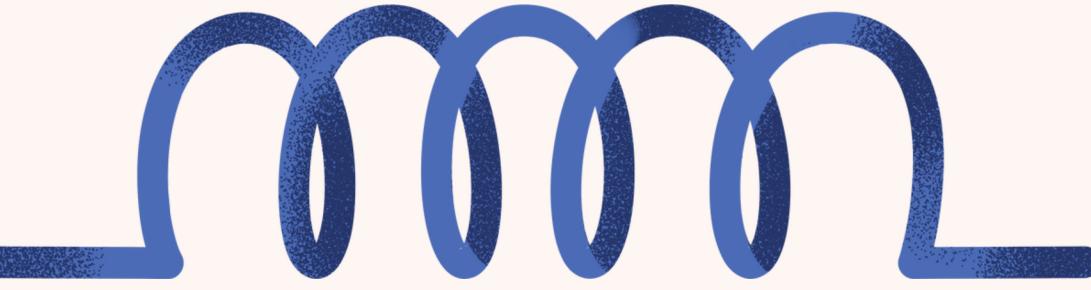


Managing Power Consumption in a Student Boarding House

Ralph Angelov F. Braganza

SCENARIO



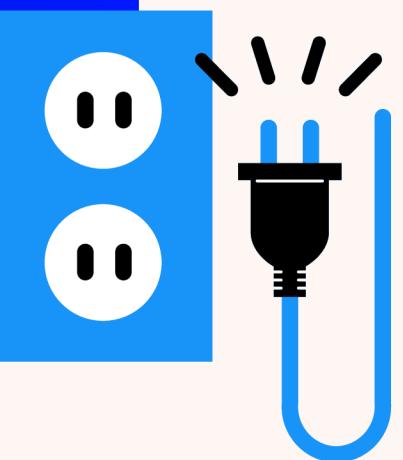
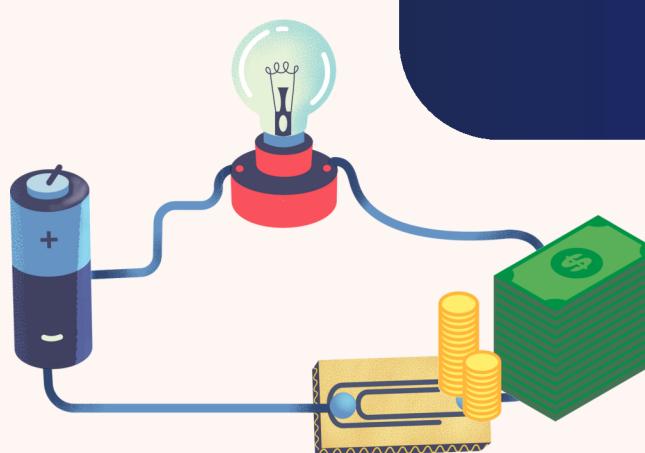
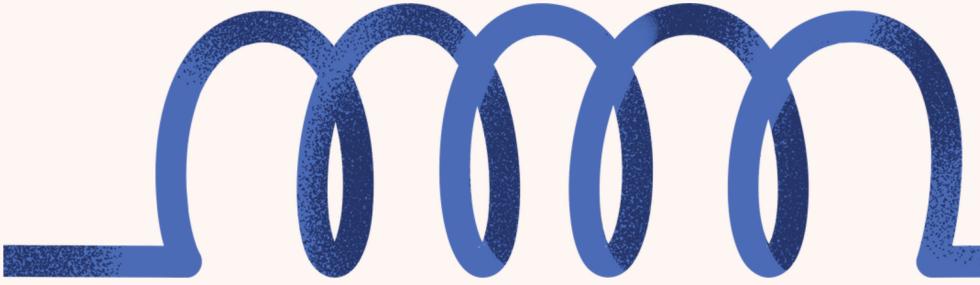
In a student boarding house near your campus, the electricity bill has been increasing every month. The landlord notices that many students forget to unplug their devices, leave lights or fans on when they go out, and use appliances inefficiently.

The landlord asks you, as computer engineering student, to come up with a solution to help monitor and reduce electricity waste.

