



ABSTRACT

Global distribution transformers market reached around \$5.5 billion in 2018 (up to 600 kVA and below 40 kV). The majority of this demand, around 74 %, came from distribution utilities globally, followed by 19 % from industry and around 7 % from power generation. As a general trend, the market in emerging countries is mostly driven by new additions along with replacements, while in

developed markets, including western Europe and North America, most of the demand is due to end-of-life replacements. Distributed generation and electric vehicle supply infrastructure are also influencing demand in certain countries around the world.

Some of the leading players in the distribution transformers market today are ABB, Schneider Electric, SGB-SMIT, Siemens, Crompton Greaves, Ormazabal, WEG, Jinpan and Voltamp trans-

formers. ABB, Schneider Electric, SGB-SMIT, Ormazabal and Siemens (esp. for dry-type) have a big share of global transformers market and are well positioned in multiple countries around the globe to maintain their market position.

KEYWORDS

distribution transformers market, oil-immersed, dry-type, cast resin, industrial

Distribution transformer market up to 600 kVA and below 40 kV, though relatively large equipment market in the T&D domain at \$5.5 billion in 2018, is highly fragmented

Distribution transformer market

A highly fragmented and competitive business

Distribution transformers: Navigating regional market differences

Market characteristics and business practices for the distribution transformer market can vary across regions and countries. Success in one part of the world does not necessarily lead to success in other parts of the world as the regulatory structure, market structure, and business practices can vary significantly. According to a recent study conducted by Power Technology Research,

the distribution substation market continues to grow.

Top level regional differences

In most cases, the market setting in these regions follows the standard model, where a central electricity authority or regulatory body, working directly under the ministry of power or energy, is responsible for the regulation of the generation, transmission, and distribution sectors. These regulatory bodies are also

responsible for setting tariffs and policies, but they are not involved in equipment planning and procurement.

Middle East and Africa region (MEA)

A few major players contribute to 60 – 70 % of the generation and in most countries of the region, the transmission is controlled by one utility. In most cases, the transmission utility is also involved in the distribution. In Africa, rural electrification agencies are common.

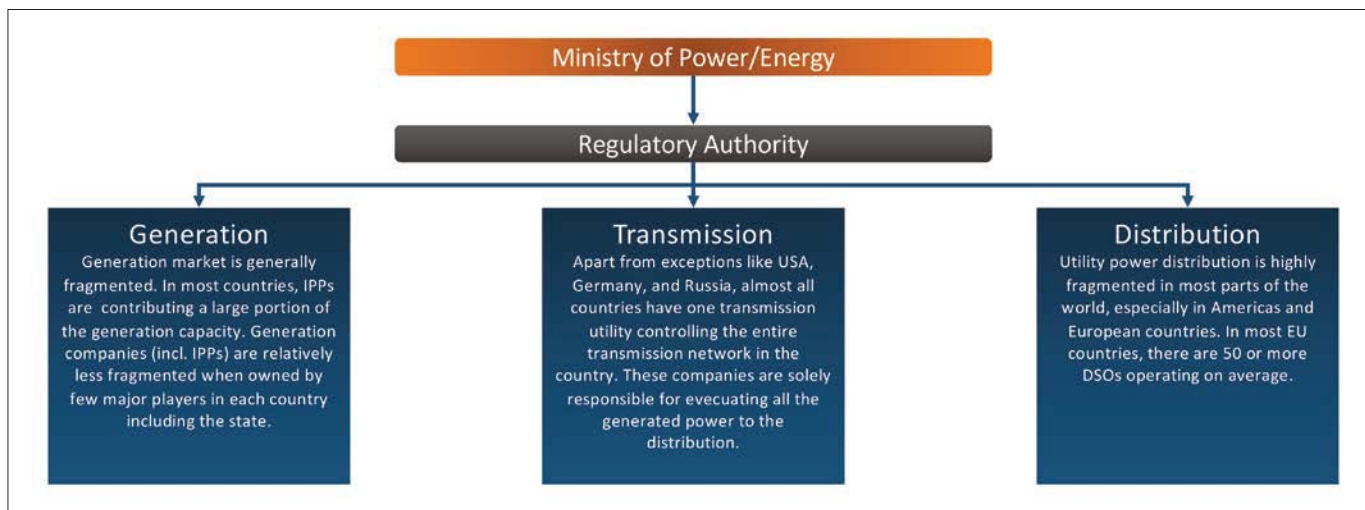


Figure 1. Distribution transformer market

As a general trend, the market in emerging countries is mostly driven by new additions along with replacements, while in developed markets most of the demand is due to end-of-life replacements

Transformer sales typically are made through engineering, procurement, construction companies (EPCs), and this is especially true in countries such as Saudi Arabia and South Africa where turnkey business is prominent. In both these countries, local content (in the form of local manufacturing, local workforce, or local ownership) gives an advantage in the bidding process for tenders.

