

Combatting E-Waste and Forced Obsolescence with Open-Source Operating Systems

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Introduction

E-Waste has become a major sustainability issue worldwide. With the recent discontinuation of software updates and security patches for Microsoft's Windows 10 and Apple's MacOS Ventura operating systems, hundreds of millions of computers have lost official software support.

This trend funnels significant numbers of serviceable computing devices into premature end-of-life pathways, frequently without adherence to proper disposal protocols.



An example of improperly disposed of electronic waste.
https://vallync.edu/libri.com/media/2025/06/25111958/egobgobuine_photor_2012-1200x800.jpg

What is planned/forced obsolescence?

- Planned (or forced) obsolescence is where a manufacturer purposefully designs something to have a limited lifespan. This could look like a lack of replaceability of consumable components (such as batteries) or artificial software support cutoffs.

How can obsolete computers be safely and securely reused?

- Install Linux, an open-source operating system built and maintained by the community, not a corporation.
- Install Opencore Legacy Patcher (OCLP) for Mac computers, bypassing Apple's artificial limit to installing the latest official MacOS versions.

What are the benefits of Linux and OCLP?

- Linux**
 - Offers a lot more user customizability and a huge library of community-made apps and features.
 - Compatible with Windows applications using a code-translation layer called WINE
- OCLP**
 - OCLP is simply a tool for installing MacOS on Intel-based Macs that are no longer officially supported by Apple. It preserves all the security and functionality of MacOS.

Implementation of the Project

The Goal

- Reduce E-Waste on campus**
- Combat planned/forced obsolescence**
- Provide free computers to students in need**

The Solution

- Establish an E-Waste collection program
- Use Student Green Fund money to order any necessary parts to refurbish each computer received
- Install an alternative operating system that does not have arbitrary support cutoffs for older machines
- Once refurbishment and software configuration is complete, make them available for students to request through a form

The Outcome

- E-Waste will be redirected from the trash into the collection program, directly reducing environmental harm
- Computers that would have otherwise been thrown away will get continue their service life
- The alternative operating systems further extend a computer's useful service life, as they are more resource efficient and are not backed by any company trying to sell you a new computer.
- Students who need a computer for classes can avoid the weekly rental procedures CWU implements to ensure access for all students.

Goal Timeline:

The overall goal of this project is to redistribute the computers to students who need them. The current plan is to have the computers fully restored by mid Fall quarter next academic year.

Collection Methods

E-Waste laptop collection from donations, broken Surplus assets, and the “Don’t Waste, Donate” Program. As laptops are collected, the repair and refurbishment process can begin.

Key Benefits:

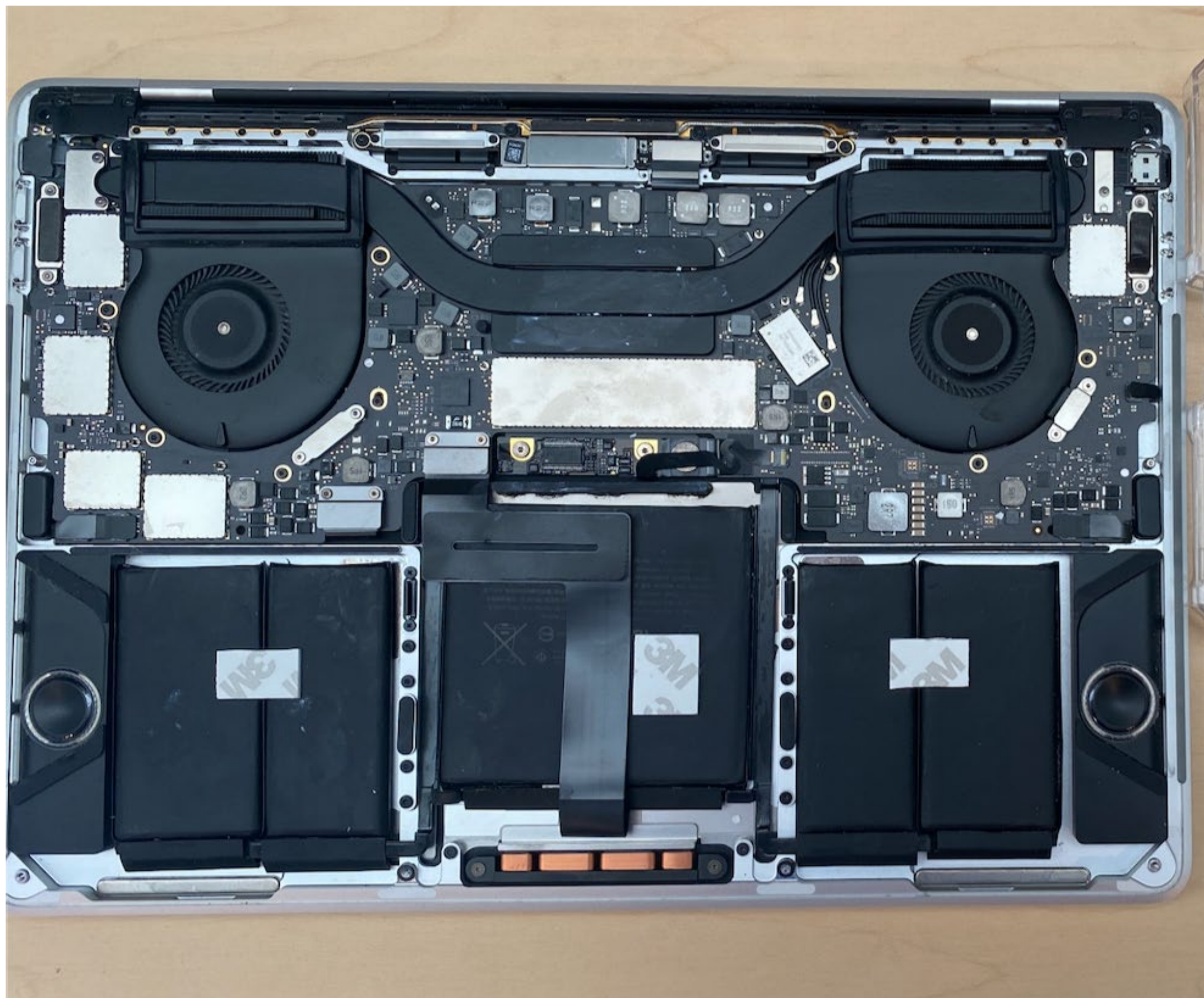
Increase student accessibility to computers

