17 - 21 MARCH 2025

GAS-TO-POWER BUSINESS FUNDAMENTALS AND DEVELOPING AN IPP PROJECT

Date: 17 - 21 March 2025

Venue: Cape Town

The inaugural Gas to Power workshop, a collaborative effort between the African Energy Chamber (AEC) and the International Hydrocarbon Training and Development Centre (IHRDC), proved to be a resounding success in Cape Town, South Africa. The workshop brought together a diverse group of participants, including energy lawyers, operations managers, and other key stakeholders, to delve into the intricacies of the gas-to-power sector. This intensive program addressed the critical need for skilled professionals in the expanding African gas-to-power sector. The positive feedback and tangible outcomes of this pilot program have paved the way for a broader initiative aimed at empowering professionals and driving sustainable energy development across Africa.

Gas-to-Power

11-15 MAR 2024

WORKSHOP KEY OUTCOMES

- **High-Quality Training**: The workshop delivered comprehensive, industry-relevant training on various aspects of the gas-to-power value chain, including exploration, production, transportation, and power generation.

- **Experienced Faculty:** Renowned industry experts and academics facilitated the program, providing valuable insights and practical knowledge.

- **Diverse Participation:** The workshop attracted a diverse range of professionals from across Africa, including engineers, project managers, and government officials.

GAS-TO-POWER BUSINESS FUNDAMENTALS & DEVELOPING AN IPP PROJECT

PROGRAM INFORMATION

Program Objectives

This program provides international energy professionals with an overview of the international gas-to-power business and the opportunity to develop an IPP project in a West African developing country setting with the guidance of excellent instructors and a challenging learning simulation workshop. After introductory lectures on gas and power industry fundamentals, the focus turns to gas supply options, including pipeline and LNG imports, and then proceeds to the key development needs of combined-cycle gas turbine power plants

(CCGT), including the project management process from screening to operation, plant technology, siting, transmission, long and short term gas supply and power purchase agreements, permitting, project equity and debt financing, regulatory issues and rate setting methods, market liberalization, carbon emissions and the impact of competing alternative energy projects.

KEY BENEFITS

1. Gain a solid appreciation of the international gas and power business fundamentals.
2. Learn the various sources and quality of natural gas, including LNG imports, and their competitive market prices.
3. Be able to describe the key components and operating cycle of a combined-cycle power plant and why they are so efficient.
4. Learn the commercial aspects of CCGT projects, how they are developed and managed through a complete life cycle.
5. Gain an understanding of the legal agreements, sources of capital, regulatory compliance, markets for power and economic aspects of developing an IPP energy project.
6. Learn how to work as a team to collect and analyze data, prepare project decisions, and present recommendations to management.
7. Appreciate the competing “cost and value proposition” of renewable power supply alternatives.

PROGRAM SCHEDULE

This program is designed as an in-person 4.5-day offering. Daily sessions, Monday through Thursday, will run from approximately 8:30 am to 5:00 pm with an hour lunch break. The final day of the program will conclude around noon with team presentations and hand out of program certificates.

INSTRUCTIONAL FORMAT

The instructional format consists of lectures by very experienced faculty along with team participation in IHRDC’s challenging power project business game. This unique design is the reason why IHRDC programs are consistently rated as the best in the industry today. The business game typically takes almost one half of the instruction time and has been highly rated by past participants for its effectiveness in internalizing learning and generating discussion among team participants. This combination of lectures and interactive simulation sessions has proven to be an ideal way for participants to learn the practical needs of today’s international energy and power markets.

WHO SHOULD ATTEND

This program is designed for professionals from diverse backgrounds, who seek a comprehensive understanding of gas-fired power plants and how the high efficiency of these plants along with the availability of imported LNG or pipeline gas offer an ideal combination for countries who are seeking solutions in today’s rapidly expanding power business.

TESTIMONIALS

“The workshops simulations were good exercises. It is a training that helps a lot on building up basic knowledge on the power industry, I would recommend to many people to attend the course.”

- **Joao Vicente De Carvalho Viera -** ExxonMobil

“The training was very fruitful and informative. It was a well-organized workshop, and we are looking forward to having more of these conversations with different participants from African countries. I would like to give a very good thanks to the African Energy Chamber for organising this and the presenters that were here to present these lessons.”

- **Mandlenkosi Gubuza -** CLG

“ I found the training to be very informative. The subject that was covered is a very topical subject in South Africa right now, for my organizational and the country. There was a lot of information, the presenters were well versed on the topic, the examples they were using was typical international examples but they also brought us back to Africa, this made the course much relevant to us. I think that this course will become a very important course in the future.”