Europe

In Europe, independent power producers (IPPs) contribute to 70 – 80 % of generation, with the exception of Germany and Russia, where one utility controls the transmission network. Utility power distribution is highly fragmented and in most EU countries there are 50 or more distribution system operators (DSOs) operating.

Most transformer sales go directly to end users. EPCs are very low compared to other regional markets. All large manufacturers have their own EPC arms and will, at times, bid on turnkey tenders. Third party EPCs in the region are focused on new generation and new industrial plant installation projects.

Asia Pacific (APAC)

In this region, each country counts a few players which contribute to 60 – 70 % of the generation capacity. In almost all countries, one utility controls the transmission network. Typically, distribution companies operate in specific states/sub-regions of a country. China is an exception where all aspects of the grid are managed by two state owned companies, SGCC and CSG.

In greenfield projects, such as substation, generation plant, or industrial facilities, distribution transformers are usually sourced through EPCs, but in the case of replacements or for expansion projects, transformers are sold directly to the utility. Large T&D players supplying the distribution transformers either have their own EPC division or partner with a local EPC to offer turnkey solutions in the region.

South America

In South America, major players account for 60 – 70 % of generation and in almost all countries, one utility controls the transmission network. The distribution sector is fragmented into 5-7

utilities that own more than 60 % of the sector.

EPCs are involved in greenfield substation additions or large power plant installations, but replacements and additions of standalone pole-mounted transformers are managed by the utility directly, resulting in a large portion of equipment going directly to the end-customer.

North America

Like in Europe, IPPs contribute to 70 – 80 % of generation, but regional transmission organizations (RTOs) control transmission assets and more than 3,500 distribution utilities control the distribution network leading to a very fragmented market.

Most distribution transformer sales go directly to end users as a big part of the market is replacement driven. EPCs are very low compared to other regional markets. All large manufacturers have their own EPC arms and will, at times, bid on turnkey tenders. Third party EPCs in the region, like in Europe, are focused on new generation and new industrial plant installation projects.

Figure 2 shows a percentage of state-owned generation, distribution, and transmission companies by region. The higher the state ownership, the more consolidated and transparent the market usually is, as almost all state-owned entities across the world advertise tenders and give projects based on bid evaluation with clearly defined criteria.

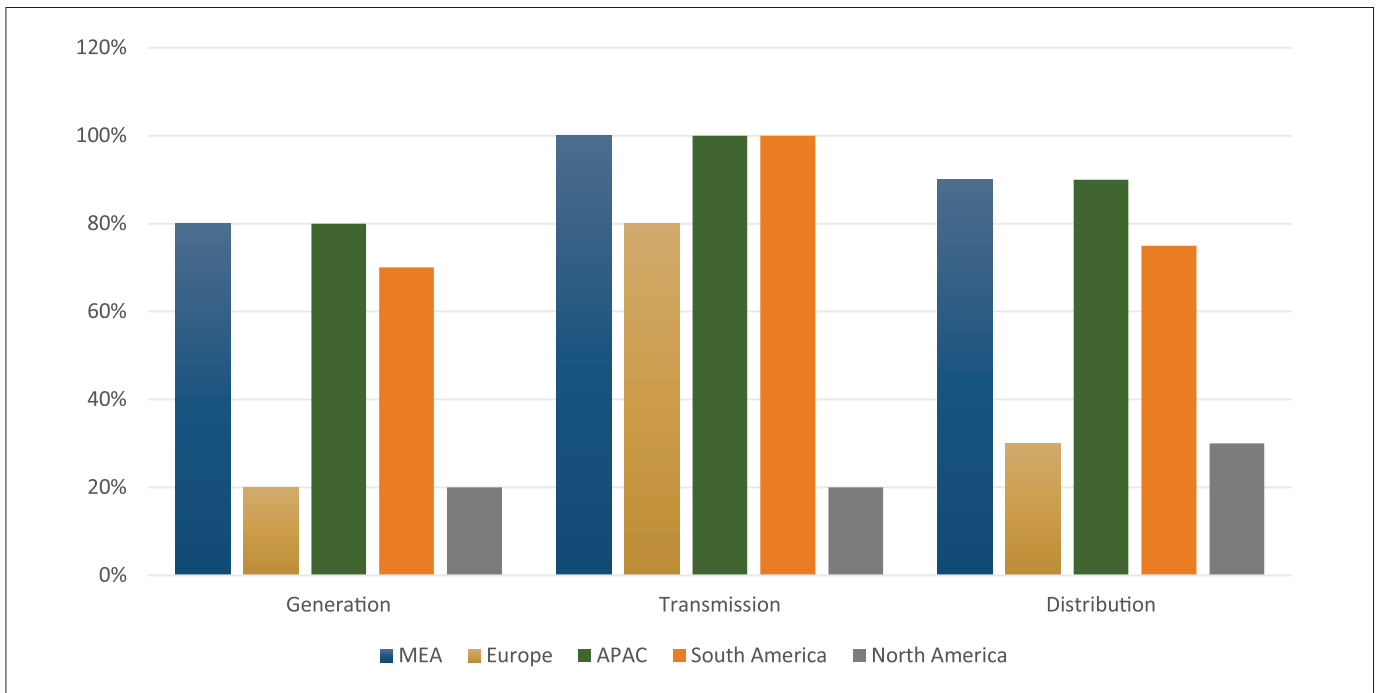


Figure 2. State ownership of generation and grid assets (% of total assets)

MARKET SETTING:

Middle East and Africa

After seeing a strong growth in the last decade, Middle Eastern markets are now relatively stagnant. This is in part due to decreasing oil prices putting projects on hold and the on-going political situation which puts additional economic pressure in the region.

In Africa, there is a major lack of funding for projects. In sub-Saharan Africa, foreign entities are financing certain development projects, and this is mostly

Varying customer base within each of the three verticals (utility, industry and generation), in each of the countries and regions, makes it a difficult market to address

focused on transmission infrastructure or rural electrification, but it may not be enough to sustain a steady market growth. China has also invested in local infrastructure, but the funding usually comes with a pre-requisite for Chinese suppliers to do the fulfillment.

In the MEA region, utility power distri-

bution continues to be the main driver of the demand having constituted ~90 % of the annual market in 2018 followed by industry (mostly chemical and Oil & Gas) at 8.3 % and generation at 2.5 %. However, generation vertical is expected to see the largest growth in MEA region at a CAGR of 10.8 % between 2018-2024.

Europe

In Europe, the distribution transformers market is driven by replacements. The major demand drivers are utility and industry sectors. Currently, a general slowdown is expected in the industrial manufacturing sector and this slow growth is expected to last 2-3 years.

In the EU, the environmentally friendly design of all new transformers and the digitalization, especially in the utilities, is driving the market. The eco-design directive from European Commission has defined the framework for the new transformers to be installed and Tier-1 regulations are already in place since July 2015. Tier-2 stage with stricter requirements is planned to be put in action in

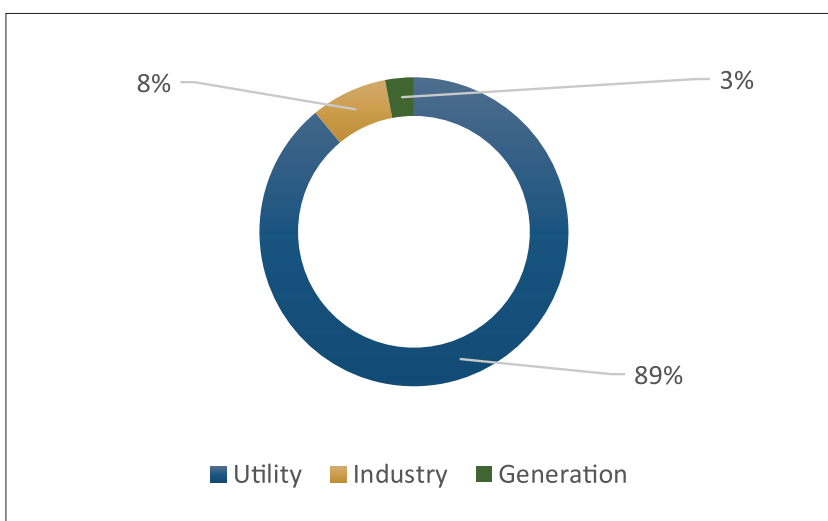


Figure 3. MEA distribution transformer revenue split by application

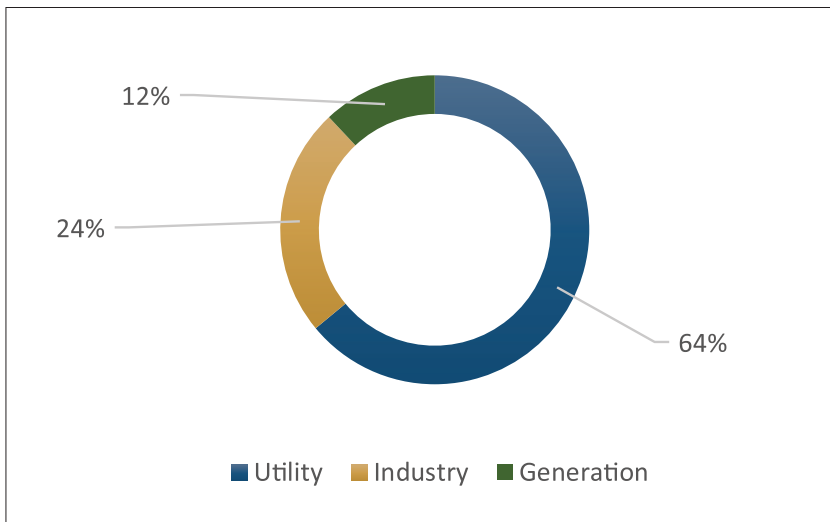


Figure 4. Europe distribution transformer revenue split by application

In the US, utility power distribution is highly fragmented with more than 3,500 utilities operating the distribution grid

2021. Having the connected monitoring and control technologies at distribution level is a key objective for many utilities as part of their smart grid initiatives, especially when it comes to dealing with distributed generation and electric vehicles.

In most European countries, the utility power distribution is highly fragmented. For example, countries like Germany have more than 800 DSOs while France has 160 and the UK has 14. The notable exceptions are Russia, with one

distribution utility, and Greece with two distribution utilities. The manufacturing sector remains strong and forms a large portion of the industrial distribution transformer installations. Power generation is a mix of conventional ~75 % and renewables ~25 % although renewables are expected to form 42 % of the total installed capacity by 2030.

Asia Pacific

Generally, the factors driving the greenfield investments in the distribution grid

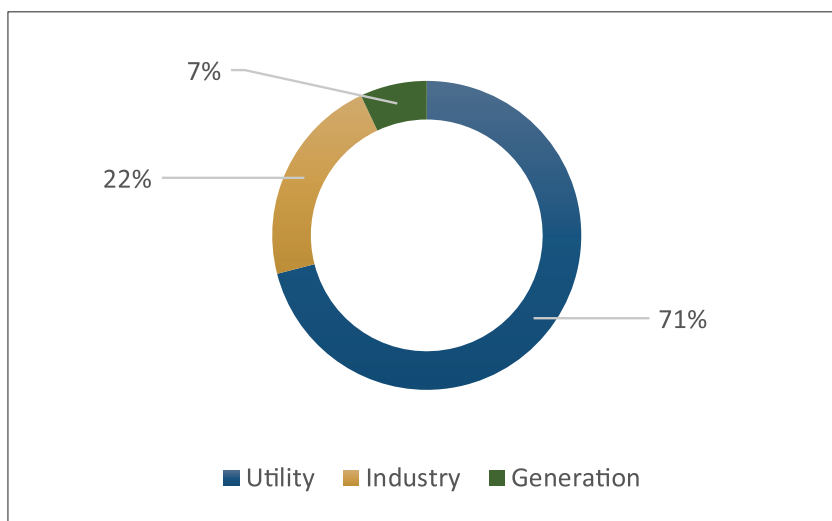


Figure 5. APAC distribution transformer revenue split by application

in this region are electrification and urbanization. In addition, very high number of failure replacements in countries like India are a major driving factor for distribution transformers.

In China, improving transformer efficiency, and a replacement program (called Action Plan for Transformation and Reform of Distribution Network (2015-2020) have impacted the transformer market. In addition, China is one of the few countries in this region where electric vehicle charging infrastructure is instigating digitization. The number of local manufacturers here has grown sharply since 2017 and the competition is fierce. Most of the market share, about 84 %, in this country is held by smaller players.

Typically, in the Asia Pacific region, multiple distribution companies operate in territories usually defined by specific states. China and Indonesia are exceptions to this where one or two state-owned companies operate. Power distribution accounts for the largest share of the revenue. In the industry sector, especially in China and India, chemical, cement, and steel companies are the largest contributors.

South America

Electrification remains the key investment driver, although countries, such as Brazil, are close to 98 %. The greenfield market overshadows the replacement market and distribution companies plan to invest heavily in the expansion of the grid. Smart metering infrastructure is becoming a priority to mitigate massive electricity theft issues.

In the MEA region, utility power distribution continues to be the main driver of demand having constituted ~90 % of the annual market in 2018 followed by industry (mostly chemical and oil & gas) at 8.3 % and generation at 2.5 %. However, generation vertical is expected to see the largest growth in the MEA region at a CAGR of 10.8 % between 2018-2024.

North America

In North America, and especially in the United States, the distribution transformers market is driven by extensive switchgear replacement programs by

Moving forward, we expect the market to become relatively more consolidated with larger players acquiring smaller local companies to maintain their presence in various countries

large utilities and the new addition of distributed generation sources. In the US, utility power distribution is highly fragmented with more than 3,200 utilities operating the distribution grid.

The industry vertical remains strong and forms a large portion of the overall distribution transformer installations. Power generation is a mix of conventional at about 88 % and renewables (wind + solar) at about 11 %. Renewables are expected to form 42 % of the total installed capacity by the next year.

Conclusion

Distribution transformers market, though relatively large equipment market in the T&D domain at \$5.5 billion (2018), is highly fragmented. Varying customer base within each of the three verticals (utility, industry and generation), in each of the countries and regions, makes it a difficult market to address. Especially for a manufacturer with international presence, as almost each country requires a dedicated strategy which cannot be replicated in other markets.

With increasing local content requirements, and high number of local manufacturers in local country markets, profit margins are being driven even lower, making it a less attractive proposition for some manufacturers to expand into the new markets. Moving forward, PTR expects the market to become relatively more consolidated with larger players acquiring smaller local companies to maintain their presence in various countries. This way, they can have the required local presence and still benefit from their international brand image.

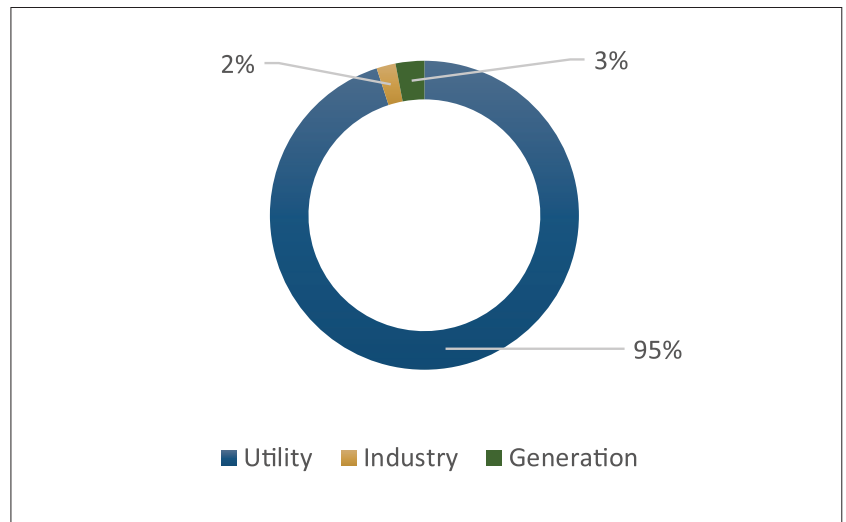


Figure 6. South America distribution transformer revenue split by application

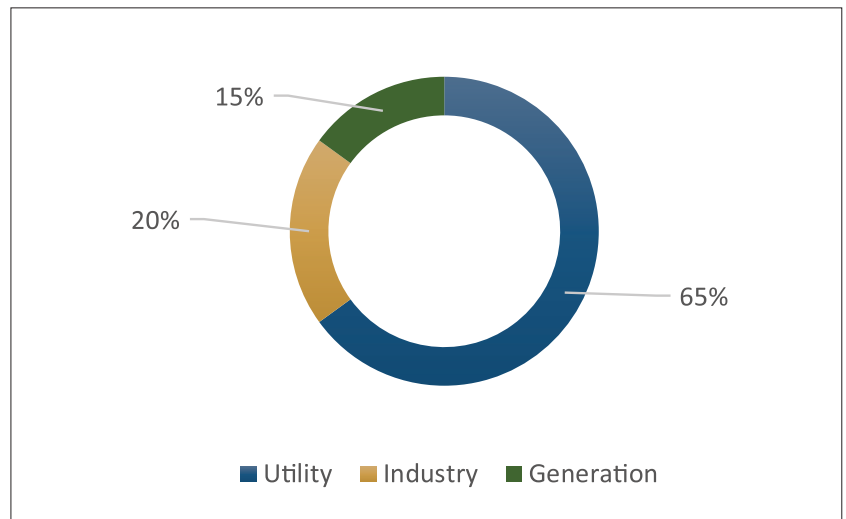


Figure 7. North America distribution transformer revenue split by application

Authors



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