



**The Daylight
Savings Company**

Energy Efficiency and Sustainability: The Hype, The Perception, The Reality



April 12, 2011



(800) 337-2192 www.daylightsavings.us



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The Daylight Savings Company

- Energy efficiency consulting and engineering firm - since 1991
- Independent contractor for many of NYSERDA's Programs
- A Partner in NYSERDA's Multifamily Performance Program (MPP)
- A Partner in New Jersey's Pay for Performance Program (P4P)
- Over 5000 energy projects completed
- Our staff is CEM & BPI certified along with PE and LEED-AP

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Agenda

•Hype , Perception, Reality

- Frank Lauricella- Business Development Director- Daylight Savings
- Adam C. Boese-President-Daylight Savings

•Greener Greater Buildings Plan

- Frank Lauricella

•Con Edison-Multifamily Energy Efficiency Program

- Phil Madnick- Assistant Manager Con Ed's-Multifamily Energy Efficiency Program

•NYSERDA's Multifamily Performance Program

- Michael Colgrove-Director of Energy Programs –NYSERDA's NYC Office

•M-Core Credit

- Michael Weisberg-Founder

•Q & A



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Seminar Objective:

- To convey the importance of energy efficiency as a component of sustainability for multifamily facilities;
- To educate as to how energy audits provide valuable information regarding energy efficiency and sustainability;
- To provide resources to manage expectations; develop a cost effective improvement plan and options for financing
- Brief overview of NYC Greener Greater Building Plan



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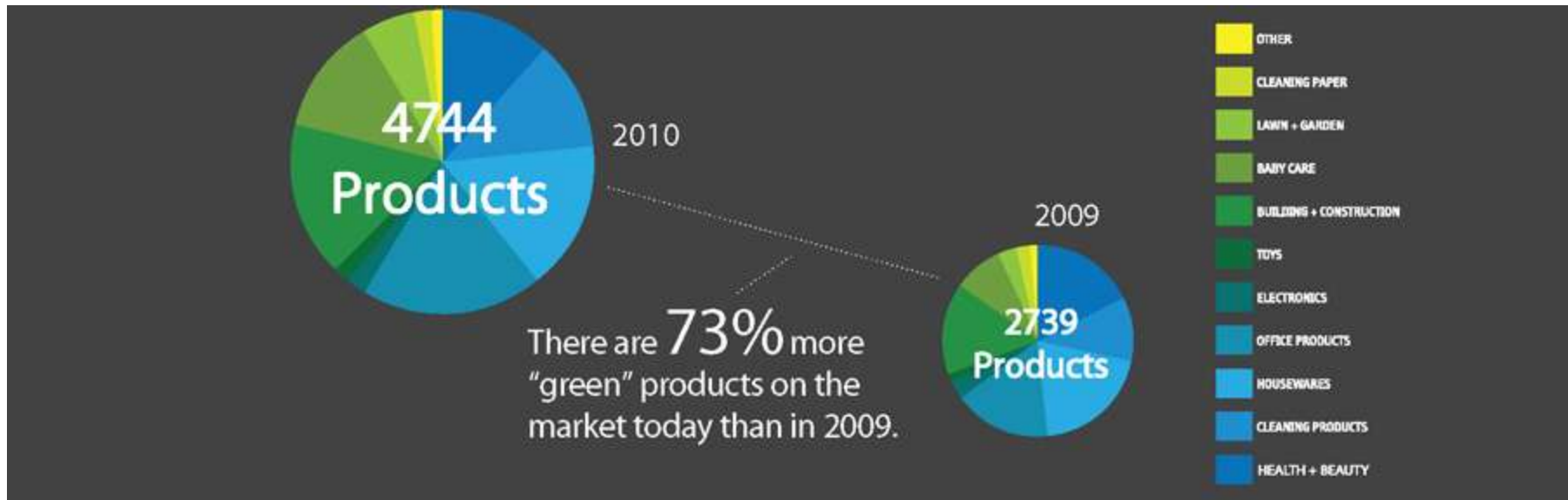
Hype and Perception

Green-Washed Marketing Campaigns, Products
and Services



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Green-washing (green'washing',) – verb: the act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service.





