



Forever Onz

Leveraging Technology and Embracing
Good Practices to Eliminate Non-
Beneficial Electricity Usage

NHGD .NTUC Health

Environmental Sustainability:

The healthcare sector is the 5th largest carbon emission contributor (Health Care Without Harm, 2019)

The annual electricity consumption of 67 healthcare facilities (GFA $\geq 5,000$ m²) has increased at a rate of 103%, compared to the growth of the corresponding GFA at 110% over the period from 2008 to 2020. It was observed that the average EUI for healthcare facilities in 2020 has increased by 3% since 2008.



Building and Construction Authority (BCA)

<https://www1.bca.gov.sg/docs/sustainability> PDF

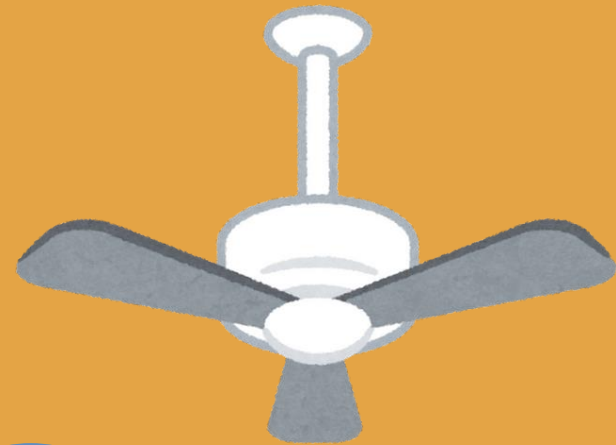
BCA Building Energy - Singapore



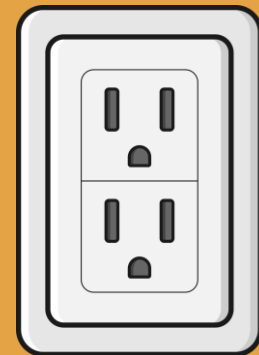
Our issue? Forever on



Both NHGD and NTUC Health recognize that there are devices left on **24/7** despite not being used. **Phantom power** from forever on electrical outlets also leads to a higher electric bill, and hazards including increased fire risk



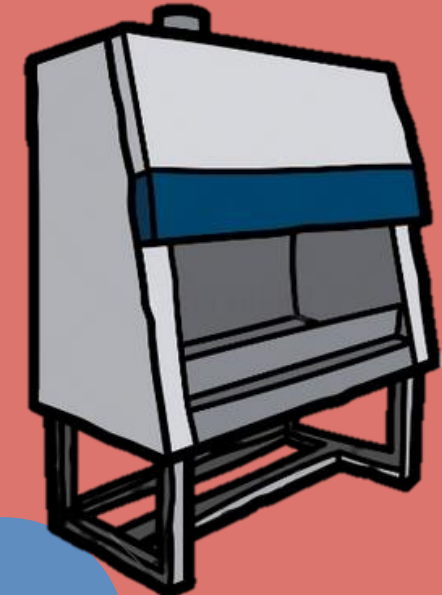
70 Fans @
NTUC Health



66 Device / outlet @
NHGD WDL, KAL
Top devices: water dispenser,
microwave, DCA, Leica



7 Fridges @
NHGD WDL, KAL



3 BSC @
NHGD WDL, KAL

No. of "Forever on"
Appliances/Devices

No. of Appliances/Devices which
usage can be further optimized

What have we done in the last 3 weeks?

