Relational Schema :

1. User Table:
User(user_id, name, account_type)
Primary Key: user_id

2. User_Phone Table:
User_Phone(user_id, phone_number)
Primary Key: (user_id, phone_number)
Foreign Key: user_id → User(user_id)

3. User_Email Table:
User_Email(user_id, email)
Primary Key: (user_id, email)
Foreign Key: user_id → User(user_id)

4. User_Address Table:
User_Address(user_id, address, city, district, postal_code, area_type)
Primary Key: (user_id, address)
Foreign Key: user_id → User(user_id)

5. Electric_Meter Table:
Electric_Meter(meter_id, user_id, location, installation_date)
Primary Key: meter_id
Foreign Key: user_id → User(user_id)

6. Electricity_Usage Table:
Electricity_Usage(usage_id, meter_id, total_usage, start_time, end_time)
Primary Key: usage_id
Foreign Key: meter_id → Electric_Meter(meter_id)

7. Appliance Table:
Appliance(appliance_id, name, power_rating, usage_rate)
Primary Key: appliance_id

8. Usage_Estimation Table:
Usage_Estimation(estimation_id, user_id, appliance_id, usage_duration, estimated_cost)
Primary Key: estimation_id
Foreign Key: user_id → User(user_id)
Foreign Key: appliance_id → Appliance(appliance_id)

9. Notification Table:
Notification(notification_id, user_id, message, status, sent_date)
Primary Key: notification_id
Foreign Key: user_id → User(user_id)

10. Bill Table:
Bill(bill_id, meter_id, issue_date, due_date, amount_due, status)
Primary Key: bill_id
Foreign Key: meter_id → Electric_Meter(meter_id)

ER Diagram to Relational Schema Mapping Document:

- User ↔ User_Phone, User_Email, User_Address: Multi-valued attributes split into separate tables.
- User ↔ Electric_Meter: One-to-many relationship.
- Electric_Meter ↔ Electricity_Usage: One-to-many relationship recording usage.
- Appliance ↔ Usage_Estimation: Represents the estimation of usage costs.
- User ↔ Notification: Multiple notifications for each user.
- Electric_Meter ↔ Bill: Each meter can generate multiple bills.