Project ideas

Provided that an **interruption** is a breaking of a pump or circuit, as a route. I have the following ideas (some practical).

- The interruption of a generator or path can be modelled probabilistically (*broken-probability* parameter), as the reparation after a breakage (*repair-probability* parameter) during ticks in the *to go* method. This leads me to think that each generator and each grid piece has a state (ON/OFF or AVAILABLE /NOT-AVAILABLE) that should be check in order to serving requests.
- Generators must serve houses, so each turtle (house or commercial building) could make a service request to the nearest generator (if ON, then available).
  We are in a static setup, so we know the nearest generators (during initialisation each turtle house/commercial must have an ordered list of generators in order of distance -> the first is the nearest, the second is the second nearest etc. you can use the turtles radius to find them).
  If the system were dynamic (houses and generators change their arrangement randomly in the plane) then a shortest path search algorithm would be needed (or work with a radius increasing by one unit per turtle until the list of generators is complete).
- Graphical routes, created in the environment, can only be useful for plotting the availability of routes for each tick in the grid. The protocol by which a house requests electricity or water should be as follows:
  - The house needs electricity or water, per tick, probabilistically (presumably a low percentage, to be found empirically), so when there is this need it is checked that the nearest generators are:
    - ON -> you must check that the path from the nearest generator to the house has no interruptions. This is checked cyclically for all generators until an available one whose path is intact is found. Then the house is served (its balance decreases by the amount demanded -> multiple of the cost of electricity or water).
    - OFF-> no solution, so it is necessary to wait until the pumps are repaired.
- To manage the cycles of the day (morning, afternoon etc.) it would be necessary to define a δ interval of time duration (e.g. 3000 ticks for each portion of the day), then use a global counter that can increment when passing from the evening to the next day (this is useful to have statistical analysis day by day and possibly weekly after the counter has reached a multiple value of 7).
  In the *to go* method it is necessary to have 4 *sub to go* methods, each for each part of the day, at the end of the night increase the counter by 1. In this way you can split the *income-regrowth-time* into 4 portions (40 pounds/day into 10 for the morning, 10 for the afternoon etc. so the house account is recharged for each portion of the day and this respect your original criteria). The counter use is useful to create a kind of balance, if there is money left over from the previous day, this can be used to buy electricity and water supplies.