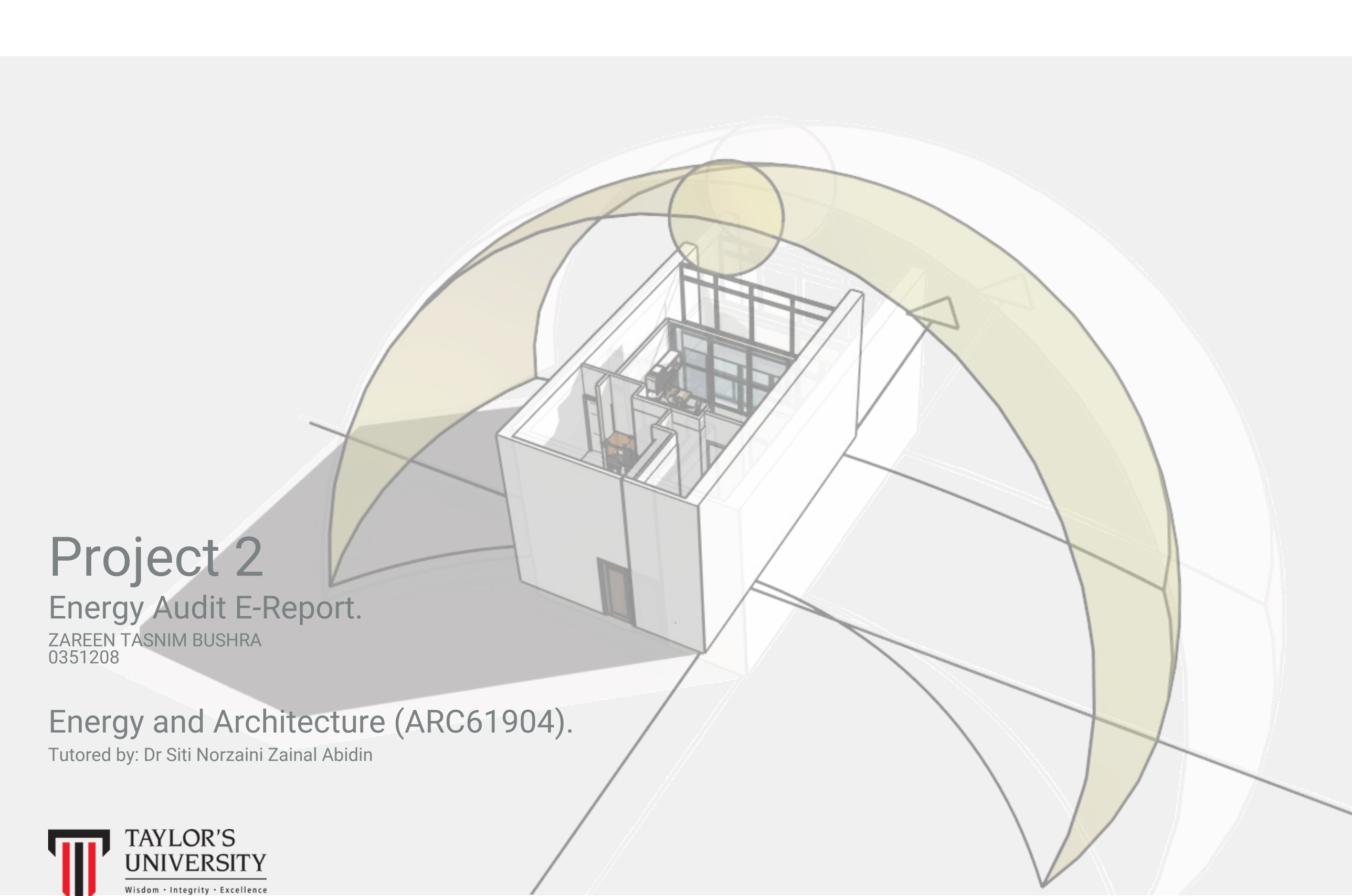


Project 2

Energy Audit E-Report.

ZAREEN TASNIM BUSHRA
0351208

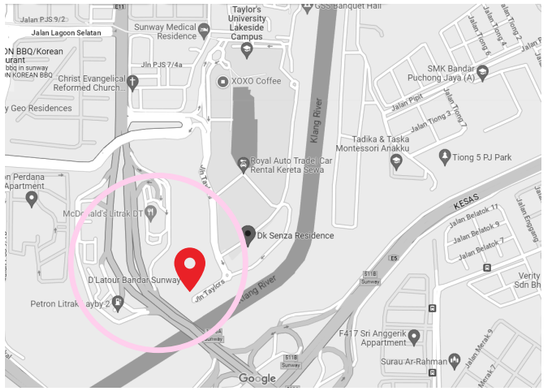
Energy and Architecture (ARC61904).

Tutored by: Dr Siti Norzaini Zainal Abidin

TAYLOR'S UNIVERSITY
Wisdom • Integrity • Excellence

Table of Contents.

1.0 | Site Information



Site Location

D'latour Condominium, Bandar Sunway

Building Typology

High-Rise Building / Apartment.

