

## Instructions

*This year's format is slightly different from last year. If you participated last year, you will remember that each case had one case partner and was written from their specific perspective. This resulted in solutions that were very useful to the case partner, but not necessarily replicable to other organizations. This year, many case partners were consulted to give a broader perspective on endemic energy efficiency implementation barriers. **Accordingly, this year's cases describe "typical" versions of problems, and your solutions will be judged on innovation and replicability.***

*Each case provides information that reflects the most common elements of the problem and some contextual assumptions. But in real life, every instance of a problem can be different. Therefore, you have two options for developing your solutions:*

- 1) You can select one or more real-world examples, and use the specifics of their situation to inform your solution OR*
- 2) You can propose a general solution based on the assumptions provided in the case text and create additional assumptions as needed.*

*Under either option, solutions will be judged for innovation and replicability. Therefore, if you choose to focus on a specific real-world example, you should indicate where aspects of your solution might be adapted or changed to be more broadly replicable.*

*In addition, any assumptions that you change or add must be clearly stated, and the sources cited in your case solution. If you use an example(s) that has different parameters than the assumptions in the case, or if your proposed solution requires changes to the case parameters, you must explain the impact of these differences on the solution's success or replicability.*

## Introduction

Laboratories constitute one of the biggest opportunities for energy reduction on university campuses. Laboratories use in the range of 250 to 800 kBtu per square foot, an energy footprint about 3 to 8 times greater than an average office building or classroom on campus. At a typical university, labs can constitute 40–50% of total energy use, even though they may take up less than 20% of the total floor space. Institutions that have taken on energy efficiency retrofits and intentional purchasing requirements in their labs have seen significant energy reductions through these efforts.

Research grants are a vital means of funding for higher education institutions, but there is little incentive for researchers to purchase more energy efficient equipment since less efficient models often leave more funds for other research project costs. Therefore, higher education institutions have seen increased energy loads as a result of new equipment purchased to support externally funded research projects.

Additionally, the system through which university indirect cost rates are set does not incentivize university investments in energy efficiency. Currently, the indirect cost rate is set based on the universities average consumption in the previous cycle. If the university conducts energy conservation measures, their baseline average consumption may decrease, decreasing the amount they are able to recoup through indirect costs.

This is a complex problem requiring participation from many stakeholders, including: grant-making institutions (e.g. National Institute of Health), federal government bodies responsible for issuing policy implementation guidance (Council on Environmental Quality [CEQ] and Office of Management and Budget [OMB]), and institutions receiving funds (universities).

## The Challenge

You are the Energy Manager for a large research university. Your job is to locate and capitalize on energy efficiency opportunities across campus to save the university money and further its sustainability goals. In line with this effort, you have been asked to propose a plan for campus laboratory energy efficiency focused on grant-funded research. Your plan may include, but is not limited to: restructuring agreements between the university and the Principal Investigator (PI); communication, education, and behavior change initiatives directed toward researchers, students, and staff; consumption data collection and maintenance/incentivizing options; modifying university procurement policies and procedures; exploring options for efficiency utilization of equipment; and energy cost allocation. The proposal should be cost effective, replicable, and sensitive to the higher education culture of putting research first. Your proposal must be approved by university leadership, which may include the VP of Facilities, the Board of Trustees, and the university President.

The proposal should address researchers' common apprehensions, such as: new equipment may differ in performance and maintaining research quality is paramount; it is not the researchers responsibility to upgrade equipment if old equipment can be made to run longer (even beyond its recommended life); and efficient equipment is more expensive. Any discussion of equipment procurement guidance must maintain performance and safety as top priorities. Without satisfactory equipment, research quality -- as well as the university's ability to attract researchers -- can be jeopardized.

You also sit on a university consortium tasked with formulating recommendations to federal agencies on how to incentivize energy-efficiency in federally funded grants. As part of the consortium, you can propose modifications to the regulatory structure and requirements of research grants for laboratory equipment. Your recommendations should identify challenges and barriers in the current system as perceived by stakeholders including researchers, university administration, procurement officers, and grant policy implementers (e.g. OMB), and suggest actionable steps that the federal grant making agencies can take.<sup>1</sup>

### Federal Guidelines for Grant-Making Activity

The Office of Management and Budget (OMB) and the White House Council on Environmental Quality (CEQ) can both issue policy implementation guidance to grant-making entities and agencies have a certain amount of freedom to insert sustainability requirements into the general clauses of grants. However, even where clauses exist to encourage sustainable practices, agencies are not sure of the enforcing power they have, have a dearth of administrative support to maintain and manage enforcement, do not know how to interpret regulations, or are simply not aware of them.

Through Executive Order 13514, CEQ has required all federal agencies to work toward specified sustainability goals, develop a sustainability plan, and report progress through an annual sustainability scorecard. The recommendations issued by the university might consider how the Executive Order could be leveraged to encourage grant-making federal agencies to incentivize energy efficient procurement of lab equipment, and how stronger coordination between grant-making institutions (NIH, CDC, etc.) and government bodies responsible for issuing policy implementation guidance (CEQ, OMB) could support this effort.

