

Know, now

Know the early signals in the market
and what they mean now

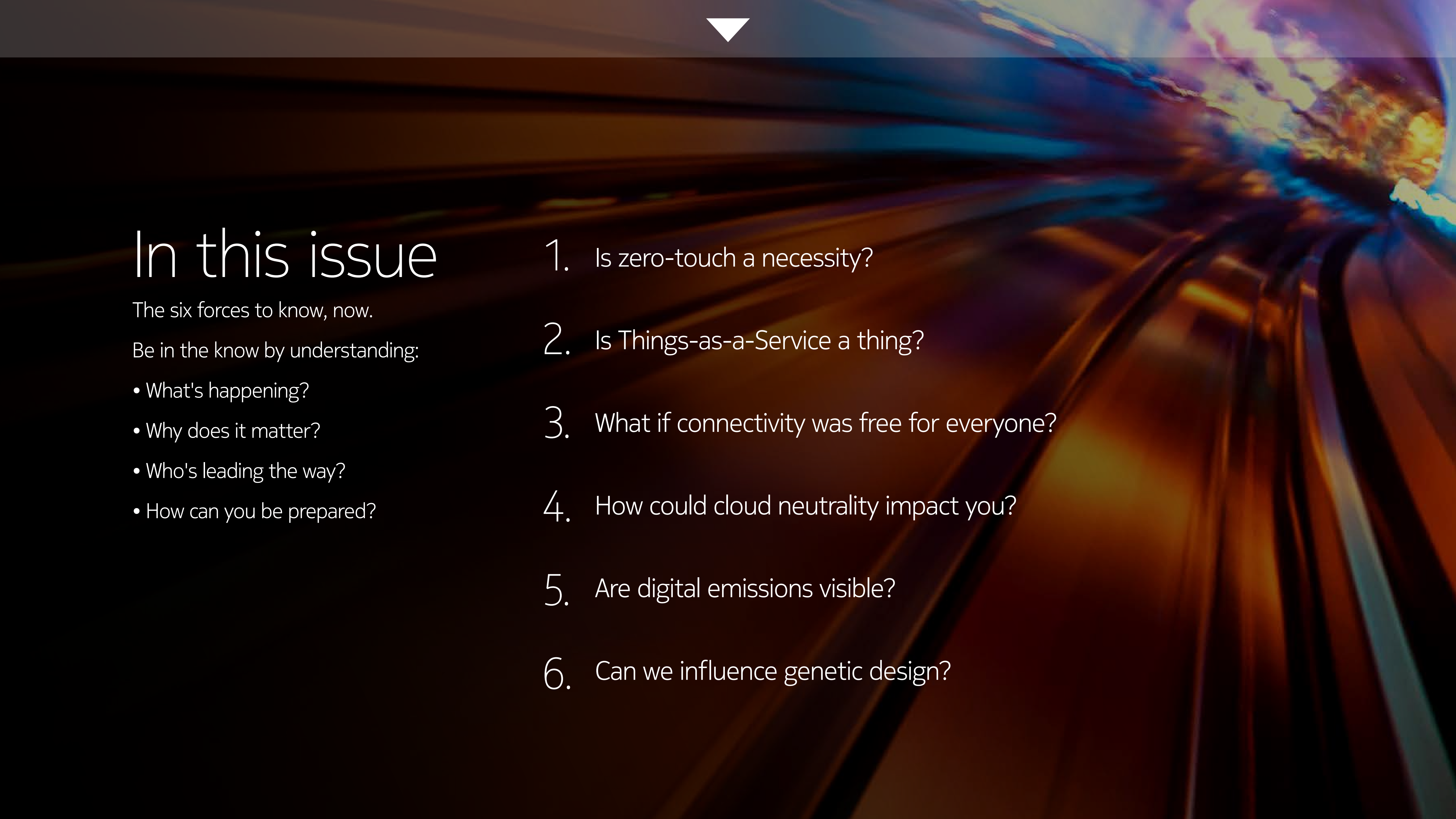


Welcome

What are the global signals, trends and game-changing technologies that communication service providers (CSPs) need to be aware of now? And what will their implications be over the next decade? Nokia and leading strategic foresight and futurology management consultants, the Future Today Institute (FTI), came together to find out.

This report provides insights on both obvious and not so obvious trends that extend across the near, mid- and long-term horizons. It reveals six forces with the potential to either create disruptive opportunities for CSPs, or become significant risks.

Throughout the report, we ask some of the pressing questions that CSPs need to consider now to prepare for their future and take greater control of it.



In this issue

The six forces to know, now.

Be in the know by understanding:

- What's happening?
- Why does it matter?
- Who's leading the way?
- How can you be prepared?

1. Is zero-touch a necessity?
2. Is Things-as-a-Service a thing?
3. What if connectivity was free for everyone?
4. How could cloud neutrality impact you?
5. Are digital emissions visible?
6. Can we influence genetic design?

Forces shaping the future of CSPs 2022-2030

ZERO-TOUCH

Zero-touch will disrupt how we build, run and operate new services. It changes the roles people play within traditional businesses; the way we allocate resources, respond to customer needs and mitigate threats.

PUBLIC CLOUD

A concentrated market for an invaluable service creates high risk. It can take several years for a large company to integrate its data into the cloud, making selection a high-stakes choice and the cost of switching prohibitive.

DIGITAL EMISSIONS

We can't ignore the virtual world if we want to meet sustainability goals. Collectively, our homes are producing significant digital emissions with every digital action creating carbon dioxide. And as smart homes and devices proliferate, these collective digital emissions will grow significantly.



THINGS-AS-A-SERVICE

While subscription models are popular, margins are constrained and revenue from network access alone is unlikely to change. XaaS challenges the CSPs' traditional ways of doing business and creates the potential for new, top-line growth.

FREE INTERNET

Free internet could change everything for CSPs, creating new forms of competition and, potentially, a complete disruption of the telecommunications industry.

SYNTHETIC BIOLOGY

Future demand for connectivity will be driven, in part, by synthetic biology and its applications. However, at present, the sector's connectivity needs have yet to be realized - and it isn't readily available in remote and non-conventional environments where the technology may need to be deployed.

Zero-touch

Is zero-touch a necessity?

// Near-term force

// Low uncertainty

// Growth opportunity for CSPs with action



1

What's happening?

2

What if networks could automatically diagnose and heal themselves? What if they could understand your intentions and respond correctly, in the moment?

3

Reducing the need for human intervention isn't simply about automation – zero-touch moves beyond that to anticipate needs using AI and machine learning. Zero-touch isn't just “nice-to-have.” Next-generation networks will need to meet ‘always-on’ expectations for service to stay competitive.

