Sustainability and Your Business
Additional Resources and Information

- Empire State Building’s online sustainability resource center
- Broadway Green Alliance’s online sustainability resource center
- Con Edison’s business and residential resources
- Hotel Association of NYC’s online sustainability resource center
- New York City’s GreeNYC program
- New York City’s growth, sustainability, resiliency, and equity plan, One New York
Elizabeth Balkan
Director of Policy and Senior Advisor to the Commissioner
NYC Department of Sanitation
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NYC Solid Waste Management System

An Exercise in Logistics

NYC + Area

Waste Generators
(Households, Businesses, Etc.)

Collection
Trucks, Barges

Energy
Recovery Facility

Transfer Station

Recycling / Processing Facility

Landfills
Ohio, Pennsylvania, and South Carolina
(Up to 500 miles)

Recyclables Market

Midwest, Southeast U.S., World

Long-haul
Trucks, Barges, Rail
NYC Solid Waste: A Snapshot

14 million tons annually
OneNYC: Zero Waste

Reduce disposed waste 90% by 2030
From a 2005 baseline

**Residential**
- Extend residential organics program to all New Yorkers by 2018
- Offer single-stream recycling by 2020
- Reduce the use of plastic bags and other non-recyclable waste
- Expand outreach to low income and minority communities
- Make all schools “Zero Waste Schools”
- Expand opportunities to reuse and recycle textiles and electronic waste
- Develop a blueprint for a Save-As-You-Throw program
OneNYC: Zero Waste

Reduce disposed waste 90% by 2030
From a 2005 baseline

**Commercial**

1–2 year horizon
• Create a Zero Waste challenge program for large commercial waste generators
• Revise the commercial recycling rules to make recycling easier for businesses

3–7 year horizon
• Conduct a comprehensive study of commercial collection zones
• Require all food service establishments to source-separate food waste
Opportunities for NYC Businesses

Food Waste Challenge: A Case Study
Six months into the program, participating restaurants had diverted >1,000 tons of food waste from landfills.
And achieved 40% recycling rate (metal, glass, plastic, paper)

DESTINATION OF PARTICIPANT WASTE, BY %

Much more is possible, every business matters
John Skipper
Manager, Account Executive Program
Con Edison
skipperj@coned.com
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Green Team Objectives

Con Edison’s Energy Efficiency / Demand Management department has several programs and tools designed to help our customers:

• Use less energy
• Save money
• Help the environment
Customer Benefits

• Reduced Replacement Costs
• Identify EE Opportunities
• Reduced Operating Costs
• Infrastructure/Value Enhancements
• Carbon Footprint Reduction
• Codes/LEED/ENERGY STAR®
  o Alignment & Compliance Ratings
• Reclaim your money!
Commercial Case Study: Westin Times Square

The Westin Hotel, a 45-story building, contains 873 guest rooms and over 34,000 square feet of event space, including 32 meeting and breakout rooms and 13 theater-style presentation rooms.

Objective:
Focus on cultural sustainability and environmental responsibility

Energy Efficiency Measures Installed
Building upgrades have included:
• VFD controlled chilled water pump
• Lighting Project: 42 occupancy sensors, 2,200 LED MR16s, 2,473 LED Candelabra, and 197 LED stairwell lights
• New Telkonet thermostats and occupancy sensors in each of the hotel guest rooms
• Domestic hot water heater project (completion paperwork pending) involves the installation of five heaters and controls

Project Overview
Total Cost $1,876,600
Con Edison Incentive $473,389
Customer Cost $1,403,211
First Year Savings $704,200
Payback Period 2 Years

Estimated Annual Savings
Electric 3,863,000 kWh
Gas 7,096 Th

Estimated Annual Cost Savings: $704,200
Small Business Case Study: International Restaurant

Industry: Food Service

Location: Sunset Park, Brooklyn

Objective: Save on energy use while improving ambiance and maintaining safety

Energy Efficiency Measures Installed
- Replaced over 30 inefficient T12 lamps with upgraded T8s
- Installed upgrades in the restaurant dining room, kitchen, basement, boiler room and restrooms
- Installed dimmable LED lamps throughout

Upgrades
- Total cost: $4,057
- Con Edison Incentive: $2,879
- Customer Cost: $1,178
- First Year Savings: $3,241
- Payback Period: 4.4 months

Estimated Annual Savings
- Energy Cost Savings: $3,241
- Energy Savings: 21,607kWh

Estimated Annual Cost Savings: $3,241
Rebecca Marshall
Energy and Sustainability Manager
Jacob K. Javits Convention Center
rmarshall@javitscenter.com
The New Javits Center
Renovation of Javits Center

• Completed top-to-bottom, $463 million renovation in 2014, including new glass façade, flooring, mechanical, sustainability and telecommunications systems

• State-of-the-art renovation has transformed the 2.1 million square-foot facility into a model of sustainability, including new features such as:
  
  o More than 6,000 high-performance, fritted glass panels along façade and roof
  
  o More than 100 energy-efficient HVAC units tracked by a single monitoring station
  
  o A 6.75-acre green roof – the second largest of its kind in the United States

• Renovation project has earned the Javits Center honors from New York City Audubon and Building Owner and Managers Association of Greater New York
Javits Center Green Roof
Sustainability at Javits Center

• **New mission.** Created a mission of sustainability – To go above and beyond government mandates and become a leader and educator in the sustainability movement by creating a paradigm shift in which sustainability is the normal behavior and thinking.

• **New leaders.** Created a position of Sustainability Manager and developed mission, goals and a sustainability master plan under the NYS Executive Order 4.

• **New partners.** Joined as a member of the Green Meetings Industry Council.

• **New goals.** Created new sustainability goals such as:
  - Reduce the energy consumption by 20% by 2020
  - Reduce water usage by 20% by 2020
  - Reduce the waste stream by 10% annually
Sustainability Efforts

• **Recycling.** Implemented recycling and composting programs to reduce waste. In Fiscal Year 2014, 1,177.3 tons of waste was diverted from landfills and recycled.

• **Variable air volume boxes.** Installed digital variable air volume (VAV) boxes in the ducts of the HVAC system to maximize efficiency and adjust the amount of outside air coming inside based on ambient air temperatures, reducing need for heating or cooling.

• **Tracking Shows Sustainability.** Offers event organizers the ability to track sustainability of their own events at the Javits Center by monitoring a show's consumption of water, gas and electric, as well as rates of diversion, recycling and composting.
Sustainability Efforts

• **Energy Dashboard.** Cutting-edge energy dashboard that allows designated engineers and employees to monitor consumption levels for electric, gas and water.

• **Bird-Friendly Glass.** Fritted glass panels designed to prevent birds from sustaining injury by accentuating the structure in front of them. Since installation, the number of bird collisions has dropped 90%, creating a healthier environment.

• **Green Roof.** Composed of sedum mats grown in Syracuse, the 6.75-acre green roof contains an underground drip irrigation. The New York City Audubon and Fordham University found 524 birds from 11 species utilized the roof as a habitat in 2014.
Javits Center Energy Dashboard

Energy Usage:
- Electric: 45,034,472 kwh
- Water: 24,617,026 gal
- Gas: 22,265 Thm

Energy Cost:
- Electric: $7,110,898
- Water: $311,441
- Gas: $26,324

Carbon Footprint: 12,502 tCO2e
Event Sustainability Metrics

Javits Center monitored five full-building events in 2014 to determine their impact on our goals and benchmark for future events:

• Events used 46% of the total kWh consumption at the Javits Center.

• Waste from these events is 1,101.57 tons – 27.68% of the total.

• Diversion rate for these shows is 9.68% – less than 3% of total diversion rate.
Future Initiatives

Future plans to improve sustainability of events:

• Consult with event managers about the sustainability of their events and encourage the use of our infrastructure to reduce consumption and waste

• Create specific meetings with event managers to develop customized sustainability plans

• Encourage event managers to include information about the Javits Center’s sustainability program in exhibitor materials
Dana Schneider
Senior Vice President
Director, Energy and Sustainability Services
Jones Lang LaSalle
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The Empire State Building

Demonstrate the business case for cost-effective energy-efficient retrofits through verifiable operating costs reductions and payback analysis.
Motivation

