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A River of Energy Solutions

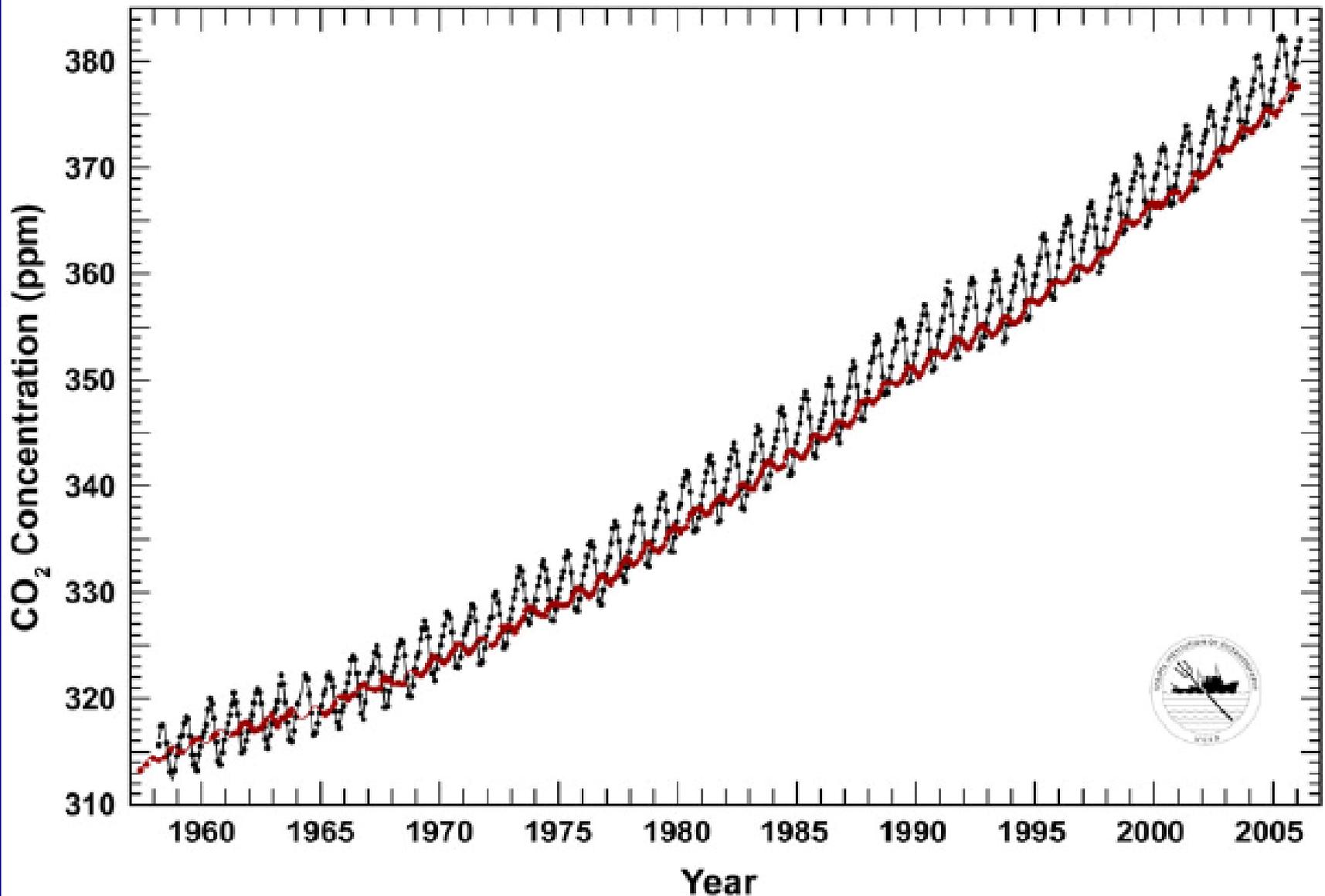
High-Performance Buildings Compliance

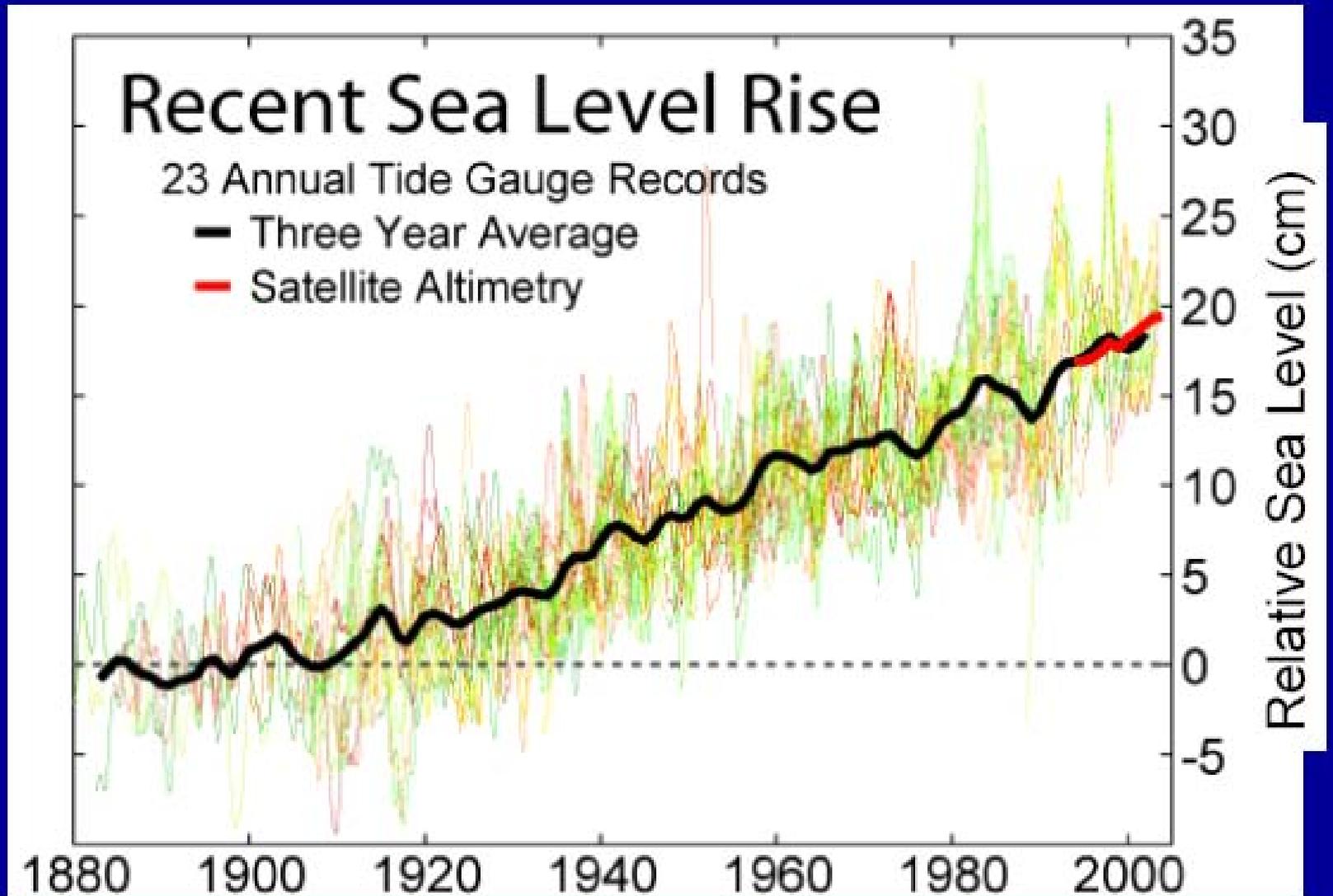
Kevin Kampschroer & John Simpson—GSA

Mauna Loa Observatory, Hawaii and South Pole, Antarctica Monthly Average Carbon Dioxide Concentration

Data from Scripps CO₂ Program

Last updated February 2006





1882-2005 sea level rise based on Permanent Service for Mean Sea Level (PSMSL) tide gauge data from 23 sites selected by Douglas (1997)

This figure was prepared by Robert A. Rohde

http://www.globalwarmingart.com/wiki/Image:Recent_Sea_Level_Rise.png

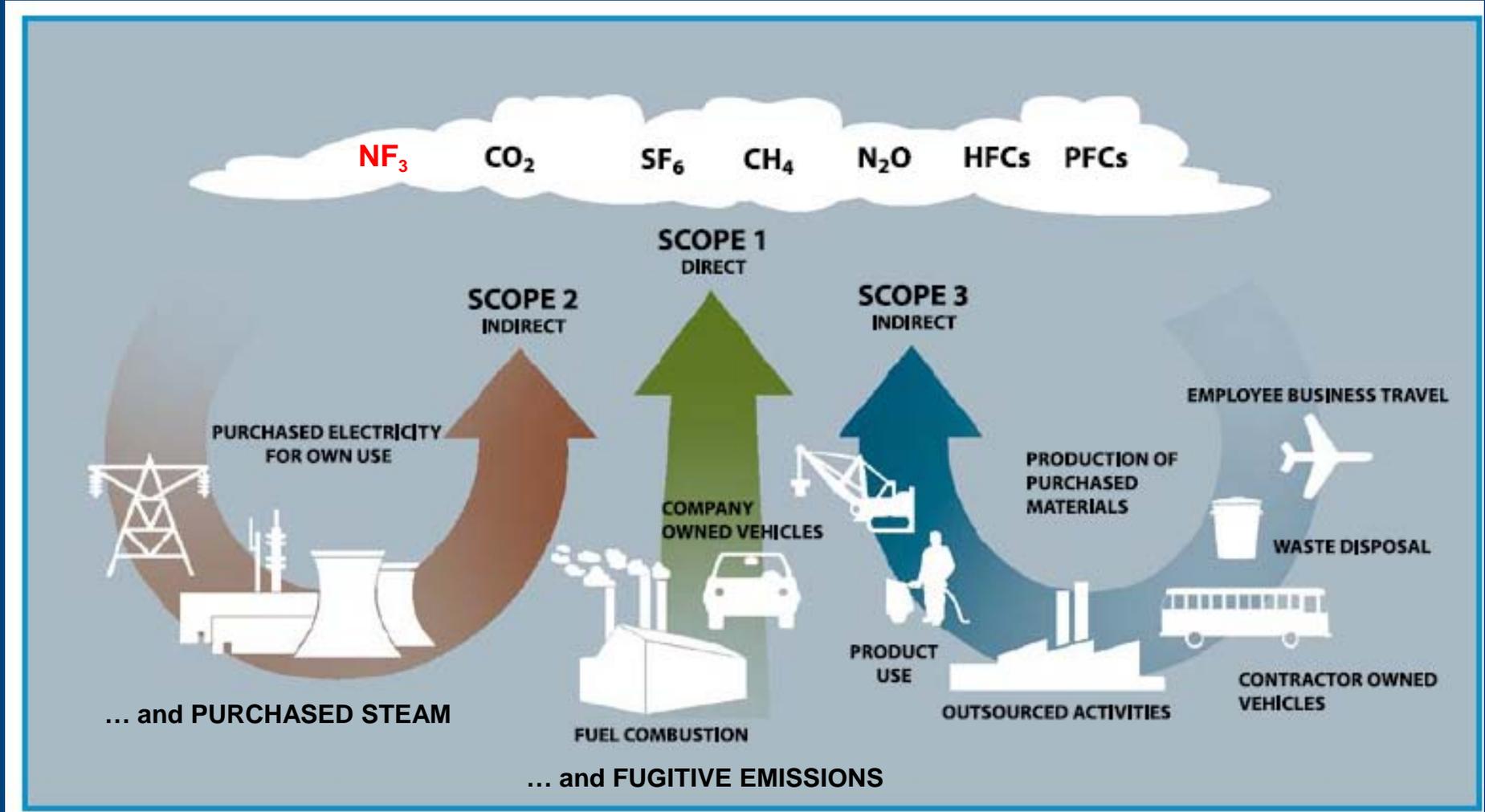
Motivation

- 40% of Annual US Energy Use
- 30% of CO₂ Production
- 40% of Ozone Depletion
- 35% of Municipal Solid Waste
- 30% of Wood And Raw Materials Use
- 25% of Water Use
- 30%+ of Buildings Have Poor Indoor Air Quality
- & Most People Spend About 90% Of Their Time Indoors

Executive Order 13514: Environmental, Energy & Economic Performance

- Measure, Manage, And Reduce Greenhouse Gas Emissions Toward Agency-defined Targets
- Scopes 1 & 2 *And* Scope3 Targets
- 26% Water Reduction By 2020
- 50% Waste Diversion
- Net Zero By 2020
- Transit-oriented Design
- Fleet & Fuel Reductions
- Green Procurement

Emission Sources (Scopes)



EO 13514

- GHG Accounting Guidance, Next Steps
 - Sequestration
 - Commuting
 - Ground Travel
 - Leased Assets
- The Supply Chain
 - Enrollment
 - Product Certification

Related Initiatives

- GreenGov
- Recovery Through Retrofit
- Adaptation Planning
- eWaste
- Better Buildings Initiative

Data Needs

- Electricity and steam purchases
- Fuel use
- Fugitive emissions, as available (refrigerants, etc.)
- Scope 3 data
 - Employee travel
 - Commuter travel
 - Contractor emissions
 - Waste disposal
 - Supply Chain, etc

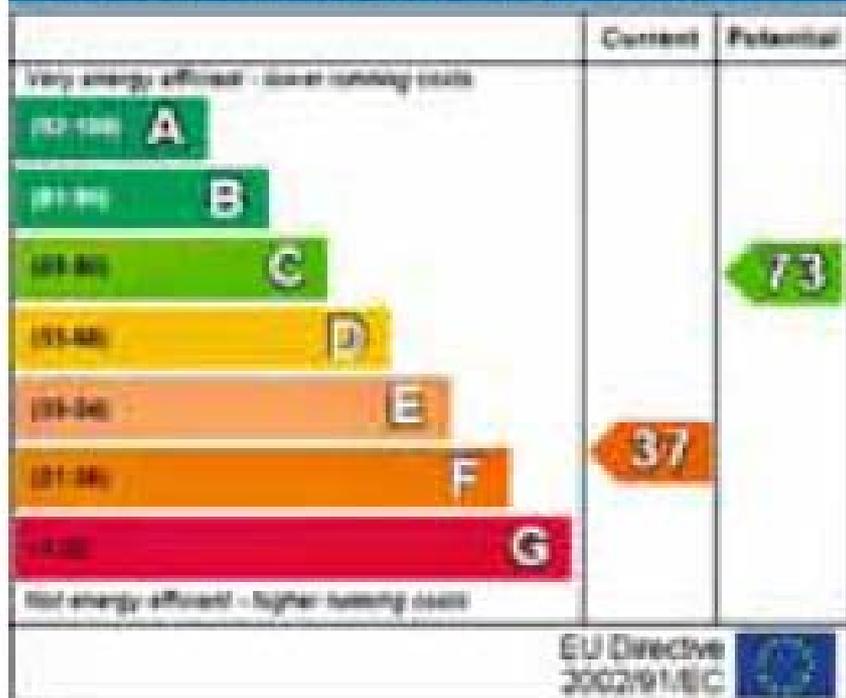
Occupant Data Needs

- What am I Using?
- What is My Influence?
- How Does My Performance Compare?

Measurement

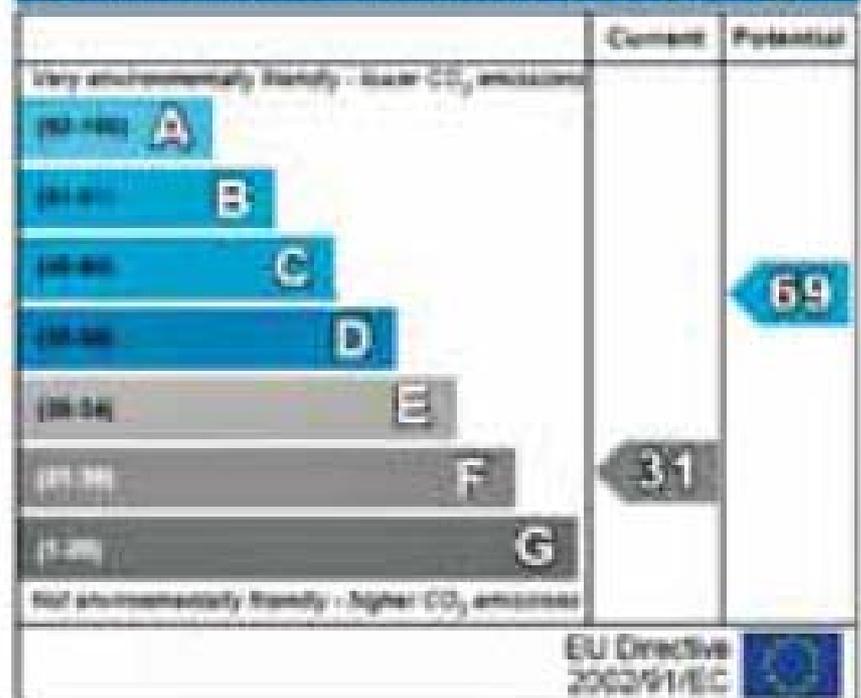
- Energy Intensity
- Fuel Source
- LEED
- Building
- Organization
- GHG Emissions
- Fuel Result
- LEEP
- Portfolio
- Enterprise....Country

