

FUTURE OF CONNECTIVITY

The background is a dark blue gradient. It features a network of glowing white and light blue nodes connected by thin, light blue lines. A prominent, thick, curved blue line sweeps across the middle of the image, starting from the left and curving towards the right. The overall aesthetic is futuristic and technological.

Capgemini  engineering



Why future of *connectivity* matters?

Internet as basic need, rather than luxury	As per a report by World Bank, Only 35% of people in developing nations have access to the internet compared to over 80% in the developed world. An estimated <i>37% of the global population</i> (approximately 2.9 billion people) remain offline.
Increasing network complexity	Autonomous networks are the need for today's operator to <i>manage the network dynamics and complexity</i> , and majority of telcos (84%) have either L1 and L2 level.
Increase in number of connected devices	By 2030, it's projected that there will be <i>125 billion connected IoT devices</i> , compared to 30.9 billion in 2020. Connectivity must evolve to support this massive increase in devices, ensuring scalability and interoperability.
Rising energy cost	The ICT sector is responsible for <i>2-3% of global carbon emissions</i> , which could increase to 14% by 2040 if no proper measures taken. Reducing carbon emissions through sustainable network designs, energy-efficient hardware, and renewable energy integration is critical to mitigating climate change.
Need for intelligent automation	Telecom operators spend up to <i>60% on their operating expenses</i> . Achieving the balance between operating expenses and customer experience is possible through network management using AI and Gen-AI.



Challenges

ACCESSIBILITY

Despite technological advancements, there remains a *significant gap in internet access between urban and rural areas*, as well as between developed and developing countries.

LACK OF INTELLIGENT NETWORK MANAGEMENT

Majority of operator's network management systems still follow rule-based/static mechanism. *Network dynamics* should be managed through AI-enabled intelligence for improving network efficiency.

SECURITY AND PRIVACY

The massive exchange of data over digital networks raises concerns about security and privacy. *As networks become more complex*, they become more vulnerable to cyber attacks.

SUSTAINIBILITY

Networks, data centers, and connected devices consume vast amounts of energy. With increasing concerns about climate change and sustainability, *reducing energy consumption* is critical.

INTEROPERABILITY

Devices often use *different protocols, standards*, and technologies, which can lead to compatibility issues when connecting to existing networks or other devices.



Our *convictions*

UBIQUITOUS CONNECTIVITY

Seamless, high-speed and affordable network access globally.

AI-DRIVEN NETWORKS

Enhancing network performance, strengthening security, and delivering personalized user experiences.

SECURE COMMUNICATION

To enable organizations to protect sensitive data, privacy, and ensure secure communication channels.

OPEN & INTEROPERABLE NETWORK DEVICES

Transformations to ensure network advancements are available and affordable to the broader audience.

SUSTAINABILITY AND GREEN CONNECTIVITY

From device, cloud, software and operations to achieve net-zero targets.