Reduce waste

Increase device service life

The Refurbishment Process:

- Inspect and test each computer.
- Determine if the computer turns on and functions.
- If it does, install Linux or MacOS, run a stress test while using another program to monitor the battery health.
- For computers that don't power on or work properly, they will be disassembled and an attempt will be made to pinpoint the issue using a multimeter. If repair opportunities exist, part costs can be estimated.
- Purchase repair parts using SGF funds and install.

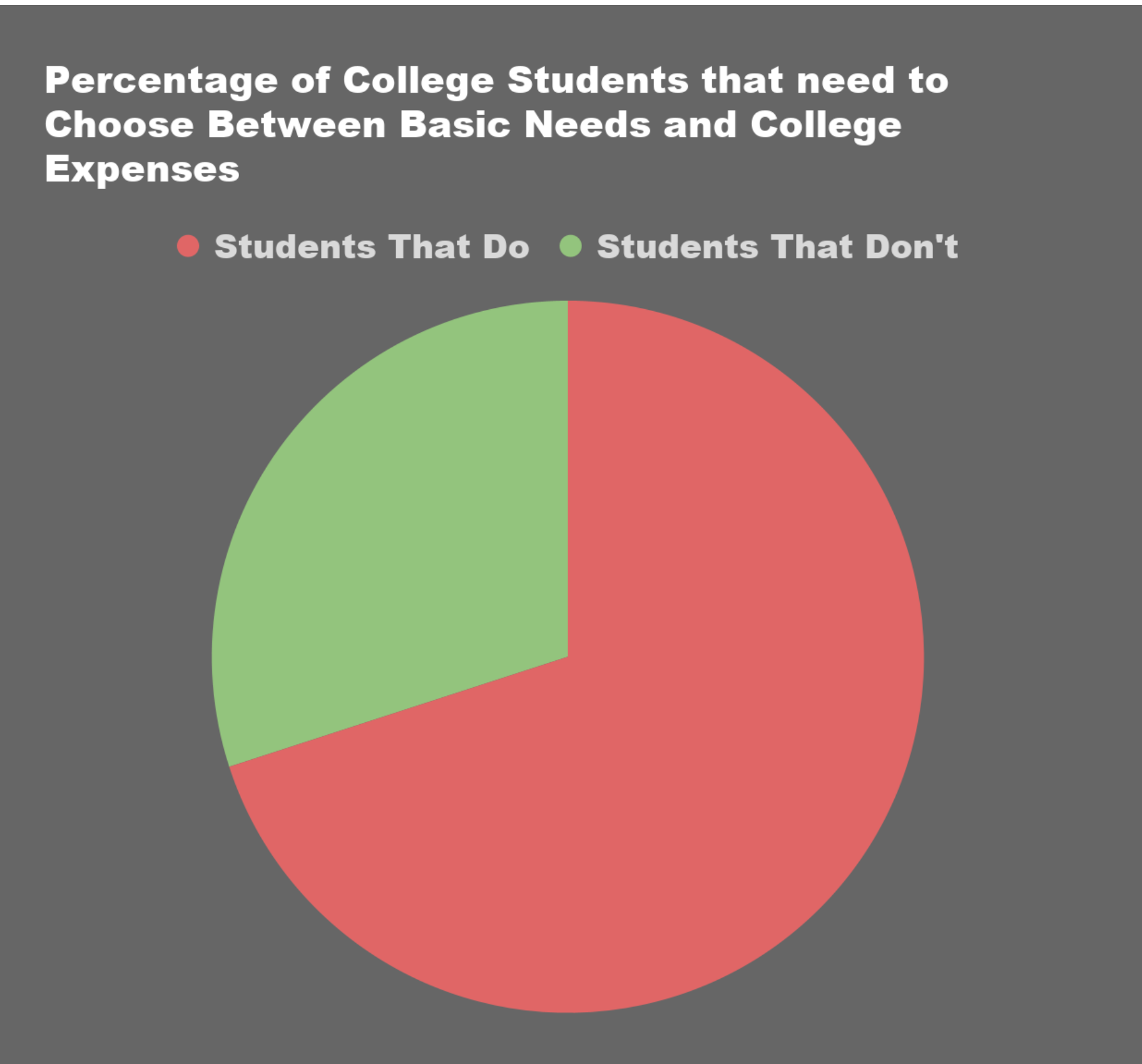


Summary

This project reduces E-waste at CWU by collecting, refurbishing, and redistributing old computers in the community.

The project was awarded \$3,050 by the Student Green Fund. This will allow for up to \$305 of repair budget per computer.

The project will provide computer assets to ten students.



This Project Supports UN Sustainable Development Goals:



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