Fire

Parsons The New School for Design

School of Constructed Environments

Interior Design (AAS)

Environmental Design

PAID 1028-X1

SP-17

Hikida

Learning Objectives

- At the end of this presentation you should know:
  - The U.S. energy use by sector;
  - The sources of household energy in the U.S.;
  - Percentage of world energy consumed in the U.S.;
  - U.S. household energy use;
  - How to select Energy Star appliances;
  - How to develop a life-cycle cost analysis that includes annual energy use;
  - The energy consumption and life-cycle costs associated with incandescent, compact fluorescent, and LED lamps;
  - What light power density (LPD) means;
  - The principles of daylight harvesting;
  - The difference between a vacancy and an occupancy sensor;
  - How to calculate daylight as a percentage in plan;
  - How to calculate daylight for seated occupants.

Fire Facts

Fire is a chemical reaction that releases light and heat.

Fires require fuel, oxygen and heat to burn.

Different types of fuel include coal, oil and wood.

Flames are the part of a fire which we can see, they can be different colors, depending on the substance which is burning.

A candle flame typically burns at around 1000 degrees Celsius (1800 Fahrenheit).

Energy Facts

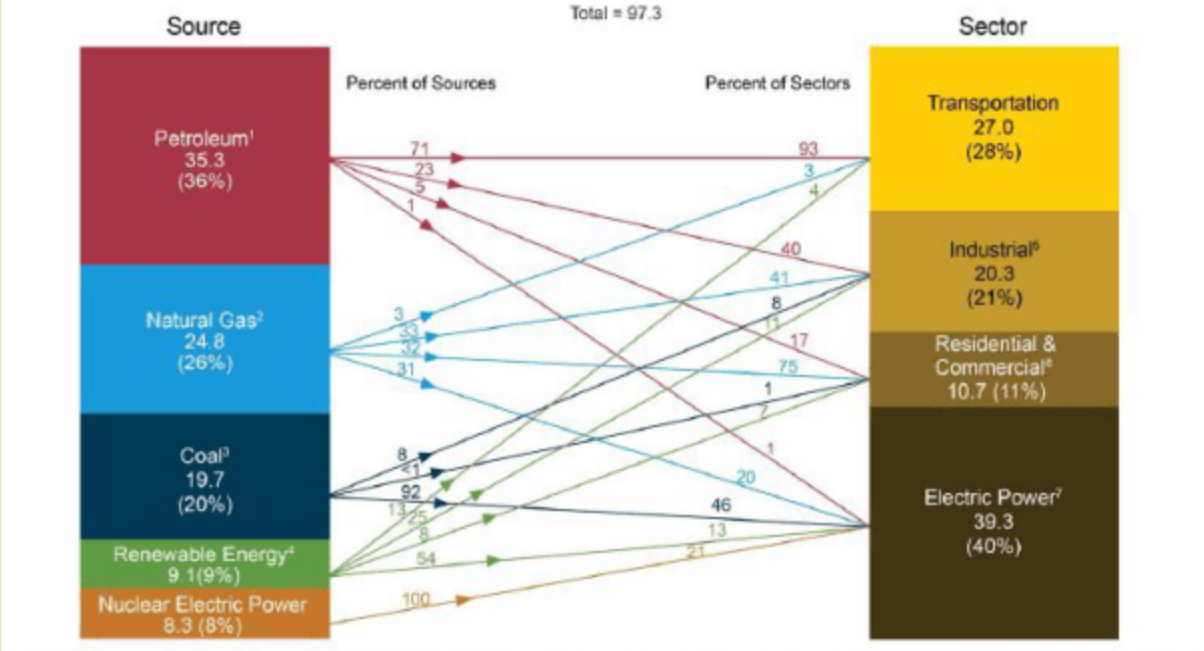
Non-renewable energy sources comprise 82%

Renewable and nuclear energy comprise less than 20%

Renewable energy includes: conventional hydroelectric power, geothermal, solar/photovoltaic, wind, and biomass.

United States Energy Information Administration Chart (2011) displaying energy sources and energy use by sector

Figure 2.0 Primary Energy Consumption by Source and Sector, 2011
(Quadrillion Btu)



[1] Does not include biofuels that have been blended with petroleum—biofuels are included in "Renewable Energy."
[2] Excludes supplemental gaseous fuels.
[3] Includes less than 0.1 quadrillion Btu of coal coke net imports.
[4] Conventional hydroelectric power, geothermal, solar/photovoltaic, wind, and biomass.
[5] Includes industrial combined-heat-and-power (CHP) and industrial electricity-only plants.
[6] Includes commercial combined-heat-and-power (CHP) and commercial electricity-only plants.
[7] Electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Includes 0.1 quadrillion Btu of electricity net imports not shown under "Source."

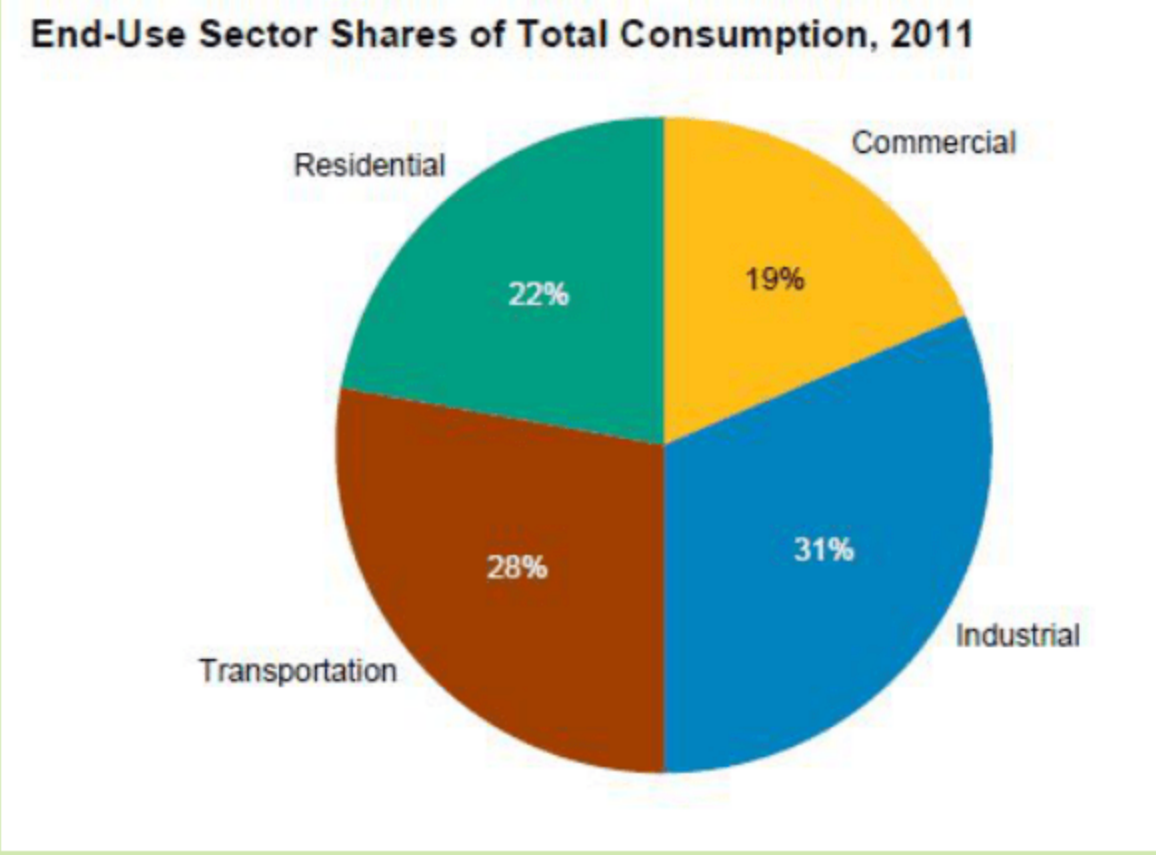
Notes: Primary energy in the form that it is first accounted for in a statistical energy balance, before any transformation to secondary or tertiary forms of energy (for example, coal is used to generate electricity). • Sum of components may not equal total due to independent rounding.

Sources: U.S. Energy Information Administration, *Annual Energy Review 2011*, Tables 1.3, 2.1b-2.1f, 10.3, and 10.4.

Energy Facts

In the United States, the Residential and Commercial sectors consume 41% of the total energy produced – includes energy used to produce electric power.

Source: United States Energy Information Administration Chart (2011) for end-use energy consumption by sector.

