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Sustainable Public Procurement
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New York State's Green Building Services

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(NYSERDA)

NYSERDA

www.nyserda.org

The New York State Energy Research and Development Authority is a public benefit corporation formed in 1975. Our mission is to use innovation and technology to solve some of New York's most difficult energy and environmental problems in ways that improve the State's economy.

Green Buildings use products, materials, and equipment with reduced impacts on global, local, and internal environments during their design, construction, operation, demolition, and reuse.

Put more simply, Green Buildings are common sense buildings.

NYSERDA's Green Building Program is designed to minimize the environmental and economic impacts of commercial, industrial, and institutional buildings in New York State.

Its long-term goal is to make green design standard practice.

Services Provided:

- Materials Analysis
- Energy Modeling
- LEED Assessment/Charette
- Commissioning
- Training
- Design Guidelines
  - NYC DDC
  - BPCA (R&D-funded)
  - World Trade Center
  - Green Guide for Health Care

Funding Sources:

- System Benefits Charges
- USDOE

New Construction Program

www.nyserda.org/funding/913pon.pdf

- Pays first $5,000 of technical assistance, cost-shares balance
- Performance-based incentives for EEMs that reduce electricity usage
- Performance-based fees for designers
- Cap per customer: $500,000
- Cost-shares Cx of systems for which it provides incentives
- Increases incentive by 10 – 25% for buildings with LEED rating

Energy Results

- $29.25 billion construction
- >117 million square feet
- 124,000 tons of CO_2 reduced/year
- $23 million savings/year
- Average 18% cost savings v. NYS Energy Code (2002)
- Average peak demand reduction: 39%
- Average increase in first costs:<1%

Green Building Tax Credit

- $25 million over 9 years
- Base building: 5% of allowable costs, max. $7.50 sf; min.: 20,000 sf
- Tenant space: 5% of allowable costs, max. $3.75 sf; min.: 10,000 sf
- Whole building: 7%, max. $10.50 sf (base) + $5.25 sf (tenant)
- 100% of incremental cost of BIPV; 25% of non-BIPV; cap: $3/w x DC-rated capacity
- Fuel cells: 30% of installed cost; cap: $1,000/ kw x DC-rated capacity
- Non-ozone depleting refrigerants, R-123: 10% of equipment cost

GBTC Criteria

- Energy efficiency (building and equipment)
- Commissioning
- Construction Materials
- Water Conservation
- Refrigerants
- IAQ Standards and Management Plans
- Compliance Methodologies

Executive Order 111

New occupied buildings 20,000 sf or larger must:

- Be designed to meet LEED requirements (Certified to Platinum); LEED rating not mandatory
- Comply with GBTC requirements
  - Commissioning
  - IAQ Plan during construction
  - IAQ Measurements
  - IAQ Plan for Operations and Maintenance

The Costs and Financial Benefits of Green Buildings

Greg Kats, Capital E, Principal Author

"In the most comprehensive analysis of the financial costs and benefits of green building conducted to date, this report finds that a minimal upfront investment of about 2% of construction cost typically yields life cycle savings of over ten times the initial investment."

Costing Green:

Davis Langdon Adamson

Lisa Fay Matthiessen and Peter Morris

"From this analysis we conclude that many projects achieve sustainable design within their initial budget, or with very small supplemental funding"

"For any building, there are typically 12 LEED points that can be earned without changing the design, and up to 18 additional points achievable with little or no added cost."

Increased Property Value

- Increasing the net operating income (NOI) of a building increases its appraised value by 10 times the annual cost savings (capitalization rate of 10%)

Example

- A 75,000 sf building saving $.50/sf/yr in operating costs increases its value by $375,000

Benefits Guide: A Design Profes-sional Guide to High Performance Buildings, New Buildings Institute

Lockheed Building 157

- Redesign > 1st cost increase of $2.5 million
- 70% more efficient than energy code
- Annual energy savings from daylighting: $0.5 million, SPB of 5 years = 20% ROI
- 15% less absenteeism > SPB of 1 year
- Increased productivity > contract award; profit paid for *entire* building in 2 years

Source: Donald Aitken

Employee Retention

- Deloitte & Touche:

  Cost of recruiting and training employees

  $12,000 for nonprofessional

  $35,000 for professional

- Families and Work Institute:

  Cost of replacing non-managerial worker, 75% of annual salary; manager, 150%

Productivity

- $318/sf, average salary and benefits in US office buildings
- $50/sf, technology cost
- $16/sf, lease or mortgage
- $2.35/sf, energy
- $1/sf churn