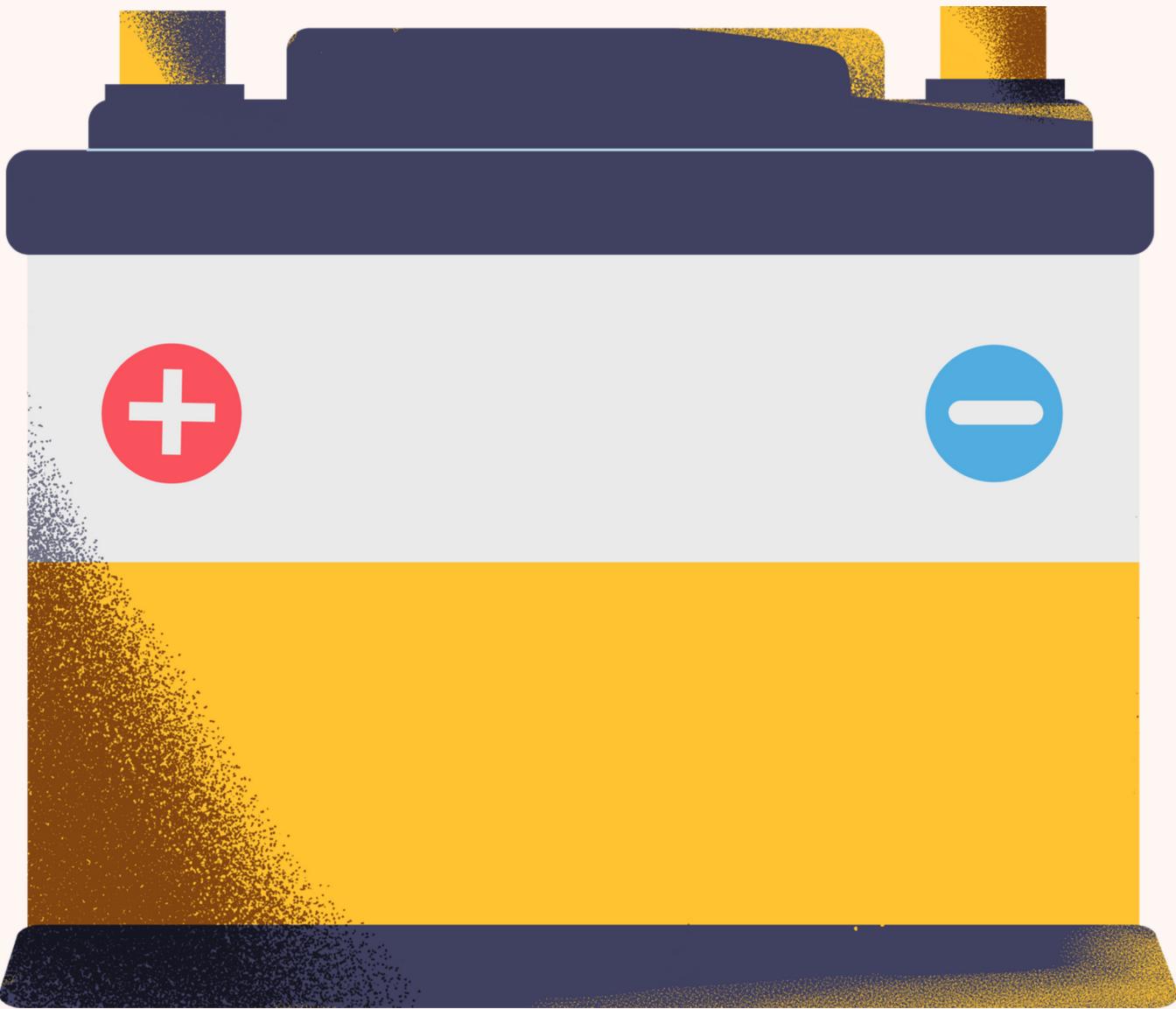
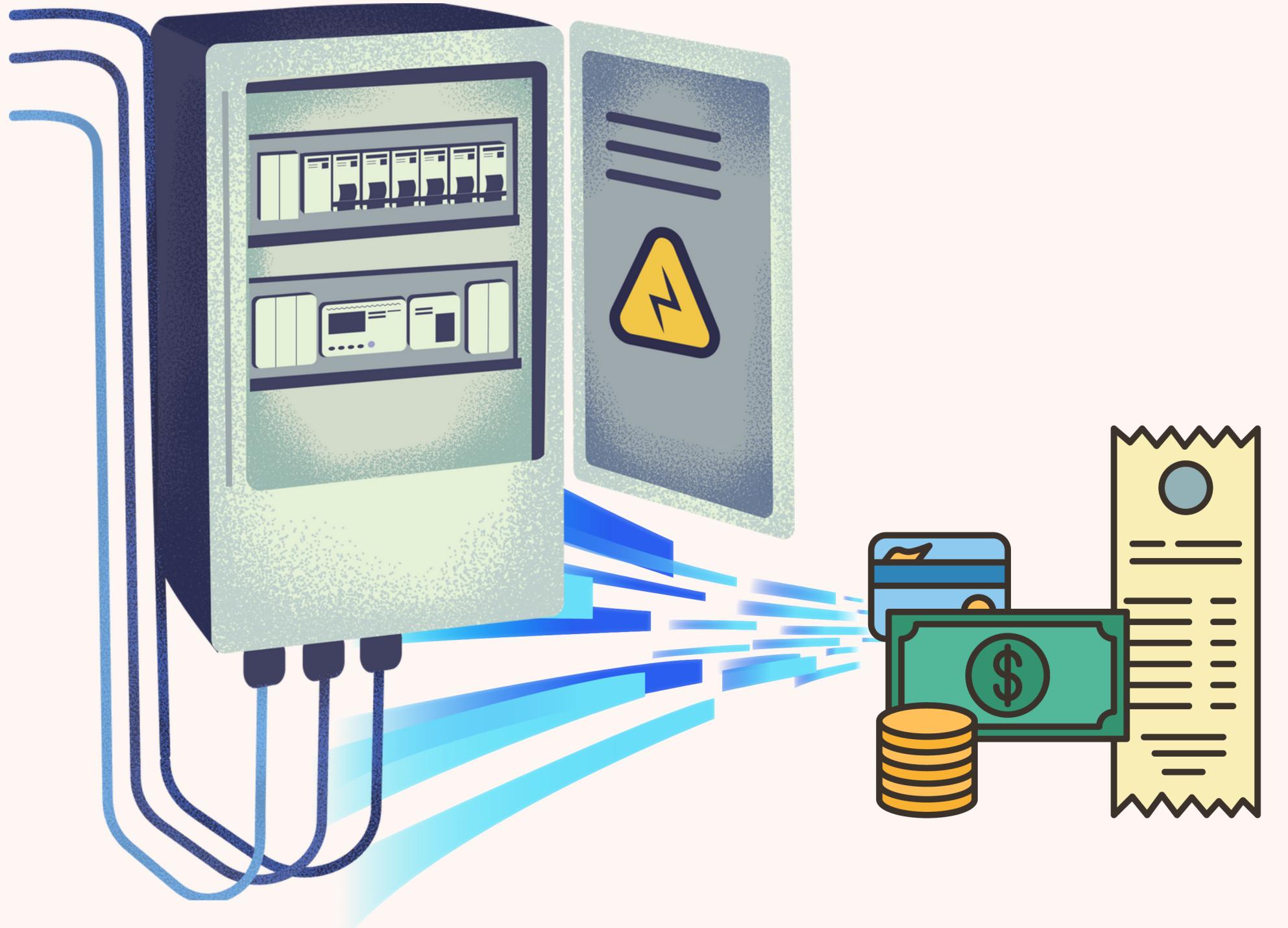


The Problem

Well, the problem is clearly stated already: the students forget to unplug their appliances from their dorm rooms. Without proper dorm rules multiple people who live in the same dorm room could possibly have multiple devices plugged in per outlet resulting the electricity bill to go up. This will not only affect the landlord with higher bills but also the students who live in the boarding house with them having to pay for higher rent for their room.



Common causes of high electricity usage:

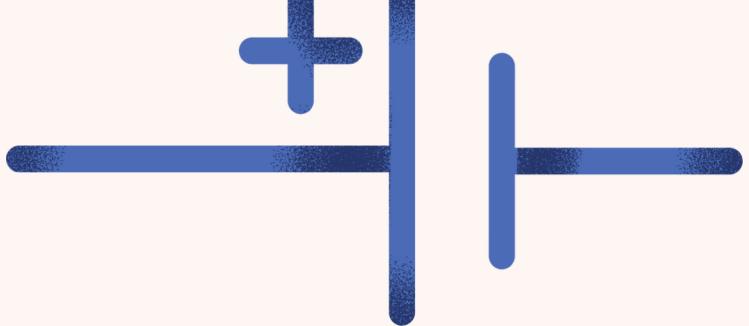


Leaving the lights on while outside.



Solution:

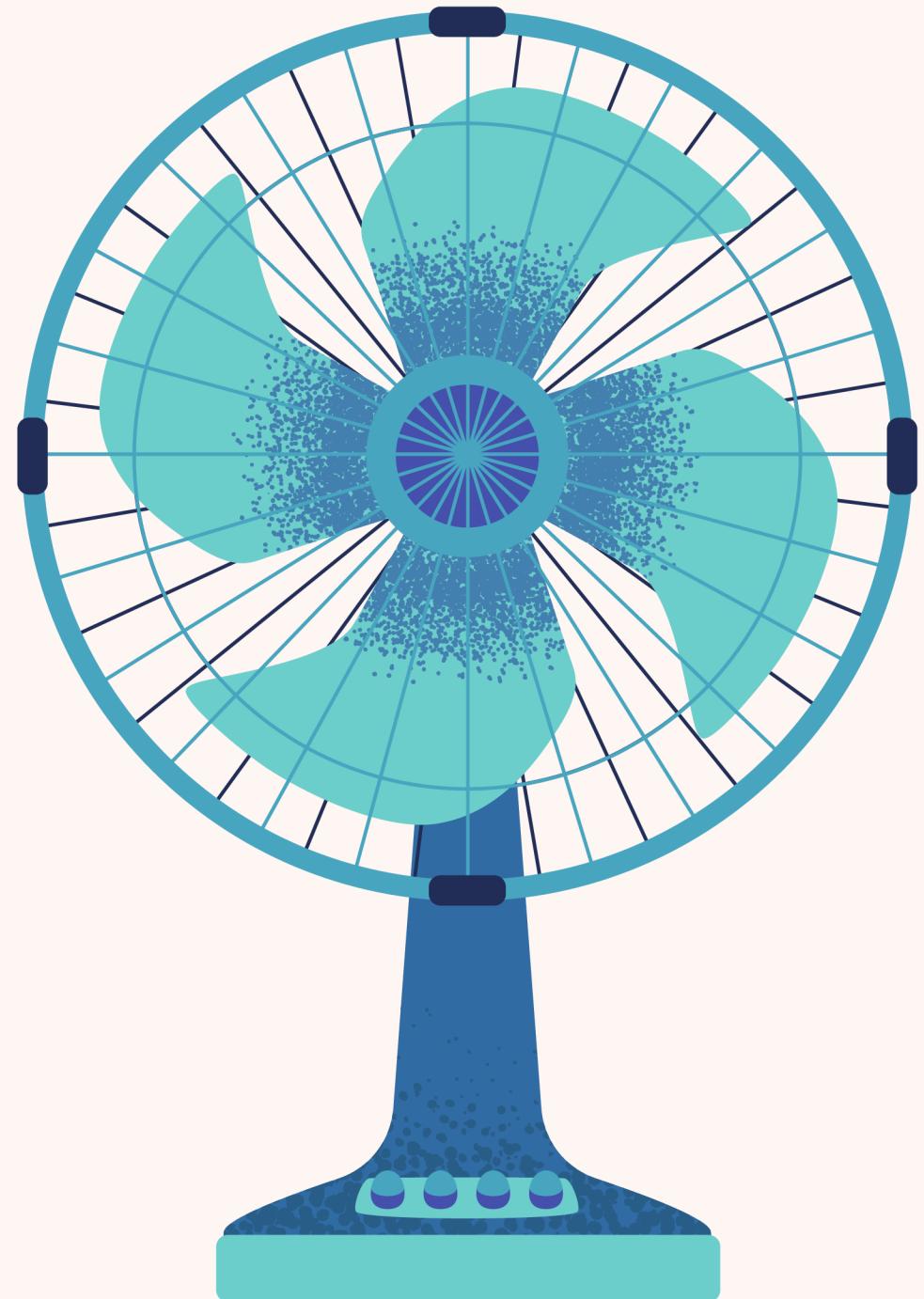
- Install motion sensors to detect when you leave and enter the dorm.
- use LED bulbs for room lighting because it LEDs use up to 90% less energy.



