

# Raters and Commercial Buildings

Expanding Opportunities to the Commercial Building Sector



# Learning Objectives

Raters Knowledge of Commercial Buildings

Residential and Commercial similarities

Commercial Programs to Participate

How to start...

# Raters Motivation

Diversification

Responsibility towards the Community

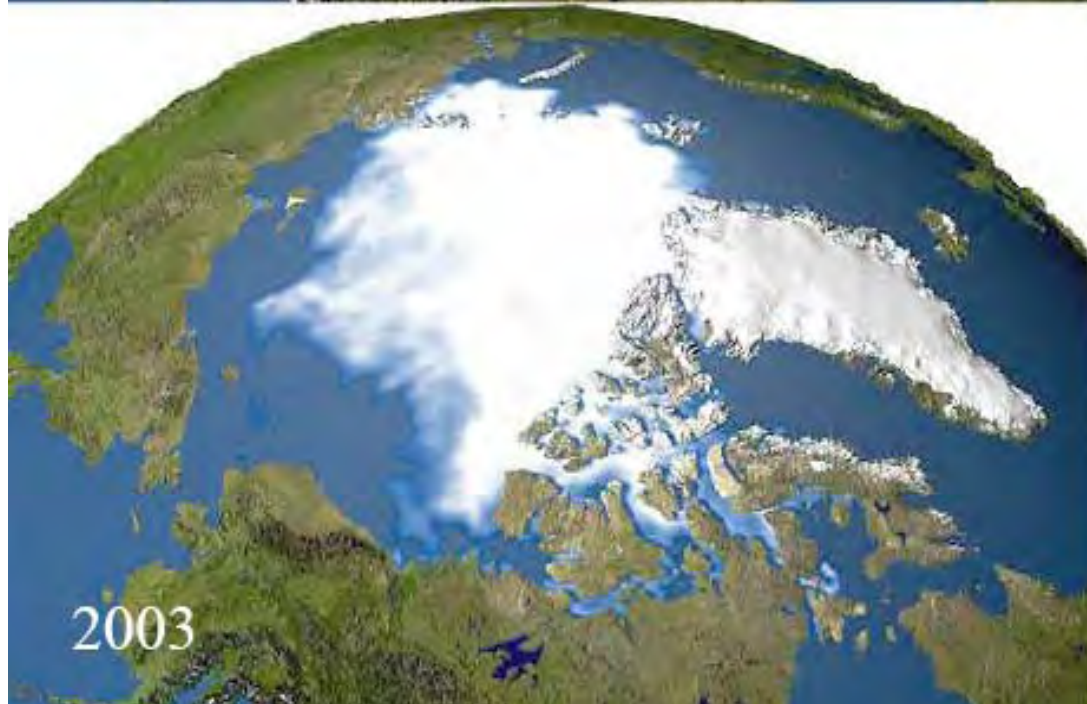
Market Differentiation

Knowledge of Fundamental

Market Opportunity

Going Green

All of the Above...



It is happening now. We cannot afford to wait for long periods of time for technical solutions.”

David H. Rind, NASA Goddard Institute for Space Studies  
October 24, 2003

# Commercial Buildings

## Rater's Area Of Knowledge

- Energy Efficiency
- Water Conservation
- Indoor Environmental Quality
- Building Envelope
  - Air Movement
  - Heat Transfer

# Commercial Buildings

## Rater's Role in the Commercial Sector

- Consumer Education (Building Owners, Designers, Architect)
- Overall Building Performance and Testing
- Energy Modeling
- Right Sizing of HVAC Equipment and proper loads
- Field Experience (Commissioning)
- Energy Efficiency Consulting
- Green Building Consulting

# Commercial Buildings

## Programs to Participate

- ENERGY STAR for Commercial Buildings
- USGBC – LEED NC, LEED EB, LEED CI, LEED CS, other..
- GREEN GLOBES

# ENERGY STAR

## Commercial Building

Buildings are scored on a 1-100 scale

75 or higher are eligible for the ENERGY STAR

Top 25% of facilities in the country for energy performance

Benchmark process against a National Registry of Buildings

Generate one-third less carbon dioxide.

ENERGY STAR Commercial buildings use on average 35% less

Credible - Government-backed label

Voluntary

# Energy Star Building Performance

Energy Performance Rating

Based on actual “whole –building” energy performance data

- DOE-CBECS

Normalizes for factors that affect energy use intensity

- Climate/weather
- Size
- Occupancy

Target Finder serves as metric for:

- AIA 2010, 2030 Challenge, USGBC LEED EB Program

# Energy Star Target Finder

Target Finder determines the EPA rating for estimated energy use of your projects.

