GREEN BUILDING COUNCIL BRASIL

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MITSUBISHI ELECTRIC

Changes for the Better

Mitsubishi Electric Green Building Solution Can Help to Get LEED Certification

What is LEED?

Leadership in Energy Environmental Design (LEED) is a building rating system which was established by the non-profit U.S. Green Building Council (USGBC) to certify the green buildings.

LEED is applicable for buildings at any stage in their life-cycles, from new constructions to existing buildings, as well as for all building types since residential to commercial buildings, hotels, retails and industries.

LEED Project Types, based on LEED v4.1:

- Building Design and Construction (BD+C) for new constructions or major renovations;
- Interior Design and Construction (ID+C) for complete interior fit-out projects;
- Building Operations and Maintenance (O+M) for improvement of existing buildings;
- Cities and Communities for new cities and communities that are in the planning/designing stage and for existing cities and communities that are more than 75% built out.
- Residential for building design and construction projects of new single-family homes, new multifamily homes and new multifamily homes core and shell.

LEED Certification v4.1

The LEED Certification v4.1 is the global standard for green design and sustainable buildings which aims to guide the owners and operators in the implementation of strategies to improve the building performance. There are four levels of LEED Certification (Certified, Silver, Gold and Platinum) that correspond to the number of credits accrued in eight green design categories:

- Innovation
- Energy and Athmosphere
- Water Efficiency
- Indoor Environmental Quality
- Location and Transportation
- Sustainable Sites
- Materials and Resources
- Regional Priority

Certification Level	Number of Points
Platinum	80 or higher
Gold	60 - 79
Silver	50 - 59
Certified	40 - 49

Why get LEED Certification v4.1?

LEED certification v4.1 means healthier and more productive environments, highly efficient and cost-saving buildings, and cost-saving green buildings from increased properties value, higher rental rates and lower operating costs.

BENEFITS:

Economical

- Operating costs decrease;
- Property value increase;
- Higher rental rates;
- Faster occupancy of property;
- Modernization and less building obsolescence;
- Tax incentives and tax exemptions - many government agencies grant benefits for sustainable constructions;

Environmental

- Rational use and reduction of natural resource extraction;
- Reduction of water and energy consumption;
- Mitigating the effects of climate change;
- Use of materials and technologies with low environmental impact;
- Reduction, treatment and reuse of construction and operation waste.

Social

- Enhancement of building occupants health, comfort and productivity;
- Economic growth of communities surrounding green buildings;
- Stimulation of public policies to promote sustainable constructions;

Mitsubishi Electric Green Building Solution

VARIABLE REFRIGERANT FLOW (VRF)

Precise and independent control for each user, according to the comfort conditions and the desired hours of use. Perfect match between demand and capacity, eliminating waste of energy and contributing strongly for LEED credits.

CHILLER REFRIGERATION SYSTEM

Efficient solutions of heating, air conditioning, refrigeration systems for industries or IT environments, such as datacenters, capable to enhance the profitability and comfort of buildings.

MULTI-SPLIT SYSTEM

Mitsubishi Electric Multi-Split System is designed to allow up to 8 indoor units to be connected to a single outdoor unit. Through the cutting-edge inverter technology we are able to offer industry-leading levels of energy-efficient operation for both heating and cooling.

LOSSNAY

Lossnay air renewal technology delivers the ultimate in purity with minimum power consumption. The best solution for eco-friendly and healthy environments.

ELEVATOR

Mitsubishi Electric elevators are contributing to the development and expansion of high-tech cityscapes around the world. And applying IT-based tools, that aid in developing artificial intelligence technology, elevators help to provide an efficient and energy-saving ride.

ESCALATOR

Mitsubishi Electric is an industry leader in vertical transportation which provides since the conventional to the world's first spiral escalator. Systems incorporate innovative engineering and energyefficient technologies that ensure operation efficiency, including the utmost reliability, durability and safety.

JET TOWEL (Hand Dryer)

Mitsubishi Electric's highspeed "Jet Towel" dries hands completely in a matter of seconds using "jet blasts" of air on each side of the hand. The brushless motor, which incorporates Mitsubishi Electric's industry-leading energy-efficiency technology, keeps power consumption low.

