

GSMA
Intelligence

A close-up photograph of two hands, one from the left and one from the right, gently cupping a small, textured globe of the Earth. The globe is painted with vibrant colors: blue for the oceans, green for the continents, and white for the clouds. The hands are positioned as if they are carefully holding and protecting the planet. The background is a solid, muted teal color. The overall composition is centered and conveys a sense of care and responsibility for the environment.

Sustainability Summit

Towards a green horizon

Who we are



3 Global Offices

📍 Delhi 📍 Barcelona 📍 London



Serves over
800
organisations



40,000
users worldwide



Extensive Datasets

Over 30 million data points, updated daily.



Topical and Timely Research

Over 100 reports and exclusive analyses published annually.



Pinpoint Accuracy

Five-year forecasts consistently accurate within +/- 2.5 % of reported data, updated quarterly.



Industry Trusted

Serving businesses across the mobile ecosystem and many other vertical industries.

Topics in Focus Today

1	Sustainability: twin imperatives	<ul style="list-style-type: none"> • The environmental • The business
2	Energy efficiency: chipping away	<ul style="list-style-type: none"> • Networks • Rest of the stack • You can't manage what you can't measure
3	Monetisation story	<ul style="list-style-type: none"> • Use cases • Style and substance (they both matter)
4	Cloud and the open movement: implications for energy	<ul style="list-style-type: none"> • Impact of growing virtualisation • Open RAN and the broader open movement • Edge vs. cloud
5	Where do we go from here?	<ul style="list-style-type: none"> • Technology questions • Partnership/biz model questions • Regulatory questions

Speaker Line-Up



John Morris

CVP, Server Business Unit - Enterprise and HPC Business, AMD



Cristina Rodriguez

VP & GM, Wireless Access Networking Division, Intel



Stephen Rose

GM, Global Telco and Distribution Industries
IBM



Bhushan Joshi

Head of Sustainability & Corporate Responsibility, Ericsson



Dominique Vanhamme

GM, WW Communication Service Providers BU, Lenovo



Jason Smith

Senior Director, Device Check
GSMA



Alexandra Rasch

CEO and Founder
Caban



Peter Jarich

Head of GSMA Intelligence



Tim Hatt

Head of Research and Consulting
GSMA Intelligence

Why sustainability matters in 2023

Must's rather than nice's

5G efficiencies versus lower energy overall

- Networks as the 'low hanging fruit': Energy is still 20-40% of opex for an average operator...and the network accounts for 90% of this. Equipment upgrades continue to target the RAN (such as AI-driven sleep), core and data centres (such as liquid cooling), with positive effects
- A holistic challenge: Lowering energy use overall is the challenge. That depends on retiring 2G/3G networks, behavioural change and moving to renewables

Future innovation as things go ever more virtual

- 5G workloads increasingly moving to the cloud: As more 5G network loads are handled in the cloud, the imperative is to measure the energy impact, and coordinate with AWS, Microsoft, Google and others on efficiency measures
- Measuring the energy impact of open RAN: A key question around open RAN is the impact on energy consumption. While open RAN will likely be adopted in phases over several years, more data is needed to determine the effect (if any)

The currency of reputation

- Changing consumer value sets: Consumers are increasingly prioritising green credentials and commitments in purchasing decisions. Retail and marketing strategies need to focus on sustainability as a selling point, beyond traditional competition in quality, price and coverage
- Investor pressures drive change: Many investors now include hard and fast ESG requirements as part of their asset allocation decisions