GPS Coordinates

3.0590009424971774, 101.615283885123

Occupants

2 Occupants for the whole unit

Number of Storeys

26

Number of Towers

2

Year of Completion

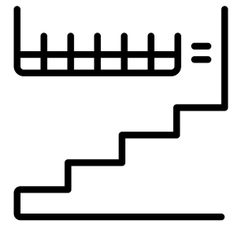
2016

Unit Floor

16

Floor to Ceiling Height (m)

3.05 meters for the ground floor units and around 2.74 meters for units on the mezzanine floors



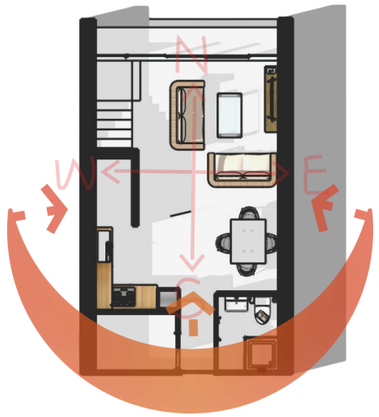
Surrounding Context

D'Latour in Bandar Sunway is near Taylor's Lakeside Campus, Sunway Pyramid, and Sunway Medical Centre. It offers excellent connectivity via major highways and the BRT Sunway Line. The area features educational institutions, shopping malls, healthcare facilities, and various amenities for a vibrant urban lifestyle

Orientation

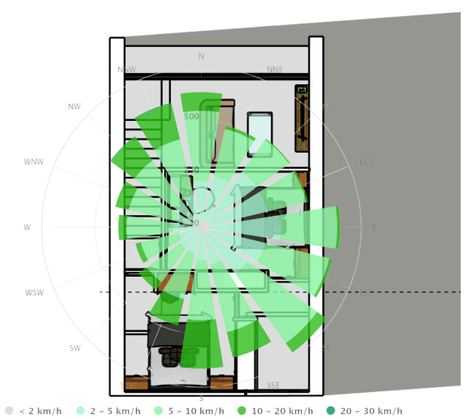
The D'Latour building in Bandar Sunway has two 23-storey blocks oriented to take advantage of natural light and airflow. This layout likely ensures that some units face north-south while others face east-west, providing a variety of vistas and sunlight exposure for residents.

2.0 | Climate Analysis



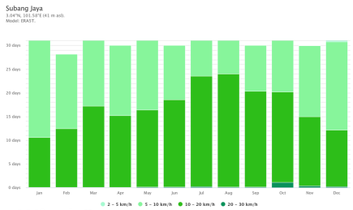
Sun orientation

North-facing units in Block A of D'Latour in Bandar Sunway receive limited direct sunlight throughout the day, offering consistent and softer natural light. This orientation helps maintain cooler indoor temperatures, reducing the need for air conditioning. It is ideal for those preferring diffused lighting and stable indoor environments.



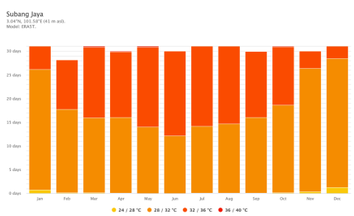
Windrose Diagram

The wind rose for Subang Jaya illustrates the annual distribution of wind directions. For example, a notation of SW indicates the wind blowing from the southwest to the northeast. This is akin to the persistent strong west winds at Cape Horn, the southernmost tip of South America, which create challenging east-to-west crossings, particularly for sailing vessels.



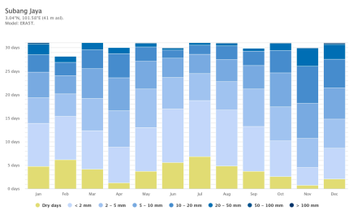
Wind Speed

The wind speed diagram for Subang Jaya illustrates the number of days per month that winds reach specific speeds. For example, on the Tibetan Plateau, the monsoon season brings strong, steady winds from December to April, while winds are generally calm from June to October. Wind speed units can be adjusted in the settings located at the top right.



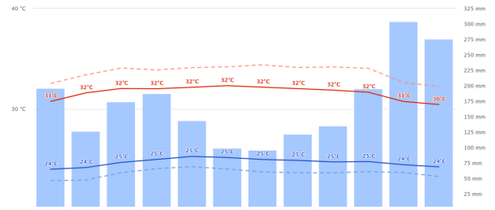
Maximum Temparature

The maximum temperature chart for Subang Jaya indicates the number of days per month that reach specific temperatures. For comparison, Dubai experiences nearly no days below 40°C in July, making it one of the hottest cities. Conversely, Moscow's winters are evident with several days not even reaching -10°C as the daily high.



Precipitation amount

The precipitation chart for Subang Jaya displays the number of days per month when specific rainfall amounts are recorded. In tropical and monsoon regions, these values might be underestimated.



