

Assignment #1- Solution

This assignment provides you with the opportunity to explore the structure of the U.S. electricity industry through data available in eGRID.

1. Download the EPA's eGRID2020 dataset¹ and use its information to fill out the tables below. Before using the information in PLNT to estimate the values of the tables, **filter out all the plants that had zero or blank capacity factor in 2020** (i.e., Column AA in PLNT20 is zero or blank).

a. (50%) Overview of the U.S. electricity industry

	Number	Nameplate Capacity ² (MW)	2020 Electricity Generation
Independent Power Producers (IPP) ³	6,038	554,704	1,679,842,959
Electric Utilities ⁴	2,752 (718 utilities)	730,082	2,173,207,184
Balancing Authorities ⁵	9,649 (68 BA)	1,322,312	4,002,028,761
ISO/RTO	6,171 (7 ISO/RTO)	734,702	2,228,728,078

¹ Released 1/27/2022 and available at <https://www.epa.gov/egrid/download-data>

² Use information in column AB of PLNT20 "Plant nameplate capacity (MW)"

³ Include both IPPs that have Combined Heat and Power (CHP) plants as well as those that have non-CHP plants (i.e., "IPP – CHP" and "IPP Non-CHP" in column J of PLNT20).

⁴ Include electric utilities that own power plants and are listed as "Electric Utility" in column J of the PLNT20 tab

⁵ Consider the Balancing Authorities (BA) listed in column K of the PLNT tab. Do not count "No balancing authority" as a type of BA.

- a. (50%) Which states have most of their power generation capacity associated to an ISO/RTO and which ones do not? Answer this question by filling out the table below for the 52 “states”⁶ listed in eGRID

State	Capacity associated to an ISO/RTO		Capacity not associated with an ISO/RTO		Is most of the state capacity associated to an ISO/RTO? (Y/N)
	MW	%	MW	%	
AK	-	-	3,025.20	100.00	N
AL	-	-	35,588.30	100.00	N
AR	14,595.30	83.67	2,847.60	16.33	Y
AZ	-	-	31,585.10	100.00	N
CA	71,669.30	79.34	18,664.80	20.66	Y
CO	-	-	19,978.60	100.00	N
CT	10,813.20	100.00	-	-	Y
DC	40.80	100.00	-	-	Y
DE	3,886.60	100.00	-	-	Y
FL	-	-	91,415.70	100.00	N
GA	-	-	43,158.90	100.00	N
HI	-	-	3,273.50	100.00	N
IA	23,505.00	98.39	384.80	1.61	Y
ID	-	-	5,602.40	100.00	N
IL	50,628.20	97.31	1,401.30	2.69	Y
IN	32,599.60	96.15	1,303.80	3.85	Y
KS	-	-	20,132.10	100.00	N
KY	8,201.90	31.15	18,124.50	68.85	N
LA	31,501.60	96.84	1,027.00	3.16	Y
MA	14,596.00	100.00	-	-	Y
MD	16,001.30	100.00	-	-	Y
ME	5,103.60	97.45	133.80	2.55	Y
MI	32,260.50	100.00	-	-	Y
MN	21,091.40	99.71	61.40	0.29	Y
MO	10,087.70	43.05	13,346.30	56.95	N
MS	6,222.70	35.16	11,477.90	64.84	N
MT	121.90	1.82	6,563.60	98.18	N
NC	2,324.50	5.43	40,516.30	94.57	N
ND	6,050.50	60.01	4,031.80	39.99	Y

⁶ This includes the 50 states plus the District of Columbia (DC) and Puerto Rico.

NE	-	-	10,568.20	100.00	N
NH	4,699.80	100.00	-	-	Y
NJ	21,571.10	100.00	-	-	Y
NM	-	-	11,816.40	100.00	N
NV	1,277.40	8.98	12,940.00	91.02	N
NY	46,484.30	100.00	-	-	Y
OH	32,722.50	96.79	1,086.50	3.21	Y
OK	2,235.30	6.39	32,745.70	93.61	N
OR	-	-	18,134.50	100.00	N
PA	54,783.70	100.00	-	-	Y
PR	-	-	6,311.70	100.00	N
RI	2,554.40	99.46	13.90	0.54	Y
SC	-	-	27,502.60	100.00	N
SD	1,780.50	30.78	4,003.40	69.22	N
TN	-	-	25,597.80	100.00	N
TX	139,011.80	89.40	16,474.20	10.60	Y
UT	-	-	11,545.90	100.00	N
VA	30,149.20	99.98	5.40	0.02	Y
VT	895.90	100.00	-	-	Y
WA	-	-	33,583.20	100.00	N
WI	19,741.30	100.00	-	-	Y
WV	15,493.00	100.00	-	-	Y
WY	-	-	10,830.30	100.00	N
Grand Total	734,701.80	55.18	596,804.40	44.82	Y