

An aerial photograph of a dense, vibrant green forest. A river, appearing in shades of blue and turquoise, winds its way through the forest, creating a complex, meandering pattern. The forest canopy is thick and textured, with varying shades of green. The river's path is clearly defined against the surrounding greenery.

NOKIA

Five actionable areas to accelerate decarbonization

How CSPs can use digital technologies
to help industries decarbonize

#NoBoundaries



The goal of the 2015 Paris Climate Agreement to limit global warming requires social and economic transformation. COP26 in Glasgow provides a crucial staging post to see what progress has been made.

Here we look at five actionable areas where communications service providers (CSPs) can help key industries commit to supporting decarbonization and transition to a low carbon economy. This in turn will present associated benefits for health, wellbeing and the planet.



01

Making manufacturing smarter and greener

Industry 4.0 has laid the groundwork for manufacturers to set a path to net zero.

Automation has played a key role in developing efficient factory and warehouse operations to date.

However, further improvements are still necessary to balance supply and demand, reduce their carbon footprint and minimize industrial waste.

Factories and warehouses need to be sustainable by design and use renewable and recyclable materials in their processes. While CSPs have a clear and important part to play in their ongoing operations.

CSPs can help manufacturers leverage a wide range of intelligent services and IoT sensors and devices to help automate the production process and aid decarbonization. Advancements in data analytics, digital twins, AR/VR technologies and intelligent robotics can optimize the quality, safety, and efficiency of operations. 5G is particularly important in this story as its low latency, higher speeds, bandwidth and reliability provide the ability to scale output volumes up or down, to match demand, and minimize energy waste.

They can also help businesses either deploy private networks that support solutions using IoT sensors and analytics, or they can provide a complete package of connectivity, devices and applications. Over time this can be complemented with additional services and include on-going support to create a complete solution.

IoT connections to rise
more than 3x to 1.5bn
by 2025*





02

Empowering energy to reduce emissions

Transitioning to cleaner energy sources, such as hydrogen-based fuels, and shifting to renewables is imperative to get the industry on a path to net zero. Smart energy systems (SES) require interconnectivity for IoT sensors to monitor solar and onshore wind farms and track usage patterns.

Solar and onshore wind farms can cover large geographical areas and require private networks on a local scale. CSPs can play an important support role here, deploying communication solutions customized for the digitalization and automation needs of energy and utilities industry operations.

The shift to connected solar and wind grids could reduce CO2 emissions by 3 GT and 1.1 GT over the 10 year period to 2030*.

Providing power to all other industries, the energy and utilities sector plays a fundamental role in reducing CO2 emissions. Our latest whitepaper [Industry pathways to net zero](#) estimates current direct emissions (those from the industry's own activities) are roughly 35% of the global total.



03

A new route for transportation

The transportation sector comprises of multiple areas from automotive to rail, aviation and shipping and currently accounts for around 8.5 GT of CO2 per year – equivalent to 17% of the global total.

Transportation companies and transit authorities are already using mobile and digital technology to assist their decarbonization path. However, closer analysis of transport modes and routes can do much more to reduce CO2 levels. The use of IoT solutions and 5G connectivity can also help reduce congestion and the emissions that come from idling traffic.

CSPs can play a major role in advanced mobile connectivity for monitoring electric vehicles (EV) for example. By combining the data from IoT sensors in vehicles with Edge compute and AI/ML to generate the insights needed to optimize routes, operators can reduce distances and ensure charging stations are available as more vehicles turn electric. Plus, where telematics and navigation systems in logistics supply chains are deployed, their collective data can help reduce distances and optimise delivery times.

Maersk now invests \$1bn per year in energy efficient technology*





04

From sustainable to regenerative buildings

The building sector, will account for around 20% of global CO2 emissions*. Raw materials will play a significant role in decarbonization, but fundamental changes to the way buildings are designed, built and insulated will also be key drivers.

While sustainable buildings are designed to use minimal resources, buildings can offer a net positive impact. For example, water from heating, ventilation, and air conditioning systems can help to irrigate roof gardens, thereby dramatically cooling the building's roof. Sensors can detect the amount of water, and external/internal temperatures to optimize the process.

IoT offers real value as sensors can be fitted to meters to track energy usage and underpin smart home systems. Plus, cloud connectivity can enable data analysis to automate lighting and temperature control based on occupancy rates and weather conditions.

Households with smart meters use 3% less energy per year on average*



05

Accelerating action towards change

COP26 brings parties together to accelerate action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change. Our report: [Industry pathways to net zero](#) shows that while 130 countries have committed to carbon neutrality by 2050 only 20% of the world's largest companies have made the same commitment.

Many businesses will need to act fast to ensure that they can meet their government commitments. Disclosure from private sector companies will become increasingly important as governments and investors demand detailed sustainability reporting. Failure to do so could lead to financial penalties.

Overall, CSPs will play a crucial role in helping enterprises digitize and provide the best visibility to track their energy usage, process optimization, emissions reduction and decarbonization achievements.

One third of the global telecom market (covering 2.5bn subscribers) has public net zero targets*

* Industry pathways to net zero - Mobile and digital technology in support of industry decarbonization report 2021
** When it reaches pre-pandemic levels





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With our commitment to innovation and technology leadership, driven by the award-winning Nokia Bell Labs, we deliver networks at the limits of science across mobile, infrastructure, cloud, and enabling technologies.

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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