Environmental Efficiency Rating

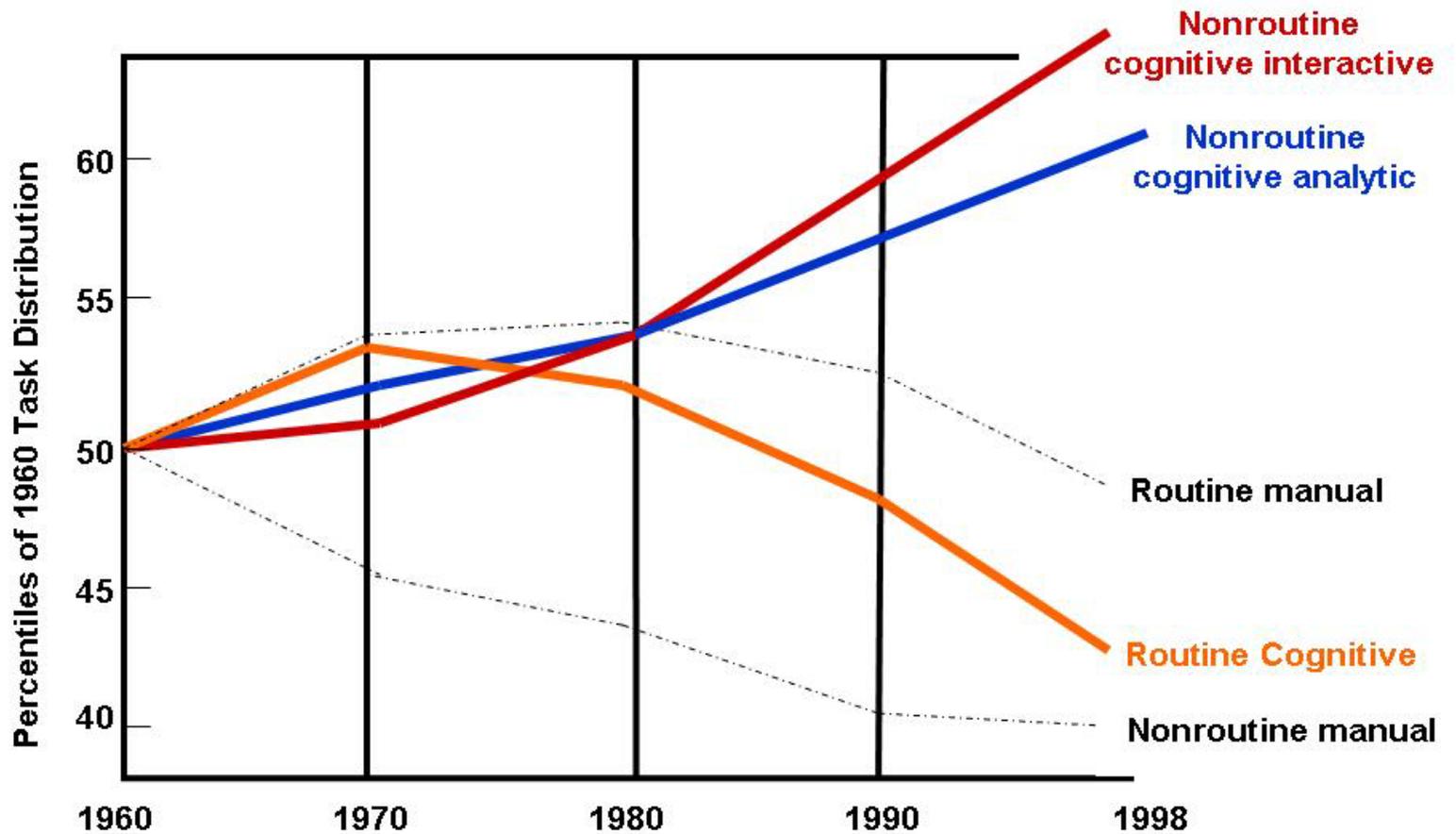


The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills will be.

Environmental Impact (CO₂) Rating

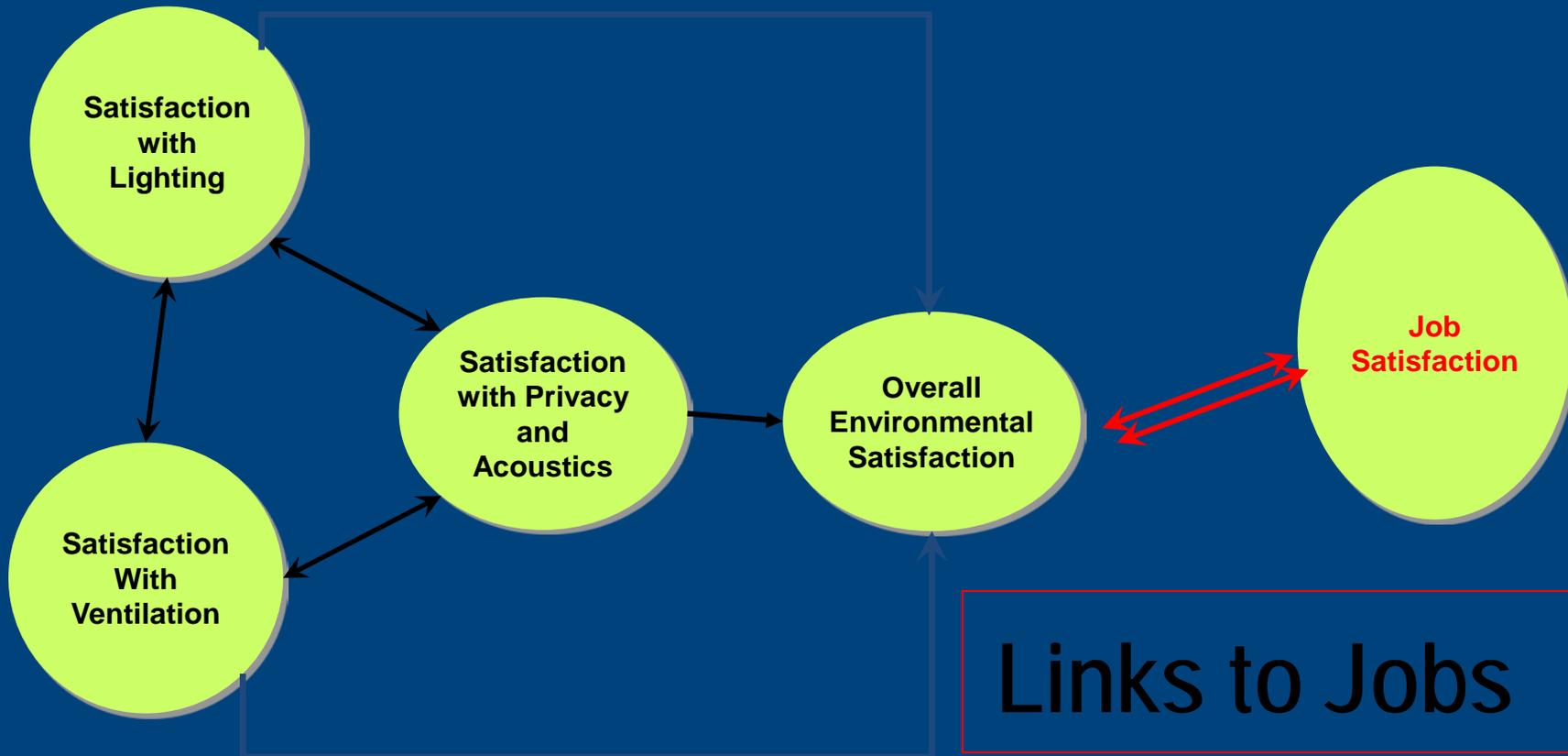


The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.



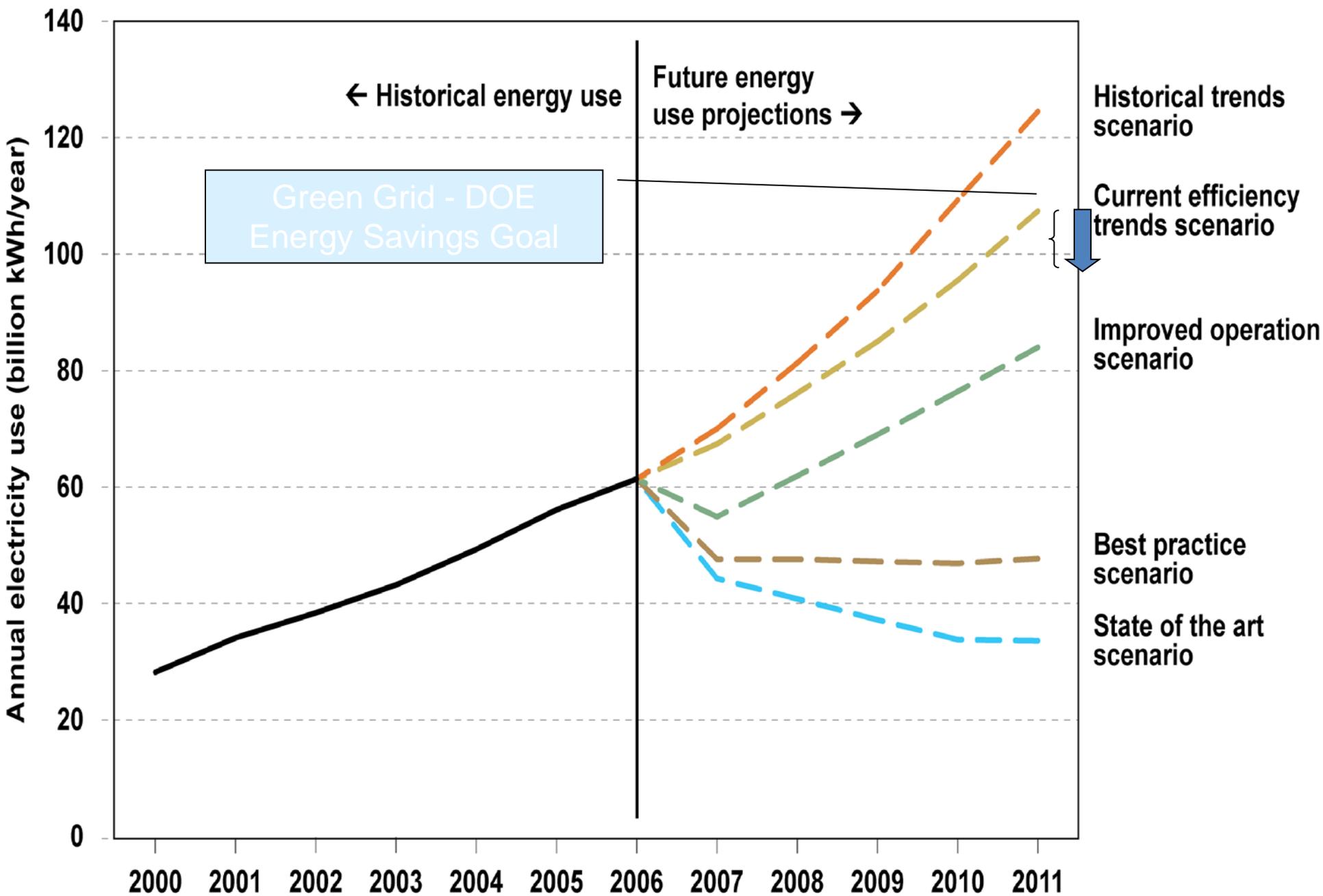
Environmental Satisfaction

Links to Job Satisfaction

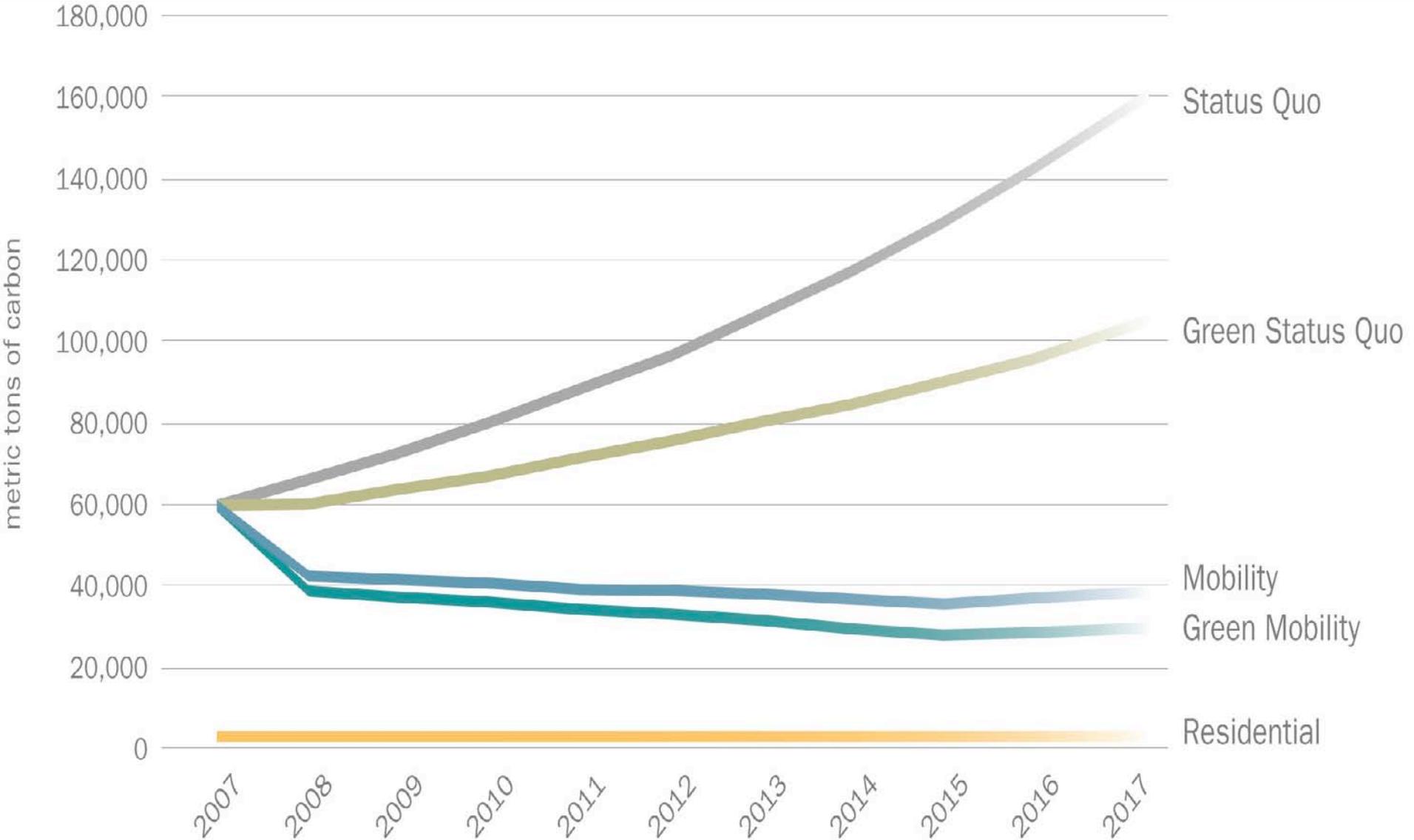


Work Is What You Do, Not Where You Are: Mobile Work





Holistic Thinking—It's Not About the Building



American Recovery & Reinvestment Act

- \$5.5 Billion
- \$4.5 Billion for Existing Buildings
- 261 Projects; 50 States, 2 Territories & DC
- Jobs
- High-Performance Green Buildings

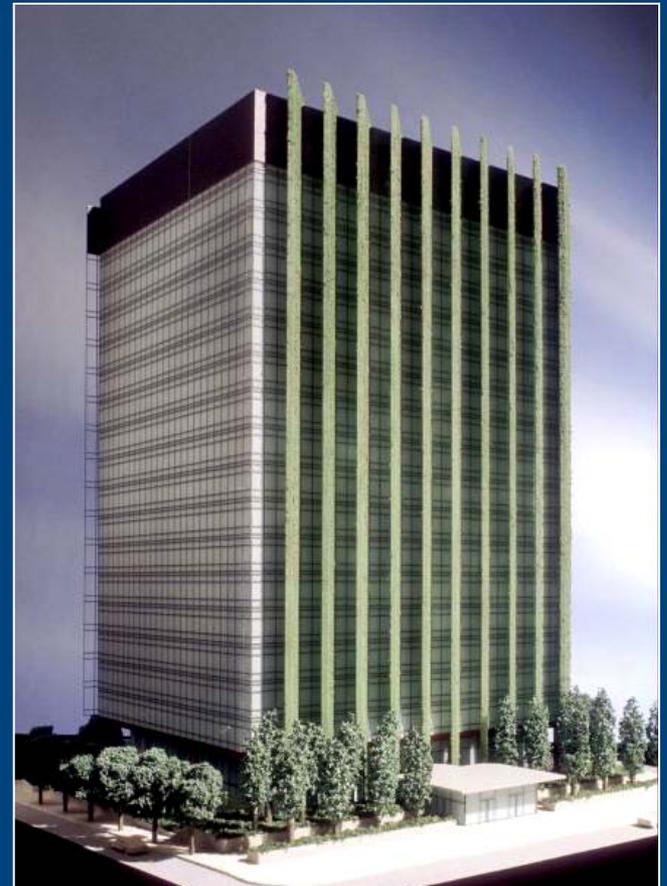
EXAMPLE: ARRA PROJECT

Broad Range of Opportunities and Challenges

- 1975 Federal Building
- Never Upgraded

Plan:

- Updating Cutting Edge 'Green' Design
- \$133 M from Recovery Act
- Full Building Modernization
- High Aims for Sustainability and Curb Appeal
- Construction procurement underway



EXAMPLES: “SHOVEL READY” PROJECTS

Broad Range of Opportunities and Challenges

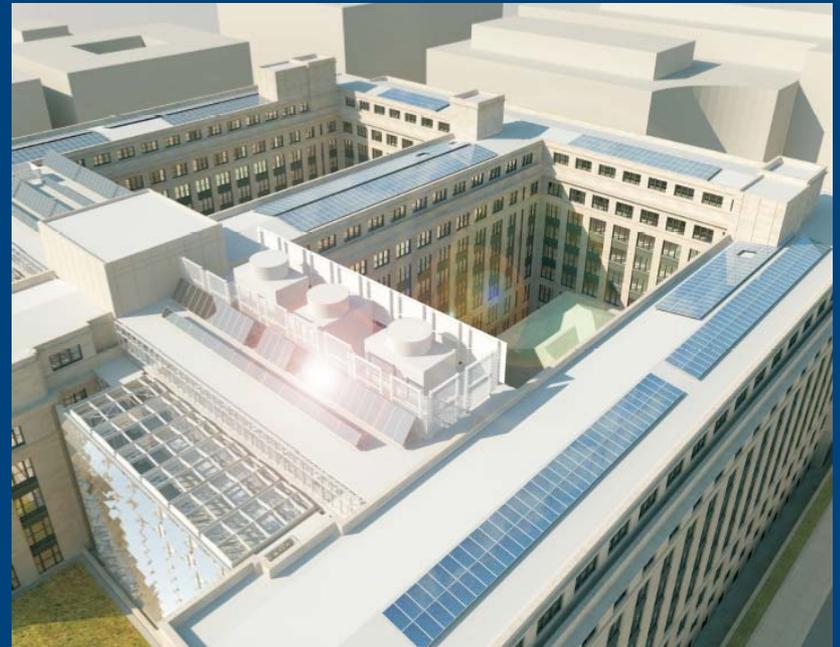
- Historic 1917 Building
- Last Upgraded in 1935

Plan:

- Modernization with Infill
- \$161 M from Recovery Act, as Phase I
- Must Redesign for Energy Goals
- Future Funding Needed for Phase II



Renderings



Swing Space







Columbus, NM, Land Port of Entry



After 1-1/2 Years...

Total Obligations (Contract Awards)
as of 9/21/10:

\$5 BILLION

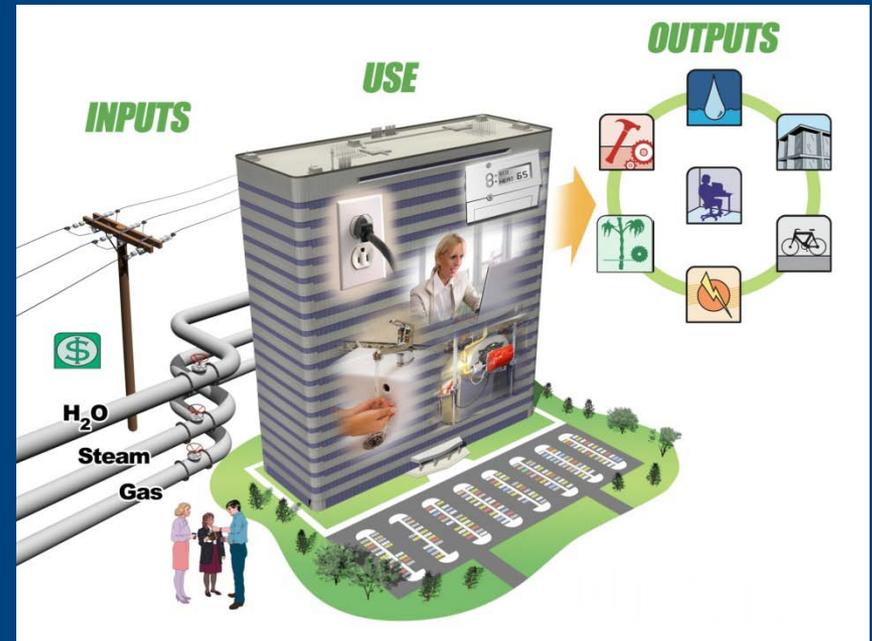
Recovery Act Performance Results

- Standard Specifications & Scopes
- Performance Results
- Metering & Sub-Metering by Sub-System
- Change to Tenant Sub-Metering?
- Commitments Are Visible (*Transparency*)
- Performance Will Be Tracked & Published
- "Proving Ground"

ALL Available on the Whole Building Design Guide

POE: Industry Standard Metrics Collected, Normalized, and Analyzed

- Water
- Energy
- Maintenance & Operations
- Waste Generation & Recycling
- Occupant Satisfaction
- Occupant Commute



Results: Green Buildings Perform Better & Cost Less

	Phase 2	Phase 1
 Domestic water use	- 11%	
 Energy use	- 25%	- 26%
 Operating costs	- 22%	- 13%
 General building satisfaction	+ 21%	+ 27%
 CO ₂ equivalent emissions	- 34%	- 33%

Education & Awareness

- Engaging Tenants In Sustainable Office Practices:
 - Space Utilization Requirements
 - Improvements in WorkPlace Effectiveness
 - Use Of Power Management Features In Electronic Equipment
 - Participation In Recycling Programs
 - Sub-Metering of Tenant Uses
 - Shared Incentives
 - Increased Measurement (e.g., Waste)
- Initiatives To Provide Tenants With Data And Recommendations To Increase Environmental Efficiency

SFTool.org

- Small Projects
- Typically No Designer/Architect
- Extensive References
- Options; What to Consider
- Easy to Use
- Free
- Give Us Feedback

GSA Sustainable Facilities Tool

Building sustainable practices one decision at a time



➤ A one-stop portal to empower any government or private sector user to identify and prioritize cost-effective green building strategies that will lead to improved environmental performance in small building projects.