REGENERATIVE CONVERTER
Using regenerative converter, the power which is generated during traction operation of elevators is transmitted back to the distribution transformer and used to feed into the electrical network in the building. Regenerative converter provides an energy-saving effect of up to 35%.

LOW VOLTAGE PRODUCTS FOR ENERGY DISTRIBUTION

Low voltage devices provide high performance and easy operation in applications ranging from protection of distribution panels to motor starters.

ECOWEBSERVER III

Devices that facilitate the measurement, collection and analysis of data on power consumption, creating a viewing solution that can enhance energy-saving initiatives, increase productivity, and reduce costs.

POWER MEASURING DEVICES

Power measuring devices offer the highly precision and durability combined with easyto-read displays, allowing fast, precise monitoring of the power supply or operational status of a machine.

PLCs (Programmable Logic Controllers)

High performance and future-proof solutions are delivered through an enhanced lineup and enhanced network systems.

INVERTERS

Inverters are variable frequency power supply units which can change the rotation speed of the threephase induction motors easily and flexibly. The FREQROL inverter offers resources designed to improve productivity and safety, and to save energy.

MC WORKS64

MC Works64 is a PCbased supervisory control and data acquisition software (SCADA) that can monitor plant-wide operations and support efficient plant operations.

DIAMOND CONTROLS

Diamond Controls can integrate almost any mechanical system (such as cooling and heating systems, lighting, elevators, escalators, ventilation, etc) from any manufacturer. The users can manage multiple tenant spaces within the same building, multiple buildings on a site and multiple sites.

Achieving LEED Credits with Mitsubishi Electric Green Building Solution

Mitsubishi Electric Green Building Solution

BMS (MC Works 64 / Diamond Controls)

LEED Credit		Applicable LEED Tipologies	Credit Description	HVAC							Jet Towel	Elevator			Energy					LED Lighting	Controllers	
				VRF	Standard-Efficiency Rooftop Units	High-Efficiency Split Systems	Standard-Efficiency Split Systems	HMI	Air Handlers	Accessories	Jet towel	Elevator	Escalator	Regenerative energy	Energy Manageement	Power Measuring Devices	LVS	VFD	Regenerative Converter	Light Bulbs	MC Works 64	Diamond Controls
				City Multi	Clima Veneta	MXZ Class	MS Class	AE-200A AE-50A	Lossnay	economizers, Zoning equipment, Dampers, erv, uvc	JT-MC206GS; JT-SB216GSN	AI-2200C; Nexiez Series; Nexway	Series Z; Series C;	Regen-erative Converter	EcoWebServer III	ME96SS; EcoMonitorPlus; EcoMonitorLight	MCCB MDU; ACB;	D700; E700; F800; A800	FR-XC	BGH; RHONA	MELSEC Series	DC8000 Series
Innovation	**Credit**	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO; EB; I	Inovation											•					•		•	•
Energy & Atmosphere	*Prerequisite*	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO	Fundamental Commissioning of Building Energy Systems	•				•							•	•	•	•			•	•
	Prerequisite	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO	Minimum Energy Performance	•		•			•		•	•	•		•	•		•	•	•		
	Prerequisite	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC	Building - Level Energy Metering												•	•	•	•			•	•
	Prerequisite	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO; EB; I	Fundamental Refrigerant Management	•	•	•	•															
	Prerequisite	EB; I	Energy Performance	•		•			•		•	•	•							•		
	Credit	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO	Optimize Energy Performance	•		•					•			•				•		•		•
	Credit	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO	Advanced Energy Metering												•	•	•	•			•	•
	Credit	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO; EB; I	Enhanced Refrigerant Management	•		•																
Indoor Environmental Quality	*Prerequisite*	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO	Minimum Indoor Air Quality Performance	•	•	•	•		•	•												
	Prerequisite	EB; I	Minimum Indoor Air Quality	•	•	•	•		•	•													
	Credit	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO	Enhanced Indoor Air Quality Strategies	•	•			•	•												•	•
	Credit	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO	Indoor Air Quality Assessment	•					•												•	•
	Credit	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO	Thermal Comfort	•	•	•	•		•	•											•	•
	Credit	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC; CI; ID+C R; ID+C HO	Interior Lighting																	•	•	•
	Credit	EB; I	Indoor Environmental Quality Performance	•	•			•	•											•	•	•
Water Efficiency	*Prerequisite*	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC	Outdoor Water Use Reduction															•			•	•
	Prerequisite	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC	Building-Level Water Metering																		•	•
	Prerequisite	EB; I	Water Performance	•																	•	•
	Credit	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC	Outdoor Water Use Reduction															•			•	•
	Credit	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC	Cooling Tower Water Use		•													•			•	•
	Credit	NC; CS; S; BD+C R; DC; WDC; BD+C HO; HC	Water Metering																		•	•