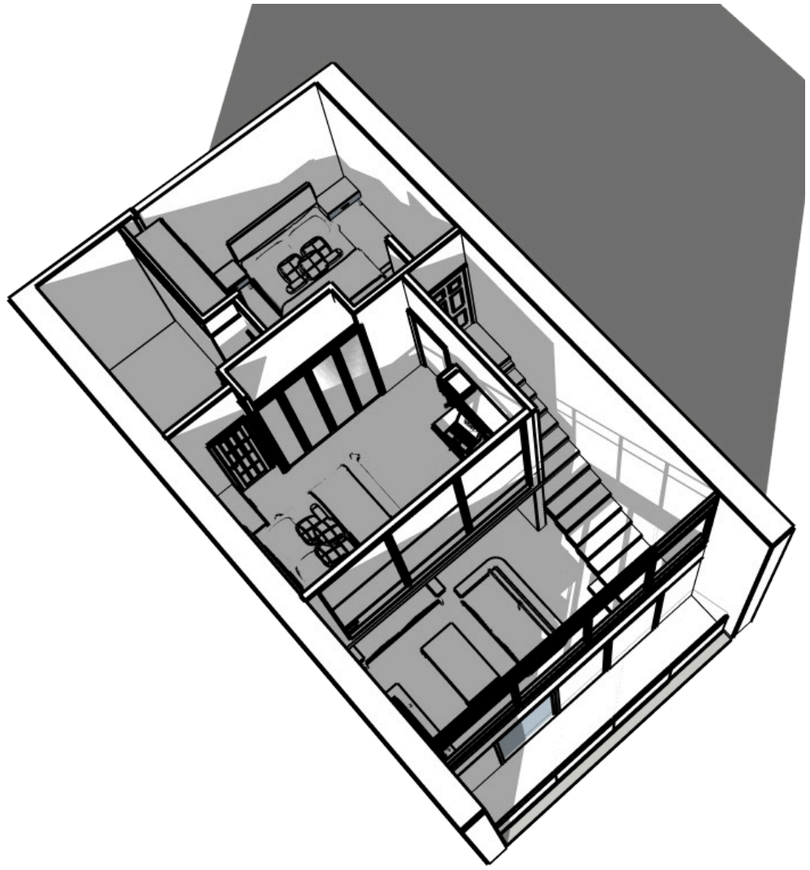
Average temperatures and precipitation

The "mean daily maximum" (solid red line) shows Subang Jaya's average highest temperature per month, while the "mean daily minimum" (solid blue line) shows the average lowest. Hot days and cold nights (dashed lines) represent the average hottest day and coldest night each month over the past 30 years. Expect average temperatures when planning vacations but be prepared for variations. Wind speeds can be displayed by enabling the option at the graph's bottom.

The precipitation chart helps plan for seasonal effects, like India's monsoons or Africa's wet season. Monthly precipitation over 150mm is wet; below 30mm is dry. Note: Simulated tropical and complex terrain precipitation may be lower than local measurements.

3.0 | Building Analysis.

Axonometric View.

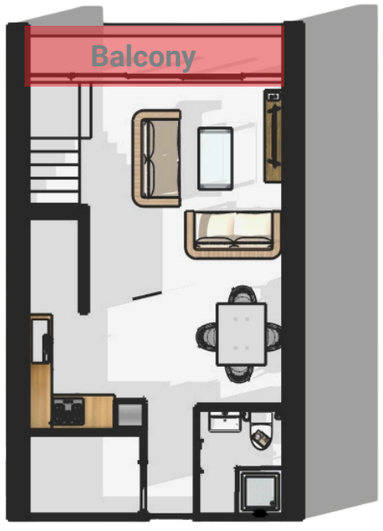


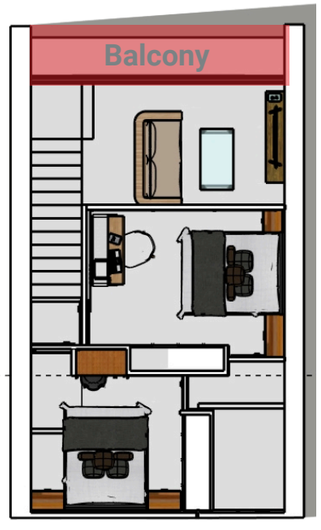
Wall U-Value Calculation Table

Wall Component	Thickness (m)	Thermal Conductivity (W/m·K)	Resistance (R-Value)
External surface	-	-	0.04
Paint finish (Exterior)	0.01	0.16	0.0625
Cement plaster (Outer)	0.03	0.18	0.167
Brick wall	0.11	0.6	0.183
Cement plaster (Inner)	0.02	0.18	0.111
Paint finish (Interior)	0.01	0.16	0.0625
Interior surface	-	-	0.13
TOTAL	-	-	0.756
U-VALUE (1/R)	-	-	1.322

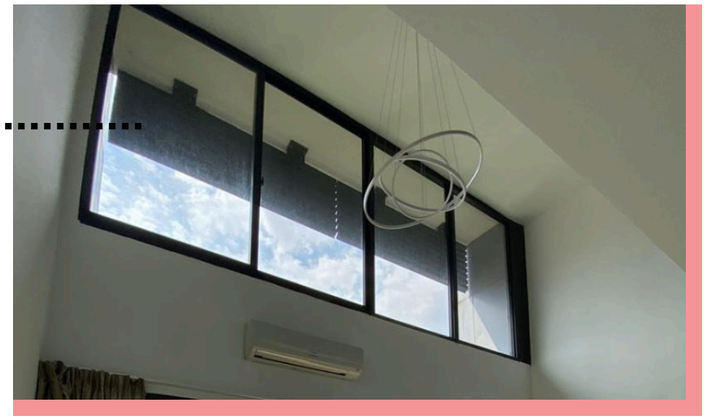
Window Panel U-Value Calculation Table

Window Component	Thickness (m)	Thermal Conductivity (W/m·K)	Resistance (R-Value)
External surface	-	-	0.4
High tempered glass	0.026	0.8	0.0325
Interior surface	-	-	0.13
TOTAL	-	-	0.5625
U-VALUE (1/R)	-	-	1.778





High Tampered glass



4.0 | Breakdown of Energy Usage Per Appliance Per Time Period (Weekdays)

No.	Types of Spaces	Electrical Appliances	Energy (kW)	00:00 - 06:00 (kWh)	06:00 - 12:00 (kWh)	12:00 - 18:00 (kWh)	18:00 - 24:00 (kWh)	Total Energy Usage (kWh)
1	Bedroom 1	Air Conditioner	1.5	9.00	0.00	0.00	9.00	18.00
		Ceiling Light	0.02	0.00	0.08	0.08	0.08	0.24
		Lamp	0.01	0.00	0.04	0.04	0.04	0.12
		Laptop	0.05	0.00	0.20	0.20	0.00	0.40
		Air Purifier	0.03	0.18	0.00	0.00	0.18	0.36
		Hair Dryer	1.2	0.00	0.30	0.00	0.00	0.30
2	Bedroom 2	Air Conditioner	1.5	9.00	0.00	0.00	9.00	18.00
		Ceiling Light	0.02	0.00	0.08	0.08	0.08	0.24
		Lamp	0.01	0.00	0.04	0.04	0.04	0.12
		Laptop	0.05	0.00	0.20	0.20	0.00	0.40
3	Living Room	Air Conditioner	1.5	0.00	4.50	4.50	0.00	9.00
		Ceiling Light	0.02	0.00	0.08	0.08	0.08	0.24
		Chandelier	0.06	0.00	0.24	0.24	0.24	0.72
		Lamp	0.01	0.00	0.06	0.06	0.00	0.12
4	Kitchen	Oven	2.0	0.00	1.00	1.00	0.00	2.00
		Fridge	0.1	0.60	0.60	0.60	0.60	2.40
		Air Fryer	1.5	0.00	1.50	0.00	0.00	1.50
		Rice Cooker	0.7	0.00	0.70	0.00	0.00	0.70
		Small LED Lights	0.005	0.00	0.03	0.03	0.03	0.09
5	Bathroom	Ceiling Light	0.02	0.00	0.00	0.00	0.00	0.00
6	Store Room	Air Conditioner	1.5	0.00	0.00	9.00	0.00	9.00
7	Balcony	Lights	0.02	0.00	0.00	0.00	0.24	0.24