Achieve an EPA rating of 75 or higher for the design project

## Project Requirements

- Design projects must be at least 95 percent complete with construction documents.

Submit two documents to EPA:

- Statement of Energy Design Intent
- Application Form from Architect of Record



# Building Types Eligible for an EPA Rating

Office

Courthouse

Bank/Financial  
Institution

K-12 School

Supermarket/Grocery

Retail (big box)

Hospital

Medical Office

Hotel

Residence  
Hall/Dormitory

Warehouse  
(refrigerated/non-  
refrigerated).

# **USGBC – LEED Programs**

How can a Raters be part of a LEED Commercial Building

- **LEED AP**
- **Create partnerships with Architects, Designer, Engineers, Interior Designers, Suppliers and General Contractors**
- **Advocate for Sustainability**
- **Become a resource of information**
- **Join your local USGBC Chapter**

# USGBC – LEED Commercial Programs

## Possible roles on LEED Commercial Projects

- Energy Efficiency Consulting
- Energy Modeling
- Lead LEED AP for the project (Program Administrator)
- Building Envelope Commissioning
- General Green Building Consulting
- Program Educator for Building Owners and Users

# Basic Commissioning

## Commissioning of the Building Energy Components

- Heating and Cooling Systems
- Ventilation
- Lighting
- Building Envelope

# SENERCON Projects

## Energy Star for Commercial Buildings (2)

- Energy Efficiency Consulting
- Building Envelope Commissioning
- Building Diagnostics

## GREEN Globes (2)

- Energy Efficiency and Green Consulting

## LEED NC – CI – EB Projects (5)

- Lead LEED AP (Program Administrator)
- Energy Efficiency and Green Building Consulting

