

# Supply–Demand Dynamics in the Transformers Market

*Trends, Challenges, and Strategic Opportunities*

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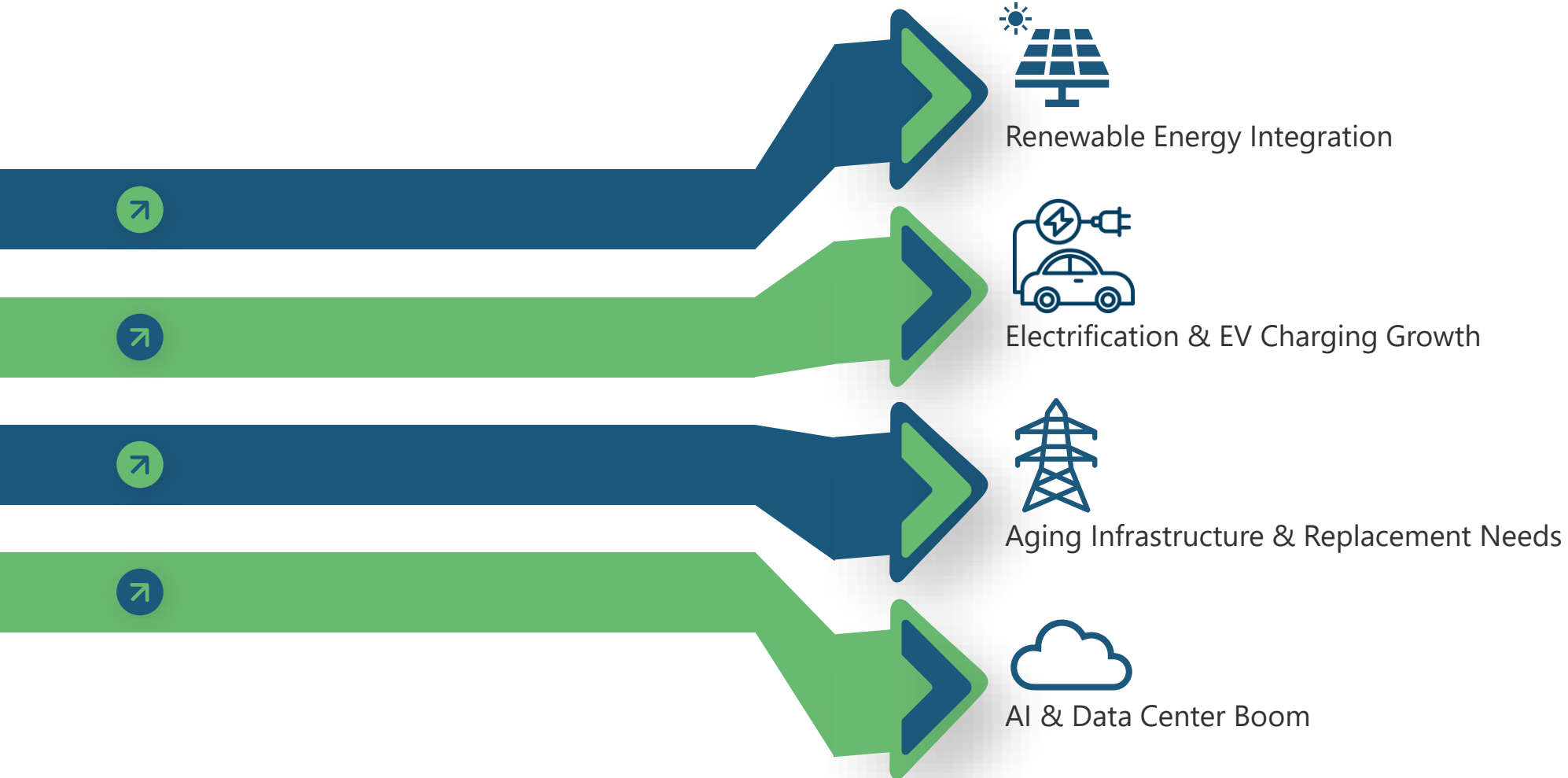
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# The Structural Forces Redefining Transformer Demand

