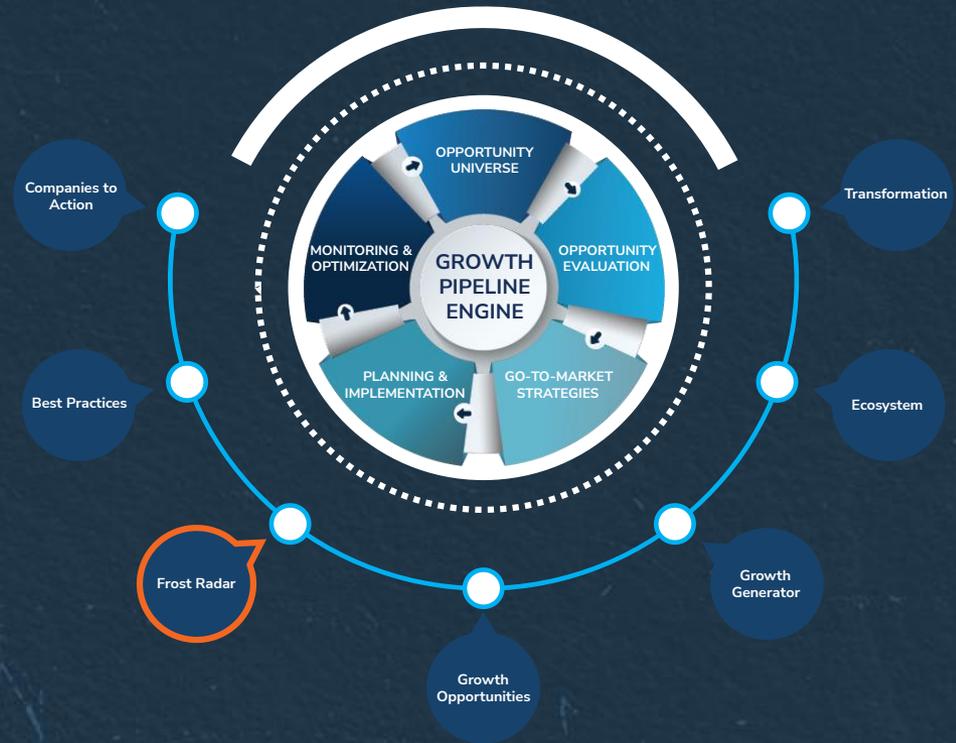


5G Network Infrastructure, 2025

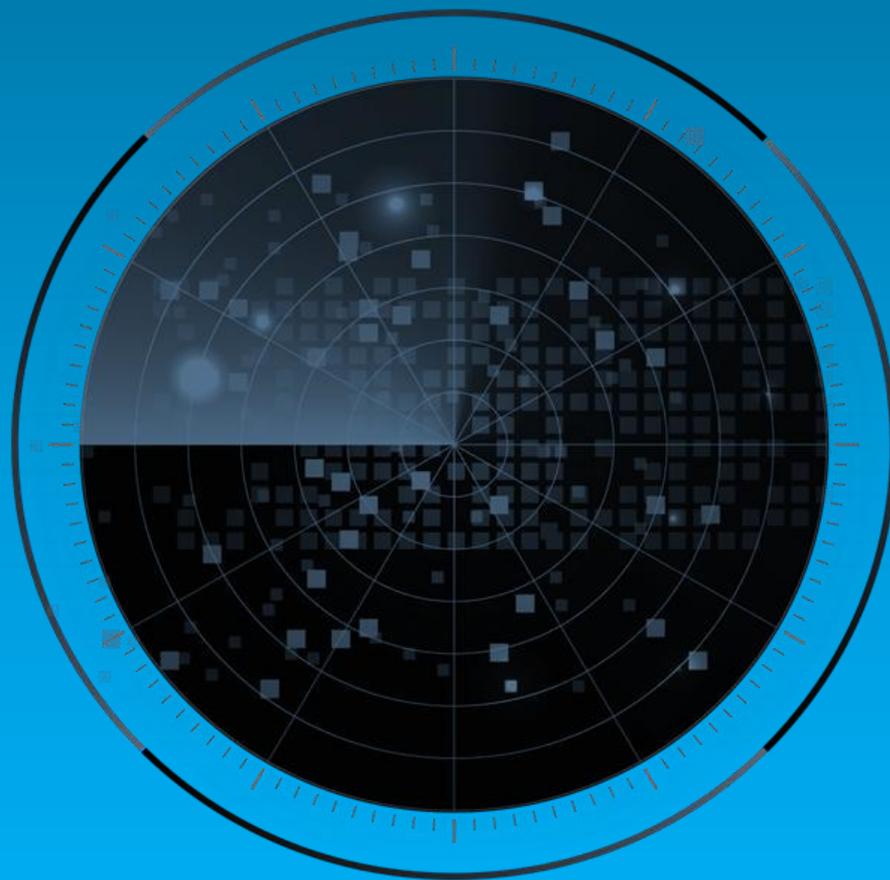
A Benchmarking System to Spark Companies to Action - Innovation That Fuels New Deal Flow and Growth Pipelines

