



**Sem.1 2023/2024**

## **SECD 2523 Database**

**Section 06**

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**Team 5: Bot**

## **PHASE 3: DATABASE LOGICAL DESIGN**

**Low Carbon Initiatives Community Monitoring  
System[Bot]**

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## **1.0 Introduction**

In this project, MBIP plays a role as our client to design a new system to handle the carbon consumption data from the users. It is because MBIP has faced problems such as time taken to process the data is too long, efficiencies and the fluency of the system. So, we are requested by MBIP to design a better system to improve the efficiency of the whole process to let the system work fluently and make it become user-friendly to the community. Thus, we decided to design the system to operate automatically. To simplify the process of inputting information to the system, we have used a camera scanner technology to help those people who are not familiar with modern technology such as the folks to insert personal and bill information fast and automatic. We have also designed an automated calculator which can automatically calculate the carbon consumption data and process them into results. It will decrease the manual method calculations which are slower and may have the possibility of making mistakes. In short, these designs will help MBIP to handle the carbon consumption data of a large number of users and make the whole system operate automatically and efficiently.

## **2.0 Overview of project**

After finishing the database conceptual design (ERD) in phase 2, we have proceeded to a further phase which shows deeper understanding and design of our system which is the database logical design. In phase 3, other than transforming into logical ERD from previous conceptual ERD in phase 2, we have also listed out the relational database schemas after normalization to let our system become penetrated so that it will be clear for our client to understand how our system works. Besides, while designing the logical design, we have also updated the business rules a few times to match the operating method of our system. After that, we will also update the data dictionary for Low Carbon Initiatives Community Monitoring System by referring to the normalized relation schemas. Then, SQL statements will be produced to create the database for the system. While developing SQL statements, we also found out some of the logics are not practical for the system so we also updated the logical design a few times to make it better.

### **3.0 Database Conceptual Design**

#### **3.1 Updated business rule**

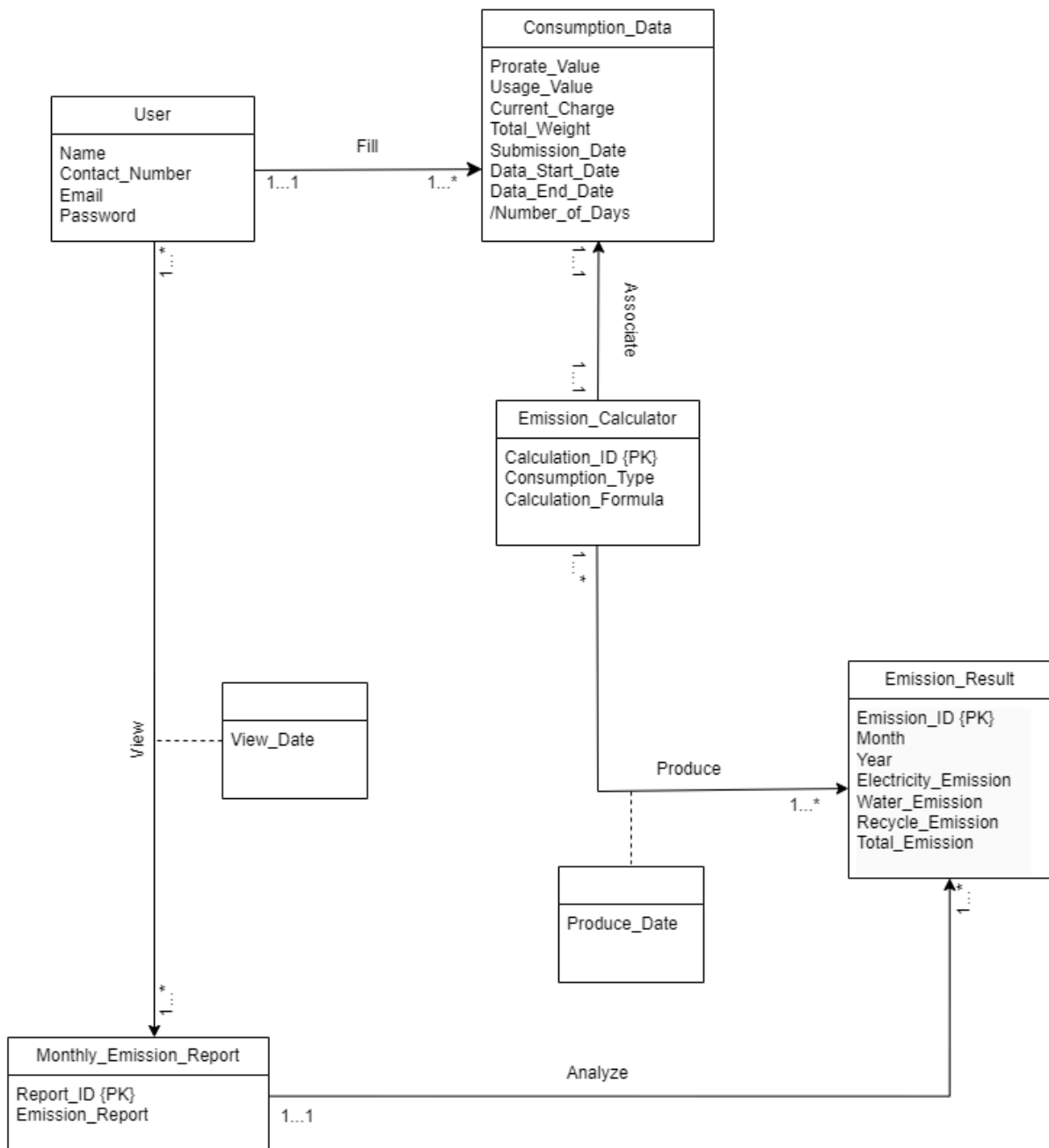
##### **Business Process**

1. The system is accessible 24/7.
2. The system provides Malay and English language, the primary language of the system is Malay.
3. New users (participants) need to register a new account.
4. Users (participants/MBIP admins) need to log in to their account to access the system.
5. Users can only access data relevant to their role.
6. Personal information provided by participants is secured and strictly confidential. MBIP has no right to share participants' personal information.
7. Participants need to enter the carbon consumption data.
8. MBIP admin needs to set the calculation method to the system so that the system can calculate the carbon footprint based on the data provided by participants.
9. The result is further processed and retrieved to print it in the dashboard. Besides that, it is also being combined into a report by system.
10. The MBIP admins are accessible to the reports.

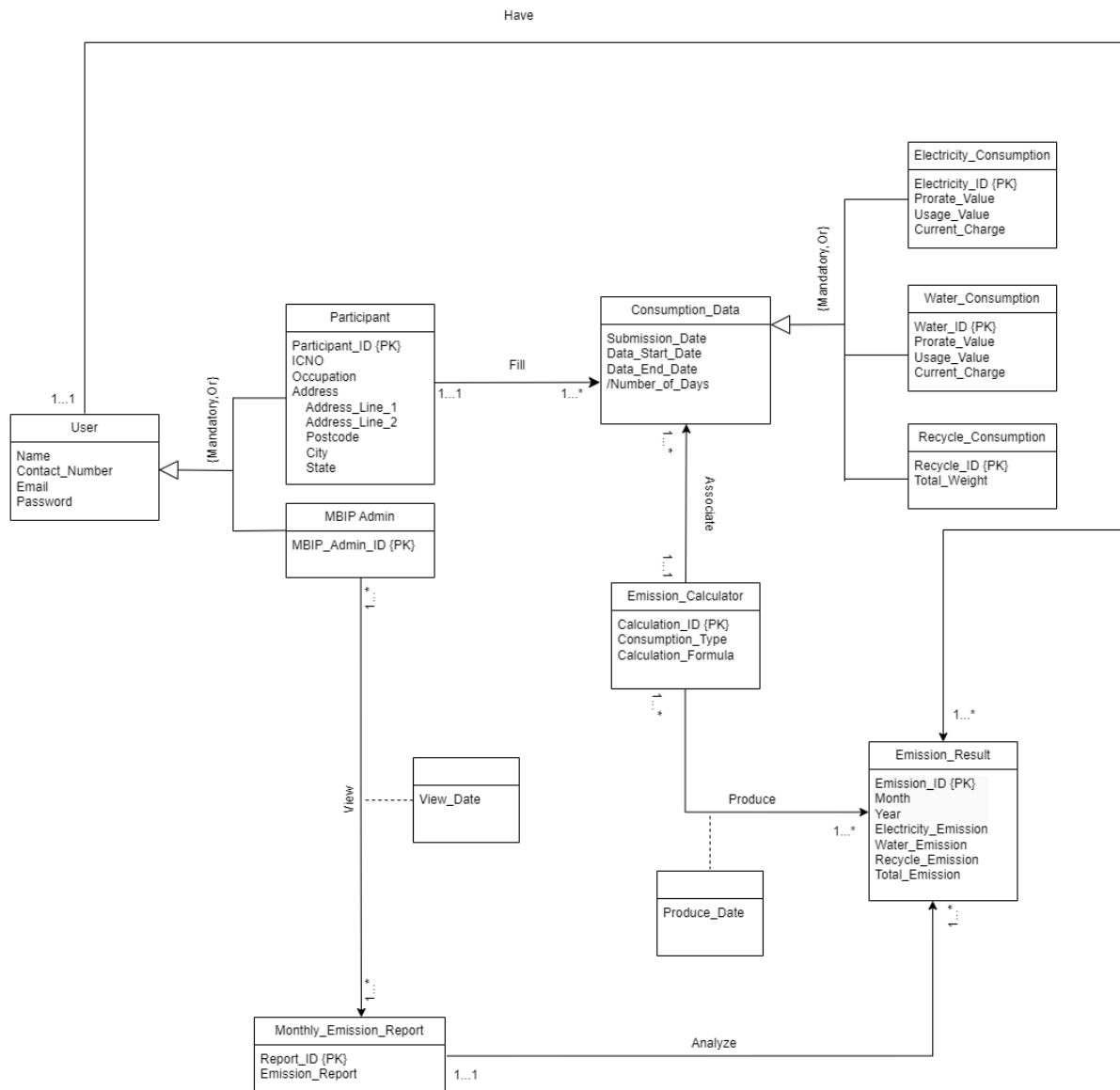
## **Business Rule**

1. A participant can have more than one emission result and each emission result can only have one participant.
2. A participant can fill in more than one electricity consumption data form and each electricity consumption data form can only be filled by one participant.
3. A participant can fill in more than one water consumption data form and each water consumption data form can only be filled by one participant.
4. A participant can fill in more than one recycle consumption data form and each electricity consumption data form can only be filled by one participant.
5. An emission calculator can associate with more than one electricity consumption data and each electricity consumption data can only be associated with an emission calculator.
6. An emission calculator can associate with more than one water consumption data and each electricity consumption data can only be associated with an emission calculator.
7. An emission calculator can associate with more than one recycle consumption data and each electricity consumption data can only be associated with an emission calculator.
8. An emission calculator can process more than one result and each result can only be processed by one emission calculator.
9. An emission result can request more than one result producing and each result producing can only be requested by one emission result,
10. A MBIP admin can view more than one emission report and an emission report can be viewed by more than one MBIP admin.
11. A monthly emission report can provide more than one report viewing and each report viewing can only provide from one monthly emission report.
12. A monthly emission report can be produced by analyzing more than one emission result and an emission result can only be analyzed into a monthly emission report.

