

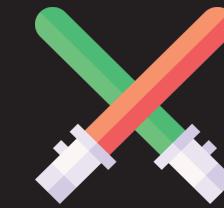
# INTRAVENTIONS PROJECT 2022 : STAIR WARS

ENVIRONMENTAL  
CHANGE  
S2444368

A LONG TIME AGO, IN A GALAXY CLOSE, CLOSE TO YOU...

# STAIR WARS

A BATTLE FOR PLANET EARTH. THE ENVIRONMENT IS COLLAPSING. WILL THE JEDIS LED BY ANAKIN STAIRWALKER DEFEAT THE EVIL EMPEROR LIFT-OF-DOOM?



## Background and research

Greenhouse gas emissions from buildings have increased steadily since 1990, driven predominantly by electricity consumption (State of Climate Action 2022 : 46). Around 80% of UK's energy that is used to power buildings is produced from fossil fuels (BP 2021). The built environment in the UK needs to reduce its energy consumption by about 80% in order to meet its 2050 net-zero carbon emissions target (ISG 2021).

With the current energy crisis due to the war in Ukraine, countries have been forced to re-evaluate energy consumption patterns. The UK has some of the oldest and most energy inefficient housing stock in Europe and the government subsidises energy bills for households and businesses that run into the tens of billions of pounds (Young 2022).

Reducing the energy intensity (amount of energy used per square meter) of buildings helps to reduce overall energy demand. Energy intensity rates are reducing globally, but at a slower pace than required to meet climate targets. An acceleration factor of 7x is required to meet 2030 emission targets.

Decarbonizing existing buildings and making new buildings zero carbon are some of the suggested approaches to achieve this target.

Through my companion species project I learnt how ants have been one of the most enduring species on the planet. They have been able to thrive by living in harmony with their environment, and knowing how to use their resources without overexploiting them. Man has assumed permanent mastership of nature when he is only allowed temporary mastership (Schumacher 2014 : 81). Civilised man has despoiled most of the lands on which he has lived for long. To emulate the ants, humankind needs to rethink the way they live and consume.

In my companion species proposal, I considered using microbots modelled on ant's exoskeletons to move objects/people vertically to save energy and replace lifts. My intravention is designed to encourage usage of stairs and reduce usage of lifts in residential buildings. The target group of this intravention is university students with no disabilities. The goal is to encourage behaviour change in terms of sustainability. This intravention addresses the system of electricity consumption which is fed by the electricity generation sector. The focus here is on reducing consumption, thereby reducing generation.

FIGURE 15 | Historical progress toward 2030 and 2050 targets for energy intensity of residential and commercial building operations