Authored by: Troy Morley
Contributor: Vikrant Gandhi



KB5C-65
May 2025

Strategic Imperative and Growth Environment



Strategic Imperative

- Frost & Sullivan defines 5G network infrastructure to include radio access networks (RAN); transport networks; and core networks, which may include one or more edge networks. The 5G network infrastructure industry includes public networks run by communications service providers (CSPs) and private 5G networks utilized by enterprises in many industry verticals. 5G RAN includes both traditional RAN and the newer open and virtual RAN; RAN also includes both macro cells and small cells.
- 5G introduces many disruptive technologies, from new chips and devices to new network architectures, that will affect all areas of network infrastructure.
- The promise of 5G for consumers and for enterprises is huge. It is equally impactful on CSPs and their suppliers (in a good way). Growth opportunities abound.
- 5G core and edge networks are now entirely cloud-based, and the 5G RAN is quickly moving to the cloud. The industry is exploring open interfaces and new architectures for the 5G RAN (which Frost & Sullivan refers to as open and virtual RAN), enabling new suppliers to compete. (The O-RAN Alliance drives the direction of open and virtual RAN.) The 5G RAN industry includes both high-power macro cells and lower-power small cells. The 5G transport network ties together the RAN, the edge, and the core and also is cloud-based.
- Functions from the core network and from the RAN are moving to edge networks to reduce latency and enable new use cases.
- While CSPs are heavily investing in 5G, how financially successful the 5G era is for them remains to be seen. This will depend largely on how they monetize the technology and how successful they are with the enterprise segment, which has the potential to grow significantly.

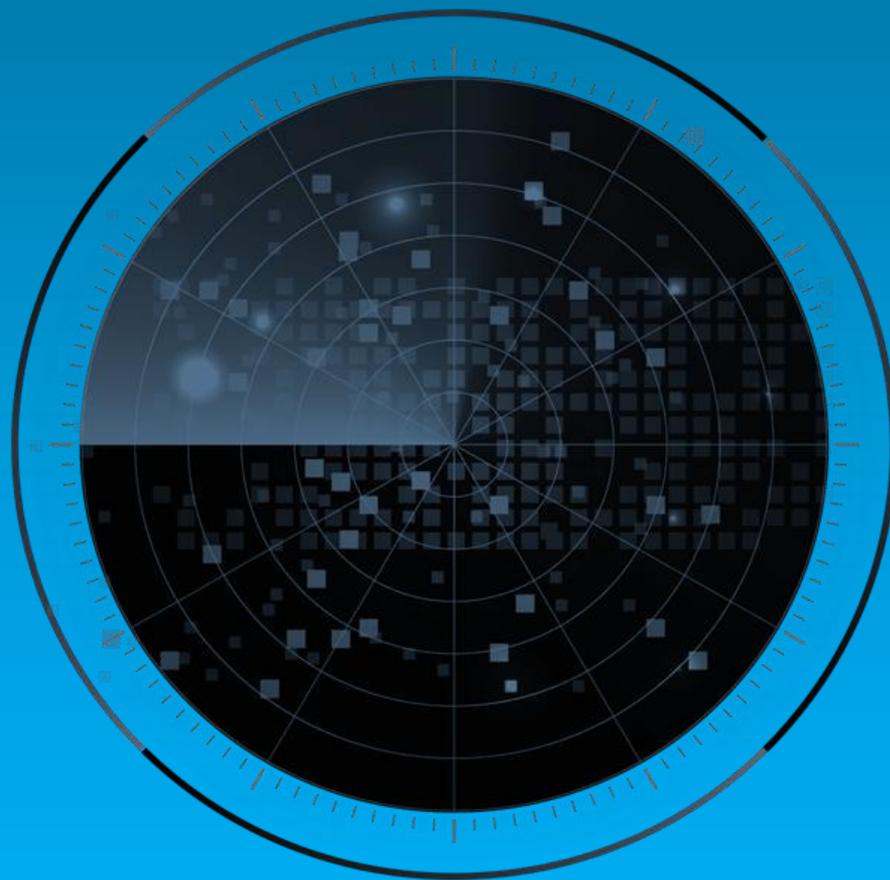
Strategic Imperative (continued)

