



JANUARY 2020

Submit a poster to the HHS Kids' Earth Day Poster Contest (due Jan. 10, 2020)! Full information is available [here](#).

Energy Use by Lab Equipment

The NIH is home to over 3,000 labs that each contribute towards improving human health through medical research. Laboratory spaces tend to be energy-intensive, typically using 5 to 10 times more energy per square foot than office spaces.¹ With so many labs, the NIH needs to conserve energy wherever possible. Building energy use can generally be split into built-in lighting, HVAC processes and plug loads. As building occupants, we have little control over HVAC processes and our influence on built-in lighting is limited to turning off lights. However, lab personnel can greatly influence [plug loads](#), the electricity used for operating equipment like freezers, bio-safety cabinets, refrigerators, incubators, shakers, drying ovens, centrifuges and even larger equipment like spectrometers. Energy use is primarily influenced by two factors: the built-in energy efficiency of the equipment and the way the equipment is used. Fortunately, there are many options when selecting new equipment and operating current equipment to minimize energy consumption.

One of the easiest ways to ensure we are purchasing energy efficient lab equipment is to look for the Energy Star label. Energy Star is the government-backed symbol for energy efficiency, assigned to products that meet designated thresholds for energy consumption.² The NIH and other government agencies are required to purchase Energy Star equipment whenever possible (according to the [Federal Acquisition Regulation, Section 23.203](#)). Equipment such as lab grade freezers and refrigerators and ULT freezers offer great energy savings with Energy Star models, as shown in the table to the right. With an average annual energy use of 8,961 kWh, a single ULT freezer can consume roughly as much electricity as a residential home.³ The NIH operates approximately 3,400 ULT freezers. By comparison, ULT freezers with the Energy Star certification use an average of 4,557 kWh per year, about half the energy consumption of non-certified models. Utilizing Energy Star equipment to replace aging non-certified models is expected to play a crucial role towards annually lowering our building energy use, as mandated by [E.O. 13834: Efficient Federal Operations](#).

Lab Equipment	Energy Star Models (kWh/year)	Non-Energy Star Models (kWh/year)
ULT Freezer	4557	8961
Lab Grade Freezer	1939	2913
Lab Grade Refrigerator	515	2162

*Data was acquired by averaging results measured at the NIH and at the University of Colorado-Boulder.

A simple way to reduce energy use with lab equipment requires only a moment to accomplish: turn off the equipment when it isn't being used. This could mean turning off drying ovens, stir plates, water baths and centrifuges overnight or even turning off the lights inside bio-safety cabinets and fume hoods when they are not being used. This practice can quickly add up to a substantial energy savings. Adopting best management practices allows us to maximize the energy efficiency of all lab equipment, regardless of their age or technology. For an equipment-specific example, we can look at bio-safety cabinets, which consume on average (5,627 kWh per year) even more energy than an Energy Star ULT freezer. A key management practice with bio-safety cabinets (and fume hoods) is to keep the sash lowered whenever possible. In addition to keeping your lab members safe, this helps reduce energy use too! A best management practice for autoclaves and other washing equipment is to consolidate small loads into a single large load. Performing a single large autoclave cycle uses much less energy than multiple smaller cycles. These are only a few examples of lab equipment best management practices. An excellent resource for more management options is the "Lab Equipment" section of the [Energy Treasure Map for Labs](#) from the EPA. Additionally, if you are interested in improving the management of your freezers at the NIH, please consider signing up for the [2020 NIH Freezer Challenge](#).

TAKE ACTION



Take the 2020 NIH Freezer Challenge

The NIH Freezer Challenge is returning for 2020 and will run through the first quarter of the year. The challenge is open to all NIH labs interested in improving their freezer management.

[LEARN MORE](#)

STAFF SPOTLIGHT



Make a New Year's Resolution to Go Green

It's the beginning of a new year, which means it's the perfect time to start or renew your commitment to protecting the environment. We look at some accomplishments from 2019 to give you ideas for the coming year.

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NEMS TRAINING

Did you know? ULT freezers and bio-safety cabinets are very common at the NIH but are also among the largest energy consumers. To learn more about energy efficiency at the NIH, please visit the [NEMS Training webpage](#) to view a short (20 minute) NIH environmental awareness training video.