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terrachoice
PART OF THE UL GLOBAL NETWORK

SINSOFGREENWASHING.ORG

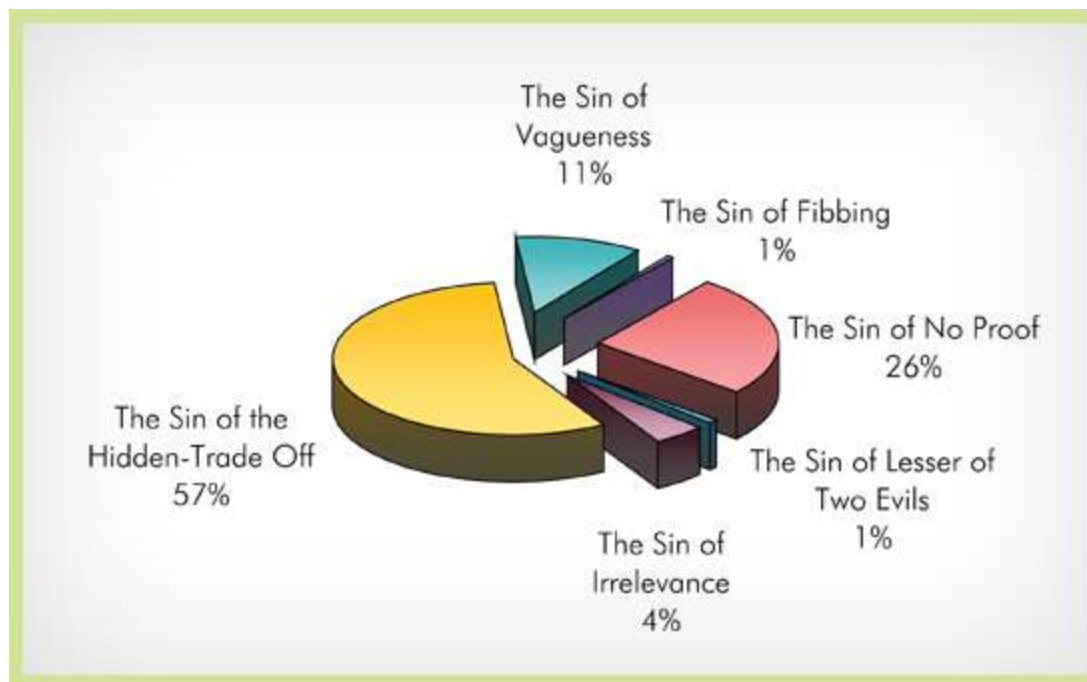
<http://www.terrachoice.com>





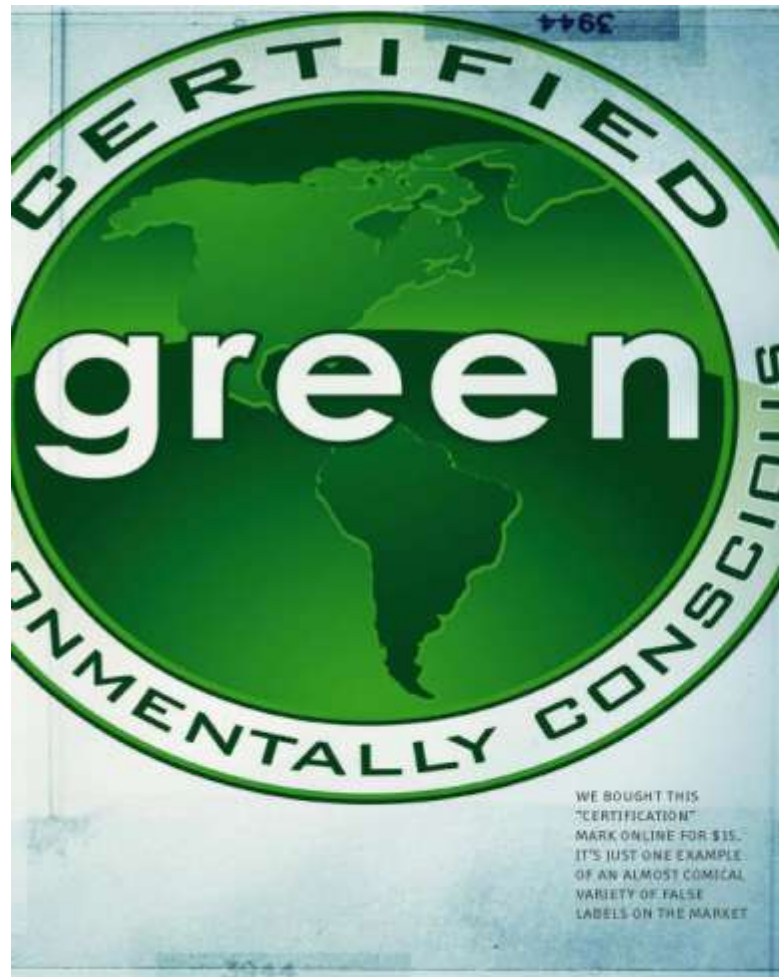
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The Six Sins of Greenwashing