### 3.2 Conceptual ERD



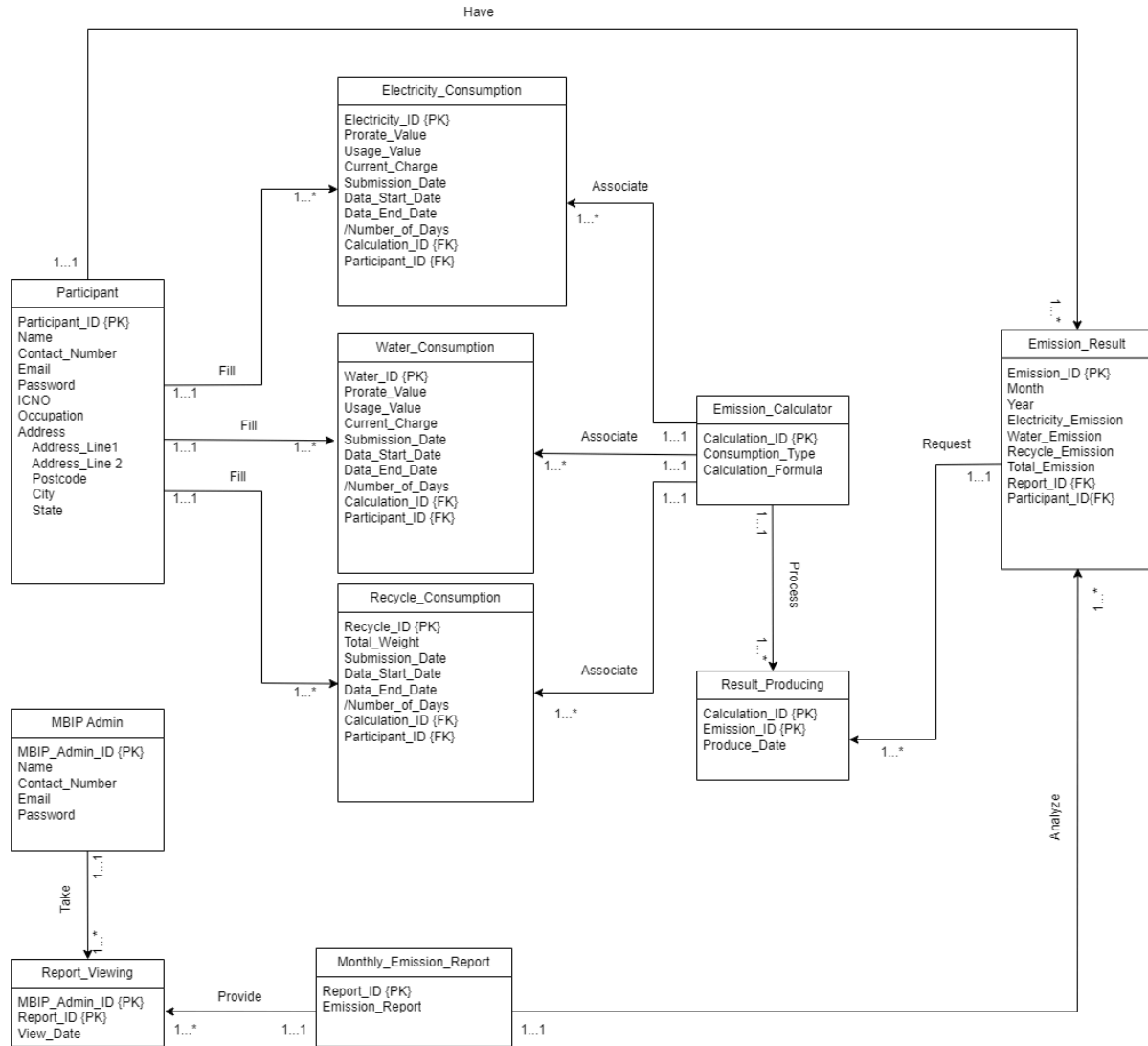
### 3.3 Enhanced ERD





## 4.0 DB logical design

### 4.1 Logical ERD



## 4.2 Updated Data Dictionary

### 4.2.1 Description of entities

Entity	Description	Occurrence
Participant	Store the information of participants	Participants will fill in their credentials and personal information into the system. The information will be stored in the database for user account management.
MBIP Admin	Store the information of MBIP Admin	MBIP admins use their credentials and information to access the system to view the emission report generated.
Electricity_Consumption	Store the data of electricity consumption	Participants will fill in their electricity consumption data into the system to let the emission calculator calculate the carbon emission result.
Water_Consumption	Store the data of water consumption	Participants will fill in their water consumption data into the system to let the emission calculator calculate the carbon emission result.
Recycle_Consumption	Store the data of recycle consumption	Participants will fill in their recycle consumption data into the system to let the emission calculator calculate the carbon emission result.
Emission_Calculator	Store the calculation function of carbon emission	The emission calculator will use the consumption data to calculate the carbon emission result.
Result_Producing	Store the information of the result calculation and production.	Calculation is processed, the produce date of the result will be stored.
Emission_Result	Store the result of carbon	Calculation is done, the

	emission	result is generated and stored. It will be used for generating the monthly emission report.
Monthly_Emission_Report	Store the monthly emission report	Monthly emission report is generated and sent to the MBIP Admin.
Report_Viewing	Store the information when MBIP view reports.	Report generated is ready for MBIP admin to view, the view date of the report by the MBIP admin will be recorded.

#### 4.2.2 Description of Relationship

Entity	Multiplicity	Relationship	Multiplicity	Entity
Participant	1..1	Fill	1..*	Electricity_Consumption
				Water_Consumption
				Recycle_Consumption
	1..1	Have	1..*	Emission_Result
MBIP Admin	1..1	Take	1..*	Report_Viewing
Emission_Calculator	1..1	Associate	1..*	Electricity_Consumption
				Water_Consumption
				Recycle_Consumption
	1..1	Process	1..*	Result_Producing
Emission_Result	1..1	Request	1..*	Result_Producing
Monthly_Emission_Report	1..1	Analyze	1..*	Emission_Result
	1..1	Provide	1..*	Report_Viewing

#### 4.2.3 Description of Attributes

Entity	Attribute	Description	Data Type	Constraint
<b>Participant</b>	Participant_ID	Participant's identification number	VARCHAR2(15)	PRIMARY KEY
	Name	Participant's name	VARCHAR2(50)	NOT NULL
	Contact_Number	Participant's contact number	VARCHAR2(12)	NOT NULL
	Email	Participant's email address	VARCHAR2(40)	NOT NULL
	Password	Participant's email password	VARCHAR2(15)	NOT NULL
	ICNO	Participant's identity card number	VARCHAR2(20)	NOT NULL
	Occupation	Participant's occupation status	VARCHAR2(30)	NOT NULL
	Address_Line_1	Participate area's address	VARCHAR2(50)	NOT NULL
	Address_Line_2	Participate area's address	VARCHAR2(50)	NOT NULL
	Postcode	Participate area's postcode	NUMBER(6)	NOT NULL
	City	Participate area's city	VARCHAR2(20)	NOT NULL
	State	Participate area's state	VARCHAR2(20)	NOT NULL
<b>MBIP Admin</b>	MBIP_Admin_ID	Admin's identification number	VARCHAR2(15)	PRIMARY KEY

	Name	Admin's name	VARCHAR2(50)	NOT NULL
	Contact_Number	Admin's contact number	VARCHAR2(12)	NOT NULL
	Email	Admin's email address	VARCHAR2(40)	NOT NULL
	Password	Admin's email password	VARCHAR2(15)	NOT NULL
<b>Electricity_Consumption</b>	Electricity_ID	Electricity consumption data identification number	VARCHAR2(15)	PRIMARY KEY
	Prorate_Value	Participant's electricity prorate factor	NUMBER(5,3)	NOT NULL
	Usage_Value	Participant's electricity usage	NUMBER(8,3)	NOT NULL
	Current_Charge	Participant's electricity current charge	NUMBER(8,3)	NOT NULL
	Submission_Date	Date of submit electricity consumption data	DATE	DEFAULT SYSDATE
	Data_Start_Date	Start date of electricity consumption data	DATE	NOT NULL
	Data_End_Date	End date of electricity consumption data	DATE	NOT NULL
	/Number_of_Days	Number of days in a month	NUMBER(4)	NOT NULL
	Calculation_ID	Emission calculation's identification number	VARCHAR2(15)	FOREIGN KEY REFERENCE Emission_Calculator
	Participant_ID	Participant's identification number	VARCHAR2(15)	FOREIGN KEY REFERENCE Participant_Data

				shboard
<b>Water_Consumption</b>	Water_ID	Water consumption data identification number	VARCHAR2(15)	PRIMARY KEY
	Prorate_Value	Participant's water prorate factor	NUMBER(5,3)	NOT NULL
	Usage_Value	Participant's water usage	NUMBER(8,3)	NOT NULL
	Current_Charge	Participant's water current charge	NUMBER(8,3)	NOT NULL
	Submission_Date	Date of submit water consumption data	DATE	DEFAULT SYSDATE
	Data_Start_Date	Start date of water consumption data	DATE	NOT NULL
	Data_End_Date	End date of water consumption data	DATE	NOT NULL
	/Number_of_Days	Number of days in a month	NUMBER(4)	NOT NULL
	Calculation_ID	Emission calculation's identification number	VARCHAR2(15)	FOREIGN KEY REFERENCE Emission_Calculator
<b>Recycle_Consumption</b>	Participant_ID	Participant's identification number	VARCHAR2(15)	FOREIGN KEY REFERENCE Participant_Dashboard
	Recycle_ID	Recycle consumption data identification number	VARCHAR2(15)	PRIMARY KEY
	Total_Weight	Total weight of recycle consumption	NUMBER(8,3)	NOT NULL
	Submission_Date	Date of submit recycle consumption data	DATE	DEFAULT SYSDATE

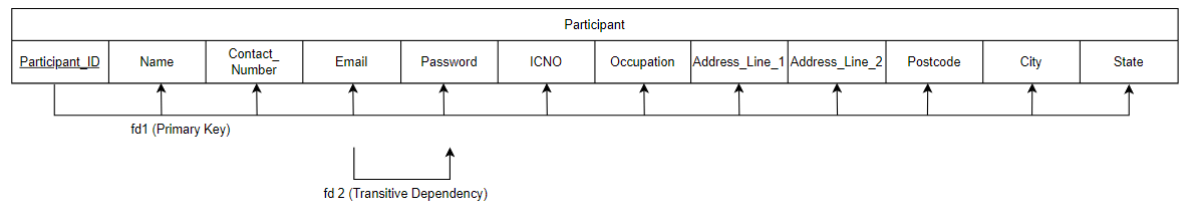
	Data_Start_Date	Start date of recycle consumption data	DATE	NOT NULL
	Data_End_Date	End date of recycle consumption data	DATE	NOT NULL
	/Number_of_Days	Number of days in a month	NUMBER(4)	NOT NULL
	Calculation_ID	Emission calculation's identification number	VARCHAR2(15)	FOREIGN KEY REFERENCE Emission_Calculator
	Participant_ID	Participant's identification number	VARCHAR2(15)	FOREIGN KEY REFERENCE Participant_Dashboard
<b>Emission_Calculator</b>	Calculation_ID	Calculation's identification number	VARCHAR2(15)	PRIMARY KEY
	Consumption_Type	Type of consumption	VARCHAR2(15)	NOT NULL
	Calculation_Formula	Formula of calculating carbon emission	VARCHAR2(100)	NOT NULL
<b>Result_Producing</b>	Calculation_ID	Calculation's identification number	VARCHAR2(15)	PRIMARY KEY
	Emission_ID	Emission result's identification number	VARCHAR2(15)	PRIMARY KEY
	Produce_Date	Date of producing report	DATE	DEFAULT SYSDATE
<b>Emission_Result</b>	Emission_ID	Carbon emission's identification number	VARCHAR2(15)	PRIMARY KEY
	Month	Month when the emission data was recorded.	VARCHAR2(10)	NOT NULL

	Year	Year when the emission data was recorded.	NUMBER(6)	NOT NULL
	Electricity_Emission	Electricity calculated emission data	NUMBER(8,3)	NOT NULL
	Water_Emission	Water calculated emission data	NUMBER(8,3)	NOT NULL
	Recycle_Emission	Recycle calculated emission data	NUMBER(8,3)	NOT NULL
	Total_Emission	Total calculated emission data	NUMBER(8,3)	NOT NULL
	Report_ID	Report's identification number	VARCHAR2(15)	FOREIGN KEY REFERENCE Monthly_Emission_Report
	Participant_ID	Participant's identification number	VARCHAR2(15)	FOREIGN KEY REFERENCE Participant_Dashboard
<b>Monthly_Emission_Report</b>	Report_ID	Report's identification number	VARCHAR2(15)	PRIMARY KEY
	Emission_Report	Report of emission result	VARCHAR(100)	NOT NULL
<b>Report_Viewing</b>	MBIP_Admin_ID	Admin's identification number	VARCHAR2(15)	PRIMARY KEY
	Report_ID	Report's identification number	VARCHAR2(15)	PRIMARY KEY
	View_Date	Date of viewing the carbon emission report	DATE	DEFAULT SYSDATE



### 4.3 Normalization

1. Participant\_Dashboard (Participant\_ID, Name, Contact\_Number, Email, Password, ICNO, Occupation, Address\_Line\_1, Address\_Line\_2, Postcode, City, State)



fd 1 (Primary key): Participant\_ID → Name, Contact\_Number, Email, Password, ICNO, Occupation, Address\_Line\_1, Address\_Line\_2, Postcode, City, State  
fd 2 (Transitive Dependency): Email → Password

1NF&2NF:

Participant (Participant\_ID, Name, Contact\_Number, Email, Password, ICNO, Occupation, Address\_Line\_1, Address\_Line\_2, Postcode, City, State)

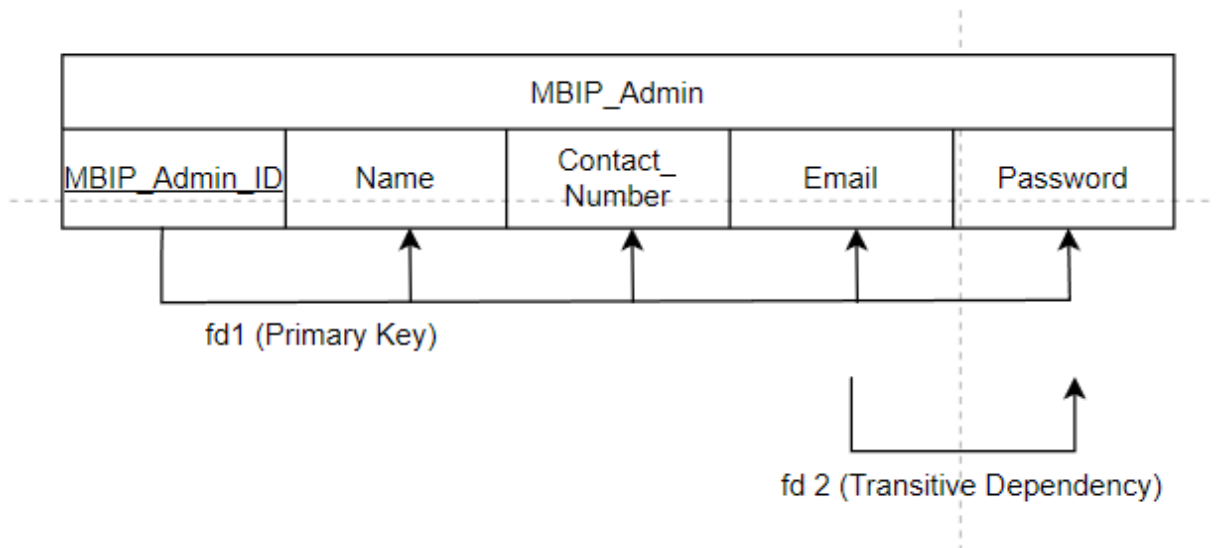
3NF&BCNF:

Participant (Participant\_ID, Name, Contact\_Number, Email, ICNO, Occupation, Address\_Line\_1, Address\_Line\_2, Postcode, City, State)

FK: Email references Participant\_Password (Email)

Participant\_Password (Email, Password)

2. MBIP\_Admin (MBIP\_Admin\_ID, Name, Contact\_Number, Email, Password)



fd 1 (Primary Key) :  $\text{MBIP\_Admin\_ID} \rightarrow \text{Name, Contact\_Number, Email, Password}$   
 fd 2 (Transitive Dependency):  $\text{Email} \rightarrow \text{Password}$

1NF&2NF&3NF&BCNF:

MBIP\_Admin (MBIP\_Admin\_ID, Name, Contact\_Number, Email, Password)

3NF&BCNF:

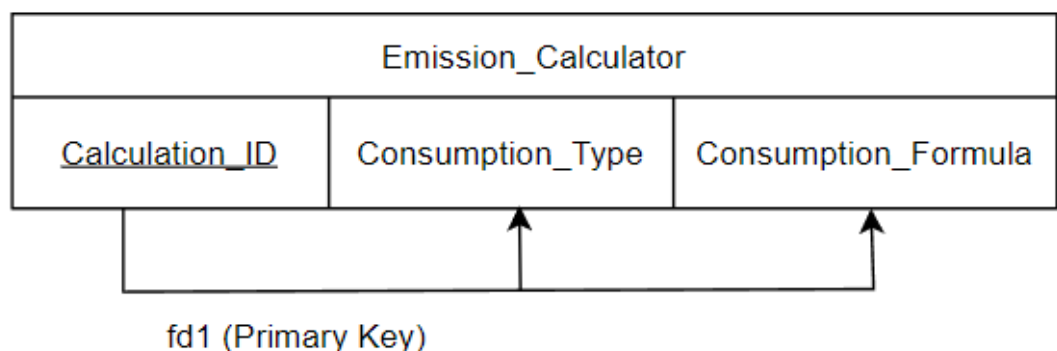
MBIP\_Admin (MBIP\_Admin\_ID, Name, Contact\_Number, Email, Password)

FK: Email references MBIP\_Password (Email)

MBIP\_Password (Email, Password)

### 3. Emission\_Calculator (Calculation\_ID, Consumption\_Type, Calculation\_Formula)

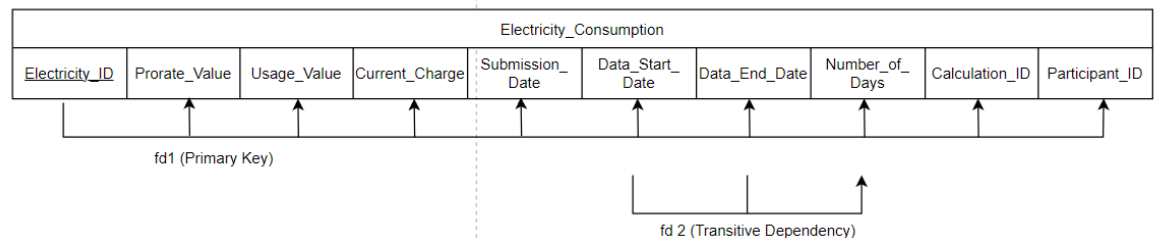
fd1 (Primary key):  $\text{Calculation\_ID} \rightarrow \text{Consumption\_Type, Calculation\_Formula}$



1NF&2NF&3NF&BCNF:

Emission\_Calculator (Calculation\_ID, Consumption\_Type, Calculation\_Formula)

4. Electricity\_Consumption\_Calculator ( Electricity\_ID, Prorate\_Value, Usage\_Value, Current\_Charge, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Number\_of\_Days, Calculation\_ID, Participant\_ID)  
 FK: Calculation\_ID references Emission\_Calculator (Calculation\_ID)  
 FK: Participant\_ID references Participant (Participant\_ID)



fd 1 (Primary Key) : Electricity\_ID → Prorate\_Value, Usage\_Value, Current\_Charge, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Calculation\_ID, Participant\_ID  
 fd 2 (Transitive Dependency) : Data\_Start\_Date, Data\_End\_Date → Number\_of\_Days

1NF&2NF;

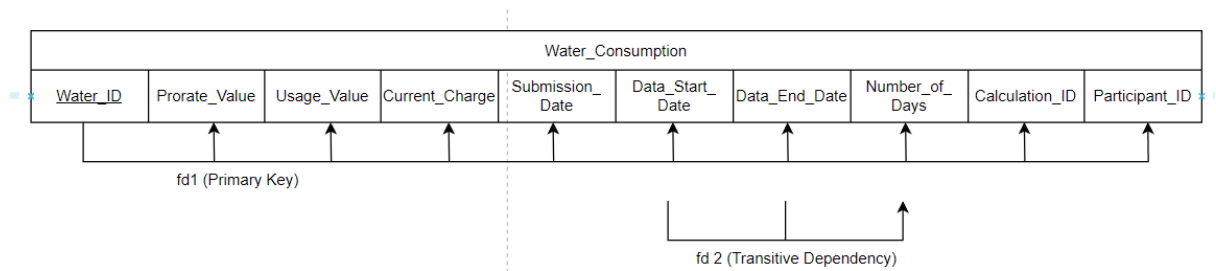
Electricity\_Consumption\_Calculator ( Electricity\_ID, Prorate\_Value, Usage\_Value, Current\_Charge, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Number\_of\_Days, Calculation\_ID, Participant\_ID)  
 FK: Calculation\_ID references Emission\_Calculator (Calculation\_ID)  
 FK: Participant\_ID references Participant (Participant\_ID)

3NF&BCNF:

Electricity\_Consumption\_Calculator ( Electricity\_ID, Prorate\_Value, Usage\_Value, Current\_Charge, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Calculation\_ID, Participant\_ID)  
 FK: Calculation\_ID references Emission\_Calculator (Calculation\_ID)  
 FK: Participant\_ID references Participant (Participant\_ID)  
 FK: Data\_Start\_Date, Data\_End\_Date references Number\_of\_Days (Data\_Start\_Date, Data\_End\_Date)

Number\_Days (Data\_Start\_Date, Data\_End\_Date, Number\_of\_Days)

5. Water\_Consumption (Water\_ID, Prorate\_Value, Usage\_Value, Current\_Charge, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Number\_of\_Days, Calculation\_ID, Participant\_ID)  
 FK: Calculation\_ID references Emission\_Calculator (Calculator\_ID)  
 FK: Participant\_ID references Participant (Participant\_ID)



fd 1 (Primary Key) : Water\_ID → Prorate\_Value, Usage\_Value, Current\_Charge, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Calculation\_ID, Participant\_ID

fd 2 (Transitive Dependency) : Data\_Start\_Date, Data\_End\_Date → Number\_of\_Days

1NF&2NF;

Electricity\_Consumption\_Calculator ( Water\_ID, Prorate\_Value, Usage\_Value, Current\_Charge, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Number\_of\_Days, Calculation\_ID, Participant\_ID)

FK: Calculation\_ID references Emission\_Calculator (Calculation\_ID)

FK: Participant\_ID references Participant (Participant\_ID)

3NF&BCNF:

Water\_Consumption\_Calculator ( Water\_ID, Prorate\_Value, Usage\_Value, Current\_Charge, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Calculation\_ID, Participant\_ID)

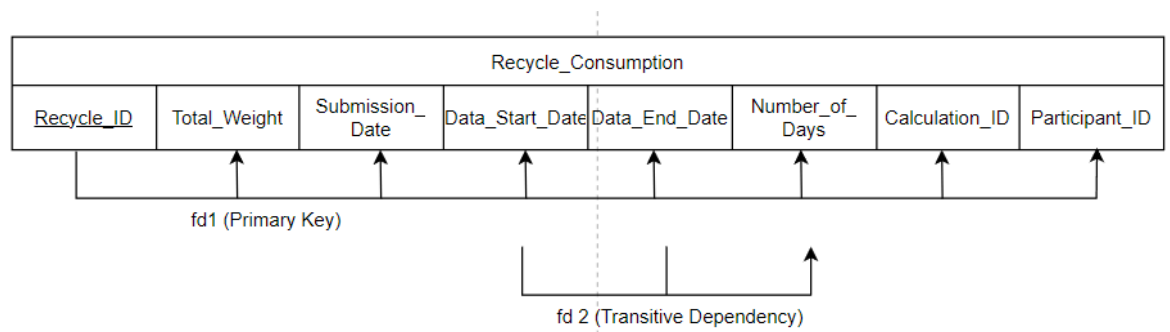
FK: Calculation\_ID references Emission\_Calculator (Calculation\_ID)

FK: Participant\_ID references Participant (Participant\_ID)

FK: Data\_Start\_Date, Data\_End\_Date references Number\_of\_Days (Data\_Start\_Date, Data\_End\_Date)

Number\_Days (Data\_Start\_Date, Data\_End\_Date, Number\_of\_Days)

6. Recycle\_Consumption (Recycle\_ID, Total\_Weight, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Number\_of\_Days, Calculation\_ID, Participant\_ID)  
 FK: Calculation\_ID references Emission\_Calculator (Calculator\_ID)  
 FK: Participant\_ID references Participant (Participant\_ID)



fd 1 (Primary Key) : Recycle\_ID → Total\_Weight, Data\_Start\_Date, Data\_End\_Date, Submission\_Date, Number\_of\_Days, Calculation\_ID, Participant\_ID

fd 2 (Transitive Dependency) : Data\_Start\_Date, Data\_End\_Date → Number\_of\_Days

1NF&2NF&3NF&BCNF:

Recycle\_Consumption (Recycle\_ID, Total\_Weight, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Number\_of\_Days, Calculation\_ID, Participant\_ID )

FK: Calculation\_ID references Emission\_Calculator (Calculator\_ID)

FK: Participant\_ID references Participant (Participant\_ID)

3NF&BCNF:

Recycle\_Consumption (Recycle\_ID, Total\_Weight, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Calculation\_ID, Participant\_ID )

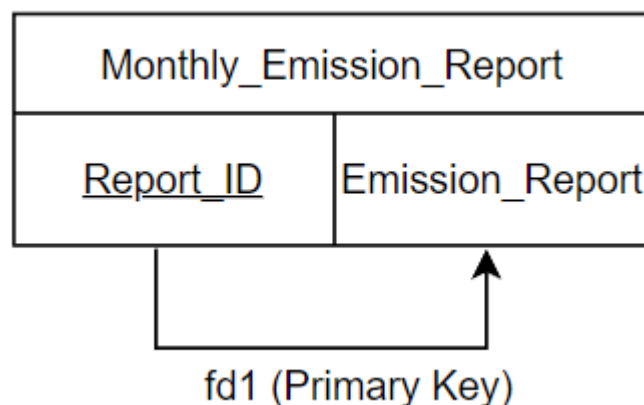
FK: Calculation\_ID references Emission\_Calculator (Calculator\_ID)

FK: Participant\_ID references Participant (Participant\_ID)

FK: Data\_Start\_Date, Data\_End\_Date references Number\_of\_Days (Data\_Start\_Date, Data\_End\_Date)

Number\_Days (Data\_Start\_Date, Data\_End\_Date, Number\_of\_Days)

#### 7. Monthly\_Emission\_Report (Report\_ID, Emission\_Report)

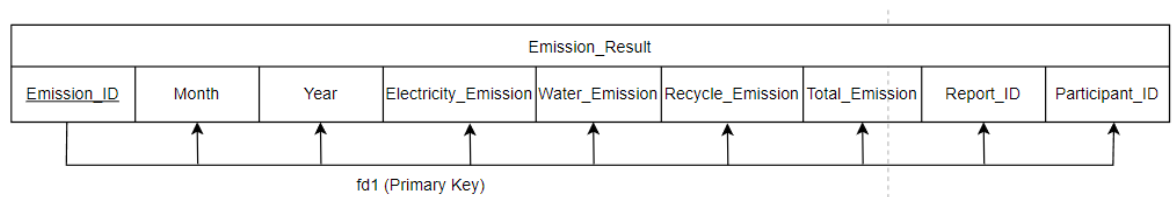


fd 1 (Primary Key): Report\_ID → Emission\_Report

1NF&2NF&3NF&BCNF:

Monthly\_Emission\_Report (Report\_ID, Emission\_Report)

8. Emission\_Result ( Emission\_ID, Month, Year, Electricity\_Emission, Water\_Emission, Recycle\_Emission, Total\_Emission, Report\_ID, Participant\_ID)  
 FK: Report\_ID references Monthly\_Emission\_Report (Report\_ID)  
 FK: Participant\_ID references Participant (Participant\_ID)

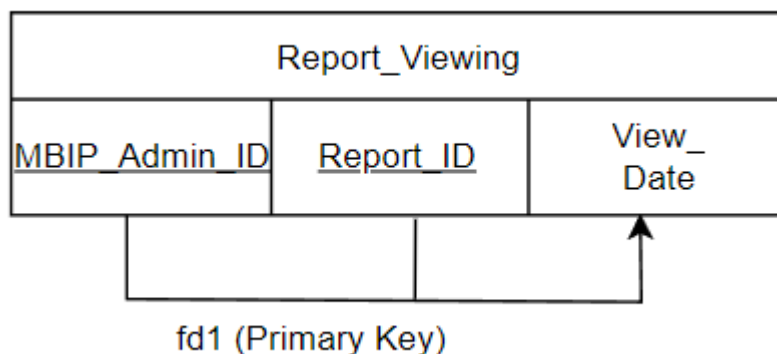


fd 1 (Primary Key): Emission\_ID → Month, Year, Electricity\_Emission, Water\_Emission, Recycle\_Emission, Total\_Emission, Calculation\_ID, Report\_ID

1NF&2NF&3NF&BCNF:

Emission\_Result ( Emission\_ID, Month, Year, Electricity\_Emission, Water\_Emission, Recycle\_Emission, Total\_Emission, Report\_ID, Participant\_ID)  
 FK: Report\_ID references Monthly\_Emission\_Report (Report\_ID)  
 FK: Participant\_ID references Participant (Participant\_ID)

9. Report\_Viewing ( MBIP\_Admin\_ID, Report\_ID, View\_Date)

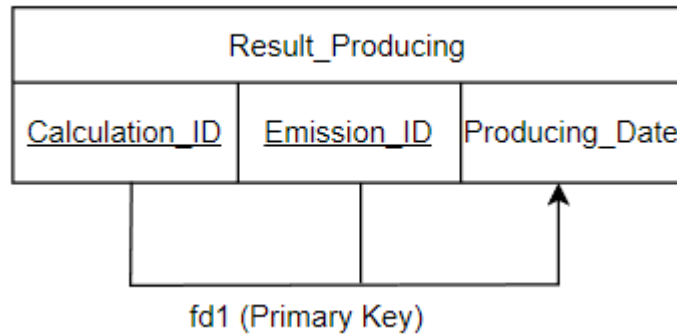


fd 1 (Primary Key): MBIP\_Admin\_ID, Report\_ID → View\_Date

1NF&2NF&3NF&BCNF:

Report\_Viewing ( MBIP\_Admin\_ID, Report\_ID, View\_Date)  
 FK: MBIP\_Admin\_ID references MBIP\_Admin (MBIP\_Admin\_ID)  
 FK: Report\_ID references Monthly\_Emission\_Report (Report\_ID)

10. Result\_Producing (Calculation\_ID, Emission\_ID, Producing\_Date)  
 FK: Calculation\_ID references Emission\_Calculator (Calculator\_ID)  
 FK: Emission\_ID references Emission\_Result (Emission\_ID)



1NF&2NF&3NF&BCNF:

- Result\_Producing (Calculation\_ID, Emission\_ID, Producing\_Date)  
 FK: Calculation\_ID references Emission\_Calculator (Calculation\_ID)  
 FK: Emission\_ID references Emission\_Result (Emission\_ID)

## 5.0 Relational DB Schemas (after normalization)

### 1) Participant

Participant										
<u>Participant_ID</u>	Name	Contact_Number	Email	ICNO	Occupation	Address_Line_1	Address_Line_2	Postcode	City	State

- Participant (Participant\_ID, Name, Contact\_Number, Email, ICNO, Occupation, Address\_Line\_1, Address\_Line\_2, Postcode, City, State)  
 FK: Email references Participant\_Password (Email)

### 2) Participant\_Password

Participant_Password	
<u>Email</u>	Password

Participant\_Password (Email, Password)

### 3) MBIP\_Admin

MBIP_Admin				
<u>MBIP_Admin_ID</u>	Name	Contact_Number	Email	Password

- MBIP\_Admin (MBIP\_Admin\_ID, Name, Contact\_Number, Email, Password)  
 FK: Email references MBIP\_Password (Email)

4) MBIP\_Password

MBIP_Password	
<u>Email</u>	Password

MBIP\_Password (Email, Password)

5) Emission\_Calculator

Emission_Calculator		
<u>Calculation_ID</u>	Consumption_Type	Calculation_Formula

Emission\_Calculator (Calculation\_ID, Consumption\_Type, Calculation\_Formula)

6) Electricity\_Consumption

Electricity_Consumption								
<u>Electricity_ID</u>	Prorate_Value	Usage_Value	Current_Charge	Submission_Date	Data_Start_Date	Data_End_Date	Calculation_ID	Participant_ID

Electricity\_Consumption\_Calculator ( Electricity\_ID, Prorate\_Value, Usage\_Value, Current\_Charge, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Calculation\_ID, Participant\_ID)

FK: Calculation\_ID references Emission\_Calculator (Calculation\_ID)

FK: Participant\_ID references Participant (Participant\_ID)

FK: Data\_Start\_Date, Data\_End\_Date references Number\_of\_Days (Data\_Start\_Date, Data\_End\_Date)

7) Water\_Consumption

Water_Consumption								
<u>Water_ID</u>	Prorate_Value	Usage_Value	Current_Charge	Submission_Date	Data_Start_Date	Data_End_Date	Calculation_ID	Participant_ID

Water\_Consumption\_Calculator ( Water\_ID, Prorate\_Value, Usage\_Value, Current\_Charge, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Calculation\_ID, Participant\_ID)

FK: Calculation\_ID references Emission\_Calculator (Calculation\_ID)

FK: Participant\_ID references Participant (Participant\_ID)

FK: Data\_Start\_Date, Data\_End\_Date references Number\_of\_Days (Data\_Start\_Date, Data\_End\_Date)

8) Recycle\_Consumption

Recycle_Consumption						
<u>Recycle_ID</u>	Total_Weight	Submission_Date	Data_Start_Date	Data_End_Date	Calculation_ID	Participant_ID



Recycle\_Consumption (Recycle\_ID, Total\_Weight, Submission\_Date, Data\_Start\_Date, Data\_End\_Date, Calculation\_ID, Participant\_ID )  
 FK: Calculation\_ID references Emission\_Calculator (Calculator\_ID)  
 FK: Participant\_ID references Participant (Participant\_ID)  
 FK: Data\_Start\_Date, Data\_End\_Date references Number\_of\_Days (Data\_Start\_Date, Data\_End\_Date)

#### 9) Number\_Days

Number_Days		
<u>Data_Start_Date</u>	<u>Data_End_Date</u>	Number_of_Days

Number\_Days (Data\_Start\_Date, Data\_End\_Date, Number\_of\_Days)

#### 10) Monthly\_Emission\_Report

Monthly_Emission_Report	
<u>Report_ID</u>	Emission_Report

Monthly\_Emission\_Report (Report\_ID, Emission\_Report)

#### 11) Emission\_Result

Emission_Result								
<u>Emission_ID</u>	Month	Year	Electricity_Emission	Water_Emission	Recycle_Emission	Total_Emission	Report_ID	Participant_ID

Emission\_Result ( Emission\_ID, Month, Year, Electricity\_Emission, Water\_Emission, Recycle\_Emission, Total\_Emission, Report\_ID, Participant\_ID)  
 FK: Report\_ID references Monthly\_Emission\_Report (Report\_ID)  
 FK: Participant\_ID references Participant (Participant\_ID)

#### 12) Report\_Viewing

Report_Viewing		
<u>MBIP_Admin_ID</u>	<u>Report_ID</u>	View_Date

Report\_Viewing (MBIP\_Admin\_ID, Report\_ID, View\_Date)  
 FK: MBIP\_Admin\_ID references MBIP\_Admin (MBIP\_Admin\_ID)  
 FK: Report\_ID references Monthly\_Emission\_Report (Report\_ID)

13) Result\_Producing

Result_Producing		
<u>Calculation_ID</u>	<u>Emission_ID</u>	Producing_Date

Result\_Producing (Calculation\_ID, Emission\_ID, Producing\_Date)

FK: Calculation\_ID references Emission\_Calculator (Calculation\_ID)

FK: Emission\_ID references Emission\_Result (Emission\_ID)

## 6.0 SQL Statements

---

```
CREATE TABLE Participant_Password(  
    Email VARCHAR2(40),  
    Password VARCHAR2(15) NOT NULL,  
    CONSTRAINT Email_PK PRIMARY KEY (Email)  
);
```

---

```
CREATE TABLE Participant(  
    Participant_ID VARCHAR2(15),  
    Name VARCHAR2(50) NOT NULL,  
    Contact_Number VARCHAR(12) NOT NULL,  
    Email VARCHAR2(40) NOT NULL,  
    ICNO VARCHAR2(20) NOT NULL,  
    Occupation VARCHAR2(30) NOT NULL,  
    Address_Line_1 VARCHAR2(50) NOT NULL,  
    Address_Line_2 VARCHAR2(50) NOT NULL,  
    Postcode NUMBER(6) NOT NULL,  
    City VARCHAR2(20) NOT NULL,  
    State VARCHAR2(20) NOT NULL,  
    CONSTRAINT Participant_ID_PK PRIMARY KEY (Participant_ID),  
    CONSTRAINT PEmail_FK FOREIGN KEY (Email) REFERENCES  
Participant_Password(Email)  
);
```

---

```

CREATE TABLE MBIP_Password(

    Email VARCHAR2(40),

    Password VARCHAR2(15) NOT NULL,

    CONSTRAINT MAEmail_PK PRIMARY KEY (Email)

);

```

```

-----

CREATE TABLE MBIP_Admin(

    MBIP_Admin_ID VARCHAR2(15),

    Name VARCHAR2(50) NOT NULL,

    Contact_Number VARCHAR(12) NOT NULL,

    Email VARCHAR2(40) NOT NULL,

    CONSTRAINT MBIP_Admin_ID_PK PRIMARY KEY ( MBIP_Admin_ID),

    CONSTRAINT MEmail_FK FOREIGN KEY (Email) REFERENCES
MBIP_Password(Email)

);

```

```

-----

CREATE TABLE Emission_Calculator(

    Calculation_ID VARCHAR2(15),

    Consumption_Type VARCHAR2(15),

    Calculation_Formula VARCHAR2(100),

    CONSTRAINT Calculation_ID_PK PRIMARY KEY (Calculation_ID)

);

```

```

-----

CREATE TABLE Electricity_Consumption(

    Electricity_ID VARCHAR2(15),

    Prorate_Value NUMBER(5,3) NOT NULL,

    Usage_Value NUMBER(8,3) NOT NULL,

```

```

Current_Charge NUMBER(8,3) NOT NULL,

Submission_Date DATE DEFAULT SYSDATE,

Data_Start_Date DATE NOT NULL,

Data_End_Date DATE NOT NULL,

Calculation_ID VARCHAR2(15) NOT NULL,

Participant_ID VARCHAR2(15) NOT NULL,

CONSTRAINT Electricity_ID_PK PRIMARY KEY (Electricity_ID),

CONSTRAINT Calculation_ID_FK FOREIGN KEY (Calculation_ID)
REFERENCES Emission_Calculator(Calculation_ID),

CONSTRAINT Participant_ID_FK FOREIGN KEY (Participant_ID)
REFERENCES Participant(Participant_ID),

CONSTRAINT ENum_Days_FK FOREIGN KEY (Data_Start_Date,Data_End_Date)
REFERENCES Number_Days(Data_Start_Date,Data_End_Date)

);

```

```

-----

CREATE TABLE Water_Consumption(

    Water_ID VARCHAR2(15),

    Prorate_Value NUMBER(5,3) NOT NULL,

    Usage_Value NUMBER(8,3) NOT NULL,

    Current_Charge NUMBER(8,3) NOT NULL,

    Submission_Date DATE DEFAULT SYSDATE,

    Data_Start_Date DATE NOT NULL,

    Data_End_Date DATE NOT NULL,

    Calculation_ID VARCHAR2(15) NOT NULL,

    Participant_ID VARCHAR2(15) NOT NULL,

    CONSTRAINT Water_ID_PK PRIMARY KEY (Water_ID),

    CONSTRAINT Calculation_ID1_FK FOREIGN KEY (Calculation_ID)
REFERENCES Emission_Calculator(Calculation_ID),

```

```

        CONSTRAINT Participant_ID1_FK FOREIGN KEY (Participant_ID)
REFERENCES Participant(Participant_ID),

        CONSTRAINT WNum_Days_FK FOREIGN KEY (Data_Start_Date,Data_End_Date)
REFERENCES Number_Days(Data_Start_Date,Data_End_Date)

);

```

---

```

CREATE TABLE Recycle_Consumption(

    Recycle_ID VARCHAR2(15),

    Total_Weight NUMBER(8,3) NOT NULL,

    Submission_Date DATE DEFAULT SYSDATE,

    Data_Start_Date DATE NOT NULL,

    Data_End_Date DATE NOT NULL,

    Calculation_ID VARCHAR2(15) NOT NULL,

    Participant_ID VARCHAR2(15) NOT NULL,

    CONSTRAINT Recycle_ID_PK PRIMARY KEY (Recycle_ID),

    CONSTRAINT Calculation_ID2_FK FOREIGN KEY (Calculation_ID)
REFERENCES Emission_Calculator(Calculation_ID),

    CONSTRAINT Participant_ID2_FK FOREIGN KEY (Participant_ID)
REFERENCES Participant(Participant_ID),

    CONSTRAINT RNum_Days_FK FOREIGN KEY (Data_Start_Date,Data_End_Date)
REFERENCES Number_Days(Data_Start_Date,Data_End_Date)

);

```

---

```

CREATE TABLE Number_Days(

    Data_Start_Date DATE,

    Data_End_Date DATE,

    Number_of_Days NUMBER(4) NOT NULL,

    CONSTRAINT Num_Days_PK PRIMARY KEY (Data_Start_Date,Data_End_Date)

);

```

```

-----

CREATE TABLE Monthly_Emission_Report(

    Report_ID VARCHAR2(15),

    Emission_Report VARCHAR(100) NOT NULL,

    CONSTRAINT Report_ID_PK PRIMARY KEY (Report_ID)

);

-----

CREATE TABLE Emission_Result(

    Emission_ID VARCHAR2(15),

    Month VARCHAR2(10) NOT NULL,

    Year NUMBER(6) NOT NULL,

    Electricity_Emission NUMBER(8,3),

    Water_Emission NUMBER(8,3),

    Recycle_Emission NUMBER(8,3),

    Total_Emission NUMBER(8,3),

    Report_ID VARCHAR2(15) NOT NULL,

    Participant_ID VARCHAR2(15) NOT NULL,

    CONSTRAINT Emission_ID_PK PRIMARY KEY (Emission_ID),

    CONSTRAINT Report_ID_FK FOREIGN KEY (Report_ID) REFERENCES
Monthly_Emission_Report(Report_ID),

    CONSTRAINT Participant_ID3_FK FOREIGN KEY (Participant_ID)
REFERENCES Participant(Participant_ID)

);

-----

CREATE TABLE Report_Viewing(

    MBIP_Admin_ID VARCHAR2(15),

    Report_ID VARCHAR2(15),

    View_Date DATE DEFAULT SYSDATE,

```

```

        CONSTRAINT Viewing_PK PRIMARY KEY (Report_ID, MBIP_Admin_ID),

        CONSTRAINT Report_ID1_FK FOREIGN KEY (Report_ID) REFERENCES
Monthly_Emission_Report(Report_ID),

        CONSTRAINT MBIP_Admin_ID_FK FOREIGN KEY (MBIP_Admin_ID) REFERENCES
MBIP_Admin(MBIP_Admin_ID)

);

```

```

-----

CREATE TABLE Result_Producing(

    Calculation_ID VARCHAR2(15),

    Emission_ID VARCHAR2(15),

    Produce_Date DATE DEFAULT SYSDATE,

    CONSTRAINT Producing_PK PRIMARY KEY (Calculation_ID, Emission_ID),

    CONSTRAINT Calculation_ID4_FK FOREIGN KEY ( Calculation_ID)
REFERENCES Emission_Calculator( Calculation_ID),

    CONSTRAINT Emission_ID_FK FOREIGN KEY (Emission_ID) REFERENCES
Emission_Result(Emission_ID)

);

