

LEED EB:OM Credit Categories

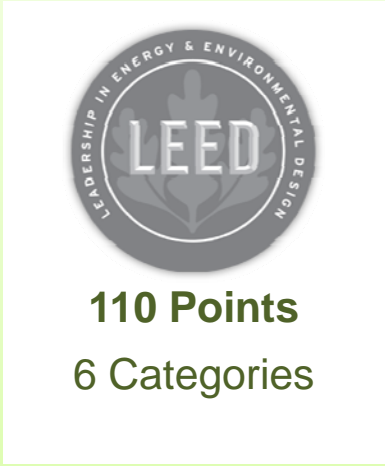


Engr Theresa Palma-Austria, LEED AP O+M
 Arch Laurice Orillano-Ayab, LEED GA
LEED for Existing Buildings :
Operations & Maintenance
 Barone International



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



Sustainable Sites



Sustainable Sites

- LEED Certified Design & Construction
- Building Exterior and Hardscape Management Plan
- Integrated Pest Management, Erosion Control, and Landscape Management
- Alternative Commuting Transportation
- Site Development – Protect or Restore Habitat
- Stormwater Quantity Control
- Heat Island Reduction – Nonroof & Roof
- Light Pollution Reduction

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Sustainable Sites

Building Exterior and Hardscape Management Plan

Integrated Pest Management, Erosion Control, and Landscape Management Plan

- Encourage environmentally sensitive building exterior and hardscape management practices
- Provide a clean, well-maintained and safe building exterior
- Preserve ecological integrity, enhance natural diversity and protect wildlife



Sustainable Sites

Alternative Commuting Transportation

- Reduce pollution and land development impacts from automobile use for commuting
 - Use mass transit, carpools - vanpools; rideshare options
 - Reward low-emitting, fuel-efficient or alternative-fuel vehicle Owners
 - Encourage bicycling, human-powered conveyances and walking
 - Encourage telecommuting or compressed work weeks



Sustainable Sites

Alternative Commuting Transportation

STREET SPACE FOR 60 PEOPLE

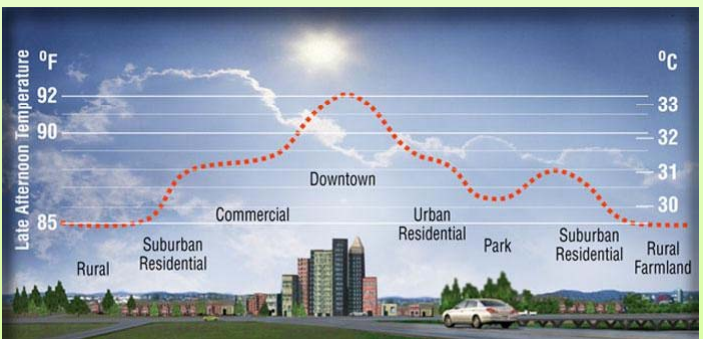
Press office, City of Münster, Germany

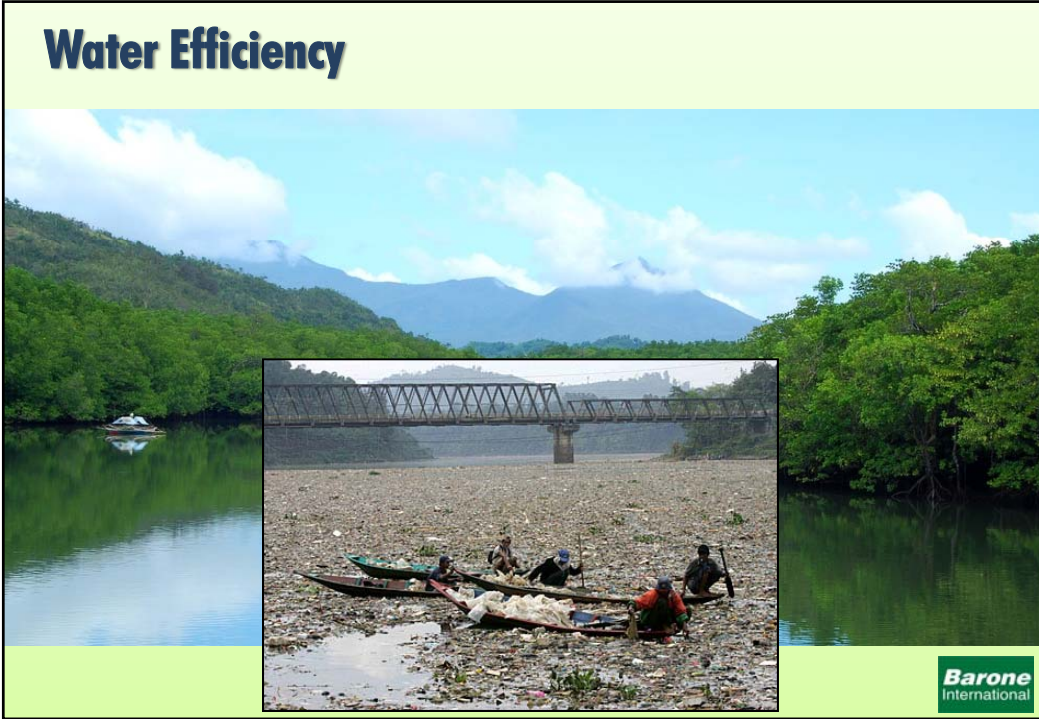
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Sustainable Sites