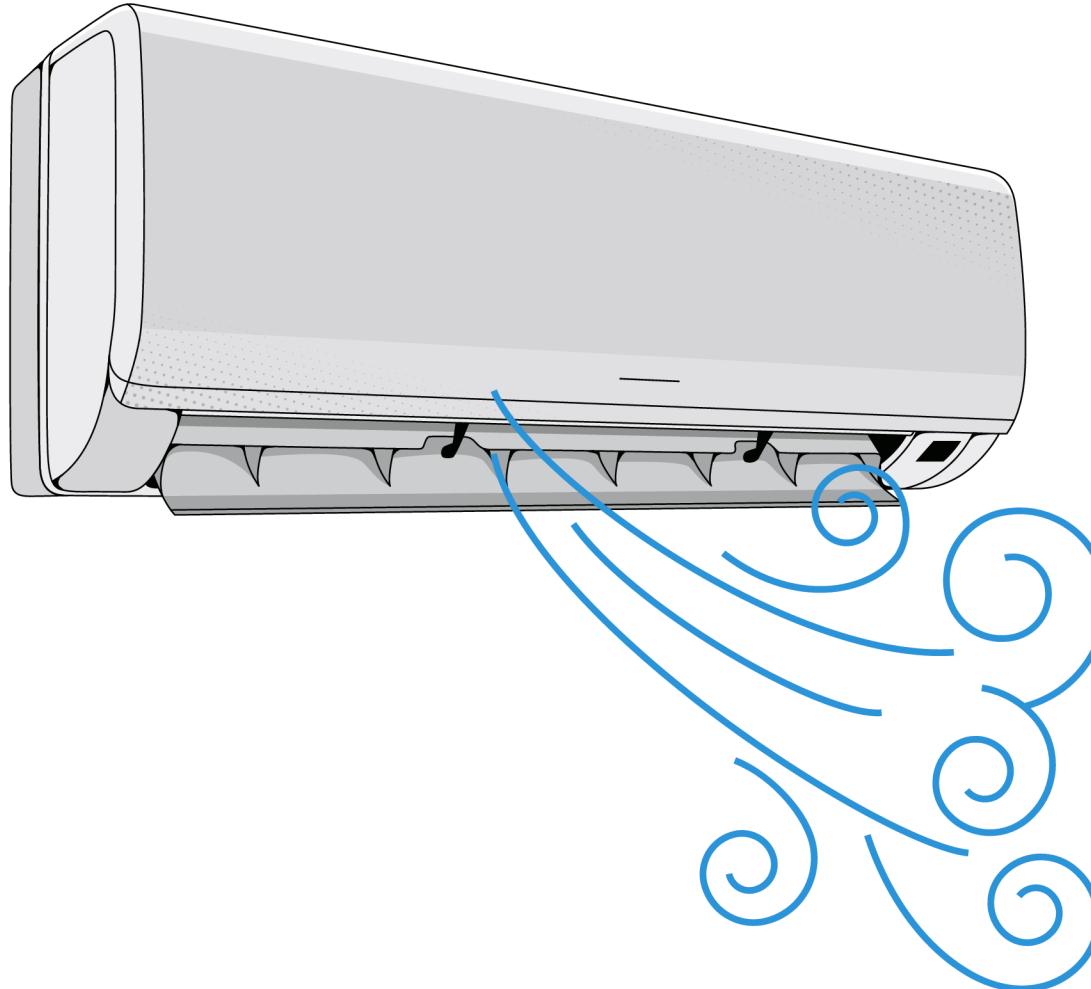
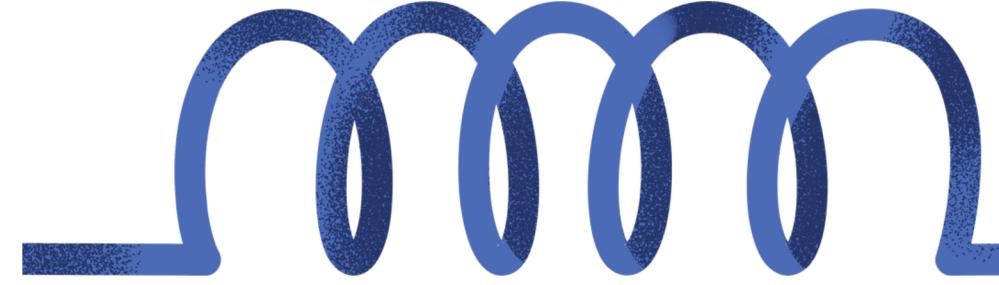
Fan left on after leaving outside.

Solution:

- use a timer switch to set schedules for when the fan turns on and off.



