



# Overview - Green Future Networks

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[www.ngmn.org](http://www.ngmn.org)

**WE MAKE BETTER  
CONNECTIONS**

# 80 COMPANIES IN NGMN TODAY

OPERATOR DRIVEN, PARTNERSHIP REFLECTS THE ENTIRE VALUE CHAIN

## MEMBERS



## CONTRIBUTORS



## ADVISORS



# COOPERATION PARTNERS



# STRATEGY

Alongside with projects supporting 5G's full implementation, the focus of NGMN's Work Programme since 2021 is on three main equally important pillars with different time horizons



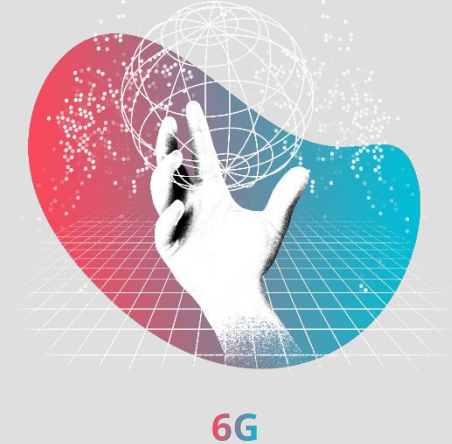
## ROUTE TO DISAGGREGATION

Leading in the development of open, disaggregated, virtualised and cloud native solutions with a **focus on the E2E Operating Model**



## GREEN FUTURE NETWORKS

**Building sustainable & environmentally conscious solutions**



## 6G

**Emergence of 6G highlighting key trends across technology and societal requirements plus use cases to address, followed now by E2E system requirements**



# PARTICIPATING NGMN COMPANIES\*



## Operators



## Mobile Technology Vendors and Service Providers



## Research Institutes



# GREEN FUTURE NETWORKS PROJECT AT A GLANCE

## Four Deliverables in 2021



Sustainability Challenges  
and Initiatives in Mobile  
Networks



Network equipment  
eco-design and end to  
end service footprint



Network  
energy  
efficiency

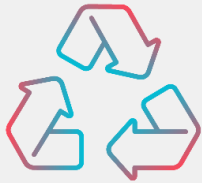


Metering for  
sustainable  
networks

### Public Presentations

- Press & Industry Briefing at MWC Barcelona 2021
- 5G World London
- TelecomTV Sustainability Event (Dec. 2021)