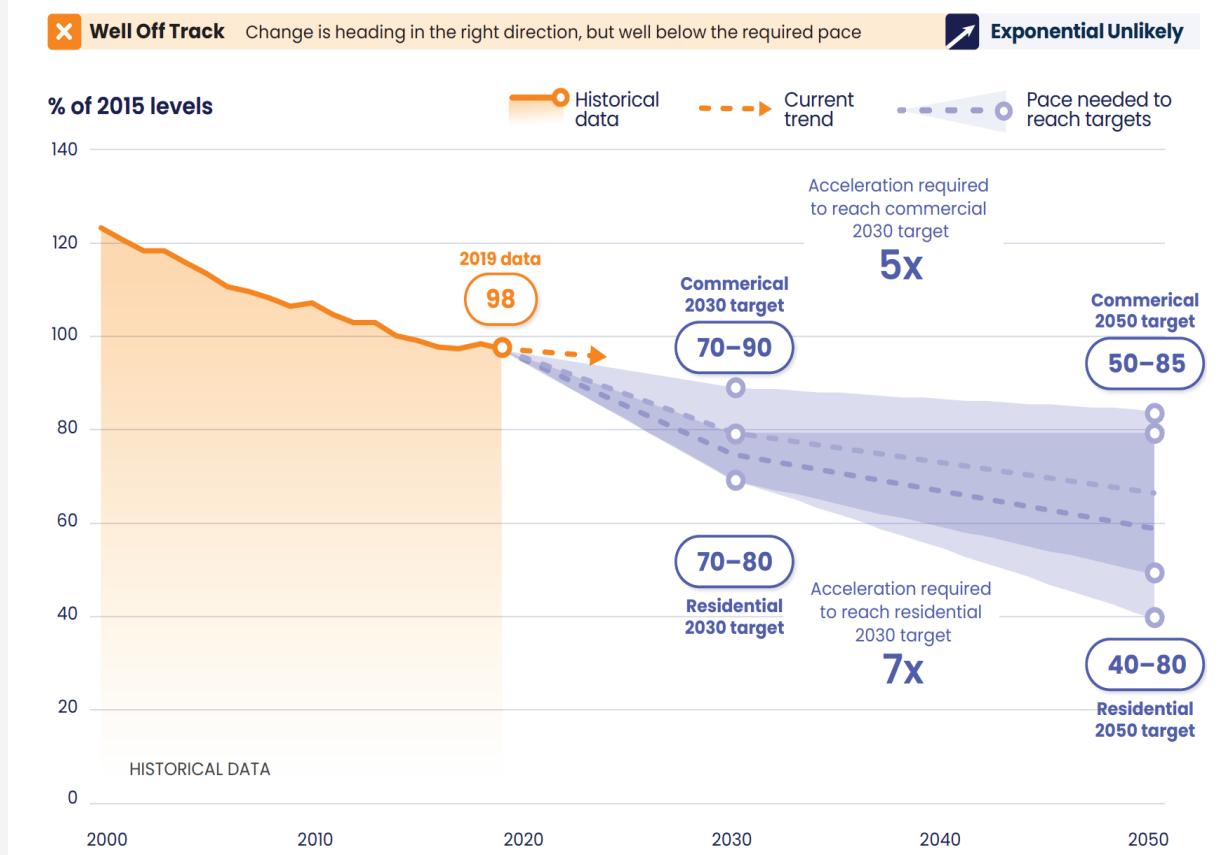


Figure 1: Global progress towards energy intensity targets

## Lifts

Lifts consume 5 to 10% of buildings' energy (WEF 2019). Cutting down on lift usage can be a small but effective way to reduce energy consumption. There are different types of lifts and the energy usage varies according to the type. An average three-story building with a hydraulic lift consumes about 3,800 KWH (Kilowatt hours) per year. In comparison, a 55 inch OLED TV consumes about 1KWH in 50 hours of usage. One year of lift usage would equal 216 years of TV usage.

Lifts operate using a pulley system. The main box or car you enter, is attached to metal cables. One end of the cable is attached to the car and the other end is attached to a counterweight. The counterweight moves in the opposite direction of the car and its weight is determined by an estimate of the car at half-full capacity. The motor and braking system help generate the movement for the lift. Finally there are speed governors to maintain the speed of the lifts and to protect the car in case of a malfunction.

The goal of this intravention is to reduce lift usage. When people can cut down on usage, the number of lifts produced will also decrease. More than 10,000 parts are used to manufacture a lift. Materials such as cables, motors, brakes, guide rails, and control boxes are used. Beyond looking at just the energy costs, I would also like to take a look in the future, at the lift manufacturing process and see how much energy is expended on that.

## Should we take the stairs or the lift?

Inspired by the concept of “exploring a creative resistance to the present that enables us to imagine the world otherwise” (Altes and Lieberman 2013 : 14), I wanted to look at a way to reduce lift usage in residential buildings. While lifts serve a purpose and considerations need to be made, I wanted to look at a potential group of people who could avoid using lifts.

Lifts are widely used in residential buildings and many people don't think twice before using lifts, even if they're only going up one or two floors. I observed the number of people using the stairs or the lift in my housing building over a 3-hour period. A total of 54 people went up or down the building and 65% of them used the lift. Almost everyone using the lifts were young, and seemingly able enough to use the stairs. A study conducted by the Chapman University, USA found that people were more likely to use the lift later in the day and suggested trying to encourage more people to take the stairs earlier in the day.

