Hero MotoCorp: a Garden Factory in Rajasthan

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Introduction

Today, India is among the fastest growing economies in the world, resulting in a strain on its finite resources. Therefore, the need of the hour is to pursue industrialization and economic growth in a sustainable and efficient manner. Incorporating Green concepts and techniques in industrial units will help address national priorities including energy efficiency, conservation of natural resources, handling of consumer waste, water efficiency and reduction in fossil fuel use. These concepts can also enhance occupant health, happiness and well being.

A Green factory is one which uses less water, improves energy efficiency, conserves natural resources and provides healthier spaces for occupants, as compared to a conventional building.

A Green factory/plant would broadly facilitate the following:

- Reduction in power demand by factory buildings
- Reduction in potable water consumption for non-process activities and process related activities by reusing treated water
- Effective and efficient management of waste generated
- Recharge of aquifers with proper storm water management
- Enhanced indoor air quality
- Healthy atmosphere and enhanced working conditions for the employees

Hero MotoCorp: a Garden Factory

The Hero MotoCorp manufacturing plant at Neemrana in District Alwar, Rajasthan has gained the distinction of being one of India's finest factories to go the Green way and for setting a new benchmark in environmental management. It is rightly called the Garden Factory, and is playing a catalytic role in spearheading the

IGBC Platinum Plaque

About the Author

Nagesh Gupta is a Counsellor with Indian Green Building Council of CII for the past 6 years. He is IGBC Accredited Professional and ECBC Master Trainer. He was instrumental in developing several rating programmes like IGBC Green Existing Buildings, Green Townships, Green Factory Buildings and Green Metro Rail. He is also involved in certification, counselling and capacity building within IGBC. He is Core Faculty Member of IGBC and has trained over 3,000 stakeholders in Green building concepts.

Shreyasi Ansingkar is an Architect associated with IGBC for over 4 years. She is one of the team members involved in development of IGBC Green Existing and Factory Building rating programmes, and is currently involved in certification activities and upgradation of the IGBC Green Factory Building Rating System. She is an IGBC AP. She has been involved in designing residential and commercial projects. She holds a bachelor's degree in Architecture and a master's in Environmental Architecture.

Hero MotoCorp manufacturing plant at Neemrana

green building movement in the country. Spread over a total area of 1,46,399 sq.m., the plant has achieved the Platinum rating under IGBC's Green Factory Rating System. It is fully automated, and is one of the most productive manufacturing units in the country. This garden factory demonstrates health and productivity; it not only manufactures products, but also nurtures life.

IGBC Green Factory Building Rating System

IGBC Green Factory Building Rating System is a holistic, voluntary and consensus based programme. IGBC rated Green factory buildings have tremendous benefits, both tangible and intangible. The most tangible benefits are the reduction in water and energy consumption right from the day of occupancy. The energy savings could range from 30 to 40% and water savings around 20 to 30%.

The intangible benefits of a Green factory include enhanced indoor air quality; good day-lighting; health, well being and safety of workmen; and more productive and environmentally friendly factories

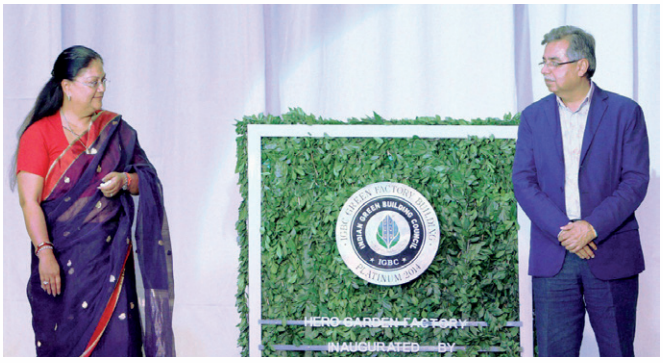
The rating system encourages:

- Building orientation to allow optimum sunlight and ventilation
- High performance walls, roofs and glass
- Energy efficient lamps, luminaires and controls
- Energy meters to measure, monitor and sustain building performance
- Renewable energy sources to meet energy requirements
- Treatment of waste water through sewage treatment plant
- Rainwater harvesting ponds
- Break-out spaces for employees
- Water efficient management techniques for irrigation
- Building Management System

By adopting the Green rating, the plant can holistically address various aspects of environmental management and in the process achieve excellence in resource conservation and bottom-line improvement and a Green corporate image.

Green Practices

Some of the Green practices incorporated in Hero MotoCorp manufacturing plant are described below.



Vasundhara Raje Scindia, Chief Minister of Rajasthan along with Pawan Kant Munjal, Chairman, MD and CEO of Hero MotoCorp at the plant inauguration on October 21, 2014

Energy Efficiency

Hero MotoCorp manufacturing plant has incorporated energy efficient technologies that go a long way towards optimizing energy consumption and in the process conserving finite resources. The highlight of this project is the passive design of the factory building, which orients it in accordance with sun path analysis. Sun path analysis helped the project team to come up with an overall fenestration design that reduces the cooling and lighting loads by avoiding excessive heat ingress and allowing more sunlight into the day-lit spaces.

With the combination of passive design and energy efficient systems, the factory building demonstrates 35% saving in energy consumption as compared to a baseline building.

Big Foot Air Conditioning System

Big Foot air conditioning system

Playing an important role in brining down energy consumption is 'Big Foot', a ductless AC system that involves air handlers where the conditioned air is distributed via displacement ventilation. Positive pressurization is its unique feature, which ensures a nearly dust free environment.

The factory has installed two Big Foot units, each consisting of a large air housing, where fresh outside air is cooled by an air cooled screw chiller. Space temperature is monitored at three levels: ceiling, mid height and 5 feet above the floor to maintain comfort level.

Natural Lighting and Outdoor Views

Ninety percent of the spaces are day-lit by slits on the roof covered with polycarbonate sheets. These slits are oriented as per sun path analysis to avoid heat ingress in building.


Break-out space


Skylights and day-lit areas

Skylights and vision windows allow plant workers keep close to nature while decreasing the load on electricity through natural sunlight during work hours. Studies reveal that more exposure to outdoor view and natural lighting increase productivity. Further, creative break-out spaces (with trees and benches) are provided to reduce workman fatigue.

Renewable Energy


On-site solar photovoltaic cells

A huge installation of south-facing renewable energy roof top solar photovoltaic panels is responsible for generating about 1.5 MW of electricity for the building. This caters to 10.3% of the annual energy consumption. Further, the company has invested in off-site green power (wind energy) at Satara, Maharashtra with a capacity of 24 MW, which is 100% of the of non-process energy consumption. This is equivalent to per capita consumption of 3,000 average Indians in 2014-15 and can power two to three mid-sized villages.

Bio-walls


Bio-wall with vertical vegetation

The plant has 300 meter of 'living walls' or 'bio-walls', laden with vertical vegetation that keep the space cool and contribute to reduction in HVAC load. They also filter out contaminants and provide clean indoor air for occupants.

Rain Water Management


Sewage treatment plant

100% of the run-off from the roof and a non-roof surface is captured in the rainwater harvesting system. This is achieved by providing a network of recharge wells, de-silting chambers and rain water harvesting pond.

Waste Management

Waste water generated in the plant is appropriately treated at the plant. Hundred percent of the waste water is treated with STP of capacity 290 kld. Treated water is reused for irrigation and a few process requirements. The STP capacity is equivalent to water required for producing 120kg of paddy, which can serve 100 households per day.

Vegetation and Heat Island Effect


Roof top vegetation

The large roof areas of the factory are vegetated with native and drought-tolerant plants; they shade the roof from harsh solar radiation to reduce air conditioning needs by 20%. The parking area has a permanent roof of off-white coloured Galvalume sheets with SRI value of 80.

Greenhouse

With the objective of delivering food to the facility's canteen and the local community, roof top greenhouses have been provided for development of local vegetation. This innovative feature is also intended to serve as a facility for food production experiments including hydroponics. Hydroponics is a method of growing plants, using mineral nutrient solutions, in water without soil.


Roof top greenhouse with provision for hydroponics

Conclusion

Today, Indian industry is in the forefront in adopting and promoting Green factories and helping India emerge as one of the global leaders in Green buildings. Over 155 green factories are going the green way with IGBC. It is estimated that the country's building stock will grow to 100 billion sq.ft. by 2030, and here lies a great opportunity for India to build all the upcoming manufacturing facilities as Green factories and set new global standards in design, construction and operation. This can contribute significantly to mitigate climate change. Green factories should be a national priority as they are beneficial to individuals, the society and the nation. ❄