

# REDUCE

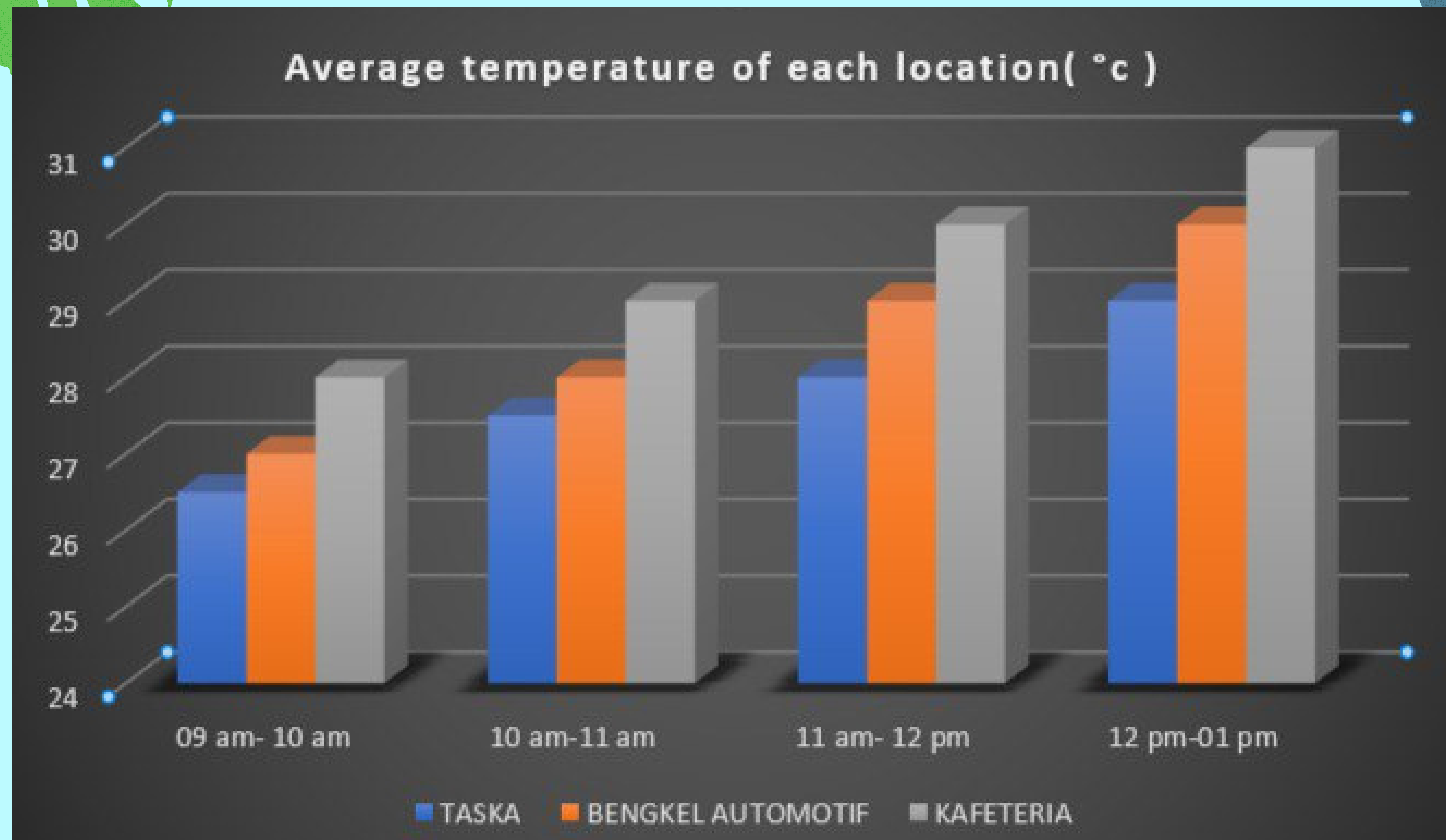
**POLITEKNIK**  
MALAYSIA  
KUCHING SARAWAK

**CARBON**

# IN PKS!

In March 2023, a small-scaled thermal comfort research was done ( in our institution ). The selected areas were the nursery, cafeteria and automotive workshop. The data collected is compiled into this presentation.