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WHAT WE FOUND

- **LEGITIMATE GREEN STANDARDS HELP FIGHT GREENWASHING.** Of products certified by an ISO 14024-based program (EcoLogo, Green Seal, and Nordic Swan) more than 30% were sin-free (compared to the 4.4% study-wide result). In other words, good eco-labeling helps prevent (but doesn't eliminate) greenwashing.
- **FALSE ECO-LABELING IS INCREASING.** The use of fake labels (a sin we first identified in 2009 and dubbed the "Sin of Worshiping False Labels") is increasing. More than 32% of "greener" products found in this study carried such a fake label, compared to the 26.8% in 2009.
- **FALSE LABELS ARE A DIME A DOZEN.** Ease of access to false, completely meaningless eco-labels has become almost comical. By searching "certified green" at many stock image websites, we were offered meaningless false eco-labels downloadable for only a few dollars.



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www.energystar.gov



Consortium for Energy Efficiency (CEE)

www.cee1.org

Resources





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Energy Efficiency Has a Significant Impact to Sustainability

For example:

- Energy performance represents 1/3 of the LEED rating.
- Theoretically, can achieve 85% of minimum points for LEED certification (35/40) using just energy & atmosphere credits.
- Approximately 50% of available EA points are for optimizing energy performance; 15% for renewables; 15-25% for Cx and M&V



Hype and Perception

Overuse of the term “Energy Audit”

Used as a sales tool.

- Lighting: utility programs; lighting installers.
- Insulation / weatherization / windows: installers.
- Billing errors: billing services.
- Commodity sales.

Used to define a variety of evaluations and analysis tasks.

- Infrared scanning, blower door testing.
- Walkthrough audit / checklist.
- ASHRAE Level I, II, III.
- Engineering Study / Feasibility Study.

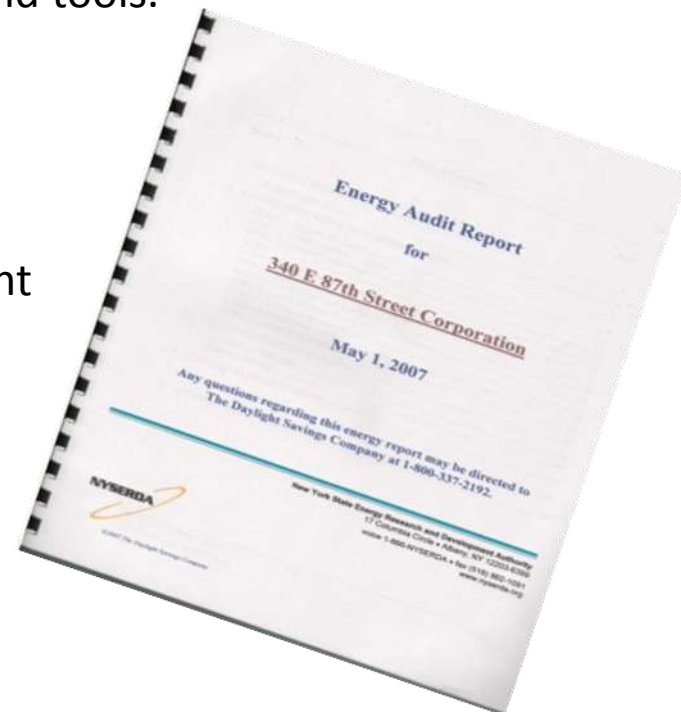


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Reality

The Energy Audit is an imperative component of a sustainability plan.