12 Jun - 17 Jun

18 Jun - 26 Jun

IoT installed to monitor baseline

Post implementation monitoring

NHGD: installed smart switch at outlets to kill phantom power via scheduled on/off

No. of "Forever on" Appliances/Devices

NTUC Health: installed sensor to turn off fan when no motion detected

No. of Appliances/Devices which usage can be further optimized

NHGD: encourage switching off Biological Safety Cabinet vent when not in use

NHGD:

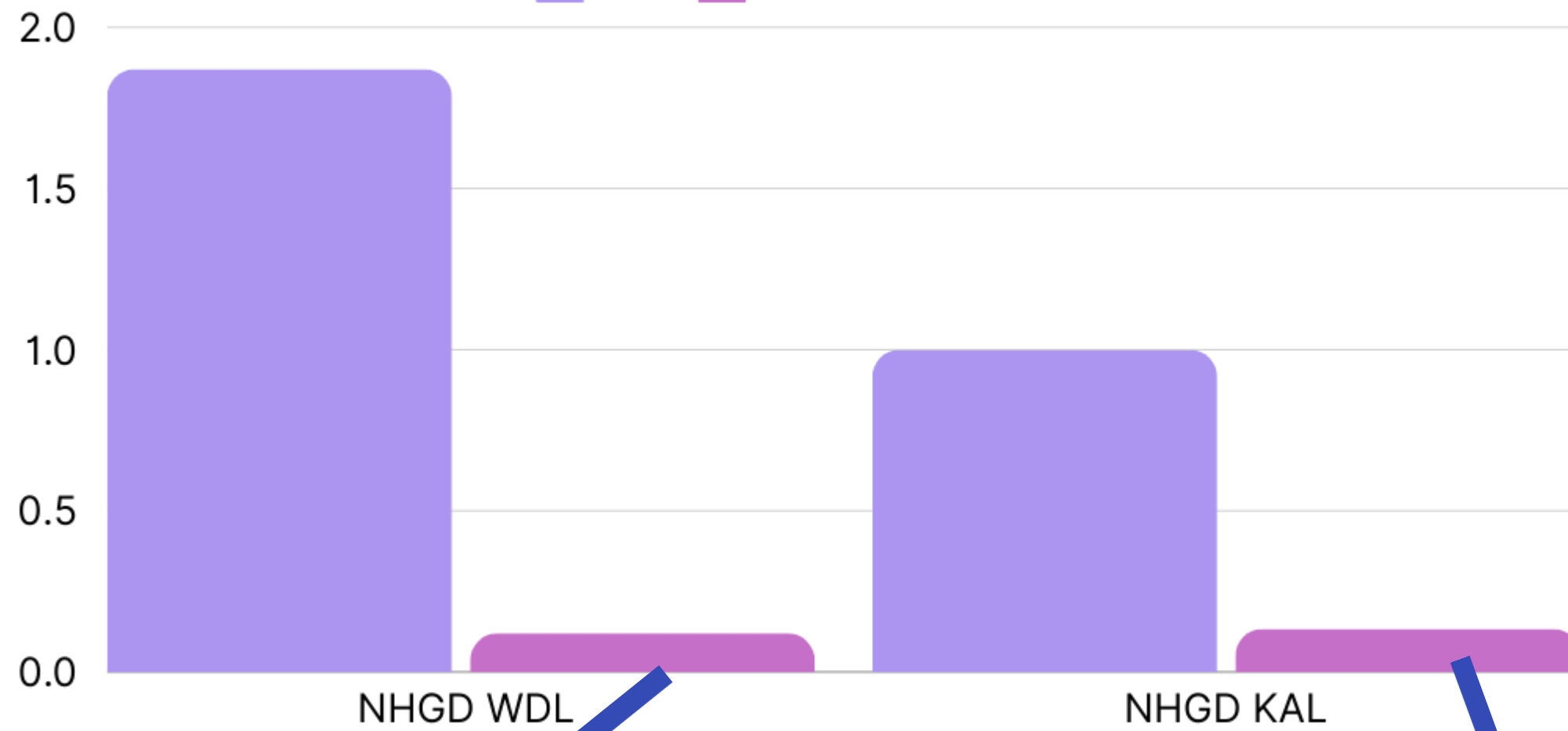
1. set fridge temp to 5°C
2. clear air vents of obstruction
3. minimise prolonged opening of fridge door

Outcomes 1/2

× FOREVER ON

kWh/day (after operating hours)