Heat Island Reduction – Nonroof & Roof

- Reduce heat islands to minimize impacts on microclimates and human and wildlife habitats
 - Parking inside building – reduce surface parking
 - Cover Parking
 - Reflective Roofs





- ### Water Efficiency
- Minimum Indoor Plumbing Fixture and Fitting Efficiency
 - Additional Indoor Plumbing Fixture and Fitting Efficiency
 - Water Performance Measurement
 - Water Efficient Landscaping
 - Cooling Tower Water Management – Chemical Management and Non-Potable Water Use
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Water Efficiency

Minimum Indoor Plumbing Fixture and Fitting Efficiency

Additional Indoor Plumbing Fixture and Fitting Efficiency

- Reduce water use within buildings to reduce the burdens on potable water supply and wastewater systems
 - Waterclosets
 - Urinals
 - Faucets
 - Showers



Water Efficiency

Water Performance Measurement

- Measure building and subsystem water performance
- Understand consumption patterns and identify opportunities for additional water savings



Water Efficiency

Water Efficient Landscaping

- **Limit or eliminate the use of potable water for landscape irrigation**
 - Rainwater catchment for irrigation
 - Use native plants



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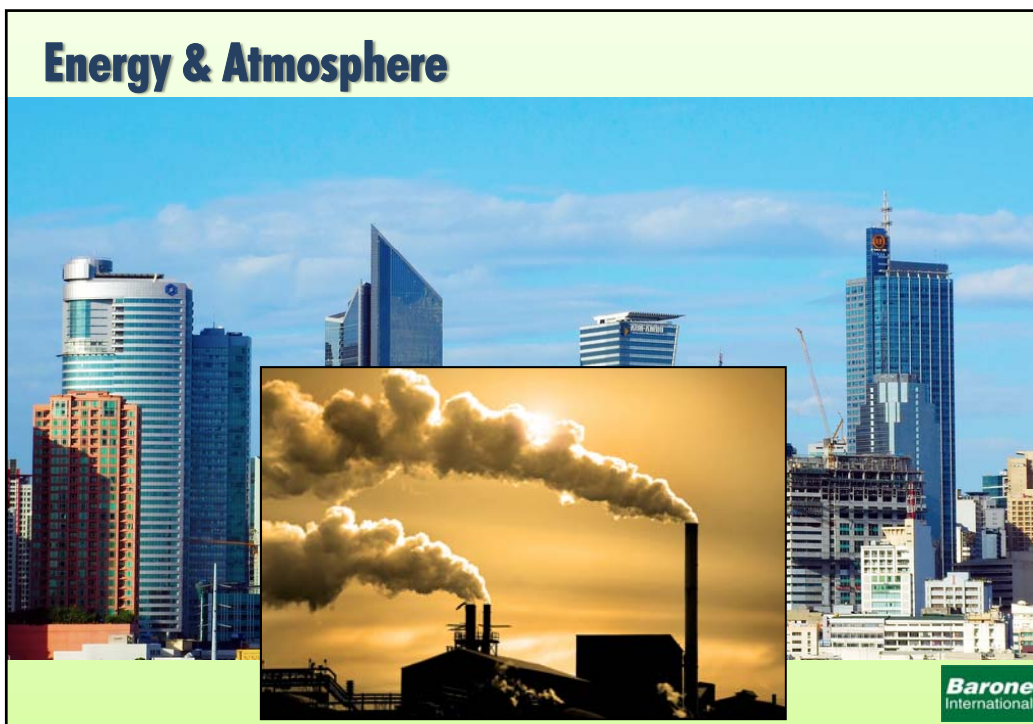
Water Efficiency