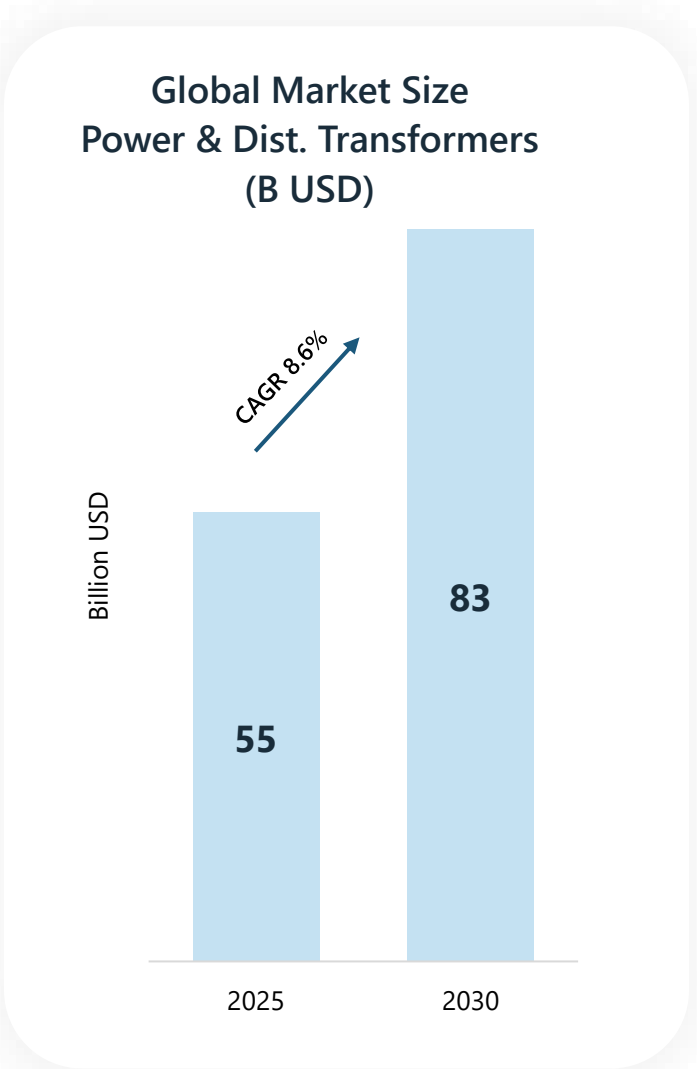
Long-term demand due to strong underlying market drivers



