In order to update the day-ahead framework to the hour-ahead framework in the models provided in GAMS, I have done the tasks listed below. We consider a 4-hour time horizon with one-hour resolution. There are two possible ways to conduct the rolling window: (i) we can simulate 4-hour windows every hour but in the last periods of the day the time horizon is shorten, or (ii) we can simulate 4-hour windows every hour of each day. The latter approach would require extra changes because we consider a set of time periods with 24 intervals. In order to implement the former approach, we have introduced the following changes:

1. Update the initial conditions:

For hours t = 1 of each day, we can use the initial conditions provided by the input data. For hours t> 1 of each day, we need to conduct the following changes:

1. Read the new onoff\_t0\_previous(i), onoff\_t1\_previous(i), and g\_0\_previous(i), i.e., the initial on/off statuses of generators from the previous window, the conditions at the first time period from the previous window, and the power output at the first time period from the previous window, respectively.
2. Create the new vectos count\_on\_initi(i) and count\_off\_init(i) which are the number of hours that the unit has been on/off previous to the time span. These conditions can be summarized as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| V\_{t-1} | V\_{t} | Count\_on(now) | Count\_off(now) |
| 1 | 1 | Count\_on(previous)+1 | 0 |
| 0 | 0 | 0 | Count\_off(previous)+1 |
| 1 | 0 | 0 | 1 |
| 0 | 1 | 1 | 0 |

1. Compute the new vectors L\_up\_min(i) and L\_down\_min(i)
2. Include pext\_2round from the day-ahead framework:

We need the actual injections given by DEPO after solving the DA framework from that day. I rename it as DA\_injections. Then, in order to do the less number of changes, I consider the new demand as the previous demand + DA\_injections.

**Issue:** Maybe I will have more than DA\_injections for different days but I do not know how to read with \_0, \_1, etc… One option is to have DA\_injections and DA\_injections\_2, and to replace them over and over.

1. Update wind power production

Kelly gave to me the short-term forecast power production for the first four days. I just removed that previous power productions and I read the new updated file.

1. Update to 1 device only

I have updated the number of devices to only one as agreed with 1Energy folks.

1. Minimum and maximum bounds are equal to 0

To run it faster, I think it is going to be better to wait until the communication is done. The communication can be done assuming for all optimization windows minimum and maximum bounds equal to 0. I have already passed on to remote desktop all files.

More issues:

1. One method to address the latter approach is:

\*This is an example how we can deal with a rolling window without shortening the time horizon at the end of the day

\*We would need to evaluate all the parameters with two "ifs", one for hours less than or equal to 21 and one for hours greater than 21

\*We would need to extend the set of time periods to 27 ordinal numbers

hour=24;

t\_ha(t)=no;

demand(s,t)=0;

alias(t,tt);

if(hour gt 21,

t\_ha(t)$(ord(t) ge hour and ord(t) lt (hour+horizon))=yes;

demand(s,t)$(t\_ha(t) and ord(t) le 24)=sum(day$(ord(day) eq N+counter),d\_day(day,s,t));

demand(s,t)$(t\_ha(t) and ord(t) gt 24)=sum((tt,day)$(ord(day) eq N+counter+1 and ord(tt) eq ord(t) -24),d\_day(day,s,tt));

);

display t\_ha, demand;

1. I will need to incorporate the capacity constraints in the pre- and post-mitigation states to compare the feasibility of the problem and how the remaining congestions can be addressed while minimizing the renewable spillage. Analyze cost change and renewable spillage change between both problems.
2. Results from the hour-ahead need to focus on the changes of generation cost as well, and how many congestions are mitigated.
3. In order to perform simulations on my own (without requiring communications), I will build one only piece of program for day-ahead and another for hour-ahead in such a way that I can run the simulations faster and independent from Brian.