Sustainability Dynamics: Twin Imperatives

Net Zero commitments must balance against revenue upside

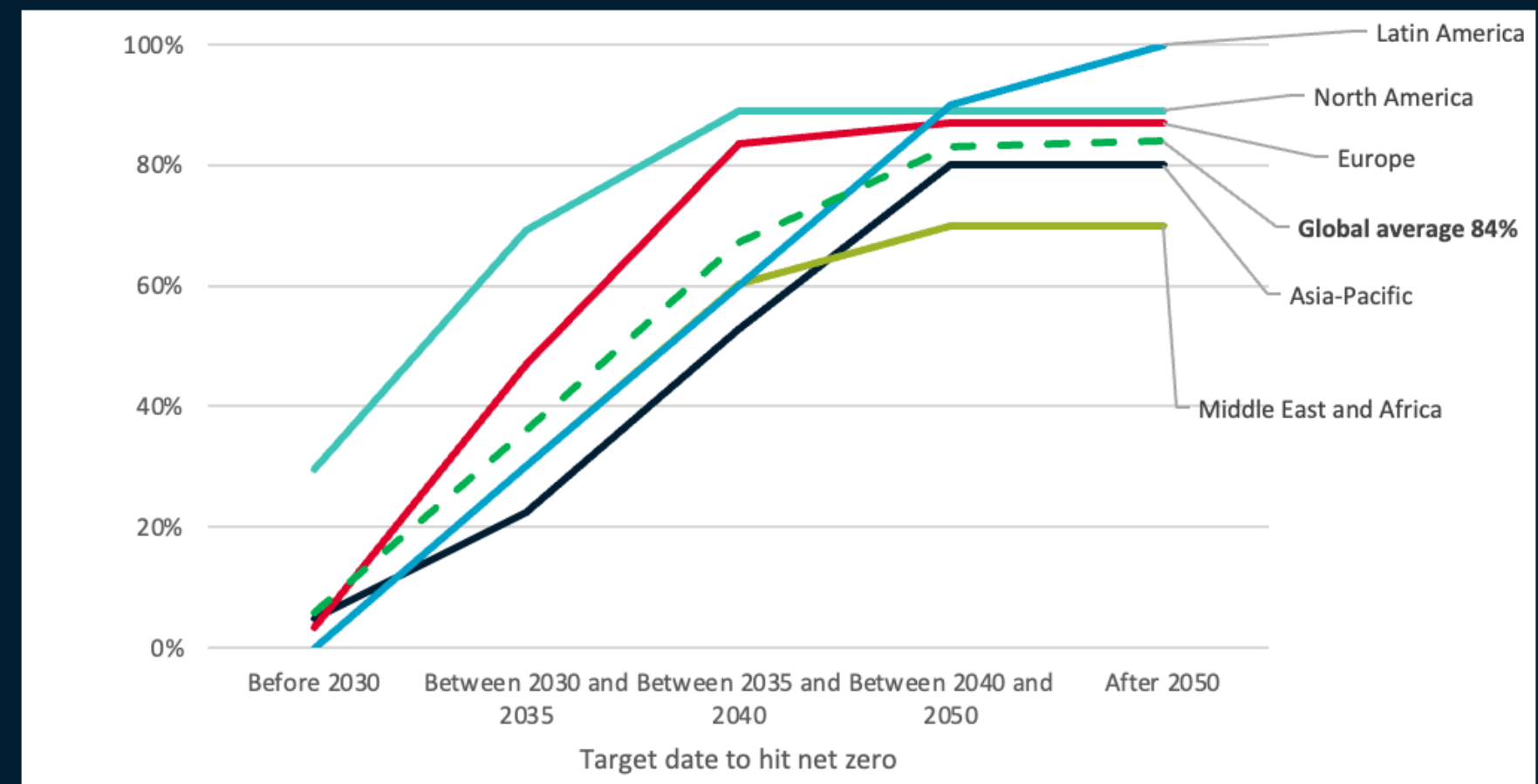
Sustainability is first, and foremost an environmental imperative

Net zero commitment rates back this up (80%+ overall, 60% by 2040)