The retrofit of the Empire State Building was motivated by the building ownership’s desire to:

1) Reposition the world’s most famous office building into a pre-war trophy asset

2) Prove or disprove energy efficiency retrofits’ economic viability

3) Use our work to publicize and differentiate our building and attract tenants

4) Produce a replicable model for energy-efficiency retrofits of existing buildings, which will make up 85% of buildings in place in New York City in 2030

5) “If the only place we succeed is ESB, the effort is a failure.”
Industry drivers for energy-efficient retrofits

**Converging forces**

Recognition of need to develop more sustainable and efficient business practices

Acceptance of energy supply constraints and national security issues posed by energy dependence

Ongoing federal, state and local legislative action

Corporate trend toward GRI reporting, self regulation and reduction in GHG emissions

Customer, employee and shareholder pressures

**Business opportunity**

Growing pressure to alter appraisals, values for lending and purchasing based on sustainability

Reduced operating costs through efficiency

Increased marketability, competitiveness

Improved work environments, productivity, recruitment and retention

Positive NPV and ROI

Fund improvements through energy savings

Maintain value
Industry drivers for energy-efficient retrofits

Demonstrate how to cost-effectively retrofit a large multi-tenant office building to inspire others to embark on integrated energy-efficiency retrofits.

1. Identify opportunities
   - 60+ energy efficiency ideas were narrowed to 17 implementable projects
   - Team estimated theoretical minimum energy use
   - Developed eQUEST energy model

2. Evaluate measures
   - Net present value
   - Greenhouse gas savings
   - Dollar to metric ton of carbon reduced
   - Calculated for each measure

3. Create packages
   - Maximize net present value
   - Balance net present value and CO₂ savings
   - Maximize CO₂ savings for a zero net present value
   - Maximize CO₂ savings

4. Model iteratively
   - Iterative energy and financial modeling process to identify final eight recommendations

NYCTalks & Company
Demonstrate business case through verifiable operating costs reductions and payback analysis

With a $550 million capital improvement program underway, ownership decided to re-evaluate certain projects with cost-effective energy efficiency and sustainability opportunities in mind.

**Capital Budget Adjustments for Energy Efficiency Projects**

- **2008 Capital Budget for Energy-Related Projects = $93m + 0% Energy Savings**
- **Sum of adds / changes / deletes = +$13m**
- **3.1 year payback on incremental cost**
- **New Capital Budget w/ Efficiency Projects = $106m + 38% Energy Savings**
Balance financial return & carbon reduction

ESB can achieve a high level of energy reduction cost-effectively.
The business case – integrated approach

More than half the savings exist within tenant spaces

Energy Savings: Base Building vs. within Tenant Space

- Tenant DCV
- Radiative Barrier
- Tenant Energy Management
- Bldg Windows
- VAV AHU's
- Tenant Daylighting/Lighting/Plugs

Annual Energy Savings (kBtu)

Measures that only affect the Base Building

Measures within Tenant Space
# Measured and Verified Energy Savings

## Utility Consumption Comparison

### 136 Madison Avenue (Class “A” Office)

<table>
<thead>
<tr>
<th></th>
<th>JAN Actual</th>
<th>FEB Actual</th>
<th>MAR Actual</th>
<th>APR Actual</th>
<th>MAY Actual</th>
<th>Total Annual Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$3,677</td>
<td>$3,921</td>
<td>$4,209</td>
<td>$4,721</td>
<td>$4,905</td>
<td>$57,306</td>
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<tr>
<td>Consumption (kWh)</td>
<td>13,760</td>
<td>15,520</td>
<td>17,920</td>
<td>14,880</td>
<td>19,893</td>
<td>220,853</td>
</tr>
<tr>
<td>Avg. Cost per KWH</td>
<td>0.27</td>
<td>0.25</td>
<td>0.23</td>
<td>0.25</td>
<td>0.25</td>
<td>0.26</td>
</tr>
<tr>
<td>Energy Cost (Per Rentable Square Foot)</td>
<td>0.22</td>
<td>0.24</td>
<td>0.26</td>
<td>0.23</td>
<td>0.30</td>
<td>3.49</td>
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</tbody>
</table>

