



Sustainable & Environmental Design Industry Advisory Panel

CARBON Neutral? – The three steps...

1. Energy Efficiency – *reduce consumption*

Baseline & Targets – *what are DOS's carbon footprint & targets?*

Green Team – *database-tracking tool*

Energy Efficiency – *lighting & HVAC*

2. Renewable Sources – *supplement power load*

Reductions - *what are the opportunities & constraints for DOS?*

Renewables – *wind & photovoltaics*

3. Carbon Offset – *balance carbon emissions*

Offsets - *how can DOS become carbon neutral?*

Reforestation – *green roofs & planting on compounds*



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Energy & Sustainable Design Program:

DE – Design & Engineering Division

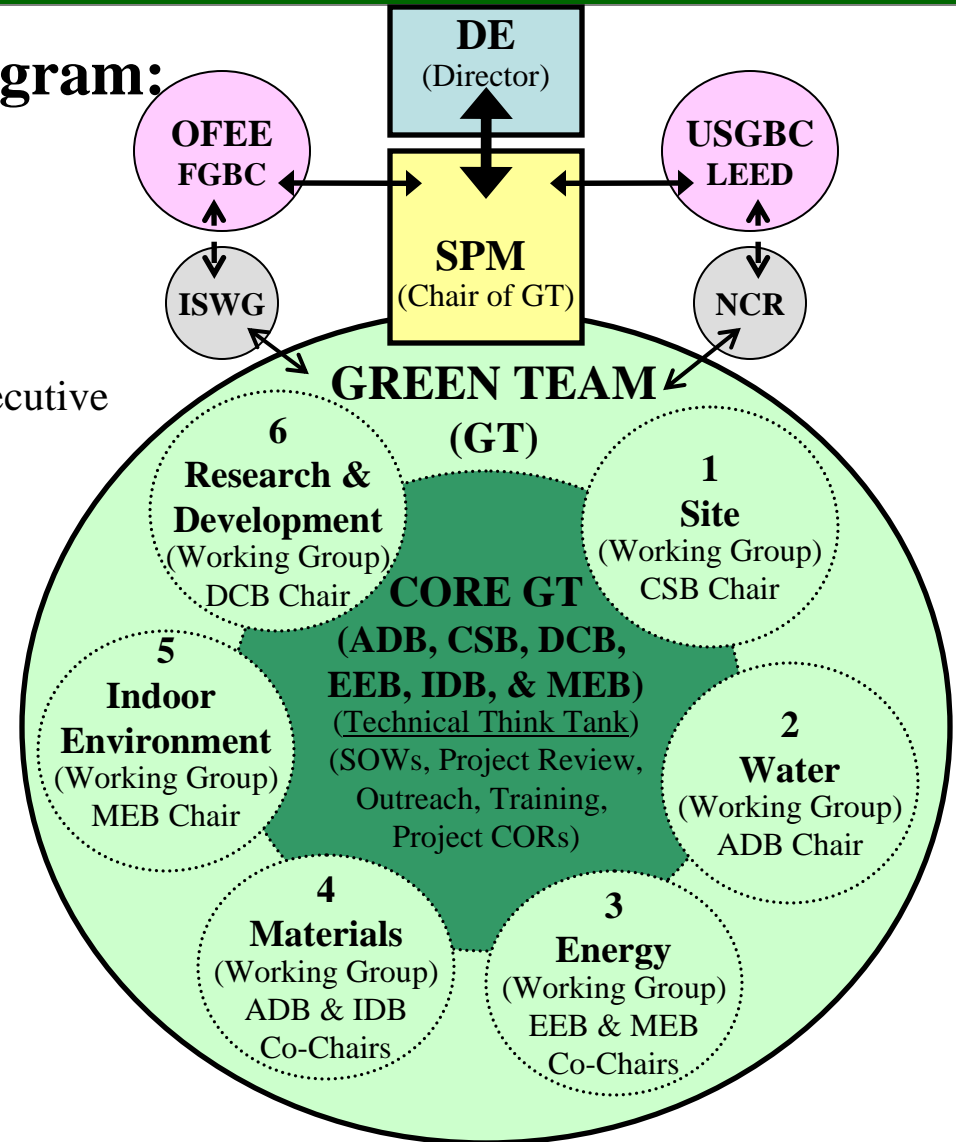
SPM – Sustainability Program Manager

OFEE – Office of the Federal Environmental Executive
FGBC – Federal Green Building Council