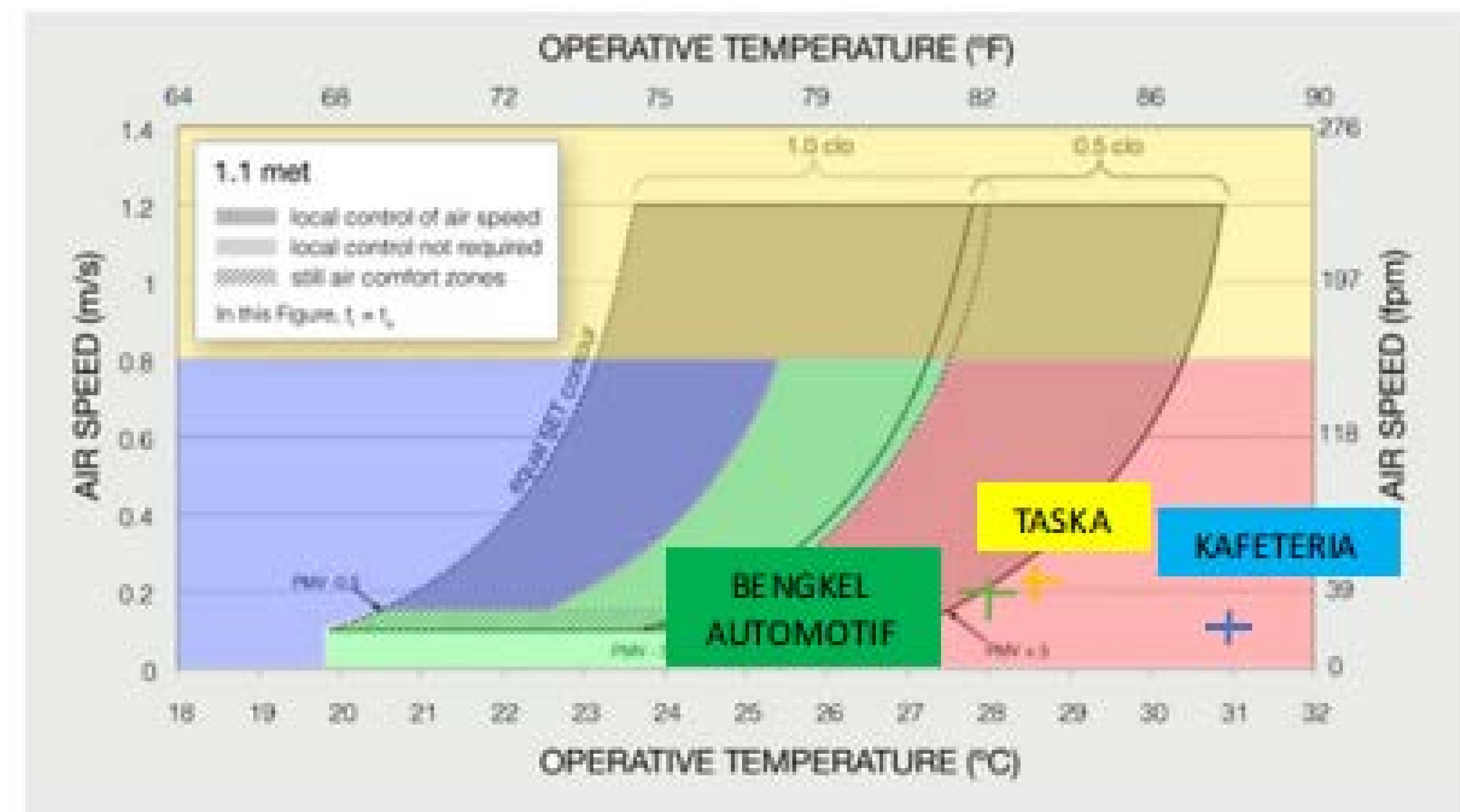


- This graph represents the average temperature of each chosen area hourly, starting from 9am till 1 pm.
- As seen in the graph, the temperature steadily rises every hour and peaks at 12pm-1pm.
- The highest temperature was recorded in the cafeteria, followed by the nursery and lastly the automotive workshop.
- The heat will cause the residents to start feeling uneasy and consequently, they will get exhausted quicker.
- Among the three areas, the automotive workshop has a lower initial temperature (26 celcius at 9am/first hour), thus the maximum temperature reached is less than 28 celcius which us comparatively lower than other areas.





## Thermal Comfort Chart using Ashrae 55 Parameters



- The diagram on the left is the Thermal Comfort Chart done using ASHRAE 55 parameters.
- It involves air velocity and room temperature.
- From the data of 4 hours, we had chosen the data of 4 hours, we had chosen the data at 12noon-1pm for analysis because it recorded the highest temperature.
- Referring to ASHRAE55 standard, all of the areas are considered very hot.
- The comfort level may differ depending on the number of occupants, the size and the design of the area.
- In conclusion, the occupants of those three areas may feel less comfortable and it may be harder to carry out their activities.