### Empire State Building (LEED Platinum)

<table>
<thead>
<tr>
<th></th>
<th>JAN Actual</th>
<th>FEB Actual</th>
<th>MAR Actual</th>
<th>APR Actual</th>
<th>MAY Actual</th>
<th>Total Annual Projected</th>
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</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$1,989</td>
<td>$1,987</td>
<td>$2,500</td>
<td>$2,151</td>
<td>$2,525</td>
<td>$32,015</td>
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<tr>
<td>Consumption (kWh)</td>
<td>10,516</td>
<td>10,506</td>
<td>11,686</td>
<td>10,523</td>
<td>12,220</td>
<td>165,764</td>
</tr>
<tr>
<td>Avg. Cost per KWH</td>
<td>0.19</td>
<td>0.19</td>
<td>0.21</td>
<td>0.20</td>
<td>0.21</td>
<td>0.19</td>
</tr>
<tr>
<td>Energy Cost (Per Rentable Square Foot)</td>
<td>0.08</td>
<td>0.08</td>
<td>0.10</td>
<td>0.09</td>
<td>0.10</td>
<td>1.31</td>
</tr>
</tbody>
</table>

Data provided by Skanska based on performance of their 32nd floor office at the ESB.
Implementing recommended measures

Eight interactive levers chosen iteratively from more than 60 options ranging from base building measures to tenant engagement deliver these results.

Annual Energy Savings by Measure

38% Reduction
The Empire State Building:
A groundbreaking energy and sustainability program

- Reduce energy use by 38 percent
- Annual savings of $4.4M
- 3.1 year payback
- Reduce carbon emissions 105,000 metric tons
- Energy Star 90
- LEED EBOM Gold
- Energy Performance Contract
- Quantifiable transparent results
- Serve as a model for owners of existing buildings
Practical Next Steps

What you can do to take action:

1) Triage your building portfolio based on renovation cycle

2) Create a sustainability master plan including retrofit projects, design standards, lease structure changes, tenant energy management programs and marketing initiatives

3) Commit to an integrated, whole-building retrofit approach: conduct whole-building audits rather than single measure projects

4) Require performance guarantees with ongoing measurement and verification of savings to reduce risk and maintain performance

5) Engage tenants, employees and building occupants in energy-saving efforts through training, tools, technology

6) Create concrete successes at the building and pre-built level to build momentum and enthusiasm
Susan Sampliner
Co-Chair
Broadway Green Alliance
www.broadwaygreen.com
ssampliner@321mgt.com
Introduction

The Broadway Green Alliance (BGA) inspires, educates and motivates the entire theatre community and its patrons to implement environmentally friendlier practices.

The BGA was publicly launched at a press conference in November 2008 featuring Mayor Bloomberg.

We are an ad hoc committee of The Broadway League and a fiscal program of Broadway Cares/Equity Fights AIDS. The NRDC is our environmental advisor.
Key Principles

• No one can be “green,” only greener

• Small actions add up

• There are 3 types of greener actions:
  o Immediate savings
  o Savings after investment
  o Greener, but higher cost
 Committees

Pre/Post Production

Education

Production

Touring

Venues

Outreach

BGA
Integrating Sustainability into Audience Experience

- Lobby signage
- Program notes
- Earth hour
- Ticket purchases (Givenik)
The Audience Experience

Broadway theaters changed to energy-efficient outside and marquee lighting.

Givenik program gives 5% of the ticket purchases to participating non-profit programs.

Broadway marquees go dark for WWF’s Earth Hour every year.

Nearly all venues’ Playbills list them as a member of the BGA on a back page.

See Adinah Alexander in Kinky Boots and Give Back to the BGA!
Every show on Broadway has a BGA liaison helping it get greener all the time – from stars to dressers to crew members.
Community Involvement

Green Merchandise

Newsletter

First Green Broadway Award Presented to Jonathan Tischert!
The Broadway Green Alliance was pleased to present the very first Green Broadway Award to Jonathan Tischert, President of Jonathan Tischert, at the Annual Green Alliances on March 27, 2013. Jonathan has been a tireless advocate for sustainability in the Broadway community and inspires initiatives to become common.

