### 1.2 Functional Requirements

**FR1 Login - *Stretch Goal***

* **FR1.1:** The player must enter their username and password in order to play the game, and the username and password must be correct
* **FR1.2:** Once the player submits their username and password, their previously saved game state will be available, if they have played before
* **FR1.3:** If the player does not have a login, they can still play the game as a guest
* **FR1.4:** The login system must authenticate users securely

**FR2 Action Log**

* **FR2.1:** User actions are saved in a log for every action that is taken
* **FR2.2:** Log can be seen by user at the end of each time period and at the end of the game
* **FR2.3:** Player has a notepad that they can write their thoughts or plan of actions if they wish
* **FR2.4:** Log will be used to calculate statistics about common player actions (TBD, Stretch Goal)

**FR3 User Creation - *Stretch Goal***

* **FR3.1:** Users shall be able to register a new username and password with the system.
* **FR3.2:** The username must be unique to the user

**FR4 Startup Page**

* **FR4.1**: Upon loading the game page, the player should be presented with a startup page
* **FR4.2**: The startup page should contain the title of the game and a button that starts the game
* **FR4.3**: The login implementation should be included on the startup page as well (Stretch Goal)

### 1.3 Gameplay Requirements

**GR1 Actors**

* **GR1.1:** The player character is an employee who is leading the environmental initiative at Clariant
* **GR1.2:** Organizations like the EPA will send letters to the player character with bonuses/sanctions based on their performance (Stretch Goal)

**GR2 Goals**

* **GR2.1:** The goal of the game involves the player implementing and updating Clariant’s technologies to reduce emissions and costs
* **GR2.2:** The player’s score will be tracked by their actions made in game
* **GR2.3:** The player’s score is based on their emissions, investments, operational costs, product cost, and product carbon footprint (PCF)
* **GR2.4:** The amount of time (in number of turns) it takes the player to reach certain milestones will also be tracked and displayed

**GR3 Rules**

* **GR3.1:** The player will interact with the game world to make decisions like placing and upgrading tiles
* **GR3.2:** Each action will change the player’s emissions, investments, operational costs, product cost, and/or product carbon footprint (PCF)

GR4 Tiles

* **GR4.1:** When hovering over a tile the player is presented with information about the emissions and operational costs from that tile
* **GR4.2:** When the player clicks on a tile, the player is given a list of options to choose from for specific actions towards that tile (such as upgrades, removal of resources/buildings on that tile, and different development options for that tile)
* **GR4.3:** When hovering over an action on the menu, the player is shown the investment cost, operational cost, and emission impact of their action on their scores
* **GR4.4:** To upgrade a tile, the player must have at least one action left in their turn.

**GR5. Turns**

* **GR5.1:** The current turn advances to the next turn once the player runs out of action points
* **GR5.2:** Each turn will advance time by a set amount of time (year/quarter)
* **GR5.3:** The player is given a number of actions (action points) each turn that they can use to upgrade or develop tiles
* **GR5.4:** Once the turn is over, the player’s action points are restored and time advances in the game

**GR6 Menu Of Choices**

* **GR6.1**: When a player clicks on a tile or the Clariant Building they are presented with a menu of choices
* **GR6.2**: The tile menu of choices presents the player with actions they can take that effect that tile
* **GR6.3**: The Clariant Building menu of choices shows actions that the player can take that affects the entire company (like purchasing Renewable Energy Certificates or Carbon Credits)

**GR7 Leaderboard/Scoring**

* **GR7.1**: A player’s scores are listed based on their emissions, investments, operational costs, product cost, and product carbon footprint (PCF) from the game
* **GR7.2**: The lower that a score is, the better a player did in that category (Lower score represents lower emissions for instance)
* **GR7.3:** Player scores will be compared in an interactive leaderboard (Stretch Goal)

### 1.4 Constraints

* **C1:** Game must be playable without users needing to download any game files.
* **C2:** Game must have a playtime of about fifteen to thirty minutes