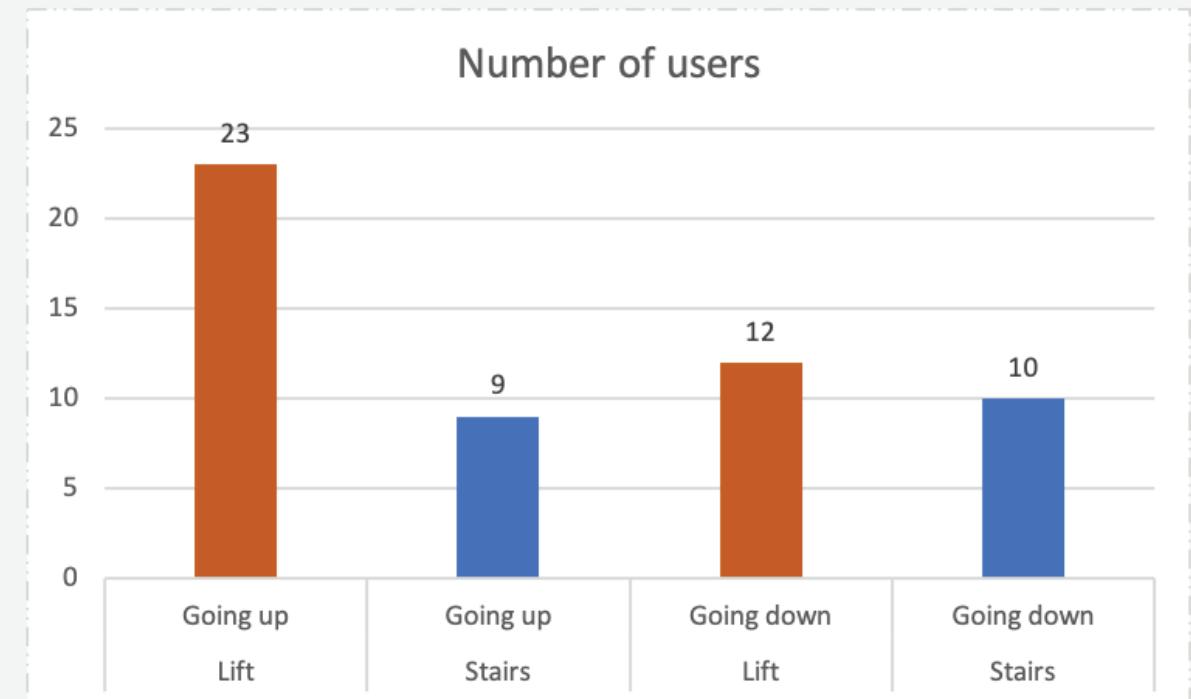


Figure 2: Number of users who took the lift or the stairs in Westfield apartment, going up and down

