**Plan of the week of 7th of December**

**Goal of the week:**

Have a playable game that can be tested with real game mechanics by external people with respect to the visualization of power loss, and understanding on terrain placement.

**Main constraints:**

Only one wind turbine, one pump and one transformers are needed. The game will have four levels. This is detailed later on.

* The wind direction change is removed from this version of the playable.
* The power loss due to distance is removed from the pump to the transformer.

**Main tasks in order of importance:**

1. Start/End game. (Kangqi)
2. Win/Lose states. (Kangqi)
3. Appropriate power distribution between the wind turbine, transformer and pumps. (Ruoqing)
4. Visualization of the power loss. (Ruoqing)
5. Scaling of the pump attack. (Ruoqing)
6. Costs introduction.(Panos)
7. Selling of the wind turbine.(Panos)
8. Terrain placement (not randomized at the start of the game). (Rick)
9. Questionnaire for the second playable. (Raphael)

**Levels:**

The playable game at the end of the week (on the 13th December) shall contain four main levels:

1. A level tuned with Map 1. This level should introduce the player only to the height effect on wind turbine output. The power loss effect should have no impact on the game. It should be a relatively easy level.
2. A level tuned with Map 1. This level should introduce the player to the power loss due to distance in addition to the height (full game at this point). It should be a relatively easy level.
3. A level tuned with Map 2. This level is the same as the second level but with a medium difficulty (the bubbles have more life points from 10 to 12).
4. A level tuned with Map 3. This level is the same as the second level but with a hard difficulty (the bubbles have more life points from 10 to 14). At this level, the player should have the option to randomize the map.

About the maps:

1. Map 1 is the original map that we have designing with since the start of the project. The pathways for the bubbles should not be changed.
2. Map 2 should change some of the pathways of the map. Maybe the addition of a pathway or a longer map.
3. Map 3 should be similarly changed as Map 2.

**Details of the tasks**

1. Start/End game:
   * The game should know when to end (win or lose states).
   * At the beginning of a game, the player should be told which level he is playing on (1 to 4).
   * At the end of a game, the player should see a display of the words: Win or Lose.
   * At the end of a game, the player should be able to see his score (remaining TC).
   * At the end of a game, the player should be able to restart the level, go to the next level (regardless of win or lose – if he loses due to unforeseen bugs, we want to allow him to go further for testing purposes), go to the previous level.
2. Win/Lose states:
   * The player loses the game once 5 bubbles have gone through to the city.
   * The player wins once all the bubbles have gone through the river and less than 5 have gotten to the city.
3. Appropriate power distribution between the wind turbine, transformer and pumps:
   * The power output of the transformer is the sum of the power inputs from each wind turbines.
   * The power inputs in the transformer per wind turbine corresponds to the power output of the wind turbine divided by the square of the length between the wind turbine and the transformer.
   * The power input in the pump is equal to the power output coming from the transformer is it connected to.
4. Visualization:
   * For all visualization, the visualization should only be readable normally at the normal zoom of the camera. That is, when zooming out, the text/line/else should not scale up but should remain the same as the original. This would avoid a cluttered space when at maximum de-zoom possibility.
   * Visualization of the power loss
     + The visualization of the power loss only happens (for this version of the game) between the wind turbine and the transformer.
     + The power loss should be visualized through either: a change in the line thickness, a change in the line color or a change in the length of a dotted line.
   * Visualization of the power output of the wind turbine:
     + Place the power output as a number (or a pie) next to the turbine. In this version of the game, as wind is not present, the power output shall remain always at 100%.
   * Visualization of the attack damage of the pumps:
     + Place the damage amount of the pump above, below or on the side of the pump.
   * Visualization of the transformer usage:
     + Two options – note that in this version of the game, the value will always be 100% for the simple reason that we only have one wind turbine and the transformers are not yet assigned a maximum capacity. This means that what is made here is not dynamic.
       - Place a color as a layer above the transformer. The color should change dynamically from green at 0% usage to deep red at 100% usage of the transformer. (In this version of the game, as the transformer is always 100%, just set it to red without need to place the dynamics inside yet).
       - Place the percentage used capacity on the sides, below or on top of the transformer.
5. Scaling of the pump attack:
   * The pump attack is simple at this stage. The attack speed is maintained at its current rate. Only the pump attack damage is increase.
   * The pump attack damage is defined as follows:
6. Costs introduction:
   * There should be a cost display in the upper side of the game.
   * The costs act as a scoring mechanism.
   * The costs are determined in TC (Turbine coins – Timmy’s coins).
   * At the beginning of the game, the player starts with 300 TC.
   * The base wind turbine (WT) costs are of 100 TC.

* The construction costs per terrain increase are linear with height (when the terrain height goes from one to a hundred):
  + Pumping one bubble from the river rewards the player with 10 TC.

1. Selling of the wind turbine:
   * When clicking on a wind turbine, the information of the wind turbine should appear along with a button that says: Sell. This allows the player to sell his wind turbines if it has been placed incorrectly.
   * Refunding the wind turbine should return 50% of the costs of the wind turbine (in this case 50 TC) to the player. It does not return the additional construction costs.
2. Terrain placement (not randomized at the start of the game):
   * Allow for a choice for the player to either play on the designed map or on a random map. On the random map, the score would not count.
3. Questionnaire for the second playable:
   * Unforeseen bug
   * Final money tally

**Additional constraints – numbers:**

* Base power output of a wind turbine (): 100 kWh.
* Turbine output with elevation: