



Course length: 4.5 hours **Cost:** \$295-\$350*
Prerequisites: None **Subscription:** 2-12 months
CPE credits: 6 (see website for more details)

An introductory overview to the business of electricity

Understanding the dynamic and rapidly evolving electricity business begins with a solid foundation in electric industry basics. Electric Industry Overview presents a clear and easy-to-understand fundamental overview of this unique business. Whether new to the industry or a veteran who is looking for a deeper understanding of the electricity business, this learning path helps participants make sense of this dynamic industry. Note that three versions of this learning path are available: U.S.; Canadian/U.S.; and Global.



WHO WILL BENEFIT FROM THIS COURSE?

- Any employee new to the electric industry
- New managers needing a broader understanding of the electric business
- Professionals moving into the electric industry from another industry
- Engineers working in the electric industry who need to understand how the business operates
- Energy industry employees with experience limited to one or two departments needing a broader business overview
- Sales professionals providing services to the electric industry
- Finance, accounting, legal, public relations, or regulatory professionals
- Technical professionals becoming involved in regulatory or business issues

WHAT PARTICIPANTS WILL LEARN

- Electricity consumers and their needs
- The components of the physical system, how it is designed to deliver electricity to end users, and the physical properties of electricity that affect how the system is designed and operated
- How the physical system is operated for maximum efficiency and reliability
- How and why the electric industry is regulated
- What areas of the industry are competitive and how this affects markets and the services offered in them
- How electric markets function, the various services offered in them, and how these services are priced

COURSE AGENDA

Introduction

- Course objectives

- Why electricity is unique and critical
- Units

Electric Customers

- The three key types of end-use customers (residential, commercial, industrial)
- Wholesale customers (utilities, marketers)
- Number of customers in each class
- Usage patterns for each class
- The importance of peak demand and overall system demand curves
- Key residential, commercial, and industrial uses of electricity and the resulting demand curves
- Aggregate demand, daily and seasonal load curves, annual and seasonal peak demand
- What affects demand curves
- Customer needs
- Services available to satisfy customer needs (bundled utility service, unbundled utility distribution with competitive supply service, self-generation, alternate fuels, energy efficiency)
- Typical utility rate structures (flat rate, time-of-use, demand charges, green power)
- Average rates and electric prices by state and by customer type
- Why rates vary by customer type

The Electric Delivery System

- An overview of the electric delivery system
- Electric circuits
- The five steps involved in system planning
- How supply planning is different in competitive markets
- Transmission and distribution system planning
- The various generation types and their characteristics (operational, financial, and environmental)
- Generation costs (capital, variable, and levelized)

* Please contact us for bulk discounts and site license pricing.





- The effect of fuel and emission costs
- Operational characteristics including location, start time, and ramp flexibility
- How demand side management is used as an alternative to generation
- The generation supply curve (how supply is matched to demand)
- The electrical transmission system (description, costs, and characteristics)
- The electrical distribution system (description, costs, and characteristics)
- System reliability
- The Smart Grid
- Information technology

Electric System Operations

- The four key physical characteristics of electrical systems
- The functions of a system (control area) operator
- Which organizations provide the system operator function including utilities, power agencies, and ISOs/RTOs
- Regulation and oversight of reliability by NERC and FERC
- How system operators run the system including demand forecasting, unit scheduling and dispatch, ramping units in real time, and monitoring
- The concept of least cost dispatch subject to constraints
- What ancillary services are and how they are scheduled and used in real time (frequency regulation, spinning reserve, non-spinning reserve, supplemental reserve, voltage support or VARs, black start)
- Transmission scheduling and power flow models
- How a system operator balances the system in real time
- How cascading outages are avoided
- System operators in a competitive market

Electric Regulation

- What regulation is
- Why the electric industry is regulated including the goals of regulators
- The traditional vertically integrated electric market structure
- Market participants under the vertically integrated structure including various types of utilities, and non-utility generators and suppliers
- Unbundling of the vertically integrated structure
- The four market models (ranging from highly regulated to less regulated) plus a hybrid
- Regions in the U.S. with competitive wholesale and retail markets
- Five functions of regulation
- Who the regulators are (federal, state, and local) and what areas of the industry they regulate
- The federal and state regulatory compacts
- Four examples of regulatory proceedings (rulemakings, rate cases, certificate cases, complaint cases) and how this process works
- The cost-of-service ratemaking process, step by step
- Incentive regulation and where this is used
- Market-based ratemaking and where this is used
- The ways in which regulation impacts utilities and other market participants

Electricity Marketplace Overview

- The variety of market structures in the U.S. and how they evolved
- Traditional market participants and their roles (IOUs, munis and PUDs, co-ops, federal power agencies, ESCOs, IPPs, and electric marketers)
- Competitive market participants and their roles (merchant generators, ISOs and RTOs, electronic exchanges and clearinghouses, wholesale marketers and retail marketers, financial services companies, transmission companies, UDCs, load-serving entities, and ESCOs)

- How participants make money (regulated and competitive)
- Wholesale transactions and services (energy, capacity, ancillary services, transmission rights, financial risk management)
- Retail transactions and services (energy, energy efficiency, DSM, power reliability, power quality, energy information)
- How prices are set in regulated markets
- How prices are set in competitive markets including locational marginal pricing
- Supply and demand and why traditional economic rules don't always apply to the electric business
- Why electric prices can be volatile
- Electric market risks and how they can be mitigated

The Future of Electricity

- Load growth
- Demand side management (DSM)
- Electric vehicles and space heating
- Climate change
- Electric storage
- Smart grids, microgrids, and distributed resources
- Information technology
- The future of regulation, technology, markets, and the workplace
- The top 10 challenges
- The energy company of tomorrow