### Requirements from Grant-Making Entities

Grant-making entities in the federal government have the opportunity to include the recommendation for procurement of efficient research equipment within their grants. However, according to federal regulation the basis for awarding a grant must be based on scientific merit, adherence to the mission of the agency, and the ability of applicant to carry out the research; sustainability and energy efficiency cannot be considered as criteria in awarding proposals or grants. Refer to Appendix 2 for the Code of Federal Regulations, which outlines rules that must be followed by all federal agencies.

Within Title 45 of the Code of Federal Regulations, the Department of Health and Human Services (HHS) is governed by a rule in the procedures<sup>2</sup> stating a preference for “products and services that conserve natural resources and protect the environment and are energy efficient.” While HHS could enforce this requirement post-award, in practice it is not enforced with the frequency of other post-award requirements. This may be due to the effort that would be required for HHS to define, monitor and

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<sup>1</sup> In evaluating these barriers and potential solutions, you may wish to speak with personnel at your own institution familiar with this issue including facilities engineers and departments of environmental health and safety, energy management, finance and treasury, and/or grant offices who are knowledgeable about the incentive structures for procuring lab equipment. Students are also encouraged to reference relevant reports, manufacturer equipment specifications, and case studies. You may make reasonable assumptions for data or organizational policies not given in the case, but these assumptions should be clearly stated in your proposal.

<sup>2</sup> See Appendix 3.

enforce energy efficiency requirements for large and diverse types of specialized equipment for numerous grant awards and the lack of standardized procedures and/or documents to do so.

### Institutional Policy for Implementing Grant-Funded Research

As the university Energy Manager, the most direct step you can take towards procuring more efficient lab equipment and increasing energy efficiency is influencing behaviors, programs and regulations on-campus. Several universities have already implemented incentive structures and there are examples of best practices but they often involve a large investment from the university and a predetermined sustainability goal. Many institutions have mandated procurement standards for types of equipment. While mandates ensure compliance from researchers, it can be difficult to identify energy efficient equipment since there is currently no standard covering lab specific equipment.<sup>3</sup>

### Financial Considerations

While federal research grants cover the direct, or “hard” costs of research (staff compensation, purchase of research equipment, etc.), universities also negotiate Indirect Cost Rate (ICR) Agreements with the Department of Health and Human Services to cover “soft” costs.<sup>4</sup> Referred to by OMB as Facilities and Administrative (F&A) Costs, these are “costs that are incurred for common or joint objectives and, therefore, cannot be identified readily and specifically with a particular sponsored project, an instructional activity, or any other institutional activity.” Indirect Cost Rate Agreements automatically allocate additional funds to a university for the use of space (building heating and cooling, energy and water use, maintenance, etc.) and administrative time associated with grant-funded research. For example, a school that has negotiated a 50% F&A rate<sup>5</sup> and wins a \$1 million research grant is allocated an additional \$500,000 to support the research. These rates generally remain in effect for 2-4 years until they expire and are re-negotiated.<sup>6</sup> While institutions want to keep costs down, they have little incentive to keep their negotiated, indirect costs down since they are recouped through ICR funds. (See Appendix 1 for a sample Indirect Cost Rate Agreement). However, maintaining competitiveness with regards to grant funding is paramount for universities, and a lower F&A rate could make your university a more attractive place to conduct research.

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<sup>3</sup> An ENERGY STAR standard is currently being developed for lab refrigerators and freezers (see Appendix 5).

<sup>4</sup> See Appendix 4.

<sup>5</sup> For the purposes of this case, the student can assume a 50% F&A rate for the next 2 years, expiring in 2015 if they so choose.

<sup>6</sup> See Appendix 4.

## Appendices

Appendix 1: [Sample of Indirect Cost Rate Agreement](#)

Appendix 2: [Code of Federal Regulations](#)

Appendix 3: [HHS Procurement Procedures](#) (see section 74.44 a.3.vi)

Appendix 4: [OMB Indirect Cost Rate Calculations](#)

Appendix 5: [Energy Star Development for Lab Refrigerators and Freezers](#)

### Other Helpful Links:

[Sample Indirect Cost Proposal Format](#)

[Council on Financial Assistance Reform](#)

[Real Property Status Report](#)

[Executive Order 13514 Background](#)

[Sustainable Facilities Tool Green Procurement Compilation](#)

[Sustainable Facilities Tool Laboratory Space](#)

[EPA Region 9 Climate Adaptation Plan](#)

[EPA Region 9 Greening Grants Policy](#)

[NIH Construction Grant Evaluation](#)

[Ultra-Low Laboratory Freezer Technology Specification Review](#)

[Sustainable Laboratories: Choosing the Right Equipment](#)

[International Institute for Sustainable Laboratories](#)

[CU Boulder Store Smart Freezer Challenge](#)

["Proposed Uniform Guidance: Cost Principles, Audit, and Administrative Requirements for Federal Awards"](#)