Summary of *main trends*

- Horizon 1 – Scaling
- Horizon 2 – Innovation
- Horizon 3 – Research

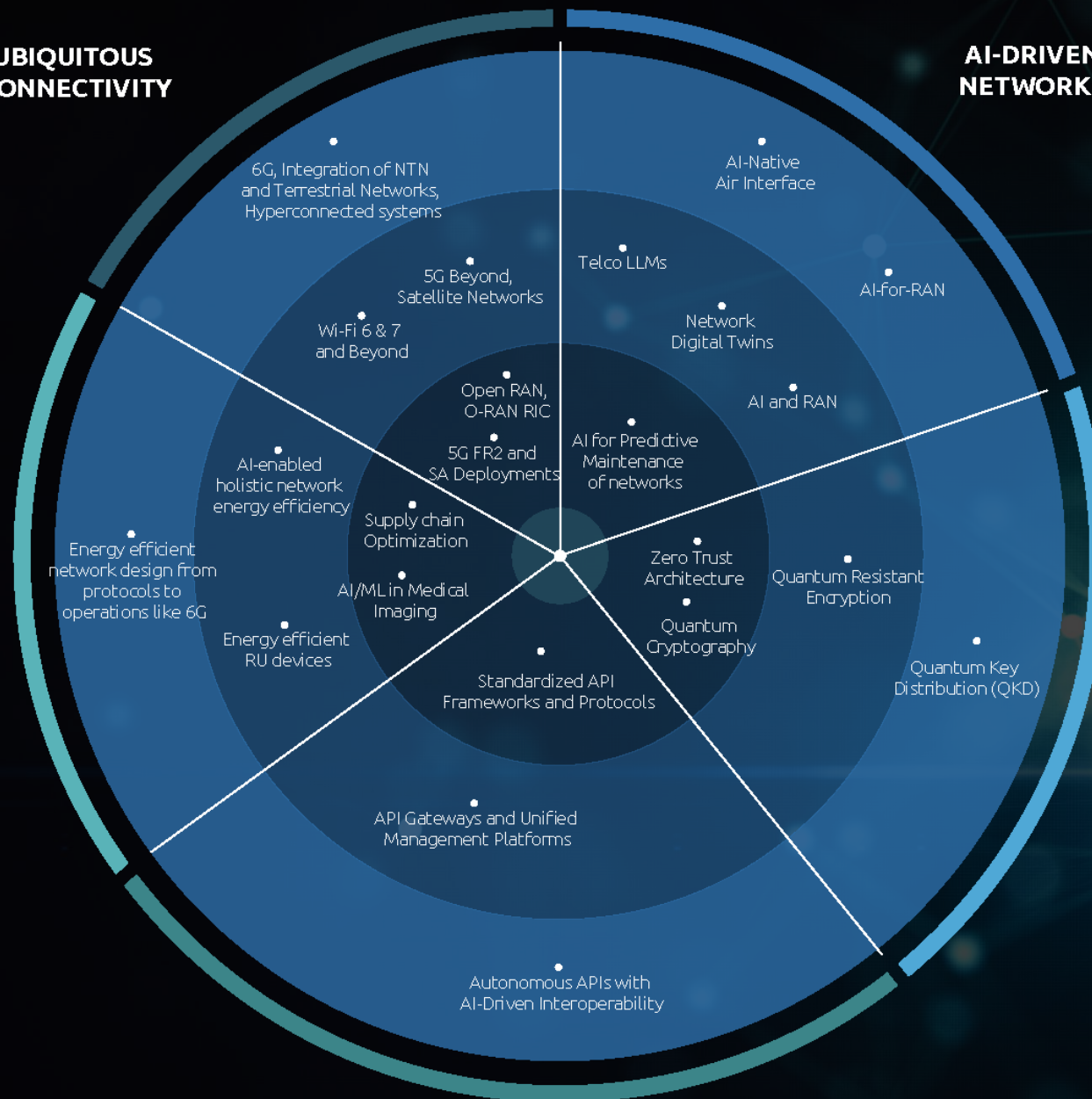
SUSTAINABILITY AND GREEN CONNECTIVITY

UBIQUITOUS CONNECTIVITY

AI-DRIVEN NETWORKS

SECURE COMMUNICATION

OPEN & INTEROPERABLE NETWORK DEVICES





R&I *projects*

UBIQUITOUS CONNECTIVITY

Imagine-b5g amazing:

Innovative
technology enablers
in Communications,
Applications and AI,
IoT and localization

AI-DRIVEN AUTONOMOUS NETWORKS

Project Marconi (India):

Intelligent Link
Adaptation in RAN

SECURE COMMUNICATION

Queens & Trust (Portugal, Proposed):

Security framework
for 6G networks that
is resistant to
attacks from
quantum computers.