# QUESTIONS

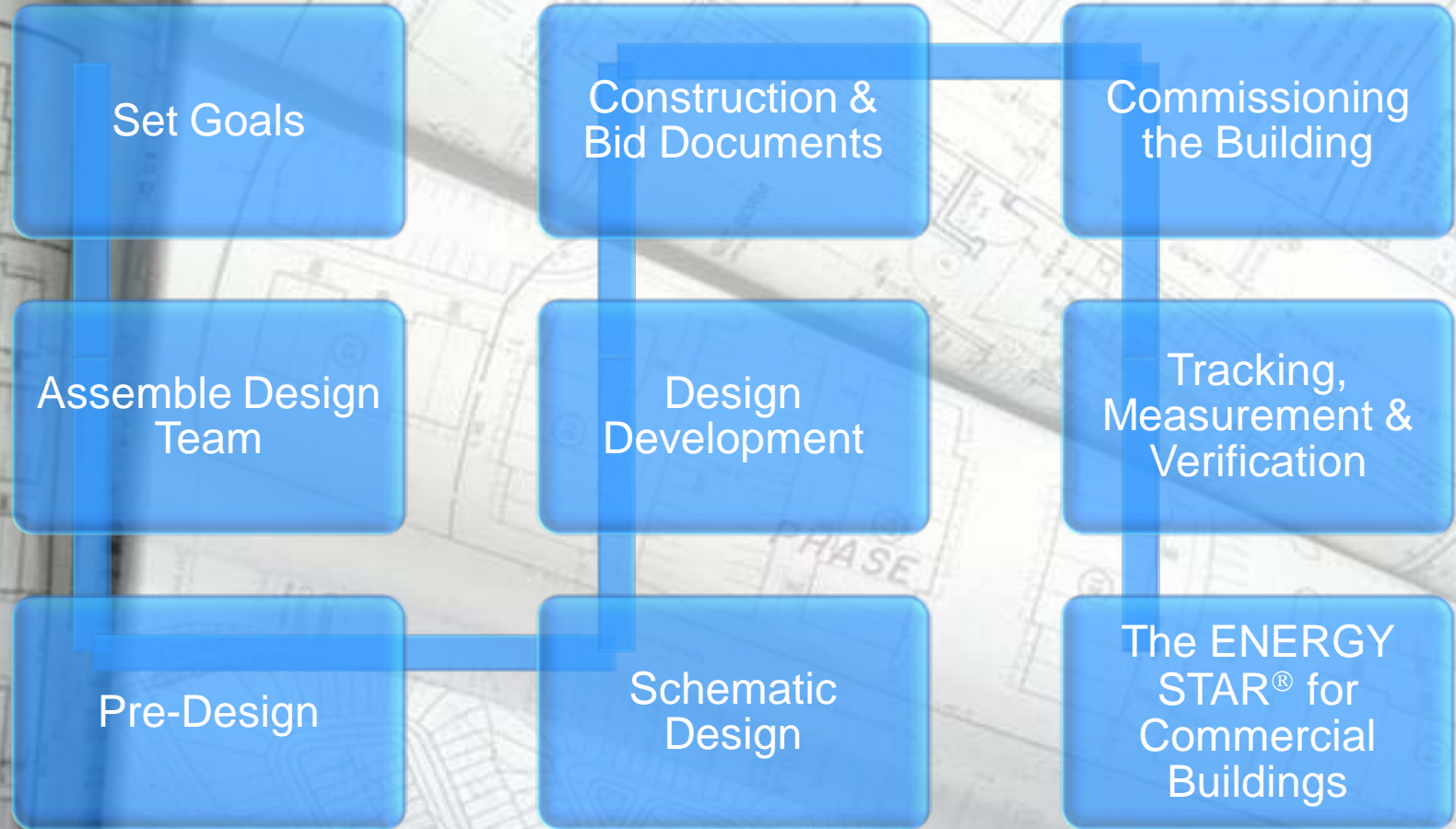


# QUESTIONS?

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LEED AP, HERS,  
Green Rater, NAHB Verifier  
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# Building Design Guidance





Join the **ENERGY STAR**  
program



Rate your design's  
estimated energy use in  
Target Finder



Achieve Designed To Earn  
the **ENERGY STAR**

# Tracking, Measurement & Verification

Post-occupancy assessment of energy performance

EPA's building energy performance rating system

- Portfolio Manager

Input data include:

- Building characteristics – gross square feet, number of occupants, operating hours/week, 12 months of energy data

Output data

- Percentile ranking (1–100) – 70, 75, 80
- LEED-EB – Energy ranking prerequisite of 67

# Target Finder

## Target Finder

**REQUIRED**

Select a target rating and/or compare your Design Energy to the target.

### 1. Facility Information

*Zip Code	<input type="text" value="10705"/>	Facility Name	<input type="text" value="Office Building"/>
City	<input type="text" value="Yonkers"/>	State	<input type="text" value="New York"/>

### 2. Facility Characteristics

\*Select Space Type(s) for this project

#### Office (General)

Delete

*Gross Floor Area	*Occupants	*Number of PCs	*Operating Hours/Week
<input type="text"/> Sq. Ft.	<input type="text"/>	<input type="text"/>	<input type="text"/> Hours

#### Computer Data Center

Delete

*Gross Floor Area	*Operating Hours/Week
<input type="text"/> Sq. Ft.	<input type="text"/> Hours

# Target Finder

## 2. Facility Characteristics

Select Space Type(s) for this project.

[Space Types]

[Space Types]

— Primary Space Types —

Office (General)

Office (Bank Branch)

Office (Courthouse)

Office (Financial Center)

K-12 School

Hotel (Economy and Budget)

Hotel (Midscale w/o Food and Beverage)

Hotel (Midscale w/ Food and Beverage)

Hotel (Upscale)

Hotel (Upper Upscale)

Medical Office

Residence Hall/Dormitory

Supermarket/Grocery

Warehouse (Refrigerated)

Warehouse (Unrefrigerated)

— Secondary Space Types —

Other

Computer Data Center

Garage

Open Parking Lot

Swimming Pool

Delete

\*Number of PCs

\*Operating Hours/Week

Hours

Delete

\*Operating Hours/Week

Hours

Choose the design target and select "View Results" to display associated energy use for the target.

# Space Type

## 2. Facility Characteristics

\*Select Space Type(s) for this project.

[Space Types]

Office (General)

\*Gross Floor Area

\*Occupants

\*Number of PCs

\*Operating Hours/Week

50000 Sq. Ft.

300

300

55 Hours

Computer Data Center

\*Gross Floor Area

\*Operating Hours/Week

5000 Sq. Ft.

168 Hours

## 3. The Target <sup>1</sup>

Target Rating

Energy Reduction Target

80

Or

Select

\*Choose the design target and select "View Results" to display associated energy use for the target.

