

NIH Recipients of an FY2021 HHS Green Champion Award

For 15 years, the HHS Green Champion Awards have honored the work of HHS employees for their contributions to sustainability. The work of these individuals, small groups and projects has demonstrated measurable results towards the HHS sustainability goals. Staff from the NIH accounted for 7 Green Champion Awards for the FY2021 cycle. These awards were nominated by peers from throughout HHS. Please take a moment to congratulate the winners from the NIH and to read a brief description of their work.

SUSTAINABLE ACQUISITIONS

What is a Green Lab? Touring an NIDDK Laboratory

Minoo Shakoury-Elizeh, Dr. Lorena Novoa-Aponte, Dr. Yubo Wang, Dr. Eyal Kesner, Samantha Grounds, Dr. Olga Protchenko, Katie Clark, Amy Reiter, Claire Gerner, Jonathan Frost

Members of the NIH's Genetics and Metabolism Section of the Liver Diseases Branch, and the Office of Communications and Public Liaison of National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), developed an informational video to showcase the green equipment and practices that have been incorporated into the daily laboratory routine. The video was promoted using the NIDDK Twitter account, posted to the NIDDK YouTube channel, and a written portion will go on the NIDDK Director's Update. It is expected that the video will reach an audience estimated at 63,722, with the potential to reach thousands more.

CHANGE AGENTS

NIH Resilient-Renewable (R2) National Institutes of Environmental Health Sciences

The NIH National Institute of Environmental Health Sciences (NIEHS) Resilient-Renewable (R2) initiative is a holistic approach to making NIEHS more energy efficient and resilient while lowering its carbon emissions.

The first step in the initiative was achieving net-zero energy-renewable energy certificate status, powering facility operations with the equivalent of 100% renewable resources, approximately 25% that were carbon pollution-free. In addition, this reduced NIEHS' Scope 2 greenhouse gas emissions for FY 2021, by approximately 38% compared to the prior year.

Under R2 NIEHS, the next steps in FY 2022 include initiating a utility energy savings contract and a carbon neutrality assessment, laying a solid foundation for the implementation of Executive Order 14057 and ultimately carbon neutrality.

ELECTRONIC STEWARDSHIP

NIH NIEHS Printer/Paper Team

Rich Cabrera, Rhonda Carroll, Kerri Hartung, Lavern James, Paul Johnson, Steve Novak, Nicole Popovich, Carranza Smith, Bill Steinmetz, Arrash Yazdani

In FY 2021, the NIH National Institute of Environmental Health Sciences (NIEHS) Printer/Paper Team renewed the existing campus printer policy to enhance reduction efforts. This policy is a unique effort as the NIEHS is the only NIH facility with a strategy focused on printer and copier paper reduction.

Since the policy's inception in FY 2015, paper usage declined from more than 5 million sheets per year to just over 2 million sheets in FY 2019. This decline was driven by paper-saving efforts such as paperless work processes, business meetings, and conferences along with educational reminders encouraging staff to print double-sided, reduce font and margins, and proof documents before printing. The further decline in printing triggered by maximum telework during the pandemic can be retained as the new policy, thanks in part to the foundation laid by the printer policy.

ENERGY & FLEET MANAGEMENT

NIH Freezer Challenge

Laboratory freezers and refrigerators are used throughout the NIH to store samples, vaccines, pharmaceuticals and reagents required for medical research and treatments. Mechanical freezers and refrigerators are also energy intensive. Energy use, energy costs and emissions for one older unmaintained Ultra-Low Temperature (ULT) freezer can amount to 14,000 kWh, \$1,500 and 9.9 MTCO_{2e} annually.

There are over 5,000 laboratory freezers and refrigerators in service at the NIH and the total energy consumption, costs and emissions are significant. The NIH freezer policy, Manual Chapter 26101-16, establishes the requirements for freezer management at the NIH. The NIH Freezer Challenge goes beyond the freezer policy to further increase freezer and refrigerator reliability and reduce energy consumption.

