

ABSTRACT

There are many trends that shape the global transformer market right now. In this article a number of trends and market drivers are looked at in order to discuss the transformer market outlook. A clearer market view can support a better strategy creation and tactics planning. Market drivers are changing and more focus is on the renewable energy generation as well as energy efficiency and smart grid investments, while at the same time the globalisation of the manufacturing base including high tech transformer capabilities is continuing.

KEYWORDS

transformer market, market changes, market drivers, trends, growth, competition

Power Transformer Market Review

Trends that shape the transformer market

Transformers have existed for over 130 years and even though base materials have improved, the fundamental transformer physics is still the same as when it was defined during the second half of the 19th century. Despite the relatively old age of basic transformer technology, current trends in society and technology shape the transformer business faster than ever before. In this article we will look at what these trends are and how they shape our

business future. Using trendspotting as a tool for shaping strategies is an old school method with new opportunities given by the ever increasing flow of information.

Today we can easily gain information even from countries where we do not know the language, simply by pushing the “translate internet page” button on the browser, and gain access to updated information from all parts of the world. My trendspotting



” **The Internet is one of the game changers within the global transformer business**

will start with what information technology can do for us in the transformer business, and all the way to what the new market drivers will do for the global transformer market.

Which are then the trends that shape the transformer business environment? Let us have a look:

The Internet as a game changer for global transformer business

The Transformers Forum on LinkedIn has just celebrated the 6th anniversary and it is interesting that on the anniversary day, we could see that new members joined from all the continents! This to me shows that the interest for what is happening within transformer technologies and market is

subject to a wide interest. Most of you that have been in the business long remember that the transformers world was much more local than what it is now. Today a lot more players can and will go global in order to grow the business potential. One of the most important matters as we shape our strategies, be it developing new technologies or looking at new markets, is to have timely and correct information. Today, this is easily available without having large organisations for market research, and can be done with very simple means at your desk or even on the go when travelling. Today we have to assume that everybody is equally updated on what is going on, therefore strategies have to be kept updated accordingly.

At the same time the available information makes prospective employees updated

on what and how companies are doing, which is shaping their understanding and brand attitude. The Internet is therefore shaping our understanding of the business from all aspects and the global impact is instant.

Mergers and acquisitions (M&A) as well as partnering through joint ventures (JV) are also moving more rapidly and shaping new constellations in order to have a broader product portfolio and deeper market reach. By partnering, new JVs can get a larger geographical reach, business scope and capacity. The pace of change is high where strategies and tactics need to be fluid in a way we have never seen before. The Internet may not create new business as such, but with the free flow of information it will have an impact on how the global transformer business is conducted.

Renewable energy and energy change

Several independent studies show that the majority of energy investments will be made in renewable energy sources during the coming decades. An expected 64% of new generation investments [1] will be made in renewables up to year 2030, and are also most likely to increase its balance against energy based on fossil fuels beyond that time. This will have a deep impact on the transformer market as the countries that have the largest renewable energy investments have the renewable energy bases far from the populated areas.

Looking at energy demand, the quickest growth will be in Asia and Africa followed by South America. The powerhouses for energy demand growth will remain China and India, with India having the fastest growth out of all of the larger economies. Here the investments are expected to be slightly different compared to China where solar and wind investments far away

Majority of power investments continue to be in Asia, with Africa as strong runner up for growth

from the populated areas will continue, while in India a high portion of the investments will be rooftop solar installations. Rooftop installations will naturally have a positive impact on the local community but may have a more limited impact on the transformer business as such, due to a lesser weight of long transmission investments.

Renewable energy investments are rapidly approaching parity with fossil fuel energy due to the development of solar voltaic panels, which will drive investments more into the traditional Return On Investment (ROI) type of decisions rather than subsidised government policies, which has been the norm up until only a few years ago.

While a number of developing countries have an increasing demand on electric energy, there are a number

of countries that will have a shrinking energy need at the same time. This is driven by energy efficiency investments in combination with a lower industry output. The change going from fossil fuels to renewable energy sources is driving a need for more investments in transmission capacity. This is the case for many developed countries, specifically for Europe and North America.

