‘Go Beyond’ Award Goes to MIT.nano for Its Excellent Energy Efficiency and Environmental Sustainability

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“Go Beyond” Award celebrates commitment to excellence in efficiency and sustainability.

MIT.nano, the campus facility for nanoscience and nanotechnology research, has been awarded the International Institute for Sustainable Laboratories (I2SL) 2019 “Go Beyond” Award for excellence in sustainability in laboratory and other high-technology facility projects.

In selecting the recipients, I2SL looks for projects that “go beyond the facility itself to consider shared resources, infrastructure and services, and neighboring communities, as well as contributing to increased use of energy-efficient and environmentally-sustainable designs, systems, and products.”

Designed by Wilson HGA and completed in 2018, the 216,000 square-foot facility, located in the heart of MIT’s campus, is a shared resource for MIT faculty, students, and researchers, as well as external academic and industry users. MIT.nano offers state-of-the-art equipment and environmental controls that would be challenging for individual labs or departments to afford or maintain on their own.

“To meet MIT’s goal of designing the most energy-efficient academic cleanroom, we benchmarked against 16 national facilities to establish energy-use drivers and identify best-in-class measures for energy reduction,” explains Samir Srouji, design principal at Wilson HGA. “The design anticipates a 51 percent source energy savings and 50 percent reduction in CO2 emissions, a true feat for a cleanroom project.”

MIT.nano has 47,000 square feet of cleanroom suites that make up two, two-story spaces in

the center of the facility. The majority of the cleanroom area under filter is rated ISO 5 (i.e., Class 100), meaning the air is continuously filtered and replaced every 15-30 seconds to maintain a standard that allows no more than 100 particles of 0.5 microns or larger within a cubic foot of air.

Despite such resource-intensive technical requirements, MIT and Wilson HGA achieved high sustainability metrics by implementing 60 energy conservation measures (ECM), six of which are considered “go beyond” ECMs, meaning they are not standard practice in cleanroom design and significantly reduce energy use. These measures are:

- glycol “run-around” heat recovery from exhaust;
- variable-volume exhaust and make-up air;
- condenser heat recovery from sub-cooling chiller;
- 100 percent filter coverage in cleanroom ceiling to lower fan static;
- variable air volume (VAV) recirculation air handling unit (RAHU), based on occupancy and particle counters; and
- reheat in RAHUs, avoiding central reheat of all make-up air.

No other cleanroom to date has implemented more than three “go beyond” ECMs, according to Wilson HGA.

“MIT.nano is the most technically complex building on campus with thousands of monitoring points spread throughout the facility,” says Dennis Grimard, managing director at MIT.nano. “These points help maintain MIT.nano’s sustainability goals by constantly monitoring the building’s health and operation. Significant resources have also been committed from MIT’s Department of Facilities to ensure the building continues to operate properly.”

MIT has made increased efficiency and reduced waste a priority over the past several years, including the creation of the Office of Sustainability in 2013. One of the ways MIT is carrying out this commitment is by ensuring new buildings and renovations, from the earliest design stages, are focused on efficiency and sustainability in their energy, water, waste-handling, and other systems.

“MIT faces the unique challenge of a growing campus paired with ambitious goals in reducing emissions while increasing investments in energy efficiency,” says Julie Newman, director of

sustainability at MIT. “The MIT.nano design team boldly approached this challenge by designing a best-in-class particle-free lab that integrates sustainable and high-performance design standards while concurrently preparing for a changing climate.”

MIT.nano boasts a 40 percent water use reduction and over 90 percent of construction waste was diverted. The facility is on track to meet the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) Platinum certification. In order to reach this level, buildings must attain 80 or more points based on compliance with different aspects of sustainability. It is the highest LEED certification possible.

The Go Beyond Award is the latest honor for MIT.nano. The building has previously received the 53rd annual Lab of the Year Award from R&D Magazine and the 2019 Education Facility Design Award of Merit, presented by the American Institute of Architects Committee on Architecture for Education.

Read the original article on MIT News.