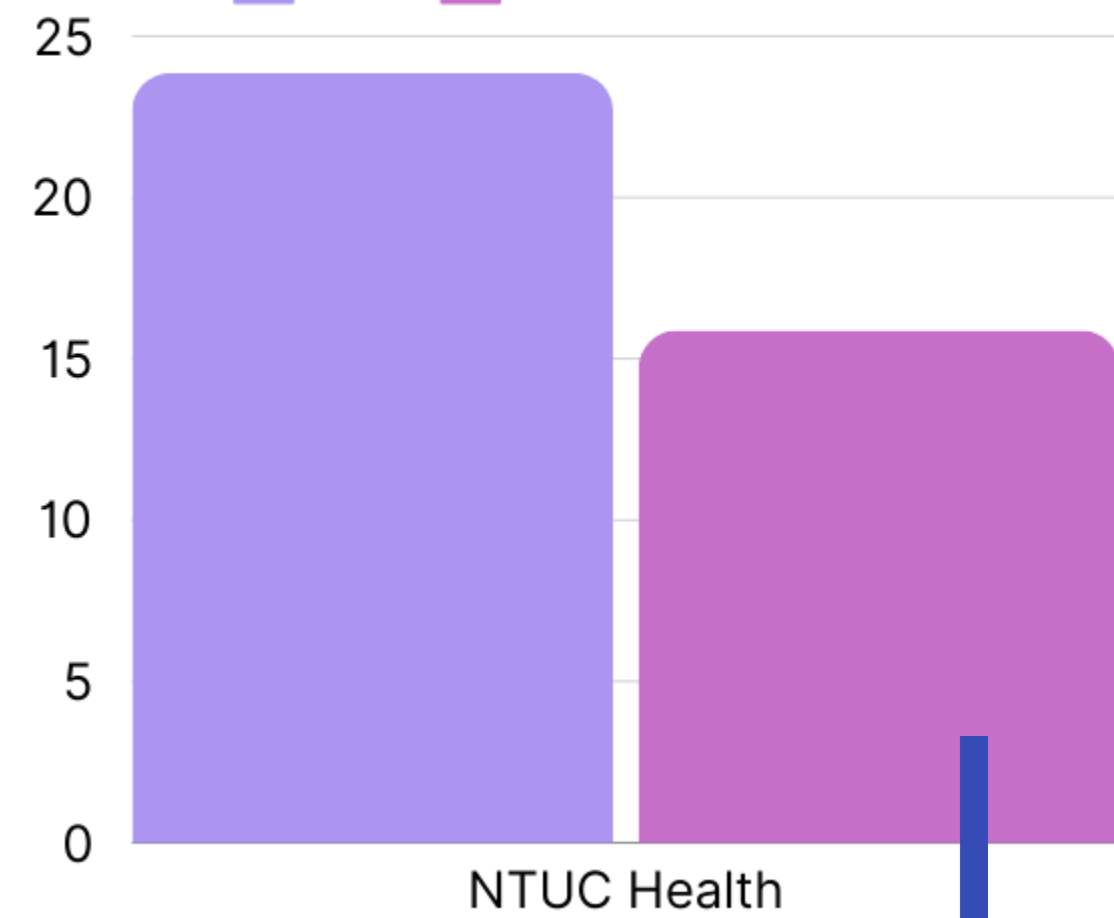
Pre Post implementation



NHGD: installed smart switch at outlets to kill phantom power via scheduled on/off

