

Reducing Energy Usage in the Laboratory

Laboratory spaces are routinely some of the largest consumers of energy. These spaces can use up to 5 times the energy of office spaces, per square foot.¹ While laboratory performance will always remain supremely important, there are many available options for reducing energy consumption. A good practice to include in your daily routine is to turn off lights, equipment and instruments whenever they are not in use. What else can you do to reduce energy usage in your laboratory? Here are a few ideas:

- Fume Hood Operating Conditions

Typically, fume hoods can be up to twice as energy intensive as ULT freezers and use as much energy as 3.5 households per day.^{1,2} Keeping the sash closed when not in use can reduce energy consumption by up to 40%.² Also, consider turning back the fume hood air flow during the evenings, if they are free of chemicals. This option is becoming more prevalent on newer fume hood models.

- -70 °C instead of -80 °C

An easy energy saving-tip is to turn your ultra-low temperature (ULT) freezer to -70 °C instead of -80 °C. Implementing this change can reduce energy consumption by 30% and can prolong the life of your freezer.³ The main concern most scientists have is whether it is safe to store their samples at this temperature. Most samples are perfectly fine when stored at -70 °C, including most nucleic acids, proteins, bacteria and viruses.³ In fact, as of 15 years ago, most ULT freezers were set to -65 °C with no negative impact on lab results.³ Further, there are already universities and organizations storing samples at -70 °C, including CU-Boulder, UC-Davis, Harvard, Dartmouth, UCSB, UPenn and the CDC.

- Keep Your Equipment Organized

As an example, keeping your freezer organized can make it easier to find items, minimizing the time with the door open. Good organization can also make it easier to discard unneeded samples and provides a layout that eliminates “dead air” spaces. A well-organized freezer can also make it possible to close off unused areas, thus reducing the volume of air that needs to be cooled. These principles can also be applied to other energy intensive equipment, such as incubators and fume hoods.

- Proper Equipment Maintenance

Proper preventive maintenance (PM) keeps equipment working at its most efficient state and can improve the lifetime of the equipment. Many forms of PM can be done on the user level and can be as simple as replacing/cleaning filters or removing ice buildup from a freezer. The NIH has established that ULT freezers are required to receive regular maintenance. Please visit the [NIH Policy Manual](#) or our [NEMS page](#) for more information.