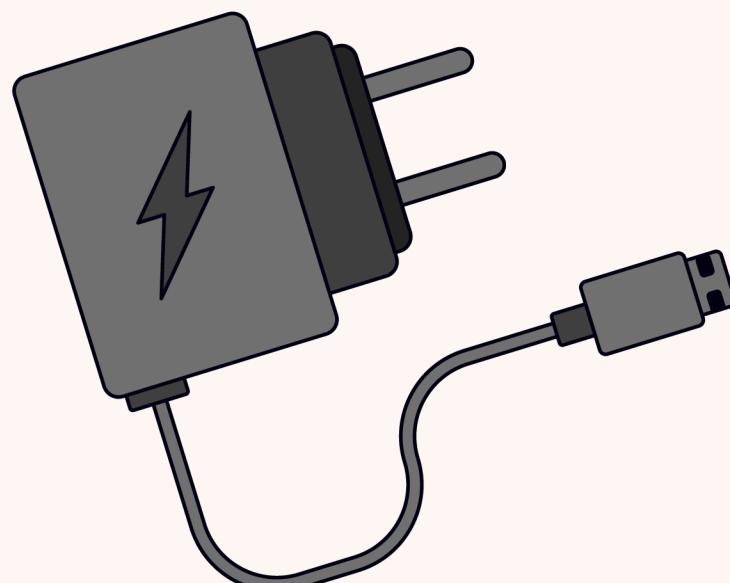
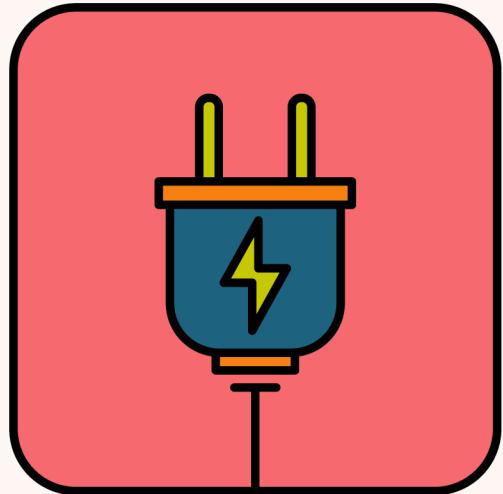
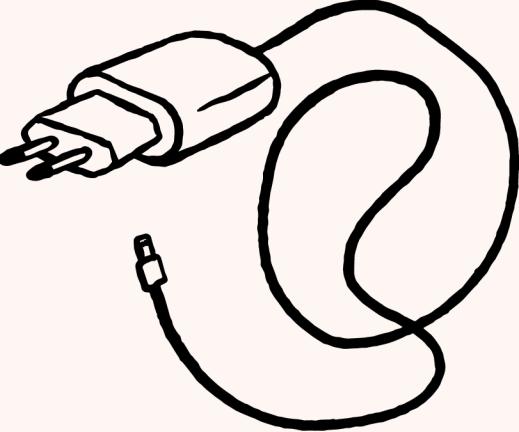
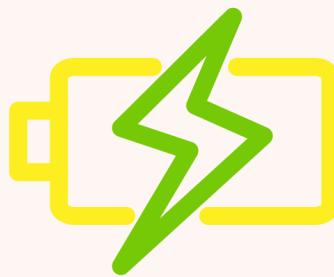
Air Conditioning consuming a lot of energy.



Solution

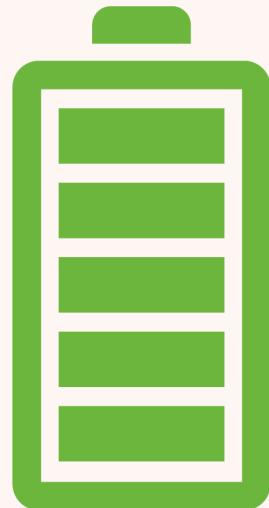
- Set the thermostat at 24-26 Celsius instead of 18-20 Celsius
(this saves roughly 20% of power)
- Make sure all doors and windows are closed shut to reduces the chances of cold air going out of the room.

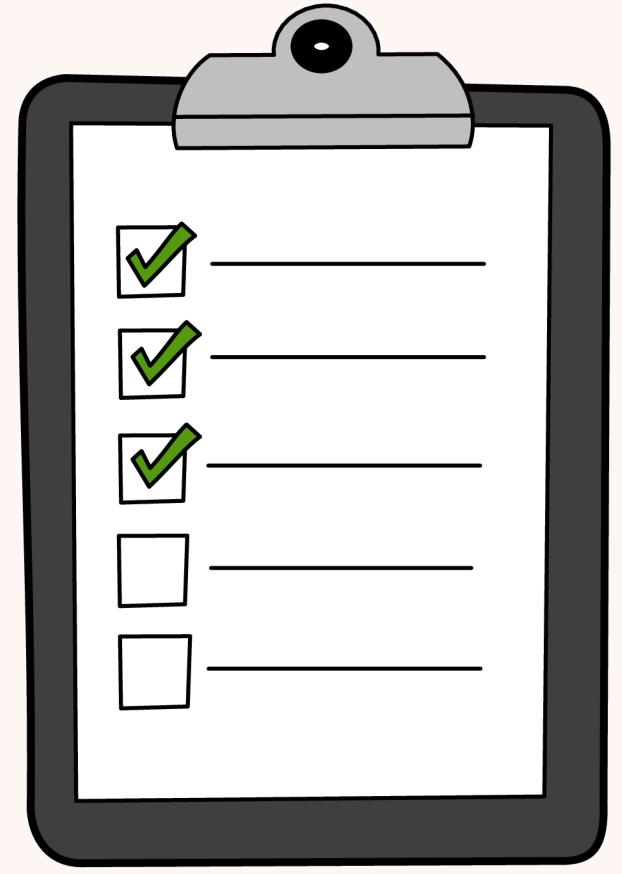
Chargers (Phantom Load/Standy Load)



Solution:

- use power strips with master switch to save power and easily turn all chargers off at once.





Specify Requirements



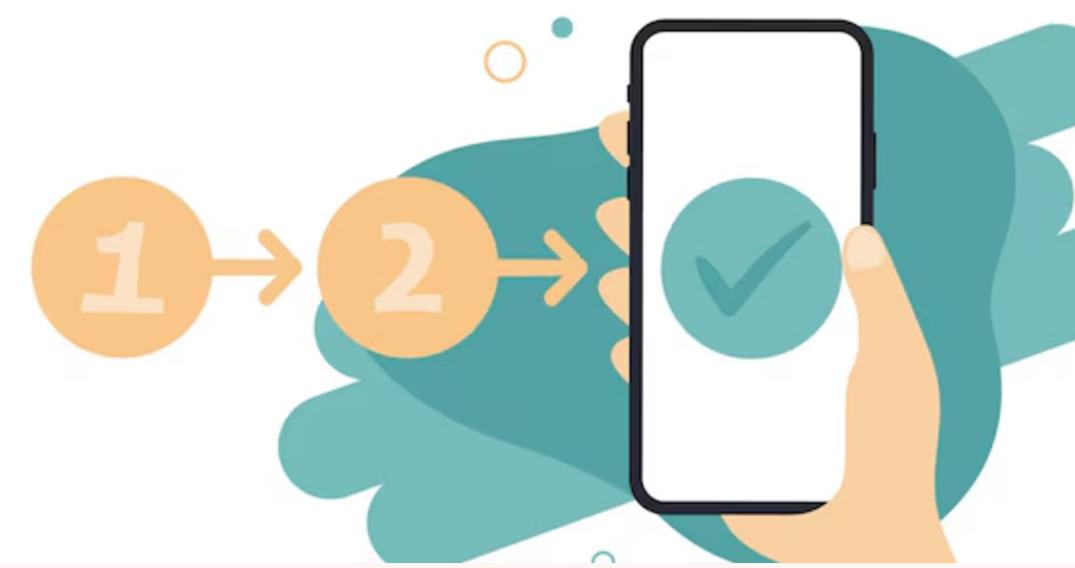
1. AFFORDABLE

It must be AFFORDABLE because nowadays dorms are really expensive, and they require multiple people to live in one to be able to afford it.



2. EASY TO USE

It must be EASY TO USE it shouldn't require a lot of brain power to be able to operate or set it up, it will defeat the whole purpose of making things easier.