# Global Transformers (Power & Distribution) Market Outlook



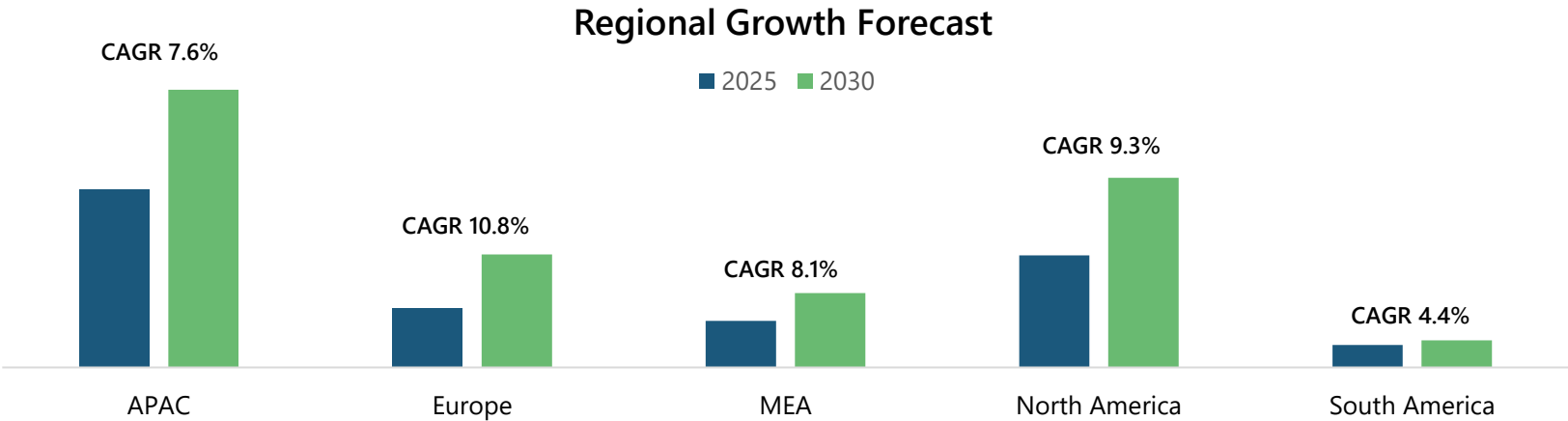
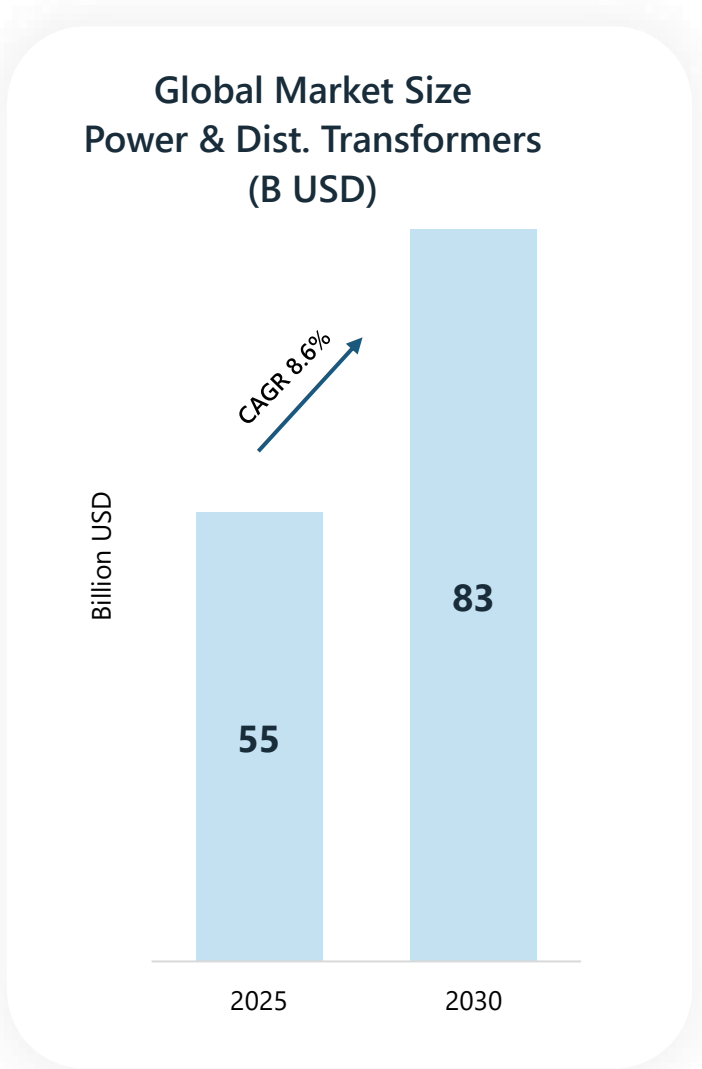
Critical expansion phase, underpinned by diverse demand drivers prompting utilities to accelerate grid investments



# Global Transformers (Power & Distribution) Market Outlook



Critical expansion phase, underpinned by diverse demand drivers prompting utilities to accelerate grid investments



The global transformers market is entering a steady multi-year growth cycle, rising from USD 55B to nearly USD 83B by 2030.

- APAC: supported by rising electricity demand, rapid industrialization, and strong solar and wind additions.
- Europe: fastest scaling region due to ambitious renewable targets, and major grid-upgrade programs.
- MEA: strong potential through mega-projects, utility-scale solar, and national grid expansion.
- NAM: driven by an aging transformer fleet, data centers, and renewable growth.
- SAM: grid modernization and infrastructure upgrades.

