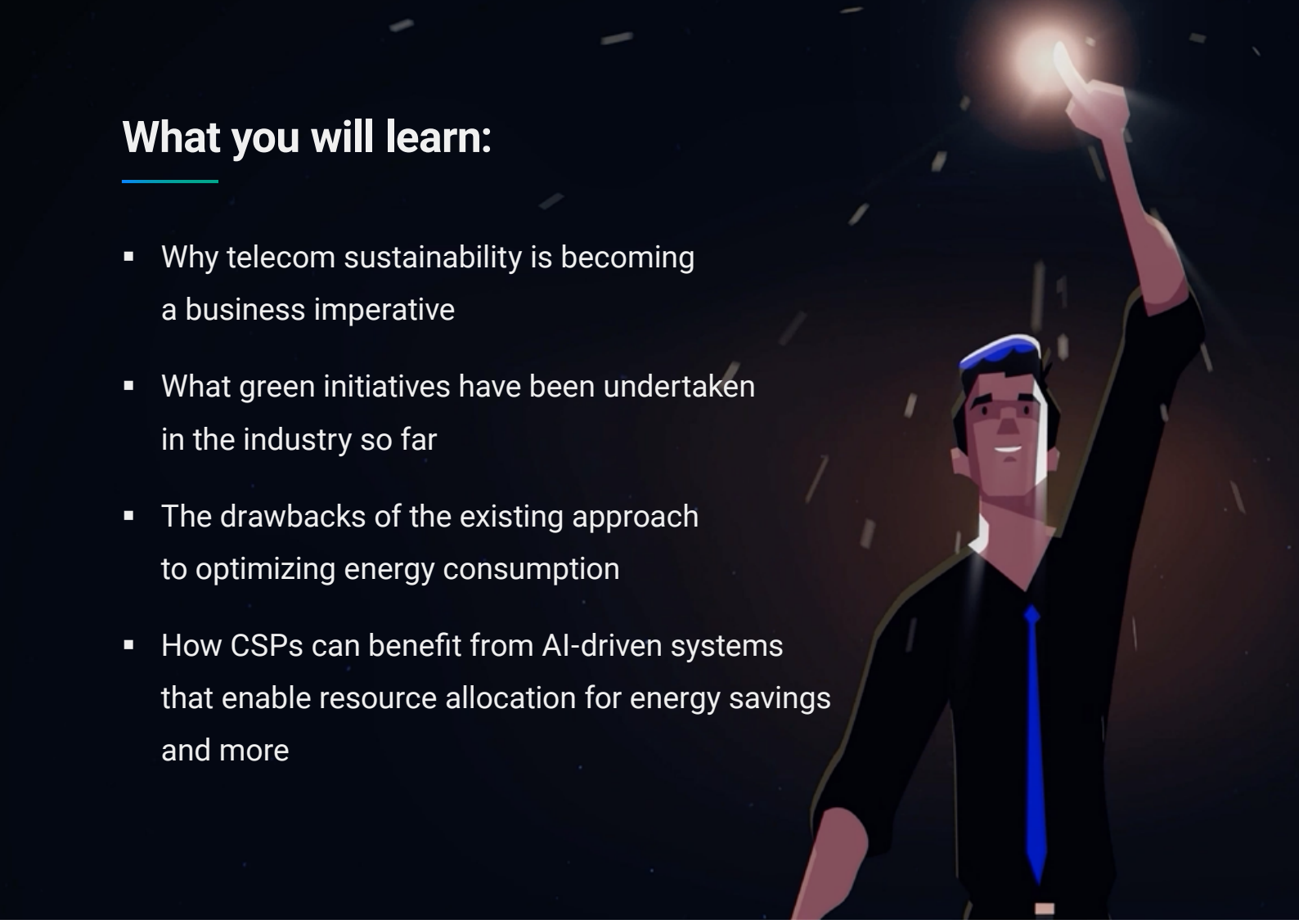
COMARCH

White Paper

# How to Make a Network Sustainable Without Affecting Service

## What you will learn:

- Why telecom sustainability is becoming a business imperative
- What green initiatives have been undertaken in the industry so far
- The drawbacks of the existing approach to optimizing energy consumption
- How CSPs can benefit from AI-driven systems that enable resource allocation for energy savings and more



With the expenses of energy constantly increasing, the establishment of net-zero goals, and the demands on network services expanding, energy usage has become crucial for sustainable operations in telco. However, the increasingly complex nature of telecom ecosystems makes achieving resource efficiency extremely challenging without the help of AI/ML-driven tools. Therefore, telecom operators are in urgent need of advanced automated systems that allow them to maximize the utilization of their networks without compromising performance.

## Why the (already) massive energy appetite of telco only gets bigger

Telecommunications services are a fundamental part of our interconnected world, but their operation comes at a staggering cost in terms of energy consumption. With an extensive network of facilities and infrastructure, this industry is a voracious consumer of electricity. **According to GSMA**, in developed countries, it's estimated to account for a substantial 2-3% of the total energy production, and this is steadily on the rise. This upward trend is not just a significant financial burden on the energy production and delivery systems, it's also an environmental concern.

This upward trajectory is further amplified by the ever-increasing frequencies used in radio systems, essential for achieving required data speeds. The result is a sprawling network of interconnected devices, akin to transmitters. The modern digital landscape, fueled by the demand for personalized services and location-based content, requires this density in our device network. It's not just about convenient access to smartphones, but the delivery of tailored content and services right at the fingertips of end-customers.

The introduction of new IoT services and visionary initiatives promising seamless communication with autonomous vehicles, drones, and their integration with IT systems, introduces yet another layer of complexity. It requires reliable network availability, which only amplifies the need for an even denser network – more devices mean more connectivity.

# Green initiatives from device design to open networks

The sustainability challenge has already been addressed in the design of telecommunications network devices. The quest to make them more energy-efficient translates into fewer energy dollars per transmitted gigabyte of data. Yet, as the need for data grows, the gains in efficiency are often eclipsed.

Furthermore, the colossal demand for new base stations, the very backbone of radio coverage, has reached levels that even the biggest vendors find challenging to meet. In the realm of 5G technology, we witness the emergence of base stations constructed from publicly available equipment, thanks to the **Open RAN Initiative**, ushering in more democratized connectivity solutions.

However, another issue emerges: seamless integration into the network, adherence to standards, and approval from the operator. These innovative approaches are predominantly leveraged within private networks and network slicing, marking a transformative path towards a more sustainable and efficient telecommunications landscape.

# Powering the core network: electricity costs and carbon footprint in the backbone

The weight of electricity costs extends its influence deep into the heart of telecommunications, encompassing the core network elements – the very pillars that underpin the delivery of innovative services across various locations, meaning: data centers. Considered by many to be even more important than reducing energy costs is the increasingly important factor related to minimizing the carbon footprint left by activities in the ICT services industry.

Recently, transformative solutions have paved the way for the dynamic placement of logical functions within an ever-shifting landscape of physical elements. In today's telecommunications realm, this flexibility is of paramount importance, driven by the high-performance requirements of a myriad of services and their fluctuating parameters, tailored to specific service goals.

This migration of virtual logic functions across a spectrum of physical devices doesn't just boost the performance of advanced services; it also offers a unique opportunity for energy optimization by taking such measures as:

- The reduction of energy consumption at the location
- A temporary shutdown of physical locations
- Prioritizing the activities of locations using green energy
- Optimization of the use of measures affecting the carbon footprint in order to maintain infrastructure

## The inefficiency of the existing approach to energy usage optimization

The reason behind the majority of methods being underutilized is simple: they're incredibly labor-intensive and time-consuming. The absence of automated systems analyzing network situations and implementing design and configurations necessitates the efforts of numerous specialists and teams.

Therefore, current measures for optimizing energy consumption rely on static, long-term analysis of a limited number of parameters. Changes are made to the configuration exclusively in response to permanent alterations or by simply turning off and on base stations (or, less frequently, transmission systems) at predetermined times of the year or days without actively monitoring the current traffic. Expanding the scope of activities leads to a significant rise in costs (especially for optimization and maintenance teams). This hinders holistic problem-solving. Fortunately, modern solutions have grown dynamically in recent years.

# A step into the future where automation is the cornerstone of sustainability and streamlining operations

The rise of automated systems has revolutionized the landscape, replacing traditional specialists and unleashing unprecedented levels of productivity. These systems effortlessly navigate complex processes, drawing insights from both historical data and real-time inputs within IT and telco networks. They have been developed to work on multiple policies, criteria, and parameters simultaneously. These systems analyze input data consistently, creating recommendations for further action in nearly all situations. Simultaneously, the data collected can be used to control the correlation between input data from detection and the formulated recommendations' effectiveness.

While these recommendations often have historical data as their foundation, the initial deployment of AI/ML-driven automated systems is a partnership between technology and human expertise. This stage allows the system to learn suitable responses to analytical outcomes resulting from detection, thus enhancing the efficacy and quality of its responses. It is now feasible to carry out these AI/ML-powered procedures on a continuous basis, and expand them to other areas that affect recommendations. The previously stated solutions, which demanded a significant amount of involvement, no longer necessitate such high costs and can now be executed widely.

A modern, advanced system powered by AI and ML aim to deliver services derived from orders created in other products by allocating ideal hardware and virtual resources based on thorough analysis of the type and parameters of services from the service catalog, extending to the supplier's original service price list. With access to information on the service endpoints (for mobile services, a geographical area) and the service parameters, it chooses the physical implementation of the service and employs hardware solutions that guarantee optimal service delivery.

This definition of the operating mode highlights the significance of the data provided to the product. Information must be comprehensive, accurate, and aligned with the selection criteria. This includes catalog energy consumption data and actual consumption measured in real time.

# How CSPs can benefit from AI-driven systems that enable resource allocation for energy savings and more

Using the selected information, the system determines the ideal configuration for physical and virtual resources, which are then implemented through an automated, continuous process. The fully automatic system always chooses the most energy-efficient configurations of network elements to provide services. Simultaneously, it guarantees that newly implemented services are offered in optimal conditions, occasionally resulting in significant modifications to the current configuration.

This occurs when the new service requires higher data throughput and can be implemented using existing resources. The existing service has been assigned resources based on energy efficiency, but its technical specifications exceed the necessary requirements. Previously, due to high workload, it operated on energy-intensive resources right from the start, causing those with lower energy consumption to remain idle until a service with higher demands was available.

If this process is automated, there is no logical reason for reserving resources unnecessarily. The system is guided primarily by technical requirements and analyzes whether completing the order is possible. It then devises a change to the existing service and executes it, freeing up space for the new service.

# Transform your telecom for a more sustainable future with Comarch

Comarch is a leading industry player with an in-depth understanding of operators' needs and the constant search for innovation to drive success. Our product development is based on industry standards, and we often take the lead in the market by offering tools that support CSPs in delivering value beyond just connectivity.

Comarch's solution addresses the challenge of sustainability by optimizing network utilization while maintaining the performance of energy-saving features. Our system is highly versatile, as it can be configured for various policies, such as those focused on energy savings, service quality and more. Additionally, it has a wide range of applications, including resource allocation planning, optimization, and ensuring business continuity and service quality, including during outages.

## ABOUT COMARCH

Since 1993, Comarch's specialist telecommunications business unit has worked with some of the biggest telecoms companies in the world to transform their business operations. Our industry-recognized telco OSS and BSS products help telecoms companies streamline their business processes and simplify their systems to increase business efficiency and revenue, as well as to improve the customer experience and help telcos bring innovative services to market. Comarch's customers in telecommunications include Telefónica, Deutsche Telekom, Vodafone, KPN and Orange.



telco-enquiries@comarch.com | telecoms.comarch.com