Recent Progress:

1. Given up on GE for API fixes or updates.
2. SQL database for cross instance/code language communication concept proven.

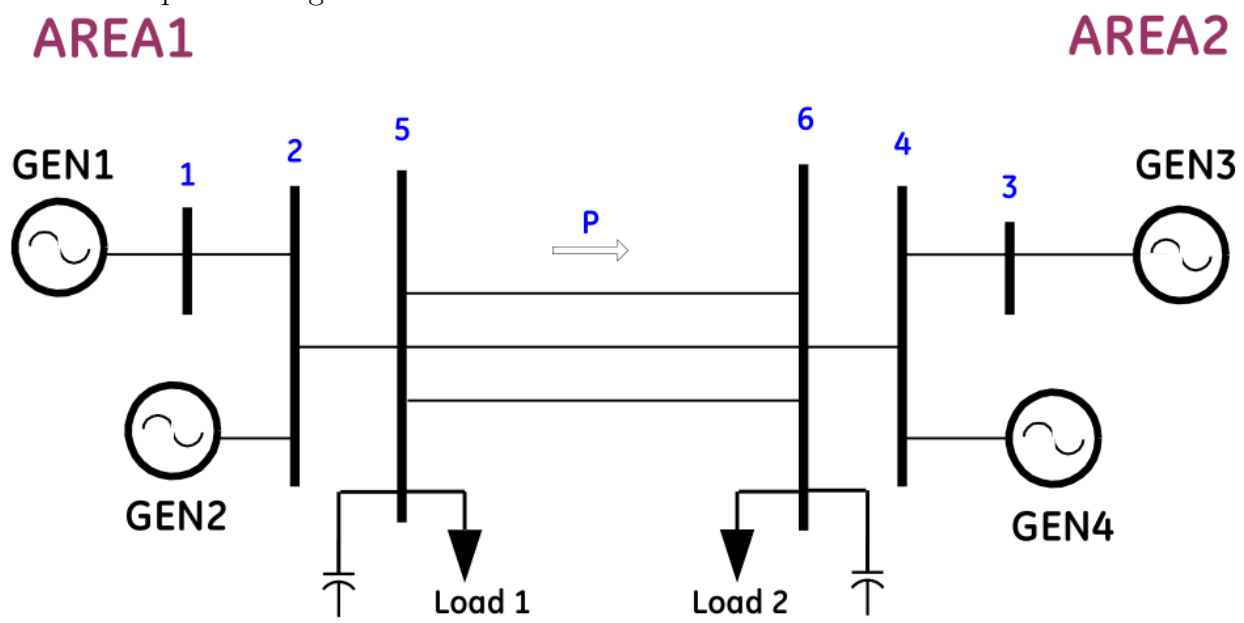
   Using SQLite3 is not a great choice - it is not designed for fast use.

   Other SQL database packages are being explored - Must be compatible with Ipy32.
3. Read papers from the 70's by Mills, Taylor, and Cresap (surprisingly good).
4. PSLF terminal output can be suppressed by EPCL command : `dispar[0].noprint = 1`
5. GitHub repository updated:

   `https://github.com/thadhaines/LTD_sim`

Current Tasks:

1. Define Agent actions for AGC/LFC (ACE calculations), Shunt Control, β calculation
2. ODE solver == numpy / scipy `odeint` in Python 3
3. Continue experimenting with a multi-area model:



4. Investigate line current data (add branch section agents to model)
5. Refine data output - keep quickplotter in mind - Dictionary structure, variable naming, functionality, meta...

Future Tasks: (Little to No Progress since last time / Things coming down the pipe)

1. Add Ramp perturbance Agent
2. An agent for every object: Shunt, SVD, Branch, Transformer, Power Plant, ...
3. Think about having all simulation parameters be defined in one file that is fed into simulation. i.e. Have all perturbance, AGC, LTD, etc., related code in a text file so python doesn't have to be a 'user' thing.
4. Package code into library and refactor (think of a nice name):
   Power System Long-Term Dynamic Simulation → PSLTDSim
5. Investigate Runge-Kutta integration.. (probably inside scipy...)

$$x_{n+1} = x_n + h(1/6)\,[\,k_1 + 2k_2 + 2k_3 + k_4\,]$$

Fourth-order Runge-Kutta method

$$k_1 = f(x_n)$$
$$k_2 = f[\,x_n + (h/2)\,k_1\,]$$
$$k_3 = f[\,x_n + (h/2)\,k_2\,]$$
$$k_4 = f(x_n + h\,k_3)$$

6. Enable multiple dyd files to overwrite / replace previously defined agents/parameters
7. Identify System Slack bus programmatically (maybe just assume in first area?)
   or calculate system slack error differently... An average of slack error?

Current Questions:

1. Overview of planned PSLF scenarios? → Similar to Heredia but on MiniWecc Scale?
2. Is there more available/relevant event data that may help us to verify simulations of specific instances (wind ramps or other behavior) that the novel research will focus on?
   (Heredia paper data helpful for some wind ramp data context)