4.0 | Breakdown of Energy Usage Per Appliance Per Time Period (Weekends)

Space	Appliance	Power (kW)	00:00 - 06:00 (kWh)	06:00 - 12:00 (kWh)	12:00 - 18:00 (kWh)	18:00 - 24:00 (kWh)	Total Energy Usage (kWh)
Bedroom 1	Air Conditioner	1.5	9.00	1.80	1.50	9.00	21.30
	Ceiling Light	0.02	0.00	0.08	0.08	0.08	0.24
	Lamp	0.01	0.00	0.04	0.04	0.04	0.12
	Laptop	0.05	0.00	0.20	0.20	0.00	0.40
	Air Purifier	0.03	0.18	0.00	0.00	0.18	0.36
	Hair Dryer	1.2	0.00	0.30	0.00	0.00	0.30
Bedroom 2	Air Conditioner	1.5	9.00	1.80	1.50	9.00	21.30
	Ceiling Light	0.02	0.00	0.08	0.08	0.08	0.24
	Lamp	0.01	0.00	0.04	0.04	0.04	0.12
	Laptop	0.05	0.00	0.20	0.20	0.00	0.40
Living Room	Air Conditioner	1.5	0.00	4.50	6.75	4.50	15.75
	Ceiling Light	0.02	0.00	0.08	0.08	0.08	0.24
	Chandelier	0.06	0.00	0.24	0.36	0.24	0.84
	Lamp	0.01	0.00	0.06	0.06	0.00	0.12
Kitchen	Oven	2.0	0.00	1.00	1.00	0.00	2.00
	Fridge	0.1	0.60	0.60	0.60	0.60	2.40
	Air Fryer	1.5	0.00	1.50	0.00	0.00	1.50
	Rice Cooker	0.7	0.00	0.70	0.00	0.00	0.70
	Small LED Lights	0.005	0.00	0.03	0.03	0.03	0.09
Bathroom	Ceiling Light	0.02	0.00	0.00	0.00	0.00	0.00
Store Room	Air Conditioner	1.5	0.00	0.00	9.00	0.00	9.00
Balcony	Lights	0.02	0.00	0.00	0.00	0.24	0.24

5.0 | Occupant Behavior

Occupant's Profile

Tapo

Age: 23
Gender: Woman
Occupation: Student

Activities:

Zareen

Age: 22
Gender: Woman
Occupation: Student

Activities:

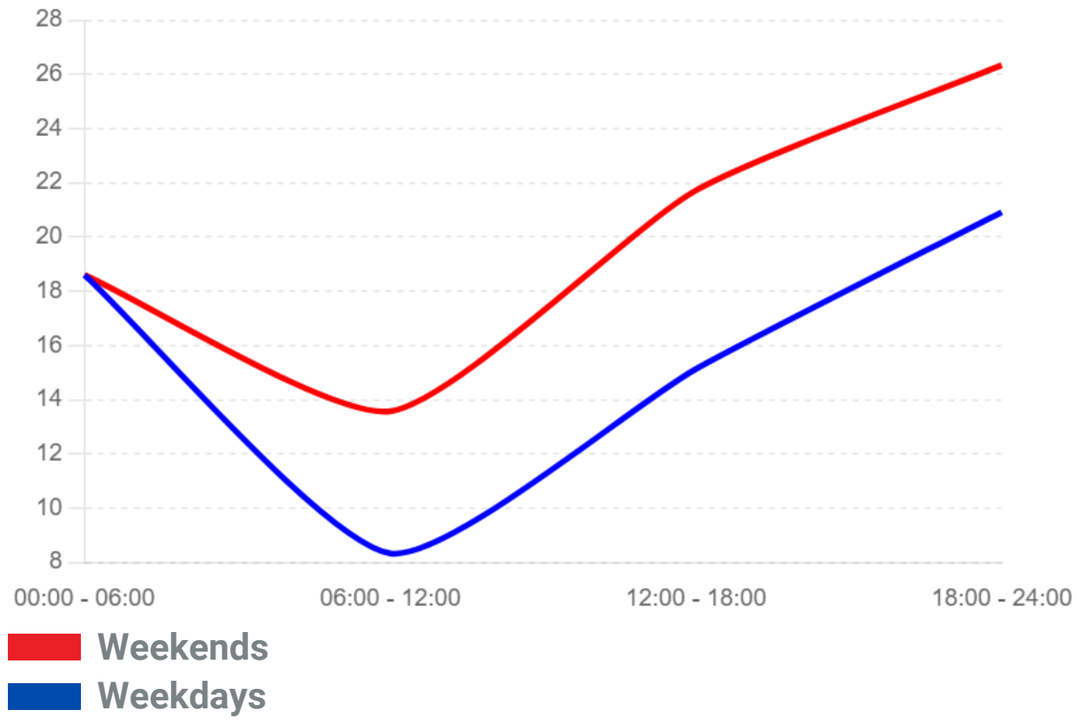
Mochi

Age: 4 Months
Gender: Boy
Occupation: Cat

Activities:

6.0 | Energy Usage Behaviour

Weekday and Weekend Energy Usage Comparison.