Inaugural College Green Captain Prize given out at UDIT 2013
The Broadway Green Alliance has presented the inaugural College Green Captain Prize to Andrew Goldsby, a student at Bard College. Andrew’s creation, a hand-crafted piece of jewelry, is made using recycled materials and is showcased in the UDIT production of "A Chorus Line." The prize was awarded as part of the UDIT Green Week.

Green Movie Drive a big success!
We are happy to report that we collected over 1,000 pounds of electronics waste from the Foxwoods community during our annual electronic waste drive. A big thanks goes to our volunteer Elizabeth Tunis, Susan Laferriere, Catherine Pelton, and all Volunteers, who sorted and collected the electronic waste from schools, offices, and select theater businesses in the area.

Community Events

BC/EFA Easter Bonnet

Kids Night on Broadway

The shedding of the new green sheet of March 2013 highlights the following events:

- The first Green Broadway Award was presented to Jonathan Tischert, President of Jonathan Tischert, at the Annual Green Alliances on March 27, 2013. Jonathan has been a tireless advocate for sustainability in the Broadway community and inspires initiatives to become common.

- The inaugural College Green Captain Prize was given out at UDIT 2013. Andrew Goldsby, a student at Bard College, won the award for his creation, a hand-crafted piece of jewelry made using recycled materials.

- A successful Green Movie Drive was held, collecting over 1,000 pounds of electronic waste from the Foxwoods community. Volunteers are thanked for their hard work.

- Additional events include the BC/EFA Easter Bonnet and Kids Night on Broadway.
Popular Initiatives

• **Collection Drives**: Two textile and two electronic waste recycling drives in Times Square each year – free and open to the public.

• **Binder Exchange**: A free library of usable binders available for stage managers and designers working with Actors’ Equity Association.
Website
Hervé Houdré
Regional Director of Operations & General Manager
InterContinental New York Barclay
http://www.hanyc.org/
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Sustainable Development

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” – 1987
Brundtland UN commission

Triple Bottom Line (TBL)

• Economic Prosperity (Profit)
• Social Responsibility (People)
• Environmental Protection (Planet)
How can we transform a theory into reality?

• Commitment from the top
• Education
• Champion, Committees
• Measurements
• Five-year roadmap
• Certifications
• Communication
• Recognition
Hotel: Crowne Plaza Times Square, New York

Solution:
• Replaced 3,300 incandescent bulbs (40W) from the façade billboard with LEDs (8W)

Cost:
• $40,000
• Rebate from Con Edison: $13,200

Results:
• $120,000 savings the first year
• Labor cost dropped $20,000/year
Hotel: New York Palace

Solution:
• Micro turbines with heat exchangers (Cogeneration)
• Supply 43% of the heating needs of the hotel and 15% of its air condition needs
• Compensate 42% of the hotel electricity needs

Cost:
• Capital expenditure: $4M
• Incentive from NYSERDA (NYS Energy Research & Development Authority): $2M

Results:
• $840K annual savings (21% of current energy expenses)
### InterContinental Barclay

**Electricity costs 2009–2013**

<table>
<thead>
<tr>
<th>Year</th>
<th>Occupancy</th>
<th>Electricity</th>
<th>Cost POR</th>
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<tbody>
<tr>
<td>2009</td>
<td>84%</td>
<td>$1,177K</td>
<td>$5.58</td>
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<tr>
<td>2010</td>
<td>82%</td>
<td>$1,119K</td>
<td>$5.41</td>
</tr>
<tr>
<td>2011</td>
<td>86%</td>
<td>$937K</td>
<td>$4.34</td>
</tr>
<tr>
<td>2012</td>
<td>85%</td>
<td>$914K</td>
<td>$4.31</td>
</tr>
<tr>
<td>2013</td>
<td>86%</td>
<td>$811K</td>
<td>$3.78</td>
</tr>
</tbody>
</table>
NYC Resources

• HANYC Sustainability Website (hanyc.org)

• Green Key Global Certification

• Department of Sanitation

• Mayor’s Sustainability Office: Carbon Challenge

• GreeNYC

• OneNYC (formerly PlaNYC)
Thank You!