Cooling Tower Water Management – Chemical Management

- **Reduce potable water consumption for cooling tower equipment**
 - Water management plan for the cooling tower that addresses chemical treatment, bleed-off and biological control
 - Automatic controls to adjust the chemical concentrations



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Energy and Atmosphere

- Energy Efficiency Best Management Practices
- Minimum Energy Efficiency Performance
- Optimize Energy Efficiency Performance
- Fundamental Refrigerant Management
- Enhanced Refrigerant Management
- Existing Building Commissioning
- Performance Measurement – Building Measurement and System Level Metering
- On-Site and Off-Site Renewable Energy
- Emissions Reduction

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Energy and Atmosphere

Energy Efficiency Best Management Practices

- To ensure that energy-efficient operating strategies are maintained and provide a foundation for training and system analysis
 - Develop a Building Operating Plan that provides details on how the building is to be operated and maintained



Energy and Atmosphere

Minimum Energy Efficiency Performance

Optimize Energy Efficiency Performance

- Establish the minimum level of operating energy efficiency performance
 - U.S. Department of Environmental Protection Agency’s ENERGY STAR® Portfolio Manager tool
 - Achieve an energy performance rating of at least 69

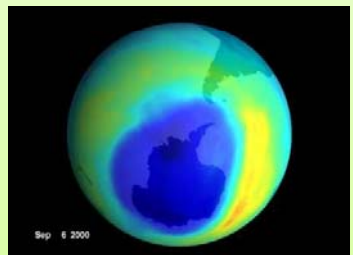


Energy and Atmosphere

Fundamental Refrigerant Management

Enhanced Refrigerant Management

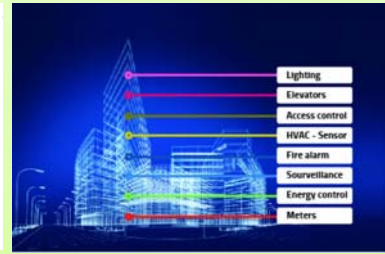
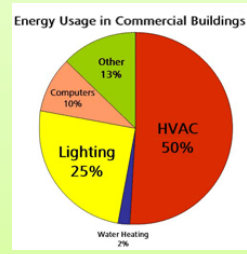
- Reduce ozone depletion
- Comply with the Montreal Protocol while minimizing direct contributions to global climate change.
 - Zero use of chlorofluorocarbon (CFC)-based refrigerants
 - Use refrigerants that minimize or eliminate ozone depletion and global warming potential



Energy and Atmosphere

Performance Measurement – Building Measurement and System Level Metering

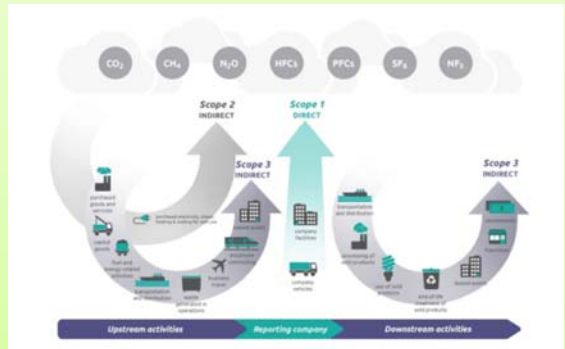
- Provide information to support the ongoing optimization of building energy performance and identify opportunities for additional energy-saving investments
 - Computer-based building automation system (BAS) that monitors and controls major building systems
 - employ system-level metering covering at least 40% or 80% of the total expected annual energy consumption of the building



Energy and Atmosphere

Emissions Reduction

- Document the emissions reduction benefits of building efficiency measures



Materials & Resources



Materials and Resources

Sustainable Purchasing Policy

Sustainable Purchasing:

- Ongoing Consumables
- Durable Goods
- Furniture
- Facilities Alterations and Additions
- Reduce Mercury In Lamps
- Food

