. Factors affecting investment vary from reduced capital flows following the Asian crisis, to poor incentives for generation investment in market design. Markets equipped with variations of capacity payments have performed better with concerns of inefficient investment and high final prices for consumers. The presentation discusses some of the challenges for financing generation in this new type of market designs from the development banks perspective. It will indicate empirical evidence on what have been investment practices in some selected countries in Latin America. It will discuss spot market risk, and also outside the energy market how risk factors play an important role. To diminish these risk investors often look for more comfortable traditional long-term contracts as apposed to new market design paradigms, which brings concerns on their effectiveness in developing countries if other institutional and regulatory factors are not in place.

Marcelino Madrigal has been a researcher for a number of years at Morelia Institute of Technology in Mexico, a Director for Research and Regulatory Development at the Energy Regulatory Commission in Mexico, and General Advisors Coordinator to the Vice minister of Electricity in Mexico until 2004. Has joined the Bank as Energy Specialist in the Infrastructure and Finances Division of Regional II for Mexico, Central America and the Caribbean.

Jaime Millan is principal energy economist in the Infrastructure Markets Division of the Inter-American Development Bank's Sustainable Development Department. He is in charge of coordinating activities and strategies related to Bank's Energy Policy and conducts research on the sustainability of power sector reform in Latin America and the Caribbean. Since joining the Bank, he has supervised the economics inputs of energy projects, drafted public utilities policy and energy strategy, and initiated a program on sustainable energy.

Javier Molina is an Investment Officer with the Energy Project Finance Group at the Private Sector Department of the Inter-American Development Bank. He has worked in power sector projects in Central America, Mexico, Brazil and Venezuela. Previously, Molina was Finance Manager for a Division of Unilever in Central America and Audit Manager with Price Waterhouse in Chile..

Rachel Robboy with the Private Sector Coordination Department of the Inter-American Development Bank.

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