- Device and infrastructure suppliers are succeeding now with CSP investments, but new business models need to be created for the providers themselves to cash in.
- The consumer market, which has been the bread and butter for CSPs, will remain important, but profit margins will remain low.
- The business and enterprise market will become essential to the success of CSPs. Network slicing and private wireless networks will be areas of focus. Slicing will become more widespread as 5G networks become stand-alone, utilizing a 5G core network. Because of the financial importance that the business and enterprise market holds for CSPs, Frost & Sullivan remains surprised at how few CSPs have made the transition to 5G stand-alone.
- While 2023 and 2024 saw some slowing of the 5G rollout globally, it is continuing to roll out faster than 4G did more than a decade ago.
- A greater impact to 5G has come from the United States pushing to block Chinese suppliers from competing in parts of the world. This primarily affects leading network infrastructure providers Huawei and ZTE. Some suppliers have tried to take advantage of the situation, with Samsung increasing market share in certain countries and NEC also looking to expand outside of Japan.
- “New” technologies impacting the 5G network infrastructure market include artificial intelligence (AI), non-terrestrial networks (NTN), and network application programming interfaces (APIs).

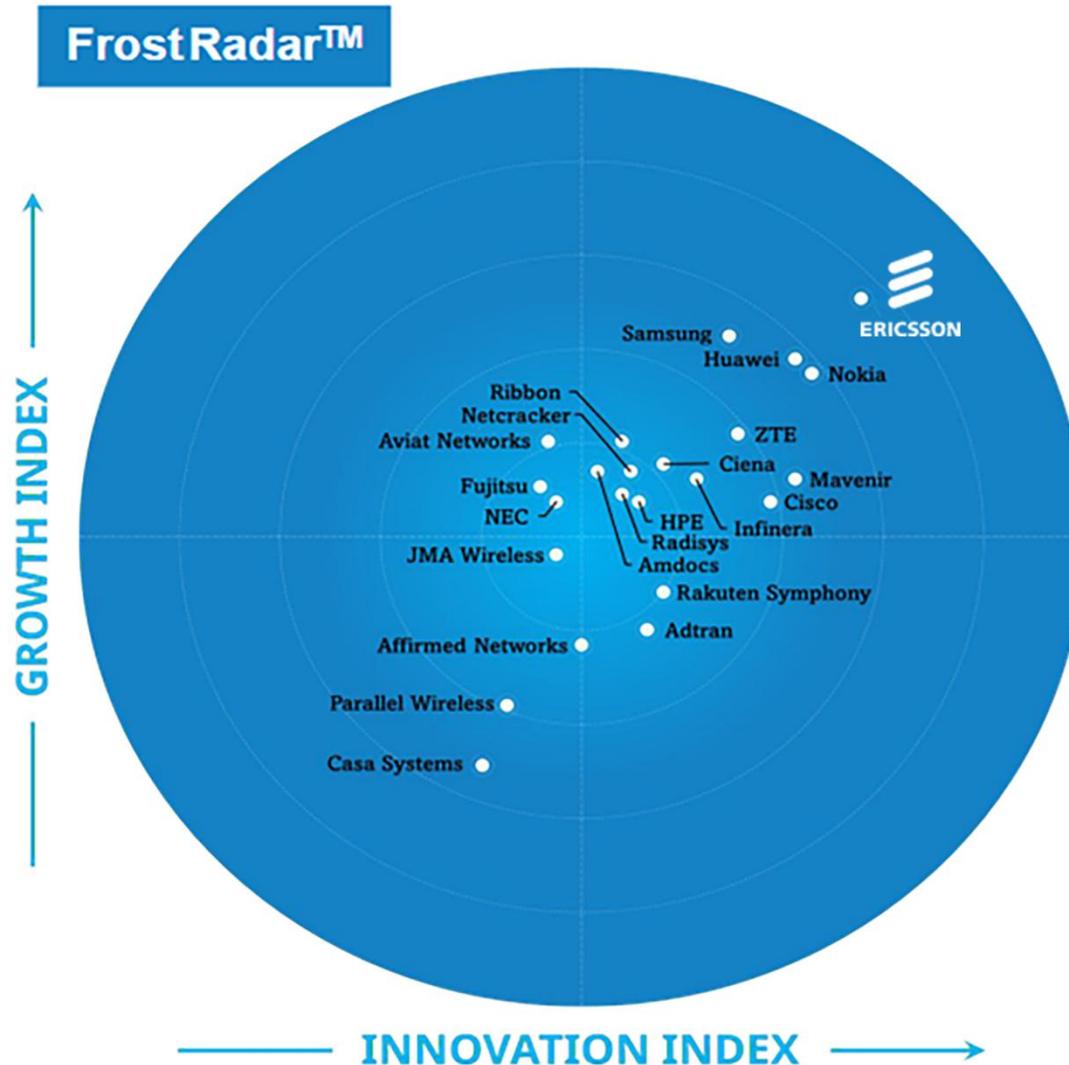
Growth Environment

- Frost & Sullivan believes that CSPs altogether invested just over \$60 billion in 2024 on their mobile and wireless network infrastructure, depending on what is included. This investment will increase at a compound annual growth rate (CAGR) of approximately 2% over the next five years. The majority of that spend is on the RAN, with smaller spend on transport and core networks. 2024 saw a continued flattening of CSPs' network infrastructure spend worldwide, specifically related to public cellular networks. Some of that slowdown will be offset by growth in private cellular networks.
- While the 5G era is underway, investments in 2G, 3G, and 4G networks continue. 4G networks remain in the majority and will be for the next few years, so investment is still considerable but is already flattening and will soon begin to decline. Investment in 5G networks will accelerate and become dominant. Investment in 2G and 3G networks is limited and is declining.
- Frost & Sullivan studies related to this independent analysis:
 - [5G Open and Virtual RAN Market, Global, 2024–2028](#)
 - [5G Small Cells, Global, 2024–2028](#)
 - [Private 5G Networks, Global, 2024–2028](#)
 - 5G Network Infrastructure, Global, 2025–2029 (KB79-65, expected summer 2025)