Sustainable Waste Management Policy

Sustainable Waste Management:

- Waste Stream Audit
- Ongoing Consumables
- Durable Goods
- Facilities Alterations and Additions



Materials and Resources

Sustainable Purchasing Policy

- **Reduce the environmental impacts of materials acquired for use in the operations, maintenance and upgrades of buildings**
- Environmentally Preferable Purchasing (EPP) policy



Materials and Resources

Sustainable Waste Management Policy

- Reduction of waste generated by building occupants that is hauled to and disposed of in landfills



Materials and Resources

Sustainable Purchasing:

- Reduce the environmental and air quality impacts of the materials acquired for use in the building
 - Ongoing Consumables
 - Durable Goods
 - Furniture
 - Facilities Alterations and Additions
 - Reduce Mercury In Lamps
 - Food



Materials and Resources

Sustainable Waste Management

- Reduction of waste and toxins generated by building occupants that is hauled to and disposed of in landfills
 - Ongoing Consumables
 - Durable Goods
 - Facilities Alterations and Additions



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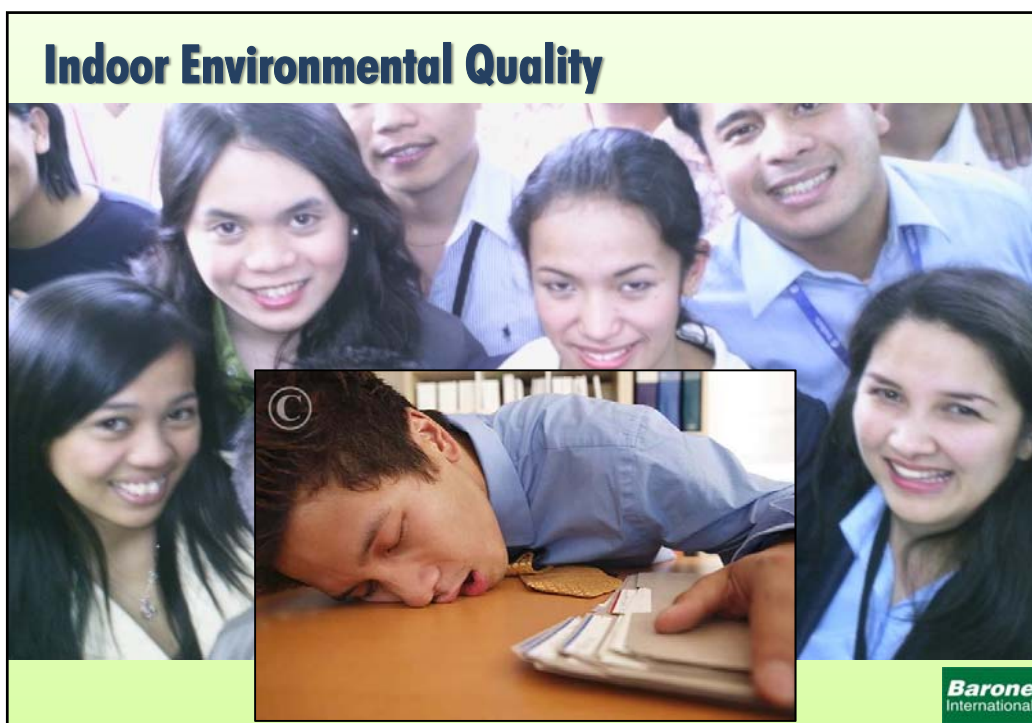
Materials and Resources

Sustainable Waste Management - Waste Stream Audit

- Waste stream audit of the building's entire ongoing consumables waste stream to establish a baseline that identifies the types of waste making up the waste stream
 - Identify opportunities for increased recycling and waste diversion



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Indoor Environmental Quality

Minimum Indoor Air Quality Performance
Environmental Tobacco Smoke (ETS) Control
IAQ Best Management Practices:

- Indoor Air Quality Management Program
- Outdoor Air Delivery Monitoring
- Increased Ventilation
- Reduce Particulates in Air Distribution
- IAQ Management for Facilities Alterations and Additions

Occupant Survey
Controllability of Systems – Lighting
Occupant Comfort – Thermal Comfort Monitoring
Daylight and Views

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Indoor Environmental Quality

Minimum Indoor Air Quality Performance

- Establish minimum indoor air quality (IAQ) performance to enhance indoor air quality in buildings, thus contributing to the health and well-being of the occupants
 - Outdoor air ventilation rate per ASHRAE Standard 62.1–2007



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Indoor Environmental Quality

Environmental Tobacco Smoke (ETS) Control

- To prevent or minimize exposure of building occupants, indoor surfaces and systems to environmental tobacco smoke (ETS)
 - Prohibit smoking in the building.
 - Prohibit on-property smoking within 25 feet of entries, outdoor air intakes and operable windows.