USGBC – U.S. Green Building Council
LEED – Leadership in Energy & Environmental Design, Green Building Rating System

GREEN TEAM & WORKING GROUPS

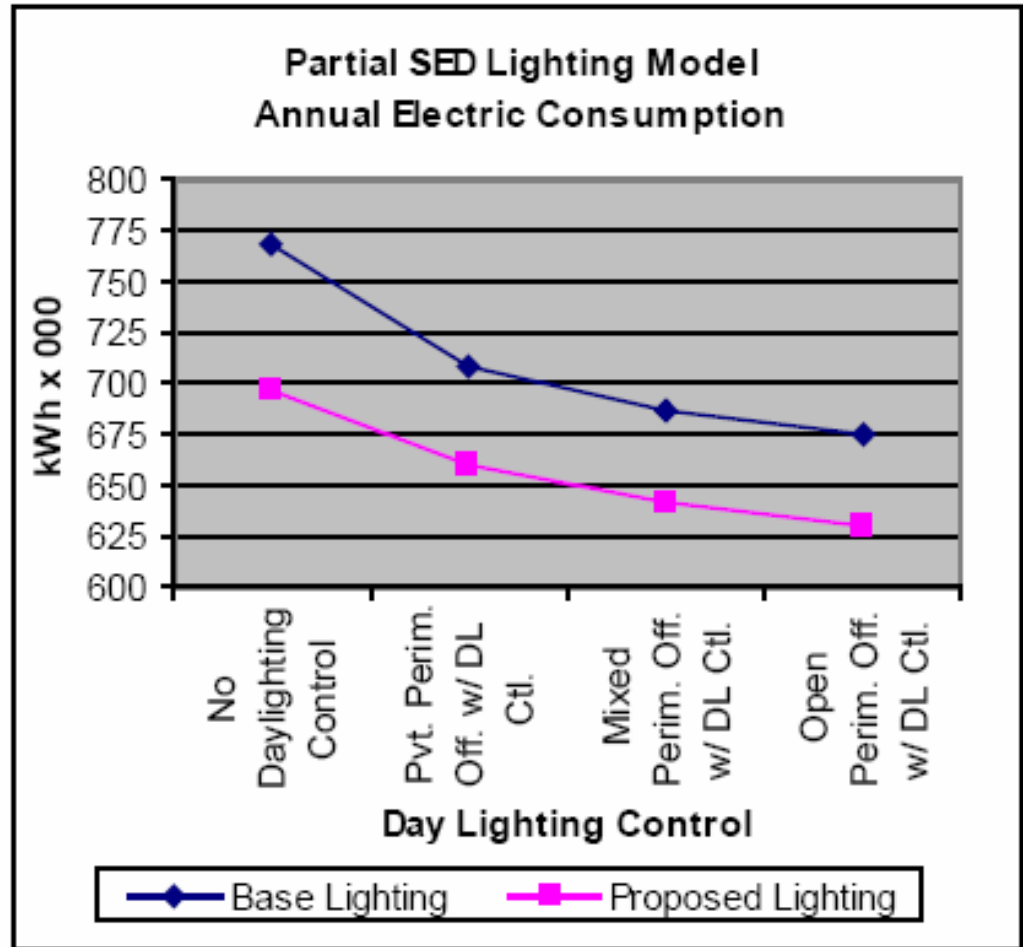
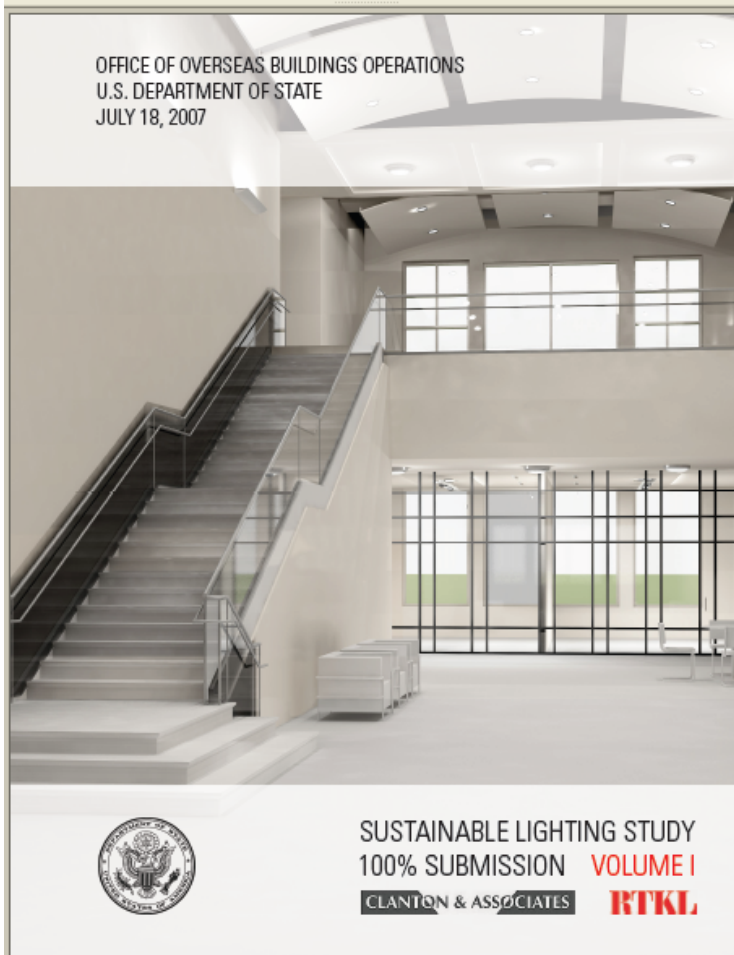
ADB – DE’s Architectural Design Branch
MEB – DE’s Mechanical Engineering Branch
EEB – DE’s Electrical Engineering Branch
CSB – DE’s Civil Structural Branch
IDB – DE’s Interiors Design Branch
DCB – DE’s Design Coordination Branch