Other countries with shrinking energy need, like Japan that also has a transformer supply base, will need to export more in order to even remain on the same transformer factory output volume. We can expect Japanese transformer vendors to get even more active on the export arena due to this fact and M&A activities to enable the growth will be targeted based on domestic market of the factory as well as currency development.



Due to the intermittency of renewable energy, HVDC and FACTS will play an even more important role in the decades to come, in combination with new right-of-way restrictions. HVDC VSC [2] technology will thus play an increasingly important role in the shaping of the future transmission landscape. With this, for transformer suppliers it is of increasing importance to understand these technologies in order to tap into the market opportunities as HVDC investments are expected to outgrow the speed of the general transformer market growth for years to come. The current expected CAGR (compound annual growth rate) of HVDC is at 17% [3], which is effectively 10 percentage points higher than the global transformer market growth, and thus driving a relatively high demand for HVDC connected transformers.

Energy efficiency

The European Commission issued an Ecodesign Regulation [4] that will ensure that transformers progressively become more efficient. This is good news as it will result in better performance of the electricity grid and decrease the European carbon footprint, and it will at the same time make the industry sharper as the regulation will effectively see to that all that want to participate on the European market have to live up to the more strict standards. Those that fail to do so will have to turn to business elsewhere.

This may be a small step when it comes to lowering emissions but as a part of solving the bigger carbon emissions picture, it is still important. When this kind of measure is followed up in other regions, eventually the sum of energy efficiency measures will be notable.

For transformers alone the EU Commission has estimated that the energy savings is equivalent to 50% of Denmark's yearly consumption of electric energy. For one type of product it is already a good start, and when followed up by other industry

and domestic energy savings, it will be a very good progress.

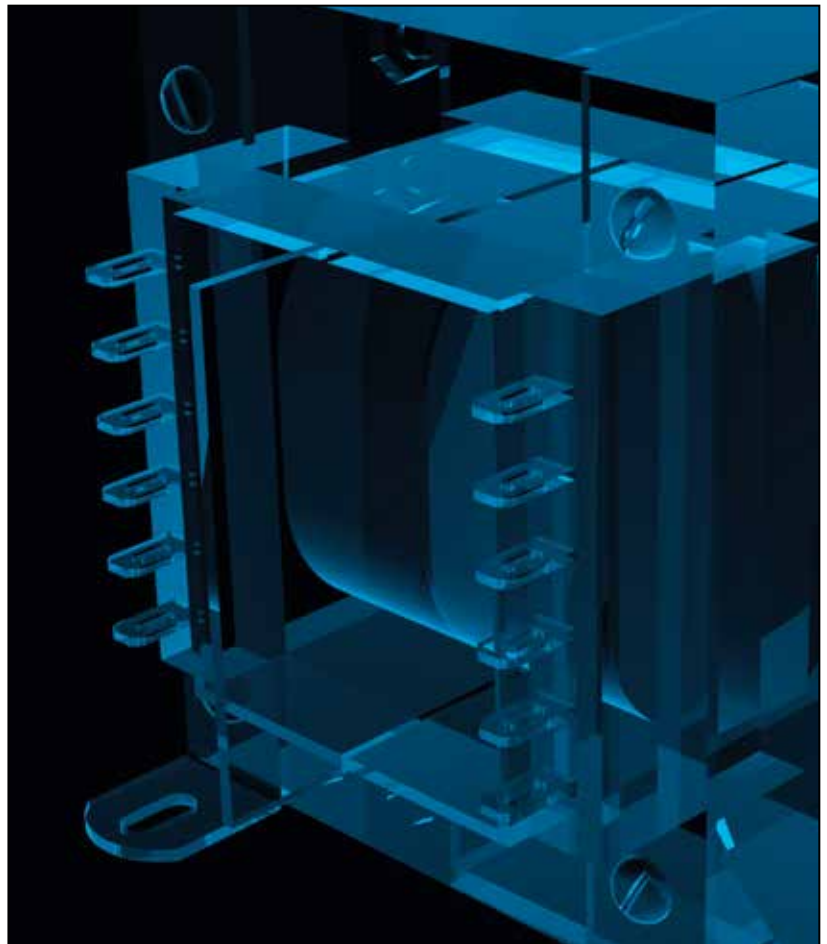
The effect on the transformer business will be that the demand for efficient core steel will increase. For those suppliers that do not have access to low loss core steel it will be tougher to get access to the European market, and at the same time make those that make it on the European market even more attractive in other markets as well due to having more efficient products while driving down the lifetime cost of ownership of such transformers.