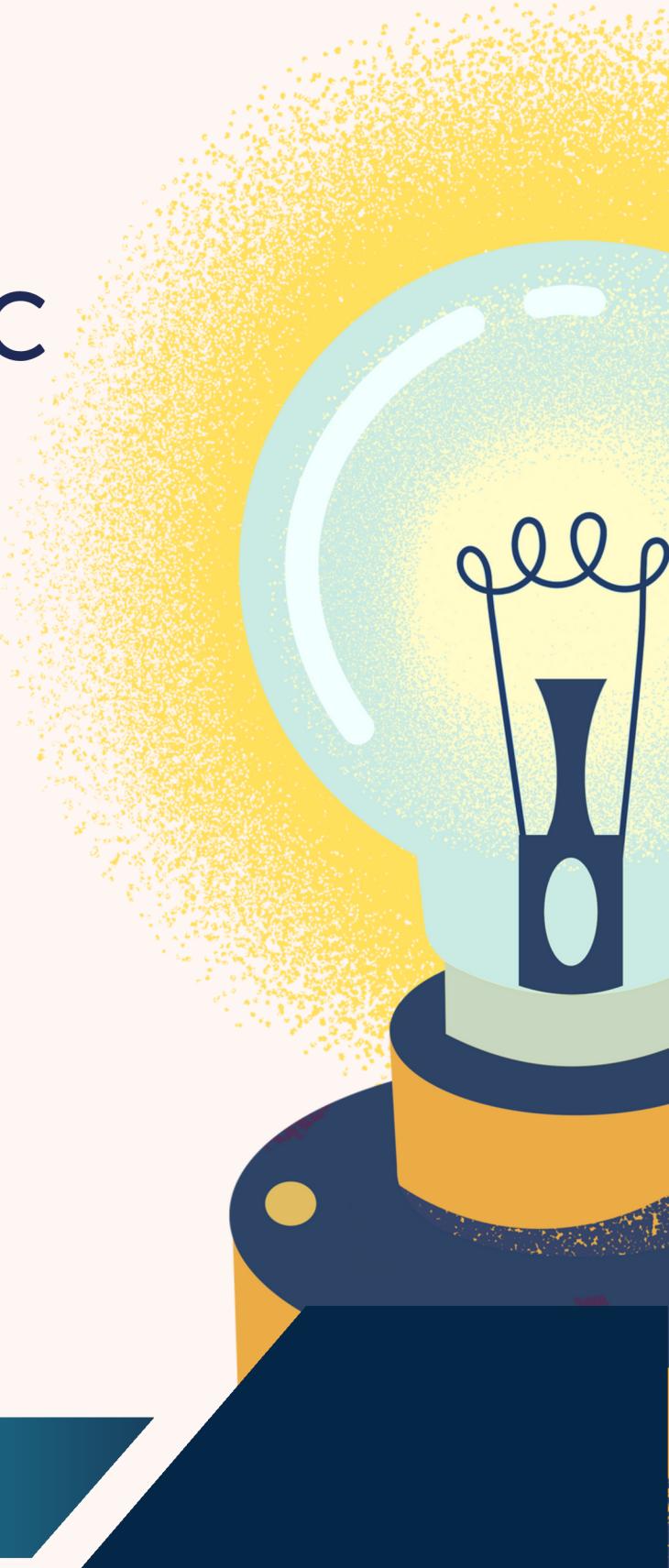
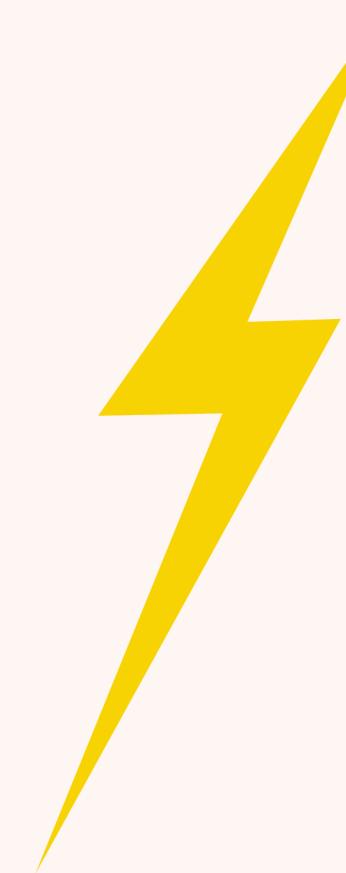
3. EFFECTIVE

It must be EFFECTIVE it must meaningfully reduce the amount of energy being wasted (at least a measurable decrease of 15-20% for electricity bills)

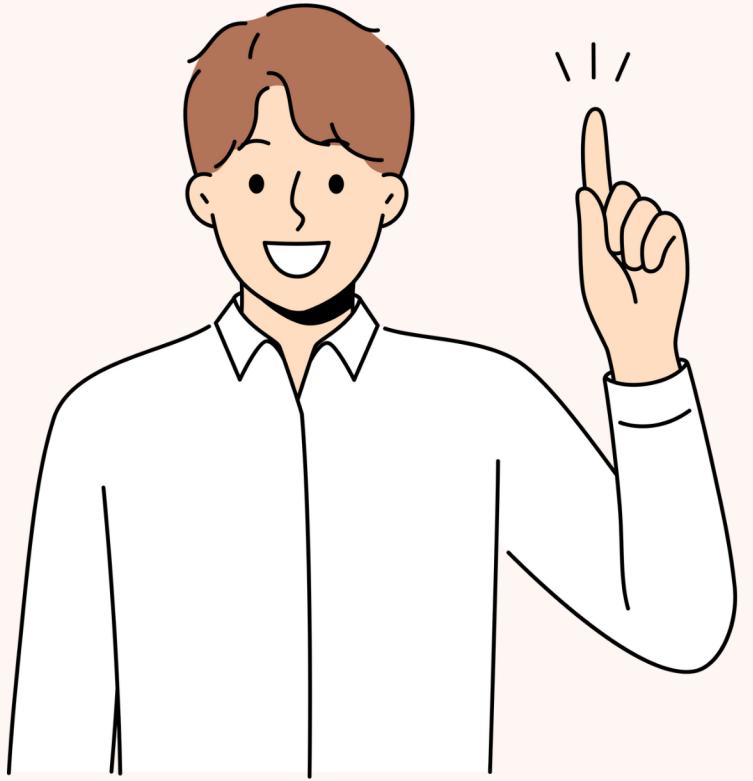
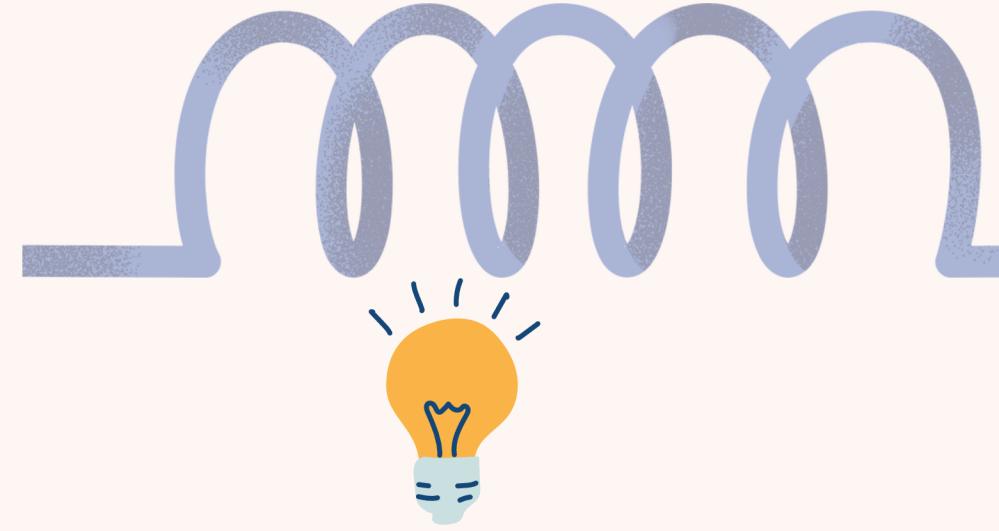
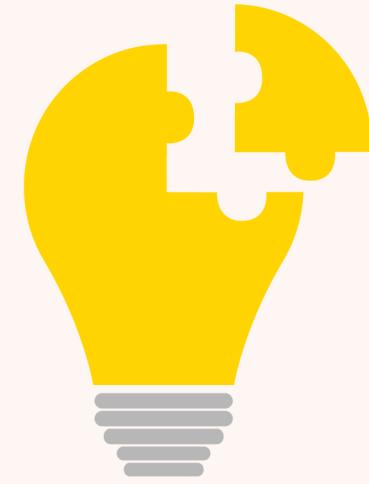
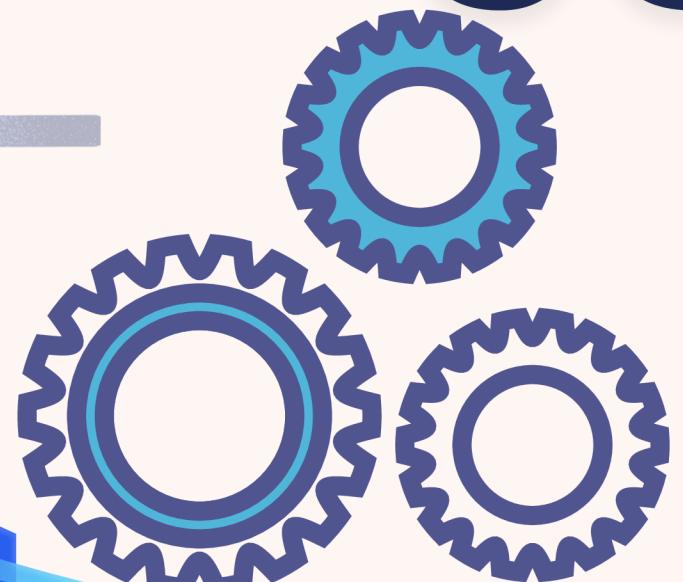


4. SAFE

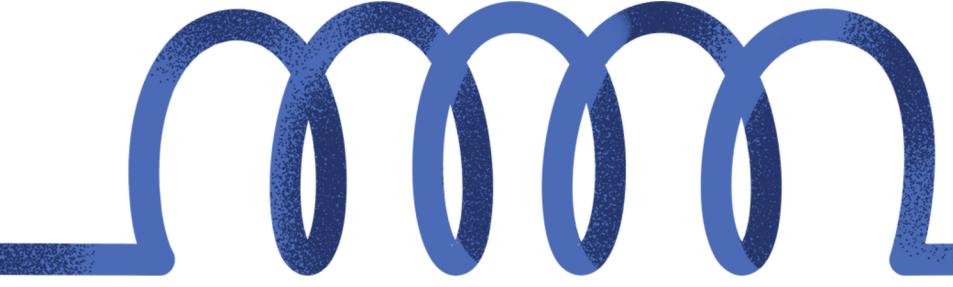
It must be SAFE to comply with basic electrical safety.



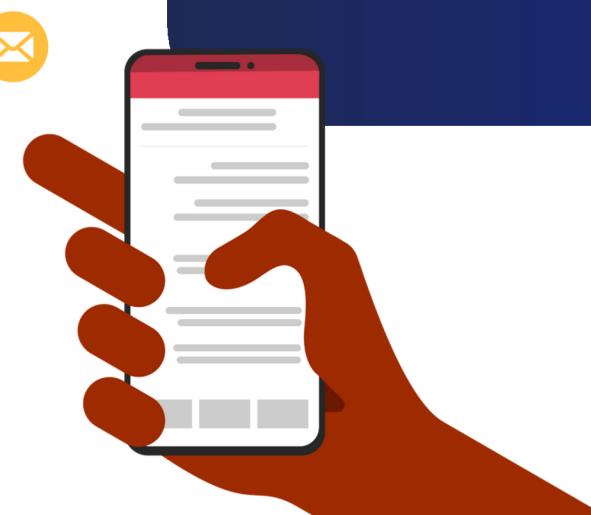
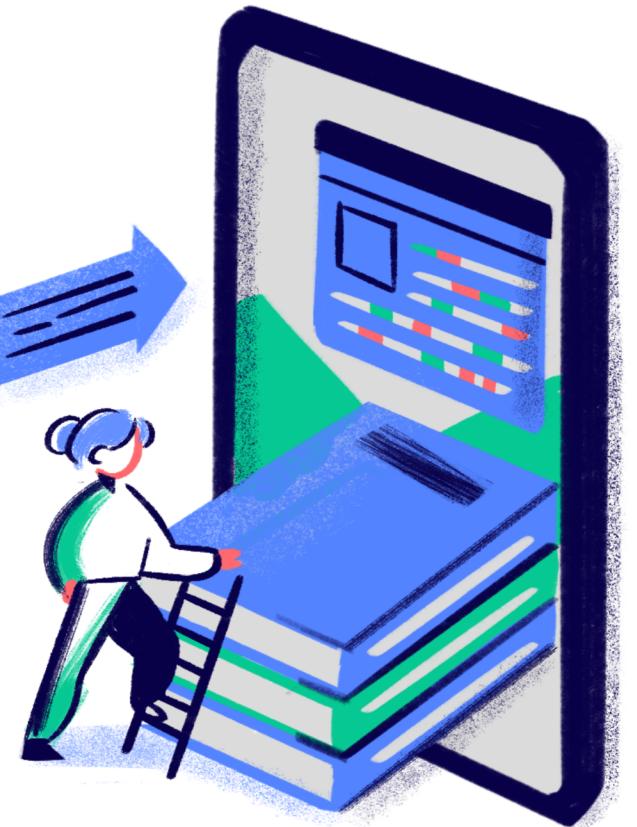
3 POSSIBLE SOLUTIONS



A. Operation SNS (Save No Spend)

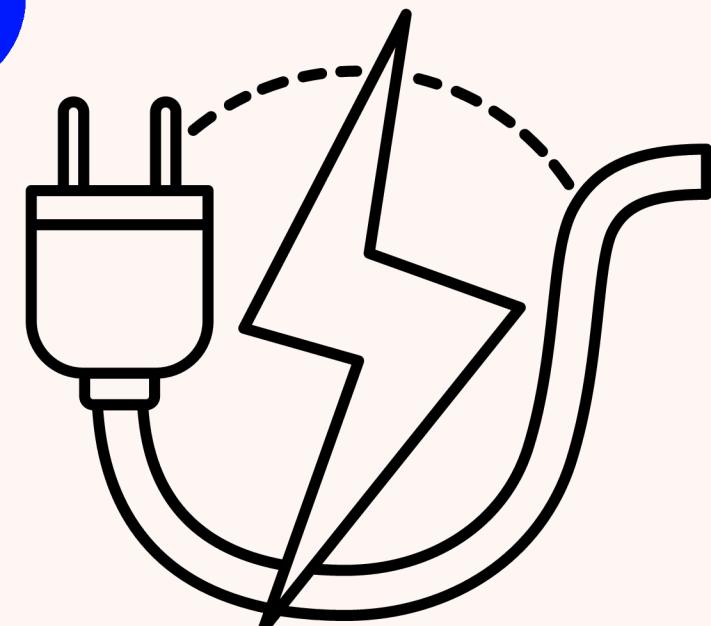
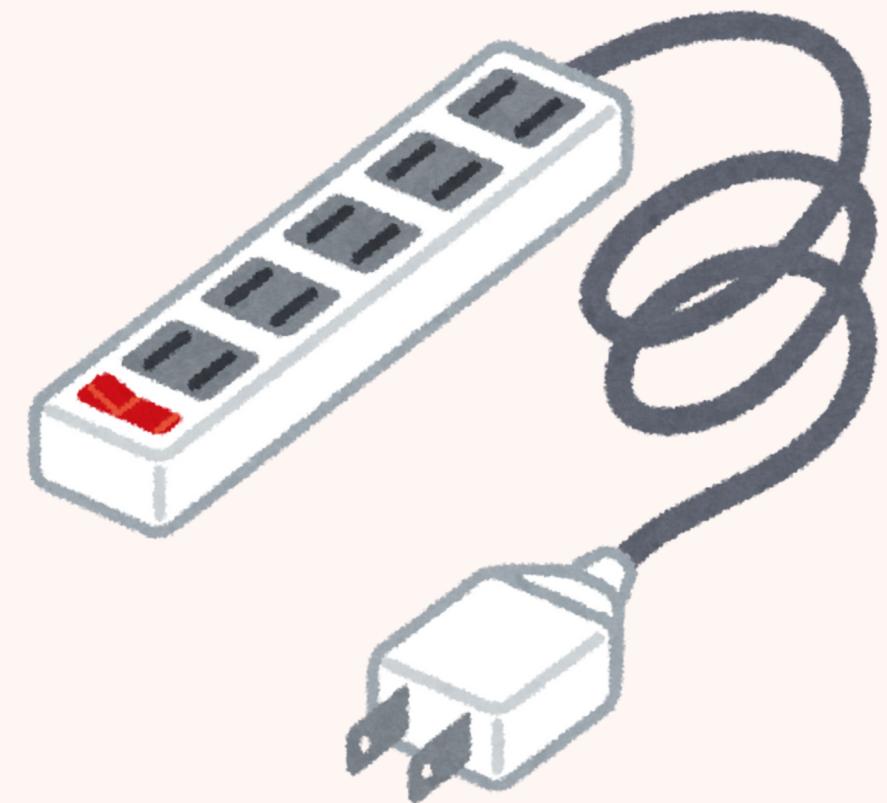


