Argonne
NATIONAL LABORATORY

ARGONNE TAKES STRIDES TO INCREASE EFFICIENCY AND PROMOTE SAFETY WITH **SMART LABS PROGRAM**

Argonne's Smart Labs Program seeks to optimize laboratory facilities to improve energy efficiency, provide safe ventilation levels, and enhance operations.

In FY 2019, the Sustainability Program formalized the Smart Labs Program by establishing a core, multidisciplinary team and standard process that is repeatable and scalable across Argonne. The Smart Labs core team includes staff from Facilities Engineering, Building Controls and Analytics, Worker Safety and Health, Project Management, and the Sustainability Program. To ensure each building is assessed and optimized with a consistent approach, the Smart Labs team began developing and testing the Smart Labs framework, which can be used to evaluate all buildings within Argonne's campus.

The Smart Labs Program took important strides in FY 2019 by selecting and benchmarking a set of focus buildings for optimizing laboratory ventilation in addition to improving energy efficiency and operations.

ARGONNE'S SMART LABS PROGRAM FOCUS BUILDINGS

BUILDING NUMBER AND NAME		SIZE
200	Chemistry	356,889 ft^2
241	Energy Sciences Building	172,311 ft^2
362	ES, HEP, TD, and Auditorium	184,621 ft^2
401	Advanced Photon Source Central Lab & Office Building	191,336 ft^2
440	Center For Nanoscale Technology	99,057 ft^2
446	Advanced Protein Crystallization Facility	66,705 ft^2

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Building 401, one of six buildings included in Argonne's Smart Labs Program

A key accomplishment in FY 2019 was completing the laboratory ventilation risk assessment (LVRA) and demand for ventilation assessment (DVA) at Buildings 362 and 401 with the help of consultants 3Flow, Grumman/Butkus Associates and Burns & McDonnell. During the LVRA, Argonne staff and the consultants surveyed the lab spaces to evaluate exposure risk levels and the protective capabilities of the exposure control devices within the building. The LVRA included surveying of all laboratory spaces, and interviewing laboratory area leads to help understand the laboratory processes, daily operation, and chemical use.

During the DVA, a series of onsite testing and measurement was completed in a sampling of labs. The process included measuring room supply airflow, measuring room exhaust airflow, measuring the air-handling unit supply and recording its operational status, and lastly assessing a sample of the Exposure Control Devices (ECDs) per the industry standard. The information from the LVRA and the DVA is used to determine appropriate operation specifications—such as air change rate, minimum airflow, and exhaust duct and stack discharge rates—for each lab within the building.

Focusing on laboratory buildings for reducing energy use is a key strategy to meet DOE's sustainability goals for Argonne. According to the DOE Better Buildings Program, a typical laboratory is three to four times more energy intensive than an average commercial building. Argonne has 48 buildings with laboratory space, 23 of which are in the top 40 energy-consuming buildings at the Lab, and together represent an area of 820,000 square feet.

Argonne's Smart Labs Program is leveraging best practices from universities, federal agencies, national laboratories, and hospitals by participating in the DOE Smart Labs Accelerator. Under the Accelerator program, Argonne participated in technical webinars, received technical assistance, and joined peer-learning sessions throughout the last year. Argonne will work to achieve an energy savings of 20% or more in the initial six buildings where this program is being implemented.

Argonne's Smart Lab Program also builds upon the retrocommissioning activities started in FYs 2017 and 2018. In FY 2018, energy-using systems for Building 362, such as the heating, ventilation, and air conditioning equipment, were evaluated and tested using an outside consultant, Burns & McDonnell. Results from the LVRA will be used to finalize the recommended improvements to Building 362 to provide safe laboratory ventilation and optimize energy-using systems to save Argonne money.