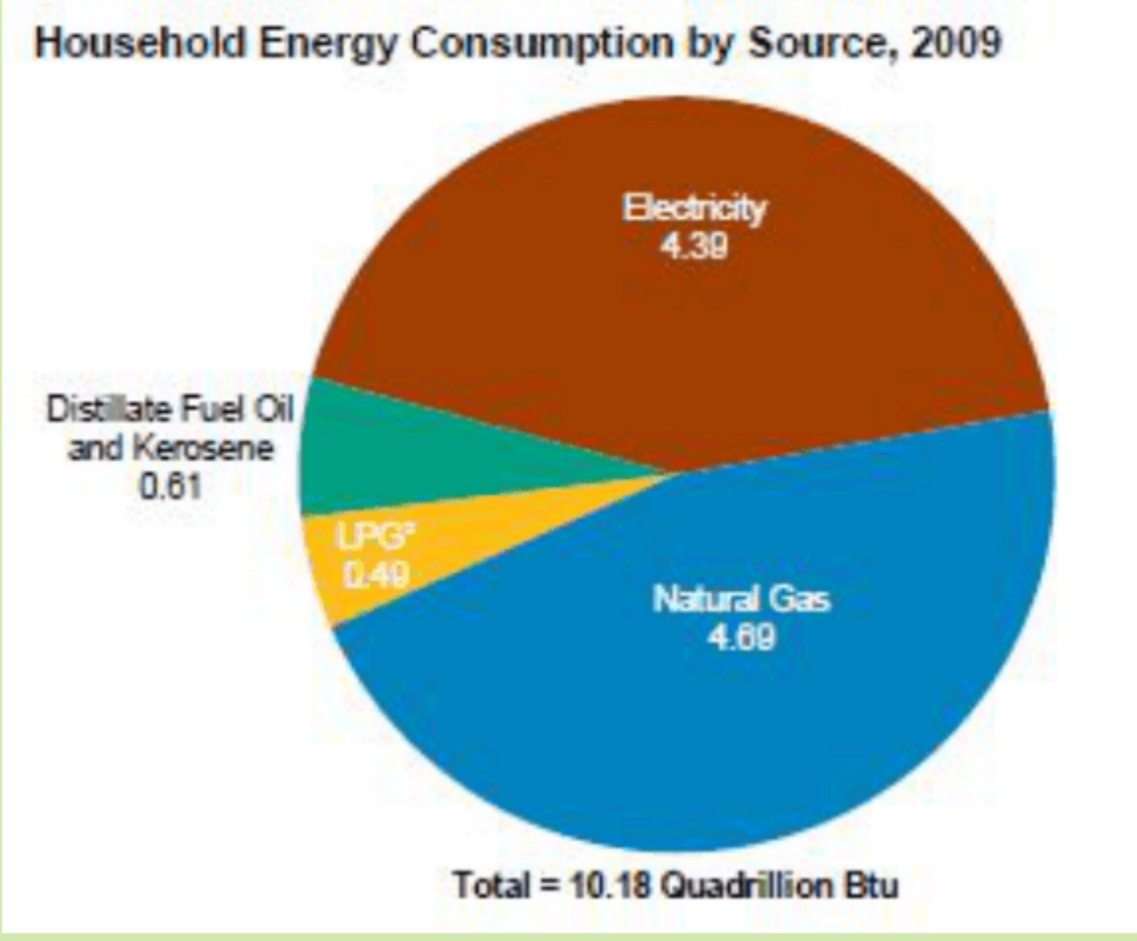


Energy Facts

46% of household energy consumption is natural gas

43% of household energy consumption is electricity

Source: United States Energy Information Administration Chart (2011) for household energy consumption by source



Energy Fact #01

Q: How much energy does a person use in a year?

A: In 2011, total energy use per person (or per capita consumption) in the United States was about 313 million British thermal units (Btu). The world per capita consumption of energy[1] in 2011 was about 75 million Btu.

People in the United States consume approximately 4-times more energy per person per year than the world average.

Q: What would the consequences be if everyone in the world consumed the same amount of energy per person as people in the United States?

Q: What would be the result if everyone in the United States reduced their energy consumption to equal the world per capita

Energy Fact #02

The population of the United States is 320 million.

The population of the world is 7.2 billion.

The population of the United States is 4.4% of the world's population.

In 2012, world total primary energy consumption was about 529 quadrillion British thermal units (Btu). Primary energy consumption in the United States was about 95 quadrillion Btu, equal to 18% of world total primary energy consumption.

Q: Is it reasonable for 5% of the world's population to consume 20% of the world's energy? Is it sustainable?

Household Energy Use

36% of household energy consumption is related to household appliances

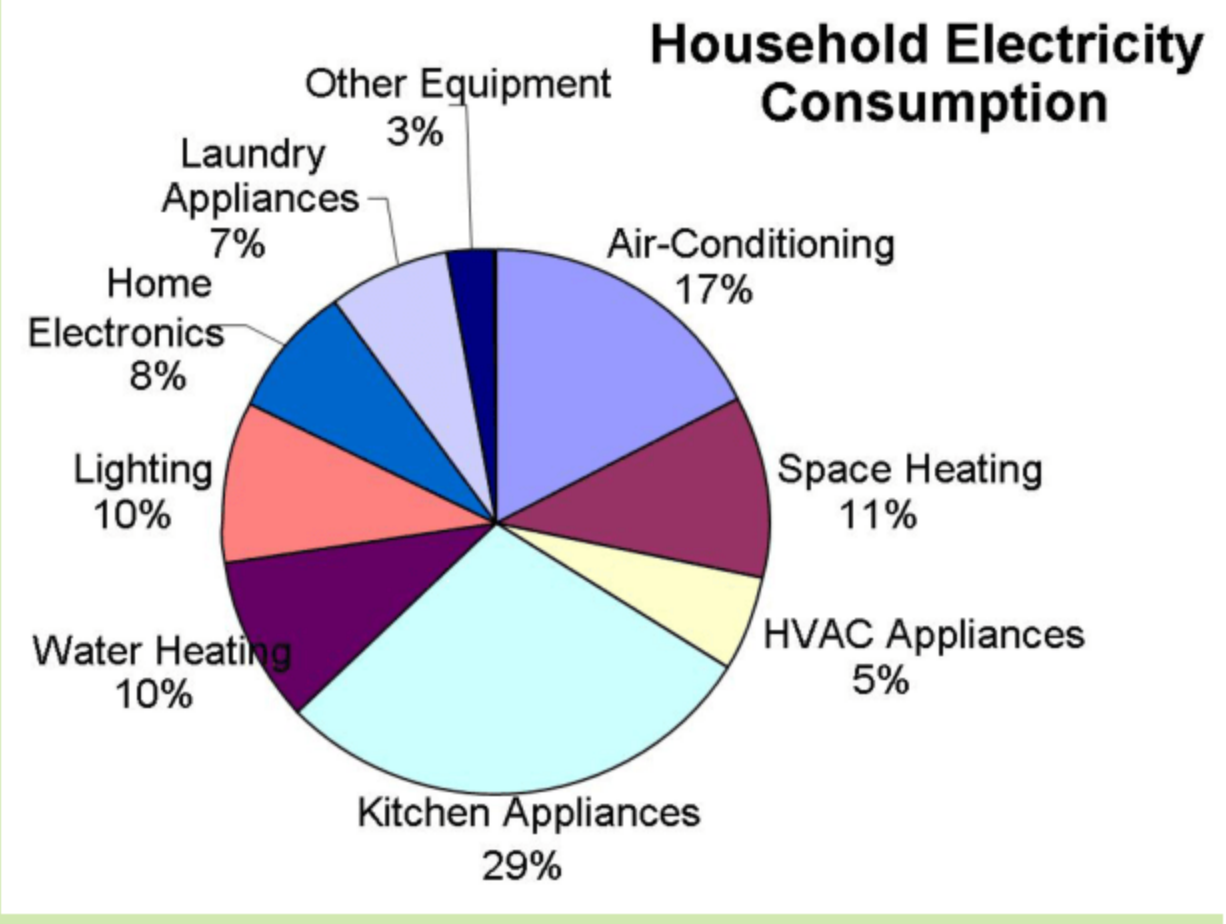
33% of household energy consumption is related to heating and air conditioning

10% of household energy consumption is related to lighting

10% of household energy consumption is related to water heating

Note: waste heat from appliances and lighting can contribute to the heat load and to additional cooling requirements.

Source: TeachEngineering.org



Energy Star Equipment and Appliances

1. *Use the USGBC LEED CI 2009 EA Credit 1.4 Letter Template to create a list of your household appliances.*
2. *Research Energy Star appliances to replace as many of your existing appliances as possible.*
3. *Note: There is no ENERGY STAR label for residential ovens, ranges, or microwave ovens at this time.*

Resource: http://www.energystar.gov/index.cfm?fuseaction=find_a_product.