4

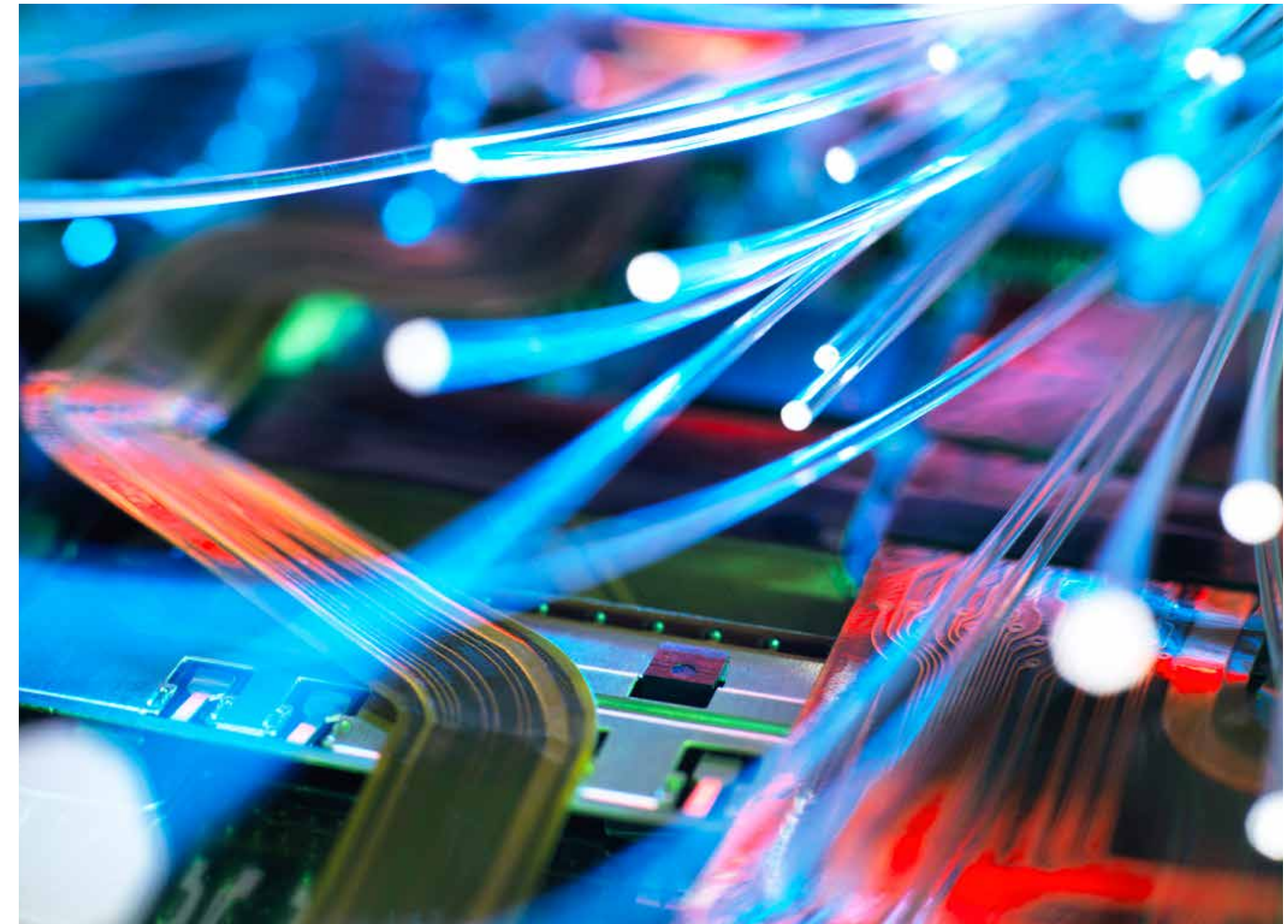
5

For enterprises, zero-touch impacts how networks are built and deployed. For consumers, zero-touch means intuitive and accurate interfaces, ready to interpret voice, gestures and facial recognition.

6

One-click online functionality gave us simpler, faster digital experiences. True zero-touch moves far beyond that, using intent-based automation that allows networks to self-configure, optimize performance in real time, and recover from failure events.

The shift is creating opportunities for new players such as Rakuten to compete in traditional CSP markets with more efficient ways of operating.



Why does it matter?

Zero-touch will disrupt how we build, run and operate new services. It changes the roles people play within traditional businesses, the way we allocate resources, respond to customer needs and mitigate threats.

There is no question, we are moving towards zero-touch technologies. For example, with the capabilities enabled by 5G, more data will be transported between billions of devices - creating large scale security complexities. It's a given that security orchestration and automation capabilities will be needed to intelligently assess and resolve cyber incidents with minimal manual intervention.

But which players will be able to modernize their networks and operations with automation and drive the most business benefits? Some new market entrants are betting the use of automation and the transition to zero-touch will be disruptive enough to create an entry point into traditional CSP markets.



Who's leading the way?

Self-healing systems

Comcast Business uses AI to prioritize network failures: Comcast Business launched a new offering that uses AI to detect and respond to service degradation without the need for operator intervention. Traffic is then automatically prioritized and rerouted around network failures.

[Read more](#)

Zero-touch provisioning

Telenor simplifies network slicing: Provisioning and orchestration of network slices with end-to-end automation and zero-touch management will be critical for successful B2B2X partnerships between CSPs and industry verticals. Through the 5G Verticals Innovation Infrastructure (5G-VINNI) consortium, Norwegian CSP Telenor is proving it's possible to simplify network slicing with zero-touch digital orchestration – building the foundation for reliable, profitable 5G services for enterprise customers.

[Read more](#)



There is no question, we are moving towards zero-touch technologies.

Zero-touch interfaces

BMW integrates gesture control: BMW is integrating more gesture control in its vehicles, which will require drivers to adopt the feature fast, as physical buttons and knobs are eliminated in lieu of extensive touchscreen controls. It's far easier to twirl a finger in the air than search for the right screen to adjust volume control.

[Read more](#)



How can you be prepared?

Zero-touch networks are an evolution that requires technologies such as cloud and machine learning among others to automate and maximize the value of the network.

While it promises several operational benefits, applying automation across an entire business is a big-bet transformation that can be high risk. Has your organization done a thorough analysis and identified the priority areas that will benefit from automation?