Energy efficiency will remain an important driver for the whole transformer industry and we can expect that countries that positively drive these kind of policies

will also drive a more efficient domestic transformer industry. Countries that put up trade barriers on the other hand will slowly but surely make the domestic industry uncompetitive.

Technology development directly related to transformers performance

Power transmission technologies are being developed quickly based on the high need for energy in several countries with long distances between energy sources and demand areas. With this we now experience the development of 1100 kV DC in China as well as 1200 kV AC in India. All this development will have a fundamental impact on the overall market due to the fact that high tech development tends to create a quality trust within the market quicker. High tech development tends to have this effect on all markets, and here the transformer market is not expected to be different.



” Global competition is increasing with high tech transformer capabilities spreading to growth countries

As much of the high tech development is currently in Asia, the trust in players from these countries can also be expected to develop in a positive manner. Just consider how Japanese cars were seen in the 70s and how it is today. We can expect the same kind of development within our industry. There are few products that remain in service as long as transformers do, therefore trust in a supplier's quality has paramount importance for the long term attractiveness of these players. As new transformer manufacturers gain this kind of market trust, it will have an equally paramount effect on the global transformers market playfield. Old and new players have to take this into account when shaping strategies (plans) and tactics (actions) going forward.

Conclusions

Market forecast reports on the transformer market are frequent and the majority are presented in the Transformer Magazine's online version, which make it easy for all of us to follow the forecasting trend in case we are interested.

Looking at recent market research studies, the global CAGR indicators were in the first quarter of 2014 at a consensus level of 7-8% for the coming 5-year period. During the last few months there has been a slight expected decline in the same "index" towards 6-7%. As these predictions estimate a development of a global and complex business, we have to treat these predictions with some caution. While looking at global CAGR data, it is important to also get a total view of manufacturing capacity and regional CAGR and market drivers in order to understand the near

Energy efficiency requirements from governments will drive transformer designs

future. When doing so, we can see that the market outlook for the transformers business looks promising, while at the same time we can expect the global competition to get even tougher. Transformer technology development is not only driven by the development of new materials, but also by the fact that countries where the transmission is developed most quickly have the largest installed bases for transformer manufacturing (Asia).

At the same time we can see great plans for energy investments in South America, Mexico and Africa. In further addition there is an impressive plan for onshore and offshore renewable energy investments in Europe and North America. With all this we can expect a healthy grow within the transformer market for the coming decades, with an increased competitiveness driven by the quick development of the Asian manufacturing base, where the volatility will be driven by currency fluctuations rather than lack of trust for a broader base of new transformer suppliers.

References

- [1] Bloomberg New Energy Finance's 2030 Market Outlook, July 1, 2014
- [2] *Transformers in HVDC Transmission*, Transformers Magazine issue 2, July 2014
- [3] MarketsAndMarkets *HVDC Transmission Market worth by 2018*
- [4] *Energy savings and reduced emissi-*

ons from new efficiency requirements for transformers, European Commission - IP/14/591, May 21, 2014

Author



Matti STOOR has 30 years of global experience in working with transformers as well as HVDC. During more

than 17 years within HVDC, he was involved in design and development of HVDC control systems and later managed the HVDC control systems department and finally was General Manager of the Converter Technologies operation, covering LCC and VSC HVDC technologies in Ludvika, Sweden. Within transformers Matti has had many roles, where the latter included heading ABB's overall Chinese Transformer operations as well as Global Business Development for Power Transformers. Matti is now running a business with focus on supporting clients in improving their holistic performance within the power industry. Matti holds an engineering degree in Control Systems, a Bachelor's degree in Business Administration and an MBA in International Business from Uppsala University, Sweden.



Protect all bushings with continuous, real-time measurement of Tan Delta and Capacitance

Qualitrol's **QCM-TBM** continuously assesses the performance of insulation in bushings so that corrective actions can be taken before any failure occurs.

The information gained from the system is used for condition based maintenance decisions to optimize maintenance expenditure.

www.qualitrolcorp.com

QUALITROL
Defining Reliability