- Choose an appropriate audit level and understand the benefits and drawbacks.
- Get a clear description of the auditing procedures and tools.
 - Data to be collected
 - On-site visit: tools, procedures
 - Is the software appropriately sophisticated?
 - Is the deliverable appropriate?
 - Will the deliverable be compliant for subsequent government or utility incentive programs?
(Local Law 84 compliance –
NYSERDA Benchmarking Program funding)





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Example of a compliant executive summary showing source fuel savings, interactive energy impacts, Peak Demand savings, estimated installation costs, payback, SIR, and LC savings.

Description	kW Saved	Annual kWh Saved	Annual MMBTU Saved	Annual \$ Savings	Installed Cost (*)	Pay-back (yrs)	% of Annual Energy Cost	Life	SIR	Life Cycle Savings
Upgrade the Lighting	30.5	171,015	(450.4)	\$17,936	\$101,102	5.6	1.4%	10	1.5	\$50,344
Install Lighting Controls		42,863	(44.0)	\$4,926	\$16,760	3.4	0.3%	10	2.5	\$24,838
Upgrade The Air Conditioning	44.1	107,181		\$27,492	\$138,700	5.0	1.6%	10	1.7	\$93,437
Install Variable-Speed Drives		146,634		\$19,062	\$62,330	3.3	1.1%	15	3.6	\$161,974
Install Pipe Insulation			615.8	\$9,040	\$30,000	3.3	0.5%	15	3.5	\$76,374
Install Pneumatic Zone Controls		90,342		\$11,744	\$23,550	2.0	0.7%	10	4.2	\$75,614
Install Stack Heat Reclaim			1,000.9	\$14,695	\$110,000	7.5	0.9%	10	1.1	\$14,082
Install De-Centralized Boilers			5,058.0	\$74,254	\$1,147,875	15.5	4.3%	25	1.1	\$116,773
Totals	74.6	558,035	6,180.4	\$179,149	\$1,630,317	9.1	10.8%	21	1.7	\$1,064,607



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Hype and Perception

Fear of “foreign dependency on oil”.

Typical phrases in the marketplace:

- Solar power reduces our dependence on foreign oil.
- Using compact fluorescent lamps reduces our dependence on foreign oil.
- Let’s all work together to become more energy efficient and reduce our dependence on foreign oil.