kWh/day

Pre Post implementation



NTUC Health: installed sensor to turn off fan when no motion detected

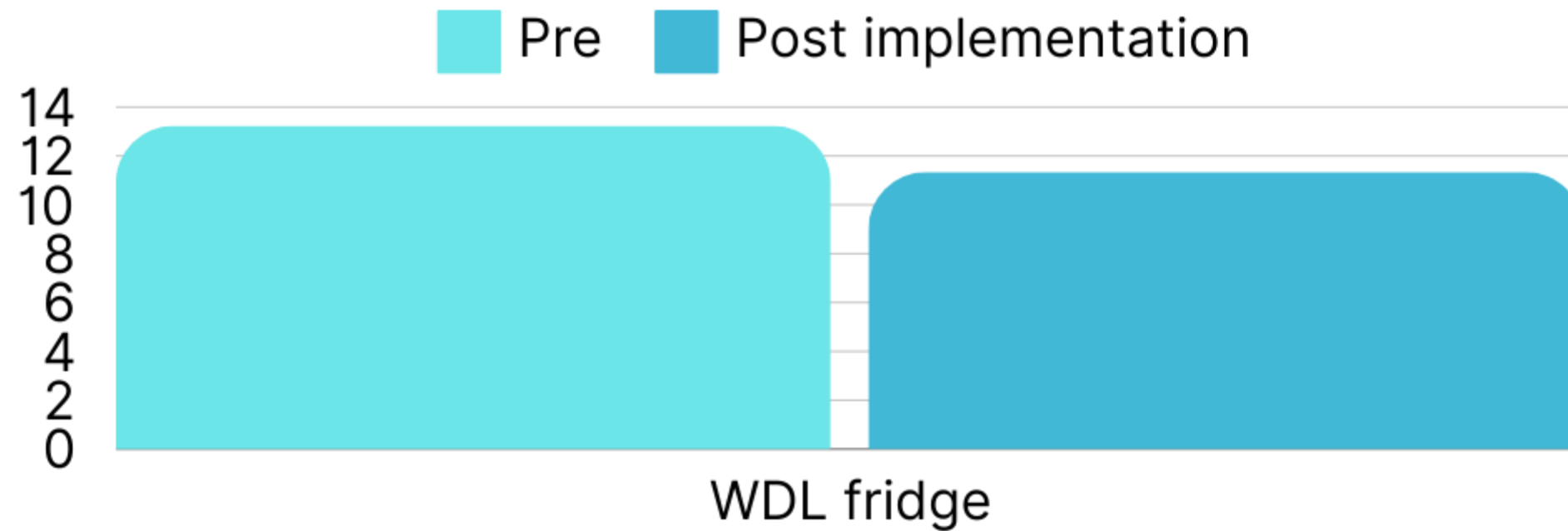