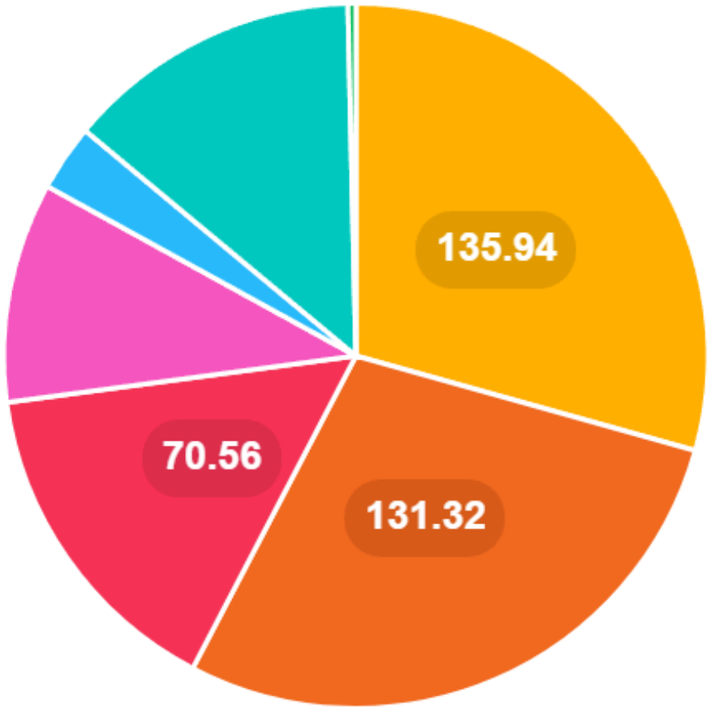


- **00:00 - 06:00:** Energy usage is identical for both weekdays and weekends at 18.60 kWh.
- **06:00 - 12:00:** Energy usage is higher on weekends (13.57 kWh) compared to weekdays (8.33 kWh).
- **12:00 - 18:00:** Energy usage is higher on weekends (21.72 kWh) compared to weekdays (15.13 kWh).
- **18:00 - 24:00:** Energy usage is higher on weekends (26.34 kWh) compared to weekdays (20.92 kWh).

The graph shows that energy consumption is generally higher on weekends, especially during the 06:00 - 12:00, 12:00 - 18:00, and 18:00 - 24:00 time periods. This likely reflects increased activity and appliance usage during weekends.

6.0 | Energy Usage Behaviour

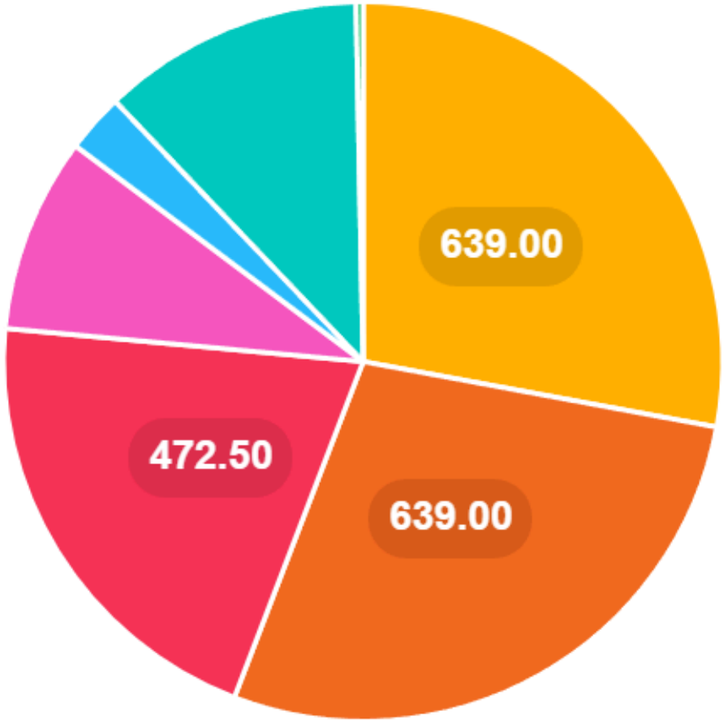
Weekly Energy Usage Breakdown



- Bedroom 1
- Bedroom 2
- Living Room
- Kitchen
- Bathroom
- Store Room
- Balcony

Bedroom 1: The largest share of energy usage at 26.1%.
Bedroom 2: The second largest share at 25.2%.
Living Room: Accounts for 13.5% of the total energy usage.
Kitchen: Represents 9.0% of the total energy usage.
Store Room: Takes up 12.1% of the total energy usage.
Bathroom: Contributes 2.7% of the total energy usage.
Balcony: The smallest share at 0.3%.

