

Introduction to LEED EB:OM



RCBC Plaza, Leading you to a Greener Environment

Dean Barone, LEED AP BD+C, ID+C, O+M, ISSP-SA

LEED for Existing Buildings :
Operations & Maintenance

Barone International



Barone International
Sustainability Consultants

Established 2009

Philippines
Guam, USA
Houston, Texas USA

Oriental Peninsula Resources Group, Inc. | JPMorganChase | Metrobank Card Corporation | M+W GROUP | RCBC
 Citibank | Frabelle | MONOLITH CONSTRUCTION & DEVELOPMENT CORPORATION
 KEYLAND | LANDBANK | Del Monte Quality | KGLIASIA | GGLC
 Anchor Land Holdings Inc. | nova construction + development | DOUBLE DRAGON | WELLS FARGO | MEGAWORLD
 FILINVEST | SUNPOWER | maxim integrated™

Barone International - Certified Projects

Sun Life Philippines Hqtrs	Taguig	LEED CI	Platinum Certified
SunPower Fab 2	Batangas	LEED EBOM	Gold Certified
8 Campus Place A	Taguig	LEED CS	Gold Certified
8 Campus Place B	Taguig	LEED CS	Gold Certified
8 Campus Place C	Taguig	LEED CS	Gold Certified
Wells Fargo Phils A	Taguig	LEED CI	Platinum Certified
Wells Fargo Phils B	Taguig	LEED CI	Platinum Certified
Wells Fargo Phils C	Taguig	LEED CI	Platinum Certified*
JP Morgan Manila	Makati	LEED CI	Gold Certified
SunPower Modco	Laguna	LEED EBOM	Gold Certified
CitiTower	Makati	LEED EBOM	Certified
JY Campos Center	Taguig	LEED NC	Silver Certified
Guam Community College	Guam	LEED NC	Gold Certified
QC Museum	QC	LEED NC	Pending Submission

*Highest certified LEED Project in the Philippines with **87 points**



Barone International - Registered Projects

Air Terminal - AAFB	Guam	LEED NC	Registered
SunPower Fab 4	Laguna	LEED NC	Registered
Aeropark-Quad 1 Bldg A	Clark	LEED CS	Precertified Gold
Aeropark-Quad 1 Bldg B	Clark	LEED CS	Precertified Gold
Aeropark-Quad 1 Bldg C	Clark	LEED CS	Precertified Gold
Aeropark-Quad 1 Bldg D	Clark	LEED CS	Precertified Gold
Aeropark-Quad 1 Bldg E	Clark	LEED CS	Precertified Gold
ArcoVia – One Paseo	QC	LEED CS	Registered
ArcoVia – Two Paseo	QC	LEED CS	Registered
Ore Square	Taguig	LEED CS	Precertified Gold
World Commerce Place	Taguig	LEED CS	Registered
6786 Ayala Avenue	Makati	LEED CS	Registered
Citibank Square	Libis	LEED EBOM	Registered
RCBC Plaza	Makati	LEED EBOM	Registered
Southeast Asian Campus	Taguig	LEED CS	Registered
Filinvest - Activa	QC	LEED CS	Registered



Barone International - Registered Projects

Jollibee Tower	Ortigas	LEED CS	Registered
Anchor Land Building	Paranaque	LEED CS	Registered
Park McKinley West	Taguig	LEED CS	Registered
Cidada de Cebu – Bldg 1	Cebu	LEED CS	Registered
Cidada de Cebu – Bldg 2	Cebu	LEED CS	Registered
Monolith - Mpire West	QC	LEED CS	Planning
JEG Tower	Cebu	LEED CS	Planning
Frabelle - Franz de Salcedo	Makati	LEED CS	Planning
Maxim Integrated	Cavite	LEED EBOM	Planning
JY Campos Center	Taguig	LEED EBOM	Planning



Climate Change & Green Buildings

Yolanda 2014 – Tacloban, Philippines



Climate Change and the Philippines

Table 2: The Climate Risk Index for 2013: the 10 most affected countries

GLOBAL CLIMATE RISK INDEX 2015

1	(2)	Philippines	2.17	6479	6.65	24538.56	3.82	117
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Weather-related Loss Events in 2013 and 1994 to 2013

S. Kreft, D. Eckstein, L. Junghans, C. Kerestan and U. Hagen



Prepared with financial support from the German Federal Ministry for Economic Cooperation and Development (BMZ). Germanwatch is responsible for the content of this publication.

6	(3)	Pakistan	15.50	301	0.16	5419.77	0.65	146
7	(143)	Lao PDR	17.67	23	0.34	263.51	0.83	139
8	(32)	Vietnam	17.83	152	0.17	2397.04	0.50	121
9	(40)	Argentina	20.33	122	0.29	2010.00	0.22	49
10	(16)	Mozambique	21.67	119	0.46	88.21	0.33	178



Advice from NASA Filipino Scientist



NASA Filipino scientist urges focus on resiliency, adaptation

by Edd K. Usman
November 11, 2015

“A large fraction of Filipinos live in coastal areas and there should be a plan for them to start moving to higher elevations...”

The Manila Bulletin met Comiso when he came home for a few days to deliver a paper at the recent 2015 Asian Conference on Remote Sensing (ACRS) in Manila.

He presented a paper on “Remote Sensing Challenges in Monitoring Climate Change, Resilience and Growth” in the final day’s plenary session before over local and international participants from 40 countries.

He is an alumnus of the University of the Philippines (UP) in Diliman, Quezon City a degree in Physics in 1982. Comiso then studied further at the Florida State University (with a Master’s Degree in Physics), and moved on to work on a Doctorate Degree in Physics at the University of California in Los Angeles (UCLA).

Comiso pointed out the irony that developing countries are the ones suffering more from the effects of greenhouse gas warming than developed economies.

“The Philippines is highly vulnerable to climate change. It is ironic that a country that is contributing to only a small fraction of atmospheric greenhouse gases will be among the most affected by greenhouse gas warming.”

“My advice to the Philippine government is to focus on resiliency and adaptation. A large fraction of Filipinos live in coastal areas and there should be a plan for them to start moving to higher elevations,” he added.



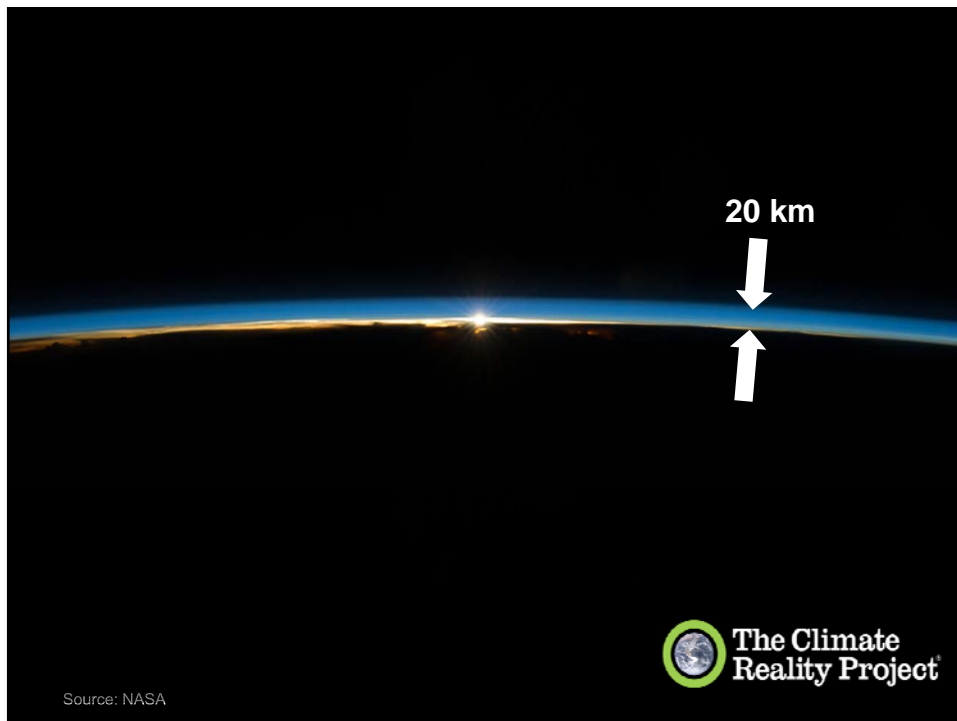
DR. JOSEFINO C. COMISO



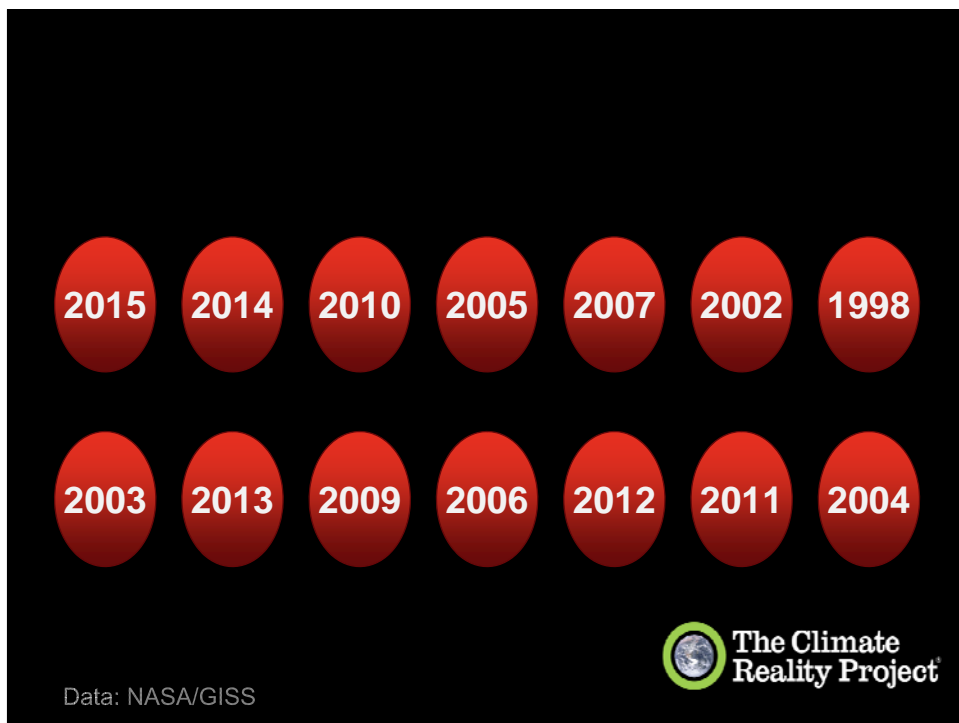
Climate Change Warriors - Philippines



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Source: NASA

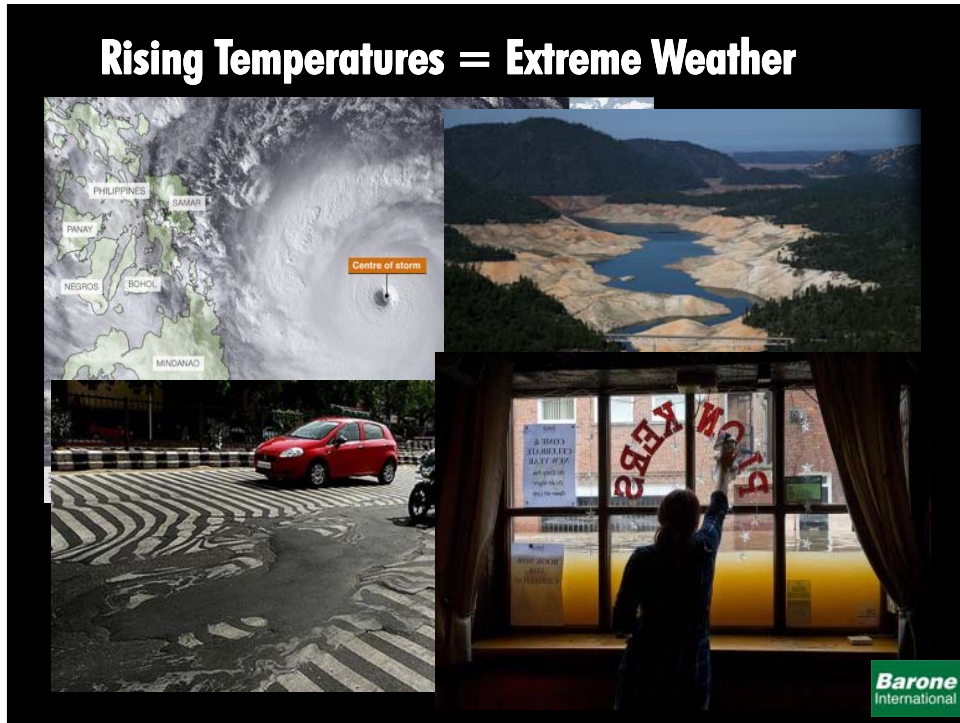


**May 2016 was the
hottest May on record**



**May 2016 was the
376nd consecutive month
with a global temperature
above the 20th century
average**





We need a bigger planet

Overstepping Ourselves

As our Ecological Footprint continues to exceed Earth's biocapacity, we overdraw from our future.