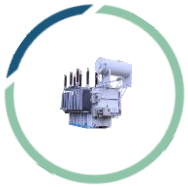
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# Power Transformers Market Overview

# Global Power Transformer Market - Demand Overview



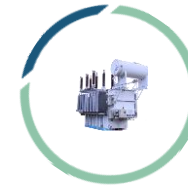
Utilities are substantially scaling up capital expenditure plans, in some cases up to 5 times



**Annual Market - 2025**  
**BUSD ~30**



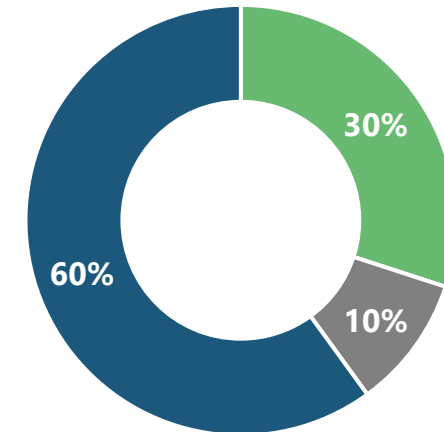
**CAGR 2025-2030**  
**10.4%**



**Annual Market - 2030**  
**BUSD ~50**

- Spending is evolving from maintenance-driven upgrades toward large-scale grid modernization and expansion.
- Utilities are facing structurally higher capital expenditure requirements.
- Large-scale transmission expansions and cross-border interconnection build-out across North America, Europe, and the Middle East also support robust demand.
- Lead times for power transformers are extending into 2030 and beyond as global demand continues to outpace manufacturing capacity.

2025 Market Split (Verticals)



■ Generation ■ Industry ■ Utility

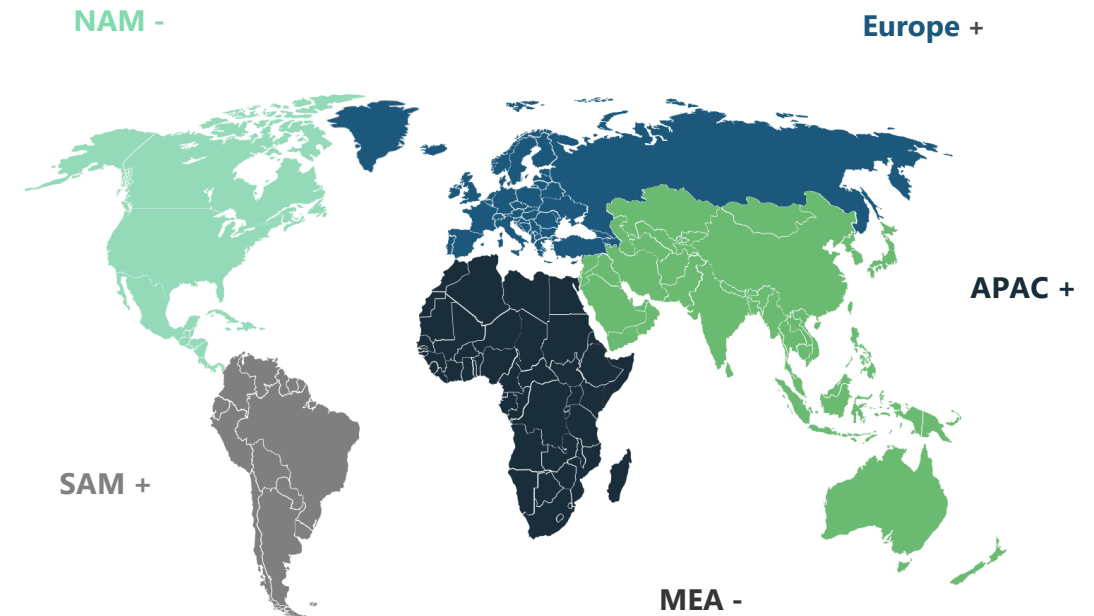
# Supply Chain Polarization: The Global Capacity Paradox



Global power transformer market supply is more than the current demand

- 2025 Actual Production: 2.1 Million MVAs
- 2025 Total Production Capacity: 3.3 Million MVAs
- Utilization Rate: 64%
- While theoretical capacity exists, actual output lags due to the following:
  1. Regional imbalances in supply and demand
  2. Critical components shortages
  3. Labor and trained manpower shortage
  4. Trade restrictions across countries
  5. Vendor approval challenges
- Historical investments in power transformer manufacturing, especially in Europe and the Americas region.

