## **Login**

1. The system allows users to login to their account using the email address and password
   1. The system must check if the information is correct by accessing the database
      1. If they are correct, the system displays the dashboard for their account
      2. If they are not, the user may choose to recover the password by hitting the 'Forgot Password' button.

## **Registration**

1. The user must be able to register a new account in the system.
   1. The system must display 3 required text fields and 1 optional text field for the user to enter registration information.
      1. The system must include a text field for Username (required).
      2. The system must include a text field for Email Address (required).
      3. The system must include a text field for the Mobile Number (optional).
      4. The system must include a text field for Password (required).
   2. The user must enter all the required fields before clicking the ‘Register’ button.
      1. The system must display an alert message if any required fields are empty.
   3. The system must verify the fields entered by the user.
      1. The system must check that the username is unique and does not exist in the database.
      2. The system must check that the email is in the correct format.
      3. The system must check that the email does not exist in the database.
      4. The system must check that the mobile number is in the correct format.
      5. The system must check that the password has met the password requirements.
         1. The password must be at least 8 characters in length.
         2. The password must contain at least 1 uppercase letter and 1 lowercase letter.
         3. The password must be alphanumeric.
      6. The system must display an alert message for any fields that fail to meet the requirements.
   4. The system must allow the user to request verification by receiving a verification email or an OTP.
      1. The system must send a verification email to the user’s email address.
      2. The system must send an OTP to the user’s mobile number.
      3. The system must display an error message for failure to send a verification email or OTP.
   5. The system must create an account upon verification.
      1. The system must store the user’s account information in the database.
      2. The system must display a message upon a successful or unsuccessful account creation.

## **Account Management**

1. The system must allow users to view and edit their account information (e.g. name, email, mobile number)
   1. The system must include an ‘Edit’ button for users to edit account information.
   2. The system must include input fields for entering the new account information.
2. The system must allow users to change or reset their password.
   1. The system must provide 3 input fields for entering the ‘Current Password’, the ‘New Password’ and ‘Confirm New Password’.
   2. The system must validate that the password has met the minimum password requirements.
      1. The password must be alphanumeric, at least 8 characters long, and contain at least 1 uppercase character and 1 lowercase character.
   3. The system must validate that the ‘New Password’ is not exactly the ‘Old Password’.
3. The system must allow users to change their security settings.
   1. The system must provide 2 options for 2FA (e.g. OTP or verification email).
4. The system must allow users to deactivate their account.
   1. The system must send a confirmation email before processing the account deletion.
5. The system must verify that the user is logged in to access account information.

## **Notifications Management**

1. The system allow user to change notification settings by hitting “Notification Setting” in the Side Menu.
   1. The setting include:
      1. The method of sending (email,mobile push)
      2. Scheduling
   2. The system will schedule notification and use the correct method accordingly.

## **Device Management**

1. The system allow users to see a short power usage description in “Power Usage” tab
   1. The system show the exact power usage from the beginning of the month to current day:
      1. The format for the power uasge is kWh
   2. The system show comparison of users’ power usage with national average power usage
   3. The system show information of 3 highest usage devices by expanding   
      “Power Tab”:
      1. The information include:
         1. Name of the device
         2. Power Usage(in kWh)
         3. Partition of usage in total usage (in %)
2. The system allow users to access their appliance list in My Device by hitting “Manage my device” in the expanded “Power Usage” tab
   1. The system allow user to see the consumption data of each appliance:
      1. The data include:
         1. Name of the device
         2. Average Power Usage (in kW)
         3. Duration (in Hour/Day)
   2. The system allow user to edit the consumption data of each appliance:
      1. The data include:
         1. Average Power Usage
         2. Duration
      2. The system will save the detail accordingly to the database.
   3. The system allow user to remove an appliance by hitting “X” button under the name of the appliance.

## **Adding New Device**

1. The system must allow user to ADD new appliance to the appliance list by hitting “+” in My Device
   1. The user must select the name of device
   2. The user must fill in the average power of the appliance:
      1. In case user do not fill in, the system will use default value.
   3. The user must fill in the usage of the appliance
   4. After all previous condition have been filled, the system will add the appliance to the account’s appliance list.

## **Electricity Consumption Calculator**

1. The system must calculate the total electricity consumption based on the devices in the device manager.
   1. The system must validate that all required fields are entered in the device management menu before calculation.
      1. The system must display an error message if there are missing fields.
   2. The system must provide a ‘Calculate’ button to perform calculations.
   3. The system must perform calculations using the correct algorithm and formula.
2. The system must calculate the expected cost for the total electricity consumption.
   1. The system must use the latest electricity tariffs for calculations.
   2. The system must calculate the total cost of electricity usage for each device.
   3. The system must determine the devices with the most electrical consumption.
   4. The system must calculate the total electricity bill for the specified period.
3. The system must display the average monthly household electricity consumption.
   1. The values must be retrieved from the EMA dataset.
   2. The system is not required to perform calculations for this metric.
4. The system must display a confirmation notification for updated calculation changes.

## **Generating Report**

1. The system must allow user to generate a report of their total electricity consumption.
   1. The layout of the report must be consistent across all users.
   2. The report must state the electricity consumption per appliance.
   3. The system must display an error message if the system fails to generate the report.
2. The system must allow the user to select the period range to generate the report (e.g. daily, monthly, annually).
   1. The system must retrieve historical data on electricity consumption.
   2. The system must provide the report statistics in chronological order.
   3. The system must display an error message if there is no data available in the chosen period.
3. The system must display a graphical representation of the data.
   1. The system must allow the user to select the type of data visualization (e.g. chart, graph, table).
   2. The system must provide a preview of the visualization.
4. The system must be logged into his account to generate or view report.
5. The system must allow users to download the report into different file formats.
   1. The recommended file format is PDF.
   2. The system must provide a ‘Download’ button for the user to download the report.
   3. The system must display a message for successful download of the report.
6. The system must store the record of the report generated.
   1. The system must allow users to access previously generated reports in ‘History’.