Source: Global Footprint Network, Earth Overshoot Day 2012

By the year **2030** we will need the equivalent of **two planets**
We are **turning resources** into **waste faster** than they can be regenerated putting the planet into **ecological overshoot**



Definition of Sustainability

Planet = Profit = People



A.K.A - Triple Bottom Line



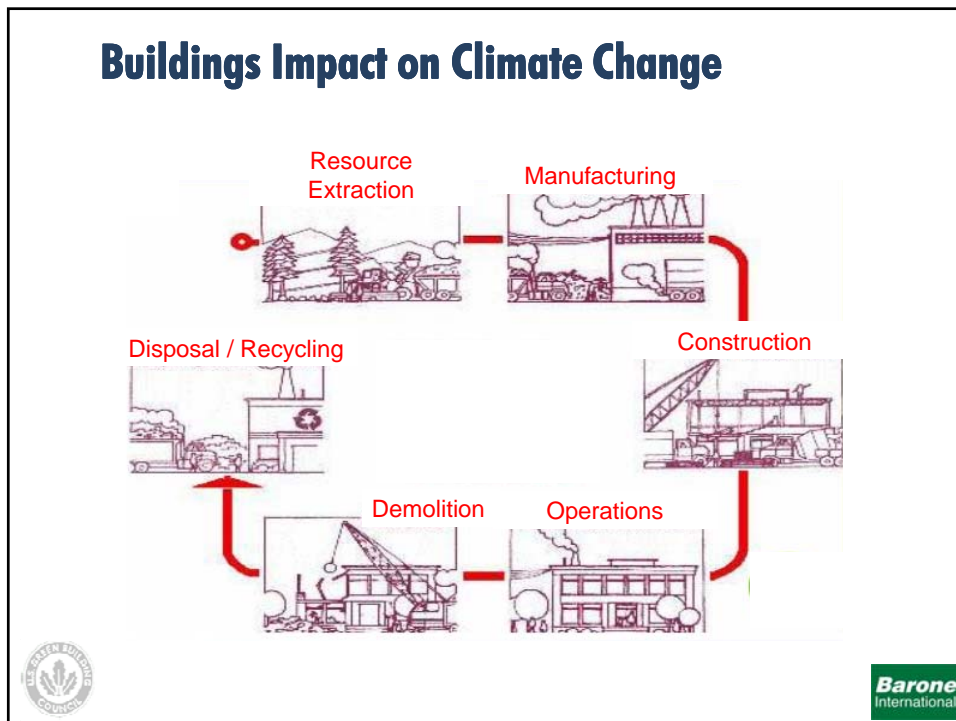




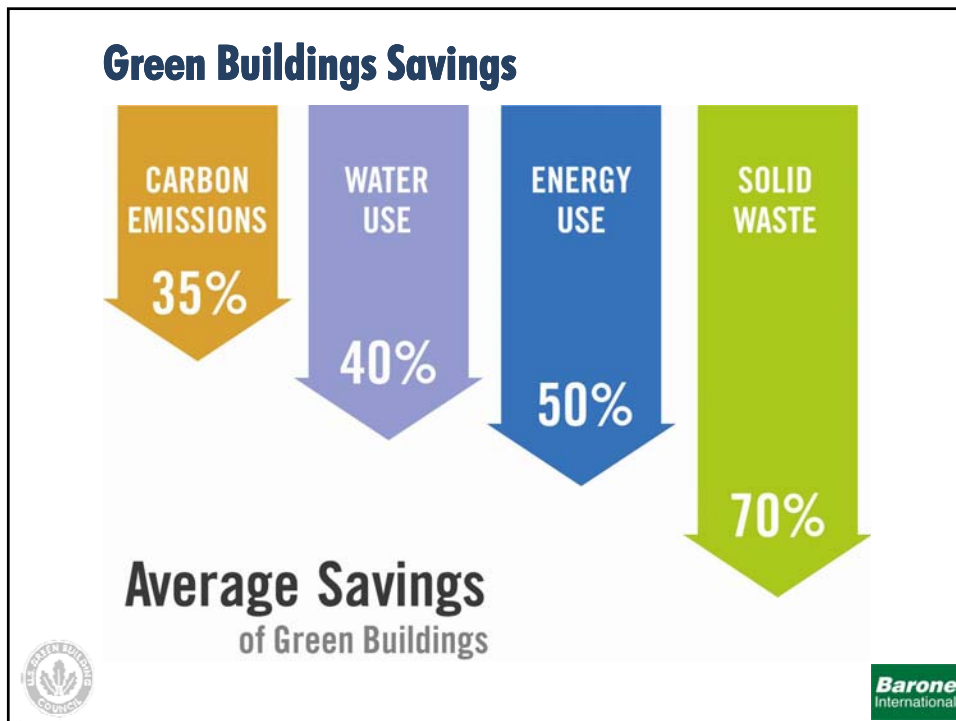
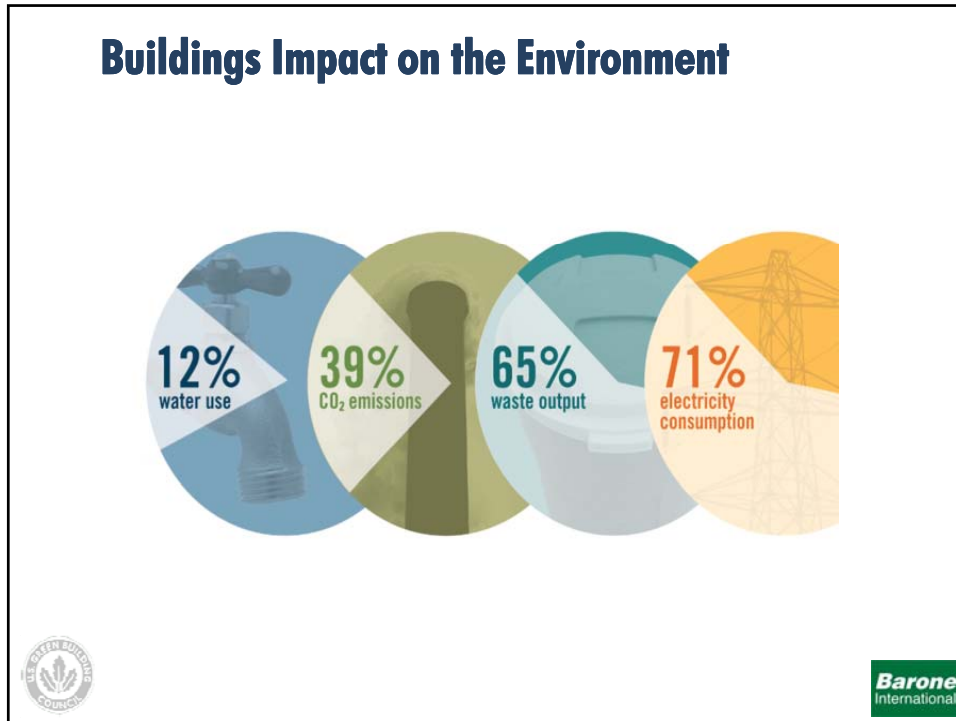
Buildings Impact on Climate Change

Global CO₂ Emissions by Sector

#1. Buildings
#2. Transportation
#3. Industry

Source: Energy Information Administration (2006). Emissions of Greenhouse Gases in the United States.





Green Buildings are Healthy

Green Building Occupants Are Healthier & More Productive

- In the U.S., people spend, on average, 90% or more of their time indoors*
- Green buildings typically have better indoor air quality and lighting

On average, green buildings save:

\$58 billion

of sick time from work annually

Green buildings add

\$180 billion

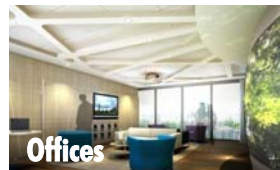
in increased worker productivity annually



Green Buildings Increase Productivity



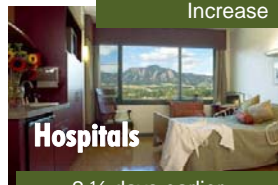
20% better test performance



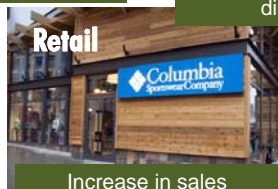
2-18% Productivity Increase



Increased productivity



2 ½ days earlier discharge



Increase in sales



In the beginning....

1970's - Oil Crisis



1980's - Sick Building Syndrome



1990's - Global Competition and Productivity



Unregulated Pollution



Earth Day



Barone International

U.S. Green Building Council

1993



Leadership in Energy & Environmental Design

Promote the efficient design, construction and operation of buildings

Rating system for the creation of "green building"

Non-Profit Organization funded by US Dept of Energy








LEED® is a tool to help Building Owners:

- Determine green project goals
- Identify green design strategies
- Measure and monitor progress
- Document success

LEED® is not a design specification or building code



Apples to Apples

Green Buildings can not be “**claimed**”, they must be “**earned**”



Not So Environmentally Friendly



Environmentally Friendly



Regional Sustainable Programs

LEED
LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN
United States of America

breem.international
United Kingdom

PHILIPPINE GREEN BUILDING INITIATIVE GREEN
Philippines

BERDE
Philippines

KSBK
Korean

CASBEE 建築環境総合性能評価システム
Comprehensive Assessment System for Built Environment Efficiency
Japan

green star
Australia

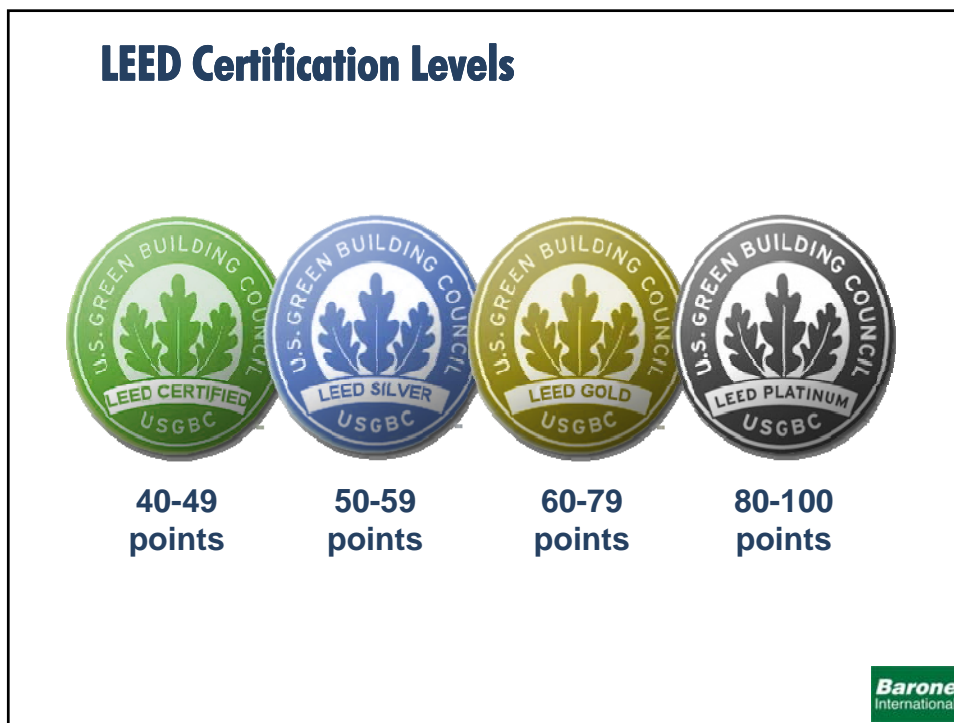
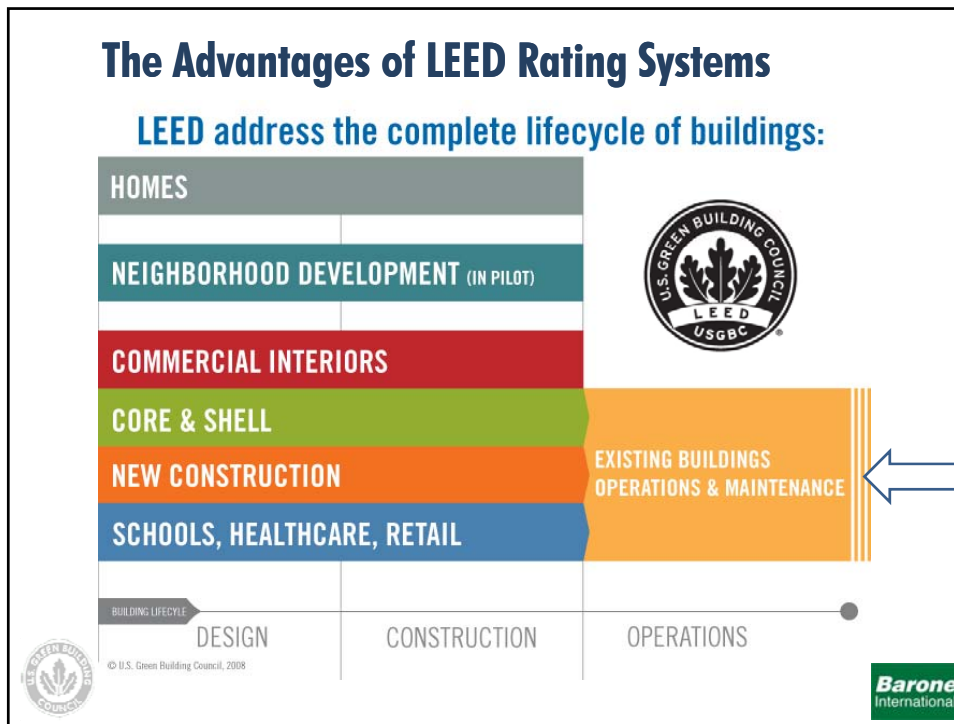
Barone International

Indonesia
Malaysia
Thailand
Taiwan
Vietnam
Singapore
China
India
Hong Kong

LEED IS GLOBAL.

With projects in over 135 countries, LEED has become the most widely recognized benchmark for green buildings in the world.

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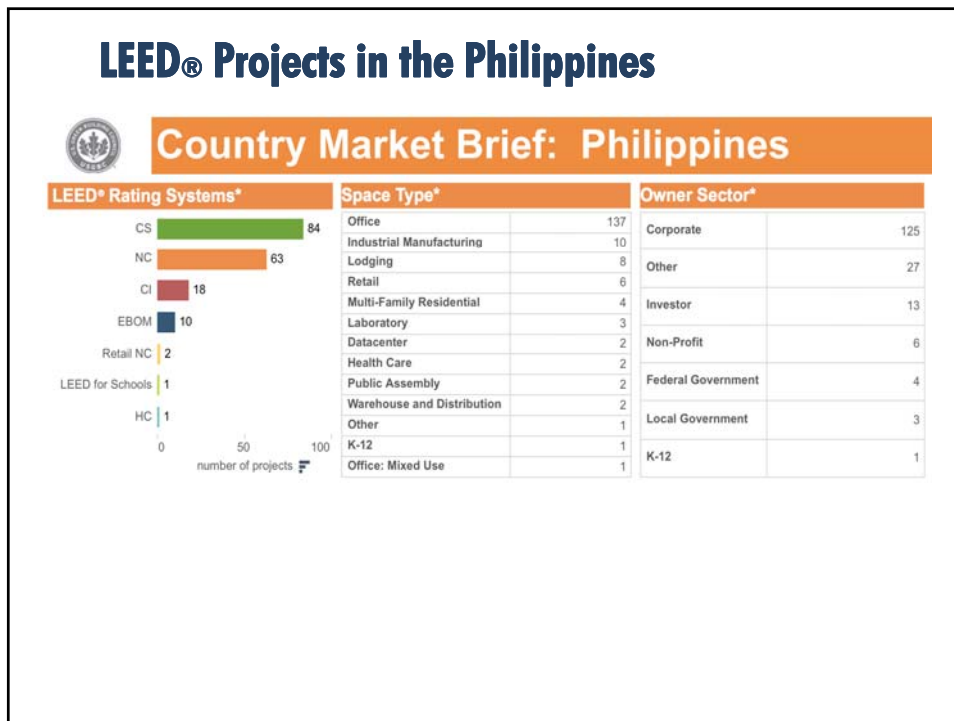
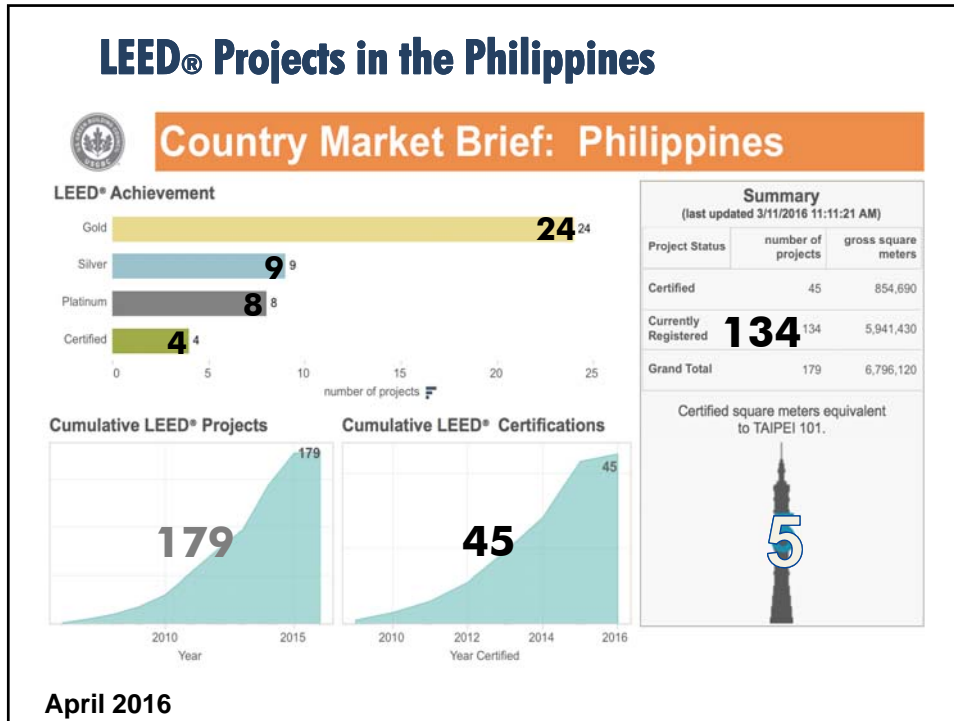


LEED® Projects Worldwide

<u>Certified</u> 44,941*	<u>Registered</u> 44,327*
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*As of April 2016

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LEED® Certified Projects in the Philippines

<p>2006 LEED NC SILVER Texas Instruments - Baguio</p>  <p>1st</p> 	<p>2011 LEED EBOM GOLD ADB Headquarters – Mandaluyong</p>   <p>1st</p> 	<p>2011 LEED CI SILVER Shell Shared Services - Makati</p>  <p>1st</p> 
<p>2010 LEED NC GOLD Texas Instruments - Pampanga</p> 	<p>2012 LEED CS GOLD Sun Life Centre – Taguig</p>  	

LEED® Certified Projects in the Philippines

<p>1st</p>  <p>2013 LEED NC (Retail) CERTIFIED Starbucks Drive Thru – Taguig</p>	<p>2012 LEED NC GOLD Aegis People Support – Cebu</p> 	<p>1st</p> <p>2013 - LEED EBOM GOLD SunPower FAB2 –</p> 
<p>1st</p> <p>2013 LEED CS PLATINUM Zuellig Building – Makati</p> 	<p>2012 LEED NC GOLD The Mind Museum – Taguig</p> 	<p>1st</p> <p>2013 LEED CI PLATINUM Bridgebury Reality – Makati</p> 
	<p>2013 LEED CI PLATINUM Sun Life of Canada – Taguig</p> 	

LEED® Certified Projects in the Philippines



2014 - LEED CS GOLD
Megaworld – 8 Campus Place Bldg A, B & C -
Taguig



Highest Scoring
87
2nd Highest Scoring
84
2014 - LEED CI Platinum
Wells Fargo – 8 Campus Place Bldg A, B & C -
Taguig



2015 - LEED EBOM GOLD
SC Johnson and Son - Makati



2015 - LEED CI GOLD
JP Morgan - Makati



2015 - LEED EBOM GOLD
SunPower Modco - Laguna

LEED® Certified Projects in the Philippines



2015 - LEED CI PLATINUM
HSBC New Alabang 7th Floor Office -
Alabang



1st
2015 - LEED CS PLATINUM (LEED 2009)
Pioneer House - Cagayan De Oro City



1st
2015 - LEED NC SILVER
Seda Nuvali – Sta Rosa



2016 - LEED NC GOLD
ADB Expansion –
Mandaluyong

LEED® Certified Projects in the Philippines



2015 – LEED EBOM CERTIFIED
Citibank Tower – Makati



2016 - LEED GOLD
Bench Building - Taguig



feather·friendly
for the prevention of bird collisions



2016 – LEED CS GOLD
8 Rockwell - Makati



2016 – LEED CS GOLD
Cocolight Building – Taguig



2016 – LEED NC SILVER
JY Campos Center - Taguig

1st



LEED® Certified Projects in the Philippines

- MWC Rodriguez WTPP - QC 2013 LEED-NC Certified
- ADGT Building 3 – Cavite 2013 LEED-NC Gold
- World Bank – Taguig 2013 LEED-CI Gold
- Pilipinas Shell Admin – Batangas 2014 LEED-NC Silver
- MCC Office Building – QC 2014 LEED-CS Gold
- KMC MAG Group HQ – Taguig 2014 LEED-CI Gold
- BTTC Center – San Juan 2014 LEED-CS Gold
- HSBC Office Fit-out – Alabang 2015 LEED-CI Gold
- Procter & Gamble SDC – Laguna 2015 LEED-NC Gold
- DTCC Manila - Makati 2015 LEED-CI Silver
- Unilab Corporate Center – Manila 2015 LEED-CS Gold



LEED® Certified Projects in the Philippines



45

total
LEED Certified
projects*

*as of May 2016



Registered LEED® Projects in the Philippines




134

Total LEED
registered projects

LEED-EBOM Projects in the Philippines

 Asian Development Bank	2012 LEED Gold Certified
 SunPower Fab2	2013 LEED Gold Certified
 SC Johnson and Son	2015 LEED Gold Certified
 SunPower Modco	2015 LEED Gold Certified
 CitiTower	2015 LEED Certified
 Cocoon Hotel	Registered (Targeting 2016)
 RCBC Plaza	Registered (Targeting 2017)
 Citibank Square	Registered (Targeting 2017)
 6780 Ayala Ave	Registered (Targeting 2020)
 JY Campos Center	Pending Registration





LEED

Version 2009 (v3)

- LEED 2009 will be **discontinued October 31, 2016**
- Projects registered starting **November 1, 2016** will be **LEED v4**
- LEED 2009 projects must be **certified by June 30, 2021**



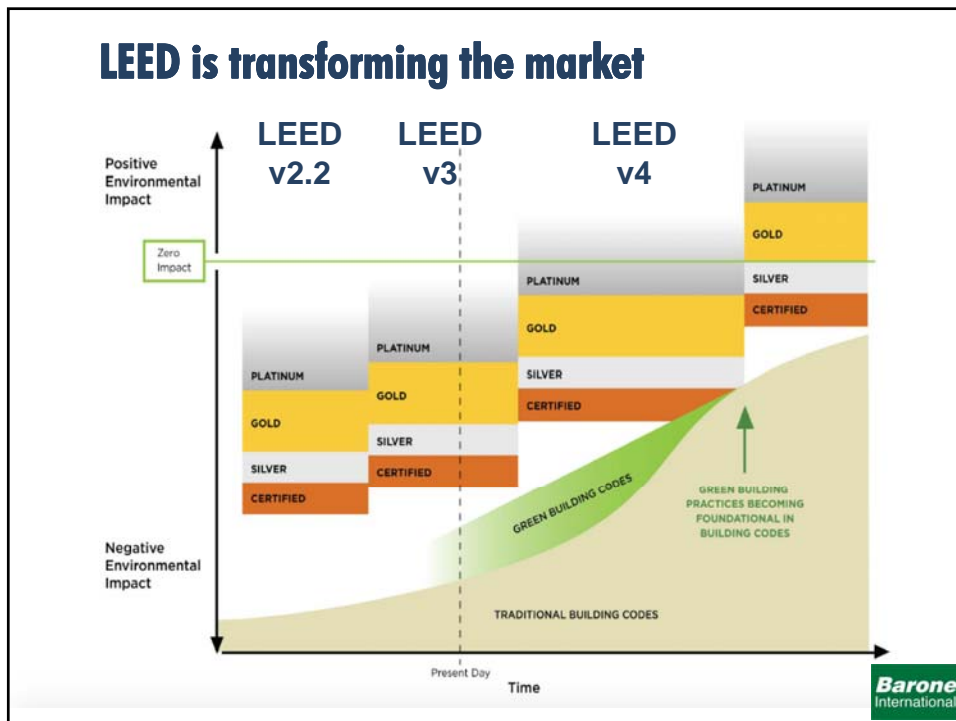
U.S. GREEN BUILDING COUNCIL f t in y






Introducing LEED v4

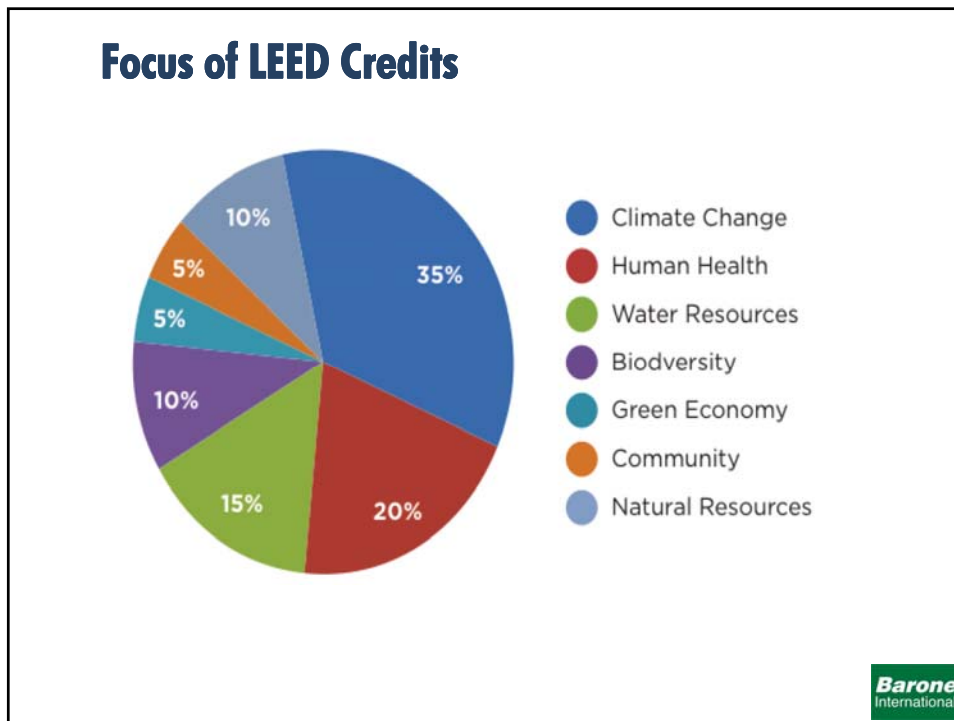
LEED v4 introduces a unified LEED experience for the entire world to share – one that offers flexibility for *all* green building projects, with new market sectors and global best practices built-in.

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LEED v4 Raising the Bar – Zuellig Building

LEED v2.0 Released 2004	LEED v3.0 Released 2009	LEED v4.0 Released 2012
		
LEED Platinum Awarded 2013	LEED Gold If certified under LEED v3	LEED Silver If certified under LEED v4





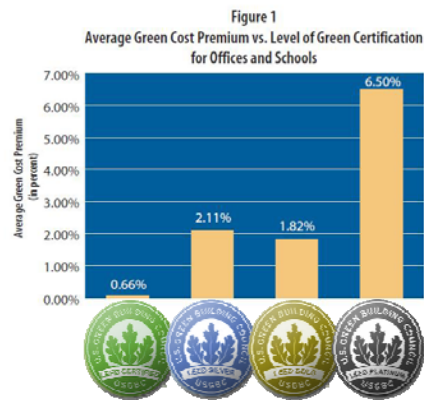
The Cost of Green

Public perception:

- Green costs 17% more than typical buildings (2007)

Actual average increase:

- only 1% - 6%



Why Green Can Cost More

Cost increase when “greening” a pre-existing design

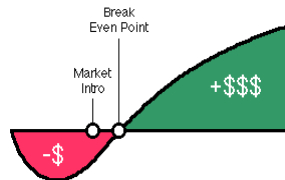


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International

The Value of Green

Payback

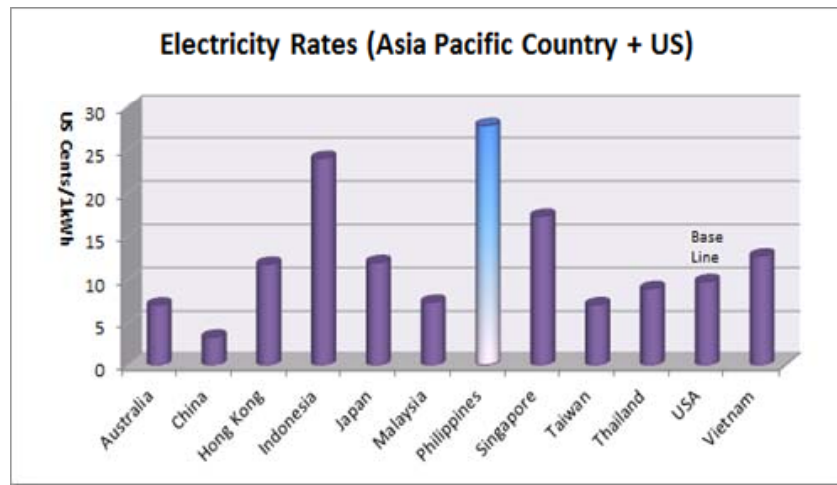
- Worldwide average, payback of green investment is approximately **2.5 years**
- Average payback in Philippines is approximately **1.5 - 2 years** based on costs of electricity



Sources: Return on investments for LEED / Green Buildings - Ed LeBard, 3 Design Consulting

