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### **Team of Instructors**

#### **Ahmad Ghamarian, Ph.D., Coordinator**

Dr. Ghamarian is the President and founding partner of Energy Markets Group. He has over 25 years of management, engineering and teaching experience in the energy sector, largely dealing with the energy sector in developing and emerging market countries. Previously, as Executive Director of the Energy Group at the Institute of International Education (IIE), he managed all of IIE's energy related programs. Specifically, Dr. Ghamarian has designed, managed and supervised a series of capacity building/training projects for the energy sectors of Asia, Europe, Africa, and Latin America, from the institutional needs assessment stage to capacity building and training implementation and evaluation. Dr. Ghamarian went to IIE from the Exxon Research and Engineering Company, where he performed research and development, and provided consulting services to promote energy efficiency in Exxon's refineries and chemical plants worldwide. Previously, he served as a Project Engineer with the Combustion Engineering Company in Tehran, working on the design of several power-generation projects for the Iranian onshore/offshore oil industry. Dr. Ghamarian has served as Adjunct Assistant Professor at the New Jersey Institute of Technology and as Adjunct Professor at The George Washington University, teaching Least-Cost Utility Planning and Power System Economics. He is the author or co-author of over two dozen technical reports and papers on energy and power planning and sustainable development; his latest report is the *Best Practices Guide: Electricity Regulation in Latin America*. Dr. Ghamarian holds an M.S. and Ph.D. in Mechanical Engineering with a focus on Energy Technology and a B.S. in Electrical Engineering with a focus on Power Systems.

#### **Frank Felder, Ph.D., Instructor**

Dr. Felder is an expert on the economics and reliability of liberalized electric power markets. He consults to a wide range of clients in the industry, advising them on market design, market power, electricity price forecasting, and risk management. He has testified before the Federal Energy Regulatory Commission and several state public utility commissions. As part of his consulting practice, Frank has conducted numerous seminars and lectures in the US and internationally, and has widespread experience explaining complex - and sometimes arcane - material in an intuitive, humorous, and accessible manner. Frank is also Associate Research Professor at the Bloustein School of Planning and Public Policy, Rutgers University where he conducts research in electricity markets and Director of the Center for Energy, Economic & Environmental Policy. At

the Center, Frank has conducted studies on renewable portfolio standards, load management measures, carbon dioxide emission allowances, and state energy policy. Currently, Frank is participating in the Center's effort to draft an Energy Master Plan for New Jersey. His primary research area is the reliability and efficiency of restructured electric power systems. He has published widely in professional and academic journals on market power and mitigation, wholesale market design, reliability, transmission planning, market power, and rate design issues. Frank is a reviewer for several academic journals including The Energy Journal and the IEEE Transactions on Power Systems. Frank holds a PhD in Technology, Management, and Policy from the Massachusetts Institute of Technology, where his research focused on the economics and reliability of restructured electric power.

**Craig Glazer, Instructor**

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A Regional Workshop on "Electricity Markets in West Africa"

June 16-20, 2008  
Novotel Hotel  
Dakar, Senegal

**Background**

During the week of October 1-5, 2007, the Energy Markets Group (EMG) held its 2<sup>nd</sup> Annual Executive Workshop entitled "Electricity Markets Design." The Executive Workshop was intended for policy and decision-makers who play a decisive role in the design and management of global electricity markets. Twenty-four very senior participants from all over the world attended the workshop, including four senior representatives from the West African Power Pool, Special Advisor to the Nigerian President on Power, and the Chief Executive Officer of the Transmission Company of Nigeria.

After the successful implementation of the workshop, the participants from West Africa expressed great interest in holding the workshop that is tailor made to their region, addressing issues that are specific to their needs. The workshop to be held in the region could reach more participants who were not able to travel to the U.S. to attend the Executive Workshop. To this end, EMG is pleased to present this workshop.

### Introduction

Today the world's electricity is provided largely by state-owned utilities, and power consumption will continue to surge over the coming decade. To meet global needs of and to maintain pace with current levels of economic growth, countries around the world must develop efficient systems to allow for increased investment and improved management within their electricity markets. To accomplish this, key decision makers require a better understanding of how these markets should operate.

Recent studies by the World Energy Council on the impacts of power sector liberalization and competition found that liberalization of electricity markets offers one viable option in response to the challenges presented by low collection; high non-technical losses; low system reliability; low levels of system infrastructure investment; aging generation assets; excessive subsidies; and antiquated pricing policies.

Latin America offers a good example of a region where energy market liberalization and the establishment of competitive electricity markets has proven successful, leading to greatly improved access, service and reliability. This has been achieved through increased technology transfer, introduction of more efficient and modern management practices, and improved regulatory transparency. Clearly, even in the best functioning electricity markets there remain obstacles to achieving true market efficiency. Young markets are not predictable given the innumerable factors affecting market performance and outcomes. At the same time, there are several basic features are included in the design and structuring of all successful electricity markets. These design basics are readily available and concepts can be readily transferred through a look at those countries that have already made the transition to and have established strong market systems. Countries in the process of or just beginning to undertake a liberalization of their electricity markets should take advantage of lessons learned by their predecessors, so that they can adapt and apply them to their own needs.