For example, with a worsening cyber threat landscape, security teams will need a better way to not only gather the supporting information about the security state from a wider range of sources, but also to automate security processes. Do you have the platforms that are best suited to your organization's existing infrastructure and your evolutionary goals? Does your workforce have the necessary skills to support zero-touch networks?



Zero-touch also creates new opportunities for your business

Are you leveraging and extending AI/ML capabilities to provide self-healing services to your customers? Self-healing solutions will be needed for more than traditional networks. Automated solutions also require automated help. This is critical as bots become key to core operations – and failures can become costly.

With the proliferation of IoT devices expanding the attack surface of networks, services such as secure onboarding via zero-touch provisioning will allow enterprise networks to scale without additional IT resources, quickly and safely.

Is your business prepared to support new interfaces that change the nature of interactions to zero-touch? These emerging ecosystems need access to real-time data and low-latency networks for cloud processing.

38.6 bn

Estimated number of IoT devices worldwide by 2025.
In 2020 IoT devices were responsible for 33 percent of the overall infections in mobile networks, a 100 percent rise from 2019.

Things-as-a-Service

Has Things-as-a-Service reached critical mass?

// Near-term force

// Low uncertainty

// Growth opportunity for CSPs with action

1

2

3

4

5

6

What's happening?

What if everyone had bleeding-edge, world-class expertise at their fingertips? What if we could build networks and offer services without owning all the assets to establish and operate them?

Networks are becoming more complex and expensive to operate – with consumers using more data than ever before. Things-as-a-Service (XaaS) models have quickly grown to address the growing need for CSPs to reduce costs. Whether it's a physical asset or a software function, CSPs can lower their capital outlay by using capabilities such as AI through a XaaS model, to help reduce operational costs. CSPs can also help their enterprise customers reduce expenditures by delivering [Network-as-a-Service](#), a market that is estimated to be \$15 bn by 2025. These cloud-based services are democratizing capabilities that would otherwise require significant resources.

On the consumer side, subscription models offer unlimited access for a recurring fee, promising an evergreen pipeline of live and on-demand content. In turn, XaaS models lead to increased use of networks, but typically without the benefit of new revenue streams for CSPs.



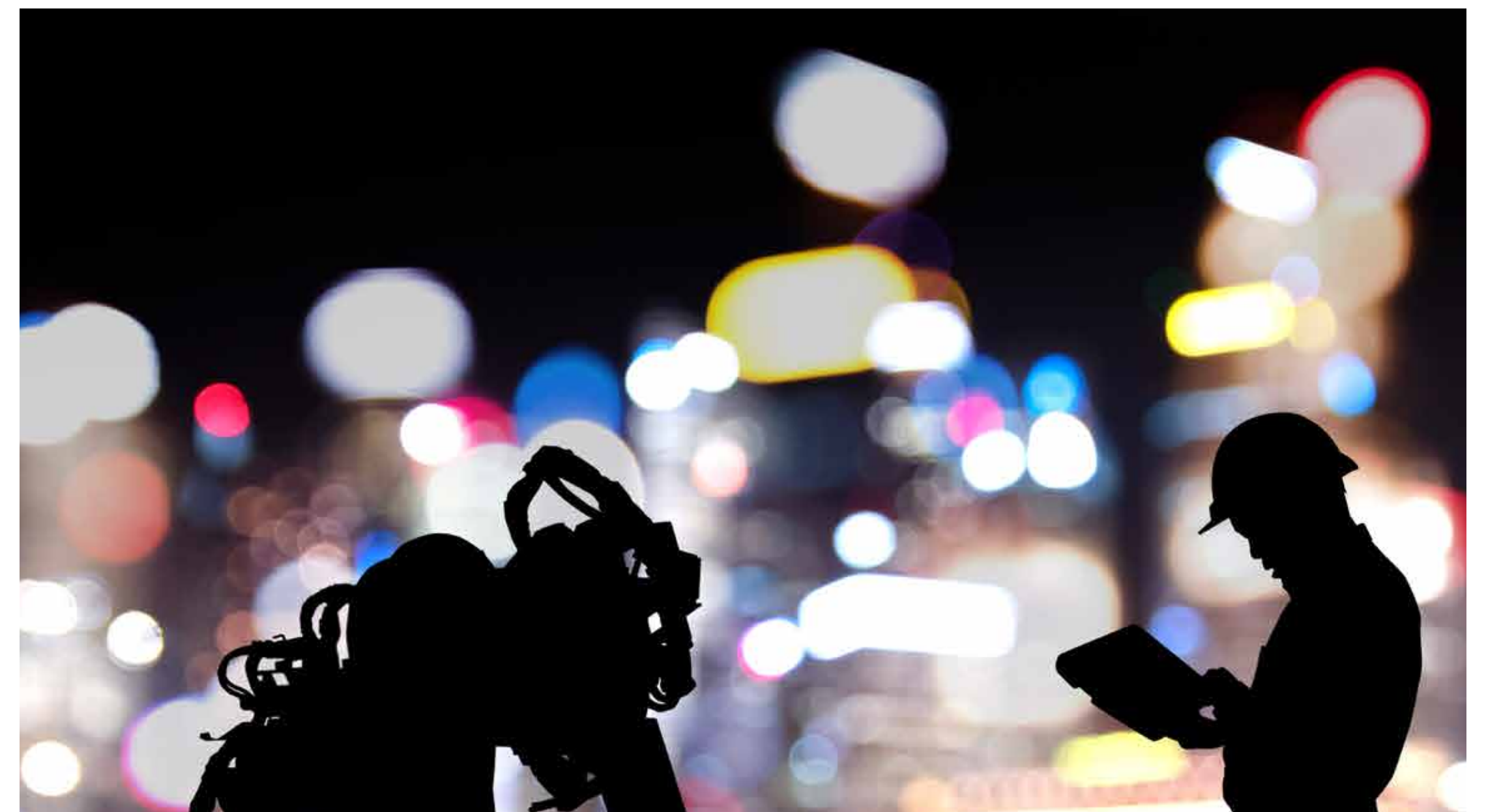
Why does it matter?

While subscription models are popular, margins are constrained and revenue from network access alone is unlikely to change. XaaS challenges the CSPs' traditional ways of doing business and creates the potential for new, top-line growth.

However, many businesses lack awareness and understanding of emerging XaaS opportunities - such as robotic process automation and AI - that will require new business models.

Yet, as demand grows for the flexibility enabled by XaaS, today's network infrastructure may not be enough to meet that need.

XaaS also has the potential to change the competitive landscape as aggressive new entrants seek greater control. Amazon, Google and Microsoft are taking on near-term risk by investing heavily in cloud-based service offerings. In time, they could seek greater control over the networks that connect them to their customers.