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Interior Lighting: Evaluate OBO requirements for interior lighting systems:






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Wind Power: Evaluate wind generated electrical power as renewable resource for OBO facilities:

WIND GENERATED ELECTRICAL POWER

A Study for the
U.S. Department of State
Office of Overseas Buildings Operations




Draft Submittal
January 29, 2007
Prepared by



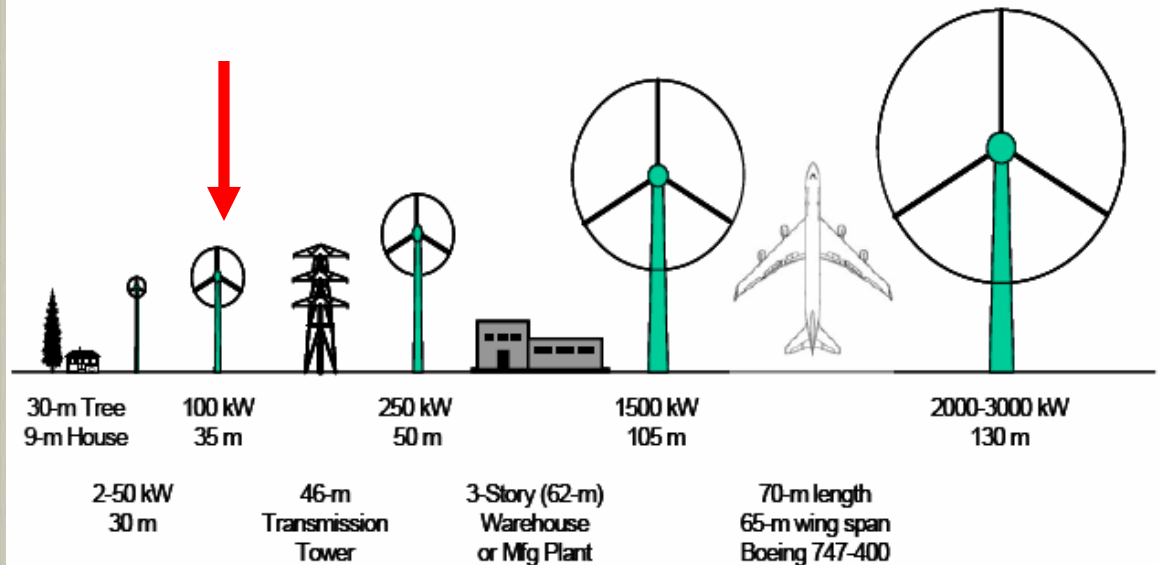
Hankins and Anderson
Consulting Engineers