```

```

-----Insert Participant Password -----

INSERT INTO Participant_Password

VALUES ('Kwek@gmail.com', '123456Abc');

INSERT INTO Participant_Password

VALUES ('Faris@gmail.com', '123456aBc');

INSERT INTO Participant_Password

VALUES ('Afiq@gmail.com', '123456abC');

INSERT INTO Participant_Password

VALUES ('Kuan@gmail.com', '123456ABc');

```



```

INSERT INTO Participant_Password
VALUES ('Danial@gmail.com', '123456AbC');

INSERT INTO Participant_Password
VALUES ('Thaqif@gmail.com', '56789Abc');

INSERT INTO Participant_Password
VALUES ('Kew@gmail.com', '56789aBc');

INSERT INTO Participant_Password
VALUES ('Amirul@gmail.com', '56789abC');

INSERT INTO Participant_Password
VALUES ('Arif@gmail.com', '56789ABc');

INSERT INTO Participant_Password
VALUES ('Siti@gmail.com', '56789AbC');

INSERT INTO Participant_Password
VALUES ('Nurin@gmail.com', '123456Cde');

INSERT INTO Participant_Password
VALUES ('Tan@gmail.com', '123456cDe');

INSERT INTO Participant_Password
VALUES ('Shafiq@gmail.com', '123456cdE');

INSERT INTO Participant_Password
VALUES ('KDS@gmail.com', '123456CDe');

INSERT INTO Participant_Password
VALUES ('JC@gmail.com', '123456CdE');

INSERT INTO Participant_Password
VALUES ('Ryan@gmail.com', '56789Cde');

INSERT INTO Participant_Password
VALUES ('William@gmail.com', '56789cDe');

INSERT INTO Participant_Password

```

```
VALUES ('YT@gmail.com', '56789cdE');
```

```
INSERT INTO Participant_Password
```

```
VALUES ('WM@gmail.com', '56789CDe');
```

```
INSERT INTO Participant_Password
```

```
VALUES ('Fatimah@gmail.com', '56789CdE');
```

```
-----Insert Participant -----
```

```
INSERT INTO Participant
```

```
VALUES ('A00001', 'Kwek Jia Cong', '012-4843622', 'Kwek@gmail.com',  
'030609-01-6969', 'Student', '123 Jalan Harmoni', 'Taman Seri  
Cemerlang', 79100, 'Iskandar Puteri', 'Johor');
```

```
INSERT INTO Participant
```

```
VALUES ('A00002', 'Ahmad Faris', '017-2493633', 'Faris@gmail.com',  
'650430-01-2456', 'Accountant', '456 Persiaran Gemilang', 'Bandar  
Nusajaya', 79200, 'Iskandar Puteri', 'Johor');
```

```
INSERT INTO Participant
```

```
VALUES ('A00003', 'Afiq Zafran', '012-7653455', 'Afiq@gmail.com',  
'030906-01-1251', 'Software Engineer', '21 Jalan Rambutan', 'Taman Seri  
Delima', 79000, 'Iskandar Puteri', 'Johor');
```

```
INSERT INTO Participant
```

```
VALUES ('A00004', 'Kuan Ji Tong', '018-9542354', 'Kuan@gmail.com',  
'830001-01-0099', 'Teacher', '8 Jalan Tanjong', 'Taman Melati', 81200,  
'Iskandar Puteri', 'Johor');
```

```
INSERT INTO Participant
```

```
VALUES ('A00005', 'Danial Hakimi', '012-0365892', 'Danial@gmail.com',  
'000002-01-1111', 'Graphic Designer', '45 Jalan Tembakau', 'Taman  
Bahagia', 81200, 'Iskandar Puteri', 'Johor');
```

```
INSERT INTO Participant
```

```
VALUES ('A00006', 'Thaqif Saifudin', '011-3652365', 'Thaqif@gmail.com',  
'001112-01-8181', 'Nurse', '12 Jalan Plentong', 'Taman Cempaka', 81560,  
'Iskandar Puteri', 'Johor');
```

```

INSERT INTO Participant

VALUES ('A00007', 'Kew Jian Heng', '016-5236514', 'Kew@gmail.com',
'890709-01-1999', 'Electrician', '33 Jalan Murtabak', 'Taman Murtabak',
79000, 'Iskandar Puteri', 'Johor');

INSERT INTO Participant

VALUES ('A00008', 'Amirul Danial', '017-8965235', 'Amirul@gmail.com',
'881217-01-1697', 'Chef', '7 Jalan Tempek', 'Taman Sutera', 79250,
'Iskandar Puteri', 'Johor');

INSERT INTO Participant

VALUES ('A00009', 'Arif Ismail', '013-4567896', 'Arif@gmail.com',
'930204-01-1581', 'Accountant', '18 Jalan Kebun Teh', 'Taman Kebun
Teh', 79250, 'Iskandar Puteri', 'Johor');

INSERT INTO Participant

VALUES ('A00010', 'Siti Hazwani', '014-6356863', 'Siti@gmail.com',
'941106-01-1961', 'Marketing Manager', '25 Jalan Tun Sri Lanang',
'Taman Mewah', 79100, 'Iskandar Puteri', 'Johor');

INSERT INTO Participant

VALUES ('A00011', 'Nurin Afiqa', '012-4543632', 'Nurin@gmail.com',
'900308-01-1320', 'Construction Worker', '14 Jalan Tun Dr. Ismail',
'Taman Bukit Peluru', 79100, 'Iskandar Puteri', 'Johor');

INSERT INTO Participant

VALUES ('A00012', 'Tan You Chun', '017-8493433', 'Tan@gmail.com',
'951031-01-1871', 'Veterinarian', '6 Jalan Kerintin', 'Taman Permaisai',
79100, 'Iskandar Puteri', 'Johor');

INSERT INTO Participant

VALUES ('A00013', 'Shafiq Israil', '012-5653455', 'Shafiq@gmail.com',
'850609-01-1317', 'Financial Analyst', '29 Jalan Murkwek', 'Taman Jessy
Kwek', 81200, 'Iskandar Puteri', 'Johor');

INSERT INTO Participant

VALUES ('A00014', 'Kew Din Shan', '018-4547354', 'KDS@gmail.com',
'800801-01-1219', 'Photographer', '11 Jalan Stulang Laut', 'Taman
Stulang', 81200, 'Iskandar Puteri', 'Johor');

INSERT INTO Participant

```

```
VALUES ('A00015', 'JC Tan Mur Bak', '018-8888888', 'JC@gmail.com',  
'750131-01-9971', 'Pharmacist', '17 Jalan Nong Chik', 'Taman Suteri',  
81550, 'Iskandar Puteri', 'Johor');
```

```
INSERT INTO Participant
```

```
VALUES ('A00016', 'Ryan Ho', '011-5652465', 'Ryan@gmail.com',  
'780721-01-8869', 'Social Worker', '22 Jalan Tan Hiok Nee', 'Taman  
Mesopotamia', 79250, 'Iskandar Puteri', 'Johor');
```

```
INSERT INTO Participant
```

```
VALUES ('A00017', 'William Fan', '016-4236574', 'William@gmail.com',  
'960228-01-9655', 'Flight Attendant', '9 Jalan Setia Tropika', 'Taman  
Orang Utan', 79200, 'Iskandar Puteri', 'Johor');
```

```
INSERT INTO Participant
```

```
VALUES ('A00018', 'Tan Yi Ting', '017-8465735', 'YT@gmail.com',  
'980205-01-1990', 'Fitness Trainer', '36 Jalan Limau', 'Taman  
Pontianak', '79250', 'Iskandar Puteri', 'Johor');
```

```
INSERT INTO Participant
```

```
VALUES ('A00019', 'Tan Wei Ming', '013-4667496', 'WM@gmail.com',  
'991213-01-1213', 'Event Planner', '15 Jalan Murkwek', 'Taman Jessy  
Kwek', '81200', 'Iskandar Puteri', 'Johor');
```

```
INSERT INTO Participant
```

```
VALUES ('A00020', 'Fatimah', '014-6396263', 'Fatimah@gmail.com',  
'900908-01-1830', 'Biomedical Researcher', '27 Jalan Murtabak', 'Taman  
Murtabak', '79000', 'Iskandar Puteri', 'Johor');
```

```
-----Insert MBIP Admin Password -----
```

```
INSERT INTO MBIP_Password
```

```
VALUES ('muhammad.abdullah@mbip.gov.my', 'Pa$$w0rd123');
```

```
INSERT INTO MBIP_Password
```

```
VALUES ('nurul.aisyah@mbip.gov.my', 'Secure!456');
```

```
INSERT INTO MBIP_Password
```

```

VALUES ('lim.weixiang@mbip.gov.my', '7H@rd2ss');

INSERT INTO MBIP_Password

VALUES ('siti.nurul.huda@mbip.gov.my', 'P@ss!789');

INSERT INTO MBIP_Password

VALUES ('tan.meiling@mbip.gov.my', 'Str0ngP@55');

INSERT INTO MBIP_Password

VALUES ('azizul.rahman@mbip.gov.my', 'Ex@mP@ss');

INSERT INTO MBIP_Password

VALUES ('wong.meiyee@mbip.gov.my', 'Ch0c0l#M1lk');

INSERT INTO MBIP_Password

VALUES ('norazlina.ibrahim@mbip.gov.my', 'Qwerty@123');

INSERT INTO MBIP_Password

VALUES ('kelvin.tan@mbip.gov.my', 'B@anaP@ss!');

INSERT INTO MBIP_Password

VALUES ('hafizah.abdulrahman@mbip.gov.my', 'P@ss2023');

INSERT INTO MBIP_Password

VALUES ('rajan.subramaniam@mbip.gov.my', '3xam#P@ss');

INSERT INTO MBIP_Password

VALUES ('izzati.mohamad@mbip.gov.my', 'Bl@ck@t987');

INSERT INTO MBIP_Password

VALUES ('lee.jiaming@mbip.gov.my', 'P@55w0rd_!');

INSERT INTO MBIP_Password

VALUES ('norazman.mustafa@mbip.gov.my', 'SulneP@ss');

INSERT INTO MBIP_Password

VALUES ('tan.huixin@mbip.gov.my', 'C0ffeeL0ver!');

INSERT INTO MBIP_Password

VALUES ('firdaus.mohamad@mbip.gov.my', 'Sparkl3#Star');

```

```

INSERT INTO MBIP_Password
VALUES ('aisyah.lim@mbip.gov.my', '12M0untains!');

INSERT INTO MBIP_Password
VALUES ('harith.iskandar@mbip.gov.my', 'P@0rd&Go');

INSERT INTO MBIP_Password
VALUES ('saraswathi.rajendran@mbip.gov.my', 'H3lloW0rld!');

INSERT INTO MBIP_Password
VALUES ('zulkarnain.ahmad@mbip.gov.my', 'Gl@ctory');

-----Inse
rt MBIP Admin
Data-----
-----

INSERT INTO MBIP_Admin
VALUES ('AD00001', 'Muhammad bin Abdullah', '012-3456789',
'muhammad.abdullah@mbip.gov.my');

INSERT INTO MBIP_Admin
VALUES ('AD00002', 'Nurul Aisyah binti Mohd Ali', '011-2345670',
'nurul.aisyah@mbip.gov.my');

INSERT INTO MBIP_Admin
VALUES ('AD00003', 'Lim Wei Xiang', '019-8765432',
'lim.weixiang@mbip.gov.my');

INSERT INTO MBIP_Admin
VALUES ('AD00004', 'Siti Nurul Huda binti Ismail', '017-6543210',
'siti.nurul.huda@mbip.gov.my');

INSERT INTO MBIP_Admin
VALUES ('AD00005', 'Tan Mei Ling', '014-3214365',
'tan.meiling@mbip.gov.my');

INSERT INTO MBIP_Admin

```

```

VALUES ('AD00006', 'Mohd Azizul Rahman bin Yusof', '013-4567809',
'azizul.rahman@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00007', 'Wong Mei Yee', '018-9012345',
'wong.meiyee@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00008', 'Norazlina binti Ibrahim', '016-7890123',
'norazlina.ibrahim@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00009', 'Kelvin Tan Keng Leong', '015-6789012',
'kelvin.tan@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00010', 'Hafizah binti Abdul Rahman', '010-2345678',
'hafizah.abdulrahman@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00011', 'Rajan a/l Subramaniam', '012-9876543',
'rajan.subramaniam@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00012', 'Nurul Izzati binti Mohamad', '019-0123456',
'izzati.mohamad@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00013', 'Lee Jia Ming', '017-8901234',
'lee.jiaming@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00014', 'Norazman bin Mustafa', '015-4321098',
'norazman.mustafa@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00015', 'Tan Hui Xin', '016-5432109',
'tan.huixin@mbip.gov.my');

INSERT INTO MBIP_Admin

```

```

VALUES ('AD00016', 'Mohd Firdaus bin Mohamad', '014-6543210',
'firdaus.mohamad@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00017', 'Aisyah Lim Li Ying', '011-1222333',
'aisyah.lim@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00018', 'Harith bin Iskandar', '018-8777660',
'harith.iskandar@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00019', 'Saraswathi a/p Rajendran', '013-3445566',
'saraswathi.rajendran@mbip.gov.my');

INSERT INTO MBIP_Admin

VALUES ('AD00020', 'Mohd Zulkarnain bin Ahmad', '017-7889900',
'zulkarnain.ahmad@mbip.gov.my');

```

-----Insert Emission Calculator-----

```

INSERT INTO Emission_Calculator

VALUES ('CAL00001', 'Electricity', 'Electricity Usage Carbon Emission =
Electricity Consumption * 0.584');

INSERT INTO Emission_Calculator

VALUES ('CAL00002', 'Water', 'Water Usage Carbon Emission = Water
Consumption * 0.419');

INSERT INTO Emission_Calculator

VALUES ('CAL00003', 'Recycle', 'Recycle Reduced Carbon Emission =
Recycle Weight * 2.86');

```

-----Insert Number of Days -----

```

INSERT INTO Number_Days

VALUES (TO_DATE('1/1/2023', 'DD/MM/YYYY'), TO_DATE('1/2/2023',
'DD/MM/YYYY'), 31);

```



```

INSERT INTO Number_Days

VALUES (TO_DATE('8/1/2023', 'DD/MM/YYYY'), TO_DATE('8/2/2023',
'DD/MM/YYYY'), 31);

INSERT INTO Number_Days

VALUES (TO_DATE('1/2/2023', 'DD/MM/YYYY'), TO_DATE('1/3/2023',
'DD/MM/YYYY'), 28);

INSERT INTO Number_Days

VALUES (TO_DATE('8/2/2023', 'DD/MM/YYYY'), TO_DATE('8/3/2023',
'DD/MM/YYYY'), 28);

-----Insert Electricity_Consumption -----

INSERT INTO Electricity_Consumption

VALUES ('ELE00001', 1.033, 121, 26.36, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00001');

INSERT INTO Electricity_Consumption

VALUES ('ELE00002', 1.033, 150, 32.7, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00002');

INSERT INTO Electricity_Consumption

VALUES ('ELE00003', 1.033, 96, 20.97, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00003');

INSERT INTO Electricity_Consumption

VALUES ('ELE00004', 1.033, 200, 43.66, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00004');

INSERT INTO Electricity_Consumption

VALUES ('ELE00005', 1.033, 81, 17.68, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00005');

INSERT INTO Electricity_Consumption

```

```

VALUES ('ELE00006', 1.033, 180, 39.24, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00006');

INSERT INTO Electricity_Consumption

VALUES ('ELE00007', 1.033, 131, 28.51, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00007');

INSERT INTO Electricity_Consumption

VALUES ('ELE00008', 1.033, 160, 34.89, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00008');

INSERT INTO Electricity_Consumption

VALUES ('ELE00009', 1.033, 111, 24.29, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00009');

INSERT INTO Electricity_Consumption

VALUES ('ELE00010', 1.033, 140, 30.52, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00010');

INSERT INTO Electricity_Consumption

VALUES ('ELE00011', 1.033, 106, 22.99, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00011');

INSERT INTO Electricity_Consumption

VALUES ('ELE00012', 1.033, 190, 41.52, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00012');

INSERT INTO Electricity_Consumption

VALUES ('ELE00013', 1.033, 116, 25.29, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00013');

INSERT INTO Electricity_Consumption

```

```

VALUES ('ELE00014', 1.033, 170, 37.12, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00014');

INSERT INTO Electricity_Consumption

VALUES ('ELE00015', 1.033, 125, 27.26, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00015');

INSERT INTO Electricity_Consumption

VALUES ('ELE00016', 1.033, 151, 32.9, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00016');

INSERT INTO Electricity_Consumption

VALUES ('ELE00017', 1.033, 100, 21.82, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00017');

INSERT INTO Electricity_Consumption

VALUES ('ELE00018', 1.033, 146, 31.79, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00018');

INSERT INTO Electricity_Consumption

VALUES ('ELE00019', 1.033, 155, 33.87, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00019');

INSERT INTO Electricity_Consumption

VALUES ('ELE00020', 1.033, 165, 35.97, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00020');

INSERT INTO Electricity_Consumption

VALUES ('ELE00021', 0.933, 111, 23.36, SYSDATE, TO_DATE('8/2/2023',
'DD/MM/YYYY'), TO_DATE('8/3/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00001');

INSERT INTO Electricity_Consumption

```

```

VALUES ('ELE00022', 0.933, 160, 34.89, SYSDATE, TO_DATE('8/2/2023',
'DD/MM/YYYY'), TO_DATE('8/3/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00002');

INSERT INTO Electricity_Consumption

VALUES ('ELE00023', 0.933, 106, 22.97, SYSDATE, TO_DATE('8/2/2023',
'DD/MM/YYYY'), TO_DATE('8/3/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00003');

INSERT INTO Electricity_Consumption

VALUES ('ELE00024', 0.933, 168, 36.66, SYSDATE, TO_DATE('8/2/2023',
'DD/MM/YYYY'), TO_DATE('8/3/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00004');

INSERT INTO Electricity_Consumption

VALUES ('ELE00025', 0.933, 96, 19.58, SYSDATE, TO_DATE('8/2/2023',
'DD/MM/YYYY'), TO_DATE('8/3/2023', 'DD/MM/YYYY'), 'CAL00001',
'A00005');

-----Inse
rt Water_Consumption
Data-----
-----

INSERT INTO Water_Consumption

VALUES ('WAT00001', 1.033, 15.2, 18.24, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00001');

INSERT INTO Water_Consumption

VALUES ('WAT00002', 1.033, 20.5, 24.6, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00002');

INSERT INTO Water_Consumption

VALUES ('WAT00003', 1.033, 18.8, 22.56, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00003');

```

```

INSERT INTO Water_Consumption

VALUES ('WAT00004', 1.033, 25, 30, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00004');

INSERT INTO Water_Consumption

VALUES ('WAT00005', 1.033, 14.3, 17.16, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00005');

INSERT INTO Water_Consumption

VALUES ('WAT00006', 1.033, 22.1, 26.52, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00006');

INSERT INTO Water_Consumption

VALUES ('WAT00007', 1.033, 19.6, 23.52, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00007');

INSERT INTO Water_Consumption

VALUES ('WAT00008', 1.033, 17.9, 21.48, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00008');

INSERT INTO Water_Consumption

VALUES ('WAT00009', 1.033, 23.5, 28.2, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00009');

INSERT INTO Water_Consumption

VALUES ('WAT00010', 1.033, 16.7, 20.04, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00010');

INSERT INTO Water_Consumption

VALUES ('WAT00011', 1.033, 21.3, 25.56, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00011');

INSERT INTO Water_Consumption

```

```

VALUES ('WAT00012', 1.033, 18, 21.6, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00012');

INSERT INTO Water_Consumption

VALUES ('WAT00013', 1.033, 24.8, 29.76, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00013');

INSERT INTO Water_Consumption

VALUES ('WAT00014', 1.033, 19.2, 23.04, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00014');

INSERT INTO Water_Consumption

VALUES ('WAT00015', 1.033, 16.5, 19.8, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00015');

INSERT INTO Water_Consumption

VALUES ('WAT00016', 1.033, 20.9, 25.08, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00016');

INSERT INTO Water_Consumption

VALUES ('WAT00017', 1.033, 18.3, 21.96, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00017');

INSERT INTO Water_Consumption

VALUES ('WAT00018', 1.033, 22.6, 27.12, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00018');

INSERT INTO Water_Consumption

VALUES ('WAT00019', 1.033, 17, 20.4, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00019');

INSERT INTO Water_Consumption

```

```
VALUES ('WAT00020', 1.033, 24, 28.8, SYSDATE, TO_DATE('8/1/2023',
'DD/MM/YYYY'), TO_DATE('8/2/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00020');
```

```
INSERT INTO Water_Consumption
```

```
VALUES ('WAT00021', 1, 24.8, 29.76, SYSDATE, TO_DATE('8/2/2023',
'DD/MM/YYYY'), TO_DATE('8/3/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00001');
```

```
INSERT INTO Water_Consumption
```

```
VALUES ('WAT00022', 1, 18.8, 22.56, SYSDATE, TO_DATE('8/2/2023',
'DD/MM/YYYY'), TO_DATE('8/3/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00002');
```

```
INSERT INTO Water_Consumption
```

```
VALUES ('WAT00023', 1, 21.3, 25.56, SYSDATE, TO_DATE('8/2/2023',
'DD/MM/YYYY'), TO_DATE('8/3/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00003');
```

```
INSERT INTO Water_Consumption
```

```
VALUES ('WAT00024', 1, 23.5, 28.2, SYSDATE, TO_DATE('8/2/2023',
'DD/MM/YYYY'), TO_DATE('8/3/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00004');
```

```
INSERT INTO Water_Consumption
```

```
VALUES ('WAT00025', 1, 17.9, 21.48, SYSDATE, TO_DATE('8/2/2023',
'DD/MM/YYYY'), TO_DATE('8/3/2023', 'DD/MM/YYYY'), 'CAL00002',
'A00005');
```

```
-----Insert Recycle_Consumption -----
```

```
INSERT INTO Recycle_Consumption
```

```
VALUES ('REC00001', 15, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00001');
```

```
INSERT INTO Recycle_Consumption
```

```
VALUES ('REC00002', 20, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00002');
```

```
INSERT INTO Recycle_Consumption
```

```

VALUES ('REC00003', 18, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00003');

INSERT INTO Recycle_Consumption

VALUES ('REC00004', 25, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00004');

INSERT INTO Recycle_Consumption

VALUES ('REC00005', 14, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00005');

INSERT INTO Recycle_Consumption

VALUES ('REC00006', 22, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00006');

INSERT INTO Recycle_Consumption

VALUES ('REC00007', 19, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00007');

INSERT INTO Recycle_Consumption

VALUES ('REC00008', 17, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00008');

INSERT INTO Recycle_Consumption

VALUES ('REC00009', 23, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00009');

INSERT INTO Recycle_Consumption

VALUES ('REC00010', 16, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00010');

INSERT INTO Recycle_Consumption

VALUES ('REC00011', 21, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00011');

INSERT INTO Recycle_Consumption

VALUES ('REC00012', 18, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00012');

INSERT INTO Recycle_Consumption

```



```

VALUES ('REC00013', 24, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00013');

INSERT INTO Recycle_Consumption

VALUES ('REC00014', 19, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00014');

INSERT INTO Recycle_Consumption

VALUES ('REC00015', 16, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00015');

INSERT INTO Recycle_Consumption

VALUES ('REC00016', 20, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00016');

INSERT INTO Recycle_Consumption

VALUES ('REC00017', 18, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00017');

INSERT INTO Recycle_Consumption

VALUES ('REC00018', 22, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00018');

INSERT INTO Recycle_Consumption

VALUES ('REC00019', 17, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00019');

INSERT INTO Recycle_Consumption

VALUES ('REC00020', 24, SYSDATE, TO_DATE('1/1/2023', 'DD/MM/YYYY'),
TO_DATE('1/2/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00020');

INSERT INTO Recycle_Consumption

VALUES ('REC00021', 18, SYSDATE, TO_DATE('1/2/2023', 'DD/MM/YYYY'),
TO_DATE('1/3/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00001');

INSERT INTO Recycle_Consumption

VALUES ('REC00022', 23, SYSDATE, TO_DATE('1/2/2023', 'DD/MM/YYYY'),
TO_DATE('1/3/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00002');

INSERT INTO Recycle_Consumption

```

```

VALUES ('REC00023', 14, SYSDATE, TO_DATE('1/2/2023', 'DD/MM/YYYY'),
TO_DATE('1/3/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00003');

INSERT INTO Recycle_Consumption

VALUES ('REC00024', 26, SYSDATE, TO_DATE('1/2/2023', 'DD/MM/YYYY'),
TO_DATE('1/3/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00004');

INSERT INTO Recycle_Consumption

VALUES ('REC00025', 19, SYSDATE, TO_DATE('1/2/2023', 'DD/MM/YYYY'),
TO_DATE('1/3/2023', 'DD/MM/YYYY'), 'CAL00003', 'A00005');

-----Insert Monthly Emission Report-----

INSERT INTO Monthly_Emission_Report

VALUES ('REP00001', 'January_2023_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report

VALUES ('REP00002', 'February_2023_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report

VALUES ('REP00003', 'March_2023_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report

VALUES ('REP00004', 'April_2023_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report

VALUES ('REP00005', 'May_2023_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report

VALUES ('REP00006', 'June_2023_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report

VALUES ('REP00007', 'July_2023_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report

VALUES ('REP00008', 'August_2023_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report

VALUES ('REP00009', 'September_2023_Carbon_Emission_Report.xlsx');

```

```

INSERT INTO Monthly_Emission_Report
VALUES ('REP00010', 'October_2023_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report
VALUES ('REP00011', 'November_2023_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report
VALUES ('REP00012', 'December_2023_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report
VALUES ('REP00013', 'January_2024_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report
VALUES ('REP00014', 'February_2024_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report
VALUES ('REP00015', 'March_2024_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report
VALUES ('REP00016', 'April_2024_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report
VALUES ('REP00017', 'May_2024_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report
VALUES ('REP00018', 'June_2024_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report
VALUES ('REP00019', 'July_2024_Carbon_Emission_Report.xlsx');

INSERT INTO Monthly_Emission_Report
VALUES ('REP00020', 'August_2024_Carbon_Emission_Report.xlsx');

-----Insert Emission Result -----

INSERT INTO Emission_Result
VALUES ('EMI00001', 'Jan', 2023, 70.664, 6.369, 42.9, 34.133,
'REP00001', 'A00001');

```

```

INSERT INTO Emission_Result

VALUES ('EMI00002', 'Jan', 2023, 87.6, 8.590, 57.2, 38.990, 'REP00001',
'A00002');

INSERT INTO Emission_Result

VALUES ('EMI00003', 'Jan', 2023, 56.064, 7.877, 51.48, 12.461,
'REP00001', 'A00003');

INSERT INTO Emission_Result

VALUES ('EMI00004', 'Jan', 2023, 116.8, 10.475, 71.5, 55.775,
'REP00001', 'A00004');

INSERT INTO Emission_Result

VALUES ('EMI00005', 'Jan', 2023, 47.304, 5.992, 40.04, 13.256,
'REP00001', 'A00005');

INSERT INTO Emission_Result

VALUES ('EMI00006', 'Jan', 2023, 105.12, 9.260, 62.92, 51.460,
'REP00001', 'A00006');

INSERT INTO Emission_Result

VALUES ('EMI00007', 'Jan', 2023, 76.504, 8.212, 54.34, 30.376,
'REP00001', 'A00007');

INSERT INTO Emission_Result

VALUES ('EMI00008', 'Jan', 2023, 93.44, 7.500, 48.62, 52.320,
'REP00001', 'A00008');

INSERT INTO Emission_Result

VALUES ('EMI00009', 'Jan', 2023, 64.824, 9.847, 65.78, 8.891,
'REP00001', 'A00009');

INSERT INTO Emission_Result

VALUES ('EMI00010', 'Jan', 2023, 81.76, 6.997, 45.76, 42.997,
'REP00001', 'A00010');

INSERT INTO Emission_Result

VALUES ('EMI00011', 'Jan', 2023, 61.904, 8.925, 60.06,
10.769, 'REP00001', 'A00011');

INSERT INTO Emission_Result