  Environmental Building News

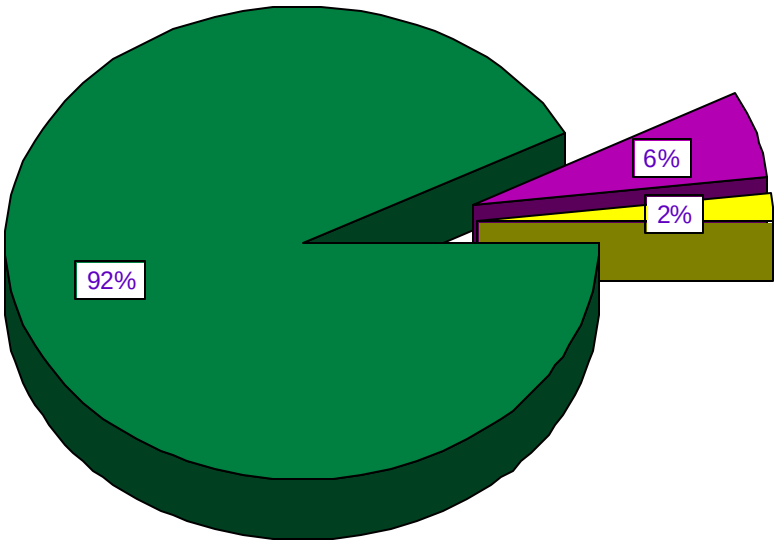
- Productivity improvements in Green Buildings:

  0.4% - 18%

  Carnegie Mellon University

True Cost of Building Ownership: Office Building over 30 Years

source: BOMA



- Design and construction
- Operation and Maintenance
- Personnel

Financial Benefits of Green Building

Category	20-year NPV/sf
Energy Savings	$5.80
Emissions Savings	$1.20
Water Savings	$0.50
O&M Savings	$8.50
Productivity and Health Benefits	$36.90 to $55.30
Subtotal	*$52.90 to $71.30*
Average Extra Cost of Building Green	(-$3.00 to -$5.00)
Total 20-year Net Benefit	*$50 to $65*

Source: Capital E

Green Building in Developing Countries

- Use common sense
- Build how and where your ancestors did
- Use natural light
- Orient the long axis of the building to the south
- Design overhangs for shading
- Use natural ventilation
- Use native materials
- Use LEED as a guideline
- Use common sense

NYS DEC HQ: LEED Silver

High performance glazing
Reduced lighting power densities
High-efficiency chillers
Variable speed fans and pumps
Building commissioning

Urban redevelopment
Certified wood
CO_2 monitoring
High recycled content materials
Low-emitting materials

Region 1 DOT HQ: LEED Silver

- 35% more efficient than ASHRAE 90.1-1999
- High performance glazing
- Daylight dimming at perimeter
- Premium efficiency motors (ECMs)
- High efficiency chillers
- Low power density lighting system (1.1 wsf)
- DCV (CO2) in conference and training rooms
- Occupancy sensors in enclosed offices

Administration for Children's Services

Argon gas filled low-e windows
Ventilation air heat recovery system
Energy-efficient lighting and daylight dimming
Demand-based ventilation
Modular chillers

Cementitious, foamed in place insulation
Cork flooring
Low VOC paints and adhesives
Mineral fiber ceiling tiles
Biocomposite wall panels

The Solaire

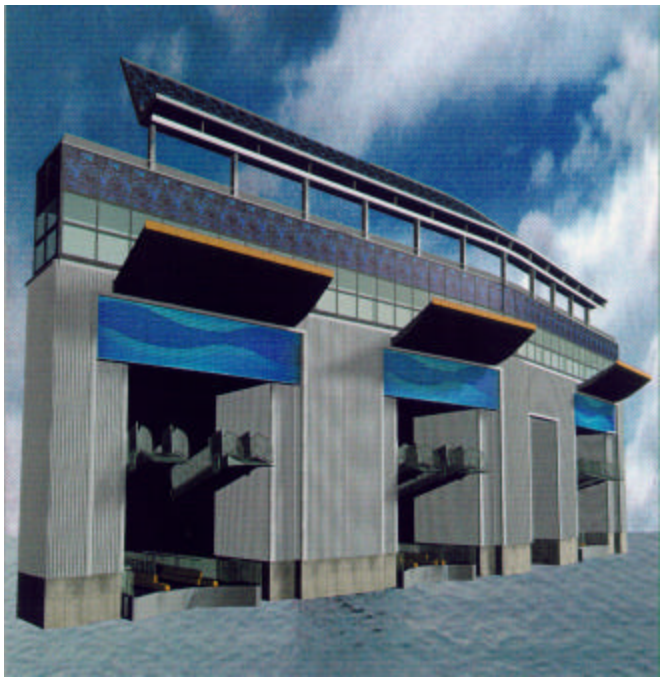
35% more efficient than Energy Code
Gas-fired absorption chiller
High-performance glazing
VSD pumps, motors, and fans
BIPV

