



# Operating Sustainable Facilities

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## Chapter 1: Energy

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*After completing this chapter, students will be able to:*

- Describe and illustrate the goals of sustainable energy use.
- Describe general approach to calculating greenhouse gas emissions.
- Describe the process of carbon trading and the role of carbon offsets and renewable energy credits.
- Distinguish between renewable and nonrenewable energy alternatives.
- Describe examples of distributed generation, including combined heat and power systems and on-site energy systems using renewable energy sources.
- Explain the purpose and process of buyback and net metering.
- Describe the organization and pricing practices of the natural gas and electric industries.
- Describe tools and strategies to help SFPs improve the sustainability of facility energy purchasing practices, including metering, load shedding and shifting, energy management systems and demand response.
- Describe the role of commissioning, energy audits, building automation systems and energy performance contracting in optimizing facility energy performance.
- Illustrate the purpose and benefits of performing a Triple Bottom Line analysis on energy initiatives.
- Provide examples of energy initiatives undertaken in facilities and their results.

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*After completing this chapter, students will be able to:*

- Support the need for initiatives aimed at improving a facility’s sustainable use of water resources.
- Summarize key goals in increasing the sustainability of a facility’s water consumption.
- Provide examples of metrics related to an organization’s water performance.
- Describe approaches to benchmarking facility water use.
- Trace the flow of water into, through, and out of a facility and describe the issues related to each part of that path.
- Describe ways to increase the efficiency of facility fixtures and fittings.
- List key elements in water-conserving landscaping.
- Discuss ways in which boiler and cooling tower operation can be improved to increase water efficiency.
- Outline a process for harvesting rainwater and list possible uses.
- Describe sources and uses for recycled graywater.
- Use the Triple Bottom Line to analyze a water conservation initiative.
- Provide examples of the types of projects facilities can undertake and their results.

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*After completing this chapter, students will be able to:*

- Describe sustainable goals for facility management of materials and resources.
- Provide examples of metrics for reporting and benchmarking.
- Explain how a facility’s sustainable performance can be affected by its supply chain partners.
- Describe how a supply chain carbon footprint is calculated.
- Describe the process for calculating total cost of ownership and its usefulness to SFPs.
- Describe tools to calculate life-cycle cost analysis.
- Describe the contents and purpose of a total cost of ownership cash flow statement.

- Provide examples of other factors that may influence purchasing decisions.
- Provide examples of product sustainability labels.
- List sources to verify product sustainability claims.
- Define a green lease and describe its characteristics.
- Provide examples of the criteria that might be included in a green lease.
- Analyze the Triple Bottom Line implications of a materials and resources initiative.
- Provide examples of facility management of sustainable materials and resources.

## Chapter 4: Workplace Management

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*After completing this chapter, students will be able to:*

- Explain how workplace management improves facility sustainability from environmental, economic and social perspectives.
- Provide examples of metrics that could be used to measure facility effectiveness in workplace management.
- Describe ways in which workplaces have evolved in current facilities.
- Illustrate ways in which SFPs can use facility space more flexibly to reduce churn or the effects of churn.
- Describe tools SFPs can use to support virtual workplaces.
- Provide guidelines that affect decisions about location of facility meeting rooms, amenities and services.
- Use the Triple Bottom Line to analyze a sustainable workplace management initiative.
- Provide examples of sustainable workplace management implemented by facilities.

## Chapter 5: Indoor Environmental Quality

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*After completing this chapter, students will be able to:*

- Define the components of indoor environmental quality (IEQ) and describe how IEQ contributes to sustainable facility management.
- List possible measures of indoor environmental quality.
- List common threats to indoor air quality (IAQ).
- Describe initiatives an SFP might implement to improve a facility's IAQ.
- Describe sustainable initiatives that can increase occupants' sense of thermal, visual and acoustical comfort.
- Describe at least one strategy to increase occupants' perception of control over their environment.
- List the characteristics of sustainable cleaning products and practices.
- Distinguish between conventional pest control and integrated pest management (IPM).
- List chemicals commonly found in facilities that pose a challenge to a sustainable IEQ.
- Describe steps an SFP can follow to manage on-site hazardous materials in a more sustainable manner.

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*After completing this chapter, students will be able to:*

- Explain how facility services can be affected by organizational commitment to sustainability.
- Provide examples of metrics used to assess the quality of various facility services.
- Describe tactics to improve the sustainability of:
  - Mail services.
  - Printing and copying.
  - Content and document management.
  - Food service.
  - Meeting services.
  - Hardscape maintenance.
  - Landscaping and property amenities.
- Apply the Triple Bottom Line to analyze a facility services initiative.
- Provide examples of successful facility service initiatives.

## Chapter 7: Waste

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*After completing this chapter, students will be able to:*

- Define different types of waste and the process of waste management.
- List levels in the waste hierarchy.
- Provide examples of metrics used for reporting the sustainability of an organization’s waste management practices.
- Describe how tools such as ISO 14001 certification and the EPA WasteWise program benefit a facility.
- Describe the different ways in which waste is collected and disposed of.
- Describe strategies for reducing waste.
- Describe the criteria for a successful recycling program.
- List and describe the steps in developing, implementing and tracking a facility recycling program.
- Describe how hazardous waste is managed in a sustainable facility.
- Use the Triple Bottom Line to analyze a waste management initiative.
- Describe an example of a successful facility waste management program.

## Chapter 8: Site Impact

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*After completing this chapter, students will be able to:*

- Describe sustainable site considerations that can help SFPs minimize the impact of the facility site on its surroundings.
- Provide examples of metrics used to report performance related to managing site impact.
- Describe how site impact can be reduced in the following areas:
  - Stormwater management
  - Light pollution
  - Heat island contributions
  - Transportation use

- Use the Triple Bottom Line to analyze an initiative aimed at reducing site impact.
- Provide an example of how a sustainable facility can reduce the impact of its site.

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