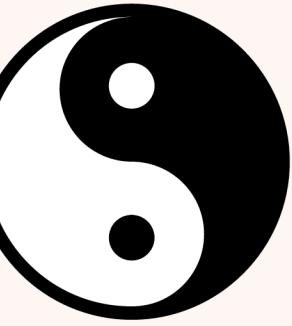
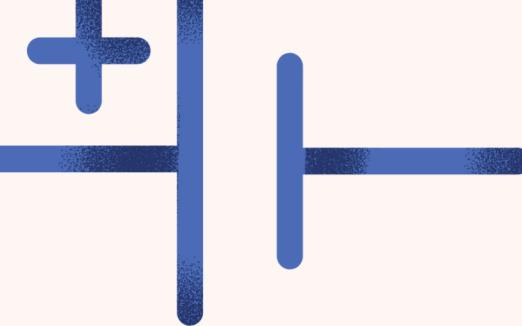
- With this solution the entire boarding house has to put stickers near switches and sockets to remind them to turn off the lights when leaving.
- Create a shared Discord (or any communication app) group/server with a bot that automatically reminds all the users to keep everything off when leaving or turn it off when not in use.
- Make prizes for people who consumed the least amount of electricity in 1 month



B. Invest No Stress

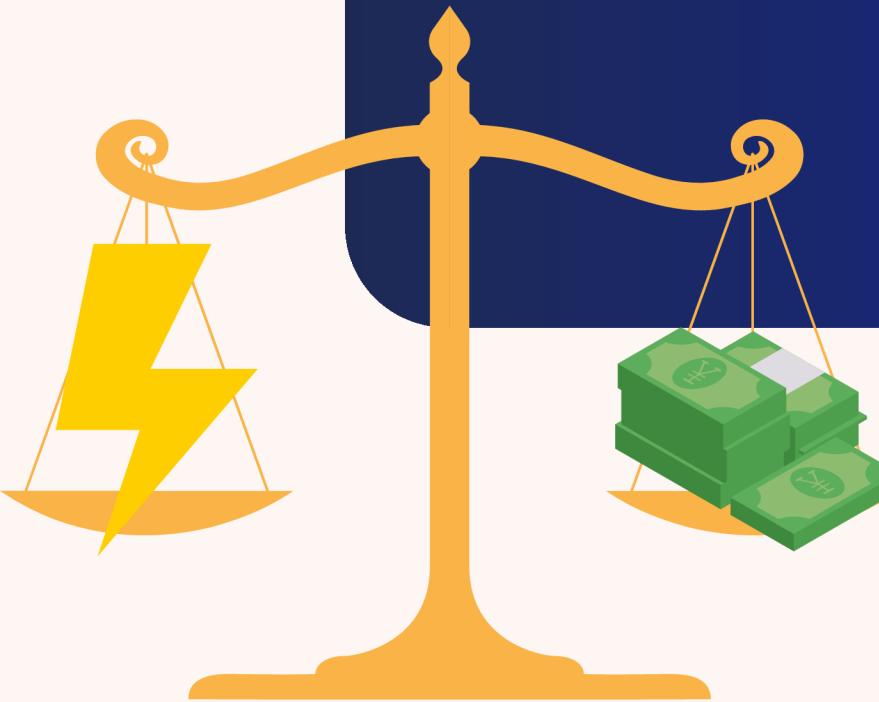
- students will invest in smart plugs, power strips and LED bulbs so everything will be easier when they forget (individual control).





C. Electrical Balance

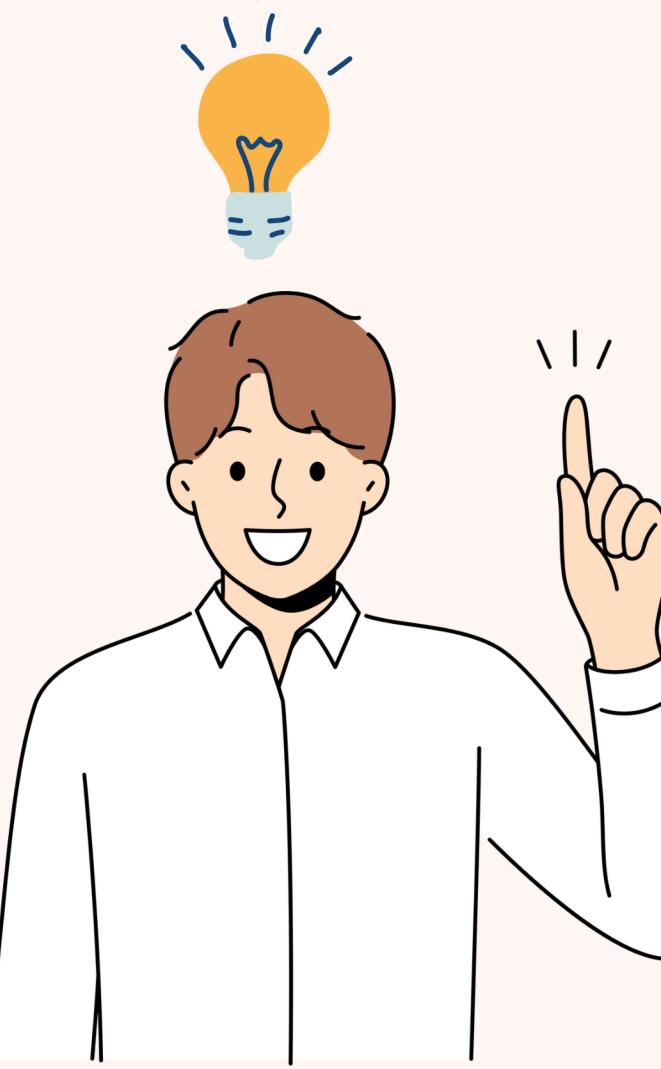
- Instead of spending everything in one go on power strips and smart plugs, we implement what we can first.
- Make a dedicated communication medium for everyone in the boarding house where a bot reminds the people in the boarding house to properly turn off and save energy.
- research about affordable smart plugs, strips, and LED bulbs for students who are on a tighter budget.