➤ Targeted User Community:

- Facility Managers
- Realty Specialists
- Project Managers from Governmental Agencies
- Private Sector Developers

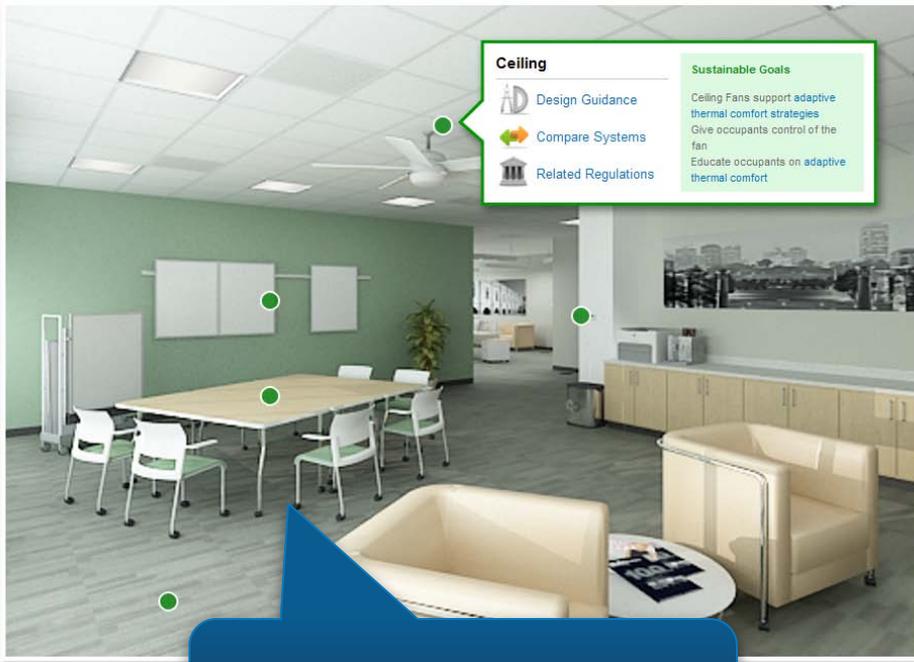
GSA Sustainable Facilities Tool

Open Teaming Space

Teaming spaces are designed to foster collaboration and innovation with tools for information sharing, easy to reconfigure work surfaces where groups can spread out the work, and vertical surfaces for making work visible. Seating is agile and passively ergonomic; to move around the space easily and comfortably. Configure space with privacy screens to surround team members and allow them to brainstorm freely, without disrupting others. Energy savings are maximized through the use of occupant sensors for powering down lamps and temperature when movement is not detected and automatic lighting controls for light dimming based on time of day and available daylight.

Click on a hotspot to learn sustainable strategies and compare materials for that system

Change View



3-D Interactive Walkthrough of Office Interiors

➤ Key Features:

- Valuable resources for **sustainable building principles and concepts**
- **3-D interactive walkthrough** of office interiors & **material comparisons**
- **Sustainable metrics**, essential **regulations & guidelines**, and case studies
- **Take-away checklist** for tracking sustainable design
- **Intuitive and easy-to-navigate** user interface

GSA Sustainable Facilities Tool

Open Teaming Space

Teaming spaces are designed to foster collaboration and innovation with tools for information sharing, easy to reconfigure work surfaces where groups can spread out the work, and vertical surfaces for making work visible. Seating is agile and passively ergonomic, to move around the space easily and comfortably. Configure space with privacy screens to surround team members and allow them to brainstorm freely, without disrupting others. Energy savings are maximized through the use of occupant sensors for powering

Key Benefits:

- Empowers decision-making for **sustainable goals & objectives** to meet the Guiding Principles
- Promotes the use of **energy efficient, sustainable design** and **environmentally preferable materials** in renovations, alterations & leases
- Enhances skill sets to assess **green leases & architect/design team deliverables**
- **Supports green practices** throughout the life of a facility

	Wood Flooring	Cork	Bamboo
Description	There are many different species of wood and types of wood flooring including reclaimed , suppressed , and wood from responsibly managed forests .	Cork flooring is made from the by-product of cork oak trees. The bark can be stripped without introducing damage to the tree.	Bamboo is a grass that has a short growth cycle and continues to grow after it is cut without replanting or cultivating. Durability is dependent upon the maturity of the bamboo. Bamboo provides for extremely durable commercial grade floors when fully mature, usually 8-10 years.
IEQ	Wood Flooring	Cork	Bamboo
Pollutants	✔ Does not retain pollutants, easy to clean	✔ Does not retain pollutants, easy to clean	✔ Does not retain pollutants, easy to clean
VOC - Binders, Adhesives, Finishes	ⓘ VOC emitting products are used during finishing of material or system. Ensure that low-VOC finishes are used. Use nails or staples to install.	ⓘ VOC emitting products are used during production , installation and finishing of material or system. Ensure that low-VOC adhesives, binders and finishes are used.	ⓘ VOC emitting products are used during production and finishing of material or system. Ensure that low-VOC binders and finishes are used. Use nails or staples to install.
Ergonomics	⊖ Wood flooring is hard and therefore does not provide ergonomic benefits.	✔ Consider installing in areas of the building where occupants primarily stand, such as a mail room, security, or possibly break room to help alleviate foot pain as cork can naturally compress and absorb pressure.	⊖ Bamboo is a hard material that does not provide ergonomic benefits
Acoustical	⊖ May contribute to noise pollution	✔ Provides acoustical benefits due to over 100,000 cells per cubic inch which absorb and so	⊖ May contribute to noise pollution
Air Quality, Maintenance	ⓘ Typically requires waxing and buffing, and may require sanding and refinishing. Look for low VOC products.	ⓘ Re	

Comparison feature provides benefits and considerations for each option selected



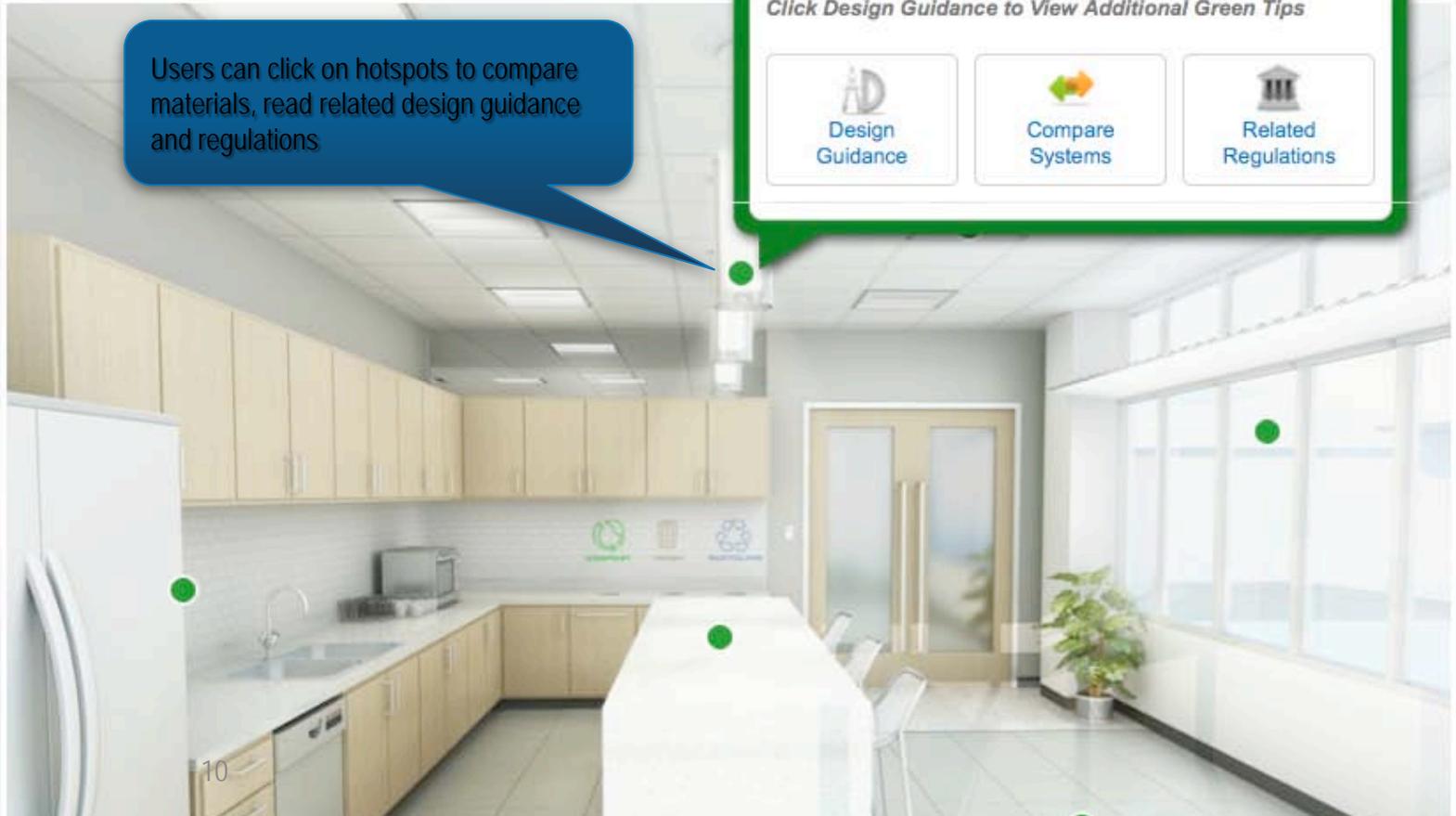
Break/Pantry

Break rooms provide space for beverage containers and utility and refrigerators. Include acoustic panels to prevent sound from penetrating adjacent rooms by soundproofing doors and windows to conserve water. Make sure to use sustainable materials.