## Regional Production Capacity vs. Demand Gaps (2025)



**Surplus/Deficit: Total Production Capacity - Actual Demand**

**Surplus: +**

**Deficit: -**

# Regional Power Transformers Supply Dynamics



The gap between supply and demand is likely to stay, however with higher factory utilization rates by 2030

## Europe

- 2025 Regional Demand: 220,000 MVAs
- 2025 Actual Production: 270,000 MVAs
- 2025 Total Production Capacity: 330,000 MVAs
- Utilization Rate: 82%, constrained by QC issues, testing failures, material shortages, and supply chain disruptions.
- Net exporter of transformers – exports focused on large units to North America and MEA; imports of small-to-medium units (renewables).

## North America

- Heavy reliance on imports (>80%) – current LPT capacity is expected to nearly double by 2030, with more than 70% of growth already announced.
- Facilities running at 90%+ utilization, constrained by component delays (notably bushings, tap changers) and skilled labor shortages.
- Despite \$1 Billion+ in announced expansions (GE Vernova, WEG, Siemens Energy), the US remains a net importer with more than 100k MVA annual gap.
- Lead times still stretched: 1.5–2 years for small/medium units; 6–7 years for LPTs, with deliveries quoted into 2031.

# New Production Facilities and Expansions - Europe



Focus on large power transformers. Hitachi Energy has the largest number of expansions planned within the region

Hitachi Energy has announced an investment exceeding €30 million to expand its facility in Bad Honnef, Germany.

Siemens Energy has announced €220 million to expand its power transformer facility in Nuremberg, Germany, increasing production capacity by ~50% by 2028.

Hitachi Energy has announced an €80 million investment to expand its facility in Córdoba, Spain.

■ **Large Power Transformers Facility**  
▲ **Small to Medium Power Transformer Facility**

Hitachi Energy has announced an investment in Turkey. A new 45,000 sq. m. state-of-the-art facility in Dilovası will increase production capacity by 70%.

Hitachi Energy is investing nearly €170 million in its Vaasa, Finland facility, where it manufactures small power transformers.

Hitachi Energy's largest expansion plan in Europe is focused on its Ludvika, Sweden, facility, with a pledged investment of €327 million.

R&S Group Holding AG to double power transformer manufacturing capacity under the "ZREW" brand in Łódź, Poland, with \$31 M investment.

