



# How Sustainability Goals will impact your RAN business

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## Introduction

Background on Mobile Operators and commitments to climate goals

## Market Demand for “Net Zero” Telecom

Consumer demand for climate policy

European customers

Other world regions

What if operators don't meet their commitments?

## Government Regulations and Pressure

Roles of multiple organizations:

- The Intergovernmental Panel on Climate Change (IPCC)
- The UN Framework Convention on Climate Change (UNFCCC)
- The Global e-Sustainability Initiative (GeSI)
- Science Based Targets Initiative (SBTi)
- The Carbon Disclosure Project (CDP)
- The International Telecommunication Union
- And others

How governments will put it all together

The EU's “Green Deal and Circular Economy Action Plan (CEAP)

How regulations will be settled

## **How Energy is Consumed in a Mobile Network**

Analysis of how a telecom company consumes energy overall

Analysis of the radio access network

The most significant actions

Analysis of energy efficiency for 5G vs LTE

## **How 5G and 6G will Help**

The potential for 6G to save more power

Semiconductor improvements

Power amplifier improvements

CMOS in processors

Wider frequency bands and higher order MIMO

How these improvements scale to 6G bands at 7 GHz, 12 GHz, 140 GHz

## **The Impact of AI/ML, SON and Open RAN Software**

How AI/ML saves power in a network

Per-user optimization compared with per-site optimization

Overall estimate of savings possible from AI/ML

Examples of ORAN xApps and rApps to save power

all possible ways for an xApp to optimize power consumption for the nearly infinite variety of users.

## **Overall Power Savings in the Network**

Calculation of how multiple factors will combine for power savings

How much power savings we will create through technology in the next 10 years

## **Conclusions**

Power savings compared with “Scope 3” savings in other industrial sectors

How much energy is saved through automation compared with 5G network operations

Analysis for a drone example: energy savings for package delivery compared with trucks

Overall conclusion about the impact of climate policy on the radio market

## **Illustrations:**

**Figure 1: Energy breakdown for a Mobile Operator**

**Figure 2: Energy Efficiency and its Relationship to Spectral Efficiency**

**Figure 3: Energy Efficiency of LTE Compared to 5G (kB/Joule)**

**Figure 4: Comparing the Energy Consumption of Drone Delivery vs. Delivery Trucks**