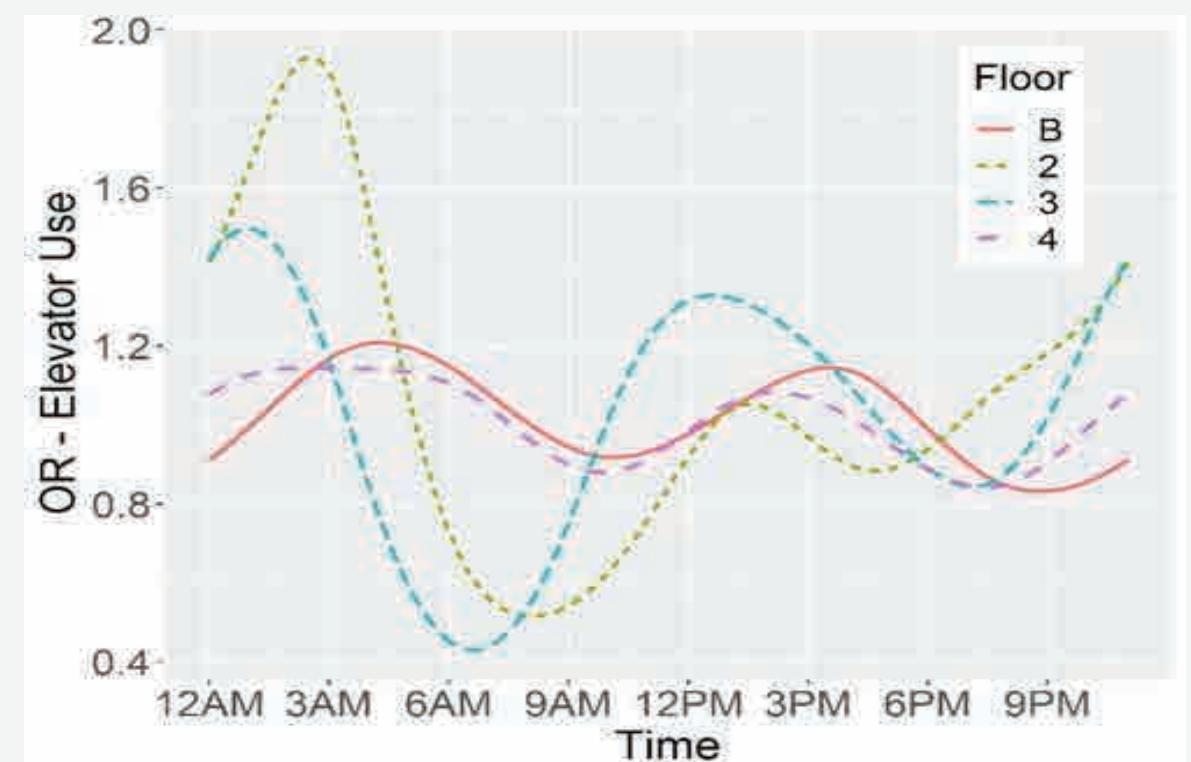
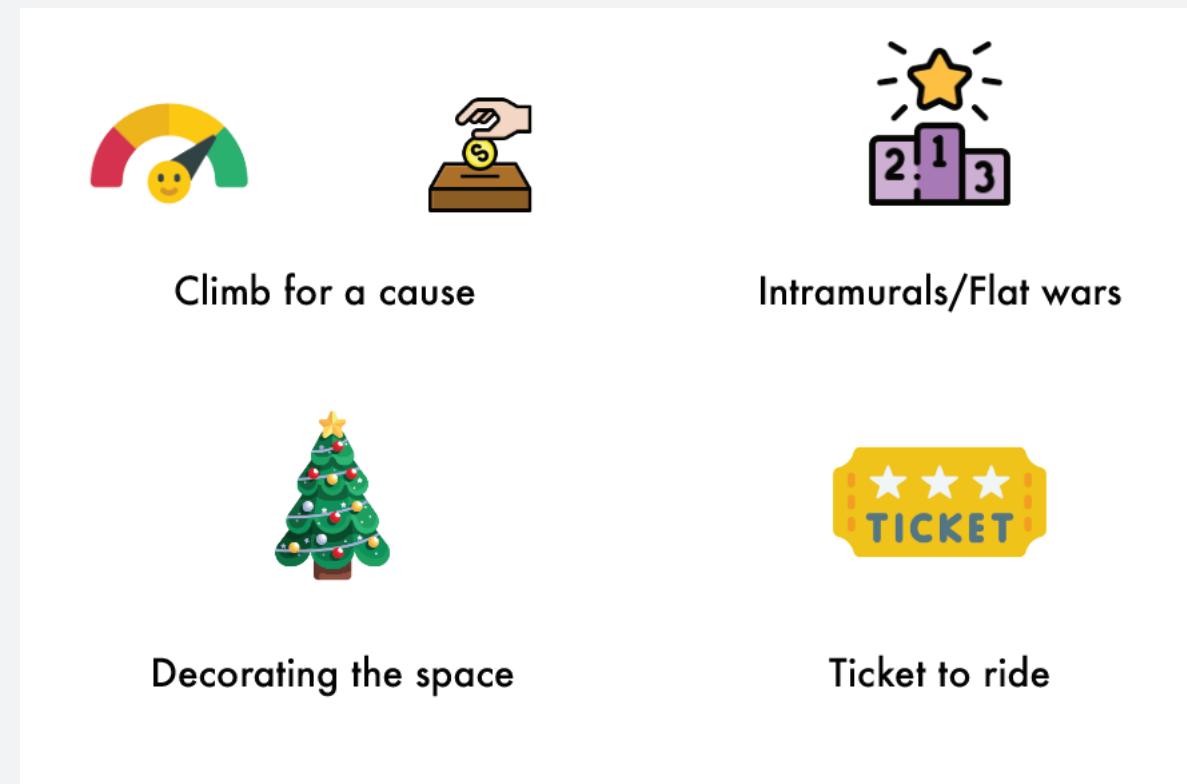


Figure 3: Lift usage at different times of the day in a residence hall at Chapman University, CA, USA

## Intravention - Action approach and Ideas

I considered a few different options for my action. I had 4 ideas-

- 1.Climb for a cause: This involved setting up a charity target. For example: Donating 50 pounds to an organization if a target of 200 floors were climbed. The money would come from the energy savings from reduced electricity consumption.
- 2.Intramurals/Flat wars: A stair count competition among floor occupants.
- 3.Decorating the space: Beautifying stairways inspired by existing approaches used in the Scotsman steps and the Piano Staircase in Stockholm.
- 4.Ticket to ride: Collecting an entry ticket for people to use the lift.



The final theme I chose was based on Star Wars and I titled my intravention 'Stair Wars'. I created a story and made it a battle between two sides. The purpose of this was to engage people and draw them in to learn more about sustainability in terms of using lifts. I designed a set of posters to introduce and present my intravention. In my posters, I nudged people to take the stairs and used some provocation saying that if someone chose to use the lift, they'd be contributing to the destruction of earth.