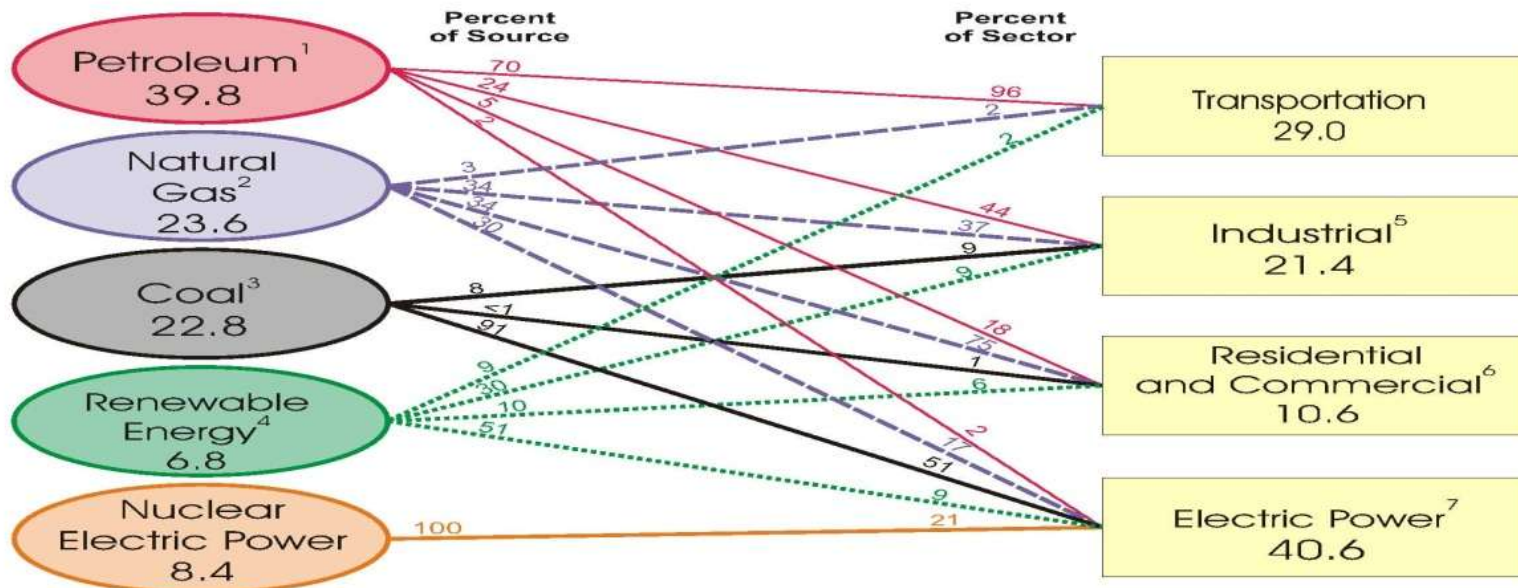


Reality

Proper dissemination of energy information: www.eia.gov

- Oil is mainly used for transportation and mfg. Very little is used for electricity.

U.S. Primary Energy Consumption by Source and Sector, 2007
(Quadrillion Btu)

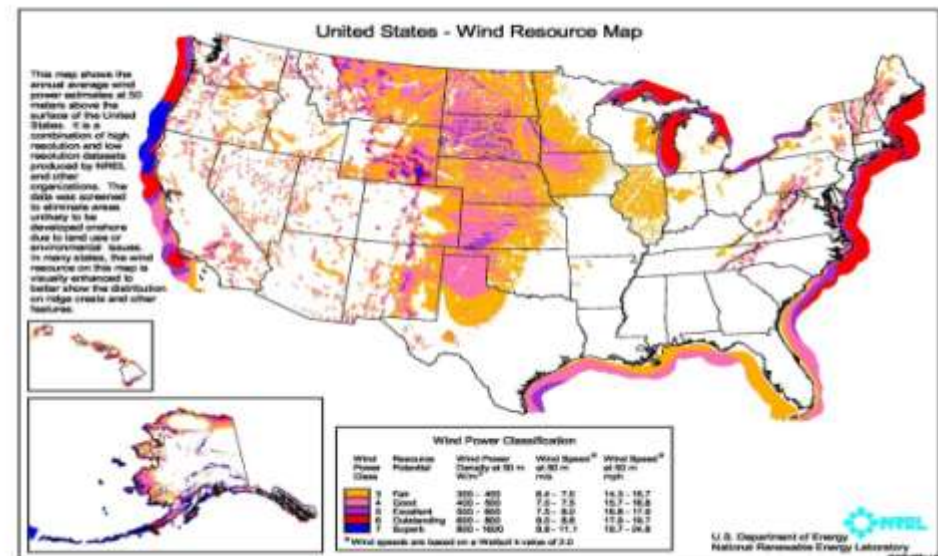
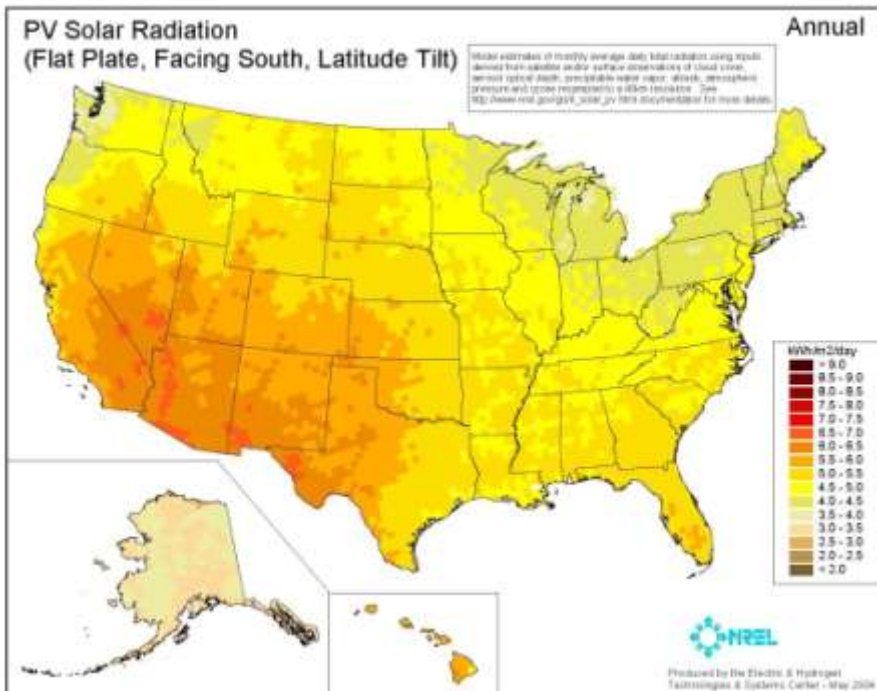




Hype and Perception

Over emphasis on “renewables” at the building level.