However, this need not mean it as a burden, or cost drain

Revenue upside in consumer and enterprise segments

Cumulative share of operators committed to net-zero



Source: GSMA Intelligence

Sustainability Dynamics: Can't Think in Silos

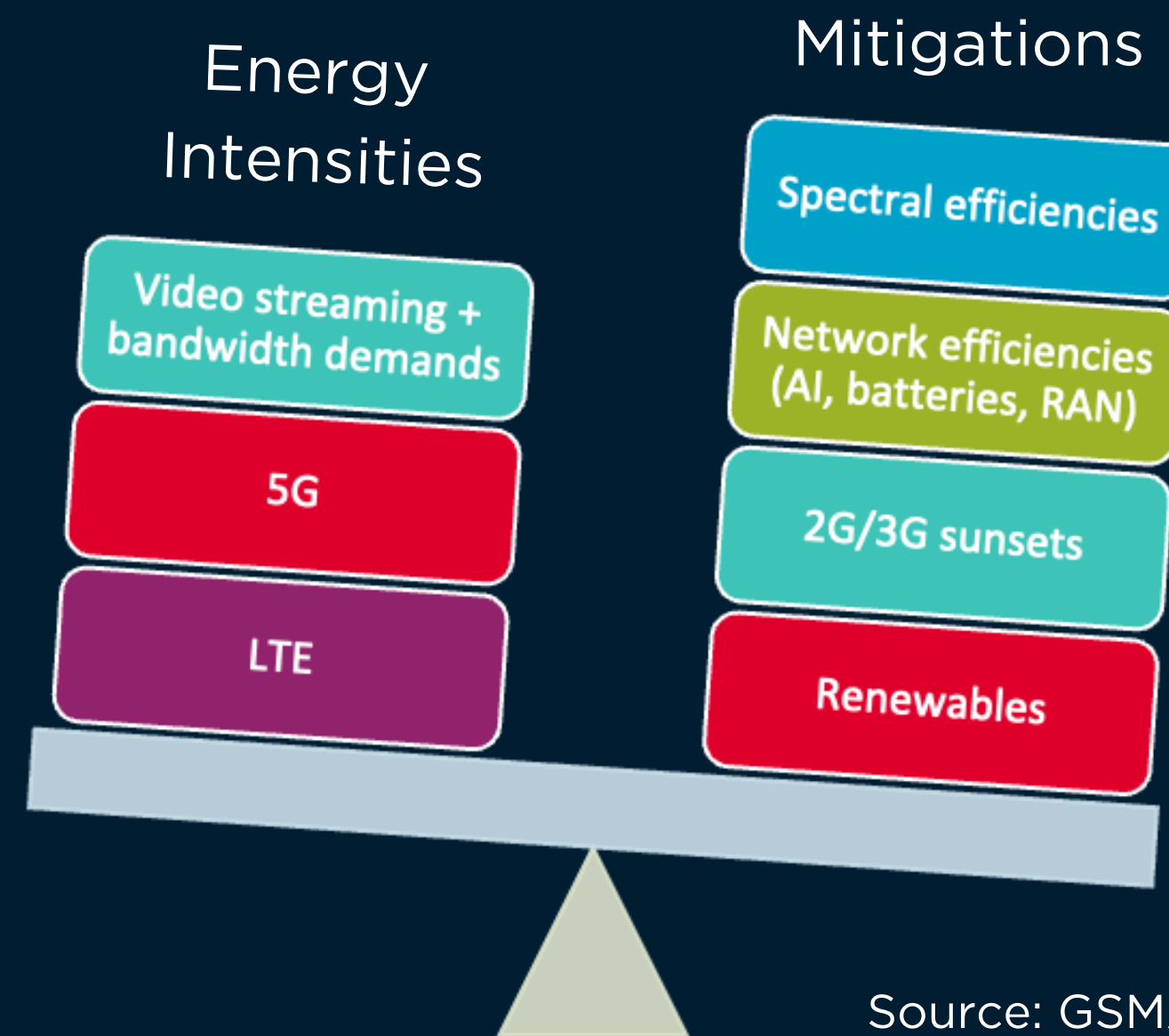
Lowering energy for telcos is a holistic challenge