High-efficiency air filtration
Humidification
Water recycling plant
Regional and low/no VOC materials
Recycled, recyclable, or sustainable materials

CDTA/Amtrak Station

Daylight dimming controls
Direct Digital Controls for HVAC system
Premium efficiency motors
Variable speed drives on pumps and fans
High intensity discharge lamps
Reflective glazing

Whitehall Ferry Terminal



High performance glazing
High-efficiency fluorescent and metal halide lighting
Daylight dimming
Photovoltaic panels
CO_2–controlled demand-based ventilation
Variable speed fans and pumps
Displacement ventilation
Radiant floor heating
Energy-efficient chillers
Heat recovery units on large AHUs

For More Information

- NYSERDA: www.nyserda.org;

  1-866-NYSERDA
- New Construction Program: www.nyserda.org/funding/913pon.
- pdf
- Green Building Program: http://www.nyserda.org/programs/
- Green_Buildings/default.asp
- Green Building Tax Credit: http://www.dec.state.ny.us/website/

  ppu/grnbldg/index.html

For More Information

Environmental Building News:
www.buildinggreen.com

Big Green Forum:
biggreen@forum.oikos.com

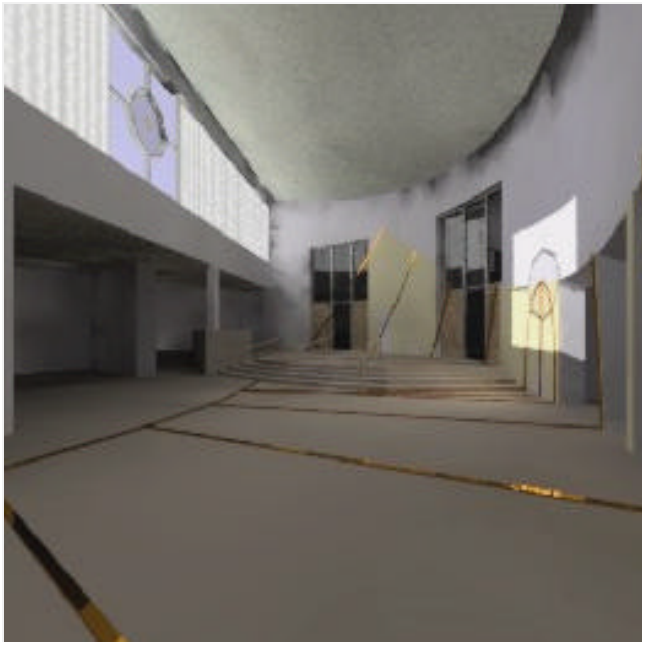
Green Guide for Health Care:
www.gghc.org

For More Information

- Renewable Portfolio Standard (RPS) 9/24/04 and 4/14/05 orders
  http://www.dps.state.ny.us/03e0188.htm
- World Trade Center Sustainable Design Guidelines:

http://www.renewnyc.com/content/pdfs/eis/04-12-2004/vol2/Appendix%20A-Sustainable%20Design%20Guidelines%20.pdf

Rosamond Gifford Zoo



Daylighting Study:
Translucent glazing
Calculated overhangs
Conventional and cylindrical skylights
Daylighting controls

ICF (Insulated Concrete Forms)
Waterless urinals
Copper roof (recycled, locally manufactured)
Salvaged equipment for kitchens and baths
Carpeting (take back/recycle lease program)

4 Times Square

Daylight dimming
Fuel cells (2 @ 200 kW each)
Building integrated photovoltaics (15 kW)
Gas-fired absorption chiller/heaters
Analysis of thermal by-passes

Construction Waste Management Plan
Sustainably harvested wood
Recycled/Recyclable materials
Tenant Guidelines for material selection
Building Commissioning

Hearst Headquarters

19-28% more efficient than ASHRAE 90.1-1999

Daylight dimming

- Reduced lighting power density (1.0 wsf)
- DDC-controlled temperature reset
- VSDs on AHUs, cooling towers, circulation pumps (condenser water and hot water)
- Wet bulb reset for cooling towers
- High efficiency chillers
- High efficiency glazing
- Enthalpy-based air side economizers