Who's leading the way?

Apple introduces Create ML

Create ML is Apple's no-code, drag-and-drop tool that lets users build custom models such as recommendation engines, natural processing systems, and text classifiers.

[Read more](#)

Cobalt Robotics introduces robot security guards

Cobalt Robotics provides 'always-on' robots that can augment or replace human security guards. The data the robots collect is funneled back to AI algorithms that can find insights to improve security operations.

[Read more](#)



AI for telecom

In collaboration with Microsoft, Nokia is delivering multiple AI use cases over public cloud for CSPs such as Australian provider TPG to securely inject AI into their networks to manage business complexity, and optimize network coverage, capacity and performance.

[Read more](#)





How can you be prepared?

Are you seizing near-term opportunities to offer Network-as-a-Service solutions to enterprise customers?

IDC expects global enterprise spending on NaaS to hit [\\$15 bn by 2025](#), and webscale companies such as Amazon and Microsoft are already getting in on the action as a natural extension of their cloud IT services offerings.

CSPs can compete by playing to their natural advantages in edge and access networks. And with network slicing, CSPs can offer differentiated services that are flexible and dynamic – based on the customer’s requirement rather than a one-size-fits-all approach.

So, CSPs need to assess whether they are making the right technology investments, particularly in orchestration and automation, to be able to offer NaaS to their customers.

Have you evaluated what new assets you're able to offer aaS? For example, 87 percent of enterprise executives consider [digital twins](#) to be essential to their organization’s ability to collaborate in strategic ecosystem partnerships.

These companies will benefit from CSPs that offer digital twins as a service, underpinned with low-latency, high-capacity networks.

Are there immediate opportunities for you to be part of the subscription value chain?

CSPs could develop new packages that include game controllers for gamers seeking exceptional wireless and wireline experiences, wherever they are playing.

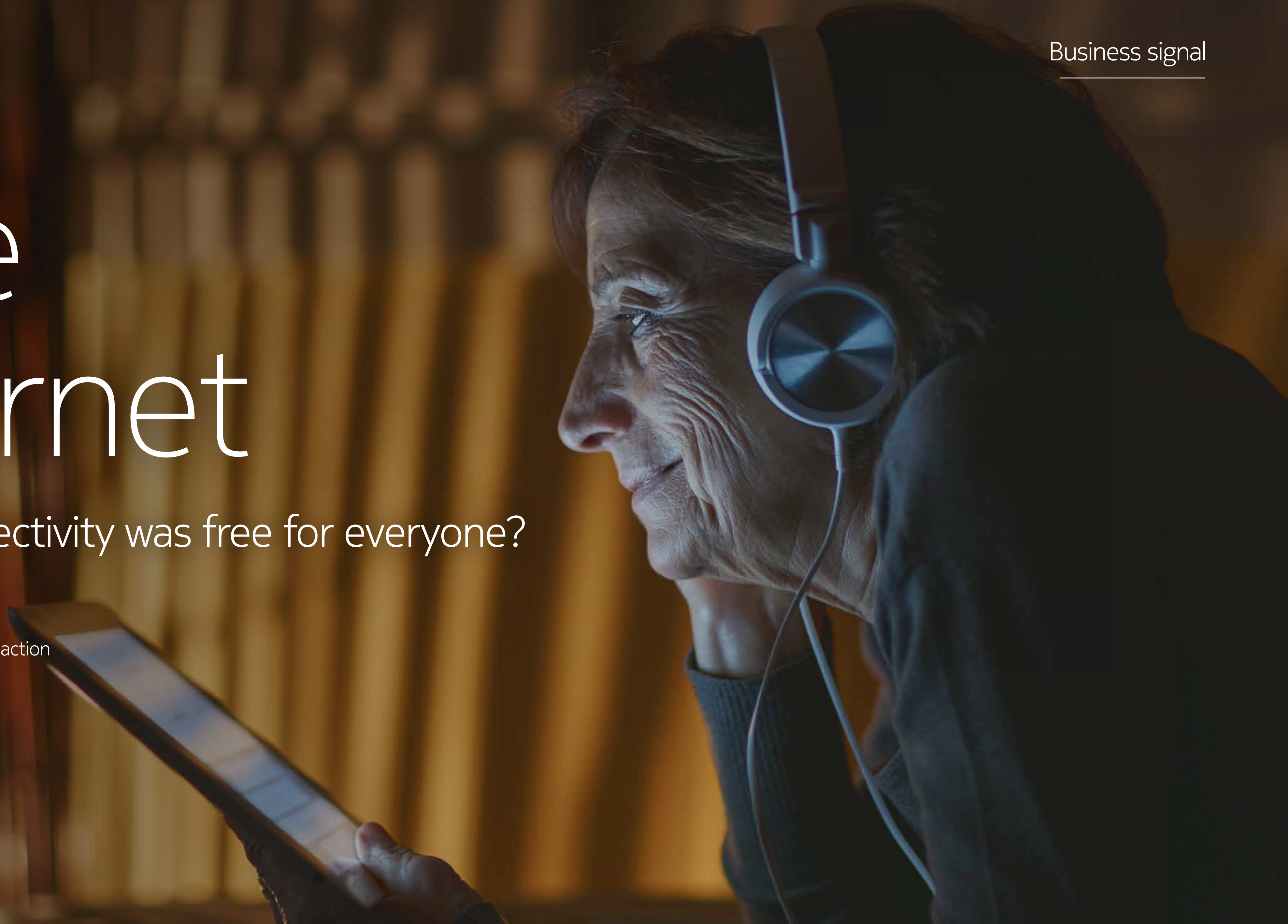
Free internet

What if connectivity was free for everyone?

// Mid-term force

// Some uncertainty

// High risk to CSPs without action



1

What's happening?

2

What if the internet was always on and offered for free? This year, thousands of satellites will be deployed in mega-constellations, bringing to life the promise of viable internet connectivity beamed from space.

3

It has the potential to provide more ubiquitous broadband connectivity without needing extensive additional ground based infrastructure. The increased pressure to connect the unconnected and close the digital divide is shining a spotlight on these solutions and helping them gain traction.

4

Closer to earth, mesh networks are also on the rise, creating self-healing capabilities for networks that allow continued connectivity, even if a node is lost.

5

The idea of free connectivity isn't new. Facebook Free Basics has been offering free internet - mainly to access Facebook and a handful of web-based services - provided through partnerships with local CSPs in over 60 countries. It's not beyond the realm of possibility that a company may choose to offer connectivity services for free as part of a larger package.

6





A single player could offer free internet, stealing market share from existing CSPs and upending the value equation for connectivity services.

Why does it matter?

Free internet could change everything for CSPs, creating new forms of competition and, potentially, a complete disruption of the telecommunications industry.

We're already developing new and very different ideas about what network connectivity looks like and how it operates. A single player could offer free internet, stealing market share from existing CSPs and upending the value equation for connectivity services.

This creates a dramatic shift where consumers and enterprises place the value on a given service and force CSPs to re-evaluate their own value assumptions and competitive strategies.

For example, Amazon could integrate its global satellite broadband project into its Amazon Web Services (AWS) ecosystem.

This could create significant retention risks for a CSP's enterprise base and coveted industries such as utilities and transport.

That said, the economics of satellite broadband makes it unlikely to be offered free, and its current limited coverage and performance also don't meet the needs of many applications and for many businesses. However, it's worth asking - what would it take for a free internet offer to make sense as a business strategy for any company? Is it possible that the data that flows through is more valuable to a company than a subscription service would be?

Who's leading the way?

Space-based internet

Amazon's Kuiper satellite mega-constellation

In August 2020, the U.S. Federal Communications Commission approved Amazon's latest satellite mega-constellation, which includes 3,236 micro-sats built to provide high-speed internet – that's more than double the total number of satellites currently in orbit.

[Read more](#)

OneWeb launches 254 satellites

OneWeb has launched 254 satellites, part of its ultimate plan of 650 to power what it calls “fiber-like internet” coverage in the Arctic.

[Read more](#)



SpaceX's Starlink LEO network

SpaceX is already starting to offer high-speed, low-latency broadband service to over 10,000 users across several countries via an interconnected Low-Earth Orbit (LEO) satellite network and plans to launch up to 42,000 satellites by 2027.

[Read more](#)

Mesh networks

Amazon Sidewalk links smart devices using low-energy Bluetooth

Amazon Sidewalk links its ecosystem of smart home devices, such as Ring and Echo, using Bluetooth low-energy and unlicensed spectrum like the 900MHz band. Sidewalk pools internet bandwidth from devices within a half-mile with the service turned on. The more neighbors that participate, the more bandwidth is made available. It can transmit software and security updates, too. One early use case: if a customer loses her keys and has a Tile attached, she can use the Sidewalk network to automatically locate where she left them.

[Read more](#)



How can you be prepared?

We are potentially at the beginning of a business disruption that can create opportunities or challenges. If a CSP takes a wait and see approach, it may be left vulnerable. Exploring the possibilities and taking some action now, such as understanding what the needs of consumers and enterprises will be and preparing for that new reality, allows you to be in a solid position to compete if and when the disruption takes hold.

Are you taking an open approach to your business and leveraging open forums, open ecosystems, open interfaces, and an open culture? Adopting an open approach will be key to innovating fast and bringing valuable new services to market alongside connectivity solutions.

Do you have a business ecosystem strategy in place that brings together a broad set of partners to deliver new value to customers? And with that, do you have the right platforms and operational processes in place to make your ecosystem effective?



12,000 satellites

Size of SpaceX's Starlink fleet as approved by the FCC
– Starlink already accounts for a quarter of active satellites.

The public cloud

How will you leverage the public cloud to your advantage?

// Mid-term force

// Some uncertainty

// High risk to CSPs without action

1

What's happening?

2

The three biggest cloud providers, Microsoft, Amazon, and Google, have collectively invested tens of billions of dollars building infrastructure: data centers, monitoring systems, and software.