Video Monitor

Computer and Monitor

Printer

Refrigerator

Dishwasher

Clothes Washer

Clothes Dryer

Energy Star Equipment and Appliances

1. *Use the USGBC LEED CI 2009 EA Credit 1.4 Letter Template to create a list of your household appliances.*
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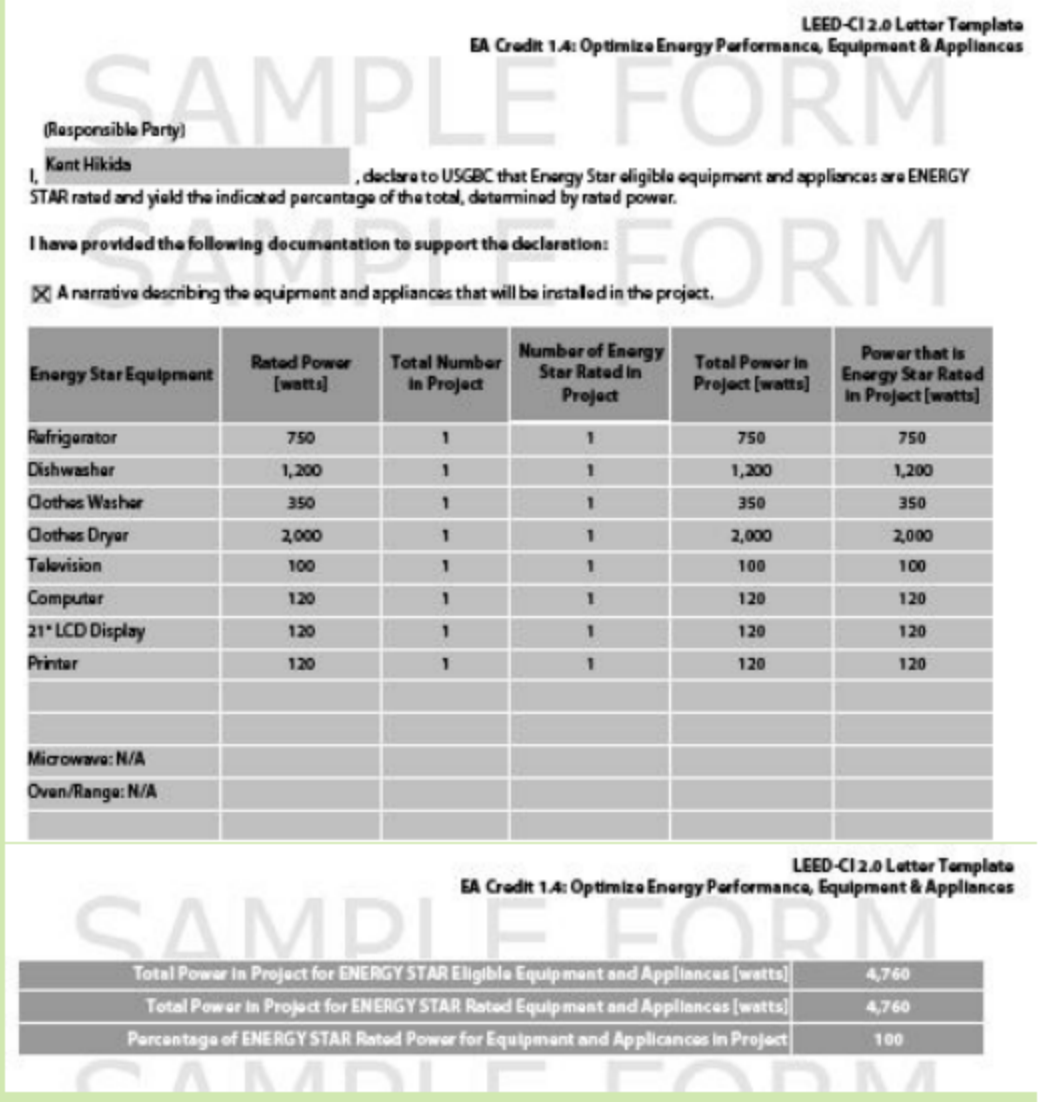


LEED-CI 2.0 Letter Template
EA Credit 1.4: Optimize Energy Performance, Equipment & Appliances

SAMPLE FORM

(Responsible Party)

I, Kent Hikida, declare to USGBC that Energy Star eligible equipment and appliances are ENERGY STAR rated and yield the indicated percentage of the total, determined by rated power.

I have provided the following documentation to support the declaration:

☒ A narrative describing the equipment and appliances that will be installed in the project.

Energy Star Equipment	Rated Power [watts]	Total Number in Project	Number of Energy Star Rated in Project	Total Power in Project [watts]	Power that is Energy Star Rated in Project [watts]
Refrigerator	750	1	1	750	750
Dishwasher	1,200	1	1	1,200	1,200
Clothes Washer	350	1	1	350	350
Clothes Dryer	2,000	1	1	2,000	2,000
Television	100	1	1	100	100
Computer	120	1	1	120	120
21" LCD Display	120	1	1	120	120
Printer	120	1	1	120	120
Microwave: N/A					
Oven/Range: N/A					

LEED-CI 2.0 Letter Template
EA Credit 1.4: Optimize Energy Performance, Equipment & Appliances

SAMPLE FORM

Total Power in Project for ENERGY STAR Eligible Equipment and Appliances [watts]	4,760
Total Power in Project for ENERGY STAR Rated Equipment and Appliances [watts]	4,760
Percentage of ENERGY STAR Rated Power for Equipment and Applicances in Project	100

SAMPLE FORM

Energy Star Equipment and Appliances

USGBC LEED CI 2009 EA Credit 1.4

Reference Table 2

Energy Consumption and Rated Power, by Equipment Type

NOTE:

From the FULL LEED CI 2009 Guide

Table 2. Energy Consumption and Rated Power, by Equipment Type

Energy Star Equipment	Rated Power (watts)	Total Number in Project	Number of Energy Star	Total Powre in Project (watts)	Power that is Energy Star (watts)
Desktop Computer	120	10	8	1200	960
Notebook Computer	45	20	16	900	720
Display (CRT) 15"	100			0	0
Display (CRT) 17"	200	2	1	400	200
Display (CRT) 21"	300			0	0
Display (LCD) 15"	45	2	2	90	90
Display (LCD) 17"	75	6	4	450	300
Display (LCD) 21"	120			0	0
Desktop laser printer	120	1	0	120	0
Office laser printer	250	2	1	500	250
Desktop copier	225			0	0
Office copier	750	1	1	750	750
Fax machine	45	1	1	45	45
Scanner	45			0	0
Refrigerator	750	1	1	750	750
Dishwasher	1200	1	1	1200	1200
Televisions	100			0	0
Commercial refrigerator/freezer	1000			0	0
Commercial fryer	10000			0	0
Commercial hot food holding cabinet	1500			0	0
Commercial steam cooker	8000			0	0
Clothes washer	350			0	0
Clothes dryer	2000			0	0
Totals				6405	5265
Percent Energy Star					82.2%

Sources: Energy Star Website (www.energystar.gov)
DOE Energy Information Portal (http://www.eere.energy.gov) Lawrence Berkeley national Laboratory Website and Reports (http://enduse.lbl.gov/ESTAR.html)
Note: The values in this table represent average rated power figures for equipment based on a variety of government information sources. The values are applicable only for weighting the LEED calculation based on relative power draws of different equipment and are not meant to be accurate estimates of actual power in use.

Life-Cycle Cost Analysis

1. *Create a life-cycle analysis for two (2) options for one (1) appliance. Include first cost, and annual energy cost. Use $0.12 per watt for the energy cost.*
2. *Which is the least expensive to purchase?*
3. *Which appliance uses less energy, and costs less to operate annually?*
4. *At what point is the more expensive appliance more cost-effective?*

GE Profile™ Series ENERGY STAR® French-Door Refrigerator

Model# PWE23KSDSS

$2,600.00

GE® 25.4 Cu. Ft. Side-By-Side

Model# GSS25GSHSS

$1,400.00

Life-Cycle Cost Analysis

1. *Create a life-cycle analysis for two (2) options for one (1) appliance. Include first cost, and annual energy cost. Use $0.12 per watt for the energy cost.*
2. *Which is the least expensive to purchase?*
3. *Which appliance uses less energy, and costs less to operate annually?*
4. *At what point is the more expensive appliance more cost-effective?*

Option	Appliance	Model No.	Cost	Annual Energy	Annual Energy Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 93
Option 1	GE Profile Series Energy Star 23.1 CU. FT. Counter-Depth	PWE23KSDSS	$2,600.00	596	$72.00	$2,672.00	$2,744.00	$2,816.00	$2,888.00	$2,960.00	$3,032.00	$3,104.00	$3,176.00	$3,248.00	$3,320.00	$9,296.00
Option 2	GE® 25.4 Cu. Ft. Side-By-Side Refrigerator	GSS25GSHSS	$1,400.00	708	$85.00	$1,485.00	$1,570.00	$1,655.00	$1,740.00	$1,825.00	$1,910.00	$1,995.00	$2,080.00	$2,165.00	$2,250.00	$9,305.00
			$1,200.00		-$13.00	$1,187.00	$1,174.00	$1,161.00	$1,148.00	$1,135.00	$1,122.00	$1,109.00	$1,096.00	$1,083.00	$1,070.00	-$9.00

Result:
Option 1 costs $1,200.00 more than Option 2.
Option 1 costs $13.00 less per year in energy costs.
It would take 93-years for Option 1 to be more cost effective than Option 2.
Note: This assumes that energy costs remain the same for the next 93-years at $0.12/kWh.