Outcomes 2/2



OPTIMISE ELECTRICITY USAGE

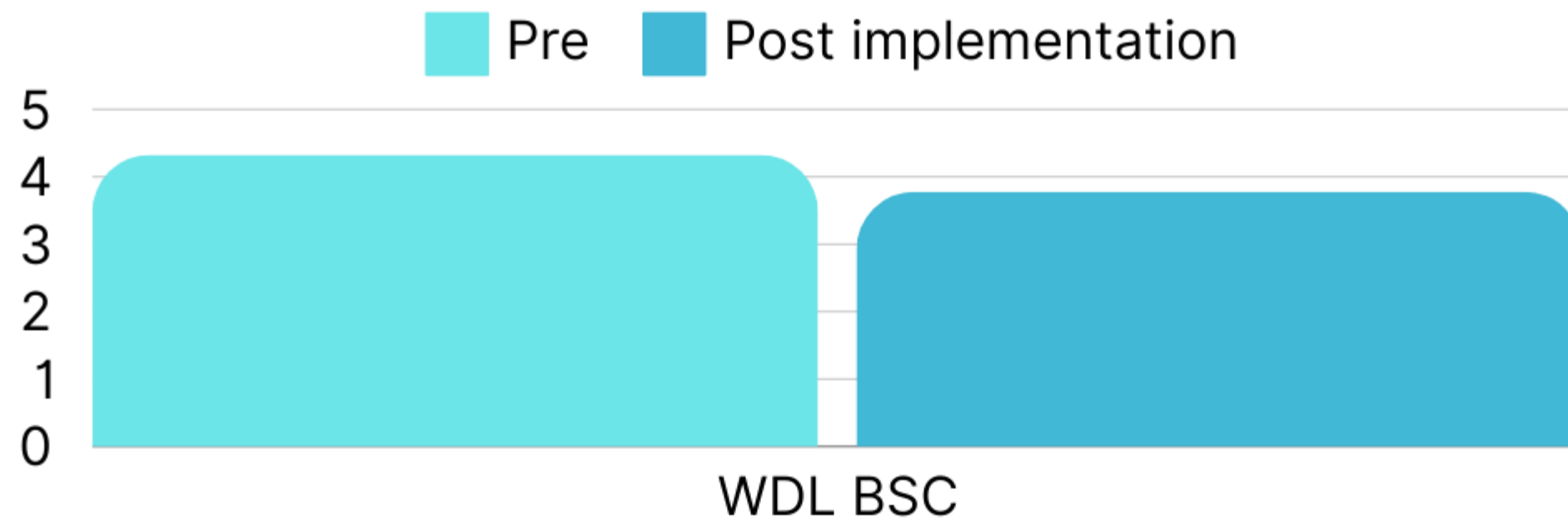
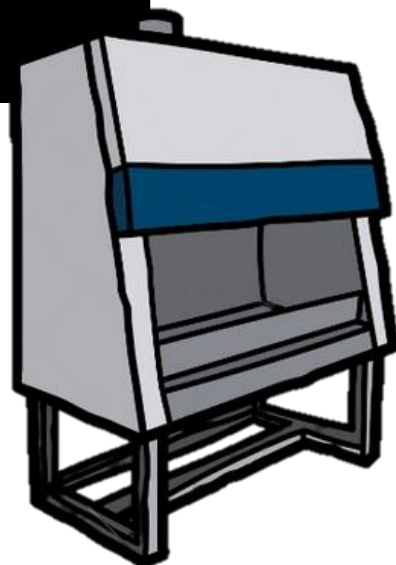
FRIDGE

