



Additional Resources from Chat: Global Kickoff for the 2024 Freezer Challenge Digital Pass

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1. Registration and Participation

- **Would you register as individual labs or as a whole research institute? i.e. what is the team size? What is the best way to register - per department (or lab) or per organization/site?**
 - **My Green Lab & I2SL Response:** We allow flexibility with how labs and organizations register for the Freezer Challenge to suit your needs. However, we recommend you register at the level at which the actions for the Freezer Challenge will be conducted. If a laboratory is doing most of the work, register your lab. If an over-arching department operations team is assisting multiple labs with preventative maintenance or purchasing energy efficient freezers, then registering the whole department together (representing multiple labs on the same scoresheet) would be appropriate. Note that for a scoresheet to be eligible for any of the Lab Awards, a scoresheet must only represent a single lab team. We define a lab for the Freezer Challenge as: “A team of people that work in the same laboratory space(s) with related research/clinical/diagnostic goals. A lab team can be unified by all working for the same head scientist or supporting the same objective. All people within a "lab" as defined by this scoresheet should know one another and regularly interact.”
 - **Response in Chat from Event:** You can register the entire department or institute for the annual Freezer Challenge. You will be asked within the registration as to how many labs are represented with your scoresheet so you can capture more than one lab per scoresheet.
 - **Follow-up:** Some of our depts. are very small, so we were wondering if it makes sense to register per dept if you have a team of 5, for example, it sounds to me like per dept would be a good idea.
- **How do we handle shared units between labs if scores should be calculated per lab?**
 - **My Green Lab & I2SL Response:** If two labs share cold storage units, then if each lab has started their own Freezer Challenge scoresheet, both labs (or three, or four) can indicate on their scoresheet that they are sharing cold storage units with other labs. However, in order to avoid double-counting all the Freezer Challenge scoresheet actions, the majority-owning lab for a particular freezer should record all the other actions pertaining to that freezer, such as samples cleaned out, preventative maintenance, energy efficient upgrades, etc. So it is ok if the “labs sharing units” question is double-counted, but not the other topics in the Freezer Challenge. Reach out to freezerchallenge@mygreenlab.org if you have further questions about this.
- **Do you need a site coordinator for the organization competition, or can labs from the same organization participate together?**

- **Response:** Labs doing the Freezer Challenge do not need a site coordinator to participate in the competition. If multiple labs from the same research organization are doing the Freezer Challenge, their points earned, and kwh/day saved will be totaled together to determine the impact of the whole organization (and will at that point be compared with other research organizations in the same sector for the Org-Level Awards).
- **My Green Lab & I2SL Response:** This role is usually filled by someone who wants or needs visibility to the lab teams doing the Freezer Challenge at their institution. For example, someone in a sustainability office, environmental health and safety role, facilities management, building operations, or department administrator.

The site coordinator role is for research institutions that wish to know which labs from their organization are participating in the Freezer Challenge for internal purposes, or to provide additional motivation for competing labs. Site coordinators are able to sign labs up to have a scoresheet, view scoresheets and responses for labs at their organization, and download a report detailing the scoresheet entries for all labs at their organization.

- **Do you get results and energy saved if you are not a site coordinator?**
 - **Response:** Yes, energy savings results are provided for all labs participating. The lab registered gets its own information, while a site coordinator (if there is one for the research organization) has access to all the results and energy savings estimates of labs at their organization.
- **Aside from freezers, do other measures affect points? We have solar panels and an EV fleet.**
 - **Response:** For this challenge, only laboratory cold storage-related actions are considered. The cold storage best practices covered by the Freezer Challenge are all described on the [Freezer Challenge website](#).
- **What reports/updates can site coordinators see? Can we do monthly rewards for the leading lab?**
 - **Response:** Site coordinators can download reports at any time and see which actions have been taken by the lab(s) along with an estimated energy savings. Furthermore, site coordinators have visibility to the labs at their institution that have started scoresheets. The data can be leveraged for any type of internal competitions and rewards you would like.
- **If no site coordinator, would I get results as the person named for the lab itself?**

