



Bridging of the Supply-Demand Gap for Large Power Transformers in the U.S. to Take Time

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- The North American transformer market is dominated by large multinationals that offer an extensive range of products and benefit from the economies of scale.
- Over the years, local manufacturers of large power transformers have been unable to meet the domestic demand, especially with regards to extra high voltage (EHV) transformers (>345 kV).
- According to Power Technology Research, the annual power transformers market in the U.S. is expected to grow with a CAGR of 5%, in terms of revenue in the next five years.

The North American transformer market is dominated by large multinationals that offer an extensive range of products and benefit from the economies of scale. There are also several smaller domestic manufacturers of transformers in the market, offering products of varying power handling capacity. In order to take advantage of lower labor costs and lenient environmental standards, certain manufacturers have built production facilities in Mexico, resulting in the country becoming a significant player in the region.

As far as the supply landscape in U.S. that is the leading market of the region is concerned there are several manufacturers that produce distribution and power transformers. These manufacturers include Hitachi Energy, WEG, Prolec GE, VA Transformer, Pennsylvania Transformer Technology, and Hyundai. Hitachi Energy, WEG, and Prolec GE manufacture both distribution and power transformers, whereas Pennsylvania Transformer Technology and Hyundai only manufacture power transformers.

Local Manufacturers	
Product Type	Company Name
PTR/DTR	Hitachi Energy
PTR/DTR	WEG
PTR/DTR	Prolec GE
PTR/DTR	VA Transformer
PTR	Pennsylvania Transformer Technology
PTR	Hyundai

Figure 1: Local manufacturers of power and distribution transformer in the U.S.
Source: Power Technology Research

Overview of the Supply Landscape

Over the years, local manufacturers of large power transformers have been unable to meet the domestic demand, especially with regards to extra high voltage (EHV) transformers (>345 kV). These transformers are essential for the transmission of power over long distances as they handle over 60% of the electricity transmission with only 6 manufacturers.

The shutdown of Mitsubishi Electric Power (MEPPI), a domestic manufacturer of extra high voltage (EHV) transformers, further complicated the situation. In 2019, HIC (Korea) purchased Mitsubishi's manufacturing facility and announced plan to invest USD 100m in the plant followed by the hiring of 131 workers by 2021. The production facility is currently not operational. Portugal-based EFACEC was another domestic manufacturer that produced large power transformers for a brief period of time in the United States, but the company sold the plant to Virginia Transformer in 2014.

Furthermore, ABB shut down the manufacturing facility in 2018, resulting in the loss of 250 jobs following the laying-off of 177 workers at another manufacturing facility in South Boston that produced smaller transformers and had a limited LPT production capacity.

Therefore, the supply-demand gap for large power transformers in the country is bridged with the help of imports from foreign countries. In order to reduce dependence on imports for large power transformers a robust policy framework and assistance from the government will be required instead of knee jerk reactions that we have seen in the past.

Import Quantities from Countries

If we look at the import quantities from the top 10 countries in terms of units (2015-2020), over 80% of the demand for large power transformers (in terms of MVA) in the country is met with imports from foreign countries. A considerable majority of large power transformers were imported from Mexico, followed South Korea, Austria, the Netherlands, Canada, China, Taiwan, and Spain, among others.

As far as medium and small power transformers are concerned, over 25% of the demand in terms of MVA is met through imports. The majority of the medium transformers from 2015-2020 were imported from Mexico, followed by South Korea, Austria, and the Netherlands, etc.

Contrary to the inadequate domestic production capacity for large power transformers in the U.S., China has excess LPT production capacity. China has around 30 large power transformers and its top three manufacturers each have the capacity to produce twice the total production capacity of the U.S.

Figure VIII - 42. Large power Transformers (>100,000 KVA) Import Quantities by Top 10 Countries (Units, 2015 - 2020 YTD Jun)								
Country	2015	2016	2017	2018	2019	2019 YTD (Jun)	2020 YTD (Jun)	SUM*
Mexico	297	151	124	150	202	92	139	1,063
South Korea	100	128	123	73	67	27	25	516
Austria	39	60	89	60	103	57	32	383
Netherlands	49	88	51	61	41	20	23	313
Canada	44	41	44	46	63	38	25	263
China	47	27	22	23	25	18	31	175
Taiwan	10	19	18	24	40	20	6	117
Spain	24	12	8	31	1	1	2	78
Brazil	6	7	16	8	14	7	12	63
Poland	6	8	10	13	16	11	3	56

Figure 1: Large power transformers (> 100 MVA) import quantities by top 10 countries in terms of units from 2015-2020
Source: United States International Trade Commission, U.S. Department of Commerce, Bureau of Industry and Security

Figure VIII-25. Medium power Transformers (>10,000 KVA to 100,000 KVA) Import Quantities by Top 10 Countries (Units, 2015 - 2020 YTD Jun)								
Country	2015	2016	2017	2018	2019	2019 YTD (Jun)	2020 YTD (Jun)	SUM*
Mexico	430	234	255	254	280	135	150	1,603
South Korea	43	90	66	109	124	61	73	505
Taiwan	72	45	15	37	36	12	26	231
Germany	6	38	42	66	38	13	15	205
Austria	9	19	25	32	39	9	36	160
Portugal	41	6	14	14	30	9	10	115
Colombia	5	18	4	40	13	10	23	103
Brazil	0	11	4	1	0	-	23	39
Japan	12	4	2	0	8	0	12	38
Italy	14	4	1	4	3	0	1	27

Figure 2: Medium power transformers (10 MVA to 100 MVA) import quantities by top 10 countries in terms of units from 2015-2020.
Source: United States International Trade Commission, U.S. Department of Commerce, Bureau of Industry and Security

Looking Ahead

According to Power Technology Research, the annual power transformers market in the U.S. is expected to grow with a CAGR of 5%, in terms of revenue in the next five years. The supply-demand gap already exists in the country but national security concerns and the possibility of a blanket ban on the imports of transformers again in the future is expected to attract investments. The investments will be focused on enhancing the LPT production capacity in already existing facilities and building new production facilities. Siemens has recently announced plans to invest USD 54m in key manufacturing facilities in the U.S. that meet demand from critical infrastructure market in the country.

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