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Indoor Environmental Quality

IAQ Best Management Practices - Indoor Air Quality Management Program

- Enhance indoor air quality to prevent the development of indoor air quality problems in buildings
- Correcting indoor air quality problems when they occur and maintaining the well-being of the occupants
 - Monitor all purchasing policies for VOC's in cleaning materials, paints, building materials, etc



Indoor Environmental Quality

Occupant Survey

- Assessment of building occupants' comfort
 - Thermal comfort
 - Acoustics
 - Indoor air quality (IAQ)
 - Lighting levels
 - Building cleanliness
 - Other comfort issues
- Representative sample of building occupants making up at least 30% of the total occupants



Indoor Environmental Quality

Green Cleaning Policy

Green Cleaning:

- High Performance Cleaning Program
- Custodial Effectiveness Assessment
- Purchase of Sustainable Cleaning Products and Materials
- Sustainable Cleaning Equipment
- Indoor Chemical and Pollutant Source Control
- Indoor Integrated Pest Management



Indoor Environmental Quality

Green Cleaning Policy

Green Cleaning - High Performance Cleaning Program

- Reduce the exposure of building occupants and maintenance personnel to potentially hazardous chemical, biological and particulate contaminants, which adversely affect air quality, human health, and the environment



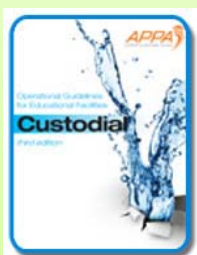
Non-toxic
ECO-FRIENDLY
SOLUTIONS
for **your BUSINESS !**



Indoor Environmental Quality

Green Cleaning - Custodial Effectiveness Assessment

- Conduct an audit in accordance with APPA Leadership in Educational Facilities' (APPA) "Custodial Staffing Guidelines" to determine the appearance level of the facility



Indoor Environmental Quality

Green Cleaning - Purchase of Sustainable Cleaning Products and Materials

- Reduce the environmental impacts of cleaning products, disposable janitorial paper products and trash bags



Indoor Environmental Quality

Green Cleaning - Sustainable Cleaning Equipment

- Implement a program for the use of janitorial equipment that reduces building contaminants and minimizes environmental impact
 - Vacuum cleaners are certified by “Green Label”
 - Maintenance equipment with devices for capturing fine particulates
 - Powered equipment designed to minimize vibration and user fatigue
 - Battery-powered equipment



Indoor Environmental Quality

Green Cleaning - Indoor Chemical and Pollutant Source Control

- Employ permanent entryway systems (grilles, grates, mats) at least 10 feet long in the primary direction of travel to capture dirt and particulates entering the building at all public entry points



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Indoor Environmental Quality

Green Cleaning - Indoor Integrated Pest Management

- Use least-toxic chemical pesticides
- Minimum use of chemicals
- Use chemicals only in targeted locations
- Use chemicals only for targeted species



Innovation in Operations



Innovation in Operations

Innovation or Leadership in Sustainable Practices

- To provide building operations, maintenance and upgrade teams with the opportunity to achieve additional environmental benefits achieved beyond those already addressed by the LEED EB:OM Rating System

Exemplary Performance

- Earned for achieving double the credit requirements and/or achieving the next incremental percentage threshold of an existing credit in LEED



Innovation in Operations

LEED Accredited Professional

- At least one principal participant of the project team shall be a LEED Accredited Professional (AP)



Innovation in Operations

Documenting Sustainable Building Cost Impacts

- Document overall building operating costs for the previous 5 years and submit to the USGBC



Salamat Y'all



Sustainability Consultants

673 Boni Avenue, 2F Unit E
 Mandaluyong City, Philippines
dean.barone@baroneinternational.com

www.baroneinternational.com