Certified: 40 to 49 points **Silver:** 50 to 59 points **Gold:** 60 to 79 points **Platinum:** 80 to 110 points

Building Design and Construction (BD+C)				
	NC	New Construction	DC	Data Centers
	CS	Core and Shell	WDC	Warehouses and Distribution Centers
	S	Schools	BD+C HO	Hospitality
	BD+C R	Retail	HC	Healthcare

Interior Design and Construction (ID+C)		
	CI	Commercial Interiors
	ID+ C R	Retail
	ID+C HO	Hospitality

Operations and Maintenance (O+M)		
	EB	Existing Buildings
	I	Interiors

Mitsubishi Electric Contribution for LEED Credits

INNOVATION (IN) : 1 – 5 points

CREDIT: INNOVATION

To encourage projects to achieve exceptional or innovative performance.

Our High Energy Efficiency products allied to Regenerative Converter on Elevators and VFDs with efficient BMS programming can help achieve next percentage threshold for energy.

ENERGY AND ATMOSPHERE (EA) : 1 – 35 points

PREREQUISITE: FUNDAMENTAL COMMISSIONING AND VERIFICATION

To support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability.

VRF Controllers, HMIs and Energy Equipment with visual interface can provide easy visualization of the required data for reports. The BMS can combine all the data in one single platform.

PREREQUISITE: MINIMUM ENERGY PERFORMANCE

To reduce the environmental and economic harms of excessive energy use by achieving a minimum level of energy efficiency for the building and its systems.

Mitsubishi Electric can provide High Efficiency products for HVAC Systems, Elevators, Escalators, Energy Management, VFDs. BMS can complement these equipment making the building operation even more efficient when programmed accordingly to the Building's specificities.

PREREQUISITE: BUILDING-LEVEL ENERGY METERING

To support energy management and identify opportunities for additional energy savings by tracking buildinglevel energy use.

Our Energy Products can provide power consumption data for a facility. The BMS can aggregate all data to provide total building energy consumption, facilitating the analysis for even bigger savings.

PREREQUISITE: FUNDAMENTAL REFRIGERANT MANAGEMENT

To reduce stratospheric ozone depletion.

Our HVAC Products are completely Eco Friendly, as they do not use chlorofluorocarbon (CFC)-based refrigerants in heating, ventilating, air-conditioning, and refrigeration.

PREREQUISITE: ENERGY PERFORMANCE (EB, I)

To support energy management and reduce environmental and economic harms associated with excessive energy by reducing greenhouse gas emissions and achieving higher levels of operating energy performance.

Our Energy Products can provide power consumption data for a facility. The BMS can aggregate all data to facilitate visualization and provide total building energy consumption, enabling analysis for even bigger savings.

CREDIT: OPTIMIZE ENERGY PERFORMANCE

To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic harms associated with excessive energy use.

Our High Energy Efficiency products allied to Regenerative Converter on Elevators and VFDs with efficient BMS programming can help reduce building consumption to seek higher percentage threshold for energy savings.

CREDIT: ADVANCED ENERGY METERING

To support energy management and identify opportunities for additional energy savings by tracking buildinglevel and system-level energy use.