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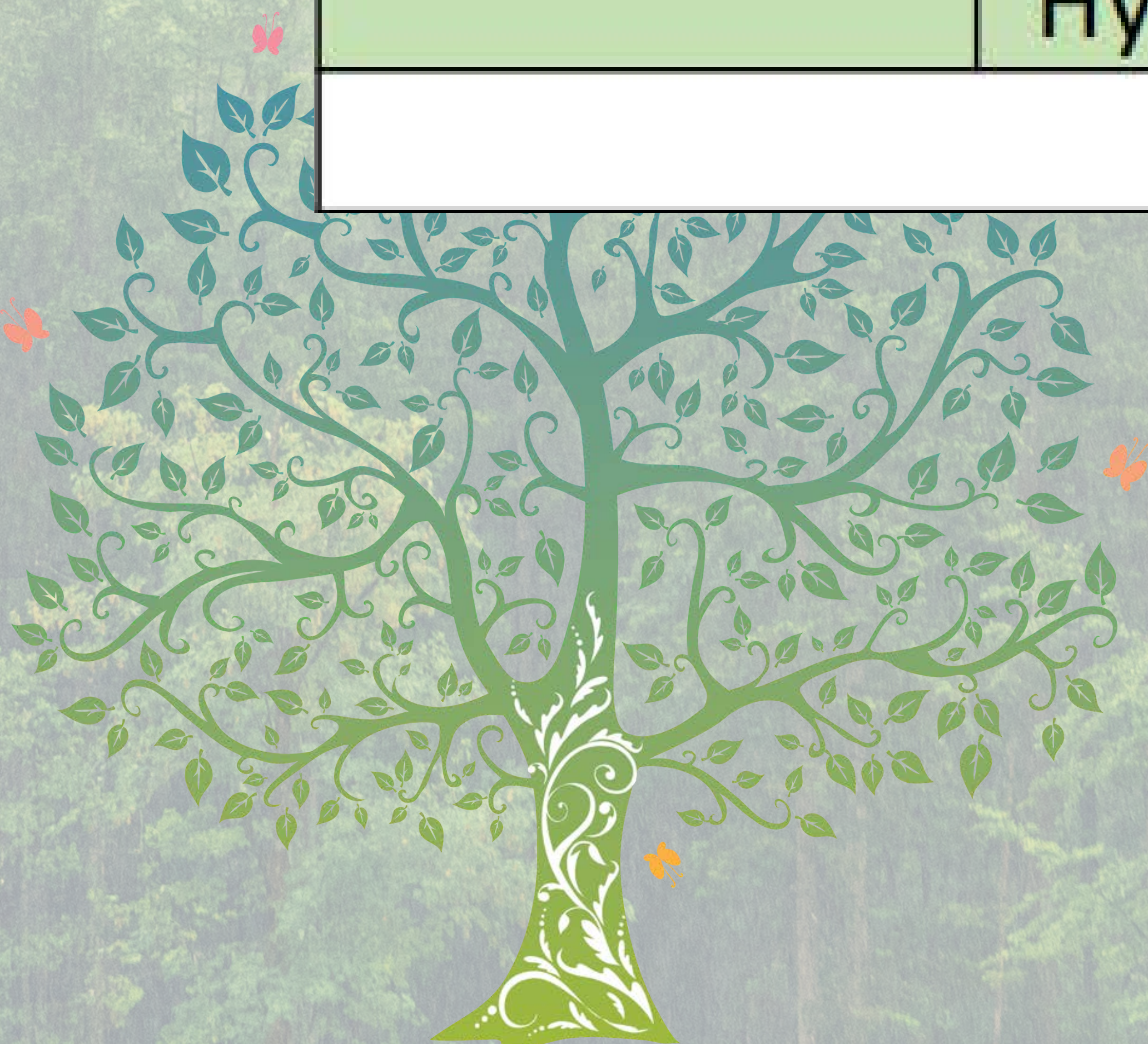
## Calculation of the resulting carbon emission value

| Location            | Items              | Units | kw    | Hours | Day × Year | Total    |
|---------------------|--------------------|-------|-------|-------|------------|----------|
| Cafeteria           | Fluorescent lamp   | 69    | 0.036 | 14    | 30 × 12    | 12519.36 |
| Nursery             | Fluorescent lamp   | 10    | 0.036 | 8     | 20 × 12    | 691.200  |
|                     | Printer            | 2     | 0.25  | 8     | 20 × 12    | 960      |
|                     | Computer           | 1     | 0.500 | 8     | 20 × 12    | 960      |
| Automotive workshop | Fluorescent lamp   | 45    | 0.038 | 8     | 20 × 12    | 3283.2   |
|                     | computer           | 2     | 0.200 | 8     | 20 × 12    | 798      |
|                     | Air-conditioning   | 1     | 2.5   | 8     | 20 × 12    | 4800     |
|                     | Hydraulic car lift | 1     | 0.11  | 5     | 20 × 12    | 132      |
| Total :             |                    |       |       |       |            | 24143.76 |