[Strategies](#)

Click on a hotspot to learn sustainable strategies and compare materials for that system

Users can click on hotspots to compare materials, read related design guidance and regulations



Each space type provides an overview with common strategies to make the space more sustainable

Lighting

- ✔ Use **controls** that turn off electric lighting in response to natural light levels to reduce energy consumption.
- ✔ Use sustainable lighting practices such as **occupant sensors** to decrease utility costs.
- ✔ Limit the use of accent lighting to specific artwork or educational items to reduce energy consumption.

Click Design Guidance to View Additional Green Tips



Lighting

Design Guidance

Compare Options

Relevant Regulations

Design Guidance

Overall Strategies

Lighting within the office space is a major contributor to energy consumption. Incorporating sustainable lighting practices, such as lighting controls and [daylighting](#), may reduce energy consumption and increase occupant satisfaction. Improper lighting systems are inefficient and give off extensive heat, leading to discomfort and more energy [waste](#) through the [air conditioning](#) system. [Daylighting](#) is usually preferred to artificial light and contributes to the well being of the individuals in the office space.

Provides complete control over the level of content drill down and information displayed

Task Lighting

Decorative / Accent Lighting

Lamp Types

- ✔ Incorporate sustainable lighting practices such as [daylighting](#) and [occupant sensors](#) to decrease utility costs.
- ✔ Limit the use of accent lighting to specific artwork or educational items to reduce energy consumption.
- ✔ Incorporate [daylighting](#) or views to the outside to create an inviting, aesthetically pleasing environment as natural light is usually preferred to artificial lighting.
- ✔ Use efficient LED task lighting to reduce energy consumption while providing occupants control of the light levels.
- ✔ Use [direct-indirect lighting](#) to contribute to an efficient lighting system.
- ✔ Use efficient fluorescent lamps as they do not give off as much heat and have a long useful life.

Lighting

[Design Guidance](#)
[Comparison](#)

Comparison feature provides benefits and considerations for each option selected

Compare Lighting Options

i The intent of the 'Evaluate Section' is to assist users in understanding the sustainable attributes of various materials and systems. Please note that this tool does not promote any particular material or system, since each may have benefits and considerations as they relate to greening a project.

+ Benefit
 - Consideration
 i Information

	Occupant Sensor	Manual Light Switch	Timer
Description	Occupant controls use sensors to determine when there are people in a given space. The lights turn on when motion or heat is detected in the space and they turn off based on a set amount of time in the absence of heat or motion.	Manual light switches are typically wall mounted switches that control lighting within a room.	Timer controls can be set to turn lights on and off at certain times, therefore specifying the duration of time the lights will be turned on.
IEQ	Occupant Sensor	Manual Light Switch	Timer
Daylighting, Lighting, Views	- Occupant sensors turn the lights on when motion or heat is detected regardless of the daylight that may be present in the space.	i A manual light switch can be used to turn the lights off when daylight is present in the space.	- Timers turn the lights on based on a set time schedule regardless of the daylight that may be present in the space.
Materials	Occupant Sensor	Manual Light Switch	Timer
Effectiveness	i Occupants need to understand the function of the controls in order for them to be effective. Otherwise, users may override controls and leave the lights on, thus negating the benefits.	i Educate occupants in order to encourage them to turn the lights off when not in use.	i It is important that timers be matched to the specific task of the space to avoid leaving occupants in the dark.
Energy	Occupant Sensor	Manual Light Switch	Timer
Other	+ May reduce the amount of electricity consumed as controls respond to the	- Manual light switches do not respond to the ambient light	+ May reduce the amount of electricity consumed as lights



Lighting

Relevant Regulations

Relevant Regulations

Shows relevant regulations with link to source document.

Guiding Principles

More Info in Next Section

Environmentally Preferable Product (Guiding Principles, Executive Order 13514 & 13423 [EB, NC])

Section: V. Reduce Environmental Impact of Materials



Use products that have a lesser or reduced effect on [human health](#) and the environment over their lifecycle when compared with competing products or services that serve the same purpose. A number of standards and ecolabels are available in the marketplace to assist specifiers in making environmentally preferable decisions. For recommendations, consult the Federal Green Construction Guide for Specifiers.

[Federal Green Construction Guide for Specifiers - Whole Building Design Guide](#)

[Federal Green Construction Guide for Specifiers](#)

[Environmentally Preferable Purchasing \(EPP\)](#)

Daylighting and Lighting Controls (Guiding Principles, Executive Order 13514 & 13423 [EB])

Section: IV. Enhance Environmental Quality



Automated lighting controls (occupancy/vacancy sensors with manual-off capability) are provided for appropriate spaces including restrooms, conference and meeting rooms, employee lunch and break rooms, training classrooms, and offices. Two options can be used to meet additional [daylighting](#) and lighting controls performance expectations: ? Option 1: Achieve a minimum daylight factor of 2 percent (excluding all direct sunlight penetration) in 50 percent of all space occupied for critical visual tasks, or? Option 2: Provide [occupant controlled](#) lighting, allowing adjustments to suit individual task needs, for 50% of regularly occupied spaces.

Energy Efficiency (Guiding Principles, Executive Order 13514 & 13423 [NC])

Section: II. Optimize Energy Performance



Establish a whole building performance target that takes into account the intended use, occupancy, operations, plug loads, other energy demands, and design to earn the [ENERGY STAR](#) - targets for new construction and major renovation where applicable. For new construction, reduce the energy use by 30 percent compared to the baseline building performance rating per the American National Standards Institute (ANSI)/American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., ([ASHRAE](#))/Illuminating Engineering Society of North America (IESNA) Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential. For major renovations, reduce the energy use by 20 percent below pre-renovations 2003 baseline. Laboratory spaces may use the Labs21 Laboratory Modeling Guidelines. Use [ENERGY STAR](#) and FEMP-designated Energy Efficient Products, where available.



Search



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Implement

My Projects

Store and manage green project information including material checklists

[Add a New Project](#)

Click "Add Materials" to activate the project and add materials to the evaluate section.

Name	Description	Type	Size	Actions
Office Bldg A - Bathroom Renovation	Old bathroom needs new flooring and upgrades. Existing toilets are operating at 3.5 gallons per flush, need to replace 5 toilets and install water conserving faucet aerators.	Bathroom	400	Edit Details Add Materials Delete Project
Office Bldg B - Conference Room Upgrade	Office Bldg B project includes retrofitting 6 large conference rooms and 2 support work areas with efficient lights, occupancy sensors, Energy Star office equipment and other technologies to lower energy use.	Conference Room	4000	Edit Details Add Materials Delete Project
Kitchen Installation	Need to replace aging and worn cabinets in office kitchen with green materials and environmentally preferable countertops	Kitchen		Edit Details Add Materials Delete Project
Office Furniture Replacement		Small Office		Edit Details Add Materials Delete Project



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[MY PROJECT\(6\)](#)