6889 Sadler Road Glen Allen, Virginia 23060
(804) 285 4171 (804) 217 8520 Fax
www.haengineers.com



GEC
GLOBAL ENERGY CONCEPTS

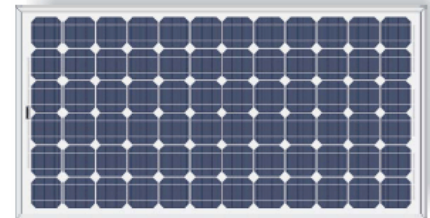
10097 The Avenue, Suite 300, Fairfax, VA 22031
(703) 359-4200 (703) 387-4250 Fax
www.globalenergyconcepts.com





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Photovoltaics: OBO Prioritization Listing **by Payback:**

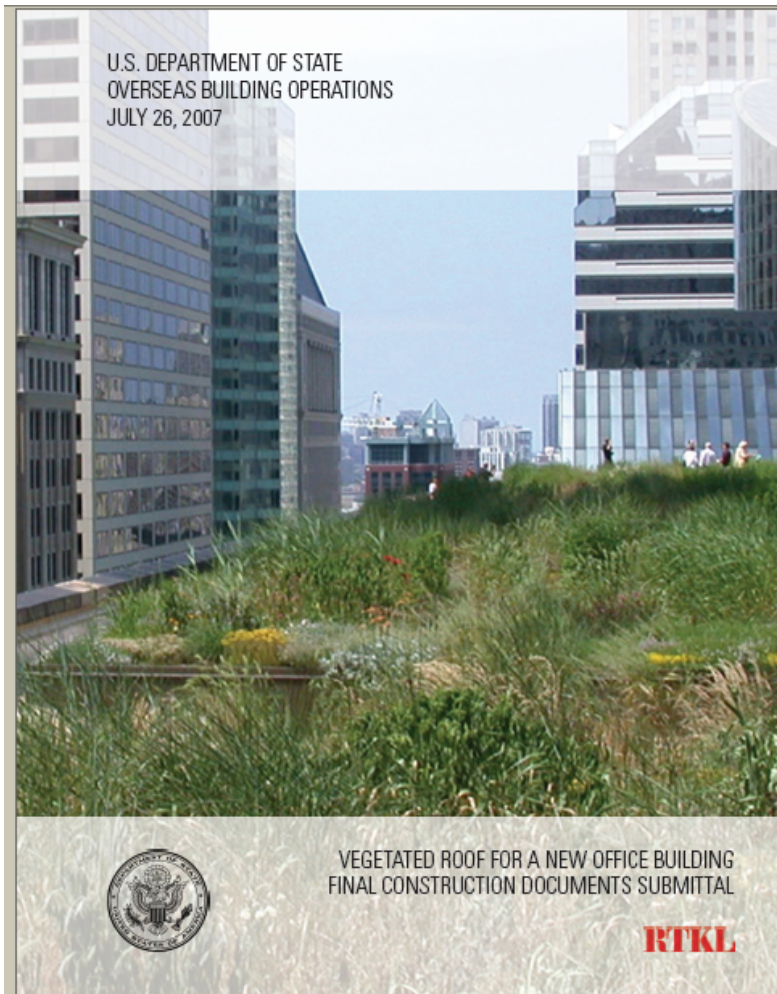


Rank	FY NEC	Post	Country	kW PV	Project Cost (Total)	Annual Savings	Simple Payback (Years)	Utility Rate \$/kWh
1	10	N'Djamena	Chad	300	\$3,085,000	\$1,955,088	2	\$1.21
2		Abuja - Spectrum	Nigeria	100	\$1,085,000	\$670,948	2	-
3		Abuja - NOX	Nigeria	125	\$1,085,000	\$671,104	2	-
4		Rangoon	Burma	250	\$2,585,000	\$671,882	4	-
5	09	Monrovia	Liberia	500	\$4,085,000	\$1,106,718	4	\$0.00
6	10	Santo Domingo	Dominican Republic	500	\$4,085,000	\$1,043,485	4	\$0.40
7	05	Kigali	Rwanda	419	\$4,275,000	\$973,385	5	\$0.45
8	05	Port-Au-Prince	Haiti	339	\$4,390,000	\$889,466	5	-
9	06	Harare	Zimbabwe	569	\$4,637,000	\$863,245	6	\$0.15
10	06	Djibouti	Djibouti	569	\$4,637,000	\$821,817	6	\$0.40
11	07	Ouagadougou	Burkina Faso	569	\$4,637,000	\$770,991	6	\$0.40
12	07	Johannesburg	South Africa	569	\$4,637,000	\$767,662	6	\$0.30
13		Kabul	Afghanastan	250	\$2,085,000	\$344,801	6	-
14		Athens	Greece	404	\$2,711,000	\$557,506	6	\$0.12



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Vegetated Roofs: Evaluate feasibility for OBO & develop construction docs.



VEGETATED ROOF FEASIBILITY CHART

CODE		CRITICAL							MITIGATING			Site						Climate Classification	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
Yes	Yes	Yes	Yes	0%	No	10	No	No	Low	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0 km	10	
				10%		9						90%					160 km	9	
				20%		8						80%					320 km	8	
				25%		7						70%					480 km	7	
				30%		6						60%					640 km	6	
				40%		5			Med.			50%					800 km	5	Average
				50%		4						40%					1600 km	4	
				60%		3						30%					2400 km	3	
				70%		2						20%					3200 km	2	
				80%		1	Yes	Yes				10%					≥ 4000 km	1	
				90%					High	No	No	0%	No	No	No				
				100%	Yes														
					No														

NOTE:
The numbered columns represent the 18 factors above. Indicate your evaluation in the column space provided.
10=Best Rating / 1=Worst Rating
Column widths correlate with the importance of the individual factor in making a vegetated roof feasible. Wider columns are more vital than the narrow columns.
Any critical failure indicates:
Not to Proceed

FINAL PROGNOSIS:
 Proceed with Vegetated Roof
 Do Not Proceed with Vegetated Roof

FACTORS:
 1. Is a vegetated roof required by the OBO and/or the local municipality?
 2. Is stormwater retention required on site by the OBO and/or the local municipality to mitigate stormwater runoff?
 3. Can the structure support loads of 17g/square cm (100 mm media depth)?
 4. Does the building need a new roof membrane?
 5. What is the roof slope?
 6. Over the lifetime of the vegetated roof, is an irrigation system required to sustain vegetative life? (This refers to a permanent irrigation system, not the two year establishment watering system.)
 7. What is the climate rating?
 8. Despite the climate rating, does the site's microclimate render uninhabitable conditions, such as levels of low moisture, intense heat, or high winds?
 9. Is the vegetated roof area exposed to man-made conditions that would make the vegetative environment uninhabitable?
 10. What are the wind conditions on the roof?
 11. Are stormwater management techniques, alternative to vegetated roofs, constrained on site?
 12. Does the locale's current storm water management system lack adequate capacity, or is it non-existent?
 13. What percentage of the post-developed site is impervious?
 14. Is the site located in an urban heat island?
 15. Is the site located in a region with a warm season? (Cfc, Csc, Cwc, BSk, Dsc, and Dwd are the only climates that can accommodate a vegetated roof that do not have an adequate warm season.)
 16. Is the structural deck made from concrete?
 17. Is vegetated roof technology currently established in the region? (Are materials and labor easily attainable for installation and maintenance?)
 18. How important are the diplomatic implications of installing a vegetated roof?



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Water Systems & Resources: Evaluate OBO standard water requirements:

