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Assessing the Market for Low-Cost 5G Phones



In 2022, three years after the launch of the first commercially available 5G smartphone, almost 1 billion 5G smartphones will be sold around the world. The scale of the opportunity has reached a level where 5G smartphones can be palatably priced for consumers in developed economies and in developing ones.

As mobile phone brands seek to take advantage of a backlog of delayed smartphone purchases following a lull in the market during the Covid-19 pandemic, 2022 presents an opportunity for manufacturers to gain market share by offering low-cost 5G phones. The 5G opportunity for smartphone brands is now truly global.

With a brighter year ahead for both the global economy and smartphone market, we consider the next steps on the journey to more widespread adoption of 5G smartphones. There is particular interest in the growth of sales of low-cost 5G smartphones, because affordable devices will democratize the technology and allow it to reach greater numbers of people, particularly in less-affluent markets.

This report assesses the current state of the global mobile phone market, examining the forecast for adoption of 5G smartphones, regional variations and the dynamics of the smartphone and semiconductor industries.



5G Chipset Dynamics: No Longer a Flagship Feature

Although 5G technology has been around for a few years, a sticking point in bringing 5G-capable smartphones to consumers worldwide has been the added costs associated with 5G chipset designs. With 5G capabilities initially appearing only in high-end chipsets — placing a premium on the technology at its launch — 5G was restricted to flagship smartphones. As production of 5G silicon has grown and chipmakers have made clever design choices, the added cost of 5G has fallen.

The main reason for the increased cost of 5G devices compared with their 4G counterparts has been the new radio designed for 5G networks, which adds more components and complexity to the radio frequency front-end. With multiple architectural challenges at play, the challenge for the chipset industry has been balancing the addition of network features while controlling price increases. Balancing this equation has been a critical aspect in bringing 5G capabilities down the price curve.

One relatively straightforward way to do this is to remove support for millimetre-wave connections, a higher-frequency version of 5G using radio bands from 24 GHz to 40 GHz. By only using frequencies below 6 GHz, network operators can offer widespread coverage more easily. Given that only a few operators have deployed infrastructure supporting millimetre-wave connectivity, dropping support for this standard has been a logical decision in the design of more-affordable 5G chipsets without affecting the user experience. Further savings can also be found by limiting the number of 5G bands supported, and disaggregating Wi-Fi and cellular functions.

We have seen these approaches employed by semiconductor suppliers as they develop lower-cost 5G solutions, most notably Qualcomm and MediaTek, which dominate the smartphone chipset landscape.

Qualcomm was the front runner in 5G chipset design and deployment, securing several early phone design wins with its premium Snapdragon chips. It has since spread these capabilities through its portfolio into mid-range and more-affordable devices, with 5G connectivity now a standard on all Snapdragon platforms.

Rival firm MediaTek has taken the opposite approach to 5G, focussing on bringing the capability to the masses first before more recently extending its products into the flagship tier of devices. Its Dimensity platforms have proven especially popular with low-cost smartphone brands, as they have provided an affordable means of enabling 5G connectivity.

As millimetre-wave infrastructure is introduced in more markets, it will make the standard more prevalent, but we expect sub-6 GHz connections to remain the norm in emerging markets. Semiconductor companies have shown that they are capable of enabling this connectivity on low- and mid-cost chipsets, and we expect demand for these products to continue as companies focussed on emerging 5G markets around the world seek to offer devices tailored to these regions. Sales of 5G phones are entering a new phase, with new markets ready to play an important role in this next stage of growth.