- **Response:** Yes, if you register and start a scoresheet, you will receive your own energy savings estimate at the end of the competition.
 - **Is there a way to continue conversations with other sites after this call?**
 - **Response:** Join the My Green Lab Ambassador Program for networking, questions, and collaboration. Here's the [link](#).
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2. Safe Storage Temperature: -80°C to -70°C

- **Have any GMP labs made the switch to -70 C? If so, is there any guidance?**
 - **Response:** You can find information on GMP labs that have made the switch to -70 on this link. Additionally, for a list of institutions and data, you can refer to this [spreadsheet](#).
 - **From attendees:** Consider implementing a cooling circuit with water instead of air. Also, filling your freezer from the bottom up can be helpful. We top fill with ice packs where the temperature is less stable at opening.
 - **We recently purchased a new -80 freezer with an energy-saving -70 function. The warning mentioned potential ice build-up at -70. Is this a common problem?**
 - **Response:** It might be unrelated to temperature; factors like increased door opening or longer open durations could contribute. Consider checking with your freezer manufacturer for advice.
 - **How much energy is saved with -70 vs -80?**
 - **My Green Lab & I2SL Response:** Approximately 30% depending on the unit's fullness and age. My Green Lab collaborated with utility companies in California in 2016 to establish the Energy Star test method for ULT freezers, and this included comparing the energy consumption of various makes/models at -70 C and -80 C. You can download the 2016 ULT Freezer study via the CEEL program off the [My Green Lab website](#). Please see [this article](#) to learn how -70°C is the new -80°C
 - **From attendees:** For brand comparisons, we tested Dometic vs Stirling, and Stirling's UTL freezers were more energy-efficient at -70°C.
 - **Are there any labs working with cells that are stored in -70°C ULT freezers?**
 - **Response:** You can find information on labs working with cells stored in -70°C ULT freezers on this [spreadsheet](#).
 - **From attendees:** We routinely store cells, such as CHO cells, at -150°C in a freezer. They remain stable for years, showing comparable or even better stability than liquid nitrogen storage.
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3. Systems & Equipment

- **What monitoring equipment do people use to compare energy savings before and after - 70 degrees?**
 - **Response:** Some use Thermo Insight Motes to monitor temp, energy, door opening, etc. And Klatu provides the analytics and alarm notifications.
 - Other systems are WATTIQ, Elemental Machines, Rees. My Green Lab does not endorse or promote specific temperature monitoring equipment. There are many options out there for laboratories to compare and consider.
 - **What system do people use to track sample storage? We have a QR sticker system, but it is not great. Stickers get lost even though they are meant to be used with ULT.**
 - **Response from My Green Lab / I2SL:** A Laboratory Information Management System (LIMS) is a software-based system designed to manage and automate laboratory operations and data management. One of the primary functions of a LIMS is to track samples from the moment they are received in the laboratory until they are disposed of. This includes sample registration, labeling, storage, and retrieval. Depending on budget, a lab could purchase a system like this as they are usually customized depending on the labs' needs.
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4. Freezer Maintenance