Our Energy Products can provide power consumption data for a facility. The BMS can aggregate all data to facilitate visualization and provide total building energy consumption, enabling analysis for even bigger savings.

CREDIT: ENHANCED REFRIGERANT MANAGEMENT

To reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change.

Mitsubishi Electric sets the boundaries of VRF technology with City Multi, using R410A refrigerant with zero ODP (Ozone Depletion Potential). It has been specifically designed for today's building requirements and addresses key market issues such as energy efficiency, adaptability and reability.

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INDOOR ENVIRONMENTAL QUALITY (EQ) : 1 – 16 points

PREREQUISITE: MINIMUM INDOOR AIR QUALITY PERFORMANCE

To contribute to the comfort and well-being of building occupants by establishing minimum standards for indoor air quality (IAQ).

In order to meet ASHRAE 62.1 requirements, our VRF can be integrated with Lossnay system providing air renovation and transferring sensible and latent heat to reduce the load caused by ventilation.

PREREQUISITE: MINIMUM INDOOR AIR QUALITY (EB, I)

To contribute to the comfort and well-being of building occupants by establishing minimum standards for indoor air quality.

In order to meet ASHRAE 62.1 requirements, our VRF can be integrated with Lossnay system providing air renovation and transferring sensible and latent heat to reduce the load caused by ventilation. Our BMS can be programmed to alarm when maintenance is required.

CREDIT: ENHANCED INDOOR AIR QUALITY STRATEGIES

To promote occupants' comfort, well-being, and productivity by improving indoor air quality.

Our VRF can be integrated with Lossnay System to increase outdoor air ventilation rates and provide exhaust for spaces where hazardous gases or chemicals are present or used. When installed, particle filters provide even better air quality. Our BMS can control/monitor air exchange, filter status and CO2 sensors.

CREDIT: INDOOR AIR QUALITY ASSESSMENT

To establish better quality indoor air in the building after construction and during occupancy.

Our HVAC Systems can promote air flush out.

CREDIT: THERMAL COMFORT

To promote occupants' productivity, comfort, and well-being by providing quality thermal comfort.

Our VRF System can provide a zoned design for group thermal comfort controls for shared or individual spaces. The BMS can integrate with an acceptance research platform to help operation ensure an 80% KPI achievement.

CREDIT: INTERIOR LIGHTING

To promote occupants' productivity, comfort, and well-being by providing high-quality lighting.

Our BMS can provide multizone control to meet group needs and preferences for several lighting levels or scenes.

CREDIT: INDOOR ENVIRONMENTAL QUALITY PERFORMANCE

To assess how well the building is performing for the occupancy, in particular with regards to indoor air quality and comfort.

Our BMS can compile sensors data to facilitate creation of required reports.

WATER EFFICIENCY (WE) : 1 – 11 points

PREREQUISITE: OUTDOOR WATER USE REDUCTION

To reduce outdoor water consumption by at least 30%.

Our VFD can prevent water leak on irrigation lines. The BMS can control irrigation system to avoid water waste.

PREREQUISITE: BUILDING-LEVEL WATER METERING

To support water management and identify opportunities for additional water savings by tracking water consumption.

Our BMS can compile water consumption data to facilitate the creation of monthly and annual summary reports.

PREREQUISITE: WATER PERFORMANCE (EB, I)

To support water management and reduce water consumption.

Our BMS can compile water consumption data to facilitate visualization and help avoid water waste.

CREDIT: OUTDOOR WATER USE REDUCTION

To reduce outdoor water consumption by at least 50%.

Our VFD can prevent water leak on irrigation lines. The BMS can use smart scheduling technologies to control irrigation system and avoid water waste.

CREDIT: WATER METERING

To support water management and identify opportunities for additional water savings by tracking water consumption.

Our BMS can compile water consumption data to facilitate visualization and help avoid water waste.

Note: Prerequisites and Credit points can be achieved by combining these indicated products with the strategies defined by LEED v4.1 manual.

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eco Changes for a greener tomorrow

Eco Changes is the global environmental statement of Mitsubishi Electric Group, and expresses its position on environmental management. Through a wide range of companies, we are contributing to more sustainable society.

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