- Set fridge temp to 5°C.
- Clear air vent clear obstruction
- Minimise prolonged opening of fridge door

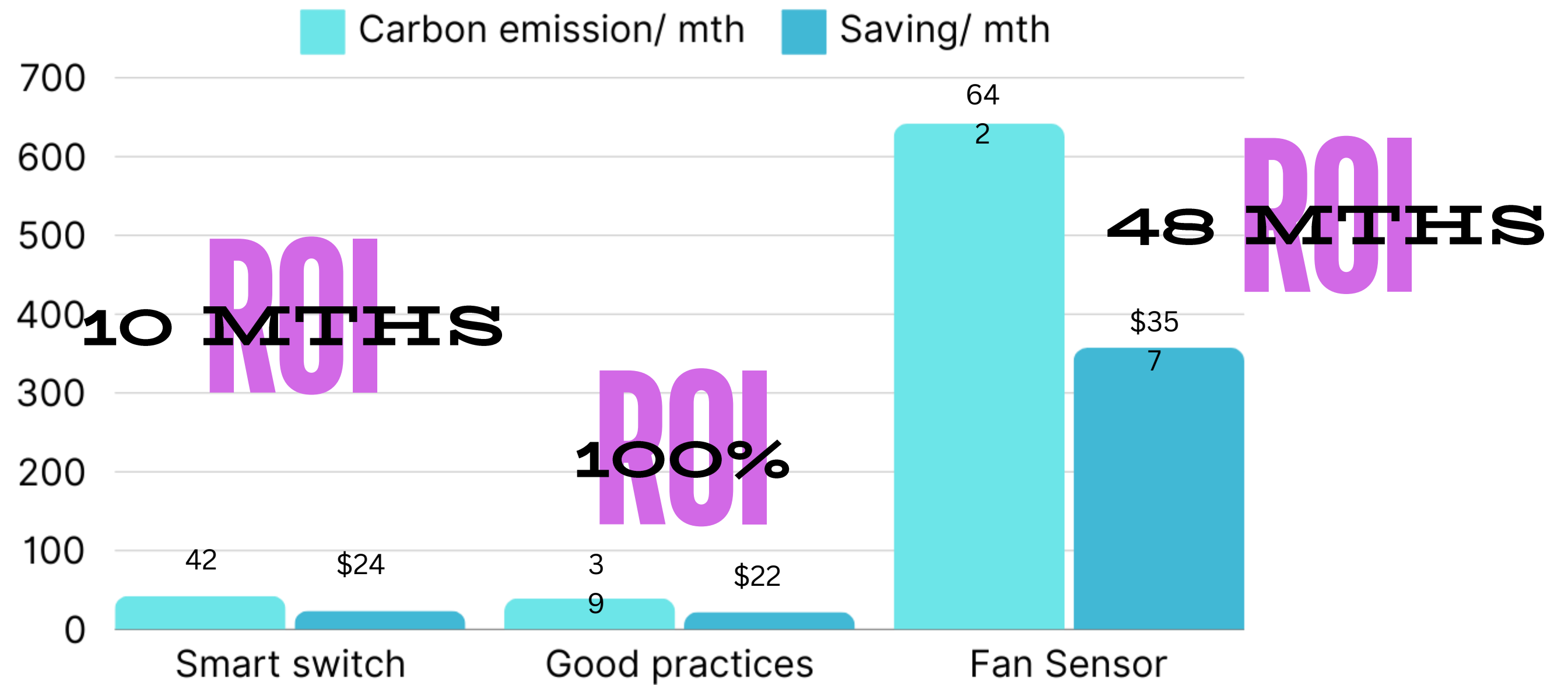


BIOLOGICAL SAFETY CABINET

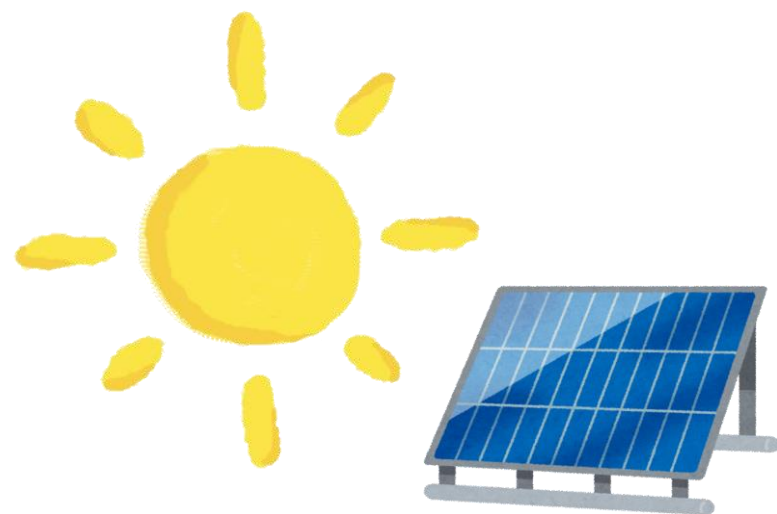
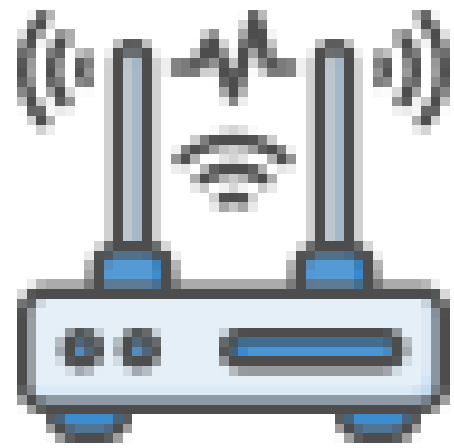
Switching off BSC vent when not in use



Return on Investment



Longevity of solution



- **Implement on/off schedule** across NHGD labs and NTUC Health's nursing home to maximise electrical savings