- **Natalie Taft -** Strategic Fuel Fund

“The training was a very good experience. I left with an overall rewarding experience. We got to learn a lot about the oil and gas industry from exploration to storage and distribution. Most importantly gas to power generation which is my core”

- **Ntongwe Enongene –** APR Energy

PROGRAM CONTENT

The program includes the following topic areas in form of subject matter lectures:

POWER INDUSTRY INTRODUCTION

Power Industry Structure, Terminology and Units; Overview of the Electric Power Industry; Including Trends in Market Liberalization and Privatization of Assets.

GAS MARKET ANALYSIS AND PRICING

Structure of the gas value chain; regional gas markets in key world markets; analysis of gas market opportunities; five major gas pricing formulations.

GAS PRODUCTION AND PIPELINE SYSTEMS

Gas field reserves, gas quality, field deliverability profile including swing; gas pipeline networks; pipeline and compressor design; capital costs; regulation and typical tariff; firm, interruptible and spot contracts; major contract terms; daily operations and nomination. Case studies.

LNG SUPPLY: Liquefaction, Transportation, and Receiving Terminals

LNG value chain: supply, transportation, receiving terminals; key LNG metrics, conversion, and worldwide markets; liquefaction cycle; supply options, long-term and spot contracts; option to liquefy your own natural gas; receiving terminal design options and operation to meet power plant needs.

OVERVIEW OF OTHER FORMS OF POWER GENERATION

Coal and Oil-Fired Steam Turbines; Hydroelectric Plants; Nuclear Power Plants; Renewables.

INTRODUCTION TO POWER GENERATION AND COMBINED CYCLE GAS TURBINE PLANTS

Power Generation Fundamentals, Power Plant Terminology, Power Plant Thermal Efficiencies, Combined Cycle Gas Turbine Power Plants: Technology and Costs.

KEY PLAYERS IN INDEPENDENT POWER PROJECTS

Identifying the key players in the project: Developers, Suppliers, Customers; Partners; Manufacturers, EPC Contractors, Regulators, Financiers.

FINANCING ENERGY PROJECTS

Traditional vs Project Financing Fundamentals; Creditworthiness; Sources of Equity and Debt; Bilateral and Multilateral Financing; Investment Guarantees; Structuring and closing on debt and equity Financing.

OVERVIEW OF TRANSMISSION AND DISTRIBUTION

Technology and Costs; 50/60 Hz; Synchronization of Plant to Grid; Instabilities; Relationship of Power Generation Costs to Price to Consumer; Economic Trade-off: Gas-by-Pipe or Electricity-by-Wire; Distribution of Electricity

OVERVIEW OF THE ELECTRIC POWER INDUSTRY LIBERALIZATION

Structure of a typical power value chain; models for management and regulation; markets and load profiles in various regions of the world; regulation of the industry with examples in developed and lesser developed countries; power supply, demand, and pricing in various regions of the world; history of market liberalization In North America and the UK.

POWER PROJECT INVESTMENT SCREENING, SELECTION AND PROJECT DEVELOPMENT

Project Feasibility; Project Design and Development – Getting the Process Right; Project Economics; Legal and Regulatory Issues; Financing Structure; Risk Mitigation; Project Management Structure: Agreement Linkages, Project Development Phase Activities; Management of Construction and Operations; Typical Project Screening Process.

GREENHOUSE GAS EMISSIONS AND THEIR IMPACT ON THE POWER INDUSTRY

Calculating CO2 emissions from power plants; regional and international growth of greenhouse gas emissions in the world; Carbon trading as an incentive to reduce – how do they work; the Paris Accords; Sustainability targets in various countries.

GLOBAL POWER TRENDS AND REGIONAL MARKETS

World Energy Trends; Projected global capacity growth trends; Investment and infrastructure trends; Energy efficiency targets; Government incentives; Optimization of generation portfolio; Smart grids.

MERCHANT POWER PLANTS

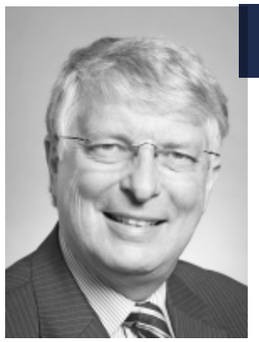
Definition; Financial Viability; Projecting Market Demand and Supply; Merchant Plants Financing; U.S. and the U.K. Merchant Plant example.

LEAST COST DISPATCHING, OPERATION OF POWER POOLS, AND ELECTRICITY TRADING

What is a Power Pool? Power Pool Economics and Structure; U.K. Power Pool; Nordic Market and Electricity Trading; What is an ISO? U.S. Power Pools, NEPOOL.

INSTRUCTORS

The Gas-to-Power: Business Fundamentals and Developing and IPP Project program requires a team of instructors to teach the lectures and run the business simulation. A brief summary our instructors that teach this course is below. Based on the final scheduled time two of these instructors will be included. In addition, we invite, you or another senior officer of the Africa Energy Chamber, if you so choose, to speak on the first day of the program to kick-off the session.