BEST SOLUTION



APPROVED

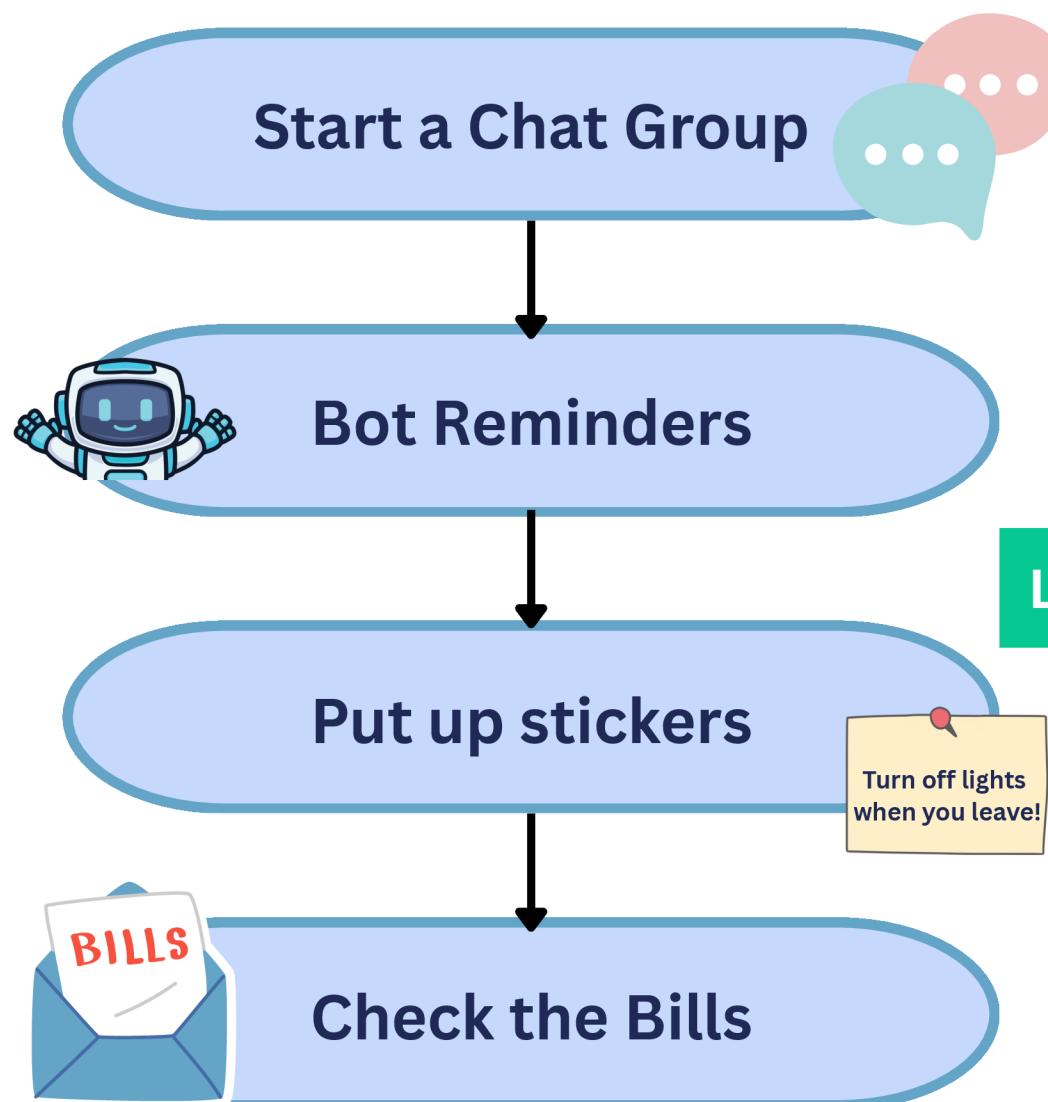


The Best Solution for Me

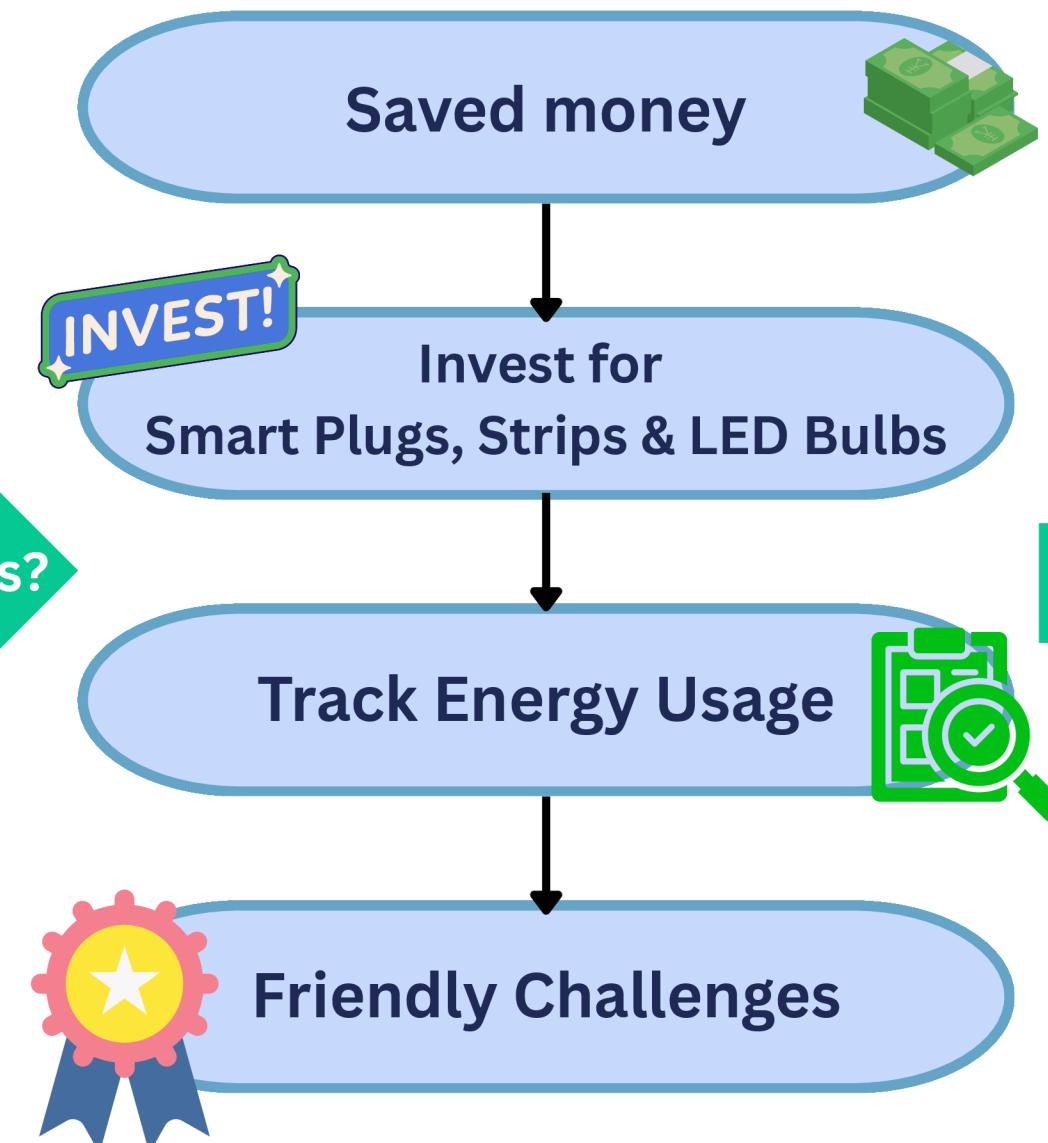
The best possible solution is option C because not every student can afford smart plugs, power strips, and LED bulbs at the moment. It is better for the boarding house to control what they can for now, so the students won't be overwhelmed with things they need to buy to be able to save money on the electricity bill. Building that community connection is one of the best things to be able to decrease the electricity bill; every person adds up to the bill, so every person counts. By combining community accountability with phased upgrades, Option C is both sustainable and effective, making it the most realistic and fair solution for all students.

Flowchart of how it works

Phase 1: Talk and Remind



Phase 1: Tech Upgrade



Phase 1: Keep it Going

