Documentation for Oligopolistic MCP model of Energy and Capacity markets for Saudi Arabia's Power Sector.

This model project, **CMO.gpr**, consits of 7 core .gms files.

1. **run\_model.gms:** used this file to run the model. $INCLUDES all other .gms files in proper sequence, loads a save point to initialize, and calls the PATH solver to solve the model.
2. **Macros.gms:** formulas used to calculate annualized capital costs – *discounting*(). Macros is generalized for use in recursive dynamic models. (*describe of how to use macros…*)
3. **SetsAndVariables.gms:** Define all the sets and variables used in the model equations.
4. **demand.gms:** aggregates hourly power demand for Saudi’s 4 power grids (East, West, Central and South), pre-loaded into the db/load.gdx file, into predefined load segments. Currently demand is aggregated into 8 load segments, spanning a typical day in one of three seasons (summer, spring/fall and winter).
5. **parameters.gms**: declares all the fixed parameters used to calibrate the model. Includes several parameter definitions, such as existing generation and transmission capacities, capital, fixed, and marginal costs (fuel prices can be defined separately).
6. **equations.gms:** Declare and define the complementarity conditions and market clearing equations used to model the competing firms and ISO.
7. **demand\_calib:** Final parameter calibration.Set the power demand to the desired levels, including future demand growth as well as residual and stochastic demand patterns. Calibrate coefficients of the inverse demand functions (slope and intercept). (details…).