# Design Target

## 3. The Target <sup>1</sup>

Target Rating      Energy Reduction Target

80      Or      Select

<sup>1</sup> Choose the design target and select "View Results" to display associated energy use for the target.

## 4. Estimated Design Energy

Use results from energy analysis and enter total estimated energy for the design. Select "View Results" to compare Estimated Energy Use to your Target

Energy Source	Units	Estimated Total Annual Energy Use <sup>2</sup>	Energy Rate (\$/Unit)
Electricity	kWh		\$ 0.10
Natural Gas	therms		\$ 0.80

<sup>1</sup> Target Rating is the EPA energy performance rating 1-100 scale. A 75 or higher denotes ENERGY STAR. Energy reduction target is the percent reduction for a similar building's average energy consumption or the equivalent of an EPA Rating of 50.

<sup>2</sup> Annual Energy Use - the fuel mix percentage is determined from DOE-EIA. The Electric % is typical of the area designated by zip code. Natural gas is used as 2<sup>nd</sup> energy source. The defaults for percentage of energy use by fuel type will be displayed at top of Results page.

Clear Form

View Results

# Energy Performance Results

NOTE: Assumptions are 76% electricity and 24% % Natural Gas. The Target & Top 10% energy use for this facility are calculated based on the typical fuel mix in the zip code specified.

[View Statement of Energy Design Intent](#)

Target Energy Performance Results (estimated)			
Energy	Design	Target	Top 10%
Energy Performance Rating (1-100)	N/A	80	90
Energy Reduction (%)	N/A	27	39
Source Energy Use Intensity (kBtu/Sq. Ft./yr)	N/A	210.2	174.8
Site Energy Use Intensity (kBtu/Sq. Ft./yr)	N/A	82.7	68.8
Total Annual Source Energy (kBtu)	N/A	11,558,261.7	9,614,388.0
Total Annual Site Energy (kBtu)	N/A	4,547,619.7	3,782,798.9
Total Annual Energy Cost (\$)	N/A	\$ 110,317	\$ 91,764
Pollution Emissions			
CO2 Emissions (1000 lbs/year)	N/A	1,066.1	886.6
CO2 Emissions Reduction (%)	N/A	27%	39%

# Estimated Design Energy

## 3. The Target <sup>1</sup>

Target Rating

80

Or

Energy Reduction Target

Select

<sup>1</sup>Choose the design target and select "View Results" to display associated energy use for the target.

## 4. Estimated Design Energy

Use results from energy analysis and enter total estimated energy for the design. Select "View Results" to compare Estimated Energy Use to your Target.

Energy Source	Units	Estimated Total Annual Energy Use <sup>2</sup>	Energy Rate (\$/Unit)
Electricity	kWh	748365	\$0.10
Natural Gas	therms	10914	\$0.80

<sup>1</sup>Target Rating is the EPA energy performance rating 1 – 100 scale. A 75 or higher denotes ENERGY STAR. Energy reduction target is the percent reduction for a similar building's average energy consumption or the equivalent of an EPA Rating of 50.

<sup>2</sup>Annual Energy Use – the fuel mix percentage is determined from DOE-EIA. The Electric % is typical of the area designated by zip code. Natural gas is used as 2<sup>nd</sup> energy source. The defaults for percentage of energy use by fuel type will be displayed atop of Results page.

Clear Form

View Results

# Energy Performance Results

NOTE: Values are 70% electricity and 30% other energy source. The Target & Top 10% energy use for this facility are calculated based on fuel mix of input estimated energy use.

Apply

Target Energy Performance Results (estimated)			
Energy	Design	Target	Top 10%
<u>Energy Performance Rating (1-100)</u>	92	80	90
<u>Energy Reduction (%)</u>	44	27	39
<u>Source Energy Use Intensity (kBtu/Sq. Ft./yr)</u>	159.8	210.2	174.8
<u>Site Energy Use Intensity (kBtu/Sq. Ft./yr)</u>	66.1	87.0	72.3
<u>Total Annual Source Energy (kBtu)</u>	8,790,897.1	11,558,261.7	9,614,388.0
<u>Total Annual Site Energy (kBtu)</u>	3,638,065.6	4,783,433.4	3,978,953.4
<u>Total Annual Energy Cost (\$)</u>	\$ 83,370	\$ 109,617	\$ 91,181
<b>Pollution Emissions</b>			
<u>CO2 Emissions (1000 lbs/year)</u>	841.2	1,075.1	894.2
<u>CO2 Emissions Reduction (%)</u>	43%	27%	39%