



Fundamentals of Energy Efficiency: Understanding the Other Side of the Meter

Course Summary

Most people have a reasonably good sense of where our energy comes from but have a poor sense of where it goes. For example, few people realize that almost 2/3 of all electricity is consumed by electric motors or that 20% of auto fuel consumption is used to overcome rolling resistance of the tires. *This course introduces concepts and tools necessary to understand and critically evaluate how people use energy and prospects for reducing consumption.*

The course begins with a brief review of the basic concepts of energy and power, along with the key units and transformations. The course then examines the kinds of services provided by energy-using devices, including mechanical power, thermal comfort, and illumination. The concepts of energy efficiency are explained in the context of the machines that provides these services.

Technical and economic limits to energy saving will be discussed, along with strategies that make it possible to bypass them. Real-world examples will be presented to illustrate theories and generic approaches.

Coursework will consist primarily of problem sets and an individual project. Students will make their own measurements and calculations, using meters that are provided.

Students will emerge from this course with an appreciation of the technical, economic, and behavioral aspects of energy use in addition to the tools to professionally evaluate conservation opportunities.

This course is the first in a 3-part series examining different aspects of energy efficiency: fundamentals, economics, and innovations.