Lamp Cost Comparison

60 watt incandescent lamb

= 14 watt compact fluorescent lamp (CFL)

= 10 watt LED lamp

Life-Cycle Analysis for 50,000 hours:

60 watt incandescent = $8,812.50

14 watt compact fluorescent lamp (CFL) = $2,243.75

10 watt LED lamp = $2,143.75

Source:

[redacted]*_comparison.html*

Cost Comparison between LEDs, CFLs and Incandescent light bulbs

	LED	CFL	Incandescent
Light bulb projected lifespan	50,000 hours	10,000 hours	1,200 hours
Watts per bulb (equiv. 60 watts)	10	14	60
Cost per bulb	$35.95	$3.95	$1.25
KWh of electricity used over 50,000 hours	500	700	3000
Cost of electricity (@ 0.10per KWh)	$50	$70	$300
Bulbs needed for 50k hours of use	1	5	42
Equivalent 50k hours bulb expense	$35.95	$19.75	$52.50
Total cost for 50k hours	$85.75	$89.75	$352.50

Energy Savings over 50,000 hours, assuming 25 bulbs per household:

Total cost for 25 bulbs	$2143.75	$2243.75	$8812.50
Savings to household by switching from incandescents	$6668.75	$6568.75	0

Notes:
- Cost of electricity will vary. The figures used above are for comparison only, and are not exact. Residential energy costs among the various states range from 28.53 cents (Hawaii) to 6.34 cents (Idaho) per KWH.
- The cost per bulb for LEDs may vary. We used the figure of $35.95 (for a 60 watt equivalent LED bulb) as an average among lighting retailers.
- Estimates of bulb lifespan are projected, since it would take about 6 years of continuous lighting to test. Some manufacturers claim the new LED bulbs will last up to 25 years under normal household use, but this is not proven.
- Bulb breakage and bulb replacement costs have not been factored into this comparison chart. Incandescent bulbs and CFL bulbs are more easily broken than LEDs, which increases their cost of use.
- Most LEDs come with a minimum 2-year guarantee. Any defective LED bulb will usually fail within this time.

Lamp Types

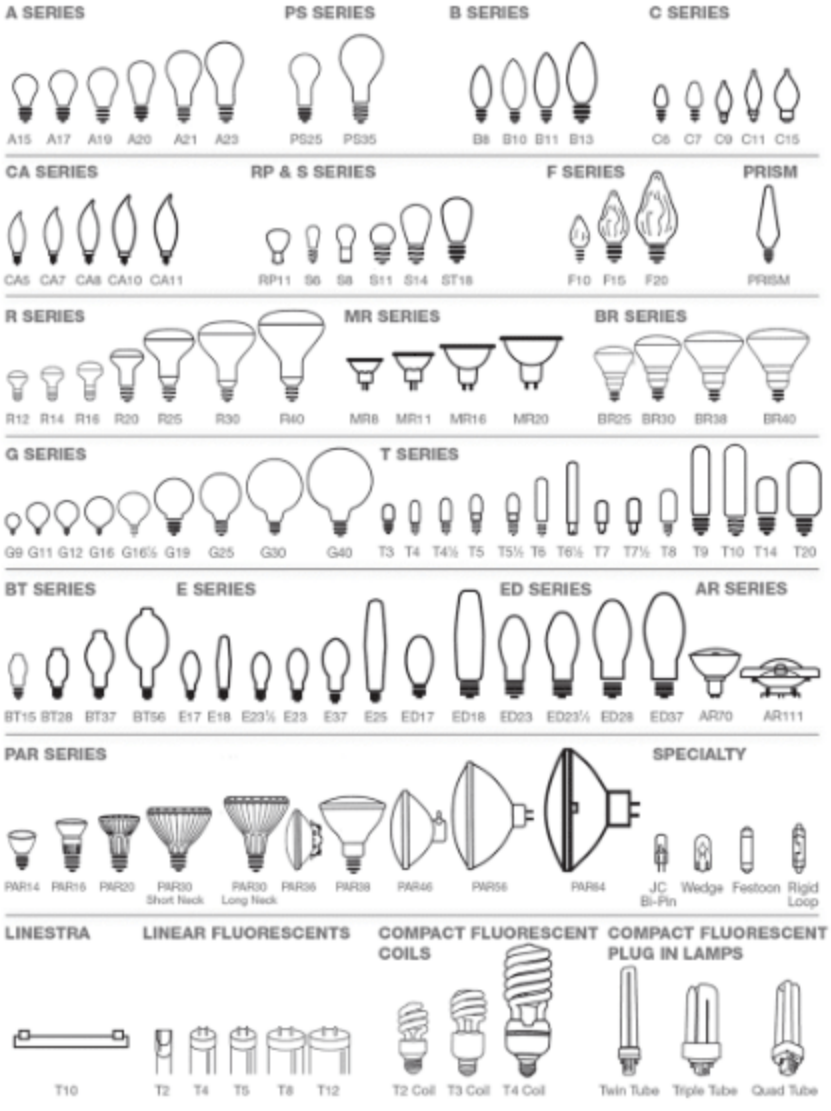
Incandescent and Fluorescent lamps

11-watt LED lamp equivalent to a 60-watt incandescent lamp

Source:

[redacted]

shapes-sizes

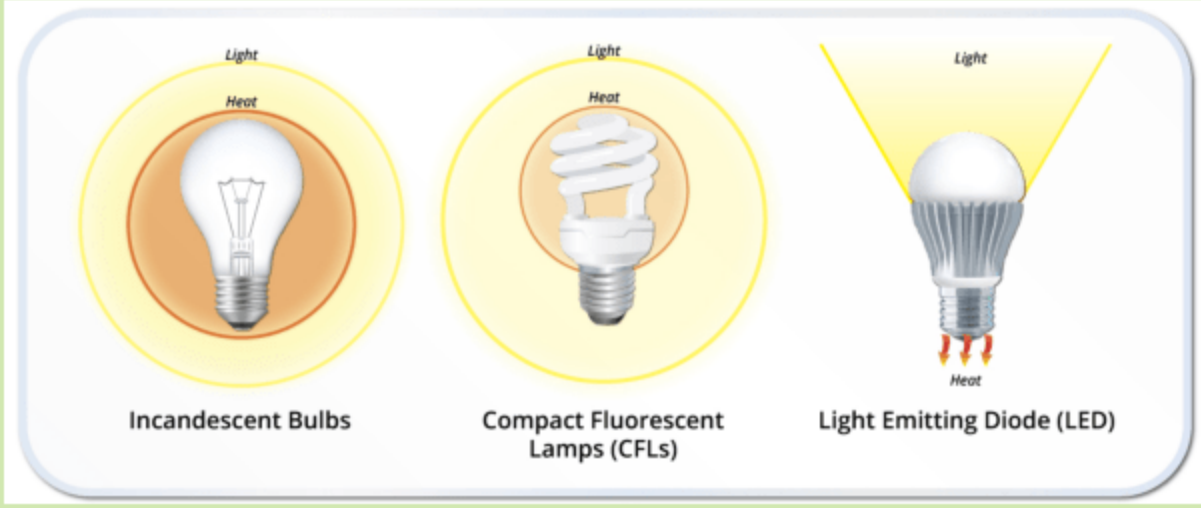


Lamp Comparison

Incandescent: 90% of the energy they release is as heat, not light.

CFLs create light by having an electric current forced through a tube containing gas.

LED lighting is the most efficient lighting available today.



Source:

http://www.smartenergytoday.net/industryknowledge/lighting/

Lamp Comparison

Note Heat Emitted which also increases the need for air conditioning

Note hazardous materials for CFLs

Note required lighting levels (lumens or foot-candles) must be met, and required emergency lighting for life safety must be met (emergency lighting for exiting).

Source: [redacted]*_comparison.html*

Comparing the features of Incandescent, CFL and LED bulbs

	LEDs	CFLs	Incandescents
Frequent On/Off Cycling	no effect	shortens lifespan	some effect
Turns on instantly	yes	slight delay	yes
Durability	durable	fragile	fragile
Heat Emitted	low (3 btu's/hr)	medium (30 btu's/hr)	high (85 btu's/hr)
Sensitivity to high temperature	some	yes	no
Sensitivity to low temperature	no	yes	no
Sensitivity to humidity	no	yes	some
Hazardous Materials	none	5 mg mercury/bulb	none
Replacement frequency (over 50k hours)	1	5	40+