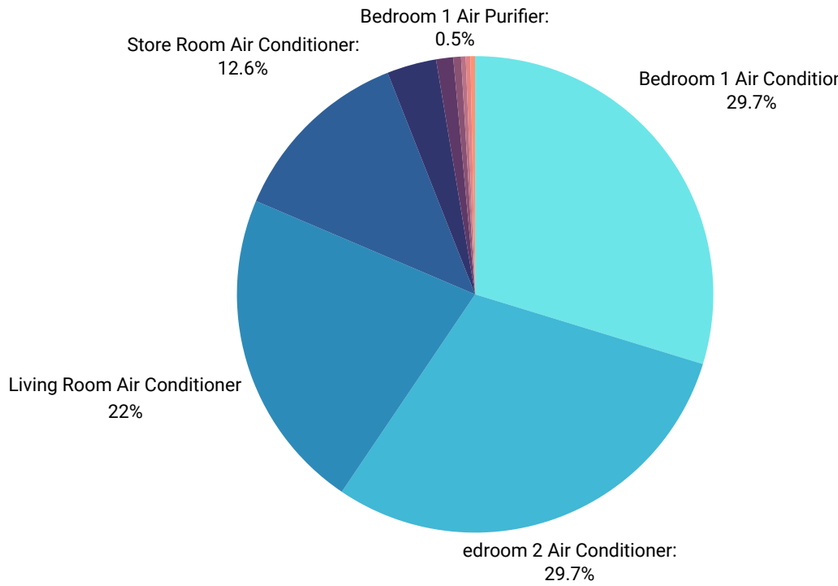
Monthly Energy Usage Breakdown



- Bedroom 1
- Bedroom 2
- Living Room
- Kitchen
- Bathroom
- Store Room
- Balcony

Bedroom 1: The largest share of energy usage at 25.5%.
Bedroom 2: The second largest share at 25.5%.
Living Room: Accounts for 18.8% of the total energy usage.
Kitchen: Represents 8.0% of the total energy usage.
Store Room: Takes up 10.8% of the total energy usage.
Bathroom: Contributes 2.4% of the total energy usage.
Balcony: The smallest share at 0.3%.

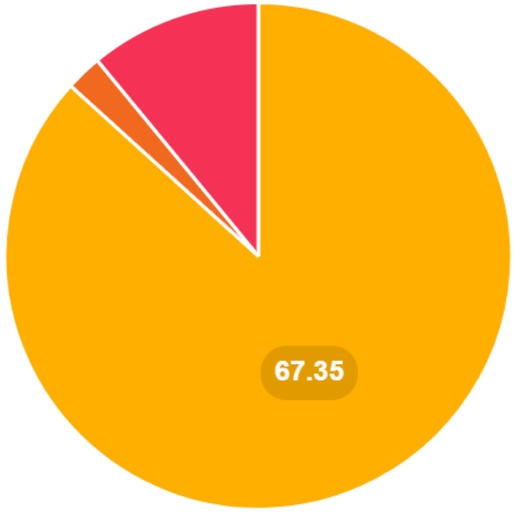
Top 10 energy consuming appliances



- Bedroom 1 Air Conditioner: 28.3% of total daily energy usage.
- Bedroom 2 Air Conditioner: 28.3% of total daily energy usage.
- Living Room Air Conditioner: 20.9% of total daily energy usage.
- Store Room Air Conditioner: 12.0% of total daily energy usage.
- Kitchen Fridge: 3.2% of total daily energy usage.
- Living Room Chandelier: 1.1% of total daily energy usage.
- Bedroom 1 Air Purifier: 0.5% of total daily energy usage.
- Bedroom 1 Ceiling Light: 0.3% of total daily energy usage.
- Bedroom 2 Ceiling Light: 0.3% of total daily energy usage.
- Living Room Ceiling Light: 0.3% of total daily energy usage.

6.0 | Energy Usage Behaviour

Daily Energy Consumption Pattern By Household Activities



Cooling: 86.7% of total daily energy usage.
Lighting: 2.3% of total daily energy usage.
Appliance Usage: 11.0% of total daily energy usage.

Breakdown of Electricity Bill June 2024

Activity	Daily Usage (kWh)	Monthly Usage (kWh)	Cost (RM)
Cooling	52.08	1562.5	300.00
Lighting	4.58	137.29	26.36
Appliance Usage	20.60	617.92	118.64
Total	77.26	2317.71	445.00

DK-MY Properties Sdn Bhd (D'LATOUR)
Management Office,
G1-G4, Ground Floor D'Latour,
Jalan Taylor PJS 7,
Bandar Sunway, 47500 Subang Jaya
Selangor Darul Ehsan.
Telephone : 03-50390585
Mobile: 016-3024866
Email : dlelec@dkgroup.com.my

OFFICIAL RECEIPT

Receipt No. : **OR0035721**
Receipt Date :**13/05/2024**

Payor Details

Account No. :VIA.0001
Name :VIANA OMEGA SDN BHD
Address :NO.21-23, JALAN USAHAWAN 5
OFF JALAN GENTING KELANG
53200 KUALA LUMPUR

Property Unit

A-16-09
D'LATOUR, JALAN TAYLOR
PJS 7, BANDAR SUNWAY
47500 SUBANG JAYA, SELANGOR

PAY THE SUM OF RINGGIT MALAYSIA FOUR HUNDRED FIFTY AND CENTS FIFTEEN ONLY

Payment Issued

Payment By	Ref No	Payment Method	Transaction ID	Approval Code	Payment Amount
Online Payment	24-05-00775		T056116377624	121280011017194	450.15

Paid For

Item Description Electricity	**Amount (RM)**
Charges (June 24) **TOTAL**	450.15
AMOUNT PAID	**450.15**

Outstanding Amount	450.15
Payment Amount	450.15
Balance	**0.00**

** This is a computer generated receipt. No authorised signature is required. **

6.0 | Energy Usage Behaviour

D'Latour JMB

Management Office,
Level 3A, D'Latour,Jalan Taylor PJS 7,
Bandar Sunway,47500 Subang Jaya,
Selangor Darul Ehsan.
Telephone : 03-50361565
Email :dlatour.mgmt@gmail.com

OUTSTANDING STATEMENT

As At 13-06-2024

VIANA OMEGA SDN BHD NO.21-23, JALAN USAHAWAN 5 OFF JALAN GENTING KELANG 53200 KUALA LUMPUR	**Property** A-16-09 A-16-09 D'LATOUR,JALAN TAYLOR PJS 7,BANDAR SUNWAY 47500 SUBANG JAYA,SELANGOR

