Press Release
May 5th, 2021
LYON, France

The GaN power market will surpass $1 billion in 2026[1]

The GaN power market doubled in 2020, highlighting the impressive growth of smartphone fast chargers and leading the way for telecom and automotive markets.

OUTLINE:

- Market forecasts:
  The GaN[2] power market is expected to reach the US$1.1 billion mark in 2026.
  In 2026, consumer applications, as the main driver, will represent 61% of the total GaN market.
  The consumer market segment will grow to ~US$672 million in 2026 with a CAGR[3] of 69%.
  The automobile market segment will grow to ~US$155 million with a CAGR of 185%.
- Technology trends:
  More new players enter the market with GaN-on-Si[4] e-mode technology, targeting the booming fast-charger segment.
  GaN-on-Si is considered the platform to expand capacity for foundries in the coming years. However, some challenges remain in epitaxy for larger wafer size.
  Some notable investments have been made at the GaN epitaxy and fab level to increase GaN device fabrication capacity.
- Supply chain:
  Power Integrations and Navitas increased their market share within the power GaN market thanks to the fast-charging application for smartphones.
  STMicroelectronics has strengthened its position and product portfolio through its collaboration with TSMC, and the acquisition of majority stakes of Exagan.
  Texas Instruments and GaN systems have lately qualified their GaN device for automotive applications.
  EPC, Transphorm, and Infineon pursue their penetration within several applications to name a few the datacenter and aerospace markets.

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[1] Extracted from: GaN Power 2021: Epitaxy, Devices, Applications and Technology Trends report, Yole Développement, 2021
[2] GaN: Gallium Nitride
[3] CAGR: Compound Annual Growth Rate
[4] GaN-on-Si: GaN on Silicon

"Following Oppo's adoption of GaN in its 65W inbox fast chargers for its Reno Ace flagship model in late 2019, several phone OEMs and accessory charger providers released GaN-solution design wins for their fast chargers in 2020." asserts **Ahmed Ben Slimane, PhD, Technology & Market Analyst, Compound Semiconductors and Emerging Substrates at Yole Développement (Yole).**

The GaN power market doubled in 2020 compared to 2019 and is poised to surpass the US$1 billion mark in 2026. As further confirmation of this impressive GaN market growth, Yole forecasts that the markets for telecom & datacom and automotive & mobility will contribute in the mid- to long-term to overall growth, benefiting from GaN's ascension in fast chargers.

In this context, Yole investigates disruptive power GaN technologies and related markets in depth, to point out the latest innovations and underline the business opportunities. Released today, the GaN Power 2021: Epitaxy, Devices, Applications and Technology Trends report provides a clear understanding of the GaN power industry, covering markets from epiwafers to discretes and GaN IC[5]s. It also analyzes the market drivers and bottlenecks within the GaN power industry by studying GaN adoption for different end-applications and supply chains. This study also delivers an in-depth understanding of the ecosystem and main players' strategies.

What is the status of the GaN power industry? What are the economical and technical challenges? What are the key drivers? Who are the suppliers to watch, and what innovative technologies are they working on? What are the recent investments, mergers and acquisitions? Yole presents today its vision of the GaN power industry.

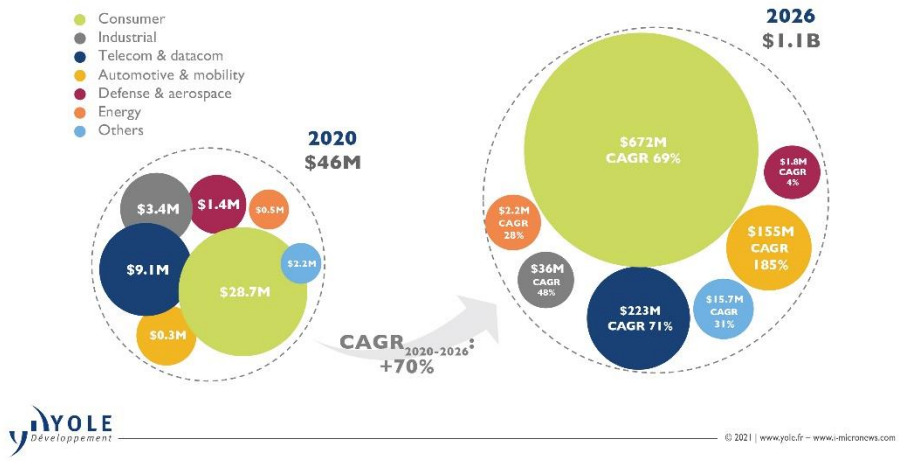
As analyzed by Yole's team in the new GaN Power 2021: Epitaxy, Devices, Applications and Technology Trends report, in the consumer market, GaN enjoyed a successful year in 2020 thanks to several companies, such as Xiaomi, Lenovo, Samsung, Realme, Dell and LG, as well as other Chinese aftermarket companies that adopted GaN technology. Yole expects the GaN consumer power supply market to be the main driver, as this market is forecast to grow from almost US$29 million in 2020 to around US$672 million in 2026 with a CAGR of 69%.

According to **Poshun Chiu, Technology & Market Analyst specializing in Compound Semiconductor and Emerging Substrates at Yole**: *"In the telecom & datacom market, which requires more efficient, smaller power supply amidst tighter regulations for energy consumption, datacenter & telecom operators are already interested in GaN devices".*

[5] IC: Integrated Circuit

2020-2026 power GaN market forecast split by application

(Source: GaN Power 2021: Epitaxy, Devices, Applications and Technology Trends report, Yole Développement, 2021)



Following the first small-volume adoption of GaN-based power supplies by Eltek, Delta, and BelPower in recent years, Yole expects a larger penetration of GaN, with a market valued at US$9.1 million in 2020 and a $CAGR_{2020-2026}$ of 71%, reaching more than US$223 million in 2026. *"The automotive & mobility market is also paying lots of attention to GaN, following big incentives for the electrification of cars and the interest in increasing driving range through system efficiency optimization".* asserts **Poshun Chiu**. Players such as EPC, Transphorm, GaN Systems, Texas Instruments and Nexperia are AEC qualified. The major IDM[6] STMicroelectronics, through partnership and acquisition, is also targeting GaN for EV[7]s. Starting from 2022, GaN is expected to penetrate in small volumes in applications such as OBC[8] and DC/DC converters, mainly related to sampling by OEM[9]s and Tier-1s. Yole expects the automotive & mobility market to reach more than US$155 million in 2026.

In 2020, the power GaN market doubled thanks to an impressive penetration of GaN devices in fast charger applications. The adoption of GaN in the smartphone market is fueled by system compactness, high efficiency, and adapter multifunctionalities. Fast charging is likely to be the killer application for the GaN power device market. So far, at least 10 smartphones OEMs have launched more than 18 phones with an inbox GaN charger. This growth will continue in the aftermarket as well, with companies like Apple, Xiaomi, and Samsung opting for an out-of-the-box charger solution. How will these OEMs' decisions affect the GaN market? What are the possible market scenarios for GaN adoption?

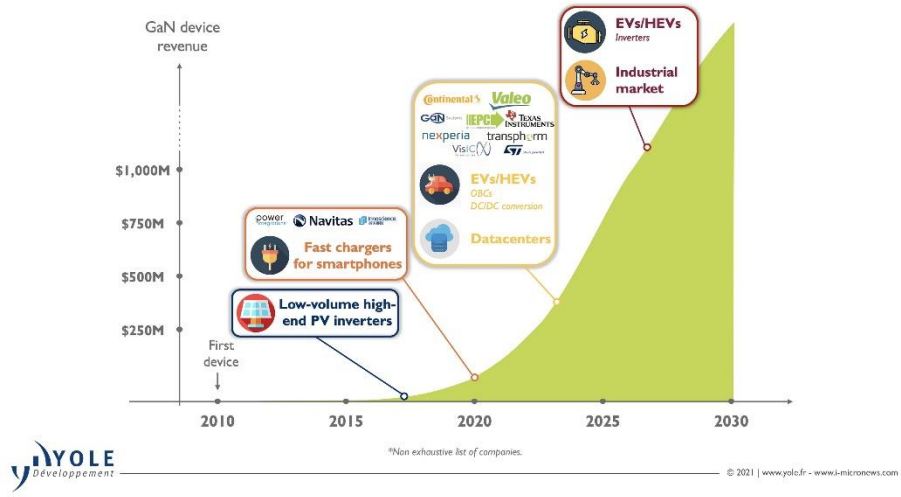
For **Ahmed Ben Slimane**: *"While GaN continues its ascension in the mass consumer market, the markets for telecom & datacom and automotive & mobility will benefit from the "economy of*

[6] IDM: Integrated Device Manufacturer
[7] EV: Electric Vehicle
[8] OBC: On Board Charger
[9] OEM: Original Equipment Manufacturer

scale effect" and price erosion. Indeed, in these markets where reliability and cost are paramount, Yole expects that GaN penetration will see increasing volumes starting from 2023 – 2024".