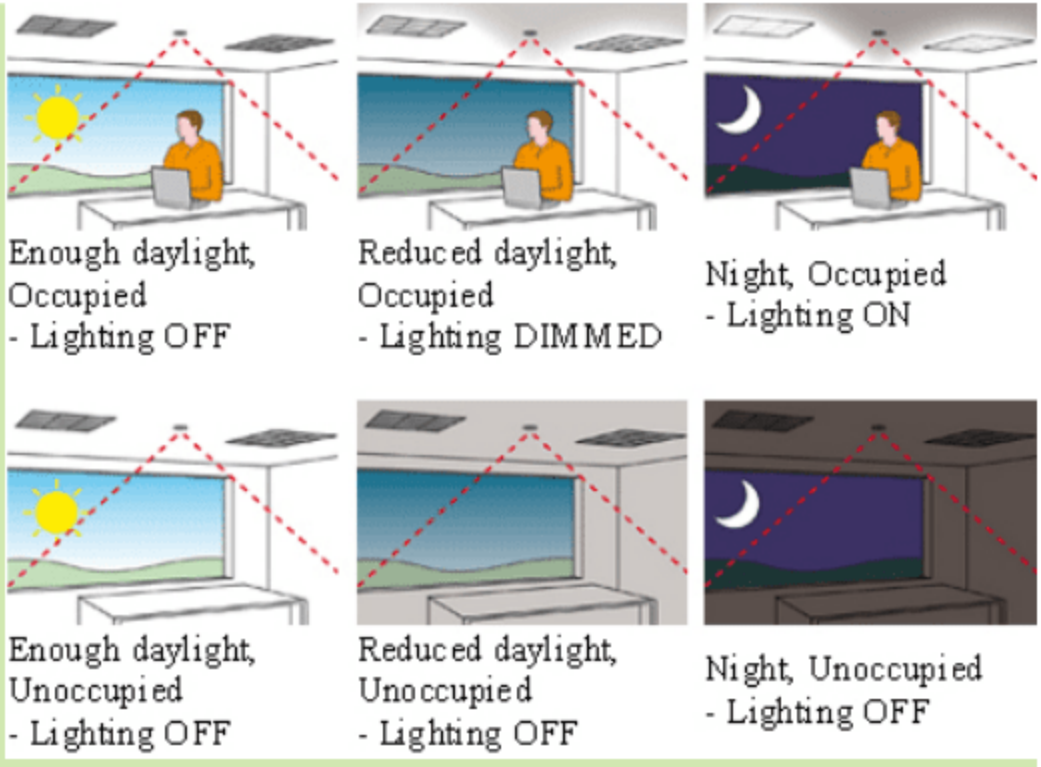
Daylighting Strategies

Example from http://www.slideshare.net/BNIM/this-is-every-building

EA Credit 1.2 Optimize Energy Performance, Lighting Controls

1. *Daylight dimming controls for 15'-0" from windows, and under skylights;*
2. *Daylight dimming controls for 50% of the lighting load;*
3. *Occupancy sensors for 75% of the connected lighting load*

Diagrams from: http://www.scldirect.co.uk/pir-occupancy-switch-with-daylight-linked-dimming.html



EA Credit 1.2 Optimize Energy Performance, Lighting Controls

1. *Daylight dimming controls for 15'-0" from windows, and under skylights;*
2. *Daylight dimming controls for 50% of the lighting load;*
3. *Some daylight sensors can integrate occupancy / vacancy sensors.*

369262g 1 10.29.14

Radio Powr Savr™ Wireless Daylight Sensor

Lutron® wireless daylight sensor is a battery-powered sensor that automatically controls lights via RF communication to compatible dimming or switching devices. This sensor mounts to the ceiling and measures light in the space. The sensor then transmits the light level to the associated dimming or switching devices that automatically control the lights to balance light level in the space. The sensor combines both convenience and exceptional energy savings potential along with ease of installation.

Features

- Wireless daylight sensor has simple calibration.
- Daylight compensation through Lutron® reliable open loop control.
- Designed to give a linear response to changes in viewed light level.
- Light range 0 to 1600 lx (0 to 150 fc).
- Uses Clear Connect® technology.
- Works with Radio Powr Savr™ occupancy/vacancy sensors and Pico® wireless controls.
- One sensor can be associated with up to 10 compatible RF dimming and switching devices allowing for switching, stepped dimming, and continuous dimming of multiple zones.
- Intuitive test mode provides instant system verification.
- Multiple ceiling mount methods available for different ceiling materials.
- Front accessible test buttons make setup easy.
- 10-year battery life.
- RoHS compliant.

Model Number

LRFX-DCRB-WH

- Color Code
- Frequency/Channel Code

Frequency/Channel Codes

2 = 431.0 – 437.0 MHz (U.S.A., Canada, Mexico, Brazil)
3 = 868.125 – 869.850 MHz (Europe, U.A.E.)
4 = 868.125 – 868.475 MHz (China, Singapore)
5 = 865.5 – 866.5 MHz (India)
6 = 312.3 – 314.8 MHz (Japan)
7 = 433.05 – 434.79 MHz (Hong Kong, Macau)

Color Code

WH = White

Compatible RF Devices

- For use with Lutron® products only.
- Communicates to various wireless Lutron® systems*.

EA Credit 1.1 Optimize Energy Performance, Lighting Power

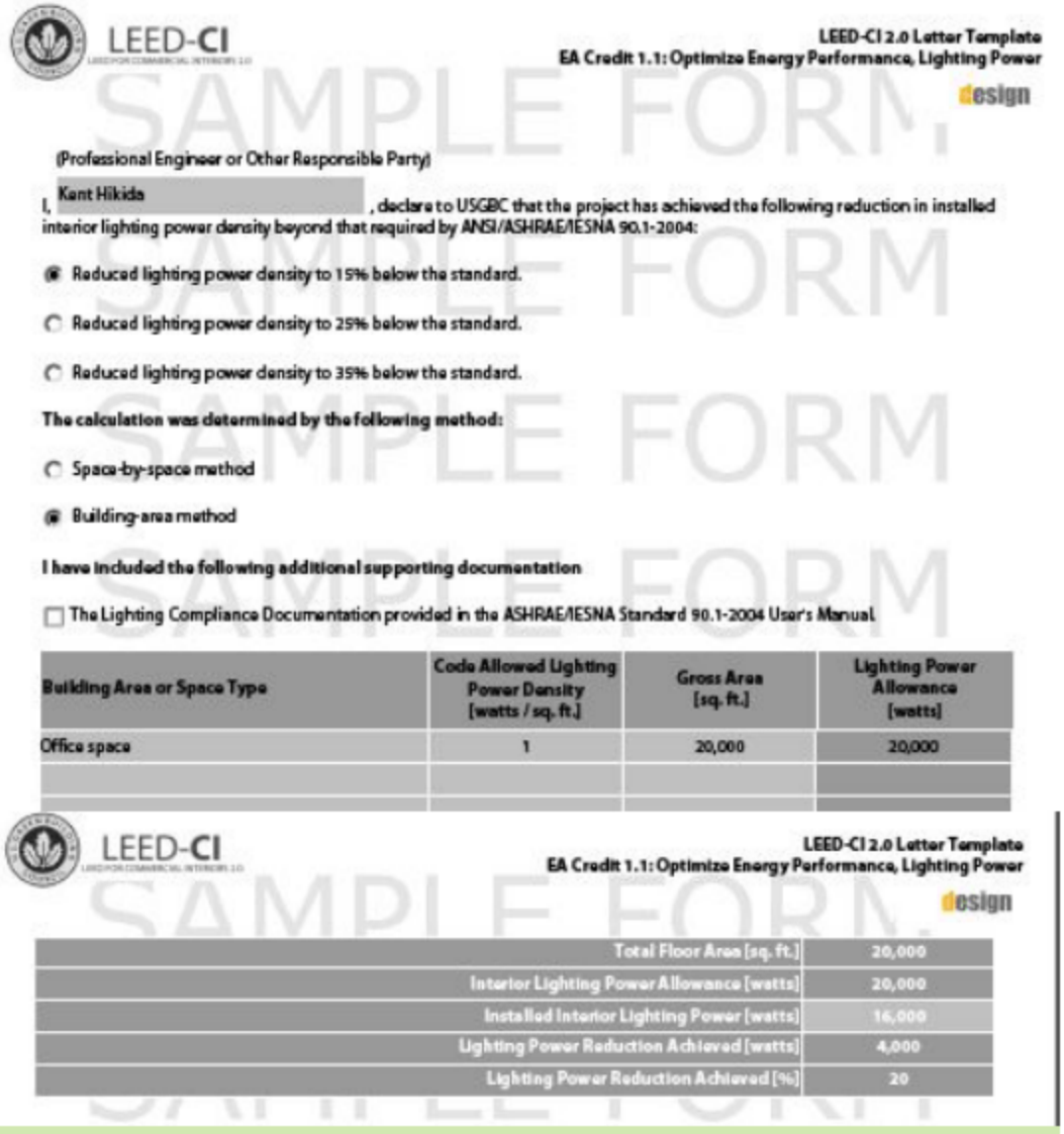
As of January 1, 2015 Commercial projects must comply with the 2012 International Energy Conservation Code (IECC)

Scheduled to take effect in August 2015 all Residential projects must comply with the 2015 International Energy Conservation Code (IECC).

ASHRAE 90.1 prescribes a maximum of 1.0 watts per square foot for lighting power density (LPD)

For a 10'-0" x 10'-0" room = 100 square feet the maximum energy that can be used for lighting is 100 watts.