# GREEN FUTURE NETWORKS PHASE 2



**1. SUPPLY CHAIN  
SUSTAINABILITY  
CRITERIA**



**3. NETWORK  
ENERGY EFFICIENCY  
PHASE 2**



**2. REDUCING  
ENVIRONMENTAL  
IMPACT**



**4. GREEN NETWORKS KPIs**

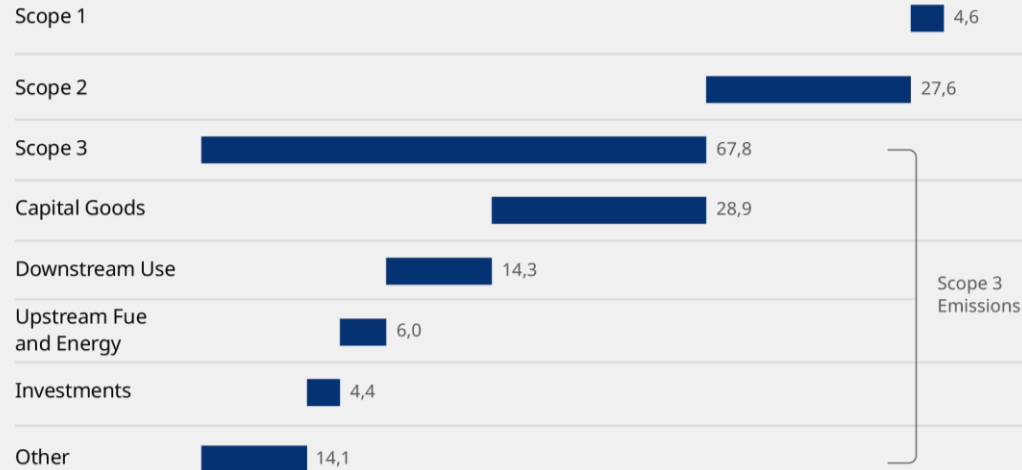


Sustainability



# WG1 – Supply Chain Sustainability

# VALUE CHAIN EMISSIONS ARE ONE OF THE BIGGEST CHALLENGES FACED BY TELCOS



**CDP data, Basket of 19 telcos with revenue of 717Bn€, 2019\***

- For the operators that have managed to switch fully to renewable energy in their operations, over 80 - 90% of the emissions are generated in the supply chain.
- Typically, 1/3 of the supply chain emissions are from network equipment.
- WG1 focuses on addressing supply chain emissions through sustainability criteria in procurement



# WG2 - Reducing Environmental Impact

# REDUCING ENVIRONMENTAL IMPACT (WG2)

GUIDING PRINCIPLES AND TOPICS COVERED IN 2022

Leverage Handprint of ICT sector while ensuring that the benefits are not offset by environmental costs.

„Waste + Knowledge = Asset“ Idriss J. Aberkane\*

## Building on 2021 Findings



Minimizing carbon emissions



Creating a Circular Economy



## Topics 2022

- **Network Equipment Eco-Design**  
Sustainable Antenna Design
- **ICT Ecosystem Water Footprint**
- **Carbon Offsetting**



## Connections to other WGs



Importance of collaboration across the supply chain



Tradeoff between material efficiency & energy efficiency

\*Idriss J. Aberkane. From waste to kwaste: on the Blue Economy in terms of knowledge flow. CS-DC'15 World e-conference, Sep 2015, Tempe, United States. ffhal-01291106

Sustainability



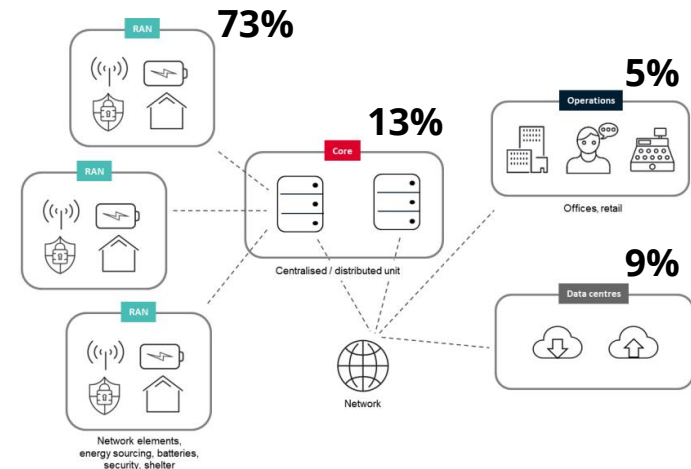
## WG3 - Energy Efficiency

## Areas of work

1. Evaluation methodologies for NEE
2. Radio frequency units and antennas
3. Central and distributed units and virtualization
4. Site infrastructure (cooling, energy distribution and harvesting)
5. 4G/5G RAN energy efficiency features
6. The role of the UE on NEE
7. Large-scale 4G and 5G NEE optimization
8. Artificial intelligence
9. Additional NEE enablers

## Progress

- 17 contributions (plus corresponding updates)
- 13 sections agreed; 6 sections already drafted



**73% of the network energy is consumed in the RAN**

Network energy consumption decomposition (Source: GSMA)



# WG4 – Green Networks KPIs

# MAIN PILLARS



- Several KPIs per 'pillar'.
- Translate into 'A-F' style energy classification.



- Decomposable KPIs





# THANK YOU

In case of further questions please contact  
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