Frost Radar™: 5G Network Infrastructure



Frost Radar™: 5G Network Infrastructure



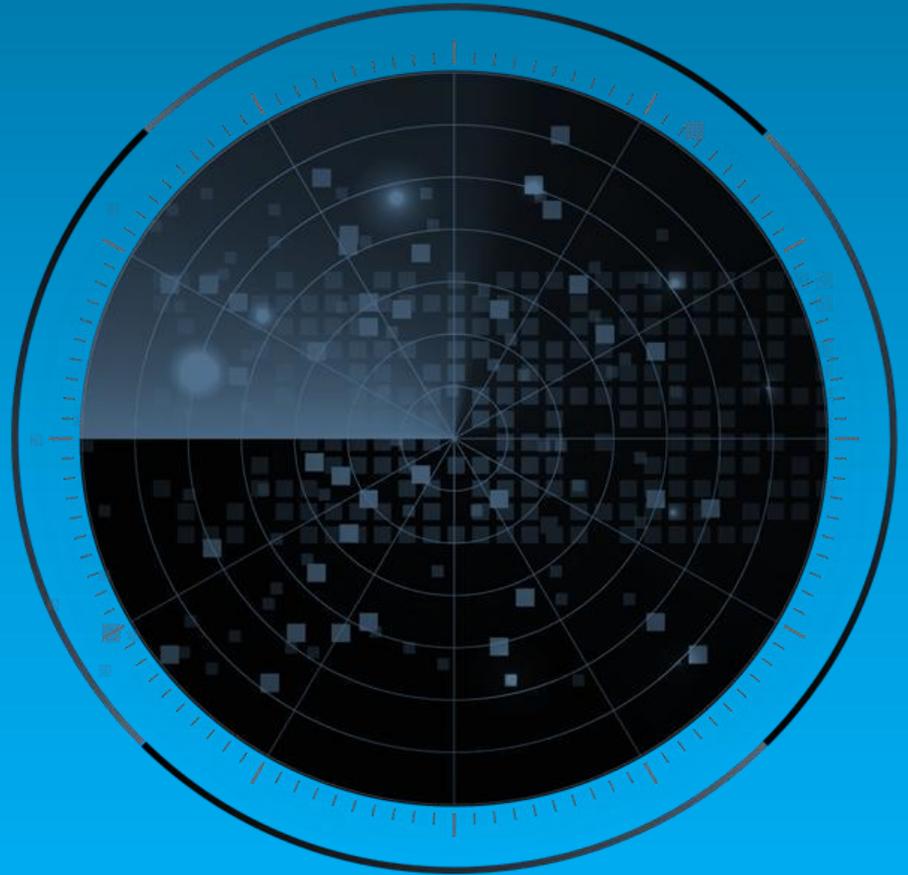
Frost Radar™ Competitive Environment

- From a field of more than 100 industry participants globally, Frost & Sullivan independently plotted the top 23 companies in this Frost Radar™ analysis. These companies either lead the market overall, lead a segment, or are thought leaders in certain segments.
- The 5G network infrastructure industry is emerging and built upon the established 4G network infrastructure space; therefore, it is unsurprising that leaders from 4G place highly here.
- The architecture of 5G brings the possibility of many suppliers working together in each area of network infrastructure: RAN, core/edge networks, and transport networks. In other words, the core network is likely not from a single supplier, but from many suppliers each providing one or more network functions. This opens the arena to new suppliers. Increased competitive intensity raises the level of innovation.
- The Frost Radar™ measures growth rates in addition to absolute revenue and combines them with several other factors to measure companies' performance along the Growth Index. The Frost Radar™ measures innovation for each company by assessing its product portfolio, the scalability of its innovations, the efficacy of its R&D strategy, and several other factors.
- In this analysis, Ericsson is the Growth and Innovation leader, followed by Huawei and Nokia. All were leaders in 4G network infrastructure and continue to lead in 5G network infrastructure. Their offerings include RAN, transport networks, and core/edge networks.
- ZTE also ranked highly. ZTE was in a similar position with 4G network infrastructure, and has had strong initial success in 5G, particularly in China. Huawei and ZTE dominate in China but are limited in other parts of the world by political forces.
- Samsung also has had strong initial success with 5G, moving into new countries and regions and offering itself as an alternative to the leaders, particularly in locations where there is resistance to Chinese suppliers, such as the United States.

Frost Radar™ Competitive Environment (continued)

- Ericsson, Huawei, Nokia, ZTE, and Samsung hold a combined market share of more than 90%. Most of the rest either focus on a limited part of the infrastructure market or are smaller suppliers (or both).
- Mavenir ranks highly in innovation. This is notable given that it is much smaller than the top five. Mavenir supports core/edge networks and is actively involved in the open and virtual RAN movement.
- Cisco offers core/edge solutions and transport solutions and also ranks highly in innovation.
- HPE ranks highly even though its focus is only on core/edge networks. It continues to offer the “infrastructure for the infrastructure,” providing hardware that underlies the telco cloud and software network functions for core and edge networks.
- Ciena is strong in growth but only supports transport networks. Infinera also supports only transport and ranks higher in innovation but is roughly half the size of Ciena.
- A number of smaller suppliers focus on open and virtual RAN but are thought leaders in the space, including Rakuten Symphony and Radisys.
- 2024 brought a number of changes to this market that will impact future Frost Radar™ analyses:
 - Casa Systems filed for bankruptcy and its 5G core and RAN assets were acquired by Lumine Group. Casa Systems will not be included in future analyses.
 - Infinera was acquired by Nokia, with the deal finalizing in early 2025. Nokia will continue to be included in future Frost Radar™ analyses, but Infinera will not.
 - Affirmed Networks, a Microsoft Company, will be impacted by Microsoft’s strategic decision to no longer provide edge/core network functions, but instead focus on Azure, its cloud platform. While it is still unclear what will happen to Affirmed Networks and its customers, this will likely be its last Frost Radar™ appearance.