The reason I didn't go with decorating the stairways is because the stairs are located behind a door and is hidden to people. If someone were to use the stairs, they would open the door anyway and choose to use them.



Figure 4: The Scotsman Steps, Edinburgh, Scotland



Figure 5: Piano staircase in Stockholm, Sweden

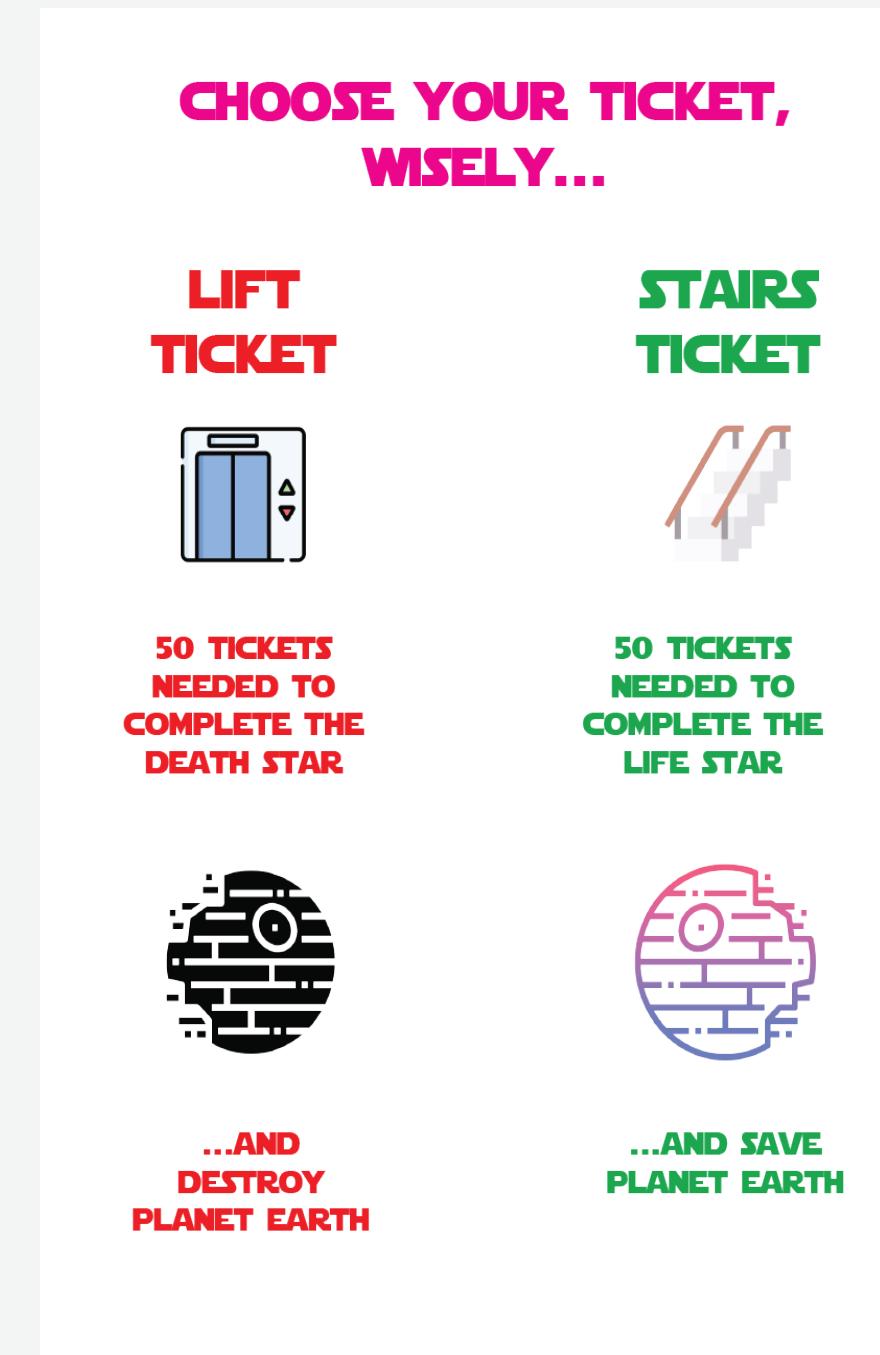
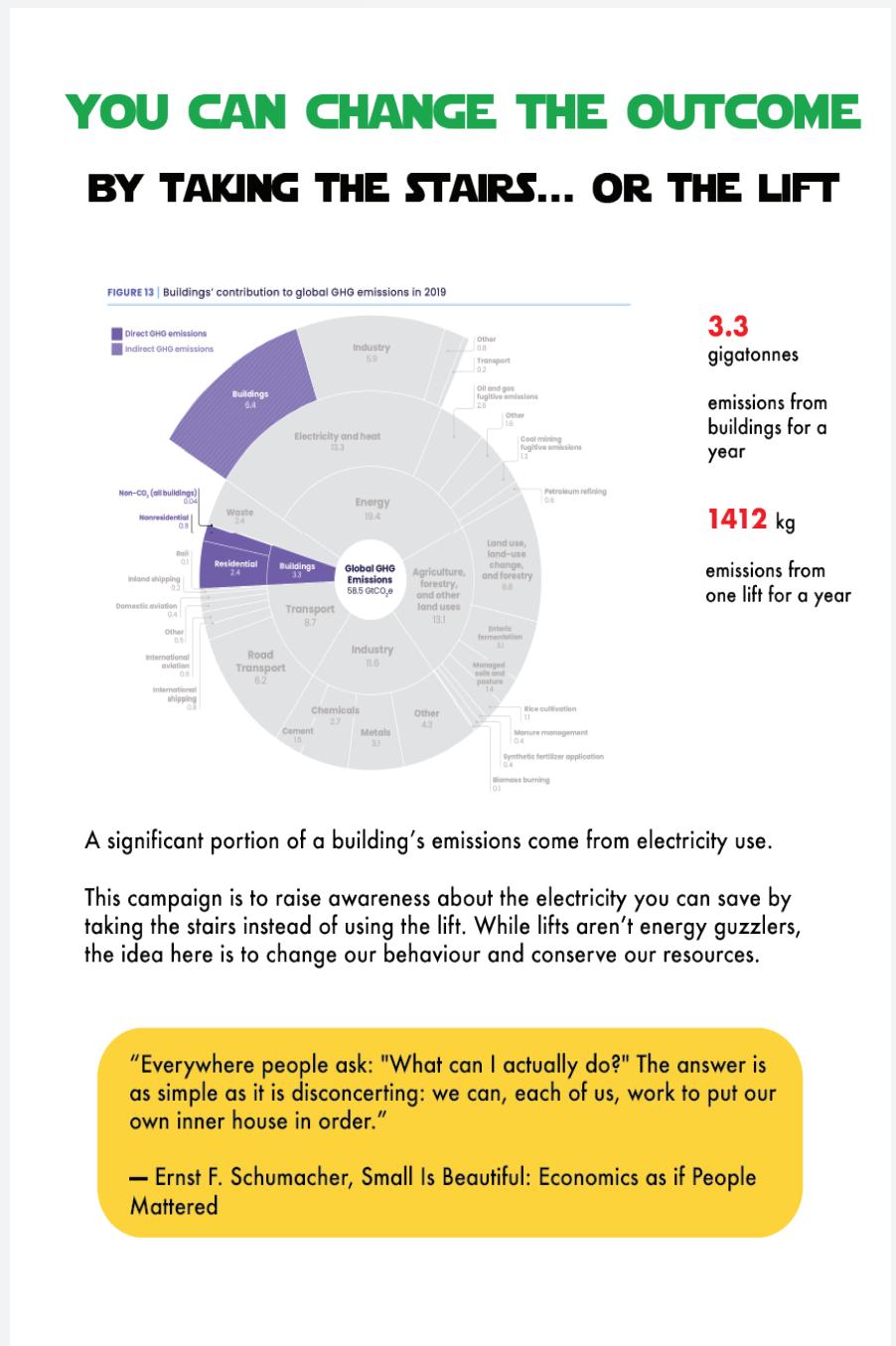
## Intravention - Duration and effect

I planned on doing my intravention at my accommodation building. The planned duration was for one day. I setup my intravention near the reception area beside the lifts and stairs.

The main goal of my intravention was to get people to think. I wanted to do this by raising awareness through my campaign, and informing people of some of the effects of unchecked greenhouse gas emissions. While there were a lot of other areas I could have chosen to create a bigger impact, I felt like the idea of focusing on stairs rather than lifts was of the perfect scale for the intravention. It was designed as a way to spark a change in people's behaviour. By choosing the stairs instead of the lift, people can also rethink other aspects of their lives and how they can live more sustainably in the way they travel, consume, and eat.

I stuck the introduction posters and the individual campaign posters on a wall in between the stairs and the lifts in my accommodation building. I printed out lift and stairs tickets for people to select and drop in a voting box beside the lift. The idea was for people to choose a ticket and drop it in the box every time they used the lift or the stairs.

## Intravention Posters - 1, 2, 3



The second part of the introduction talks about how people have the power to influence the outcome of the battle. They can do this by taking the stairs or by using the lift. The poster has an image of the annual greenhouse gas emissions from the various sectors. Highlighted in purple is the contribution from buildings. It goes on to say that buildings contribute 3.3 gigatonnes of emissions every year. There is a note about the estimated emissions caused by a single lift for a year.

The choose your ticket wisely poster was used to give people an idea about the types of tickets available to them to either use the lift or the stairs. Their actions would contribute to the battle and influence the outcome. I set the target ticket count at 50, to decide how the battle would be won. There was a bit of dramatization towards the end, giving people a glimpse of the final outcomes depending on their choices. Taking the lift 50 times or 50 lift tickets would complete the construction of the death star and destroy planet earth. Similarly 50 stairs tickets would complete the life star and save planet earth.

## Intravention Posters - 4, 5, tickets

# JOIN STAIRWALKER

## WHAT'S IN IT FOR YOU?



### CLIMBING STAIRS REDUCES HEALTH RISKS

Climbing 8 flights of stairs reduces your early mortality risk by 33%



### REDUCE YOUR CARBON FOOTPRINT

You can save about 15kg of CO2 a month



### SAVE TIME BY NOT WAITING FOR LIFTS

Studies show office workers save 15 minutes a day by taking the stairs

# JOIN LIFT-OF-DOOM

## WHAT'S IN IT FOR YOU?



### INCREASE YOUR HEALTH RISKS

Taking the lift increases your mortality risk



### INCREASE YOUR CARBON FOOTPRINT

You can add about 15kg of CO2 a month



### SPEND MORE TIME WAITING FOR LIFTS

Studies show office workers lose 15 minutes a day waiting for lifts



The Join Stairwalker poster was a promotional style campaign poster to influence people to use the stairs. It lists out some of the benefits of using the stairs. This is based on a positive feedback loop (Kimmerer 2013 : 305).

The Join Lift-of-doom poster was a promotional style campaign poster to discourage people from using the lift.

I designed tickets for the lift and the stairs. The lift ticket was red in colour, keeping up with the theme of the campaign. The stairs ticket was green in colour.

## Intravention testing and results

I ran the intravention at my accommodation building in Westfield. It was done on 10/12/2022 and went on from 10 am to 5 pm. The intravention threw up some interesting results. The usage of the lift and stairs was fairly balanced. The final vote count stood at 16 votes for the lift and 13 votes for stairs. Some people were interested in the information on the poster and took some time to read it and thought before selecting what they wanted to do. There were however a few people who didn't show interest in the campaign. I had another idea of placing an 'Out of Order' sign as an alternate strategy. This would seem like a more provocative action and might have produced better results. The COVID pandemic showed us that when we're forced to change our behaviour, we realize that are alternate ways of doing things that aren't so bad.



Figure 6: Intravention posters in my apartment lobby. Tickets and voting box are on top of the suitcase

## Reflection and conclusion

A lot of people are genuinely concerned about climate change. They are interested in helping, but are unaware of what they can do or feel like their actions aren't going to make a difference. I had some useful learnings from my intravention. Overall, I think the response to my campaign was lukewarm. The results however did surprise me. The number of lift users and stairs users was almost the same. Some of the participants did in fact change their behaviour, even if it might have only been temporary.

Some participants still chose the lift, but at least they were aware of their impact and still chose to participate. There were a few other lift users who didn't stop by to look at the posters. This leads me to think that the intravention could have been more provocative. The idea of using an 'Out of order' sign, coupled with the posters might have produced a different effect. Influencing people's behaviour by forcing them to question the authenticity of the sign or looking at social cues in terms of other people's behaviour would have been interesting to see.

I've noticed that stairs aren't easily accessible in a lot of buildings. In my accommodation, the lifts are more easily accessible. When you enter the building, you can walk straight to the lift. To get to the stairs you have to swipe your key fob and open a door. The closed door approach to the stairs or the hidden stairways is a type of design I've noticed in a lot of places. We need to rethink how we design stairways in buildings and make them more accessible and enjoyable to use.