- PV (South West is the preferred location for PV)
- Wind (Coastlines -offshore and Great Lakes are preferred locations for wind)





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Reality

Proper dissemination of renewables information

- PV can be an attractive option with financial incentives
- Solar Thermal (less expensive method to harvest renewable energy)-new incentives may be available
- Wind is currently expensive, has a long payback, and has very limited applicability.
- Small wind turbines have even less applicability:
http://news.cnet.com/8301-11128_3-10196182-54.html
 - data showed that the estimated production was about three times higher than the turbines' actual production.
 - what you feel on the ground has nothing to do with what you have 100 feet up





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Hype and Perception

Over emphasis on expensive, sometimes immature technologies and inapplicable applications of technologies.

- LED Lighting (myriad of issues of false claims, marketing on a grand scale, news hype)
- Geothermal (assumed to be applicable everywhere, confusion with geothermal energy)
- CHP (assumed to be applicable everywhere, confusion with California Highway Patrol)
- Capacitor Banks (power factor correction equipment)





Reality

LED Lighting

- Still very limited applications and long paybacks (5+ years).
 - Accent lighting – not area illumination.
 - Long life (50,000 hrs) is sought for difficult applications. (However, 32W T8's with PS ballasts last 42,000 hrs.)
 - Exit signs. Other signage.
 - Emerging technology.
- NYSERDA will only accept SSL products listed by either ENERGY STAR or DesignLights Consortium's Qualified Products List .





Reality

Geothermal

- Geothermal HVAC Retrofits (limited applicability)
- No fossil fuels to deal with.
- New construction – YES!
- Retrofit – maybe: upon full HVAC replacement.
- Very costly. \$5-8,000/Ton. Paybacks 8-20 years.
- Very efficient. Heating COP 3.0+. Cooling COP 4.0+.

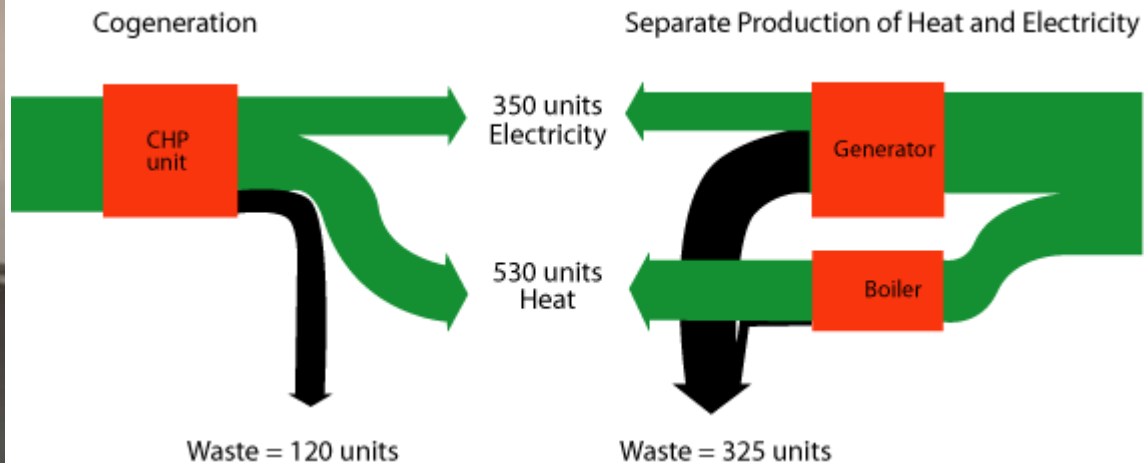




Reality

Combined Heat and Power (CHP)

- Limited applicability – need a 24/7 thermal load
- Multifamily – maybe.
- Very costly. \$1000-2,000/kW (or more).
Paybacks ~6 years (or more w/o incentives).