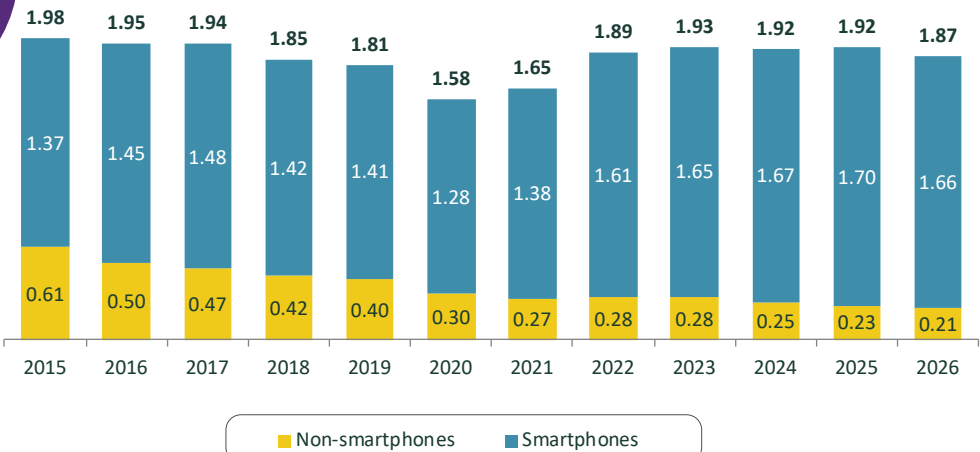
Global Smartphone Market after Covid-19

The smartphone market is set to see a year of recovery and opportunity in 2022, and CCS Insight forecasts a 15% annual rise in shipments of mobile phones, as shown below. Disruption to the supply chain and retailers during the pandemic, alongside bruised consumer confidence, will improve during the year, giving mobile phone suppliers ample opportunities to expand sales worldwide. Most importantly for the growth of 5G, low-cost mobile phone manufacturers, which have seen the greatest difficulties during the pandemic, will benefit from the stabilization of component supplies, and the presence of many customers waiting enthusiastically to upgrade old mobile phones and benefit from the industry's latest and greatest innovations.

For many people forced to delay smartphone purchases, 2022 is the year to upgrade

Globally, all economies faced substantial difficulties during the Covid-19 pandemic. In 2020, the economic shock of the pandemic and the limited availability of lower-cost mobile handsets came as a double blow to developing economies. All developing markets except India saw further declines in mobile phone shipments in 2021, while developed economies recorded recoveries, as shown on the next page. But two years of subdued sales and the subsequent backlog of replacement purchases will mean higher sales and greater adoption of smartphones in emerging economies during 2022. For many people forced to delay smartphone purchases, 2022 is the year to upgrade to new features and technologies recently introduced to low- and mid-tier smartphones.

Mobile phone shipments by type, worldwide



5G Smartphone Performance and Forecast

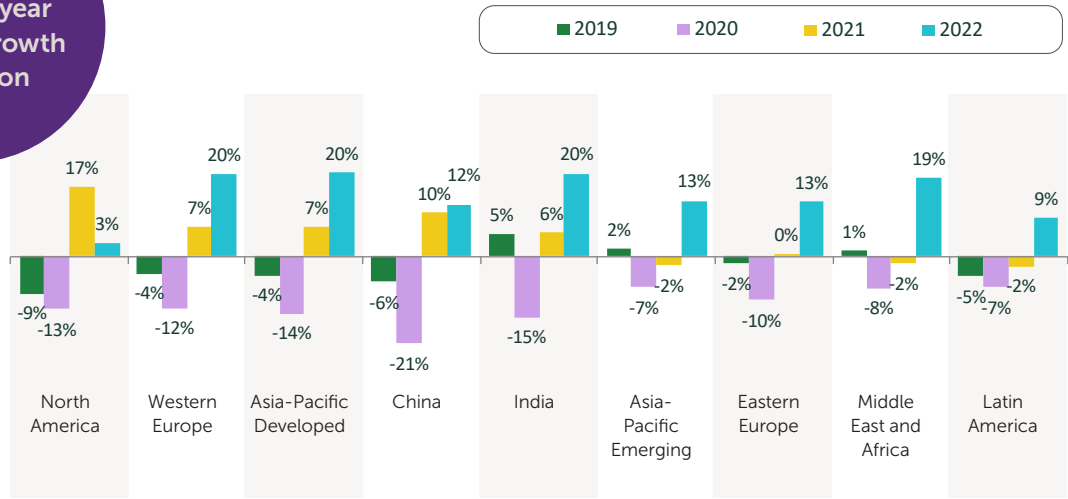
During 2021, an important shift in the smartphone market saw 5G chipsets becoming more commonplace in lower-cost smartphones, with 5G devices retailing for \$200 to \$250. Falling prices bolstered the performance of the 5G phone market significantly, resulting in a wider geographical uptake of 5G smartphones, both in developed and emerging economies.