```

```

VALUES ('EMI00012', 'Jan', 2023, 110.96, 7.542, 51.48, 67.022,
'REP00001', 'A00012');

INSERT INTO Emission_Result

VALUES ('EMI00013', 'Jan', 2023, 67.744, 10.391, 68.64, 9.495,
'REP00001', 'A00013');

INSERT INTO Emission_Result

VALUES ('EMI00014', 'Jan', 2023, 99.28, 8.045, 54.34, 52.985,
'REP00001', 'A00014');

INSERT INTO Emission_Result

VALUES ('EMI00015', 'Jan', 2023, 73, 6.914, 45.76, 34.154, 'REP00001',
'A00015');

INSERT INTO Emission_Result

VALUES ('EMI00016', 'Jan', 2023, 88.184, 8.757, 57.2, 39.741,
'REP00001', 'A00016');

INSERT INTO Emission_Result

VALUES ('EMI00017', 'Jan', 2023, 58.4, 7.668, 51.48, 14.588,
'REP00001', 'A00017');

INSERT INTO Emission_Result

VALUES ('EMI00018', 'Jan', 2023, 85.264, 9.469, 62.92, 31.813,
'REP00001', 'A00018');

INSERT INTO Emission_Result

VALUES ('EMI00019', 'Jan', 2023, 90.52, 7.123, 48.62, 49.023,
'REP00001', 'A00019');

INSERT INTO Emission_Result

VALUES ('EMI00020', 'Jan', 2023, 96.36, 10.056, 68.64, 37.776,
'REP00001', 'A00020');

INSERT INTO Emission_Result

VALUES ('EMI00021', 'Feb', 2023, 64.824, 10.391, 51.48, 23.735,
'REP00002', 'A00001');

INSERT INTO Emission_Result

```

```
VALUES ('EMI00022', 'Feb', 2023, 93.44, 7.877, 65.78, 35.537,  
'REP00002', 'A00002');
```

```
INSERT INTO Emission_Result
```

```
VALUES ('EMI00023', 'Feb', 2023, 61.904, 8.925, 40.04, 30.789,  
'REP00002', 'A00003');
```

```
INSERT INTO Emission_Result
```

```
VALUES ('EMI00024', 'Feb', 2023, 98.112, 9.847, 74.36, 33.599,  
'REP00002', 'A00004');
```

```
INSERT INTO Emission_Result
```

```
VALUES ('EMI00025', 'Feb', 2023, 56.064, 7.500, 54.34, 9.224,  
'REP00002', 'A00005');
```

```
-----Insert Report Viewing -----
```

```
INSERT INTO Report_Viewing
```

```
VALUES ('AD00001', 'REP00001', SYSDATE);
```

```
INSERT INTO Report_Viewing
```

```
VALUES ('AD00002', 'REP00001', SYSDATE);
```

```
INSERT INTO Report_Viewing
```

```
VALUES ('AD00003', 'REP00001', SYSDATE);
```

```
INSERT INTO Report_Viewing
```

```
VALUES ('AD00004', 'REP00001', SYSDATE);
```

```
INSERT INTO Report_Viewing
```

```
VALUES ('AD00005', 'REP00001', SYSDATE);
```

```
INSERT INTO Report_Viewing
```

```
VALUES ('AD00006', 'REP00001', SYSDATE);
```

```
INSERT INTO Report_Viewing
```

```
VALUES ('AD00007', 'REP00001', SYSDATE);
```

```
INSERT INTO Report_Viewing
```

```

VALUES ('AD00008', 'REP00001', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00009', 'REP00001', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00010', 'REP00001', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00001', 'REP00002', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00002', 'REP00002', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00003', 'REP00002', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00004', 'REP00002', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00005', 'REP00002', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00006', 'REP00002', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00007', 'REP00002', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00008', 'REP00002', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00009', 'REP00002', SYSDATE);

INSERT INTO Report_Viewing

VALUES ('AD00010', 'REP00002', SYSDATE);

```

-----Insert Result Producing-----

```

INSERT INTO Result_Producing
VALUES ('CAL00001', 'EMI00001', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00002', 'EMI00001', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00003', 'EMI00001', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00001', 'EMI00002', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00002', 'EMI00002', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00003', 'EMI00002', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00001', 'EMI00003', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00002', 'EMI00003', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00003', 'EMI00003', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00001', 'EMI00004', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00002', 'EMI00004', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00003', 'EMI00004', SYSDATE);

INSERT INTO Result_Producing
VALUES ('CAL00001', 'EMI00005', SYSDATE);

INSERT INTO Result_Producing

```



```

VALUES ('CAL00002', 'EMI00005', SYSDATE);

INSERT INTO Result_Producing

VALUES ('CAL00003', 'EMI00005', SYSDATE);

INSERT INTO Result_Producing

VALUES ('CAL00001', 'EMI00006', SYSDATE);

INSERT INTO Result_Producing

VALUES ('CAL00002', 'EMI00006', SYSDATE);

INSERT INTO Result_Producing

VALUES ('CAL00003', 'EMI00006', SYSDATE);

INSERT INTO Result_Producing

VALUES ('CAL00001', 'EMI00007', SYSDATE);

INSERT INTO Result_Producing

VALUES ('CAL00002', 'EMI00007', SYSDATE);

```

-----Display all participants' information-----

```

SELECT *

FROM Participant;

```

PARTICIPANT_ID	NAME	CONTACT_NUMBER	EMAIL	ICNO	OCCUPATION	ADDRESS_LINE_1	ADDRESS_LINE_2	POSTCODE	CITY	STATE
A00001	Kwek Jia Cong	012-4845622	Kwek@gmail.com	030609-01-6969	Student	123 Jalan Harmoni	Taman Seri Cemerlang	79100	Iskandar Puteri	Johor
A00002	Ahmad Faris	017-2493633	Faris@gmail.com	650430-01-2456	Accountant	456 Persiaran Gemilang	Bandar Nusajaya	79200	Iskandar Puteri	Johor
A00003	Afiq Zafzan	012-7653455	Afiq@gmail.com	030906-01-1251	Software Engineer	21 Jalan Rambutan	Taman Seri Delima	79000	Iskandar Puteri	Johor
A00004	Kuan Ji Tong	018-9542354	Kuan@gmail.com	830001-01-0099	Teacher	8 Jalan Tanjong	Taman Melati	81200	Iskandar Puteri	Johor
A00005	Danial Hakimi	012-0365892	Danial@gmail.com	000002-01-1111	Graphic Designer	45 Jalan Tembaku	Taman Bahagia	81200	Iskandar Puteri	Johor
A00006	Thaqif Saifudin	011-3652365	Thaqif@gmail.com	001112-01-8181	Nurse	12 Jalan Plentong	Taman Cempaka	81560	Iskandar Puteri	Johor
A00007	Kew Jian Heng	016-5236514	Kew@gmail.com	890709-01-1999	Electrician	33 Jalan Murtabak	Taman Murtabak	79000	Iskandar Puteri	Johor
A00008	Amirul Danial	017-8965235	Amirul@gmail.com	881217-01-1697	Chef	7 Jalan Tempek	Taman Sutera	79250	Iskandar Puteri	Johor
A00009	Arif Ismail	013-4567896	Arif@gmail.com	930204-01-1581	Accountant	18 Jalan Kebun Teh	Taman Kebun Teh	79250	Iskandar Puteri	Johor
A00010	Siti Hazwani	014-6356863	Siti@gmail.com	941106-01-1961	Marketing Manager	25 Jalan Tun Sri Lanang	Taman Mewah	79100	Iskandar Puteri	Johor

-----Display participants ID, name, email and their password-----

```

SELECT Participant_ID, Name, Email, Password

FROM Participant JOIN Participant_Password

USING (Email);

```

PARTICIPANT_ID	NAME	EMAIL	PASSWORD
A00001	Kwek Jia Cong	Kwek@gmail.com	123456Abc
A00002	Ahmad Faris	Faris@gmail.com	123456aBc
A00003	Aliq Zafran	Aliq@gmail.com	123456abC
A00004	Kuan Ji Tong	Kuan@gmail.com	123456ABc
A00005	Danial Hakimi	Danial@gmail.com	123456AbC
A00006	Thaqif Saifudin	Thaqif@gmail.com	56789Abc
A00007	Kew Jian Heng	Kew@gmail.com	56789aBc
A00008	Amirul Danial	Amirul@gmail.com	56789abC
A00009	Arif Ismail	Arif@gmail.com	56789ABc
A00010	Siti Hazwani	Siti@gmail.com	56789AbC

-----Update specific participant's password-----

```
UPDATE Participant_Password
SET Password = 'Team05Bot'
WHERE Email = 'Kwek@gmail.com';
```

-----Check the updated password-----

```
SELECT Participant_ID, Name, Email, Password
FROM Participant JOIN Participant_Password
USING (Email);
```

PARTICIPANT_ID	NAME	EMAIL	PASSWORD
A00001	Kwek Jia Cong	Kwek@gmail.com	Team05Bot
A00002	Ahmad Faris	Faris@gmail.com	123456aBc
A00003	Aliq Zafran	Aliq@gmail.com	123456abC
A00004	Kuan Ji Tong	Kuan@gmail.com	123456ABc
A00005	Danial Hakimi	Danial@gmail.com	123456AbC
A00006	Thaqif Saifudin	Thaqif@gmail.com	56789Abc
A00007	Kew Jian Heng	Kew@gmail.com	56789aBc
A00008	Amirul Danial	Amirul@gmail.com	56789abC
A00009	Arif Ismail	Arif@gmail.com	56789ABc
A00010	Siti Hazwani	Siti@gmail.com	56789AbC

----Display Participants' emission data for January 2023, ordered by total emission-----

```
SELECT Participant_ID, Name AS "Participant_Name", Address_Line_1 || ', ' || Address_Line_2 || ', ' || Postcode || ', ' || City || ', ' || State AS "Participant_Address",
Electricity_Emission, Water_Emission, Recycle_Emission, Total_Emission
FROM Participant JOIN Emission_Result
USING (Participant_ID)
```

```

WHERE Month = 'Jan'

AND Year = 2023

ORDER BY Total_Emission;

```

PARTICIPANT_ID	Participant_Name	Participant_Address	ELECTRICITY_EMISSION	WATER_EMISSION	RECYCLE_EMISSION	TOTAL_EMISSION
A00009	Arif Ismail	18 Jalan Kebun Teh, Taman Kebun Teh, 79250, Iskandar Puteri, Johor	64.824	9.847	65.78	8.891
A00013	Shafiq Israil	29 Jalan Murkwok, Taman Jessy Kwek, 81200, Iskandar Puteri, Johor	67.744	10.391	68.64	9.495
A00011	Nurin Afiqa	14 Jalan Tun Dr. Ismail, Taman Bukit Peluru, 79100, Iskandar Puteri, Johor	61.904	8.925	60.06	10.769
A00003	Afiq Zafran	21 Jalan Rambutan, Taman Seri Delima, 79000, Iskandar Puteri, Johor	56.064	7.877	51.48	12.461
A00005	Daniail Hakimi	45 Jalan Tembaku, Taman Bahagia, 81200, Iskandar Puteri, Johor	47.304	5.992	40.04	13.256
A00017	William Fan	9 Jalan Setia Tropika, Taman Orang Utan, 79200, Iskandar Puteri, Johor	58.4	7.668	51.48	14.588
A00007	Kew Jian Heng	33 Jalan Murtabak, Taman Murtabak, 79000, Iskandar Puteri, Johor	76.504	8.212	54.34	30.376
A00018	Tan Yi Ting	36 Jalan Limau, Taman Pontianak, 79250, Iskandar Puteri, Johor	85.264	9.469	62.92	31.813
A00001	Kwek Jia Cong	123 Jalan Harmoni, Taman Seri Cemerlang, 79100, Iskandar Puteri, Johor	70.664	6.369	42.9	34.133
A00015	JC Tan Mur Bak	17 Jalan Nong Chik, Taman Suteri, 81550, Iskandar Puteri, Johor	73	6.914	45.76	34.154

-----Display Participants' emission data with Postcode (79100) for January 2023, ordered by total emission-----

```

SELECT Participant_ID, Name AS "Participant_Name", Address_Line_1 || ',
' || Address_Line_2 || ', ' || Postcode || ', ' || City || ', ' ||
State AS "Participant_Address",

Electricity_Emission, Water_Emission, Recycle_Emission, Total_Emission

FROM Participant JOIN Emission_Result

USING (Participant_ID)

WHERE Month = 'Jan'

AND Year = 2023

AND Postcode = 79100

ORDER BY Total_Emission;

```

PARTICIPANT_ID	Participant_Name	Participant_Address	ELECTRICITY_EMISSION	WATER_EMISSION	RECYCLE_EMISSION	TOTAL_EMISSION
A00011	Nurin Afiqa	14 Jalan Tun Dr. Ismail, Taman Bukit Peluru, 79100, Iskandar Puteri, Johor	61.904	8.925	60.06	10.769
A00001	Kwek Jia Cong	123 Jalan Harmoni, Taman Seri Cemerlang, 79100, Iskandar Puteri, Johor	70.664	6.369	42.9	34.133
A00010	Siti Hazwani	25 Jalan Tun Sri Lanang, Taman Mewah, 79100, Iskandar Puteri, Johor	81.76	6.997	45.76	42.997
A00012	Tan You Chun	6 Jalan Kerintin, Taman Permais, 79100, Iskandar Puteri, Johor	110.96	7.542	51.48	67.022

-----Delete specific participant's emission record in January 2023-----

--Check initial record--

```

SELECT Participant_ID, Name AS "Participant_Name", Address_Line_1 || ',
' || Address_Line_2 || ', ' || Postcode || ', ' || City || ', ' ||
State AS "Participant_Address", Month, Year,

Electricity_Emission, Water_Emission, Recycle_Emission, Total_Emission

FROM Participant JOIN Emission_Result

USING (Participant_ID)

WHERE Participant_ID = 'A00001';

```

PARTICIPANT_ID	Participant_Name	Participant_Address	MONTH	YEAR	ELECTRICITY_EMISSION	WATER_EMISSION	RECYCLE_EMISSION	TOTAL_EMISSION
A00001	Kwek Jia Cong	123 Jalan Harmoni, Taman Seri Cemerlang, 79100, Iskandar Puteri, Johor	Jan	2023	70.664	6.369	42.9	34.133
A00001	Kwek Jia Cong	123 Jalan Harmoni, Taman Seri Cemerlang, 79100, Iskandar Puteri, Johor	Feb	2023	64.824	10.391	51.48	23.735

```
--Delete record in result producing table--
```

```

DELETE FROM Result_Producing

WHERE Emission_ID IN (

    SELECT Emission_ID

    FROM Emission_Result

    WHERE Participant_ID = 'A00001'

    AND Month = 'Jan'

    AND Year = 2023

);

```

```
--Delete record in emission result table--
```

```

DELETE FROM Emission_Result

WHERE Participant_ID = 'A00001'

AND Month = 'Jan'

AND Year = 2023;

```

```
--Display latest emission record after deleting--
```

```

SELECT Participant_ID, Name AS "Participant_Name", Address_Line_1 || ',
' || Address_Line_2 || ', ' || Postcode || ', ' || City || ', ' ||
State AS "Participant_Address", Month, Year,

Electricity_Emission, Water_Emission, Recycle_Emission, Total_Emission

```

```

FROM Participant JOIN Emission_Result

USING (Participant_ID)

WHERE Participant_ID = 'A00001';

```

PARTICIPANT_ID	Participant_Name	Participant_Address	MONTH	YEAR	ELECTRICITY_EMISSION	WATER_EMISSION	RECYCLE_EMISSION	TOTAL_EMISSION
A00001	Kwek Jia Cong	123 Jalan Harmoni, Taman Seri Cemerlang, 79100, Iskandar Puteri, Johor	Feb	2023	64.824	10.391	51.48	23.735

----Display emission reports viewed by MBIP Admins

```

SELECT RV.MBIP_Admin_ID, MA.Name AS "MBIP_Name", RV.View_Date,
RV.Report_ID, REP.Emission_Report

FROM Report_Viewing RV

JOIN Monthly_Emission_Report REP ON RV.Report_ID = REP.Report_ID

JOIN MBIP_Admin MA ON RV.MBIP_Admin_ID = MA.MBIP_Admin_ID;

```

MBIP_ADMIN_ID	MBIP_Name	VIEW_DATE	REPORT_ID	EMISSION_REPORT
AD00001	Muhammad bin Abdullah	01/14/2024	REP00001	January_2023_Carbon_Emission_Report.xlsx
AD00001	Muhammad bin Abdullah	01/14/2024	REP00002	February_2023_Carbon_Emission_Report.xlsx
AD00002	Nurul Aisyah binti Mohd Ali	01/14/2024	REP00001	January_2023_Carbon_Emission_Report.xlsx
AD00002	Nurul Aisyah binti Mohd Ali	01/14/2024	REP00002	February_2023_Carbon_Emission_Report.xlsx
AD00003	Lim Wei Xiang	01/14/2024	REP00001	January_2023_Carbon_Emission_Report.xlsx
AD00003	Lim Wei Xiang	01/14/2024	REP00002	February_2023_Carbon_Emission_Report.xlsx
AD00004	Siti Nurul Huda binti Ismail	01/14/2024	REP00001	January_2023_Carbon_Emission_Report.xlsx
AD00004	Siti Nurul Huda binti Ismail	01/14/2024	REP00002	February_2023_Carbon_Emission_Report.xlsx
AD00005	Tan Mei Ling	01/14/2024	REP00001	January_2023_Carbon_Emission_Report.xlsx
AD00005	Tan Mei Ling	01/14/2024	REP00002	February_2023_Carbon_Emission_Report.xlsx

## 7.0 User Interface Design

### 7.1 Participant/MBIP Admin Login Page

The image displays two mobile application login screens side-by-side. Both screens feature a 'Welcome back' greeting with a hand icon. They include input fields for 'Email' and 'Password', a 'Sign In' button, and a 'Forgot password?' link. The left screen is for Admin login, with a link to 'OR LOG IN AS ADMIN'. The right screen is for Participant login, with a link to 'OR LOG IN AS PARTICIPANT'. Both screens also have a 'Don't have an account? Sign up' link at the bottom.

**Left Screen (Admin Login):**

- Header: Welcome back 🖐️
- Email input: Enter email
- Password input: Enter password (with eye icon)
- Link: Forgot password?
- Button: Sign In
- Link: OR LOG IN AS [ADMIN](#)
- Footer: Don't have an account? [Sign up](#)

**Right Screen (Participant Login):**

- Header: Welcome back 🖐️
- Email input: Enter email
- Password input: Enter password (with eye icon)
- Link: Forgot password?
- Button: Sign In
- Link: OR LOG IN AS [PARTICIPANT](#)
- Footer: Don't have an account? [Sign up](#)

Description: Participants and MBIP Admin can log in to our system from this page.

## 7.2 Participant Register Page

The image displays two mobile application screens for user registration.

**Left Screen: Welcome and Account Creation**

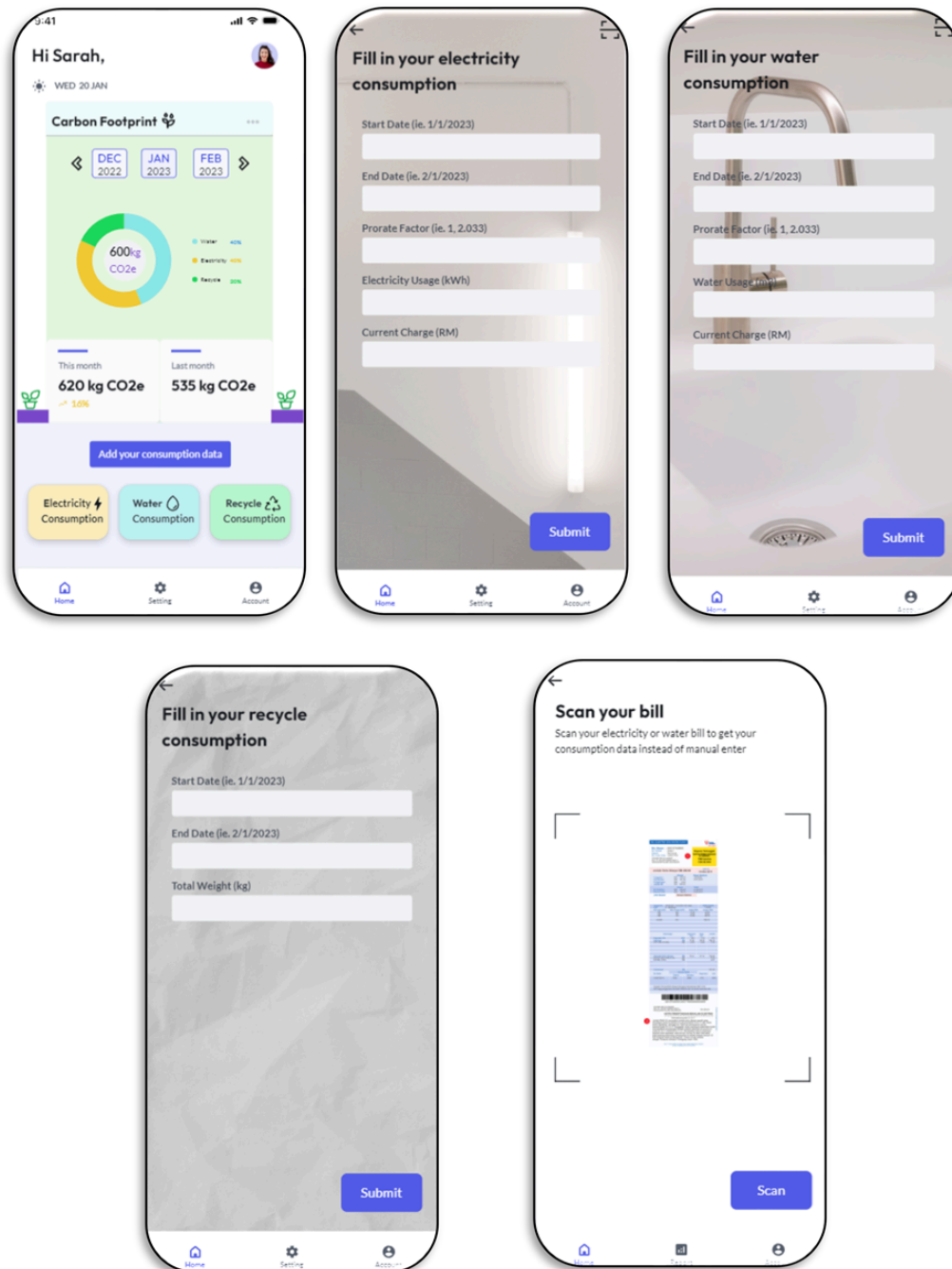
- Header: A back arrow icon.
- Image: A circular profile picture placeholder with a tree icon.
- Greeting: "Nice to see you!"
- Subtext: "Create your account"
- Form Fields:
  - Username: "Enter your user name" (with a person icon)
  - Email: "Enter your email address" (with an envelope icon)
  - Password: "Enter your password" (with a lock icon and a toggle eye icon)
- Agreement: A checked checkbox followed by "I agree with [Terms & Conditions](#)"
- Action: A blue "Continue" button.

**Right Screen: Personal Information Form**

- Header: A back arrow icon.
- Title: "Fill in your personal information!"
- Form Fields:
  - Name: A single-line text input.
  - ICNO: A single-line text input.
  - Contact Number (ie. 012-3456789): A single-line text input.
  - Occupation: A single-line text input.
  - Address Line 1: A single-line text input.
  - Address Line 2: A single-line text input.
  - Postcode: A single-line text input.
  - City: A single-line text input.
  - State: A single-line text input.
- Action: A blue "Register" button.

Description: If a participant does not have any account, he/she needs to register a new account at this page.

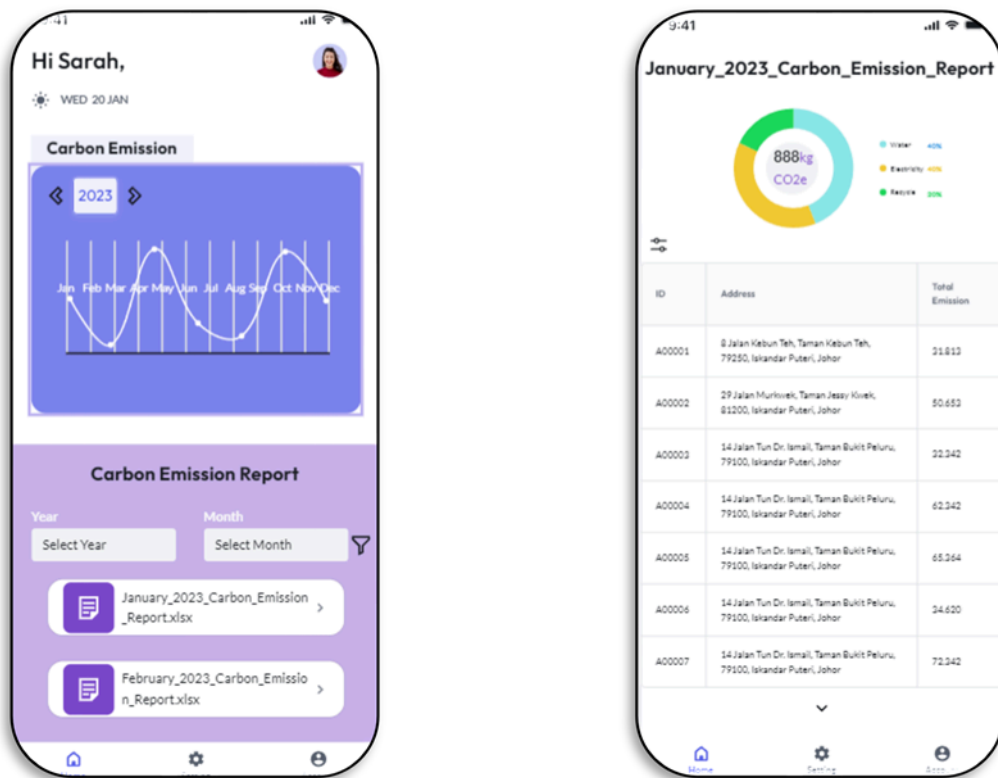
### 7.3 Participant Dashboard & Consumption Data Fill In



Description: After login to the system, participants can access a self monitoring dashboard which displays monthly carbon emission in a chart. Participants can fill in their consumption data by clicking on the button below which represents different consumption types. Participants can use the text scanner function to scan the bill instead of manual input.



## 7.4 MBIP Admin Dashboard & Carbon Emission Month Report



Description: After login to the system, MBIP Admin can access a dashboard which displays an overview of monthly carbon emission in a chart. MBIP Admin can find the desired emission report by selecting the month and year. MBIP Admin can click the report to view the details of the report.

**User Interface Link in Visilly:**

<https://app.visily.ai/projects/75509158-4e4e-4f92-89fc-a3e67073be22/boards/703866>

## 8.0 Summary

In this phase, we have transformed our system's conceptual ERD into logical ERD. The business rules also have been updated based on the functional dependencies between relationships in the logical ERD. After that, we normalized the relation schemas and updated the data dictionary which includes the description of entities, relationships and attributes by referring to the normalized relations. The normalization is performed from the first normal form (1NF) to Boyce Codd normal (BCNF) in order to help users to read and use the database more efficiently. The relational database schemas after normalization also have been clearly listed out. Finally, we construct SQL statements to develop the database according to the logical ERD that we designed.

However, throughout this phase, we have faced some obstacles. While designing the logical ERD, we found out that there is something not logical or it is unnecessary. So, we keep making changes on the logical ERD until we find the most suitable logical ERD for our system.

In conclusion, we have tried our best to construct a new system to meet MBIP requirements to help them to handle the carbon consumption data automatically. Throughout this project, we have also learned how to transform a logical diagram into a system step by step using normalization, relation schemas and SQL statements. We hope that we will implement the knowledge that we gained to produce a lot of better systems to help the community in the future.