Reality

Capacitor Banks (properly used for power factor correction)

- Improperly marketed as energy banking units “EBU”
- Most multifamily customers do not have PF penalties
- “Power Factor correction does reduce line currents supplied to low power factor loads, it does not result in a significant corresponding reduction in the load’s power requirements or annual energy consumption”
- <http://www1.eere.energy.gov/femp/pdfs/29267-5.7.3.pdf>



Hype and Perception

Over emphasis on ratings, instead of just understanding and reducing energy use.

- LEED (documents overall sustainability, not a means for ensuring optimized energy efficiency design or performance)
- Energy Star Portfolio Manager (compares a given building to a national database – can give incorrect perception of building performance due to certain variables; algorithms unknown)



Reality

Proper use of ratings and the Energy Audit as a core element of sustainability.

- Information is powerful
- Utility data holds very valuable information
- Examining energy bills should be done at least annually
- LEED is useful as a guide to sustainability
- Energy Star is a useful guide for benchmarking

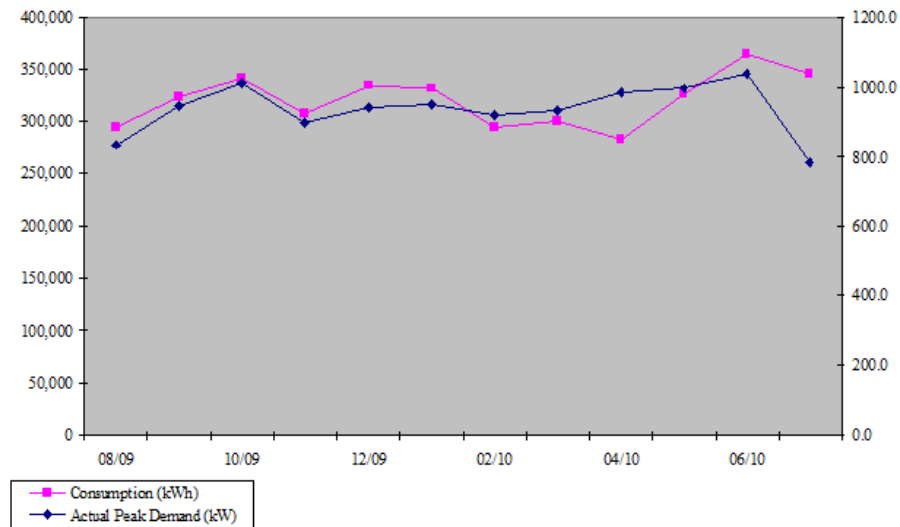
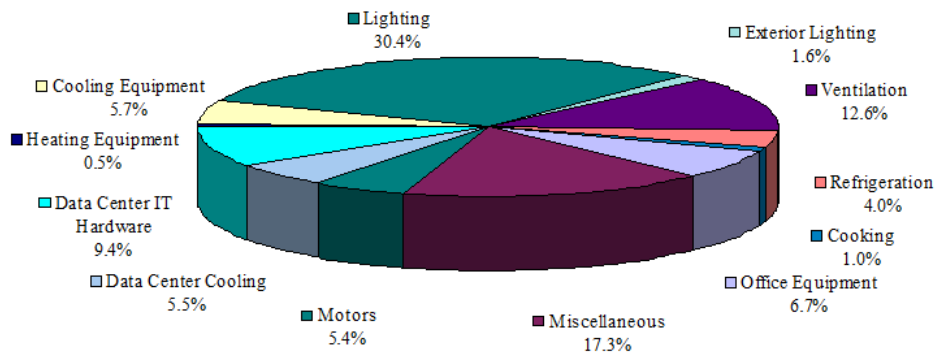
None of these will save energy, unless you are diligent on an annual basis to follow the recommendations of a qualified energy efficiency engineer.



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Reality

Examine your utilities at least annually through an Energy Audit.





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Hype and Perception

Belief that incentives will fully pay for the project.

