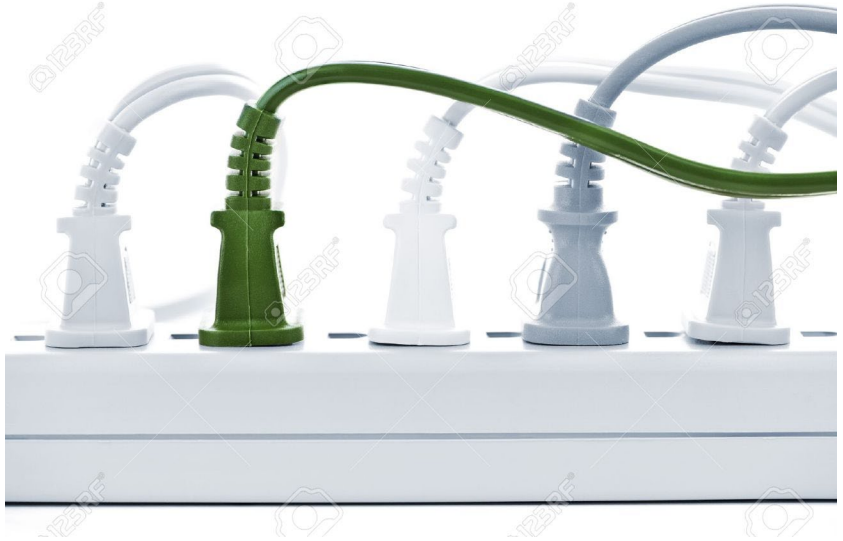
Energy and Atmosphere (EA)

GA02 Excerpt EA Overview. LEED BD+C RG v4 - Pgs. 323-324

The Energy and Atmosphere (EA) category addresses:

- Energy use reduction
- Energy-efficient design strategies
- Renewable energy sources

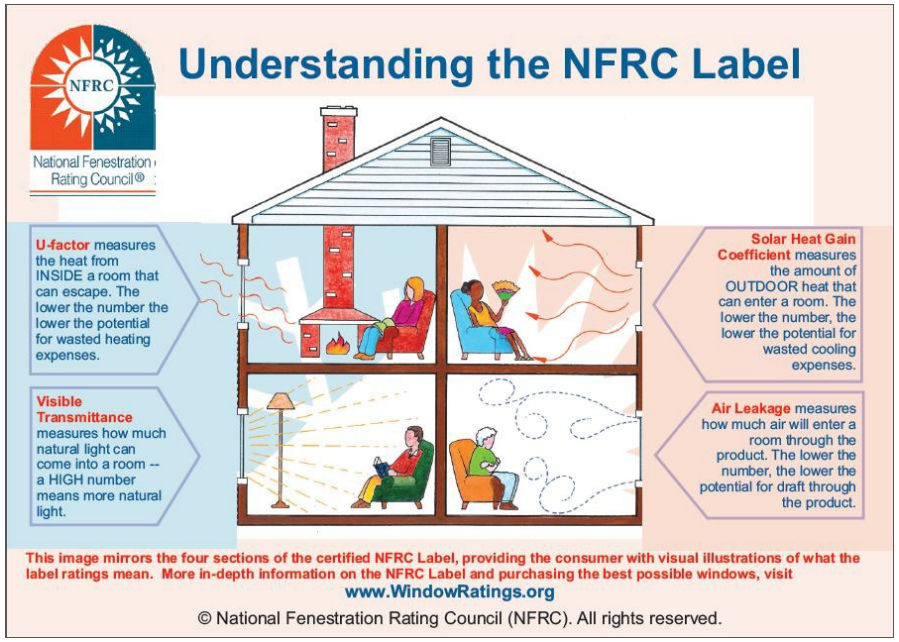


Energy and Atmosphere (EA)

GA02 Excerpt EA Overview. LEED BD+C RG v4 - Pgs. 323-324

Strategies to help reduce energy demand in a green building:

- Building orientation and glazing selection
- Choosing climate-appropriate building materials
- Passive heating and cooling
- Natural ventilation
- High-efficiency HVAC systems partnered with smart controls



Energy and Atmosphere (EA)