The NIH held its third freezer challenge from January 1 to May 1 of 2021. Labs were challenged to adopt one or more initiatives from a set of freezer and refrigerator management techniques and 10 participated in the challenge. Their efforts in this challenge will annually save the NIH approximately 368,884 kWh, \$31,608, and 261 metric tons of carbon dioxide equivalent greenhouse gas emissions.

The NIH submitted these results to the International Freezer Challenge and won the 2021 I2SL Freezer Challenge in the government organization category. Additionally, the NCI Laboratory of Cell Biology won the 2021 I2SL Freezer Challenge in the individual government laboratory category.

ENVIRONMENTAL STEWARDSHIP

Mansi Mehta

In FY 2021, the NIH Division of Environmental Protection, Waste Resource and Recovery Branch, under the program management of Ms. Mansi Mehta, implemented a medical pathological waste (MPW) totes program to promote environmental stewardship through source reduction and waste minimization.

The NIH Medical Waste Totes program was implemented as a pilot program in Building 14 on the Bethesda main campus in November 2019 at the Division of Veterinary Research (DVR). The intent of this pilot program was to utilize MPW totes in lieu of MPW boxes to effectively reduce the number of boxes used as well as the overall total weight of waste sent for incineration. In FY 2021, the NIH reduced the number of MPW boxes used by 12,038, saving \$55,134 and \$11,267 in disposal costs for a total savings of \$66,401.

NIEHS Green Researcher Self-Assessment

Kerri Hartung, Diane D'Agostin, Rachel Faison, Paul Johnson, Justin Kosak, Amy Papaneri, Julie Rice, Bill Steinmetz

The NIH National Institute of Environmental Health Sciences (NIEHS) Green Researcher Self-Assessment (GRSA) presented researchers at the Institute with an engaging 20-minute online survey-style assessment to determine the sustainability of their individual research practices. As part of the assessment, participants had the opportunity to share sustainability related success stories from their work and provide feedback on how to improve the assessment for the following year.

All participants received an individual analysis of their responses and tips for additional improvement. Twenty researchers participated in the inaugural year. Three researchers achieved silver level status and seven researchers achieved bronze level status. Overall, participants rated the GRSA 4.5 out of 5 stars.

WATER USE EFFICIENCY & MANAGEMENT

NIH CUP Advanced Water Treatment Program

Ye Tao, Andrew Gomes, John Fratangelo, Chris Lyon, Jason Cook

The NIH Bethesda Campus Central Utility Plant (CUP) generates heating, cooling, process steam and chilled water for the NIH Bethesda Campus. The CUP consumes 1 to 1.5 million gallons of water each day for chilled water, boiler feed water, and cooling tower water makeup.

The NIH CUP installed a Reverse Osmosis (RO) system to reduce boiler blowdown, and an Industrial Water Storage System (IWS) to ensure reliable CUP operations. The steam produced by the boiler plant and cogeneration plant is used for building heating, humidity control, equipment sterilization and cleaning.

To prevent damage to the boilers and boiler system components, a limit is set for the concentration of certain minerals in the boiler feedwater. When the limit is reached, an automatic blowdown valve opens to release concentrated solids, water treatment chemicals and heated water.

The RO system provides additional water purification to reduce boiler blowdown, reducing water consumption, energy consumption and the use of chemicals. In 2020, the RO system saved the NIH CUP 28 million gallons of water, 55,907 million British thermal units of natural gas, resulting in \$1 million of savings. The CUP cooling towers have 10 minutes of reserved condenser water in their basins.

The NIH CUP installed a 5-million-gallon industrial water storage (IWS) tank to provide additional reserve water to prevent unexpected dryout of the cooling tower pans and failure of the condenser water

system. The IWS tank ensures reliable CUP operations for four-to-five days, in case water sources from Montgomery County becomes unavailable. By continuing to optimize the NIH CUP water treatment program, the plant can reduce energy consumption, water consumption and cost, while adhering to strict reliability standards.