3

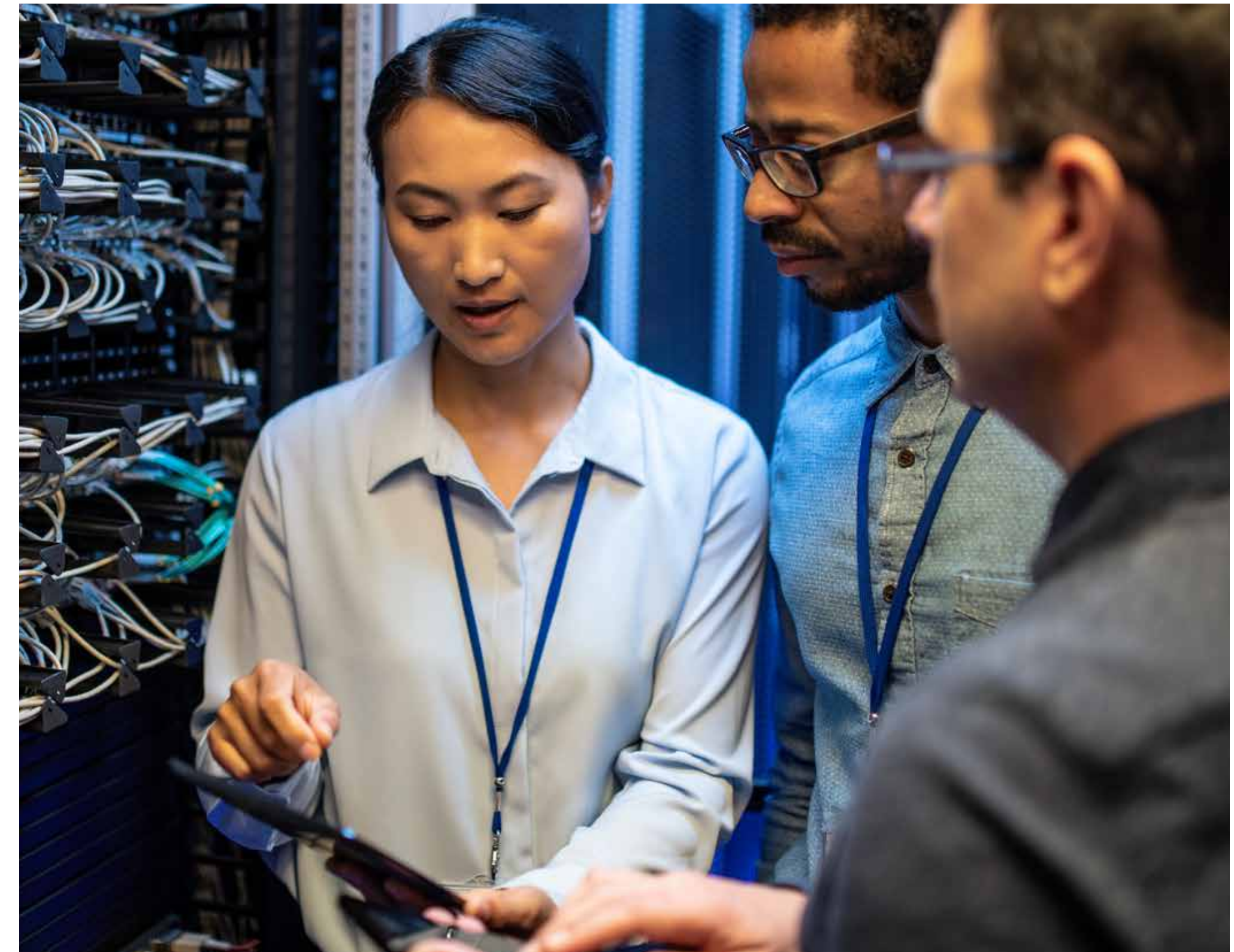
4

These robustly designed systems prevent downtime and data loss, and few other companies in the world can compete. But the cloud isn't public infrastructure; it's private. And as private companies, cloud providers currently control access to their services – services that are becoming the lifeblood of businesses.

5

6

These private companies sometimes compete with the cloud provider's offerings as well. Take Netflix, for example. It runs its streaming business on AWS, which is in direct competition with Amazon Prime's streaming service.





Going forward, CSPs will need to partner with hyperscale players, especially for the edge cloud. It's not a question of "if" but of "how" and "when?".

Why does it matter?

A concentrated market for an invaluable service creates high risk. It can take several years for a large company to integrate its data into the cloud, making selection a high-stakes choice and the cost of switching prohibitive.

To be clear, moving network functions to the cloud delivers compelling benefits and a cloud-native environment is a must-have for future 5G services.

Today, most CSPs operate in a private cloud model – whether it's telco, IT or edge cloud. But, as they determine their cloud evolution strategy, it will be important to understand the strategic implications of their choices – be that cost, performance, or longer-term competitiveness. Going forward, CSPs will need to partner with hyperscale players – especially for the edge cloud. It's not a question of "if" but of "how" and "when?"



Who's leading the way?

DISH announces partnership with AWS

DISH, the satellite TV company, selected AWS and Nokia to deploy the world's first 5G network in the public cloud. DISH is using AWS' Open-RAN technology and Nokia's 5G stand-alone core network, security, subscriber data management, and device management capabilities. The deployment on AWS gives DISH the automation required to meet evolving customer needs, including new enterprise and consumer 5G use cases quickly, securely and across multiple cloud stacks at end customer premises.

[Read more](#)



Google Cloud developing cloud-native 5G services with Nokia

Google Cloud and Nokia are jointly developing cloud-native network functions, 5G edge services, and a 5G core to mobile operators. The two companies are working to validate, optimize and evolve cloud-native network functions, and will also co-innovate new solutions that will help CSPs deliver 5G connectivity and services at scale.

[Read more](#)



How can you be prepared?

While a concentrated cloud services market creates risks, CSPs can only evolve their business models and unlock new monetization opportunities by embracing cloud. Navigating skillfully to the cloud will be critical to success.

74%

of the highest performing CSPs say partnering with webscale companies for 5G-enabled edge computing would mostly benefit the strategic interests of webscalers.

The big questions CSPs must answer going forward are whether to take a public or private cloud approach, for what parts of the network, and when - both from a regulatory and mission-critical perspective. In addition, they'll need to assess how much value is being created for each party. CSPs must also take into consideration the automation and orchestration of applications across multi-cloud, multi-stack, and multi-vendor environments. Embracing a cloud-native approach and its principles of microservices architecture, openness, and DevOps will be vital for 5G success.

More practically, as CSPs partner with hyperscalers, it's crucial to be clear on ownership of data, and defining end-to-end SLAs that determine who will be responsible for what, and how issues will be resolved.

Digital emissions

Can you curb digital emissions to meet ESG goals?

- // Longer-term force
- // Some uncertainty
- // Growth opportunity for CSPs with early action

1

What's happening?

2

The internet's data may be invisible, but it requires physical data centers across the world that must be powered on, cooled, and protected 24 hours a day, seven days a week.

3

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5

The energy used when you read a Reddit post or order more toilet paper is negligible – only a few grams of carbon dioxide are emitted each time. But consider the scale: billions of people and things complete multiple actions online, every day. These individual actions, although tiny, contribute to a huge global impact on greenhouse gases.

6

For businesses committed to Environmental, Social and Governance (ESG) goals, reducing digital emissions will be key in achieving company-wide emissions targets. Eventually, regulation could mean that companies will need to use their energy sources differently, requiring tracking and monitoring.





According to a McKinsey survey, 66 percent of all respondents, plus 75 percent of millennial respondents, said they consider sustainability when making a purchase.

Why does it matter?

We can't ignore the virtual world if we want to meet sustainability goals. Collectively, our homes are producing significant digital emissions with every digital action creating carbon dioxide. And as smart homes and devices proliferate, these collective digital emissions will grow significantly.

Companies are starting to focus on both their own and their customers' environmental impact – creating new services or tackling internal targets using automation to lower digital emissions.

Consumers are also taking sustainability into account more than ever when making purchasing decisions and, increasingly, expect the brands they associate with to play a positive role. According to a McKinsey survey, 66 percent of all respondents, plus 75 percent of millennial respondents, said they consider sustainability when making a purchase.



Who's leading the way?

Google invests in cold-climate data centers

The act of cooling IT equipment eats up about 40 percent of the energy typically required by data centers. Google first opened a data center in Finland, to cut energy use using natural cold weather climates and its success has led to additional investment. Google also uses high-tech evaporative cooling, smart temperature controls, plus machine learning systems to automatically adjust energy consumption.

[Read more](#)

Elisa dramatically reduces emissions

By employing liquid cooling base stations, Finnish telecom operator Elisa reduced the potential expenses of its base stations by up to 30 percent. Approximately 90 percent of energy consumed by base stations is converted to waste heat, however, with a heat re-use option – where waste heat is converted and repurposed – Elisa has been able to reduce its CO2 emissions by approximately 80 percent.