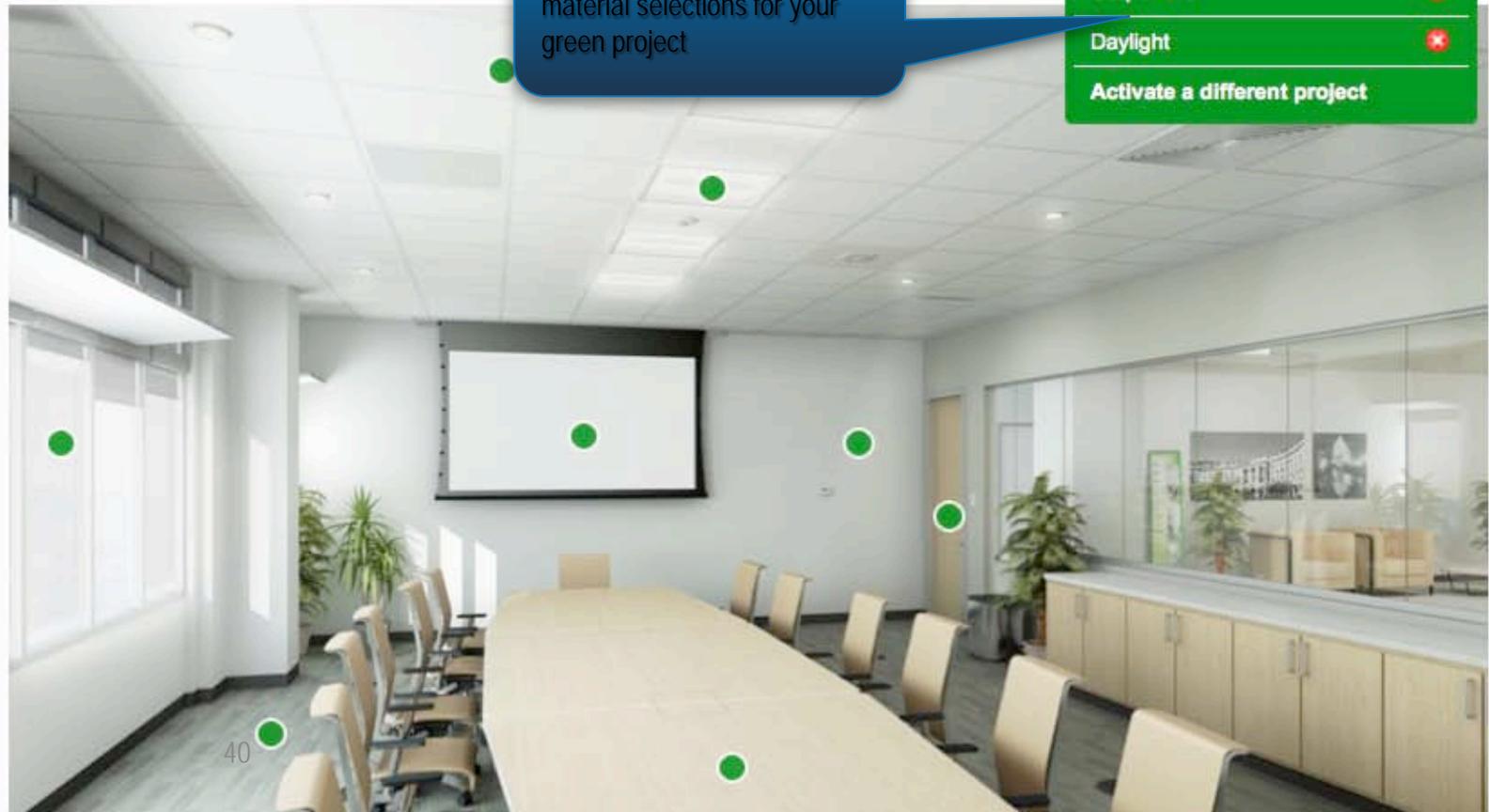
Enclosed Conference

Enclosed conference rooms should be designed to facilitate video conference technologies to reduce travel related GHG. Individual temperature & lighting controls to save energy and different sizes. Include movable partitions to separate larger rooms if needed. Optimize daylighting strategies by utilizing Strategies

Click on a hotspot to learn sustainable strategies and compare materials

Easily add and remove material selections for your green project

- View Office Bldg B - Conference Room Upgrade Details**
- Direct
- Occupant Sensor
- Shades
- Composite Wood Furniture
- Carpet Tile
- Daylight
- Activate a different project**



Flooring

Design Guidance

Compare Options

Relevant Regulations

Compare Flooring Options

Carpet

Broadloom Carpet +

Carpet Tile -

Dynamically add project materials and systems to your green project

Compare Selected

Hard Surface

Terrazzo +

Ceramic Tile +

Linoleum +

Vinyl Flooring +

Wood Flooring +

Concrete Flooring +

Rubber Flooring +

Fluid Applied +

Cork +

Bamboo +

Cut Natural Stone +

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Share

[Home](#)[Stories](#)[Questions](#)

User Stories



Centralized Filing



Connected Workplace

Have a story to share?

Have you successfully integrated sustainable design into your space? Did something not go the way you planned? Upload your pictures and a brief write-up to share your success/struggles with your green renovation. Get comments from the community and helpful suggestions to your issues.

Share green success stories and lessons learned!

[See All Stories](#)

Questions

[Ask a Question](#)

Post sustainable design questions and discussion topics

68

Viewed

Is Bamboo a Sustainable Building Material?

9 Nov by bgardner

64

Viewed

What are VOCs?

VOC

42

12 Nov by mcorrigan



Share

Home Stories Questions

Question

69 Viewed

Is Bamboo a Sustainable Building Material?

I'm thinking of choosing bamboo flooring for our break room, but answers as to how sustainable it is.

Answer

Bamboo flooring is a durable product made from a sustainable design to harvesting of wood products. It has a low carbon footprint, contains little to no recycled material, can negatively impact transit energy, and have a negative affect on indoor air quality.

Questions are tagged and linked to related site content

[Back to Questions](#)

Bamboo

Description

Bamboo is a grass that has a short growth cycle and continues to grow after it is cut without replanting or cultivating. Durability is dependent upon the maturity of the bamboo. Bamboo provides for extremely durable commercial grade floors when fully mature, usually 8-10 years.

Tips

O+M Tips

- Use cleaning chemicals and solutions that are [Green Seal](#) certified.

End of Life Tips

- Not easily recycled as the bamboo strips may be bound together with [adhesives](#) during production and [finished](#) during the installation process.
- Visit Earth 911 <http://earth911.com/> to determine the most responsible way to dispose of the material.

For alignment with LEED Standards

- Regional Materials: At a minimum, use 20% of the combined value of construction and Division 12 (Furniture) materials and products that are manufactured regionally within a radius of 500 miles. Additionally, use a minimum of 10% of the combined value of construction and Division 12 (Furniture) materials and products extracted, harvested or recovered, as well as manufactured, within 500 miles of the project.
- Construction Waste: Recycle and/or salvage a minimum of 50% of nonhazardous construction and demolition debris.
- Rapidly Renewable Resources: At a minimum, use [rapidly renewable](#) construction and Division 12 (Furniture and Furnishings) materials and products for 5% of the total value of all materials and products used in the projected based on cost
- FloorScore certified
- Adhesives & Finishes: Must meet the [volatile organic compound](#) (VOC) requirements of South Coast Air Quality Management District (SCAQMD) Rule 1113 & Rule 1168.



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Plan

Start Plan

Introduction to Integrated Design includes sharing Keys to Success

Start Plan

[Edit](#)

[Planning to Build Green](#)

Sustainable design, construction, operation, and renovation are best thought of as an integrated process, rather than a *collection of things*. The process involves new ways of designing, constructing and operating our buildings and facilities. A few keys to success include:

Keys to Success

[Plan Section Guidance](#)

- ✔ **Think about sustainability goals and "greening" strategies as early as possible.** Early planning allows you to identify synergies among potential strategies to increase their effectiveness and reduce costs, and makes it easier to budget for the green elements.
- ✔ **Use a systems thinking approach.** Instead of thinking about each strategy in isolation, systems thinking asks you to think about how the strategies interact, how they work together (or against one another) in the whole project, and whether there are unintended consequences. You look first at the project overall, then work toward specific strategies, such as selecting a floor covering or appliance, rather than starting with the details.
- ✔ **Use an integrative design approach.** An integrative approach usually involves a team of relevant professionals and stakeholders - for a small project, this might include the facility manager, engineer, systems furniture vendor, a space planner, an interior designer, representatives of users of the space and owner's representative. When this team works together early in the process to address space requirements, it works! For example: the paint color selected for walls should enhance the [daylighting](#) strategies, the modular furniture can allow light to penetrate the space, and the enclosures for private offices (located near the core of the building) should include enough glass to permit daylight to reach the occupant.
- ✔ **Use green building strategies that are appropriate for the project type, existing conditions and intended use of the space.** The "best" strategies for any project will vary based on the project type, goals, existing conditions, opportunities and constraints. This Plan section helps you identify these strategies for your projects.

The [Learn Section](#) contains more information on these concepts.



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Plan

Start Planning **Sustainable Project Strategies**

Sustainable Project Strategies

Best Practices Applicable to All Project Types

Materials, Furniture, and Furnishings Replacement

Space Reconfiguration and Renovation Projects

Under 10,000 SF Interiors Gut Rehab Project

Building Systems Upgrades

Sustainable Building Operations and Maintenance Services

Best Practices Applicable to All Project Types

[Edit](#)

Sustainable design, construction, operation, and renovation are best thought of as an integrated process, rather than a *collection of things*. The process involves new ways of designing, constructing and operating our buildings and facilities. A few keys to success include:

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Users can click on one of five different types of projects for relevant best practices, resources, and sustainable strategies.

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The [Learn Section](#) contains more information on these concepts.

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Learn

[Home](#)[Sustainability Topics](#)[Regulations and Guidelines](#)[Did You Know](#)[Case Studies](#)

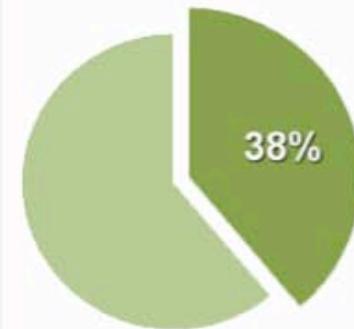
What is Sustainability

Sustainability is best thought of as a process, rather than a thing. US Executive Order 13423 states that sustainability "means to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations." In order to achieve such conditions, new ways of designing, constructing and operating buildings and facilities must be identified.

[Continue reading "What is Sustainability"](#)

Presents sustainability metrics to inform decision-making & promote learning

Did You Know?



Buildings are one of the heaviest consumers of natural resources and account for a significant portion of the greenhouse gas emissions that affect climate change. In the U.S., buildings account for 38% of all CO2 emissions.

Source: Energy Information Administration (2008). Assumptions to the Annual Energy Outlook.

Word cloud diagrams group sustainable terms

Learn About Sustainability Topics

Materials & Resources

Energy & Atmosphere

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Sustainable Sites





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Topics, regulations, case studies, metrics, are readily available in navigation and sidebar

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Sustainability Topics

Materials & Resources

In the construction and day-to-day operations of buildings, many materials and resources are used and a great deal of waste is generated. The materials selected for use in a facility and the way they are disposed of impact the environment.

[Continue reading Materials & Resources](#)

Content is presented at both high and detailed levels for those who want to learn more.

Indoor Environmental Quality (IEQ)

Indoor Environmental Quality (IEQ) is most simply defined as the quality of the indoor environment. It does not refer to the air quality alone, but the entire environmental quality of a space, which includes air quality, access to daylight and views, pleasant acoustic conditions, and occupant control over lighting and thermal comfort.