Frost Radar™: Companies to Action



Ericsson

INNOVATION

- Ericsson has proven its ability to scale its innovations globally with 2G, 3G, 4G, and now 5G. The company reports that it has customers in more than 175 countries.
- The company invests significant amounts in R&D; this is essential in an industry in which technology is always evolving. For 2024, Ericsson invested 21.6% of revenue toward R&D.
- Ericsson's product portfolio includes all areas of 5G network infrastructure as well as previous generations of network infrastructure. This includes traditional RAN, open and virtual RAN, and private networks. Ericsson is also promoting network APIs as a road to new innovation around mobile networks and utilizing AI to automate its network offerings.
- The company began to offer open and virtual RAN solutions in 2024. Frost & Sullivan believes this will result in significant growth in the open and virtual RAN market.
- Ericsson's strategy continues to center on CSPs' evolving needs in all areas of the world. However, with its 2020 acquisition of Cradlepoint, Ericsson also is expanding its role with enterprise customers.

Ericsson (continued)

GROWTH

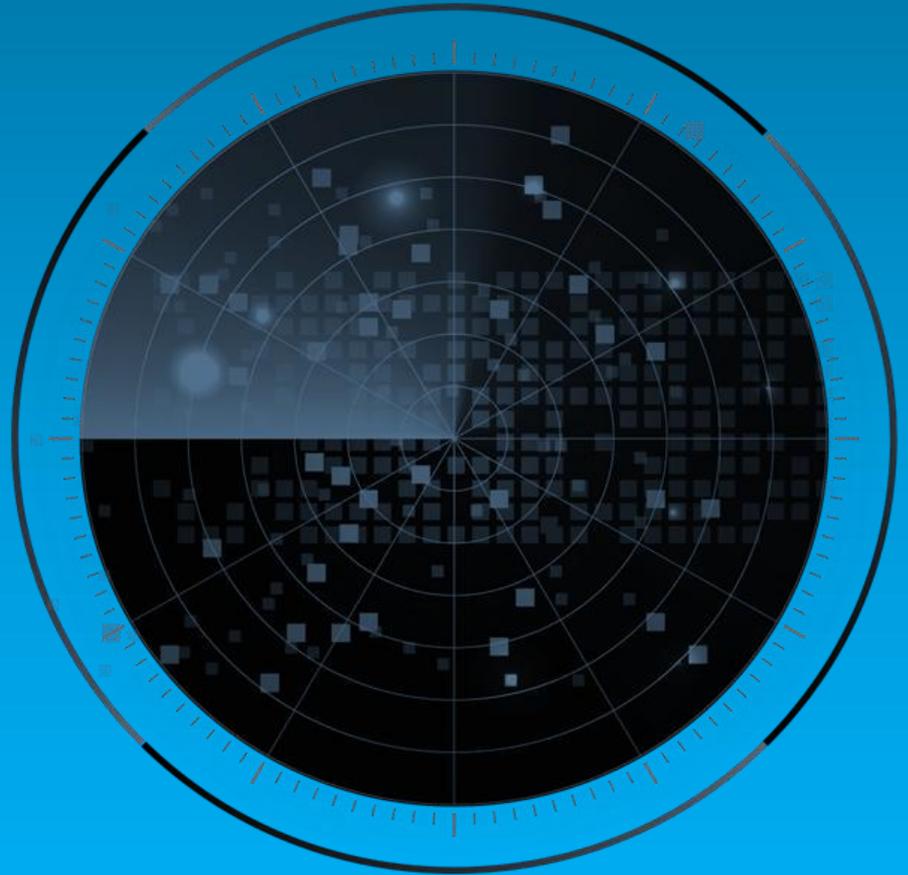
- As a leader in 4G infrastructure, Ericsson enters the 5G arena with a large customer base. The company has done an excellent job keeping its current customers and adding new customers (including significant replacement wins over competitors).
- 2023 and 2024 were down years in network infrastructure and they impacted Ericsson. However, Ericsson has spent the last few years adjusting its overall strategy to focus on profitability, which enabled it to weather the pandemic and the slowing of the infrastructure market.