Figure 7: The choose your ticket poster



Figure 8: The ticket pickup box

## Bibliography

- Altés Arlandis, A., Lieberman, O. (2013) Immediate Architectural Interventions, Durations and Effects: Apparatuses, things and people in the making of the city and the world
- Berardi, Vincent, et al. "Stair versus Elevator Use in a University Residence Hall Setting." *Journal of American College Health*, 27 July 2021, pp. 1–6, 10.1080/07448481.2021.1920602
- Boehm, S., L. Jeffery, K. Levin, J. Hecke, C. Schumer, C. Fyson, A. Majid, J. Jaeger, A. Nilsson, S. Naimoli, J. Thwaites, E. Cassidy, K. Lebling, M. Sims, R. Waite, R. Wilson, S. Castellanos, N. Singh, A. Lee, and A. Geiges. 2022. State of Climate Action 2022. Berlin and Cologne, Germany, San Francisco, CA, and Washington, DC: Bezos Earth Fund, Climate Action Tracker, Climate Analytics, ClimateWorks Foundation, NewClimate Institute, the United Nations Climate Change High-Level Champions, and World Resources Institute. <https://doi.org/10.46830/wrirpt.22.00028>
- BP Statistical Review of World Energy 2022
- ISG. "Sustainable Buildings Monitor." [www.isgltd.com](http://www.isgltd.com), 2021, [www.isgltd.com/en/campaigns/sustainable-buildings-monitor](http://www.isgltd.com/en/campaigns/sustainable-buildings-monitor).
- Kimmerer, Robin. *Braiding Sweetgrass : Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*, Milkweed Editions, 2013
- Kinsey, M, et al. Stairs or Lifts? -A Study of Human Factors Associated with Lift/Elevator Usage during Evacuations Using an Online Survey. 2010
- Radiere, Guerric. "Why I Stopped Taking the Lift." World Economic Forum, 9 Sept. 2019, [www.weforum.org/agenda/2019/09/why-i-stopped-taking-the-lift/#:~:text=Lifts%20consume%205%20to%2010](http://www.weforum.org/agenda/2019/09/why-i-stopped-taking-the-lift/#:~:text=Lifts%20consume%205%20to%2010)
- Schumacher, E F, and Bill Mckibben. *Small Is Beautiful : Economics as If People Mattered*. New York, Ny, Harper Perennial, 2014
- Woodford, Chris. "How Do Elevators and Lifts Work?" Explain That Stuff, 11 June 2019, [www.explainthatstuff.com/how-elevators-work.html](http://www.explainthatstuff.com/how-elevators-work.html)
- Young, Sarah. "Britain Targets Energy Efficiency with Consumption Cut Goal." Reuters, 17 Nov. 2022, [www.reuters.com/business/energy/britains-hunt-sets-out-plans-reduce-energy-consumption-by-15-by-2030-2022-11-17](http://www.reuters.com/business/energy/britains-hunt-sets-out-plans-reduce-energy-consumption-by-15-by-2030-2022-11-17)

## Image list

Figure 1: Boehm, S., L. Jeffery, K. Levin, J. Hecke, C. Schumer, C. Fyson, A. Majid, J. Jaeger, A. Nilsson, S. Naimoli, J. Thwaites, E. Cassidy, K. Lebling, M. Sims, R. Waite, R. Wilson, S. Castellanos, N. Singh, A. Lee, and A. Geiges. 2022. State of Climate Action 2022. Berlin and Cologne, Germany, San Francisco, CA, and Washington, DC: Bezos Earth Fund, Climate Action Tracker, Climate Analytics, ClimateWorks Foundation, NewClimate Institute, the United Nations Climate Change High-Level Champions, and World Resources Institute. <https://doi.org/10.46830/wrirpt.22.00028>, pp. 49.

Figure 2: Self-produced

Figure 3: Berardi, Vincent, et al. "Stair versus Elevator Use in a University Residence Hall Setting." *Journal of American College Health*, 27 July 2021, pp. 1–6, 10.1080/07448481.2021.1920602

Figure 4: Steven. Scotsman Steps. 2019. <https://lh3.googleusercontent.com/p/AF1QipNQ6Tc-Dp4EdLmVozY62m3wLz047KTu0RL25Z3R6=s1360-w1360-h1020>

Figure 5: Linton, Siena. "This Piano Staircase Social Experiment Revealed How Music Makes Everything Better." Classic FM, May 2022, [www.classicfm.com/discover-music/instruments/piano/musical-staircase-experiment/](http://www.classicfm.com/discover-music/instruments/piano/musical-staircase-experiment/)

Figure 6, 7, 8: Self-produced