- **Is a full freezer more stable and energy-efficient than a half or quarter-full freezer chamber?**
 - **Response:** We did a [blog post about this in 2020](#), and there's a [Lab Manager resource that provides a bit more detail here](#). Yes, fuller freezers are more thermally stable than ones with lots of empty space. If you don't have enough samples yet to fill your freezer, consider filling empty space with extra ice packs, jugs of frozen water, or even empty Styrofoam shipping containers with their lids on that fit into your freezer shelves. Or consolidate your units together so you can power an empty one off for a while until you have enough samples it is needed again.
 - **How do we employ a maintenance program when funding and maintenance are at the scientist's cost?**
 - **Response:** If freezer maintenance is the responsibility of scientists at an institution rather than provided by your university or company, never fear! Routine preventative maintenance for cold storage units is straightforward and doesn't require expensive tools. [Pages 6 and 7 of this guide](#) talk about some of the tools you might want on hand. At a minimum, gloves to protect your hands, some sort of scraper, and a soft-bristled brush. Access to a vacuum or shop vac might help clean dust and debris from the filters and coils of your units. If you are doing a full defrost of a freezer, you'll want to remove all samples and turn the unit off, propping the door so all ice melts. Absorbent pads in front of the freezer door, or even spare broken-down cardboard boxes, can help catch the melting water. If you live in a dry enough climate, you can then let the cardboard dry and put it back in the recycling bin. As your building manager or proctor (whoever helps run your lab building) if they have access to a shop vacuum, mop, or even brushes, and scrapers, that your lab could borrow. If your building has none of these materials but has several cold storage units, consider asking your department or university to invest in these materials to have on hand for all labs to use when doing preventative maintenance.
 - **Is there an instruction video on how to vacuum freezer filters?**
 - **Response:** It varies by manufacturer, but it's usually simple. Remove the sponge-like filter, vacuum, and replace it. For PHCBI, here's a [link](#). NIH has a video on ULT Freezer User Level PM on [YouTube](#).
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5. Replacement and Incentives

- **Is there an incentive program to replace units over 10 years old?**
 - **Response:** There are various incentives, including rebate programs. Start by reaching out to your local utility company to find out if they offer rebates for energy efficient lab equipment. Next, reach out to the person that pays the energy bills at your institution and see if an incentive program for the purchase of energy efficient equipment is something they'd explore with you. Some institutions and companies collaborate with facility members or utility companies. Some examples are below. Keep in mind, these programs are designed for labs that operate at each of these universities.
 - [Colorado State University Freezer Incentive Program](#)
 - [University of British Columbia ULT Freezer Rebate Program](#)
 - [University of Pennsylvania Freezer Replacement Rebate Program](#)
 - [UNC-Chapel Hill Efficient Freezer Rebate Program](#)
- **When is a freezer considered "old"?**
 - **Response:** This is a complicated question to answer. Some freezers can run for decades and still be quite energy efficient. Don't automatically replace a freezer that is 10 or 15 years old just because it has aged. If you know for sure the unit is consuming more energy than it was several years ago, it might be time for an upgrade. Some clues might be if you are seeing lots of temperature fluctuations, or if the compressor(s) seems to be on most of the time. If it was designed as an energy efficient unit, then perhaps it will last your lab longer than 10 or 15 years. Some questions to consider when purchasing a new freezer can be found [here](#).
- **Any resources on the life cycle analysis of the environmental cost of disposing of 'older' ULT freezers and buying new ones?**
 - **Response:** Older fridges/freezers tend to use harmful refrigerants that affect the ozone layer. [Here is a resource on refrigerants](#). [This link](#) can provide additional insights into considerations when evaluating ULT freezers. As far as My Green Lab is aware, a formal life cycle analysis has not been done comparing disposal of older ULT freezer models with purchasing a new ULT freezer.
 - **From attendees:**
 - Legacy ULTs (over 7 years old) use 26.4 kWh/day.
 - PHCBI VIP Eco Smart currently leads in energy efficiency at 5.4 kWh/day.
 - The "Voltcraft 6000" costs only €30 (in the Netherlands).

- **Is there a recommended replacement age for ULTs, -20 freezers, and standard refrigerators?**
 - **Response:** The ACT database can help with informed purchasing decisions: [ACT Database](#). NIEHS targets 10 years for ULTs, considering compressor warranty expiration. 10-15 years seems to be the average age for replacement. However, some units can run for decades and still be energy efficient. If possible, verify the energy consumption of your unit before you automatically plan to dispose of it.