

EE1

**ENERGY
ECONOMICS I**

PROFESSIONAL LEVEL

SYLLABUS & EXAMS GUIDE



PROFESSIONAL LEVEL

EE1 – ENERGY ECONOMICS I

SYLLABUS & EXAMS GUIDE



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OVERVIEW



This course is an energy economics course not a general energy policy course. It will cover a variety of theoretical and empirical topics related to energy demand, energy supply, energy prices, environmental consequences of energy consumption and production, and various public policies affecting energy demand, supply, prices, and environmental effects.

Energy economics or more precisely the economics of energy is a branch of applied economics where economic principles and tools are applied to “ask the right questions” (*Stevens 2000*), and to analyse them logically and systematically to develop a well-informed understanding of the issues.

The energy sector is complex because of a number of factors:

- The constituent industries tend to be highly technical in nature, requiring some understanding of the underlying processes and techniques for a good grasp of the economic issues.
- Each industry of the sector has its own specific features which require special attention.
- Energy being an ingredient for any economic activity, its availability or lack of it affects the society and consequently, there are greater societal concerns and influences affecting the sector.
- The sector is influenced by interactions at different levels (international, regional, national and even local), most of which go beyond the subject of one discipline.

Consequently, analyses of energy problems have attracted interdisciplinary interests and researchers from various fields have left their impressions on these studies. The influence of engineering, operations research and other decision support systems in the field of energy economics has been profound. Energy issues have been analysed from an economic perspective for more than a century now. But energy economics did not develop as a specialised branch until the first oil shock in the 1970s (*Edwards 2003*). The dramatic increase in oil prices in the 1973–1974 highlighted the importance of energy in economic



development of countries. Since then, researchers, academics and even policymakers have taken a keen interest in energy studies and today energy economics has emerged as a recognised branch on its own.

Like any branch of economics, energy economics is concerned with the basic economic issue of allocating scarce resources in the economy. Thus, the microeconomic concerns of energy supply and demand and the macro-economic concerns of investment, financing and economic linkages with the rest of the economy form an essential part of the subject. However, the issues facing the energy industry change, bringing new issues to the fore. For example, in the 1970s, the focus was on understanding the energy industry (especially the oil industry), energy substitution and to some extent on renewable energies. Moreover, there was some focus on integrated planning for energy systems with a major emphasis on developing countries.

The scope of the work expanded in the 1980s. Environmental concerns of energy use and economic development became a major concern and the environmental dimension dominated the policy debate. This brought a major shift in the focus of energy studies as well- the issue of local, regional and global environmental effects of energy use became an integral part of the analysis.

In the 1990s, liberalisation of energy markets and restructuring swept through the entire world although climate change and other global and local environmental issues also continued. These changes brought new issues and challenges to the limelight and by the end of the decade, it became evident that unless the fundamental design is not well thought through, reforms cannot succeed.

In recent years, the focus has shifted to high oil prices, energy scarcity and the debate over state intervention as opposed to market-led energy supply. This swing of the pendulum in the policy debate is attributed to the concerns about security of supply in a carbon-constrained world.

[Source: Energy Economics, Concepts, Issues, Markets and Governance, by Subhes C. Bhattacharyya, Published by Springer, 2011]



LEARNING OBJECTIVES



At the end of the paper, learners are expected to be able to:

- The aim is to provide an overall understanding of the energy sector and to equip learners with the analytical tools that can be used to understand demand, supply, investments, energy-economy interactions and related policy aspects.
- Fundamental energy market dynamics through an economic lens
- Describe current energy market trends and relate current conditions to historical markets
- Employ analytical tools to guide decision making under uncertainty
- Your role as an energy analyst to address the energy economic challenge



RECOMMENDED TEXTS



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READING TOPICS



Introduction to Energy Economics

- Introduction
- Energy and Multidimensional Interactions

Energy Data and Energy Balance

- Energy Basics
- Introduction to the Energy System
- Energy Information
- Energy Accounting Framework
- Accounting of Traditional Energies
- Analysis of Energy Balance Information

Understanding and Analysing Energy Demand

- Evolution of Demand Analysis
- Overview of Energy Demand Decisions
- Economic Foundations of Energy Demand
- Alternative Approaches for Energy Demand Analysis
- Factor (or Decomposition) Analysis
- Analysis Using Physical Indicators
- Energy Demand Analysis Using the Econometric Approach

Energy Demand Analysis at a Disaggregated Level

- Disaggregation of De
- Sectoral Energy Accounting
- Analysis at the Sectoral Level

Energy Demand Forecasting

- Econometric Approach to Energy Demand Forecast
- Review of Some Common Energy Demand Analysis Models

Energy Demand Management

- Energy Demand Management
- Load Management
- Energy Efficiency Improvements and Energy Conservation
- Analysing Cost Effectiveness of DSM Options
- Energy Efficiency Debate

Economic Analysis of Energy Investments

- Basics of the Economic Analysis of Projects
- Economic Versus Financial Investment Analysis
- Indicators of Cost-Benefit Comparison
- Uncertainty and Risk in Projects



READING TOPICS



Economics of Fossil Fuel Supply

- Field Development
- Production
- Economics of Fossil Fuel Production
- Resource Rent
- Supply Forecasting

Economics of Non-Renewable Resource Supply

- Depletion Dimension: Now or Later
- A Simple Model of Extraction of Exhaustible Resources

Economics of Electricity Supply

- Basic Concepts Related to Electricity Systems
- Alternative Electricity Generation Options
- Economic Dispatch
- Investment Decisions in the Power Sector

The Economics of Renewable Energy Supply

- Introduction: Renewable and Alternative Energy Background
- Renewable Energies for Electricity Generation
- Bio-Fuels
- Drivers of Renewable Energy
- The Economics of Renewable Energy Supply
- The Economics of Bio-fuels





EXAMINATION GUIDE



EXAMS GUIDE



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MISCONDUCT IN AN EXAMINATION

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EXAM STRUCTURE

- The **Professional Level exams** consists of **140 multiple choice questions** which are all compulsory
- The duration for the exam is **3 hours & 15 minutes**



EXAM RESULTS

- Learners receive instant results after each exam.
- Results are available and accessible via MyICCE.



ADDITIONAL READING PLATFORMS



NEWS PORTALS

- The Economy360
- FI Sense
- The Economist
- Bloomberg Business week
- Harvard Business Review
- Sloan Management Review

JOURNALS

- The Economic Journal
- Quarterly Journal of Economics
- Journal of Financial Economics
- Journal of International Economics
- American Economic Review
- The Review of Economic Studies
- The Journal of Finance
- Journal of Political Economy
- Journal of Accounting and Economics
- The Review of Economics and Statistics
- The Review of Financial Studies
- Quantitative Economics
- Journal of Management Studies
- Journal of Econometrics
- Journal of Banking and Finance

Available on Elsevier, Oxford Academic, JSTOR, Wiley Online Library, Springer, Science Direct



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- [○ Exams Proctor](#)
- [○ About ICCE Scholarships](#)
- [○ About ICCE Application](#)
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ICCE

INSTITUTE OF CERTIFIED
CHARTERED ECONOMISTS

6 Liberty Square
Boston, MA 02109
Massachusetts, USA
learner@charteredeconomist.org

EE2

**ENERGY
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EE2 – ENERGY ECONOMICS II

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READING TOPICS



Energy Markets and Principles of Energy Pricing

- Extension of the Basic Model
- Market Failures
- Government Intervention and Role of Government in the Sector

Energy Pricing and Taxation

- Tradability of Energy Products and Opportunity Cost
- Peak and Off-Peak Pricing
- Energy Taxes and Subsidies
- Implications of Traditional Energies and Informal Sectors in Developing Economies for Energy Pricing

International Oil Market

- Developments in the Oil Industry
- Analysis of Changes in the Oil Market

Markets for Natural Gas

- Specific Features of Natural Gas
- Status of the Natural Gas Market
- Economics of Gas Transportation
- Gas Pricing

Developments in the Coal Market

- Coal Facts
- Changes in the Coal Industry
- Technological Advances and the Future of Coal

Integrated Analysis of Energy Systems

- Evolution of Energy Systems Models
- A Brief Review of Alternative Modelling Approaches
- Energy Economy Interactions

Overview of Global Energy Challenges

- Grand Energy Transitions
- Issues Facing Resource-Rich Countries
- Issues Facing Resource-Poor Countries
- Other Sector Management Issues

Impact of High Energy Prices

- Recent Developments in Energy Prices
- Impacts of Energy Price Shocks: Case of Importing Countries
- Energy Price Shocks and Vulnerability of Importers
- Impact of Higher Oil Prices: Case of Oil Exporting Countries



READING TOPICS



Energy Security Issues

- Energy Security: The Concept
- Economics of Energy Security
- Optimal Level of Energy Independence
- Policy Options Relating to Import Dependence
- Costs of Energy Supply Disruption
- Trade-Off between Energy Security and Climate Change Protection

Investment Issues in the Energy Sector

- Problem Dimension
- Issues Related to Investments in the Energy Sector
- Developing Country Perspectives on Investment
- Reform and Investment
- Global Economic Crisis and the Energy Sector Investments

Energy Access

- Problem Dimension
- Indicators of Energy Poverty
- Energy Ladder and Energy Use
- Diagnostic Analysis of Energy Demand by the Poor
- Evaluation of Existing Mechanisms for Enhancing Access
- Effectiveness of Electrification Programmes for Providing Access
- Renewable Energies and the Poor
- Alternative Solutions

Alternative Solutions

- Energy-Environment Interactions
- Environmental Kuznets Curve
- Economics of the Environment Protection
- Options to Address Energy-Related Environmental Problems

Pollution Control from Stationary Sources

- Direct Pollution Control Strategies
- Indirect Policies

Pollution Control from Mobile Sources

- Special Characteristics of Mobile Pollution
- Social Costs of Transport Use
- Mitigation Options

The Economics of Climate Change

- Climate Change Background
- The Economics of Climate Change
- Economic Approach to Control the Greenhouse Effect
- Alternative Options to Cope with Global Warming



READING TOPICS



The Clean Development Mechanism

Basics of the Clean Development Mechanism
Economics of CDM Projects

Regulation of Energy Industries

Traditional Regulation
Problems with Traditional Regulatory Approach
Price-Cap Regulation
Revenue Caps
Yardstick Competition
Performance Based Regulation

Reform of the Energy Industry

Government Intervention in Energy Industries
Rationale for Deregulation
Reform Process
Options for Introducing Competition
Restructuring Options





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6 Liberty Square
Boston, MA 02109
Massachusetts, USA
learner@charteredeconomist.org