

Calculating the Total Demand for Renewable Energy in the PJM and MISO Footprints

In order to estimate the demand for renewable energy in PJM and MISO, we first researched the statutory renewable energy requirements for states in the PJM and MISO footprints. Shown below are the state-by-state annual renewables percentage requirements as a percentage of state electricity sales, adjusted for how much of the total retail sales is eligible load. We used 2016 Energy Information Agency (EIA) data on the split of electric sales between investor-owned utilities, cooperatives, etc. to determine how much of future load will be subject to RPS requirements.

RPS requirement										
% (RPS percentage of total electric sales)										
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
DC	13.50%	15.00%	16.50%	18.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Delaware	14.50%	16.00%	17.50%	19.00%	20.00%	21.00%	22.00%	23.00%	24.00%	25.00%
Illinois	10.40%	11.76%	13.11%	14.47%	15.83%	17.18%	18.54%	19.90%	21.25%	22.61%
Indiana	3.19%	3.19%	3.19%	5.58%	5.58%	5.58%	5.58%	5.58%	5.58%	7.98%
Iowa	0.58%	0.58%	0.59%	0.58%	0.58%	0.57%	0.57%	0.56%	0.56%	0.55%
Maryland	15.20%	15.60%	18.30%	17.40%	18.00%	18.70%	20.00%	20.00%	20.00%	20.00%
Michigan	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Minnesota	20.68%	20.68%	20.68%	20.68%	26.10%	26.10%	26.10%	26.10%	26.10%	28.80%
Missouri	3.45%	3.45%	6.91%	6.91%	6.91%	10.36%	10.36%	10.36%	10.36%	10.36%
Montana	10.36%	10.36%	10.36%	10.36%	10.36%	10.36%	10.36%	10.36%	10.36%	10.36%
New Jersey	14.81%	16.95%	19.14%	21.39%	23.72%	24.27%	24.94%	25.66%	26.46%	27.38%
North Carolina	6.00%	6.00%	10.00%	10.00%	10.00%	12.50%	12.50%	12.50%	12.50%	12.50%
North Dakota	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Ohio	2.20%	3.08%	3.96%	4.84%	5.72%	6.60%	7.48%	8.36%	9.24%	10.12%
Pennsylvania	13.77%	14.26%	14.74%	15.23%	17.46%	17.46%	17.46%	17.46%	17.46%	17.46%
South Dakota	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Virginia	5.77%	5.77%	5.77%	5.77%	5.77%	5.77%	9.89%	9.89%	9.89%	12.36%
Wisconsin	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%

Next, we compiled the projected electric load based on 2015 retail sales for each state and future power projections from the EIA.

Total load										
GWh										
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
DC	11,226	11,301	11,380	11,411	11,345	11,334	11,348	11,388	11,425	11,447
Delaware	11,332	11,407	11,487	11,518	11,452	11,440	11,454	11,495	11,533	11,554
Illinois	139,960	139,402	139,524	140,545	140,463	141,021	141,783	142,871	143,919	144,736
Indiana	102,059	101,967	103,195	104,155	104,207	104,685	105,275	106,155	106,893	107,459
Iowa	47,544	47,378	47,078	47,627	47,838	48,218	48,616	49,109	49,544	49,914
Maryland	61,264	61,671	62,104	62,269	61,912	61,850	61,927	62,147	62,350	62,465
Michigan	102,883	102,514	103,413	104,137	104,006	104,332	104,816	105,585	106,267	106,781
Minnesota	66,253	66,021	65,603	66,368	66,662	67,191	67,746	68,432	69,040	69,555
Missouri	81,962	81,636	81,707	82,305	82,257	82,584	83,030	83,668	84,281	84,759
Montana	14,019	14,207	14,396	14,583	14,654	14,762	14,878	15,054	15,211	15,322
New Jersey	74,493	74,987	75,514	75,715	75,281	75,206	75,299	75,566	75,814	75,953
North Carolina	131,952	133,021	134,415	135,720	136,020	136,833	137,825	139,229	140,543	141,656
North Dakota	17,897	17,834	17,721	17,928	18,007	18,150	18,300	18,485	18,649	18,789
Ohio	148,023	147,891	149,672	151,063	151,139	151,833	152,688	153,964	155,035	155,855
Pennsylvania	145,111	146,074	147,100	147,491	146,647	146,499	146,681	147,202	147,684	147,956
South Dakota	12,213	12,170	12,093	12,234	12,289	12,386	12,488	12,615	12,727	12,822
Virginia	74,380	74,380	74,380	74,380	74,380	74,380	74,380	74,380	74,380	74,380
Wisconsin	69,077	68,849	69,619	70,252	70,332	70,679	71,099	71,701	72,219	72,626

Next, we multiplied the adjusted renewable energy percentage requirement by the total load for a given state in a given year to form the table below. We summed the renewable generation requirements to determine the total demand in PJM and in MISO.

Renewables requirement										
GWh										
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
DC	1,516	1,695	1,878	2,054	2,269	2,267	2,270	2,278	2,285	2,289
Delaware	1,643	1,825	2,010	2,188	2,290	2,402	2,520	2,644	2,768	2,888
Illinois	14,557	16,390	18,297	20,337	22,231	24,232	26,287	28,427	30,588	32,725
Indiana	3,256	3,253	3,292	5,815	5,818	5,845	5,878	5,927	5,968	8,571
Iowa	276	276	276	276	276	276	276	276	276	276
Maryland	9,312	9,621	11,365	10,835	11,144	11,566	12,385	12,429	12,470	12,493
Michigan	10,288	10,251	10,341	10,414	10,401	10,433	10,482	10,558	10,627	10,678
Minnesota	13,701	13,653	13,566	13,725	17,398	17,536	17,681	17,860	18,019	20,032
Missouri	2,830	2,818	5,642	5,683	5,680	8,554	8,600	8,666	8,729	8,779
Montana	1,452	1,471	1,491	1,510	1,518	1,529	1,541	1,559	1,575	1,587
New Jersey	11,030	12,708	14,450	16,193	17,860	18,255	18,779	19,389	20,061	20,795
North Carolina	7,917	7,981	13,442	13,572	13,602	17,104	17,228	17,404	17,568	17,707
North Dakota	1,790	1,783	1,772	1,793	1,801	1,815	1,830	1,849	1,865	1,879
Ohio	3,256	4,555	5,926	7,311	8,644	10,020	11,420	12,870	14,324	15,771
Pennsylvania	19,983	20,824	21,684	22,457	25,599	25,574	25,605	25,696	25,780	25,828
South Dakota	1,221	1,217	1,209	1,223	1,229	1,239	1,249	1,261	1,273	1,282
Virginia	4,290	4,290	4,290	4,290	4,290	4,290	7,354	7,354	7,354	9,192
Wisconsin	6,908	6,885	6,962	7,025	7,033	7,068	7,110	7,170	7,222	7,263
Total	115,225	121,497	137,894	146,701	159,083	170,004	178,494	183,617	188,751	200,035