Read Me First

This document describes the organization of the files passed on by Steve Burchett after completion of his PhD program at RPI in December 2018.

Excel Files

* “Money Summary\_Flat”
  + This excel file is used to **display the financial results** from a series of matlab simulations.
  + You can typically run a series of simulations for a given scenario (flat, high-ramp, EV charging, interface limits, etc) for a range of days (2-4) and a range of cases (2016 – 2030, i.e. 0 to 1).
  + **Copy the arrays from certain variables and paste them into this excel file**. The tables should automatically update and display the results.
  + Note that there are several “Money Summary…” files. There are 2 styles of these files. The first compares 2 sets of simulations (flat versus high ramp). A second compares 3 sets of simulations (flat vs. EV vs. Double EV). Check out “Money Summary\_IF\_CEast\_both2000n2700” for the 3-comparison file.
  + You paste values into the “Data\_L” and “Data\_H” worksheets. The “Base\_D1\_L” will automatically populate with results from the “Data\_L” page, as will the “Summary\_k” tab.
  + **You should check each of the formulas to make sure that they properly link.**
  + **After the matlab run is complete, paste “AllRunsSummary” variable into the cell L4 on the “Data\_L” or “Data\_H” tab, depending on which set of simulations you have just run.** Typically, I will populate the “Data\_L” with the flat scenario as a base case and then populate “Data\_H” with whatever new feature or perturbation I’ve just added. This will allow me to quickly identify changes brought about by the perturbation.
  + **Also, paste “DAMresults” into cell C3 on the “Data\_L” tab. “DAMloadCostByRegion” goes into cell C29.**
  + Obviously, you should take these excel files into your own hands and make them your own. You may want to trash everything and come up with your own summaries. I have found that quick analysis can be performed by comparing both L and H DAM results figures in the word documents and this excel file is a *good way to quickly investigate outliers*.
  + Almost forgot. **Also paste “CC\_results” into cell C29 to display the congestion charge results.**
* Matpower Input Data
  + This is a useful file for **populating various parameters and then cutting and pasting them into the matpower files for use in the model.**
  + This is also **where I keep the figure showing the various generator parameters**
  + **“xgd\_uc” tab includes all the values needed for multi period analysis** in most which involves unit commitment. The idea here is to have a place where you can see all the values in good alignment. Then you can copy the array (D5 thorough K18) that has “all light borders” and paste it directly into the “xgd\_DAM.m” file inside matlab. Alternatively, you could just go directly to the xgd.DAM.m file and made individual edits there… but the alignment is a pain to maintain.
  + The same cut and paste is used for the other worksheets. **As a warning, there are many times when I override these excel values directly in the matlab file. Step through the file and search inside the variable mdi to see the actual values used in each DAM or RTC run. I know there are better ways of doing it, and I encourage you to implement them.**
  + For those of you used to using Dr. Chow’s PST, there is a helpful “Defn” tab that connects PST variables with Matlab variables.
* Troubleshooting
  + These may not be of much use to you. These are a few files which I have used with great success to help me root out issues in unsuccessful runs. Advanced users only. You will probably make your own by that point.

Matlab Files

* Functions
  + This includes all the various functions I’ve developed over the years to help the market model run. Some are very important and some may not be used at all.
  + Several deal with graphing
    - Columnlegend
    - gridLegend
    - reorderLegend
    - reorderLegendarea
    - reorderLegendbar
      * These guys will flip the labels on stacked graphs so they match the stacking order.
  + Several are operational
    - RunRTC… this is what runs RTC 3… n in the loop
    - RunRTD3Times… this runs RTD 4,5,6 and beyond after each RTC run in the loop.
      * You should probably have these guys open when mainfile is open if you are looking into things.
    - Toogle\_iflims\_most
      * This is a file used to turn on interface limits in MOST. This is not supported by the MOST documentation as I created it myself.
      * This uses most\_if function which is by itself in the main folder.
  + GraphCostCurves is something I used to… graph cost curves long in the past.
* Program\_Files
  + **This should be saved in each revision control** (well the whole main folder should be saved for that matter). But you may find yourself changing one thing inside, forgetting about it, and getting really upset when you can’t duplicate results. Revision control is so good for your mental health.
  + Some of these files may not be used… I think xgd\_RTC is one of those.
  + **Case\_nyiso16 is where you add gen, branch, bus data from the MatlabInput excel file mentioned earlier**.
  + Each time a variable changes over time, a most profile is used. See the MOST manual for details. There are CERTAINLY better ways of implementing profiles in the MainFile code, but what’s in there is a working version. Improve as you like of course. Each profile has… what I’ll call an initial file “wind\_gen” and then profile values “wind\_profile\_Pmax” or “…Pmin”. These files don’t actually have the profile values in them… you have to add them after in the MainFile. Once you check out a few you may be able to understand and implement a better version.
    - Remember that renewables are split into 3 groups. Wind, Hydro, and Other… which includes everything not wind or hydro. Its predominately solar.
* PST files only includes the original NPCC16 machine network model in PST form. Probably won’t use this.
* MainFile is where the magic happens. You should line by line this program.
* Most\_if is the function call for most with InterFace limits added. Instead of calling most, the MainFile calls most\_if when interface limits are activated.

NYISO Data

* This is where you can direct your MainFile paths to gather data.
* ActualLoad5min has the modified 5-mninute interval load data by zone that mainfile uses to convert to regional load for the DAM and RTM markets. The 4 files correspond to each of the 4 days used in the MainFile.
* RenewableData includes the original excel file provided by the NYISO with the profiles for each renewable generator type by zone. I believe the MainFile gathers profiles from here directly before combining to zone and type (other, hydro, wind).

SMB Research Results

* This is the word and excel files I used to generate my thesis.