Carbon emission values from cafeterias, nurseries, and automotive workshops are calculated.

$$\begin{aligned}
 \text{CO}_2 &= [ \text{kWh} \times \text{factor} ] / 1000 \text{ tone/year} \\
 &= [ 24143.76 \times 0.622 ] / 1000 \\
 &= 15017.42 / 1000
 \end{aligned}$$

CO<sub>2</sub> = 15.02 tonne





This effort SDG Malaysia, which is the 3rd and 13th goals of SDG Malaysia.



Ensure healthy lives & promote well-being for all at all ages



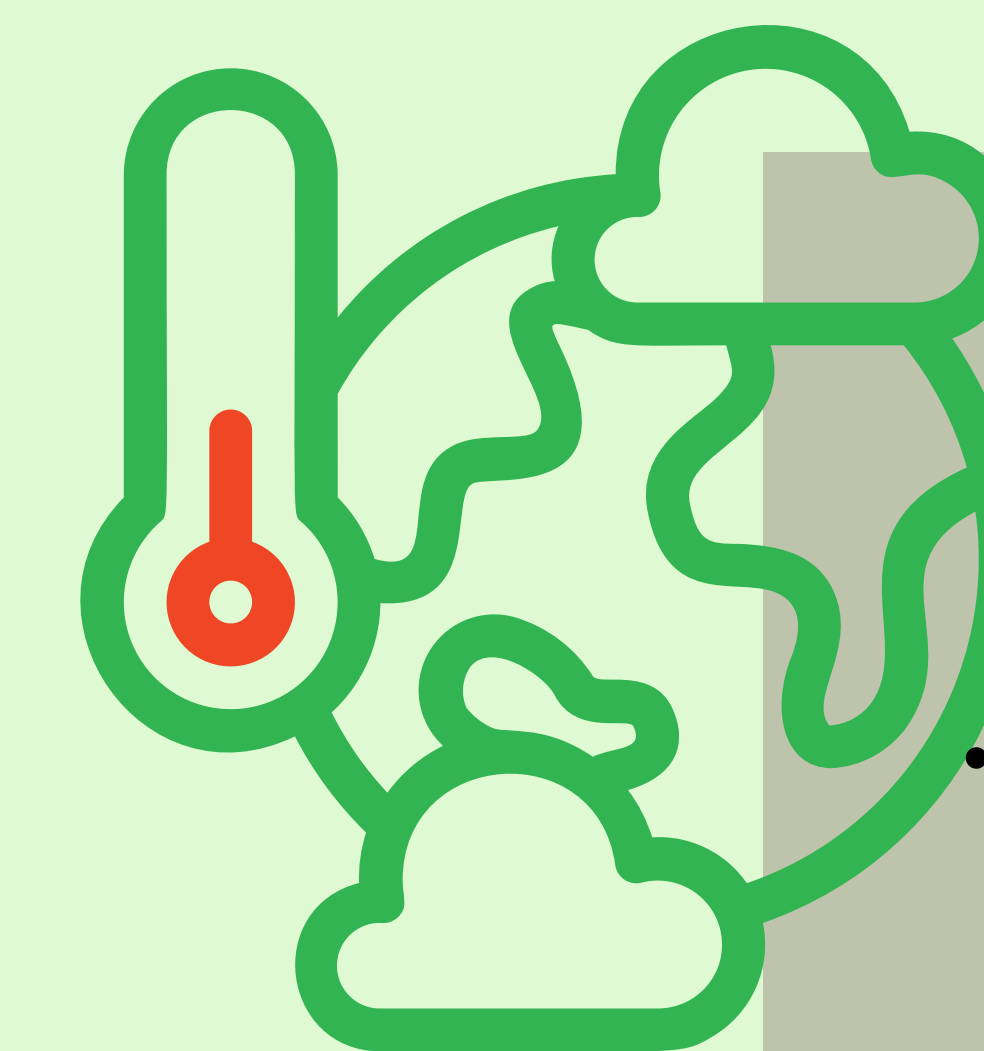
Take urgent action to combat climate & its impact

### Among the effect of climate change!!



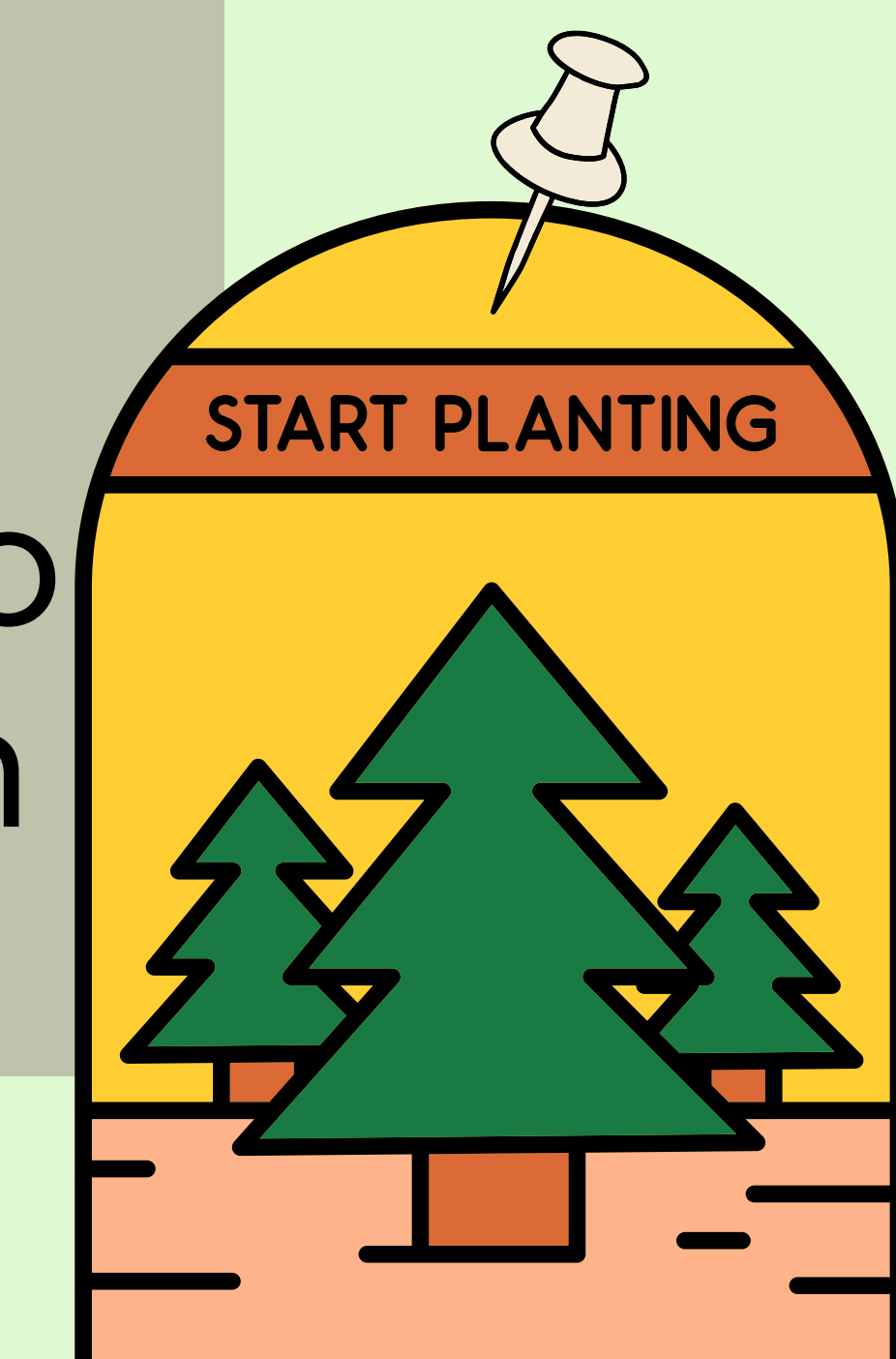
#### Impact on human health

- Easily exhaust
- Frequent muscle strains and body aches
- Feeling like passing out and dizziness
- Heat stroke



#### Impact on the environment

- Rise in sea level
- Increase incidence of medium-large-scale disasters
- Increased carbon dioxide levels due to global increase in energy consumption







# ATTAINABLE GOALS

Smart energy utilization

Less personal vehicle dependence

Better air quality, energy conversation and more green in the surrounding structure

