The new capacities for the technologies are calculated based on the Capacity\_2022.xlsx downloaded from ERCOT's website. The data is used for new capacity in the ABM diagnosis/validation(this does not work due to data inconsistency). However, the data only provide cumulative capacity of the technologies.

Therefore, I used EIA-860 2020 data to calculate Texas total capacity and new capacity installed instead.

For NG (it is actually the sum of all non-renewable), the numbers need to be adjusted by adding back the retirement (solar and wind retirement are negligible for the 2011-2020 period). I then calculated the installed NG capacity since 2000 from EIA-860 excluding commercial units. Then I applied the total and retirement capacity data to "diagnose/validate" the ABM.

Also, I found a strong linear relationship between total capacity and electricity demand (actual consumption data). Agents will use this relationship (i.e., the perceived demand curve) to determine the capacity needed for new installation.

**Retirement** after 2020 is assumed a fixed constant, the average of 2011-2020 period.

**Price** data in 2021 is distorted due to the power outage.

To correct it, we set an upper bound of the price to $50.

**Data Description (calibration):**

* Capacity\_factor\_ABM.csv: the capacity factor in 2021 from ERCOT.
* Demand\_data\_agg.csv: the output from the calculation of demand curves of the Load Zones. (The demand data is aggregated to monthly demands at the load zones. (\Sloan Project\1. Data\ERCOT\1 Demand\ - source: ERCOT website)
* Price\_data\_agg.csv: the output from the calculation of the demand curves of the Load Zones (\Sloan Project\1. Data\ERCOT\2 Day Ahead Market\ - source: ERCOT website).
* ERCOT-utility-plant-modeled.xlsx: We modeled 161 companies based on their the generator capacities (>100 MW)
* historical\_capacity\_factor\_ABM.csv: the historical capacity factors retrieved from ERCOT.
* historical\_cost\_data.csv: the historical installation cost data compiled based on several sources (Wind: Land-Based Wind Market Report: 2021 Edition. solar: Utility-Scale Solar, 2021 Edition). Original files can be found. NG (we only consider NG for the non-renewable) cost is selected based on “\Sloan Project\ABM\_Model\EIA\_cost and performance\_annual Energy outlook\_2022\_ table\_8.2.pdf” in the Cost Folder.
* Maping\_Bus\_to\_LoadZones.csv: this table was generated from GIS analysis that identified buses in the load zones (we do not have the official data so that I drew a load zone map which intersect with the buses map to generate this table).
* new\_capacity\_edited.csv: historical data of the new installation of the technologies.
* Retirement\_Total\_capacity.csv: the historical generation capacity retirement data from EIA-860.
* Total\_Demand: demand data aggregated to ERCOT annual demand (\Sloan Project\1. Data\ERCOT\1 Demand\)
* Wind capital cost: “CapEx Over Time” in the excel file named (\Sloan Project\ABM\_Model\Cost\2021\_land-based\_wind\_market\_report\_public\_data\_file\_0.xlsm)
* Solar cost: “CapEx Trend by Mount Type (PV)“ in (\Sloan Project\ABM\_Model\Cost\2021\_utility-scale\_solar\_data\_update\_0.xlsm

**Data Description (Future Scenarios: Sloan Project\ABM\_Model\Data\Future\_Data\):**

* dict agt\_size\_risk\_dict\_May-04\_2.csv: the parameter values determined by model calibration
* Cost\_dist\_May-04\_2.csv: agents’ perceived costs (% of the observed cost) – the parameter values determined by model calibration
* ERCOT\_Monthly\_Peak\_Demand\_and\_Energy\_Forecast\_2022\_2031.xlsx: demand forecast downloaded from ERCOT website. (<https://www.ercot.com/gridinfo/load/forecast>)
* The sub-directories are the data generated for future simulations. Codes of the data generations can be found in: \Sloan Project\ABM\_Model\SloanABM\