GA02 Excerpt EA Overview. LEED BD+C RG v4 - Pgs. 323-324

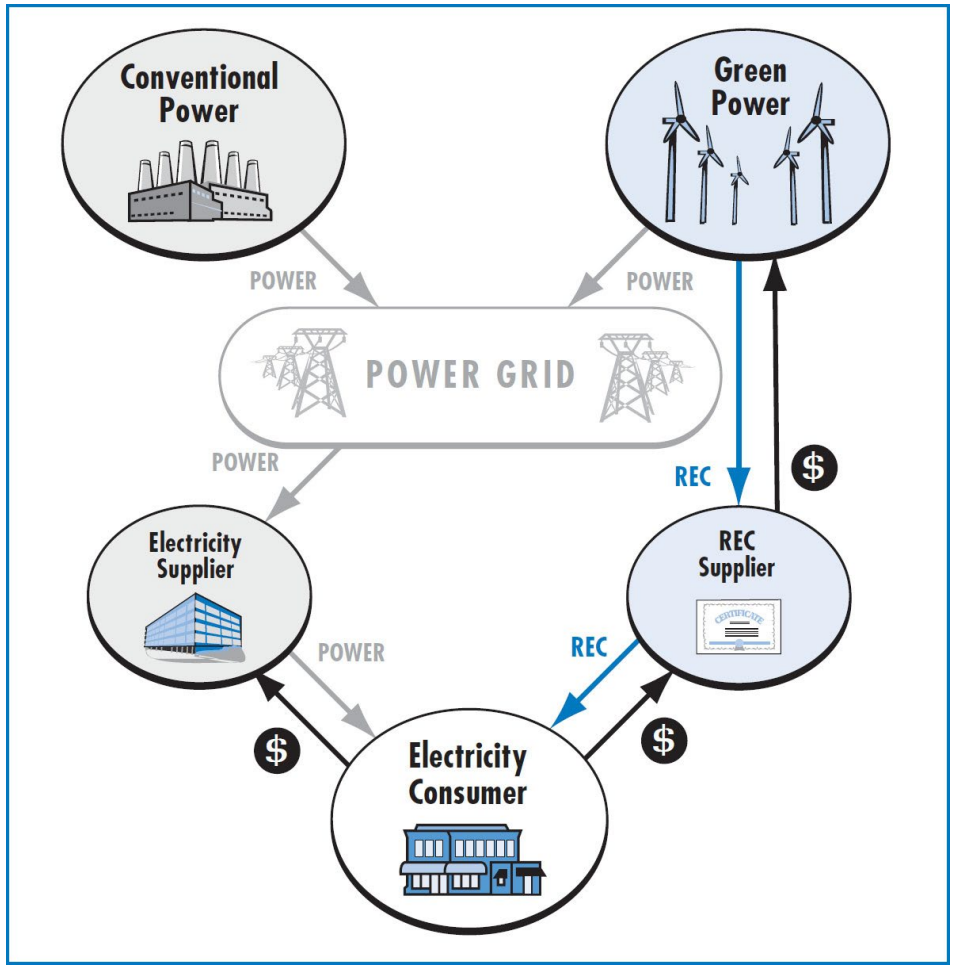
Strategies to offset nonrenewable energy use with renewable energy sources:

- Generation of renewable energy on the project site
- Purchasing green power
- RECs – Renewable Energy Certificates

Energy and Atmosphere (EA)

GA02 Excerpt EA Overview. LEED BD+C RG v4 - Pgs. 323-324

green power a subset of renewable energy composed of grid-based electricity produced from renewable energy sources



Energy and Atmosphere (EA)

GA02 Excerpt EA Overview. LEED BD+C RG v4 - Pgs. 323-324

Commissioning (Cx)

the process of verifying and documenting that a building and all of its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the owner's project requirements.

Commissioning Authority (CxA)

the individual designated to organize, lead, and review the completion of commissioning process activities. The CxA facilitates communication among the owner, designer, and contractor to ensure that complex systems are installed and function in accordance with the owner's project requirements.

Demand Response (DR)

a change in electricity use by demand-side resources from their normal consumption patterns in response to changes in the price of electricity or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized.

Demand Response (DR) Event

a specific period of time when the utility or independent service operator calls for a change in the pattern or level of use in grid-based electricity from its program participants. Also known as a curtailment event.

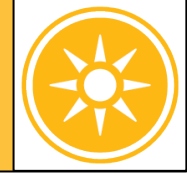
ENERGY AND ATMOSPHERE

FOLLOWING AN INTEGRATIVE PROCESS HELPS IDENTIFY SYNERGISTIC STRATEGIES FOR THE FOLLOWING AREAS:

- Energy demand
- Energy efficiency
- Renewable energy
- Ongoing performance

STRATEGIES FOR REDUCING ENERGY DEMAND IN DESIGN AND PLANNING:

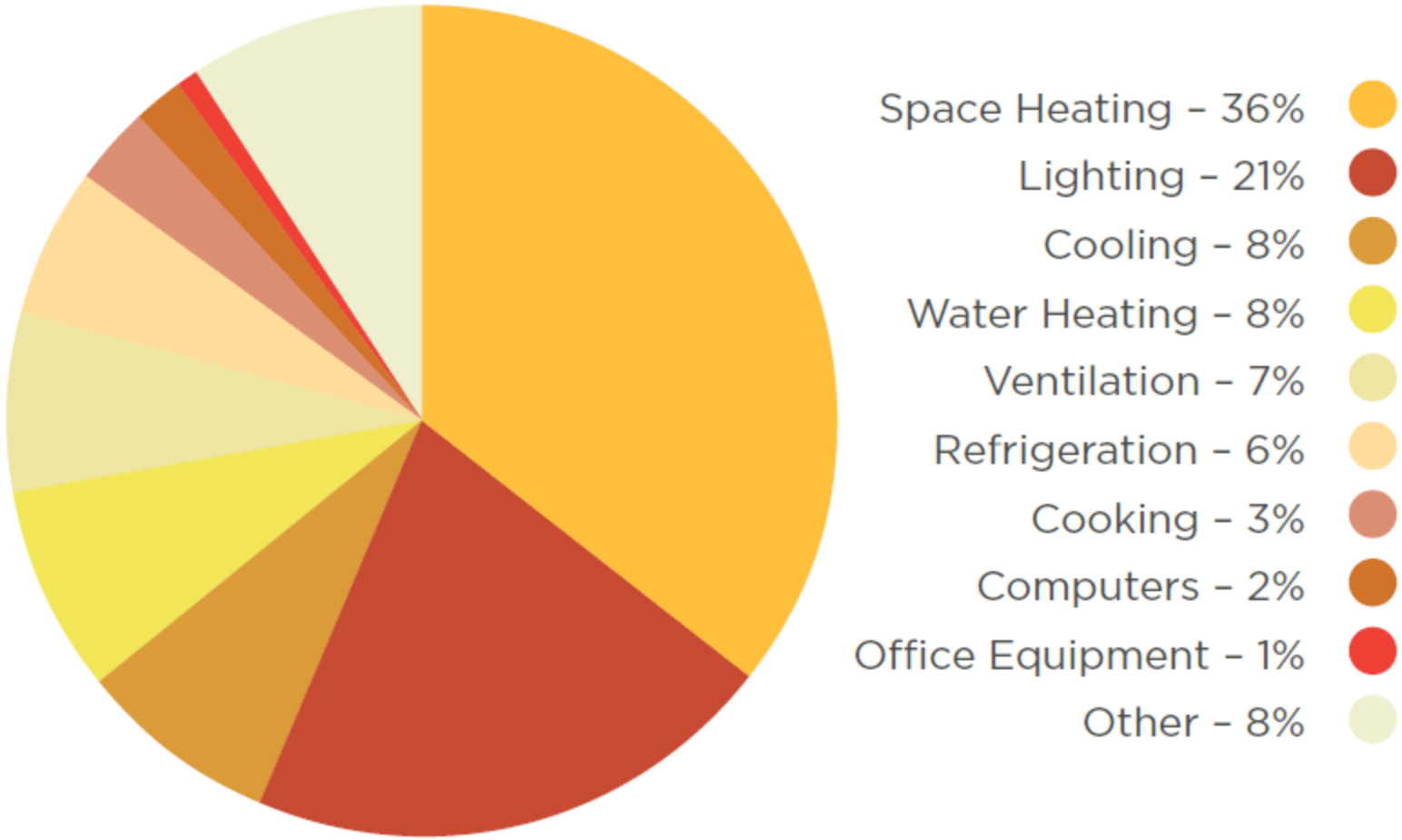
- **ESTABLISH DESIGN AND ENERGY GOALS.** Set targets and establish performance indicators at the outset of a project and periodically verify their achievement.
- **SIZE THE BUILDING APPROPRIATELY.** A facility that is larger than necessary to serve its function creates costly and wasteful energy demand.
- **USE FREE ENERGY.** Orient the facility to benefit from natural ventilation, solar energy, and daylight.
- **INSULATE.** Design the building envelope to insulate efficiently against heating and cooling losses.