Worldwide, 5G smartphone shipments reached 562 million in 2021, representing 142% annual growth, and forming 34% of the total mobile phone market. Although manufacturing and development of 5G phones have certainly felt some impact from the pandemic, the mobile phone industry's prioritization of higher-priced products allowed for significant sales of 5G smartphones despite an overall decline in the number of phones sold.

With more low-cost 5G smartphone models set to launch in 2022, and with component supply conditions easing significantly during the year, buyers will benefit greatly from falling prices, and CCS Insight forecasts global 5G shipments will grow 62% to 910 million units.

Our forecast predicts that 5G will overtake LTE as the dominant technology in new phones in 2022, accounting for 48% of mobile phone sales during the year. By 2025, 5G will be supported by 72% of phones sold that year, with LTE reduced to 21%, as shown on the next page. Although the fall in the cost of 5G mobile phones means the technology will become an almost ubiquitous feature in smartphones, a segment of ultralow-cost smartphones is expected to persist, maintaining a presence for LTE devices for some time. Standard mobile phones — basic devices and those using operating systems such as Kai OS — will continue to uphold the proportions of 2G, 3G and LTE devices, but they will come under increasing pressure from smartphones.

Mobile phone
year-on-year
volume growth
by region



Regional 5G Adoption Trends

The adoption of 5G has been far from uniform, with certain regions forging ahead with deployment of the technology while others lag; this is typically the result of a mix of social, political and economic factors.

China took an early lead in 5G phone sales, accounting for 70% of worldwide 5G smartphone shipments in 2020, although this dropped to 46% in 2021 as other markets caught up. The country's prominence in 5G smartphones has been driven in part by state initiatives to rapidly build 5G network availability, and local mobile phone manufacturers quickly developing and releasing affordable products that were snapped up by consumers. This initial burst of sales means the country is set to see relatively flat shipments

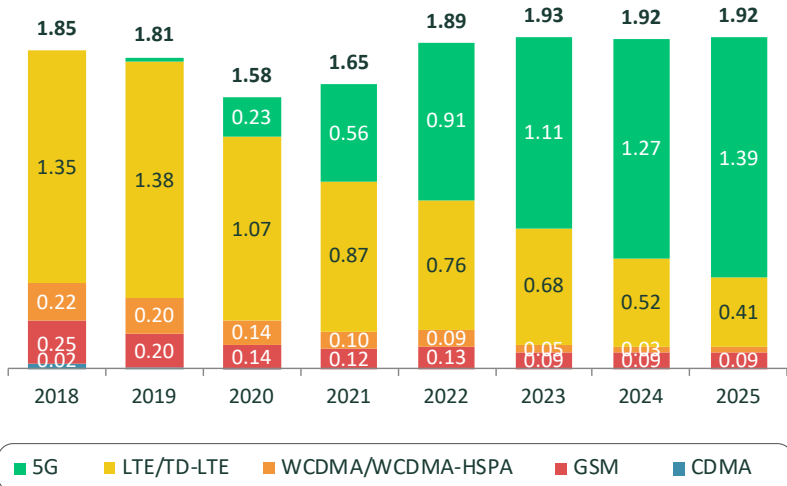
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compared with other markets. In 2022, 75% of phones sold in China will support 5G, rising to 93% of sales by 2025.

In contrast, Western Europe and North America have seen slower adoption of 5G smartphones, with major brands in these markets, such as Apple and Samsung, introducing 5G functionality more gradually into product lines, alongside slower roll-outs of 5G networks in these regions. Consumers' interest in devices with 5G capabilities continues to grow, although often as a side effect of demand for the latest smartphone. Network operators have been active in marketing the benefits of 5G networks and have witnessed data usage grow as a result of the faster mobile Internet speeds offered by advanced networks.

Mobile phone shipments by technology, worldwide

MOBILE PHONE SHIPMENTS (BILLIONS)



Developing economies saw limited adoption of 5G smartphones in 2020 and 2021, with the price of many 5G devices putting them out of reach for many people. We expect purchases of 5G smartphones to increase as prices fall and 5G becomes a baseline feature. Mobile phone manufacturers such as Infinix, Redmi and Samsung are all expected to design 5G handsets with pricing structured for developing markets, bolstering 5G smartphone sales in 2022 and beyond.

Among developing economies, Eastern Europe and Latin America have seen the highest proportions of 5G smartphone sales in 2021. Both markets have seen 5G mobile phones accounting for 18% of market volume, aided by greater consumer purchasing power than in other emerging economies, and through the initial development of 5G networks, albeit with limited geographical coverage.

The Middle East and Africa have seen pockets of 5G adoption, primarily in wealthy Middle Eastern countries where operators have quickly developed network coverage in major cities and population centres. With significant disparities in wealth in affluent nations such as the United Arab Emirates or Kuwait, 5G smartphone purchases have been isolated to more-wealthy consumers, who have driven uptake of 5G devices through the purchase of flagship smartphones. Widely available 5G networks in major cities provide a significant opportunity for brands offering 5G mobile phones at lower prices. With 5G expected to become more widely available in devices priced between \$150 and \$350, CCS Insight forecasts growing purchases of 5G smartphones in less-affluent consumer segments.

The less-developed nations in the Middle East and Africa have seen limited 5G network development and uptake of



5G smartphones. More and more 5G networks will come online in the coming years, although, as has been seen in 3G and LTE network deployments, geographical coverage is expected to be patchy. Furthermore, we expect network operators to prioritize geographic coverage when investing in their networks, opting not to use high-bandwidth 5G technologies. Nevertheless, consumers will continue to desire the latest and greatest smartphone technology, resulting in uptake of 5G devices. The desire to future-proof any purchases should also help to develop strong sales of 5G devices in the coming years.

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Similarly, emerging markets in the Asia–Pacific region offer huge potential for network operators and smartphone manufacturers looking to boost sales of 5G phones and service plans. With economies throughout the region expected to benefit from rising consumer purchasing power, and with strong regional interest in adoption new technology, there is a fertile market for low-cost 5G smartphone sales. So far, countries such as Thailand and the Philippines have led in terms of initial 5G network availability, but emerging markets in the region remain largely unserved; some nations are expecting commercial launches or expansion of 5G networks in 2022, including Vietnam and Malaysia.

We expect further launches of low-cost 5G handsets from mobile phone manufacturers focussing on emerging markets in the Middle East, Africa and Asia-Pacific, including Transsion and BBK Electronics, which produces devices under several brands.

CCS Insight forecasts 192% growth in 5G smartphone shipments in 2022 in the Middle East and Africa; these devices will account for 28% of total shipments in that region. In emerging markets in Asia-Pacific, we forecast 32 million 5G smartphone shipments in 2022, representing annual growth of 233%. Smartphones with 5G technology will rapidly account for the majority of mobile phones sold; in the Middle East and Africa, 71% of phones sold – 199 million devices – will support the technology; in emerging markets in Asia-Pacific, the proportion will be 72%, or 85 million devices.

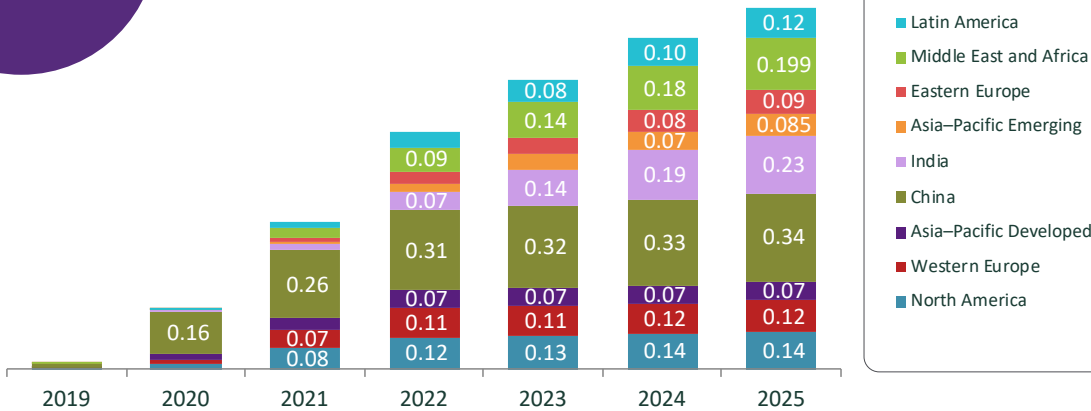
Summary of Key and Emerging Players

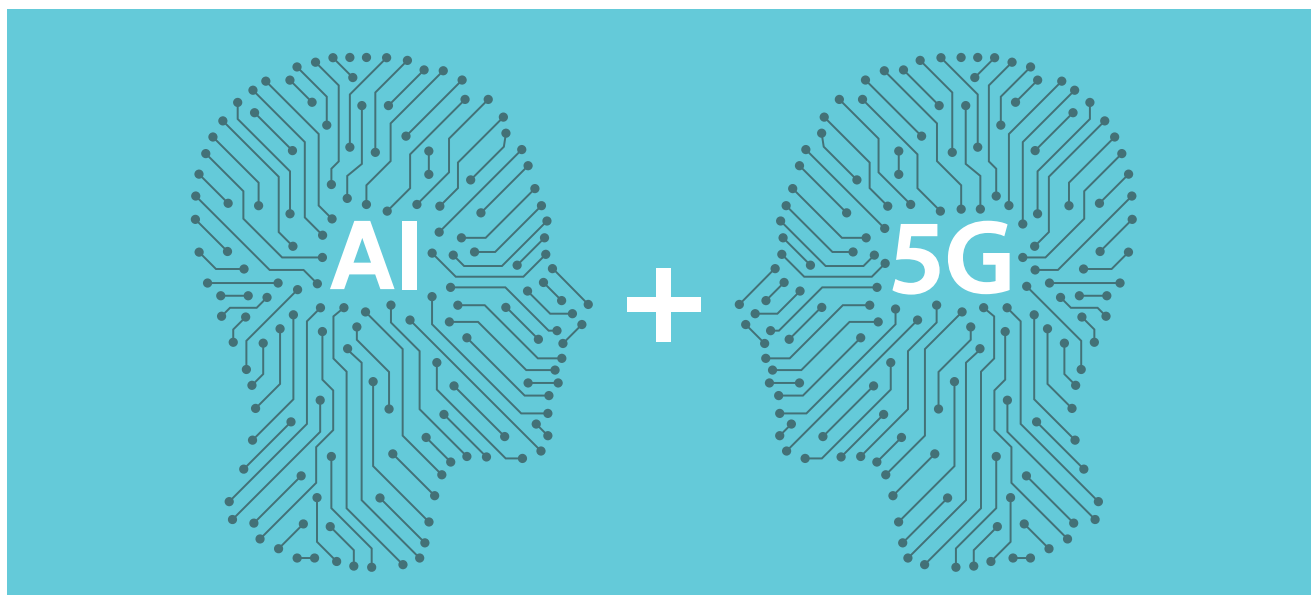
Although the first wave of 5G smartphones launched at premium prices, we have seen several companies establish leading positions in the mass market by bringing 5G technology to ever-more affordable handsets. They include brands such as Honor, Infinix, Oppo, Realme, Vivo, Xiaomi and ZTE. Many of these players have gained global market share in recent quarters as a result of Huawei’s challenges in certain markets, but the firm still has a strong hold in some markets.

Xiaomi has arguably flown the flag for this segment, most notably during 2021 when it briefly surpassed Apple to become the world’s second-largest smartphone supplier in terms of shipments. However, Oppo and Vivo, both part of the larger BBK Electronics group, are hot on the heels of their Chinese rival and have risen to contribute just under 10% of global smartphone shipments each.

5G smartphone shipments, worldwide

5G SMARTPHONE SHIPMENTS (BILLIONS)





Notably, we have seen divergent approaches to the more affordable segment of the market. The largest names, such as Huawei and Xiaomi, typically design and develop one-size-fits-all products, with a standardized approach to devices for all markets. Owing to the size of these firms, this is an efficient way to gain the widest possible geographic reach.

However, some have taken a more tailored approach, building regionally differentiated products that are more closely aligned with consumer demands. For example, Infinix has spoken about approaching its product development with an element of “glocalization” — combining designs that have global appeal with innovation aimed at local communities. For example, it has invested in improving its artificial intelligence (AI) photography algorithms to cater for a wider range of skin tones, improving the smartphone experience for a more diverse audience. AI has also been deployed in a translation tool in regions with multiple dialects, such as India and some regions of Africa, allowing for easier communication across

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cultural divides. Improvements have also focused on optimizing the local mobile Internet experience and on physical product design, resulting in cost-effective product development that meets real-world needs.