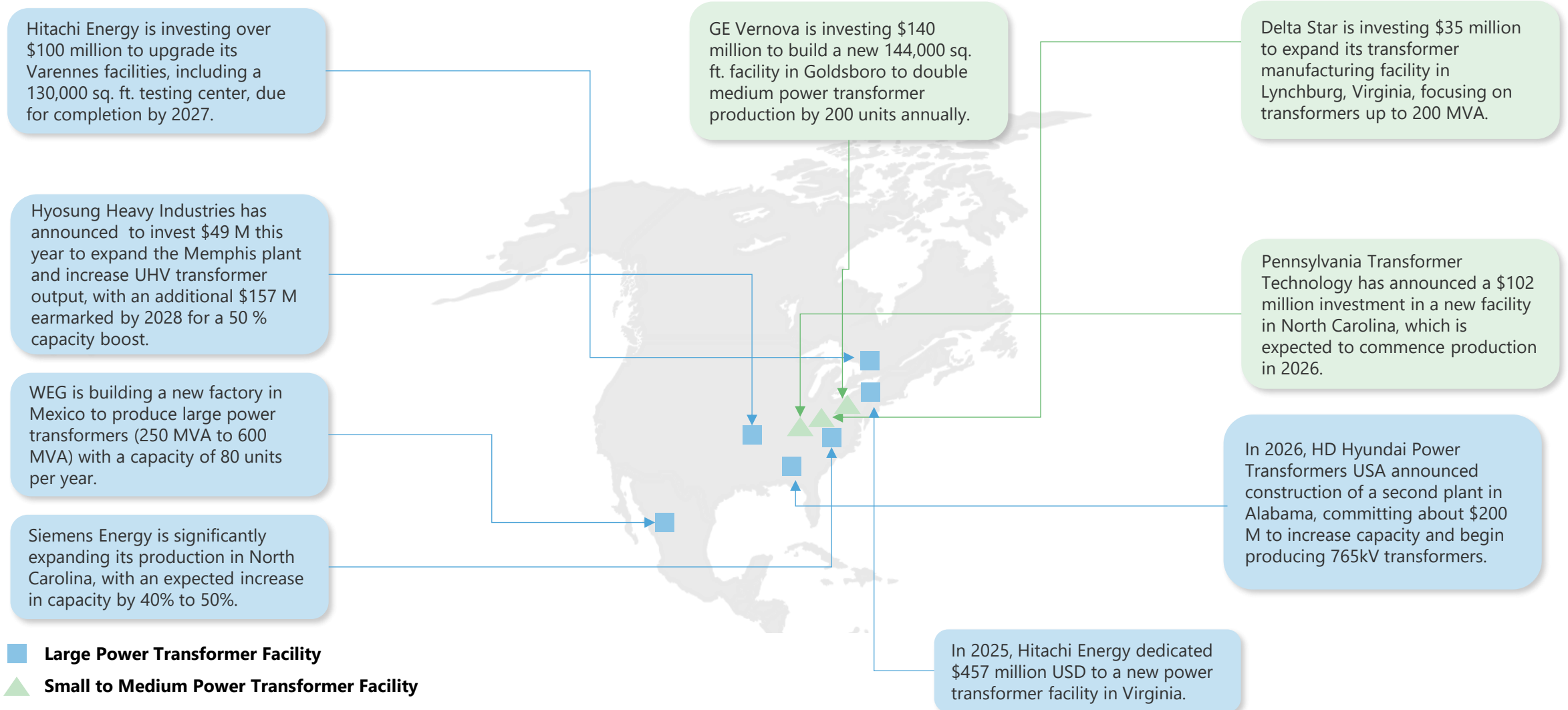
KONČAR and Siemens Energy are investing EUR 60 M to expand their large power transformer facility in Zagreb. Construction of the expanded plant began in 2026, with completion expected by 2031.

Ganz Electric, under its "GANZ 2030" investment program plan, is building a new 6,500 m<sup>2</sup> transformer facility in Tápiószéle, Hungary which is set to double its capacity by 2026.

# New Production Facilities and Expansions – North America



Most expansions in North America are also focused on large power transformers



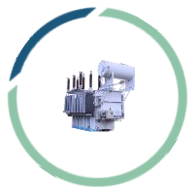
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# Distribution Transformers Market Overview

# Global Distribution Transformers Market - Demand Overview



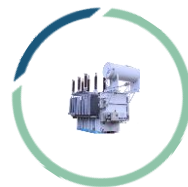
Utility-scale networks and solar applications keep oil-immersed transformers the dominant technology in use



**Annual Market - 2025**  
BUSD ~25



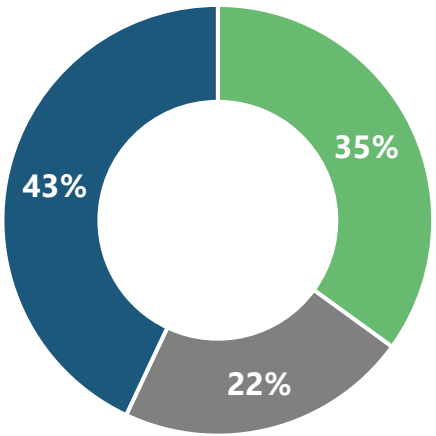
**CAGR 2025-2030**  
6%



**Annual Market - 2030**  
BUSD ~35

- Driven by rising electrification loads, grid resilience mandates, and the broader decarbonization initiatives, with major spending on upgrading local networks.
- The average transformer size within utility distribution networks has risen in recent years.
- Dry-type transformers to grow with almost double the CAGR of oil-type transformers.
- Pad-mounted solutions are expected to outpace traditional pole-mounted alternatives.