STRATEGIES FOR REDUCING ENERGY DEMAND IN OPERATIONS AND MAINTENANCE:

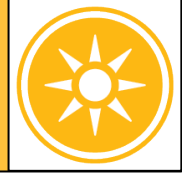
- **USE FREE ENERGY.** Use the facility's orientation and appropriate shades, windows, and vents to take advantage of natural ventilation, solar energy, and daylight.
- **MONITOR CONSUMPTION.** Use energy monitoring and feedback systems to encourage occupants to reduce energy demand.

Percentage of Total Consumption in Commercial Buildings by End Use



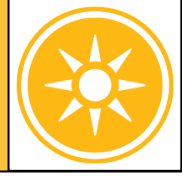
STRATEGIES FOR ACHIEVING ENERGY EFFICIENCY:

- **ADDRESS THE ENVELOPE.** Use the regionally-appropriate amount of insulation in the walls and roof and install high-performance glazing to minimize unwanted heat gain or loss. Make sure that the building is properly weatherized.
- **INSTALL HIGH-PERFORMANCE MECHANICAL SYSTEMS AND APPLIANCES.** Apply life-cycle assessment to the trade-offs between capital and operating costs, and evaluate investments in energy efficiency technologies. Appliances that meet or exceed ENERGY STAR requirements will reduce plug load demands.
- **USE HIGH-EFFICIENCY INFRASTRUCTURE.** Efficient street lighting and LED traffic signals will reduce energy demands from neighborhood infrastructure.
- **CAPTURE EFFICIENCIES OF SCALE.** Design district heating and cooling systems, in which multiple buildings are part of a single loop.
- **USE ENERGY SIMULATION.** Computer modeling can identify and prioritize energy efficiency opportunities.
- **MONITOR AND VERIFY PERFORMANCE.** Ensure that the building systems are functioning as designed and support the owner's project requirements through control systems, a building automation system, and commissioning and retrocommissioning.



STRATEGIES FOR MEETING ENERGY DEMAND WITH RENEWABLE ENERGY:

- **GENERATE RENEWABLE ENERGY.** Install photovoltaic cells, solar hot water heaters, or building-mounted wind turbines.
- **PURCHASE OFF-SITE RENEWABLE ENERGY OR CARBON OFFSETS.** Buy green power, renewable energy certificates, or carbon offsets to reduce the environmental impact of energy consumed on-site and promote renewable energy generation and the reduction in carbon dioxide emissions.



STRATEGIES FOR INCORPORATING ONGOING PERFORMANCE MEASUREMENT INTO A PROJECT:

- **ADHERE TO THE OWNER'S PROJECT REQUIREMENTS.** Prepare detailed owner's project requirements at the beginning of the design process and conduct commissioning throughout the life-cycle of the project to ensure that the building functions as designed.
- **PROVIDE STAFF TRAINING.** Knowledge and training empower facilities managers to maintain and improve the performance of buildings.
- **CONDUCT PREVENTIVE MAINTENANCE.** Develop a robust preventive maintenance program to keep the building in optimal condition.
- **CREATE INCENTIVES FOR OCCUPANTS AND TENANTS.** Involve building occupants in energy efficiency strategies. Promote the use of energy-efficient computers and equipment, bill tenants from submeter readings to encourage energy conservation, educate occupants about shutting down computers and turning out lights before they leave, and give them regular feedback on energy performance.

ENERGY AND ATMOSPHERE

Energy and Atmosphere (EA)

Adaptation	NC	CS	S	R	DC	WDC	HOS	HC
Total	33	33	31	33	33	33	33	35
Fundamental Commissioning and Verification	req	req	req	req	req	req	req	req
Minimum Energy Performance	req	req	req	req	req	req	req	req
Building-Level Energy Metering	req	req	req	req	req	req	req	req
Fundamental Refrigerant Management	req	req	req	req	req	req	req	req
Enhanced Commissioning	6	6	6	6	6	6	6	6
Optimize Energy Performance*	18	18	16	18	18	18	18	20
Advanced Energy Metering	1	1	1	1	1	1	1	1
Grid Harmonization	2	2	2	2	2	2	2	2
Renewable Energy*	5	5	5	5	5	5	5	5
Enhanced Refrigerant Management	1	1	1	1	1	1	1	1