We have witnessed a proliferation of devices that combine impressive capabilities with attractive price tags. Smartphones like the Honor 50, the Realme GT and the Xiaomi 11T offer specifications that are not far below those seen on flagship models at the premium end of the market but at a fraction of the price.

This is thanks to several decisions made in smartphone design, with 5G connectivity architecture a particularly important part of this journey. Choices such as memory configuration, display size and camera resolution are carefully balanced when building lower-cost devices, but managing the cost of 5G componentry has been a vital element of the transition to affordable 5G connectivity.

Conclusion

5G debuted as a premium feature restricted to flagship smartphones, but since then it has rapidly moved down the price curve, thanks to the efforts of a range of smartphone- and chipset-makers. The simplification of 5G radio designs and decisions to focus on specific variants of the connectivity have, among other things, led to more-affordable 5G offerings from a range of manufacturers.

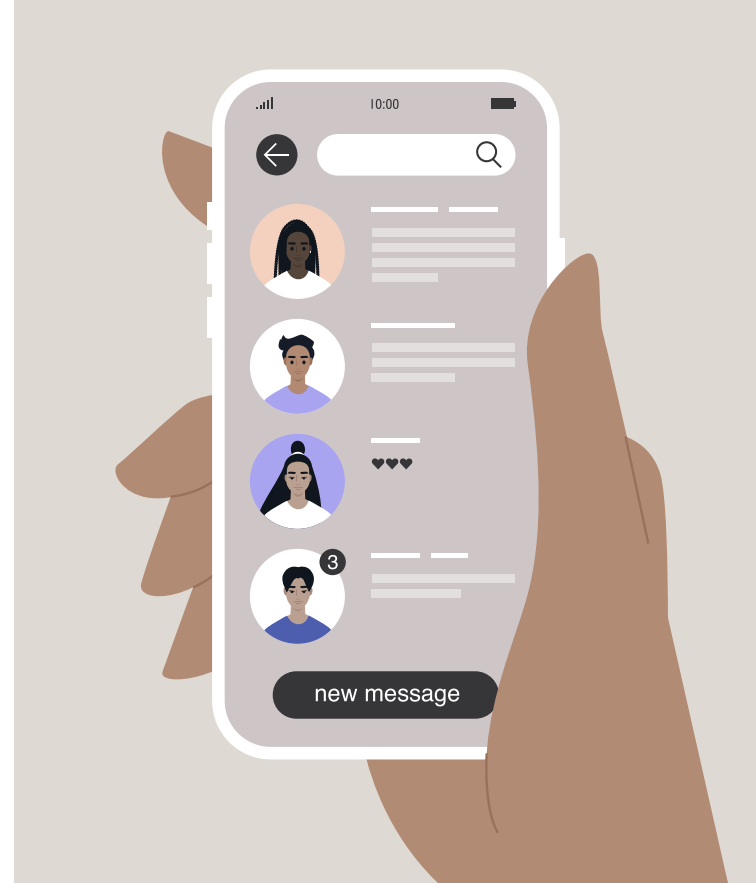
Uptake of 5G has so far been solid, especially in the context of the global Covid-19 pandemic, which has formed a challenging backdrop to the entire mobile phone industry. However, strong adoption has largely been limited to

specific regions, such as China, Western Europe and North America. We are now moving into a new wave of adoption, with phone shipments likely to ramp up in emerging markets thanks to the greater affordability of devices, people's desire to invest in a future-proof product, as well as various other social, economic and political factors.

The efforts of smartphone- and chipset-makers have helped to put 5G phones in more people's hands, with a wide range of cost-effective devices available to consumers in regions such as the Middle East, Africa and emerging markets in Asia-Pacific.

These more-affordable devices come from a wide range of players, including Honor, Huawei, Infinix, Oppo, Realme,

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Redmi, Vivo, Xiaomi and ZTE. We have seen several divergent approaches to building and selling low-cost 5G smartphones in these emerging markets, and the result is a growing number of capable, powerful smartphones that we expect to prove popular with consumers. Rising sales in these areas will help propel the overall smartphone market back to growth in 2022, with 5G set to overtake LTE as the dominant network technology on shipped devices.



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