Trnx Date	Due Date	Code	Doc Num	Item Description	From	To	Item Amount	Item Balance
01/12/2022	31/12/2022	UBWM	10044004	WATER METER BILLING	31-10-2022	30-11-2022	45.60	45.60
01/01/2023	31/01/2023	UBWM	10044962	WATER METER BILLING	30-11-2022	31-12-2022	43.32	43.32
01/04/2023	01/05/2023	UBWM	10047849	WATER METER BILLING	28-02-2023	31-03-2023	10.00	10.00
01/05/2023	31/05/2023	UBWM	10048800	WATER METER BILLING	31-03-2023	30-04-2023	37.18	37.18
01/06/2023	01/07/2023	UBWM	10049765	WATER METER BILLING	30-04-2023	31-05-2023	37.18	37.18
01/07/2023	31/07/2023	UBWM	10050730	WATER METER BILLING	31-05-2023	30-06-2023	45.76	45.76
01/08/2023	31/08/2023	UBWM	10051686	WATER METER BILLING	30-06-2023	31-07-2023	17.16	17.16
01/09/2023	01/10/2023	UBWM	10052323	WATER METER BILLING	31-07-2023	31-08-2023	10.00	10.00
01/10/2023	31/10/2023	UBWM	10053618	WATER METER BILLING	31-08-2023	30-09-2023	17.16	17.16
01/11/2023	01/12/2023	UBWM	10054545	WATER METER BILLING	30-09-2023	31-10-2023	37.18	37.18
01/12/2023	31/12/2023	UBWM	10055511	WATER METER BILLING	31-10-2023	30-11-2023	34.32	34.32
01/01/2024	31/01/2024	UBWM	10056490	WATER METER BILLING	30-11-2023	31-12-2023	20.02	20.02
01/02/2024	02/03/2024	UBWM	10057451	WATER METER BILLING	31-12-2023	31-01-2024	10.00	10.00
01/03/2024	31/03/2024	UBWM	10058406	WATER METER BILLING	31-01-2024	29-02-2024	25.74	25.74
01/04/2024	01/05/2024	UBWM	10059374	WATER METER BILLING	29-02-2024	31-03-2024	22.88	22.88
01/05/2024	31/05/2024	UBWM	10060335	WATER METER BILLING	31-03-2024	30-04-2024	22.88	22.88
01/06/2024	01/07/2024	UBWM	10061297	WATER METER BILLING	30-04-2024	31-05-2024	25.74	25.74
							Outstanding (RM)	462.12

Total Amount (RM): 25.74
Rate per m³ (RM/m³): 1.50
Water Consumption (m³): 17.16

The Story of Wasted Water: Life with Two Students and a Cat

Morning Routine: Tapo takes 15-20 minute showers.
Zareen showers for 1 and a half hours

Cooking and Cleaning: Tap left running while washing vegetables and dishes.
Whiskers frequently knocks over her water bowl, leading to constant refills.

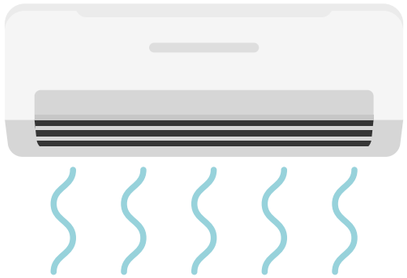
Laundry: Washing machine run for small loads frequently.

Evening Relaxation: Tapo takes another long shower before bed.

Cleaning and Maintenance: Frequent vacuuming and mopping due to Whiskers' shedding.
Daily cleaning of Whiskers' litter box with extra water.

Monthly Water Bill Shock: Bill amounts to RM 25.74, prompting a reflection on water usage habits.
Realization and Change: Shorter showers, efficient cooking, full laundry loads, mindful cleaning, and using buckets for car washing and plant watering.

6.0 | Energy Usage Strategies



Cooling (Air Conditioners)

Lighting

Set Temperature Efficiently: Set air conditioners to 24-26°C for optimal cooling and energy efficiency.

Use Fans: Complement air conditioners with fans to circulate air and reduce cooling load.

Regular Maintenance: Clean filters and service units regularly to ensure efficient operation.

Use Timers: Set timers to turn off air conditioners when not needed, such as during the night or when away.

Switch to LEDs: Replace incandescent bulbs with LED bulbs which are more energy-efficient.

Use Natural Light: Maximize the use of natural daylight by opening curtains and blinds during the day.

Turn Off Lights: Make a habit of turning off lights when leaving a room.

Use Motion Sensors: Install motion sensors or timers in areas like bathrooms and storage rooms to automatically turn off lights when not in use.

Appliance Usage

Unplug Devices: Unplug devices and chargers when not in use to prevent phantom energy consumption.

Efficient Cooking: Use energy-efficient appliances like induction cooktops and microwave ovens. Avoid leaving kitchen appliances on standby.

Full Laundry Loads: Run the washing machine only with full loads to maximize energy efficiency.

Eco-Friendly Settings: Use eco-friendly settings on appliances like washing machines and dishwashers.

Smart Power Strips: Use smart power strips to easily turn off multiple devices at once.

General Tips

Insulate Windows and Doors: Ensure windows and doors are well-sealed to maintain indoor temperature and reduce the load on heating and cooling systems.

Energy Monitoring: Use smart meters or energy monitoring devices to track and manage energy consumption more effectively.

Educate Residents: Raise awareness among residents about energy-saving practices and the impact of their habits on energy consumption.

Bedroom 1 (Zareen)

Air Conditioner: Set to 24-26°C and use a timer to turn it off at night or when not in the room.

Lighting: Replace bulbs with LED lights and ensure lights are turned off when leaving the room.

Laptop and Electronics: Unplug devices and chargers when not in use to prevent phantom energy consumption.