Ericsson (continued)

FROST PERSPECTIVE

- While the company's turnaround strategy from a few years ago has been successful, the battle to grow and maintain profitability continues and needs a sustained focus.
- The infrastructure market tends to grow slowly on average, and that means some years will feature growth and others will not. The last two years featured slowing growth, highlighting how important profitability and financial stability are to all businesses.
- Frost & Sullivan believes that eventually all RAN will be open and virtual. Ericsson's step into offering open RAN solutions in 2024 will help make this a reality, especially since its first few customers are large and influential CSPs.
- Energy efficiency has been a buzzword for a few years, and Ericsson continues to tout solutions that are smaller and lighter and that save energy, answering its customers' needs. This will continue with its traditional RAN solutions and accelerate with its new open RAN offerings.
- The market for private 4G and 5G networks has not grown as quickly as expected, but Frost & Sullivan believes there are still great opportunities to be had. Ericsson must work with its CSP customers to target these new opportunities in the enterprise world.

Best Practices & Growth Opportunities



Best Practices

1

5G network infrastructure is highly technical and always evolving. This makes strong investment in R&D a key indicator of the potential of a network infrastructure supplier.

2

The 5G RAN market remains large but also low margin. This means that suppliers must focus on profitability as well long-term financial stability to survive and thrive. Up years will happen and all will rejoice, but down years will happen too.

3

CSPs globally need to more effectively monetize their investments in 5G. However, way too many have not completed the transition from 5G non-standalone to 5G standalone. The promises of 5G cannot be realized without a complete 5G network—and neither can effective monetization.

Growth Opportunities

1

5G network infrastructure for public networks remains the largest part of the market—many tens of billions of dollars—but this submarket tends to exhibit little growth over time.

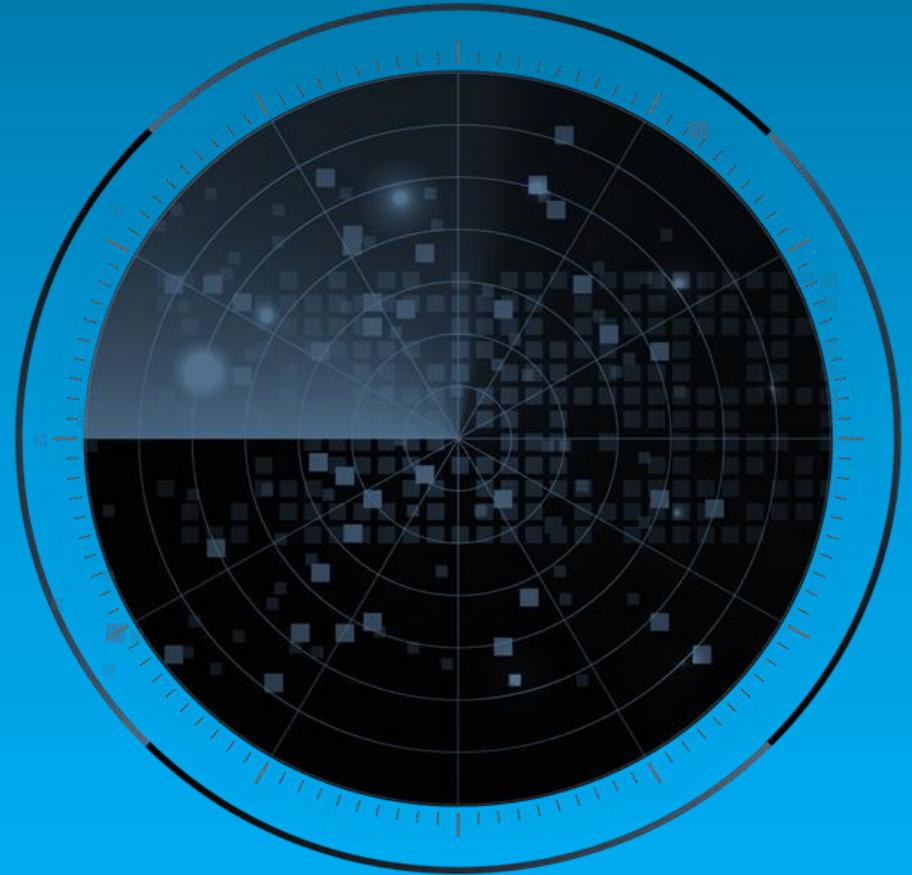
2

Private 5G networks expand the potential customer base from a few thousand CSPs to potentially millions of enterprises. While this submarket is small compared to the public 5G network market—yet still measured in the billions of dollar—it is growing much faster.