Example from the LEED CI 2009 EA Credit 1.1 Letter Template is for a 20,000 SF Office Project allowing 1W/SF, and showing a 20% Reduction Achieved



LEED-CI

LEED-CI 2.0 Letter Template
EA Credit 1.1: Optimize Energy Performance, Lighting Power

design

(Professional Engineer or Other Responsible Party)

I, Kant Hikida, declare to USGBC that the project has achieved the following reduction in installed interior lighting power density beyond that required by ANSI/ASHRAE/IESNA 90.1-2004:

- (●) Reduced lighting power density to 15% below the standard.
- ( ) Reduced lighting power density to 25% below the standard.
- ( ) Reduced lighting power density to 35% below the standard.

The calculation was determined by the following method:

- ( ) Space-by-space method
- (●) Building-area method

I have included the following additional supporting documentation

- [ ] The Lighting Compliance Documentation provided in the ASHRAE/IESNA Standard 90.1-2004 User's Manual

Building Area or Space Type	Code Allowed Lighting Power Density [watts / sq. ft.]	Gross Area [sq. ft.]	Lighting Power Allowance [watts]
Office space	1	20,000	20,000

LEED-CI

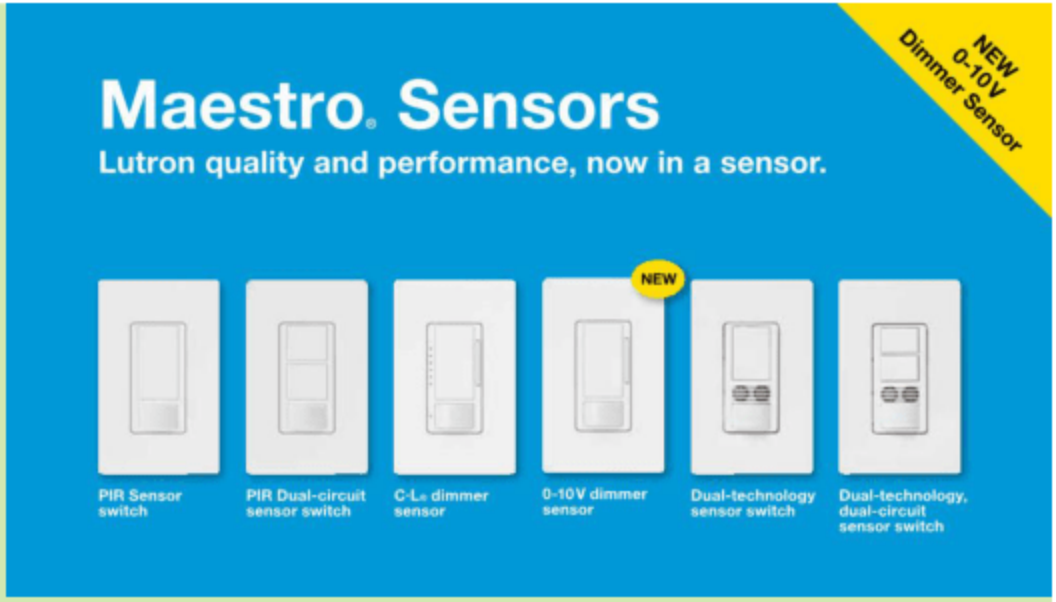
LEED-CI 2.0 Letter Template
EA Credit 1.1: Optimize Energy Performance, Lighting Power

design

Total Floor Area [sq. ft.]	20,000
Interior Lighting Power Allowance [watts]	20,000
Installed Interior Lighting Power [watts]	16,000
Lighting Power Reduction Achieved [watts]	4,000
Lighting Power Reduction Achieved [%]	20

EA Credit 1.2 Optimize Energy Performance, Lighting Controls

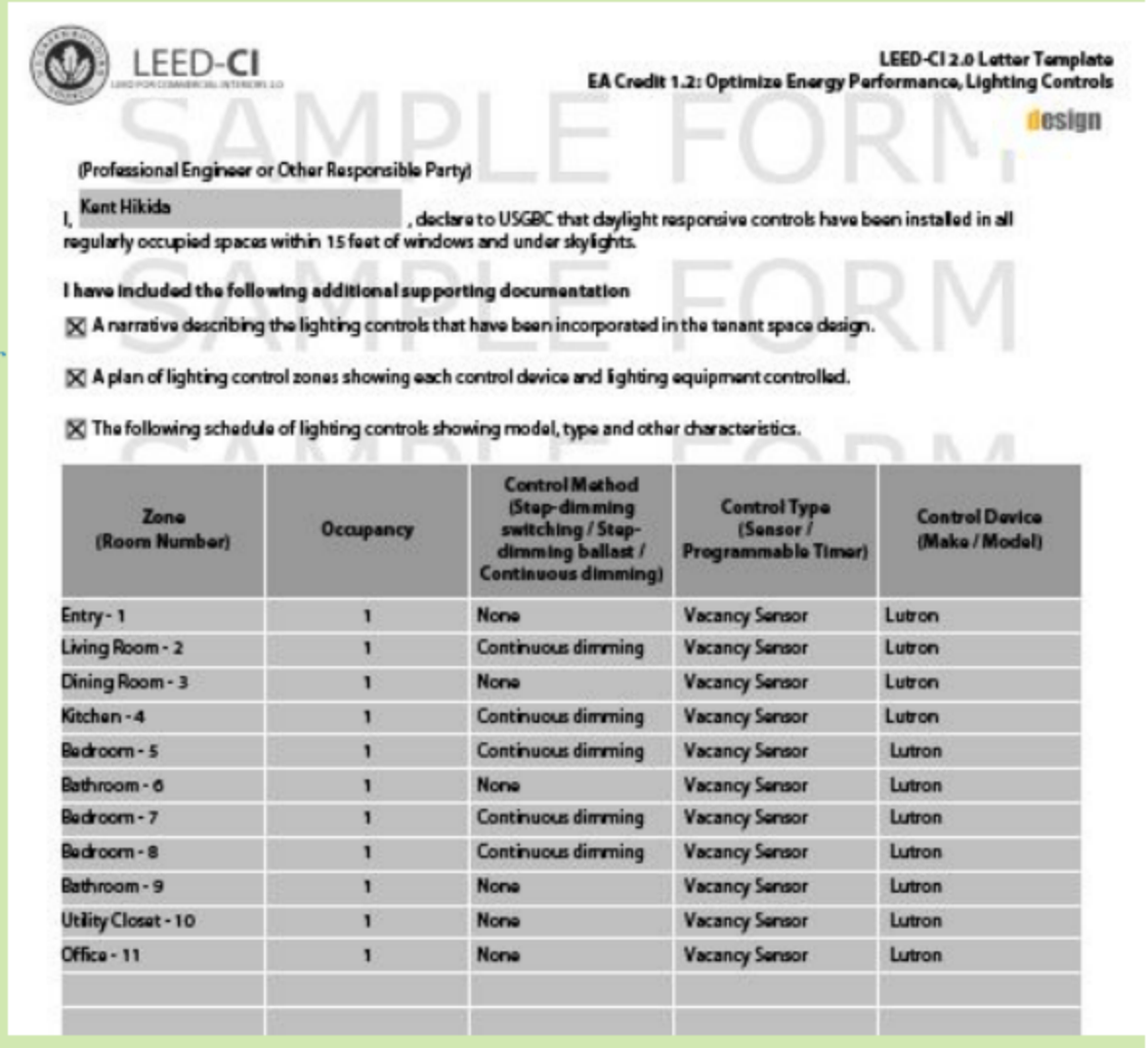
1. *Occupancy sensors for 75% of the connected lighting load*
2. *Occupancy sensors can be:*
   a. *integrated into the light fixture;*
   b. *integrated into a stand-alone daylight sensor mounted on the ceiling that connects to the light fixture;*
   c. *Integrated into the light switch*
3. *Occupancy/Vacancy sensors sense motion, and require "line of sight" to occupants.*
4. *An occupancy sensor turns on when you enter a room, but needs to be manually turned off when you leave.*
5. *A vacancy sensor needs to be manually turned on, and turns off automatically when it does not sense motion for a set period of time.*



EA Credit 1.2 Optimize Energy Performance, Lighting Controls

1. *Daylight dimming controls for 15'-0" from windows, and under skylights;*
2. *Daylight dimming controls for 50% of the lighting load;*
3. *Occupancy sensors for 75% of the connected lighting load*

Example from the LEED CI 2009 EA Credit 1.2 Letter Template



LEED-CI

LEED-CI 2.0 Letter Template
EA Credit 1.2: Optimize Energy Performance, Lighting Controls

design

(Professional Engineer or Other Responsible Party)

I, Kent Hikida, declare to USGBC that daylight responsive controls have been installed in all regularly occupied spaces within 15 feet of windows and under skylights.

I have included the following additional supporting documentation

☒ A narrative describing the lighting controls that have been incorporated in the tenant space design.

☒ A plan of lighting control zones showing each control device and lighting equipment controlled.

☒ The following schedule of lighting controls showing model, type and other characteristics.