[Read more](#)

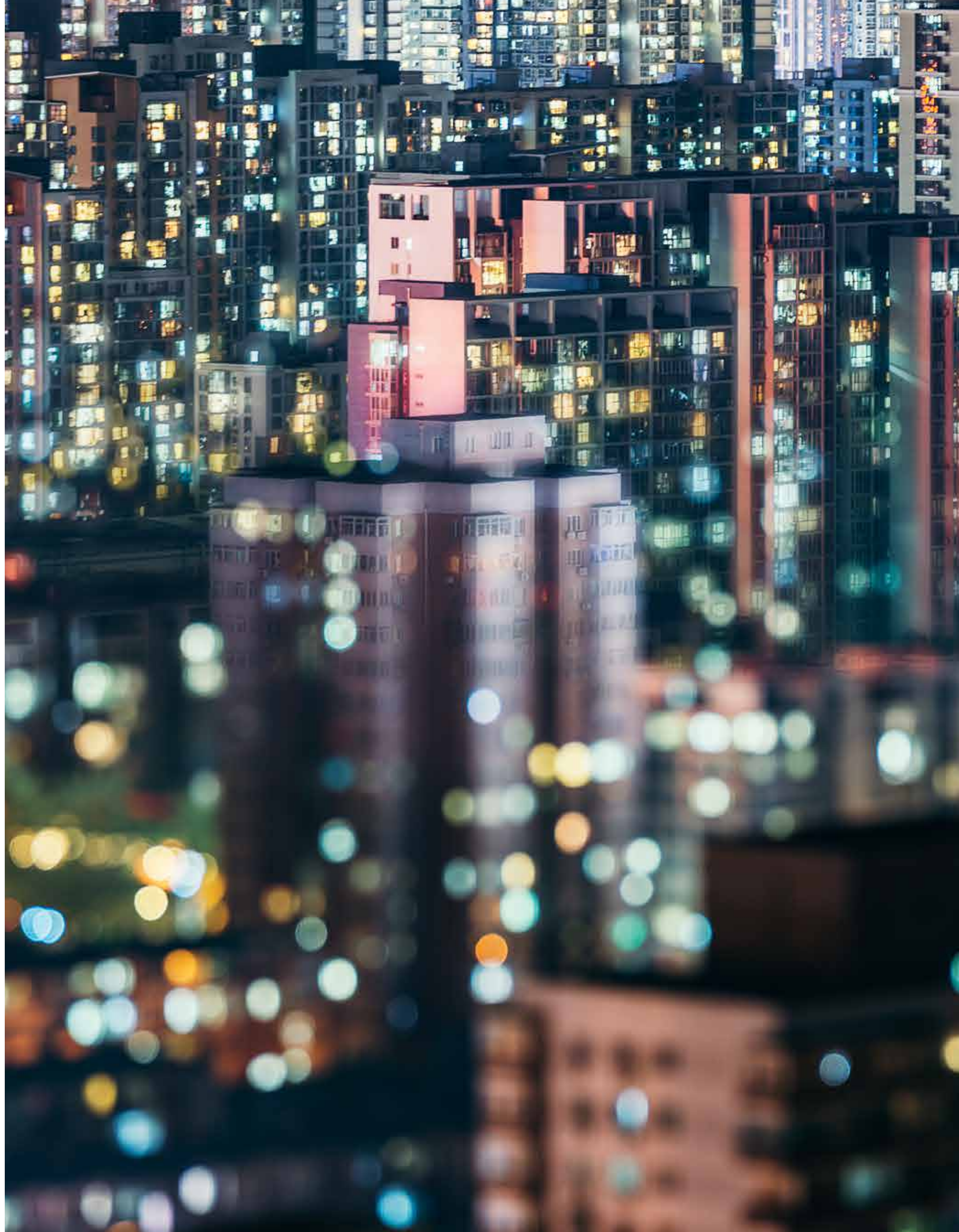


Nokia cuts CSP energy bills by 20%

By using AI for energy control, parts of the radio network can be powered down when traffic levels are low. Machine learning algorithms ensure that energy savings are maximized without compromising network quality.

[Read more](#)





How can you be prepared?

Is reducing digital emissions a part of your sustainability goals? If not, how can your company be an enabler?

Greener browsing: Companies are looking to automation as a means of reducing digital emissions. CSPs can position Robotic Process Automation expertise as a service offering.

Footprint-based routing: Dynamic route selection based on user preferences is expected to help cut the carbon footprint of internet traffic. This offers not only an option for internal sustainability metrics but can also be translated into service offerings.

Customers want to do business with brands whose values align with their own, and CSPs can improve their relationship with customers by offering solutions that improve the lives of customers in a sustainable way, such as smart home technology to monitor energy usage.

CSPs should also be evaluating their business and network operations to see how they can be made more sustainable, whether it's more automation, new ways of sourcing equipment, moving more physical assets to digital, and leveraging AI and machine learning to optimize resources.

51,560 tons

The amount of CO2 that could be saved if every adult in the US sent just one less email a year – the equivalent of taking 11,217 gas-powered cars off the road.

Synthetic biology

Can we influence genetic design?

// Longer-term force

// Some uncertainty

// Growth opportunity for CSPs with early action



1

What's happening?

2

We're entering the age of synthetic biology, where humans have the ability to shape the future of life itself – using technology to solve real-world problems.

3

Global food supply is in jeopardy because of climate change and a growing population. Viruses are becoming more frequent and difficult to fight. As a result, investments in new advancements in biotechnology are drastically changing traditional approaches to farming, health and medicine.

4

5

6

With synthetic biology, researchers design or redesign organisms on a molecular level for new purposes, making them adaptable to different environments or giving them different abilities. Synthetic biology is producing new materials, medicines, agricultural products and coatings.

One of the most promising sectors is agricultural technology.

For example, both Microsoft and Amazon are building new cloud verticals to support high-tech farming.

Our future will be shaped by advances in this sector – and a reliable telecommunications ecosystem is key to their success.



Why does it matter?

Future demand for connectivity will be driven, in part, by synthetic biology and its applications. However, at present, the sector's connectivity needs have yet to be realized – and it isn't readily available in remote and non-conventional environments where the technology may need to be deployed.

Molecular research is pushing network capabilities due to the amounts of data created and the ways in which the cloud is used – the value chain requires automation with zero-touch cognitive networks. This is where CSPs can become critical ecosystem partners in this field. However, new tech players are already developing their own bio-cloud, bio-networks and the infrastructure that will power our future.

Emerging business models in AgTech, precision agriculture and synthetic biology verticals are creating revenue opportunities for first movers that aren't constrained by commodity pricing. So, while these are emerging technologies, they are already national priorities in many countries.



Who's leading the way?

Microsoft invests in biological computing

Companies like Microsoft have already invested in biological computing. Like its project, Station B, which is a platform for creating new biological formulations using data, cloud computing and robots. And the world's biggest tech founders and venture capital firms are investing heavily in synthetic biology, with the number of new synthetic biology companies skyrocketing over the past two decades to over 600 companies in the space.

[Read more](#)

Azure FarmBeats uses technology to monitor soil

Azure FarmBeats is a B2B cloud offering intended to deploy AI and ML models using local data. Farms can assess crop health and water levels using connected sensors and satellite images, get recommendations on where to place soil sensors and, track farm conditions using on-the-ground data from sensors. Plus, they can calculate the exact additives required to keep crops healthy and use analytics to improve crop yields.

[Read more](#)



AeroFarms reaches new heights in indoor farming

AeroFarms runs the world's largest indoor vertical farm and yields up to 390x more produce than a traditional field farm. By using multi-sensory data, farms can look at how to optimize energy costs, how to identify and understand the impact of new pests and quantify crop progress with the goal of optimizing the plant health, growth and yield.

[Read more](#)



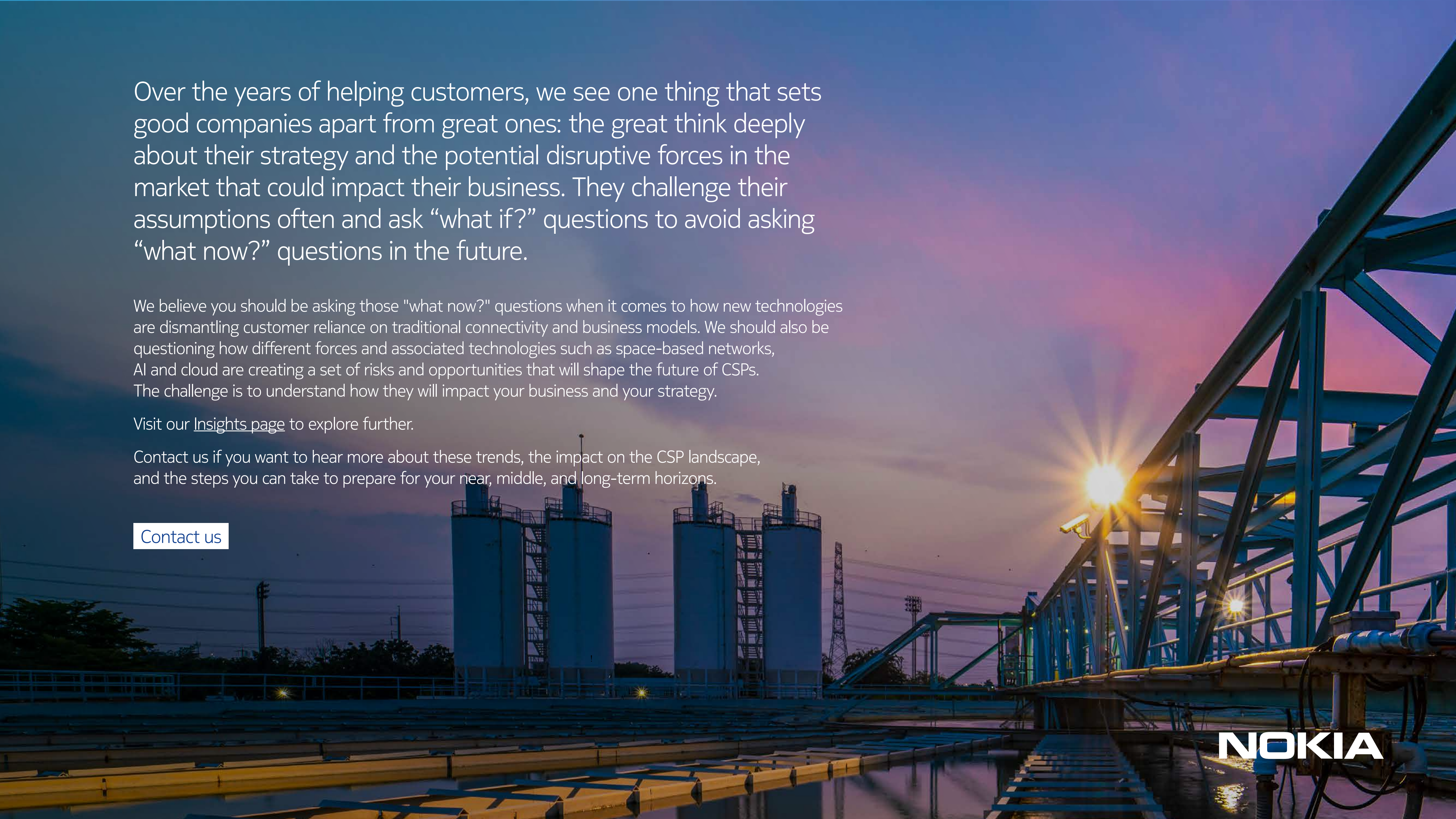


How can you be prepared?

Synthetic biology and its applications have the potential to address global challenges in areas such as farming, such as environment, health and well-being. However, the sector will need a robust technology and communications infrastructure to support new developments. CSPs should start building knowledge now and incorporate this into long-term strategies.

Biotech research would benefit from controlled, clean-room environments with low pollution levels. The facilities that sequence, synthesize and assemble biological products require zero-touch, cognitive networks to ensure the continuity of manufacturing processes. CSPs, Mobile Network Operators and Digital Service Providers can be critical ecosystem partners in synthetic biology. But if they wait, big tech players could develop bio-clouds, advanced networks, and the infrastructure for our futures.

Using AI-as-a-Service plus cloud connectivity will enable the processing of massive amounts of data. CSPs should consider how they can be part of the ecosystem delivering unique value, or risk being relegated to yet another utility-like intermediary.



Over the years of helping customers, we see one thing that sets good companies apart from great ones: the great think deeply about their strategy and the potential disruptive forces in the market that could impact their business. They challenge their assumptions often and ask “what if?” questions to avoid asking “what now?” questions in the future.

We believe you should be asking those "what now?" questions when it comes to how new technologies are dismantling customer reliance on traditional connectivity and business models. We should also be questioning how different forces and associated technologies such as space-based networks, AI and cloud are creating a set of risks and opportunities that will shape the future of CSPs. The challenge is to understand how they will impact your business and your strategy.

Visit our [Insights page](#) to explore further.

Contact us if you want to hear more about these trends, the impact on the CSP landscape, and the steps you can take to prepare for your near, middle, and long-term horizons.

[Contact us](#)

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Together with our clients and partners, FTI is helping leaders achieve their preferred futures. Our pioneering forecasting methodology and tools empower leaders to make better decisions about the future, today. Learn more at www.futuretodayinstitute.com.

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Adhering to the highest standards of integrity and security, we help build the capabilities we need for a more productive, sustainable and inclusive world.

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