- Misunderstanding of funding / incentives / low interest loans, etc.
- There are no silver bullets



Resolution 4000 x 3200 px - free download - www.psdgraphics.com



Reality

- Federal (earmarks are rare)
- State (NY / NJ incent 5-25% of select projects)
- Utility (coming on board again – similar to state)
- Private (e.g. not for profit, foundation, etc.) (unique and usually known to the building user ahead of time)
- Implementation is expensive and capital funds are typically low.
- Financing projects is a very major issue.
- Be attentive to details: CEE requirements, minimum efficiency, pre-application, prior approval, engineering analysis, engineer stamp, monitoring and verification (M&V), etc.
- You will not receive the incentive unless strict rules are followed.





Reality

Properly applied green technologies.

Lighting

- 32W T8's (highest LPW with limited installation issues)
- Use online manufacturer information (Read the footnotes!)
- CRI and lamp life are very important issues that get ignored
- Minimize stock variety

Building Controls

- Does not always have to be expensive EMS
- Can be: programmable thermostats; boiler controls with remote sensors, web based interface



Reality

Properly applied green technologies.

HVAC Equipment

- VFD's wherever possible: fans, pumps, compressors, etc.
- Low mass boilers reduce standby losses
- Modular systems reduce standby losses. Easier to establish redundancy (N+1 is much more efficient than 2N)
- Steam distribution losses (mainly due to traps) need to be minimized (digitally monitored traps are an option)
- Rooftop unit (RTU) replacements have a very long payback. Replace upon failure / perceived end of life. COP improvement from 1.9 to 3.6 takes 10+ years.



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Reality

Properly applied green technologies.

Envelope

- New windows are a long payback (15+ years)
- Weather-stripping is extremely cost effective (<5 years)
- New doors are good for comfort and aesthetics, but due to small load the impact is usually very small (20+ years payback)
- However, you may need to replace for comfort, maintenance or other reasons





Reality

Properly applied green technologies.

Choosing the best options during first purchase or other mandatory replacement (e.g. due to system failure)

- First-purchase winners: Geothermal HVAC, high-efficiency lighting and controls, building controls, windows, insulation (roof/attic, wall, slab).
- Water measures to consider: rainwater capture systems, drip irrigation.
- Economics at first purchase almost always favor the highest-efficiency models and construction methods.
- Full building / holistic methods are the most productive to develop interactive building systems (e.g. less lighting load = less cooling load, more effective envelope = less heating and cooling load, etc.)



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Reality Check

Energy savings (as an element of sustainability) will only prevail with continuous monitoring and commissioning.

- Annual energy audit update, at a minimum. System M&V preferred.
- Annual re-commissioning.
- Engineer **MUST** assist with all equipment selection.





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GREENER GREATER BUILDINGS PLAN NEW YORK CITY LEGISLATION – PASSED 12/9/2009

Benchmarking Energy and Water Use Local Law 84

- Benchmarking results must be reported no later than **August 1, 2011**, and every year thereafter.
- Requires use of the EPA's Portfolio Manager or any complementary interface designated by the OLTPS.
- Water benchmarking will only be required if the building was equipped with automatic meter reading equipment by the DEP for previous year.
- Owners must report results to the Department of Finance, using the OLTPS' format, and they must maintain records for three years.



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Energy Audits and Retro-commissioning of Base Building Systems Local Law 87

- Buildings must submit an **energy efficiency report once every ten years** on a staggered schedule determined by the Department of Finance. The first subset will be due **by December 31, 2013**.
- The energy audit must be an ASHRAE Level II Audit conducted under the supervision of an energy auditor, and the retro-commissioning study must be completed by a certified retro-commissioning agent.
- The energy audits and retro-commissioning studies apply to buildings' central systems, including the building envelope, HVAC, conveying, domestic hot water, electrical and lighting systems.



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NYC Energy Conservation Code Local Law 85 - Effective July 1, 2010.

- No longer allows IECC compliance exemptions for renovations impacting less than 50% of a building system. The NYC DOB will not issue permits without documentation of compliance, including energy analysis

Lighting Upgrades and Installation of Electrical Sub-meters Local Law 88

- Upgrades and installation must be completed by **January 1, 2025**.
- All large, non-residential buildings to upgrade lighting systems to meet the ECC standards.
- Electrical sub-meters must be installed in commercial tenant spaces that are over 10,000 SF. Compliance report must be prepared by either a registered design professional, a licensed master or special electrician.



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Q & A Session



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