INTEROPERABLE NETWORK DEVICES

1. 6G-XR (Spain):

Open platform to
develop Holographic,
XR, AR communications

2. Amazing-6g (Portugal):

Large scale trials and
pilots for verticals
in 6G

3. Exist: digital twin robotic arm:

Controlled through
the industrial
metaverse

SUSTAINABILITY

Project Bose (India):

Intelligent Energy
Saving For 5G and
Beyond Telco
Networks

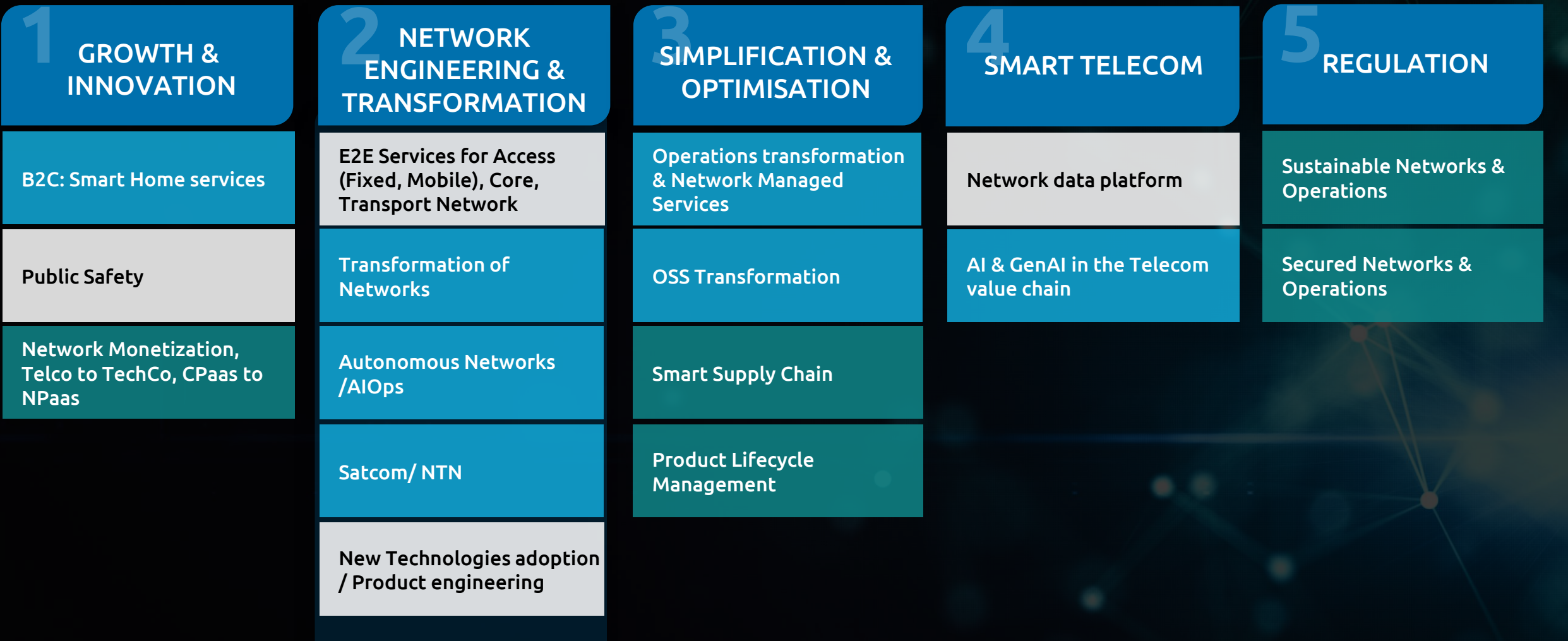


Focused offerings in 2025

Portfolio & strategy to build in 2025

Mature capabilities

Telecom offerings



Strong value proposal & key differentiators

ESTABLISHED PRESENCE IN TELECOM

30+ years

Leadership in
Engineering and
R&D services

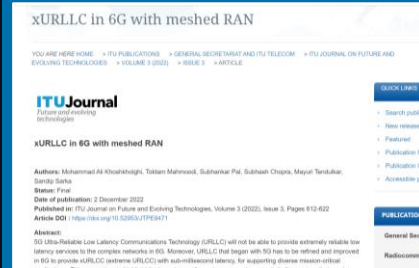


Thought leadership

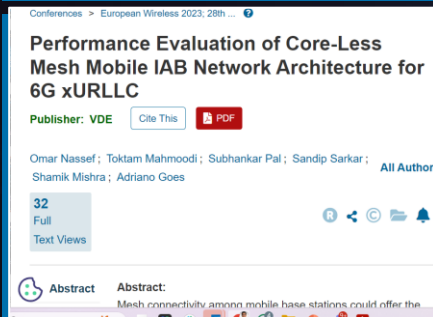
Whitepapers, blogs and press releases



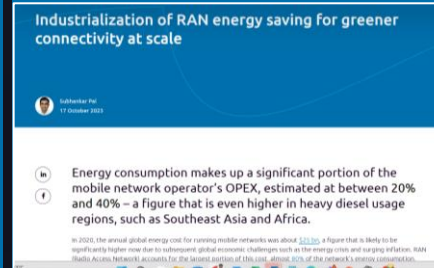
Capgemini's point of view white paper "6G for the hyperconnected future". See [link](#) for details



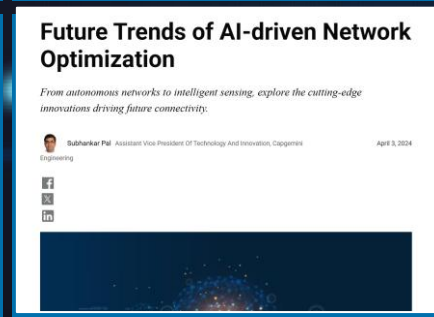
Research paper "xURLLC in 6G with meshed RAN" published in ITU Journal. Available [here](#).



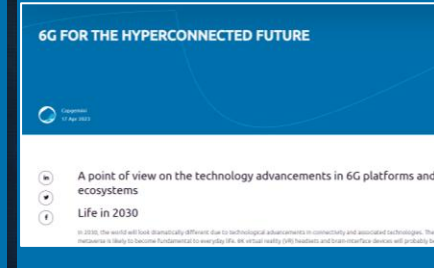
Research paper "Performance Evaluation of Coreless Mesh for 6G" published in IEEE conference. Available [here](#).



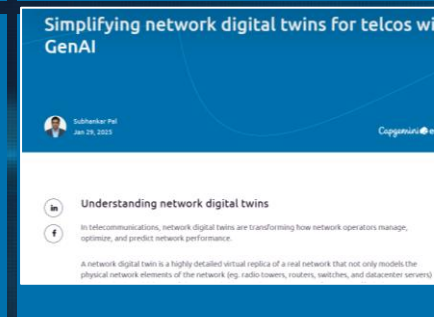
Network energy saving blog "Industrialization of RAN energy saving for greener connectivity at scale". See [link](#) for details.



Network AI blog "Future Trends of AI-driven Network Optimization". See [link](#) for details.



6G point of view blog. See [link](#) for details.



Gen AI blog "Simplifying network digital twins for telcos with GenAI". See [link](#) for details.



Scope 3 sustainability blog "Raising subscribers' awareness of energy consumption". See [link](#) for details.



Edge AI whitepaper "Capgemini Pushes AI Learning to the Edge with Advanced Privacy Preservation". See [link](#) for details.

Thought leadership

Whitepapers, blogs and press releases



Capgemini's point of view whitepaper:

"6G for the hyperconnected future."

See [link](#) for details.

Research paper published in the ITU Journal:

"xURLLC in 6G with meshed RAN."

Available [here](#).

Network energy-saving blog:

"Industrialization of RAN energy saving for greener connectivity at scale."

See [link](#) for details.

6G point of view blog:

"6G for the hyperconnected future."

See [link](#) for details.

Scope 3 - Sustainability blog:

"Raising subscribers' awareness of energy consumption."

See [link](#) for details.

Research paper published in IEEE conference:

"Performance Evaluation of Core-less Mesh for 6G."

Available [here](#).

Network AI blog:

"Future trends of AI-driven network optimization."

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