3

Open and virtual RAN is becoming more mainstream but remains a relatively small part of overall RAN sales. Like private 5G networks, open and virtual RAN remains a small submarket, but growth over the next few years should be significant. Open and virtual RAN can play a role in private 5G networks as well.

Frost Radar™ Analytics



Frost Radar™: Benchmarking Future Growth Potential

2 Major Indices, 10 Analytical Ingredients, 1 Platform

Growth Index

Growth Index (GI) is a measure of a company's growth performance and track record, along with its ability to develop and execute a fully aligned growth strategy and vision; a robust growth pipeline system; and effective market, competitor, and end-user focused sales and marketing strategies.

GI1

MARKET SHARE (PREVIOUS 3 YEARS)

This is a comparison of a company's market share relative to its competitors in a given market space for the previous 3 years.

GI2

REVENUE GROWTH (PREVIOUS 3 YEARS)

This is a look at a company's revenue growth rate for the previous 3 years in the market/industry/category that forms the context for the given Frost Radar™.

GI3

GROWTH PIPELINE™

This is an evaluation of the strength and leverage of a company's growth pipeline system to continuously capture, analyze, and prioritize its universe of growth opportunities.

GI4

VISION AND STRATEGY

This is an assessment of how well a company's growth strategy is aligned with its vision. Are the investments that a company is making in new products and markets consistent with the stated vision?

GI5

SALES AND MARKETING

This is a measure of the effectiveness of a company's sales and marketing efforts in helping it drive demand and achieve its growth objectives.

Frost Radar™: Benchmarking Future Growth Potential

2 Major Indices, 10 Analytical Ingredients, 1 Platform (continued)

Innovation Index

Innovation Index (II) is a measure of a company's ability to develop products/ services/ solutions (with a clear understanding of disruptive megatrends) that are globally applicable, are able to evolve and expand to serve multiple markets and are aligned to customers' changing needs.



II1

INNOVATION SCALABILITY

This determines whether an organization's innovations are globally scalable and applicable in both developing and mature markets, and also in adjacent and non-adjacent industry verticals.

II2

RESEARCH AND DEVELOPMENT

This is a measure of the efficacy of a company's R&D strategy, as determined by the size of its R&D investment and how it feeds the innovation pipeline.

II3

PRODUCT PORTFOLIO

This is a measure of a company's product portfolio, focusing on the relative contribution of new products to its annual revenue.

II4

MEGATRENDS LEVERAGE

This is an assessment of a company's proactive leverage of evolving, long-term opportunities and new business models, as the foundation of its innovation pipeline. An explanation of megatrends can be found [here](#).

II5

CUSTOMER ALIGNMENT

This evaluates the applicability of a company's products/services/solutions to current and potential customers, as well as how its innovation strategy is influenced by evolving customer needs.

Next Steps



JOIN:
Growth Council

APPLY:
Companies to Action

ENGAGE:
Growth Dialog

PARTICIPATE:
Growth Council Think Tank

Does your current system support rapid adaptation to emerging opportunities?

Legal Disclaimer

Frost & Sullivan is not responsible for any incorrect information supplied by companies or users. Quantitative market information is based primarily on interviews and therefore is subject to fluctuation. Frost & Sullivan research services are limited publications containing valuable market information provided to a select group of customers. Customers acknowledge, when ordering or downloading, that Frost & Sullivan research services are for internal use and not for general publication or disclosure to third parties. No part of this research service may be given, lent, resold, or disclosed to noncustomers without written permission. Furthermore, no part may be reproduced, stored in a retrieval system, or transmitted in any form or by any means—electronic, mechanical, photocopying, recording, or otherwise—without the permission of the publisher.

For information regarding permission, write to: permission@frost.com

© 2025 Frost & Sullivan. All rights reserved. This document contains highly confidential information and is the sole property of Frost & Sullivan. No part of it may be circulated, quoted, copied, or otherwise reproduced without the written approval of Frost & Sullivan.