



CWIEME Transformer Day – Post-event impressions

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CWIEME Transformer Day is a specialized digital event focusing on the transformers and components of trans-

formers, held every year, in addition to the “in-person” CWIEME events. This year’s digital event, held on 22 June

2021, focused on a wide range of topics from the global transformers market and the growth drivers to the use of



Wide Band Gap (WGB) semiconductors in the industry and innovations in the transformers space. Event Agenda consisted of three online sessions in a webinar format:

Session 1: Market Report: Transformer market and component developments

Session 2: Influence of new semiconductor technologies in power electronics on the materials of inductive components

Session 3: Innovation & challenges in the utility transformers space

Session 1: Global transformers market analysis

Saqib Saeed, Executive Director Research & Consulting at Power Technology Research presented an exclu-

sive report on *Global transformer market overview* which discussed market size, recovery possibilities, market drivers followed by a discussion on region wise market drivers in the transformer industry including

Driven by various regional and technological factors, such as an increase in electric vehicles, there will be an immense potential for growth of the transformer market

New Wide Band Gap (WBG) semiconductors like GaN and SiC are increasingly used in industrial power electronic applications

the impact of electric vehicles on the grid.

While discussing market size, the transformer market was segmented into power and distribution transformers segment as each segment follows a different trend. Global power transformer market size in 2020 was USD 16 billion which saw 6 % decline from 2019 global transformer market. Decline partially was due to COVID but if we compare it with distribution transformer market, a much larger impact was observed in the growth of distribution transformers. Global market size of distribution transformers stood at USD 7.3 billion USD which observed 19 % decline as compared to 2019 figures. Discussion on market sizing was followed by projections on recovery of the market after covid-19, which in case of the USA, China and Europe, is expected to be back to 2019 levels given a ramp up of investments in the utility and generation segment.

Transformers market growth drivers

Furthermore, light was shed on market growth drivers. As rural electrification projects of China were finished at the end of 2019, there was a natural slowdown in Chinese transformers demand in 2020, leading to a slowdown in the global transformers market. However, moving forward there are expansion plans by major transmission and distribution utilities of China in 2021 that will impact the distribution transformers market in a positive manner.

Additionally, beyond the T&D sector, growth in EV chargers market is creating immense potential for growth in the transformers market. As increases in the electricity demand due to EV chargers require grid upgradation which in turn leads to increase in demand for transformers. The grid in the future will require resilience, interconnectivity and intelligence, even on a transformers level, to support this growth in the renewables and e-mobility sector.

Regional market drivers

Lastly, the regional market drivers were discussed. In the case of renewables, major growth came from the USA and China where major renewable projects were already installed by 2019 followed by a slowdown in the sector expected by the end of 2022. In Europe, grid expansion plans were delayed once again because of COVID, however, the main TSOs / DSOs will now move forward with updated timelines. In the MEA region, progress has started on mega infrastructure projects. Primarily, markets like Saudi Arabia are reaching 2019 levels and the demand is originating from renewable energy sector, too.

Session 2: Influence of new semiconductor technologies in power electronics

Following the presentation by Power Technology Research, Dr. Dennis Kempen from BLOCK Transforma-

toren gave a presentation on *Influence of new semiconductor technologies in power electronics on the materials of inductive components* and covered contemporary power electronic systems, latest wide band gap devices and influence on inductive components.

While discussing contemporary power electronics systems, major applications of power electronics system were discussed including industrial drives, switched mode power supplies, high power converters which are all packed with inductive components.

New wide band gap devices

SiC and GAN are used in the new semiconductor technologies. In comparison to IGBT, SiC MOSFETS offer rise times and switching frequencies 10 times higher. So, with higher switching frequency lower inductance value is required, which means a smaller size of magnetics.

Influence on inductive components

Following on from the discussion on wide band gap devices, it was significant to also discuss the influence of wide band gap devices on the inductive components.

WBG (wide band gap) devices alter the choice of core materials and require high frequency materials where every core material has an optimum between frequency, required volume, loss and price. Electrical steel is the cheapest material but eddy current losses are very high. At the same time, we need to know that creepage distance increases with the frequency. Lastly, higher switching frequency means increased aging.

The last session was a panel hosted by PTR, discussing the future of renewables, challenges and opportunities for our industry, and the need for sustainable and cost-effective strategies that are in line with global and national objectives

Innovation & Challenges in the Utility Transformers Space

Panel participants



Chris Gerber
Brand Ambassador & Advisor,
Power Technology Research



Merve Maden Avci
Product Manager for
Transformers, Substations
& Cable Accessories, Eaton



Lucas Branco de Oliveira
Business Development
Manager, Cargill



Andreas Hilgers
Sales Manager EMEA,
Vaisala



Session 3: Innovation & challenges in the utility transformers space

The last session of the day was a panel discussion on *Innovation & challenges in the utility transformers space*, which was moderated by Chris Gerber, Brand Ambassador and Advisor at Power Technology Research where EATON, Cargill and Vaisala presented their take on the energy transition followed by an interactive Q&A session.

Merve Maden Avci, Product Manager Transformers, Substation & Cable Accessories at EATON, gave a presentation on 'Powering tomorrow's grid with sustainable transformers' covering energy transition and the Tier-2 eco-design directive of the European Union and energy savings in detail. Electricity demand is likely to increase 57 % by 2050 and in the same year share of renewables in the electricity generation will reach up to 75 %. Electrification of the transport sector will increase to be 27 % of global electricity demand by

2030. System resilience will become more important with the energy transition and there will be a 5–12 % increase in outage minutes.

Discussion on energy transition was followed by a discourse on eco-design directives of the European Union. It is a framework for setting of eco-design requirements to make energy related products more efficient by decreasing energy losses and pollution. The framework is an efficiency guideline which sets minimum efficiency levels for transformers including small, medium and large transformers. Tier-1 of the framework came into effect in July 2015 where the 2nd phase would come into effect on 1 July 2021.

Followed by that, Lucas Branco de Oliveira, Business Development Manager at Cargill presented on *resilient transformers* and discussed how grid resilience needs to be higher keeping in view the increased demand of electricity and that transformers are a vital part of the grid. This ties in with the FR3 natural ester-based insulation medium which Cargill is offering to the

transformers market as a solution to transformer fires and an alternative to dry-type transformers.

The final presentation of this session was given by Andreas Hilger, Sales Manager EMEA at Vaisala. The presentation focused on *Maintenance-free online DGA monitoring* and shed light on how smart grids can be supported with maintenance free online DGA monitoring leading to increased safety and reliability.

The recorded digital event can still be viewed at the event website here [CWIEME Transformer Day](#). In addition to it, the *Market report: Transformer market and component developments* is also available to download now here: [Market Report: Transformer Market and Component Developments](#).