2025 Market Split (Verticals)



■ Generation ■ Industry ■ Utility

# Global Distribution Transformer Market – Key Market Dynamics



Localization policies tend to favor domestic suppliers across most markets

Unlike power transformers, the distribution transformer market is typically regional due to simple manufacturing and standardized designs.

## Localized Market



Local production enhances competitiveness by reducing \$/kVA, speeding delivery, and improving service.

## Competitive Supplier Mix



## Lead Times



Lead times vary significantly by region and local manufacturing capacity, with APAC benefiting from shorter delivery timelines, around 12 weeks, due to strong production capabilities, while the Americas face extended lead times driven by tighter supply conditions, averaging 34 weeks.



## Investment Trends

North America leads globally in distribution transformer capacity investments, recording the highest number of new facilities and capacity expansions compared to other regions.

# Regional Distribution Transformers Supply Dynamics



North America maintains a clear and persistent pricing premium compared to other regions

## Europe

- 2025 Regional Demand: 180,000 Units
- 2025 Actual Production: 190,000 Units
- 2025 Total Production Capacity: 260,000 Units
- Utilization Rate: 72%, the persistent gap between capacity and production implies opportunities for manufacturers to increase output without additional capacity investments.
- Exports more dry-type transformers than oil-type and mostly to the MEA market.

## North America

- The U.S. meets roughly 80% of its small distribution transformer demand through domestic production, while importing the remaining 20%.
- Within that 2025 imported share, Europe contributed only ~2–3%, while Mexico accounted for 56%, South Korea (~18%), South America (~10%), China (~9%), and Canada (~4%).
- In North America, distribution transformer prices are on average ~5x higher in \$/kVA terms compared to global benchmarks.
- Utilities in the U.S. are currently experiencing significantly extended lead times for transformers, with delays reaching up to 2 years.
- EMEA manufacturers are pivoting to ANSI-compliant designs to capture the US supply gap.

# The US Demand Handoff: From Renewables to the Data Center Surge



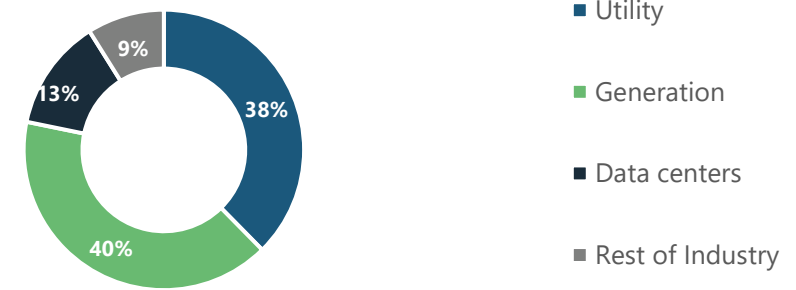
Data centers and renewables accelerate U.S. transformer demand, with utilities still being the center stage

- Renewables are estimated to account for ~40% of demand for distribution transformer units in 2025, before easing to ~30% by 2030, suggesting the mid-decade peak reflects the tail end of an aggressive renewables build-out that moderates later in the decade.

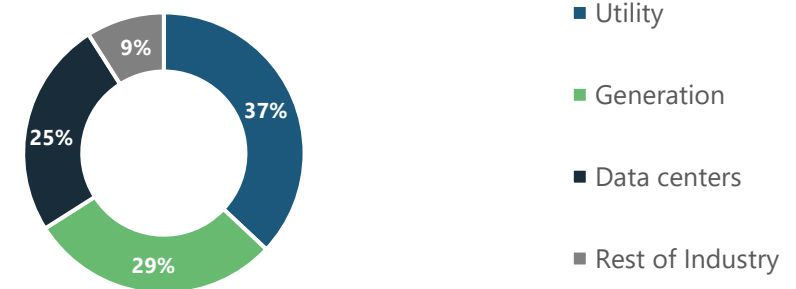
The U.S. is set to add approximately 175 GW of solar and nearly 36 GW of wind capacity between 2025 and 2030, directly increasing the distribution transformers demand and driving preference for higher-efficiency designs.
- In parallel, data centers are expected to increase their share from ~13% in 2025 to ~25% by 2030, becoming a progressively larger driver of demand.

