

Energy Conservation and Management

Chapter 1: Introduction

- 1.1 Introduction to Energy and Power
- 1.2 Past vs Present Scenario of Energy and Power in the World
- 1.3 National Energy Consumption (2023–2024) Across 7 Different Countries
- 1.4 Environmental Aspects Associated with Energy Utilization
- 1.5 Energy Auditing
- 1.6 Need for Energy Auditing
- 1.7 Types of Energy Audits
- 1.8 Methodology of Energy Audits
- 1.9 Barriers to Energy Auditing
- 1.10 Role of Energy Managers in Energy Management
- 1.11 Instruments Used in Energy Auditing

Chapter 2: Electrical Systems

- 2.1 Electricity Billing – HT Supply
- 2.2 Electricity Billing – LT Supply
- 2.3 Transformers
- 2.4 Cable Sizing
- 2.5 Concept of Capacitors
- 2.6 Power Factor Improvement
- 2.7 Harmonics
- 2.8 Electric Motors
- 2.9 Illumination – LUX and LUMEN
- 2.10 Types of Lighting
- 2.11 Efficacy
- 2.12 LED Lighting and Scope of EnCon (Energy Conservation) in Illumination

Chapter 3: Thermal Systems

- 3.1 Stoichiometry, Boilers, Furnaces and Thermic Fluid Heaters
- 3.2 Efficiency Computation and Economic Measures
- 3.3 Turbines
- 3.4 Compressors and Pumps

- 3.5 Specific Energy Consumption
- 3.6 Flexi Targeting Technique
- 3.7 Cogeneration
- 3.8 Steams
- 3.9 Steam Traps

Chapter 4: Energy Conservation in Major Utilities

- 4.1 Energy Efficiency in Pumps
- 4.2 Energy Efficiency / Saving Measures in Fans
- 4.3 Energy Efficiency / Saving Measures in Blowers
- 4.4 Energy Efficiency / Saving Measures in Compressed Air Systems
- 4.5 Energy Efficiency / Saving Measures in Refrigeration Systems
- 4.6 Energy Efficiency / Saving Measures in Air Conditioning Systems
- 4.7 Energy Efficiency / Saving Measures in Cooling Towers
- 4.8 Energy Efficiency / Saving Measures in Diesel Generator Sets (D.G. Sets)
- 4.9 Energy Efficiency / Saving Measure for Commercial Buildings

Chapter 5: Economics

- 5.1 Energy Economics
- 5.2 Discount Rate, Payback Period, Internal Rate of Return (IRR), Net Present Value (NPV), Life Cycle Costing (LCC)
- 5.3 Life Cycle Costing
- 5.4 ESCO Concept
- 5.5 Case Studies