### Program Description

The West African workshop will address the basic topics essential to good electricity market structure and design. Topics will include competition, market power, transparency and governance, wholesale electricity trading, and connecting market prices or power procurement costs with end user tariffs. The main objective is to develop participants' understanding of the basic concepts related to electricity market design—pricing and contracts, energy and reserve markets, capacity mechanisms, creation of enabling environments for investments in generation, commercial decisions and trading, system operation and coordination of a multi-participant sector, market administration and short term energy markets, priority of reliability and quality of service over

independent commercial arrangements, settlement, and compatibility between end consumer tariff regulation and wholesale market prices and efficient procurement costs.

Specifically, the program will address key areas which have been identified as important measures to ensure a well-established centrally coordinated West Africa Power Pool. In addition to highlighting the need for a sound transmission planning and inter-connection process, the program will address the need for commercial agreements, codes and standards addressing power pool operations, wheeling rules and charges, contractual mechanisms for bilateral and multilateral trading and sound operational power pool practices. The West Africa Power Pool has identified as priorities issues such as coordinated load sharing, regional sharing of spinning reserves, criteria for generator interconnection and emergency procedures. The training program will address how these issues are addressed within power pools and Regional Transmission Organizations in the United States. In addition, the program will address best practices re: the regulation of power pools with specific reference to regulation over their reliability, market and planning functions as well as market monitoring. All of these concepts will be analyzed from a variety of perspectives. Practical real-world experiences will be used to illustrate course concepts. The workshop will analyze practical issues related to implementation of electricity markets, criteria necessary for market creation in order to achieve successful implementation and sustainable electricity markets.

Case study exercises will be used to allow participants to experience real-world market design challenges on their own, allowing them to test market design and operational challenges for themselves.

#### Program Overview

The following program overview will be tailor-made to West Africa's needs once communications with the host organization has been established. Potential topics to be covered will include:

Conceptual and structural design of markets; options, and their implications for the development of the electricity market systems; role of market rules.

Products that can be traded in an electricity market and pricing system principles; role of market prices in promoting efficiency and attracting generation investment.

Market trading arrangement options, with a look to different degrees of competition; special arrangements to manage the transition.

Role of the System Operator; coordination mechanisms for the operation of the system; connecting the constraints of the electricity systems with the commercial activity and electricity trading arrangements of participants in the market.

Role of the Market Operator; settlement; metering systems; payment mechanisms; security deposits.

Spot Market or Balancing Market design and organization; opportunity trading; short-term energy prices; incentives for efficiency and new investment.

Power procurement and trading.

Contracts in electricity markets: long-term trading, types of contracts, concept of “free negotiation” and aspects that require additional regulation.  
 Ancillary services; mechanisms to procure ancillary services: regulation, contracts and ancillary services markets.  
 Operational planning in a competitive environment.  
 Institutional arrangements; market governance; rules amendment mechanisms.  
 Market surveillance; independent audits.  
 Connecting the market with end-consumer tariffs; pass-through of power procurement costs to regulated consumer tariffs

**Schedule:**

	Module I	Module II	Module III	Module IV
	8:30 am – 10: am	10:30 am – 12 pm	1 pm – 2:30 pm	3 pm – 4:30 pm
Day 1	Workshop Overview	Market Structure Design	Market Structure Design continued	Power Pool
Day 2	Role of the Regulator in a Competitive Electricity Market	Power Procurement and Trading	Contracts & Negotiation	Bilateral Trading Agreements
Day 3	Role of System Operators	Role of Market Operators	Governance of the Market	Case Study – Bidding Simulation
Day 4	Transmission Planning	Operational Planning	Market Monitoring/ Surveillance	System Reliability
Day 5	Electricity Markets Future Trends & Challenges	International Experience	Case Study – Participants Presentation	Closing Remarks & Graduation

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~~Martin Rodriguez Pardina, PhD, Instructor~~

~~Dr Rodriguez Pardina is President and founding partner of MacroConsulting S.A. a consulting firm specialized in economic regulation of utilities and competition policy. He has over 10 years experience working as a consultant in regulation and restructuring of public utilities and competitive energy markets. Until 2001 he held an academic position as Executive Director of the Economic Regulation Research Center at the Universidad Argentina de la Empresa. Since 1996, Dr. Rodriguez Pardina has been a consultant to governments, regulators, international agencies and companies in Chile, India, Brazil, Thailand, Pakistan, Russia, Cape Verde, Mali, Bolivia, Peru, as well as Argentina. He has worked on issues of market design, transmission pricing, governance mechanisms, energy trading and tariff setting in Latin America, Middle East, Africa, Russia and India. Dr. Rodriguez Pardina has been a faculty member for the Finance in Infrastructure Course organized by the World Bank Institute and an invited lecturer among others in the Regulation Course of the Public Utility Research Center of the University of Florida, the University of Beijing—China—, Technological University of Berlin—Germany—, Universidad de Chile—Chile—, Universidad ORT—Uruguay—and the Core Course on Regulation organized by SAFIR. He has published several articles on utility regulation in international journals and is the co-author of a book on resetting price caps published by the World Bank. A book on regulatory accounting—of which he is co-author—is to be published by the World Bank in 2006. Dr Rodriguez Pardina holds a PhD in Economics and an MPhil in Economics and Politics of Development both from the University of Cambridge.~~