Zone (Room Number)	Occupancy	Control Method (Step-dimming switching / Step-dimming ballast / Continuous dimming)	Control Type (Sensor / Programmable Timer)	Control Device (Make / Model)
Entry - 1	1	None	Vacancy Sensor	Lutron
Living Room - 2	1	Continuous dimming	Vacancy Sensor	Lutron
Dining Room - 3	1	None	Vacancy Sensor	Lutron
Kitchen - 4	1	Continuous dimming	Vacancy Sensor	Lutron
Bedroom - 5	1	Continuous dimming	Vacancy Sensor	Lutron
Bathroom - 6	1	None	Vacancy Sensor	Lutron
Bedroom - 7	1	Continuous dimming	Vacancy Sensor	Lutron
Bedroom - 8	1	Continuous dimming	Vacancy Sensor	Lutron
Bathroom - 9	1	None	Vacancy Sensor	Lutron
Utility Closet - 10	1	None	Vacancy Sensor	Lutron
Office - 11	1	None	Vacancy Sensor	Lutron

Daylight and Views

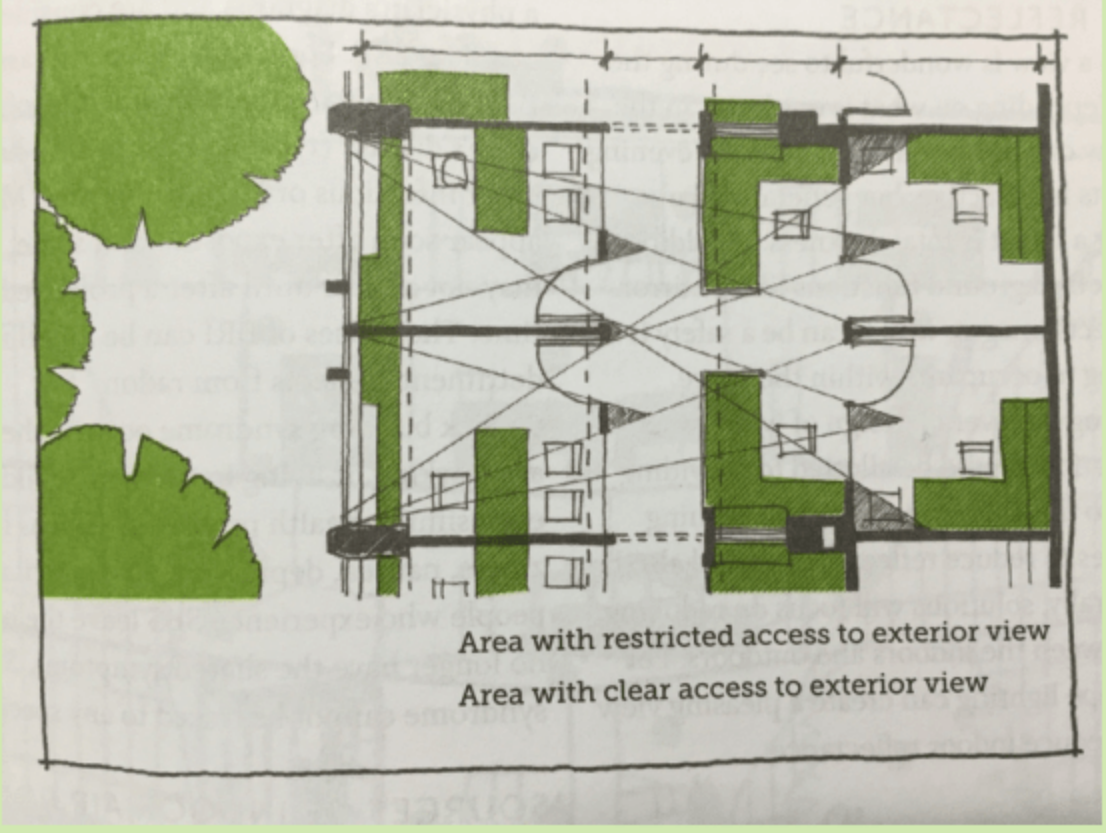
Indoor Environmental Quality

EQ Credits 8.1 and 8.2

Daylight and Views – Daylight

- *75% or 90% of spaces*
- *Show in plan*

Plan example from Winchip, Figure 6.9a on page 159



Daylight and Views

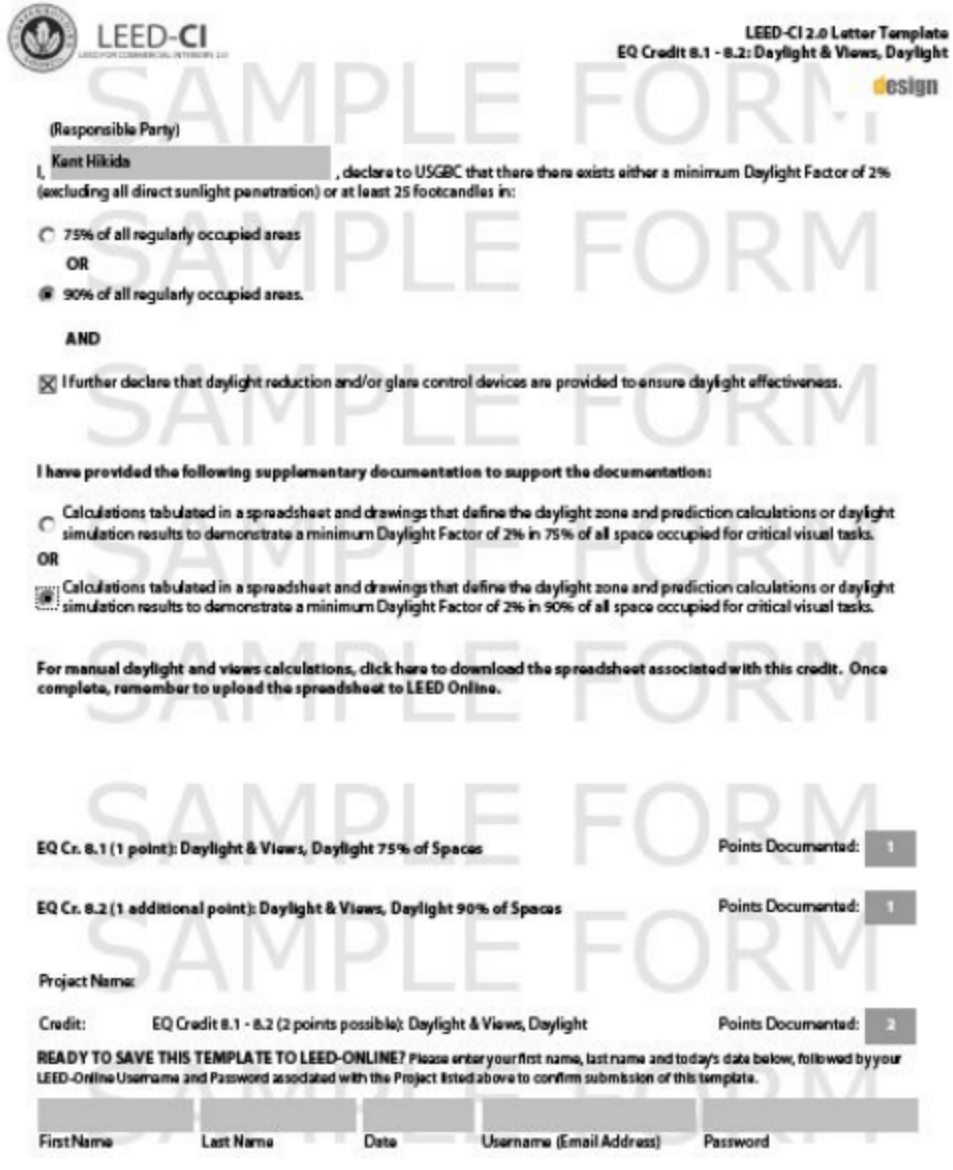
Indoor Environmental Quality

EQ Credits 8.1 and 8.2

Daylight and Views – Daylight

- *75% or 90% of spaces*
- *Show in plan*

Sample LEED CI 2.0 Letter Template



LEED-CI

LEED 2.0 Letter Template
EQ Credit 8.1 - 8.2: Daylight & Views, Daylight

design

(Responsible Party)

I, Kent Hikida, declare to USGBC that there there exists either a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) or at least 25 footcandles in:

○ 75% of all regularly occupied areas

OR

◉ 90% of all regularly occupied areas.

AND

☒ I further declare that daylight reduction and/or glare control devices are provided to ensure daylight effectiveness.

I have provided the following supplementary documentation to support the documentation:

○ Calculations tabulated in a spreadsheet and drawings that define the daylight zone and prediction calculations or daylight simulation results to demonstrate a minimum Daylight Factor of 2% in 75% of all space occupied for critical visual tasks.

OR

◉ Calculations tabulated in a spreadsheet and drawings that define the daylight zone and prediction calculations or daylight simulation results to demonstrate a minimum Daylight Factor of 2% in 90% of all space occupied for critical visual tasks.

For manual daylight and views calculations, click here to download the spreadsheet associated with this credit. Once complete, remember to upload the spreadsheet to LEED Online.