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International

Cost of Electricity



Barone International

The Value of Green

Studies have found no significant cost difference between LEED certified buildings and other new buildings

“ Certification as a green building was not a significant predictor of building costs ”



Sources: Ed LeBard, 3 Design Consulting and Davis Langdon & Seah

Barone International

Business Case for Green Buildings



“What is clear is that there is mounting evidence that in many markets across the world, part of being a better quality building means being a green building”
- World Green Building Council – The Business Case for Green Buildings, February 2013



RCBC Plaza and its mission for Gold



RCBC Plaza, Leading you
to a Greener Environment

Dean Barone, LEED AP BD+C, ID+C, O+M, ISSP-SA

LEED for Existing Buildings :
Operations & Maintenance

Barone International



LEED Green Building Rating System



NEW CONSTRUCTION
MAJOR RENOVATIONS
SCHOOLS
HEALTHCARE
RETAIL:
NEW CONSTRUCTION
MAJOR RENOVATIONS
HOMES

RETAIL:
NEW CONSTRUCTION
MAJOR RENOVATIONS
HOMES

CORE AND SHELL
DEVELOPMENT

COMMERCIAL INTERIORS
RETAIL:
COMMERCIAL INTERIORS
EXISTING BUILDINGS
OPERATIONS & MAINTENANCE



LEED EBOM Process



Can feel like chasing your tail




LEED EBOM requires recertification




Must re-certify every **five years** to keep LEED-EBOM certification





LEED for Commercial Interiors




LEED-CI | Leadership in Energy and Environmental Design
For Corporate Interiors




Tenant's applying for LEED CI will receive approx 60% of their LEED points from the RCBC Plaza - LEED EBOM certification



LEED EBOM - Stages



- **Pre-Performance Period** (July – October 2015)
 - LEED EBOM - Feasibility Study
 - Provide Recommendations
 - Secure Approvals
 - Kick-Offs & Sustainability Charrette



RCBC Plaza – Feasibility Study

July - October 2015



LEED® EB:OM Categories and Points

- Sustainable Sites**
 - 26 Points
- Water Efficiency**
 - 14 Points
- Energy and Atmosphere**
 - 35 Points
- Materials & Resources**
 - 10 Points
- Indoor Environmental Quality**
 - 15 Points
- Innovation in Operations**
 - 6 Points



110 Points
6 Categories



Prerequisites

Building must meet **nine certification prerequisites**



Energy Performance
kWh

ENERGY STAR

Refrigerant Mgmt

IAQ Performance

Energy Mgmt

Green Cleaning

Water Efficiency

Solid Waste

Reduce
Recycle
Reuse
Rebuy
Purchasing

LEED - EB



SS - Sustainable Sites

26 Total Points



Bldg Exterior Mgmt Plan

Alt Commuting Transportation

Pest, Erosion & Landscape

Heat Island - Roof

Site Dev

Heat Island - Non-Roof

Stormwater Quantity Control

Light Pollution

LEED - EB



WE – Water Efficiency 14 Total Points






Cooling Tower Water Management



Water Performance Measurement



Water Efficient Landscaping



Water Efficient Fix





Water Efficient Fixtures

LEED - EB

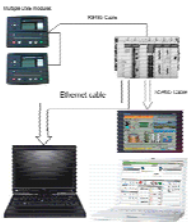


EA - Energy & Atmosphere 35 Total Points







Renewable Energy




Performance Mgmt



Refrig Mgmt



Bldg Commissioning




Emissions Reduction Reporting

Energy Performance

EPA ENERGY STAR ENERGY PERFORMANCE RATING	POINTS
71	1
73	2
74	3
75	4
76	5
77	6
78	7
79	8
80	9
81	10
82	11
83	12
85	13
87	14
89	15
91	16
93	17
95	18

LEED - EB



MR - Materials & Resources 10 Total Points

Waste Management



Construction Waste Management



Consumables



Durable Goods



Facilities Additions



Waste Stream Audit

Sustainable Purchasing



Facilities Alterations



Durable Goods



Sustainable Furniture



Food



Reduced Mercury in Lamps

LEED - EB



IEQ-Indoor Environmental Quality 15 Total Pts

Green Cleaning



Green Cleaning Program



Indoor Pollution Control



Cleaning Equipment



Green Cleaning Products

Sustainable Purchasing



Daylight and Views



VOCs



Facilities Alterations



IAQ Management



Occupant Comfort



Reduce Particulates



Control Lighting

LEED - EB



Innovation in Operations **6 Total Points**



Well done!

Exemplary



Innovation



Sustainable Bldg Cost Impacts

U.S. GREEN BUILDING COUNCIL
LEED Education Resources News & Events
Home / LEED / LEED Resources /

LEED Pilot Credit Library

The LEED Pilot Credit Library is intended to facilitate the introduction of new through LEED 2009 project evaluations before they are sent through the ball



Innovation & Design Process



One Point to hire a LEED Accredited Professional



RCBC Plaza – LEED Target

Feasibility Study Results



60 – 65 Points



Approvals

RCBC Plaza is Registered with the USGBC
– March 2016



U.S. GREEN BUILDING COUNCIL



Dear Dean Barone,

Your LEED project has been successfully registered in LEED Online.

Project ID	: 1000067796
Project Title	: RCBC Plaza - Makati City
Project Rating System	: LEED-EB:OM v2009
Registration Type	: Individual Project
Registration Date	: 02/29/2016
Project Location	: Makati City,03,PH,1226

You may now log into LEED Online to manage your project and begin the application process. The first time you log in, you will be presented with a set of 'Getting Started' information that will help you kick off the certification process. Further technical LEED



LEED EBOM - Stages



- **Pre-Performance Period (Completed)**
 - LEED EBOM - Feasibility Study
 - Provide Recommendations
 - Secure Approvals
 - Kick-Offs & Sustainability Charrette
- **Performance Period (12 months – July 2016 to June 2017)**
 - **Tenant Engagement Presentation**
 - Implementation of Policies & Procedures
 - Taking corrective actions
 - Collecting monthly energy use
 - Data Collection
- **Post Performance Period (July – November 2017)**
 - Summarize building data and submit to GBCI for certification



Technology vs Performance



“An inefficient system run well can perform better than an efficient system run poorly”

- Newman Consulting



Salamat Y'all



Sustainability Consultants

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