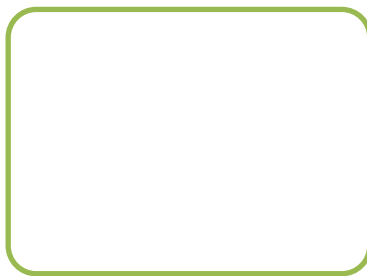




AFRICAN
SCHOOL OF
REGULATION

Power Sector Regulation in Africa

Course Program



LAUNCHING 8 APRIL 2024
HYBRID COURSE

INTRODUCTION

Objective

The objective of this course on "Power Sector Regulation in Africa" is to provide a comprehensive overview and a sound understanding of the fundamentals of power sector regulation in the diverse contexts of African countries. The course goes far beyond "having an informed opinion" on regulatory issues. It is designed with the practical objective of "learning the trade" of regulatory practice, at a level that can be achieved over the duration of the course. The course will provide a solid platform on which to build later with specialised training on different topics. The power sector in many African countries presents unique challenges that require distinctive solutions, not by copying and pasting international best practices, but by creatively adapting them or inventing new ones, always starting from the basic principles of economic regulation and an understanding of the engineering aspects of this complex industry. This is the mindset the course seeks to stimulate in the participants.

TARGET AUDIENCE

This course is designed for professionals working in the multiple entities related to the power sector, which includes regulatory authorities, ministries and governmental agencies, power utilities, academia, investors, development organisations, and others who wish to gain an indepth and practical understanding of the regulation of the power sector in Africa.

COURSE STRUCTURE AND ORGANISATION

The course consists of two parts: the first is online and lasts ten weeks; the second is in person and lasts one week. In the online and main part of the course, participants will learn the regulatory principles that apply to the several activities involved in the delivery and utilisation of electricity and their implementation in the African power sector context. The course will end with an optional in-person week devoted to the analysis of practical cases of application of the material covered during the online part of the course.

E-LEARNING

The course provides a flexible e-learning environment that features a combination of pre-selected resources - videos, podcasts and readings - live lectures and discussions with the course instructors and other participants, and a project.

IN-PERSON (OPTIONAL)

At the end of the e-learning phase, course participants can opt for an additional week-long in person activity focused on discussing relevant case studies and with the course instructors and other power sector experts from Africa and around the world. A more detailed description of some aspects of course organisation can be found at the end of this document.

COURSE CONTENT

Lesson 1: The Power Sector In Africa

Lesson 2: Regulation: Principles, Institutions And Regulation Of Monopolies

Lesson 3: Large Scale Generation Of Electricity: From Centralized Planning To Wholesale Markets

Lesson 4: Electricity Transmission And Regional Markets

Lesson 5: On-grid Distribution

Lesson 6: Tariff Design

Lesson 7: Demand Characterisation And Energy Efficiency

Lesson 8: Electricity Access & Off-grid Distribution

Lesson 9: Current Policy Issues In The Development Of The Energy Sector in Africa.
The Case of Natural Gas.

Lesson 10: Emerging Issues & Course Wrap Up

Introduction to the Course (Week 0)

Course Director – Prof. Ignacio Perez-Arriaga (Interim Director, African School of Regulation and the ASR Team)

Lesson 1

THE POWER SECTOR IN AFRICA

The aim of this lesson is to understand how the context – the physical, economic, social and political characteristics of a country – largely determines the structure and regulatory solutions adopted by countries around the world and African countries in particular.

Lesson instructor

- **Dr. Peter Twesigye** (Power Futures Lab/University of Cape Town).

Lesson 2

REGULATION: PRINCIPLES, INSTITUTIONS AND REGULATION OF MONOPOLIES

This lesson provides participants with an understanding of the need for regulation and the existence of regulatory authorities for the power sector, as well as the diversity of implementation approaches that have been adopted, with a special focus on the regulation of natural monopolies.

www.africanschoolofregulation.org

Lesson Instructors:

- **Dr. Geoffrey Mabea** (Energy Regulators Association of East Africa).
- **Dr. Peter Twesigye** (Power Futures Lab/University of Cape Town).

Lesson 3

LARGE SCALE GENERATION OF ELECTRICITY: FROM CENTRALIZED PLANNING TO WHOLESALE MARKETS

Most electricity consumed in the world is produced in large generation plants with diverse technologies. The objective of the lesson is to understand the decision making processes underlying the construction and operation of these plants, and why and how they must be regulated.

Lesson Instructors:

- **Eng. Stephan Dihwa** (Executive Director, Southern African Power Pool – SAPP) Coordination Centre).
- **Keno Shiferaw** (African School of Regulation)
- **Nnaemeka Ewelukwa** (Nigerian Bulk Electricity Trading Plc)
- **Eng. Henry Odedeh** (Kenya Electricity Transmission Company, KETRACO)

Lesson 4

ELECTRICITY TRANSMISSION AND REGIONAL MARKETS

There is a critical lack of transmission infrastructure in the African continent, especially in the interconnections among countries. Transmission regulation is essential to reduce the financial risk of potential investors and to enable efficient power trade at national and regional levels. However, it is the least understood of all aspects of electricity regulation. The aim of this lesson is to provide the solid basis that African decisionmakers need to design and implement sound regulatory solutions.

Lesson instructors:

- **Ryan Ketchum** (Hunton Andrews Kurth)
- **Chris Flavin** (Gridworks).
- **Mohamed El Abbas**, (Comillas University)
- **Eng. Stephan Dihwa** (Executive Director, Southern African Power Pool – SAPP) Coordination Centre).

Lesson 5

ON-GRID DISTRIBUTION

Virtually none of the electricity utilities in sub-Saharan Africa are financially viable. This failure is at the heart of the slow progress in access to electricity and the reluctance of potential developers of generation and transmission projects to invest in the absence of creditworthy off-takers for the power to be generated or transported. This lesson provides the criteria for assessing which regulatory and business models are best suited to the specific conditions of each country and/or utility under consideration.

Lesson instructors:

- **Dr. Peter Twesigye** (Power Futures Lab/University of Cape Town).
- **José Guerra** (CEO, Smarteec)
- **Christian de Gromard** (Engineer, former Energy Expert, French Development Agency (AFD)).

Lesson 6

TARIFF DESIGN

Tariff design brings all the regulation topics together and has critical practical importance. Remuneration of the agents that make power supply possible determines their financial viability, and end customer tariffs have important social and political implications. This is perhaps the most characteristic activity of regulatory authorities and this lesson aims to provide course participants with a clear understanding of what this activity entails.

Lesson instructor:

- **Mohamed Fayed Hendam** (EgyptERA)

Lesson 7

DEMAND CHARACTERISATION AND ENERGY EFFICIENCY

Meeting the demand for electricity is the sole objective of the electricity industry. The aim of this lesson is to understand electricity demand in its multiple dimensions: temporal patterns, sensitivity to price and reliability, the link between electricity and development growth, and the potential of energy efficiency measures, all in the residential, commercial and industrial sectors. And the potential role of the retailer as a facilitator of beneficial use of electricity.

Lesson instructors:

- **Stephen Lee** (Massachusetts Institute of Technology Center for Energy and Environmental Policy Research – MIT CEEPR)
- **Nico Peterschmidt** (INENSUS)
- **Dr. Eng. Fenwicks Musonye** (Energy & Petroleum Regulatory Authority, Kenya)

Lesson 8

ELECTRICITY ACCESS & OFF-GRID DISTRIBUTION

According to well-known studies, in the least cost electrification plans more than half of Africa's population currently without access to electricity is served by minigrids and off-grid systems. However, most current regulatory and business models for minigrids and off-grid systems in poor rural areas are neither sustainable nor scalable. This lesson focuses on providing participants with an understanding of the basic regulatory frameworks, business model designs and financing approaches needed to achieve sustainability – from both the minigrid and off-grid developer and government perspectives – and scalability in off-grid electrification.

Lesson instructors:

- **Prof. Ignacio Pérez-Arriaga** (African School of Regulation)
- **Andrés González** (Waya Energy and MIT-Comillas Universal Energy Access Lab)
- **Irene Calvé** (Sustainable Energy for All)
- **Collin Gumbu and Patrick Tonui** (Global Off-Grid Lighting Association – GOGLA)
- **Santos Díaz Pastor** (Institute for Research in Technology, Comillas University)



Lesson 9

CURRENT POLICY ISSUES IN THE DEVELOPMENT OF THE ENERGY SECTOR IN AFRICA. THE CASE OF NATURAL GAS

The natural gas sector is very important in many African countries, mainly as a fuel for power generation, but also for other uses. The gas sector, like the electricity sector, relies on network infrastructure and therefore requires regulation. It is widely accepted that power generation from gas-fired power plants will be necessary for the industrialisation of many African countries and as a bridge to a future decarbonised economy. Drawing on what has been learnt so far in the course, this lesson aims to introduce the regulation of the gas sector in those aspects that relate to the electricity sector. The lesson also presents the key elements that need to be considered when making policy and regulatory decisions on the path to electrification, industrialisation and decarbonisation of Africa's energy sector, as well as the current lack of investment and how regulation can be an enabling factor to address this pressing issue.

Lesson instructors:

- Prof. O. Gershon (Centre for Economic Policy & Development Research (CEPDeR),
- Sergio Ascari (Florence School of Regulation).

Lesson 10

EMERGING ISSUES & COURSE WRAP UP

This final lesson provides an opportunity for course participants to explore emerging issues in the energy sector in Africa, while recognising their importance in the global context. It will also be an opportunity to take stock of the progress made and how much remains to be learned and put into practice.

Lesson instructors: TBC

RESIDENTIAL WEEK: CASE STUDIES IN POWER SECTOR REGULATION (OPTIONAL).

The course concludes with a residential week largely devoted to the discussion of applied case studies, the presentation of some other topics of interest, and a final one-day workshop on equitable and sustainable development of the energy sector in Africa.

(Agenda will be provided to registered participants)



8th April 2024



10 Weeks Online



Online Course Fee: €1,200



1 Week Residential: €500

(This price does not include travel, accommodation and subsistence costs, but it includes lunches, social dinner and any other social activities.)

AFRICAN SCHOOL OF REGULATION