EQ Cr. 8.1 (1 point): Daylight & Views, Daylight 75% of Spaces	Points Documented:	1
EQ Cr. 8.2 (1 additional point): Daylight & Views, Daylight 90% of Spaces	Points Documented:	1
Project Name:		
Credit: EQ Credit 8.1 - 8.2 (2 points possible): Daylight & Views, Daylight	Points Documented:	2

READY TO SAVE THIS TEMPLATE TO LEED-ONLINE? Please enter your first name, last name and today's date below, followed by your LEED-Online Username and Password associated with the Project listed above to confirm submission of this template.

First Name	Last Name	Date	Username (Email Address)	Password

Daylight and Views

Indoor Environmental Quality

EQ Credit 8.3

Daylight and Views – Views for Seated Spaces

- *Building occupants in 90% of regularly occupied spaces will have direct lines of sight to perimeter glazing (between 2'-6" to 7'-6") from a seated position 42 inches above the floor.*

Section example from Winchip, Figure 6.9b on page 159

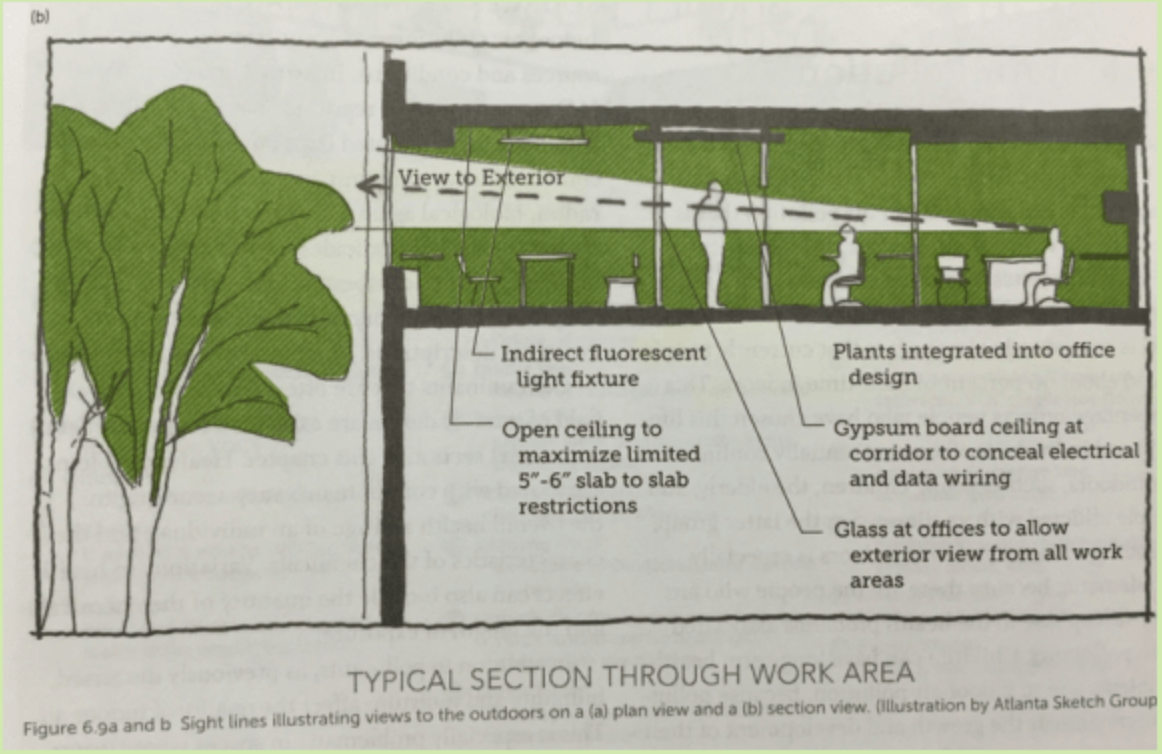


Figure 6.9a and b Sight lines illustrating views to the outdoors on a (a) plan view and a (b) section view. (Illustration by Atlanta Sketch Group

Daylight and Views

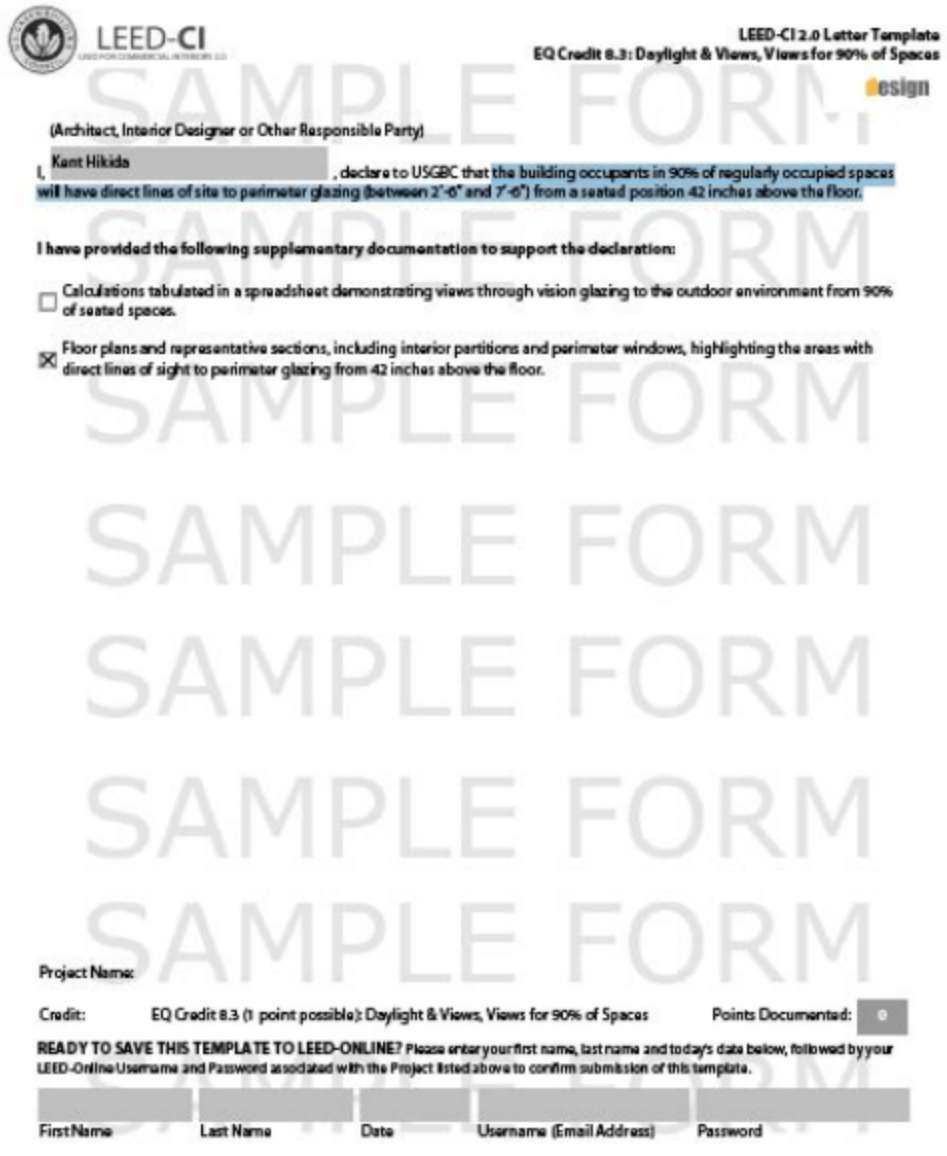
Indoor Environmental Quality

EQ Credit 8.3

Daylight and Views – Views for Seated Spaces

- *Building occupants in 90% of regularly occupied spaces will have direct lines of sight to perimeter glazing (between 2'-6" to 7'-6") from a seated position 42 inches above the floor.*

Sample LEED CI 2.0 Letter Template



LEED-CI

LEED-CI 2.0 Letter Template
EQ Credit 8.3: Daylight & Views, Views for 90% of Spaces

esign

(Architect, Interior Designer or Other Responsible Party)

I, Kent Hikida, declare to USGBC that the building occupants in 90% of regularly occupied spaces will have direct lines of site to perimeter glazing (between 2'-6" and 7'-6") from a seated position 42 inches above the floor.

I have provided the following supplementary documentation to support the declaration:

☐ Calculations tabulated in a spreadsheet demonstrating views through vision glazing to the outdoor environment from 90% of seated spaces.

☒ Floor plans and representative sections, including interior partitions and perimeter windows, highlighting the areas with direct lines of sight to perimeter glazing from 42 inches above the floor.

SAMPLE FORM

Project Name:

Credit: EQ Credit 8.3 (1 point possible): Daylight & Views, Views for 90% of Spaces Points Documented: 0

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First Name	Last Name	Date	Username (Email Address)	Password

Sources

- http://www.eia.gov/tools/faqs/faq.cfm?id=85&t=1
- http://www.census.gov/popclock/
- https://www.teachengineering.org/view_lesson.php?url=collection/cla_/lessons/cla_lesson7_household_energy/cla_lesson7_household_energy.xml
- http://www.energystar.gov/index.cfm?fuseaction=find_a_product.
- [redacted]