U.S. data centers consumed roughly 184-210 TWh of electricity in 2024, projected to rise to 485–600 TWh by 2030, increasing their share to 6.7–12% of national demand.
- Similarly, in the small to medium power transformer segment in North America, particularly the U.S., the rapid growth of the data center market is expected to create a significant supply–demand gap.

DT Demand - Market Split (Vertical wise) - 2025



DT Demand - Market Split (Vertical wise) - 2030



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# **Component Shortages: Supply Chain & Supplier Response**

# Supply bottlenecks have delayed OEM supply expansion



Component and raw material shortages mean lower utilization rates & delays in capacity expansion

## Transformers Supply Chain

- The most acute bottleneck is not factory floor space but rather access to critical components and skilled workforce.
- Transformer component suppliers are transitioning from passive vendors to capacity enablers.
- Bushings and OLTCs have been identified as the primary causes of assembly delays worldwide.
- OLTC sourcing increasingly relies on limited suppliers, including MR, Hitachi Energy, CTR even in Asian markets.
- High-voltage bushings are dominated by a limited set of manufacturers, including Pfisterer, Trench, Yash HV and Crosslink.
- GOES supply runs through Nippon Steel, Thyssenkrupp, Baosteel, and Cleveland-Cliffs, with the US relying on a single domestic producer.

## The Supply Vacuum for Suppliers

- Critical bottlenecks has created a window of opportunity for independent component makers, as OEMs cannot expand meaningfully faster than their critical component suppliers can scale.
- MR launched a major global capacity expansion program in 2024 across Germany, Italy, the U.S. and China to increase OLTC production capacity, helping stabilize on-load tap changer delivery times at approximately 16 weeks in 2026.
- Trench has announced major capacity-expansion investments, most notably a new bushing facility in the U.S. and a significant scale-up (nearly doubling) of HV components production capacity in Austria.
- Hitachi Energy has also announced major investments of more than \$250 million USD by 2027 to expand global production of critical components for transformers. It recently inaugurated a transformer components factory in Dilovası, Türkiye.

# 04

## Strategic Takeaways

# Strategic Takeaways for your 2030 Roadmap



The transformer market is no longer a commodity market; it is a strategic asset market requiring active procurement planning



## For Transformer OEMs

- European and Asian OEMs have an option to address the U.S. market by obtaining IEEE/ANSI compliance and positioning their products, especially SMPTs.
- Centralize component/raw material procurement and diversify the supplier base. Provide long-term order visibility to your vendors, enabling them to invest confidently in capacity expansion.
- Winning the next couple of years is about locking in predictable volumes with disciplined margins, not expanding nominal capacity.
- The biggest risk to 2030 targets isn't only materials, but the shortage of trained technicians. Strengthen workforce resilience by Upskilling, AI-assisted workflows, and smarter use of late-career talent.

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## For Component & Raw Material Suppliers

- Mandatory disclosure frameworks such as CBAM are driving OEMs to require end-to-end material traceability from upstream suppliers, making it a baseline qualification requirement rather than a competitive differentiator. Failure to meet these expectations risk exclusion from major tenders.
- Build credibility with end users and utilities through targeted marketing that demonstrates performance, reliability and compliance with grid-critical standards.
- Partner with new OEMs entering global markets, especially where specific brands of components are not specified.
- Align growth with OEM capacity expansions already announced.

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## For Utilities/End-Users

- The shift from Just-in-Time to Strategic Stockpiling and pre-ordering equipment before project site approvals.
- Relax vendor approval processes to onboard new suppliers, expanding sourcing options for transformers, components, and raw materials.
- Prioritize timely decommissioning and end-of-life planning within broader asset management and replacement strategies.
- Go digital: adopt online asset health monitoring to predict failures, reduce downtime, and lower repair costs for critical transformer assets.
- Consider adopting remanufacturing, retrofitting, and secondary-market transformers to manage prolonged procurement lead times.

# Questions?

To download the presentation, scan the QR code



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