Ceiling Light and Lamp: Use energy-efficient LED bulbs and turn off when not needed.

Hair Dryer: Limit usage time to reduce energy consumption.

Air Purifier: Use on lower settings and only when necessary.

Bedroom 2 (Tapo)

Air Conditioner: Similar to Bedroom 1, set temperature efficiently and use timers.

Lighting: Use LED bulbs and make it a habit to turn off lights when exiting the room.

Laptop and Electronics: Unplug when not in use.

Ceiling Light and Lamp: Replace with LED bulbs and ensure they are turned off when not needed.

Living Room

Air Conditioner: Set to an efficient temperature and use fans to help circulate air. Use timers to turn it off when the room is unoccupied.

Lighting: Replace chandelier and ceiling light bulbs with LEDs and use natural light during the day. Install motion sensors if the room is frequently left unoccupied.

Appliances: Unplug devices when not in use and use power strips to easily turn off multiple devices at once.
Kitchen

Fridge: Ensure the fridge is running efficiently by keeping it at the recommended temperature and not overloading it.

Oven and Air Fryer: Use these appliances efficiently and avoid preheating for too long.

Rice Cooker and Small LED Lights: Use eco-friendly settings and ensure lights are turned off when not needed.

General Practices: Be mindful of water usage when washing dishes and vegetables.

Bathroom

Ceiling Light: Use an LED bulb and install a motion sensor to ensure the light is only on when the bathroom is in use.

Water Heater: Limit shower time and use lower temperature settings to save both water and energy.

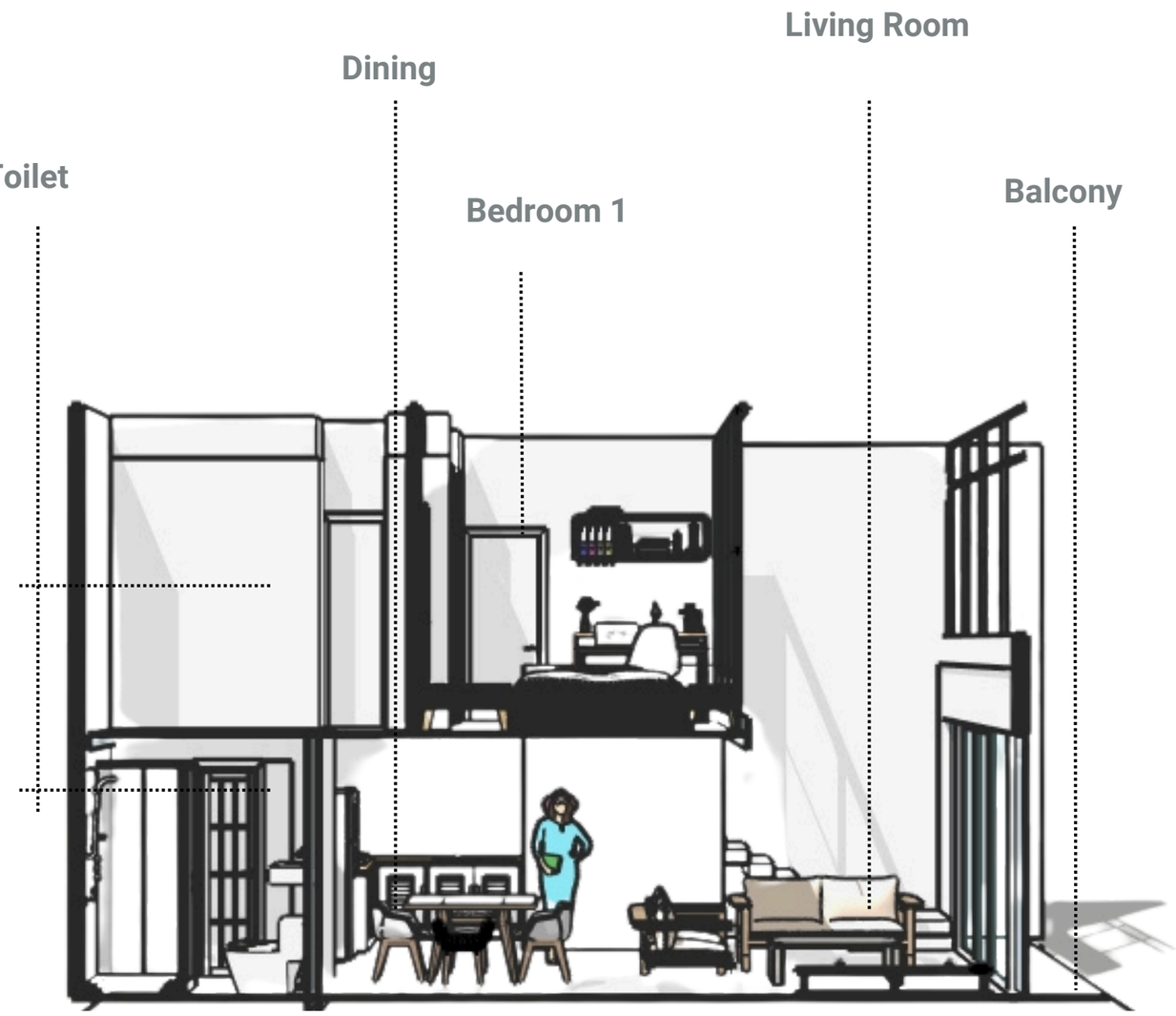
Store Room

Air Conditioner: Use only when necessary and set to an efficient temperature. Ensure it is turned off when the room is not in use.

Lighting: Install a motion sensor to ensure the light is only on when the store room is being accessed.

Balcony

Lights: Use energy-efficient LED bulbs and ensure they are only on when needed, possibly using a timer to turn them off automatically.



Sectional Perspective

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