Rick Squires

Senior Lecturer | IHRDC

Mr Squires is the founder of PiEnergy, a consultancy for the energy industry, with extensive senior management experience in the international energy sector across diverse fuels and activities. He serves on four non-executive boards, including the U.K. Green Investment Bank's $1.5 billion fund. He was previously Non-Executive Chairman of a U.K.-based offshore hybrid gas and wind power company (250 MW) and held leadership roles in Shell Gas and Power and InterGen, overseeing major global energy projects. His career spans over 25 years at Shell and includes expertise in oil trading, shipping, coal, and marketing. Academically, he holds a First-Class Honours degree in Electrical Engineering and a Master's in Business Studies and is affiliated with multiple professional institutes.

Dr. Y. Serdar Dogulu

V.P of Innovative Learning Solutions

Dr. Dogulu specializes in developing interactive learning simulators and training products, focusing on company-specific technical and project management programs for IHRDC. He is the principal developer and instructor for IHRDC's E&P Learning Simulators and has contributed to technical and financial modeling for underground gas storage projects. With a Ph.D. in Petroleum and Natural Gas Engineering from Penn State, he has also conducted postdoctoral research in energy and geo-environmental engineering. His expertise includes numerical simulation and reservoir management, with prior experience as a Research Technologist at Chevron, where he developed advanced reservoir simulation tools.

Maher Habbal

Senior Instructor | IHRDC

Mr. Habbal is an expert in economic evaluation and business simulation with over 30 years of experience. He spent seven years at Saudi Aramco leading the Economic Evaluation and Portfolio Analysis Division for Aramco Chemicals, overseeing multi-billion-dollar global investment projects in petrochemical and refinery complexes. Before that, he worked for over 20 years at IHRDC, developing and implementing business simulation models for management programs. Earlier, he served as a Senior Financial Analyst at Arthur D. Little, Inc., where he also taught finance, economics, and accounting in its Master of Science in Management Program. He holds an M.S. in Management from Hult International Business School and a B.S. in Business Economics from the Lebanese American University.

Dr. Charles Brankman

Lead Instructor | IHRDC

Dr Brankman is a geologist and project developer with expertise in energy exploration, engineering geology, and CO2-enhanced oil recovery. He holds a B.S. in Geological Engineering from Princeton, an M.S. in Structural Geology from Stanford, and a Ph.D. in Structural Geology and Earth Resources from Harvard, where he taught and earned multiple teaching awards. His career includes roles at Mobil Oil, engineering geology projects in California, and co-founding C12 Energy, where he served as VP of Geosciences, focusing on CO2 oil recovery projects.

package & COURSE COST

COURSE COST

5,000$

PER PERSON

10% Discount

For Group Bookings

Training & Certificate

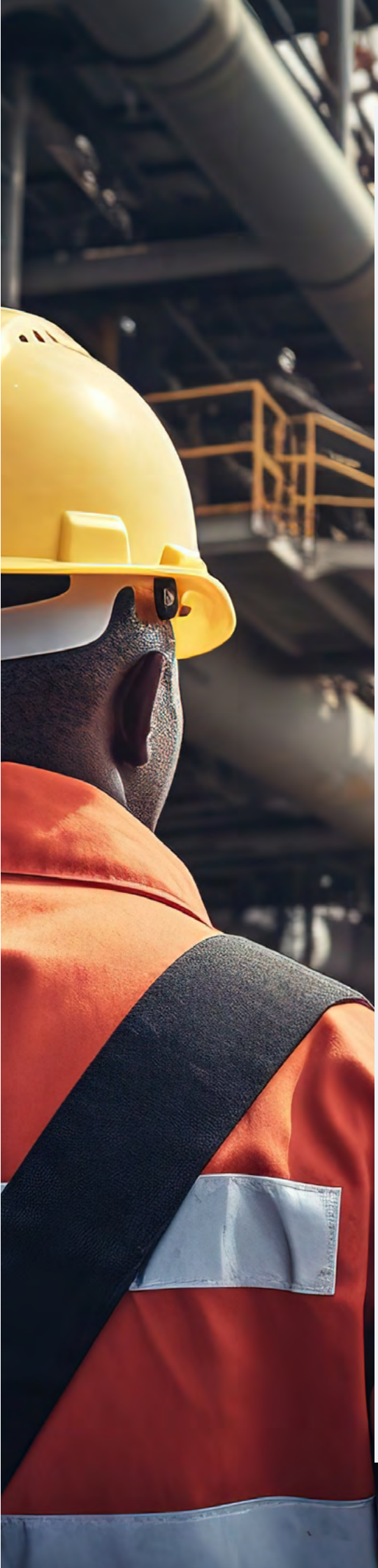
Lunch & Finger Foods

Stationary

Closing Lunch

CONTACT

For additional information on the workshop, contact Gradie.Mbono@energychamber.org.



African Energy Chamber

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