Roadmap for GaN power devices

(Source: GaN Power 2021: Epitaxy, Devices, Applications and Technology Trends report, Yole Développement, 2021)



In the long term, in cases where GaN has proven its reliability and high-current capabilities at a lower price, it can penetrate the more challenging EV/HEV[10] inverter market and the conservative industrial market, which could create remarkable high-volume opportunities for GaN. In fact, Nexperia and VisIC are working on GaN solutions for xEV inverters to compete with SiC and Si.

All year long, Yole Développement publishes numerous reports and monitors. In addition, experts realize various key presentations and organize key conferences.
In this regard, do not miss CS Mantech 2021, on May 24-27 with the following presentations:

- *The Rise of Power SiC and GaN Market and The Impact of COVID-19* - Ahmed Ben Slimane, Technology & Market Analyst, Compound Semiconductors and Emerging Substrates at Yole
- *How are High-Volume 3D Sensing Applications Shaping the Compound Semiconductor Industry?* - Ezgi Dogmus, Team Lead Analyst, Compound Semiconductors and Emerging Substrates at Yole
- *5G Smartphone and Telecom Infrastructure Markets Are Empowered by Compound Semiconductors* - Poshun Chiu, Technology & Market Analyst, Compound Semiconductors & Emerging Materials at Yole

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[10] EV/HEV: Electric Vehicle/Hybrid Electric Vehicle

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About our analysts

Ahmed Ben Slimane, PhD. is a Technology & Market Analyst, specialized in Compound Semiconductors and Emerging Substrates at Yole Développement (Yole). As part of the Power & Wireless team, Ahmed is contributing to the development of dedicated collection of compound semiconductors market & technology reports and monitor. Previously, he worked as an epitaxy (MBE/MOCVD) & fabrication process engineer for GaAs-based photovoltaic applications at TOTAL and IPVF (Paris-Saclay, France). Ahmed also completed his PhD in Material Engineering from KAUST (Saudi Arabia), where his mission was focused on GaN-based microstructures for flexible solid state lighting. During his career, Ahmed has presented work in front of an international audience. He has authored/co-authored more than 20 publications in the semiconductor field and submitted a patent on the III-V hetero-structure for the PV industry. Ahmed obtained his master's degree in electronic engineering from INPG (Grenoble, FR).

Poshun Chiu is a Technology & Market Analyst specializing in Compound Semiconductor and Emerging Substrates at Yole Développement (Yole). As a member of the Power Electronics & Wireless division at Yole, Poshun focuses on power, RF, and opto-electronics. He is engaged in the development of technology and market reports and is also involved in custom projects. Before joining Yole, Poshun had 9 years' experience in R&D and product management at Epistar (TW & CHN). He is the author or co-author of more than 10 patents in solid-state-lighting. Poshun was also engaged in the development and evaluation of novel applications of process technology and components based on relevant semiconductor material systems. Poshun received an MSc degree in Microelectronics from National Cheng Kung University (TW) and an MBA from IESEG School of Management(FR).

About the report

GaN Power 2021: Epitaxy, Devices, Applications and Technology Trends

The power GaN market doubled in 2020, highlighting the impressive growth of smartphone fast chargers and leading the way for telecom and automotive markets. – Performed by Yole Développement

Companies cited:

Aixtron, Allos, Alpha & Omega, Amec, Amkor, Apple, ASE, AT&S, Azur Space, BMW, Carsem, CGD, Coorstek, Delta Electronics, Dialog Semiconductors, DongKe, Dowa, Efficient Power Conversion, Egtronics, Enkris, Energous, EpiGaN, Episil, Epistar, Evatran, Exagan, Fairchild, Finsix, Ford, Fuji Electric, GaN Systems, GaN Power, Gener8, GlobalWafers, Huawei, IGaN, Imec, Infineon, Innoscience, IQE, LG Electronics, Jedec, Kyma, Mitsubishi Chemical, Nanowin, Navitas Semiconductors, Neditek, Nexgen, Nordic Power Converters, Nuvoton, NXP, Odyssey Semiconductor, OKMETIC, On Semiconductor and more…

Related reports:

- Power SiC: Materials, Devices and Applications 2021
- Power Electronics for E-Mobility 2021
- Status of the Power Module Packaging Industry 2020
- Status of the Power Electronics Industry 2020
- Compound Semiconductor Quarterly Market Monitor

About Yole Développement

Founded in 1998, Yole Développement (Yole) has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services, reverse engineering and reverse costing services and well as IP and patent analysis. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole group of companies has expanded to include more than 80 collaborators worldwide… More

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