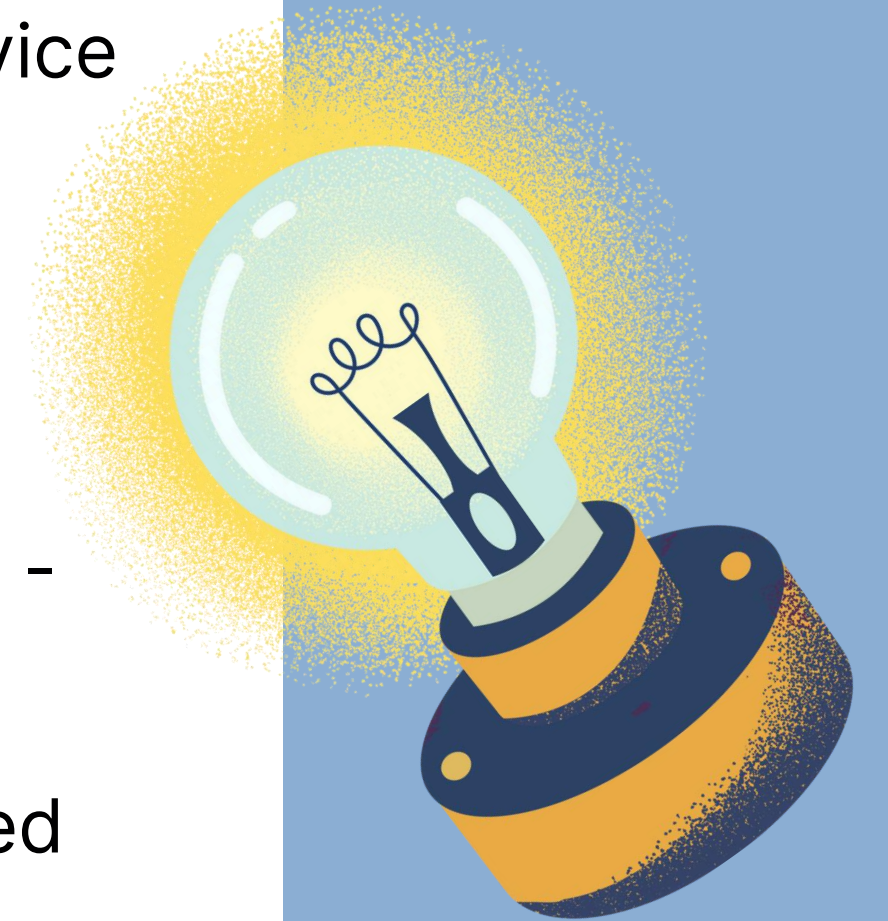
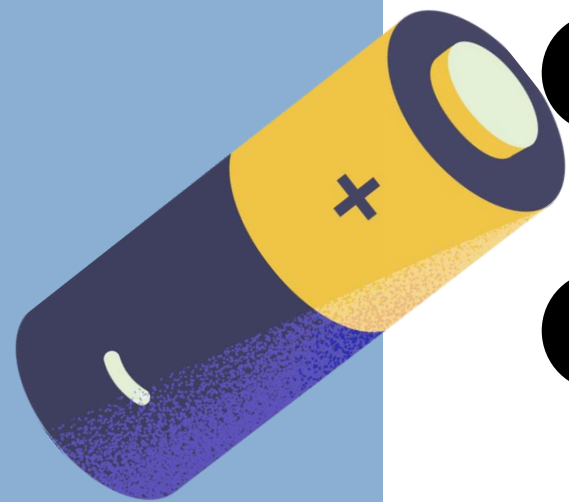
- Explore using mesh devices to link switches with gateway and dashboard that allow **mass deployment** instead of using individual plugs
- **Share outcomes on savings**, and influence internal and external healthcare providers on the best practices



- Explore new improvements with better solutions that use **cleaner energy** (e.g., solar power).
- **Incorporate smarter solution designs** during the setup of new spaces/clinics (e.g., having default shutdown of devices at a specific timing)

Our Learning points

- Limited # of smart devices per account per setup
- Scheduled program on/off can be further optimised electricity e.g interval of fan, on/off timing per device
- Not all devices have high phantom power, IoT should to be installed only in those utilising phantom energy higher than IoT
- Not all devices are suitable to program shut down - check in with vendors
- Verify the schedule programed to avoid unintended shutdown



**Thank
you very
much!**