[Continue reading Indoor Environmental Quality \(IEQ\)](#)

Sustainable Sites

Choosing a building's site and managing that site during construction are important considerations for a project's sustainability. Environmentally responsible site selection discourages development of previously undeveloped land; minimizes a building's impact on ecosystems and waterways; encourages regionally appropriate landscaping; rewards green building practices; and reduces stormwater runoff.

Additionally, appropriate site management reduces air quality impacts, including land effect and construction-related pollution. Building owners and developers should choose the environmentally preferred option for their project's site.

[Continue reading Sustainable Sites](#)

The benefits of sustainable practices are clearly articulated

Energy & Atmosphere

Buildings and facilities rely on the operation of mechanical systems and electrical systems to maintain a comfortable indoor environmental quality for occupants. Building operations consume approximately 30%

Did You Know?

People in the U.S. spend about 90% of their time indoors.

Source: Environmental Protection Agency (1987). The Total Exposure Assessment Methodology (TEAM) Study.

Case Study

Health



Good health has both physical and psychological components. Being healthy means the absence of disease and illness, as well as feeling positive about life and work. The workplace can play a role in the health of workers by eliminating risks and creating conditions that support cognitive, emotional, and social well being.



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Case studies and Metrics in sidebar can be aligned to main content

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Regulations and Guidelines

Laws

Federal Acquisition Regulation (FAR)

The Federal Acquisition Regulation govern how all government contracts are made. Specifically, Subchapter D Part 23 dictates how the sustainability requirements are made. [FAR - Part 23](#)

Important Regulations and Guidelines are described and a link to the source document is provided

ENERGY POLICY ACT OF 2005

The purpose of the ENERGY POLICY ACT OF 2005 is "To ensure jobs for our future with secure, affordable, and reliable energy." [View Act](#)

ENERGY INDEPENDENCE AND SECURITY ACT

The stated purpose of the act is "to move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas capture and storage options, and to improve the energy performance of the Federal Government, and for other purposes."

Executive Orders

HIGH PERFORMANCE and SUSTAINABLE BUILDINGS GUIDANCE

The Interagency Sustainability Working Group (ISWG), as a subcommittee of the Steering Committee established by Executive Order (E.O.) 13423, initiated development of the following guidance to assist agencies in meeting the high performance and sustainable buildings goals of E.O. 13423, section 2(f).1 [View Guidance](#)

Did You Know?

The U.S. generated approximately 254 million tons of municipal solid waste (MSW) in 2007. Excluding composting, the amount of MSW recycled increased to 63.3 million tons, an increase of 1.9 million tons from 2006. This is a 3 percent increase in the tons recycled.

Source: US EPA, Municipal Solid Waste in the United States. 2007 Fact and Figures.

Case Study

Spatial Equity



Organizations today are less hierarchical and work is more team based, more mobile, and

Sustainable Facilities **Mobile**

GSA is leveraging digital delivery channels to promote sustainability



- Provides decision-making resources optimized for your hand-held device
- Increases public accessibility to SF Tool resources
- Free to all users

What's Next?

- Change in Procurement Practice
- Change in Budget Practice
- Change in Measurement
- Criteria for Selecting Vendors
- Performance Contracting by Team Negotiation
- Change in Fee Structures
- Integration with Buildings Operations, Not Just at the Hand-Off, but for Years

Overview of FBPTA

GSA Administrator in consultation with...

Industry and Fed Gov

- a) ID core competencies...
- b) ID methods to demonstrate each core comp...**
- c) We have until June 2013...
- d) Develop or ID continuing Ed courses...**
- e) GSA & DOE develop recommended curriculum...
- f) Applies to FM contractors...**

Overview of FBPTA

Personnel addressed in the Act...

1. Building operations and maintenance
2. Energy management
3. Safety
4. Design functions

Core competencies to include the above plus...

Sustainability, water efficiency, electrical safety and building performance measures.

Overview of FBPTA

Timeframe under the Act...

June 2012 (annually)

- **ID core comp**
- **ID methods to demo core comp**
- **Continuing Ed**
- **Curriculum**

June 2013

- **Feds trained**
- **Contracts modified and contractors trained**

Mission

To create a high-performance workforce with the core competencies required to employ industry best practices and standards to – build, operate and maintain our Federal facilities in the most cost, and resource, effective manner possible.

National Program

PHASE I: INITIATE – Develop Program Strategy

- ID Program Goals & Desired Outcomes
- ID lines of Authority, Approvals and Escalations
- Establish Program Management Organization & Responsibilities
- Develop Communications Plan
- ID Performance Measures

PHASE II: PLAN – Develop an Approach

- Develop & Oversee Program Plan, Resources and Budget
- ID Risk/Management Issues
- Information Technology Resources
- ID Acquisition Strategy
- Standardize Business Processes
- Policy and Guidance
- ID Training Requirements & Plan

National Program

PHASE III: EXECUTE – Implement Plan

- Change Management
- Research and Priority Setting

PHASE IV: MONITOR – Evaluate, Measure and Take Corrective Action

- Implement Quality Assurance and Internal Controls
- Conduct Program Review

Current Milestones

1. Gather Industry and Fed Gov Contacts (Jan 11)
2. FedCenter Working Group Site (Feb 11)
3. Fed Agencies Meeting (March 11)
4. RFP for DOE/GSA Project - NREL (April 11)
5. JTA and Core Comp Dev – NREL (May/June 11)
6. Industry Symposium (May 11)
7. Request For Information [RFI] – (May 11)
8. “Mapping Session” – NREL – (June 11)

Planned Milestones

1. Finish and Consolidate Research [core comp]

- NREL Project resulting core competencies
- Camp Pendleton Study – Facilities Maintenance Department (FMD) – ALL GS/WG workforce
- MCAS Miramar – all contracted workforce
- Other DOD services and installations
- PBS – sub-working group core competencies
- PBS – contract language sub-working group
- NRC Study – Core Comp for Fed Asset Mngmt

Planned Milestones

1. Finish and Consolidate Research [Cont'd]

Inventory of how many job series in Fed FM

- EX) - OPM – 1176, 1170, 1640, 1101 series core comp
- How many personnel in each position and grade
- Contracting Officers, COTR

Inventory of how many personnel in each category

2. Crosswalk of contract language related to job categories performed by GS.

Planned Milestones

3. Finish inventory of existing courses, certifications, degrees, licenses, and registrations – [industry].
4. Finish inventory of existing Federal training courses.
5. Mapping Session of core competencies by job category to existing courses, certifications, degrees, licenses, and registrations – [industry and Fed].

Planned Milestones

6. Conduct a crosswalk of personnel (by job category) to required core competencies.
7. Perform GAP Analysis on personnel vs. core comp and methods to demonstrate.
8. Develop Scenario Based Plans: courses, certs, degrees, licenses, and registrations...
 - Fed Agency w/ training \$
 - Fed Agency w/o training \$
 - FM Contractor

Planned Milestones

9. Develop or identify comprehensive continuing education courses to ensure the operation of Fed buildings in accordance with industry best practices and standards.
10. Develop a recommended curriculum related to facility management and operation of high performance buildings.

Performance Metrics

Leaning toward a Balanced Score Card (BSC)

- Fed agencies have experience with this method.

Validate the IFMA Report cited in the Senate and House Committee reports regarding the FBPTA

- (16) Areas – 1\$ investment in FM training nets a \$3.95 return.

Other metrics being studied.

Opportunities

- Reduce O&M cost of Fed facilities – Fed footprint.
- Increased resiliency of facilities.
- High quality green jobs that cannot be outsourced.
- Standardize training with State and local governments.
- Increase quality of FM training.

Threats

- Lack of money for Program development.
- Shrinking budgets for training.
- Changing government priorities.
- Workforce mass retirement.
- No equally qualified replacements.
- Recruiting, and retention of high performing personnel.
- Deferred maintenance – crumbling infrastructure.
- Facilities not aligned with mission.

Achieving High-Performance Federal Facilities

- The National Academies recently released expert panel report *“Achieving High-Performance Federal Facilities: Strategies and Approaches for Transformational Change”*
 - Commissioned by GSA's Office of Federal-High Performance Green Buildings
- Calls for bold thinking and specific reforms to transform Federal facilities into high-performance green buildings

Why the Report Matters

- We can't get from the status quo to sustainability with incremental steps
 - We've taken some of the easy steps already
 - Need to identify and target *levers* to spur transformative change
- Meet ambitious goals to green Federal buildings set by Congress and the White House
- Need to Lead: The Federal government was an early adopter of green building – we need to spur the market again, to more profound change.

Challenges and Barriers

- Excess facilities that siphon off constrained resources
- The federal budget process
- Segmented processes that sub-optimize resources
- Lack of alignment between reporting requirements & performance measurement systems
- Perceived higher costs of building “green”
- Workforce skills & training
- Deploying innovative technologies for high-performance buildings on a widespread basis
- Gaps in knowledge on a range of topics & technologies

Levers for Change

Expert panel identified 7 Levers for Change:

1. Systems-Based Thinking
2. Portfolio-Based Facilities management
3. Integrated Work Processes
4. Procurement, Contracting, and Finance
5. Communication and Feedback for Behavioral Change
6. Standards and Guidelines
7. Technologies and Tools

Strategic Goal

Create a clean energy economy that will
increase our Nation's prosperity,
promote energy security,
protect the interests of taxpayers,
and safeguard the health of our environment.

Contact & Sources

- Kevin Kampschroer, Director
Office of Federal High-Performance Green Buildings, US GSA
kevin.kampschroer@gsa.gov
- John Simpson, FBPTA Program Director
john.simpson@gsa.gov
- Whitehouse.gov/administration/eop/ceq
- gsa.gov/recovery
- wbdg.org
- SFTool.gov or SFTool.org
- NAS Report: http://www.nap.edu/catalog.php?record_id=13140
- For doing business with the government:
 IndustryRelations@gsa.gov