Holistic vs. silos

Network stack

Strategy doesn't always trickle to products

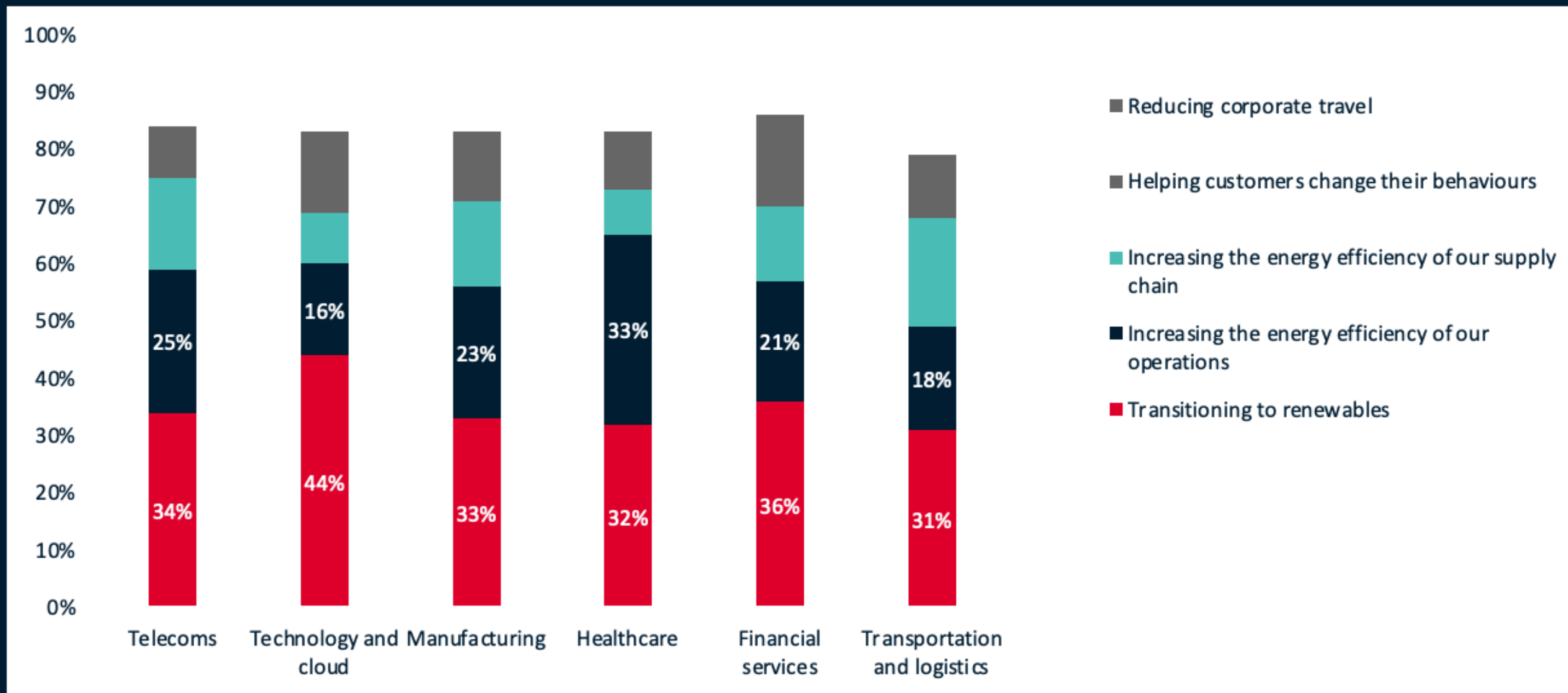
End game = net zero, but this is chunked into 3 decades



Source: GSMA Intelligence

Sustainability Dynamics: Telco vs. Vertical Thinking

Industry strategies for reaching net zero reflect telco realities too



Source: GSMA Intelligence

Energy Dynamics: Telco and Cloud

1% is a little of a lot

Telco networks (mobile and fixed) and hyperscaler datacentres each = around 1% of global electricity usage (CO2 is lower because of higher renewables use)

Pressures over rest of the decade from digitisation

Challenge is mitigation: 1% seems small, but this is still 300 tWh of power today

	Electricity usage			CO2 footprint		
	Terrawatt hours (2022)	% of global total (2022)	% of global total (2030)	Megatonnes CO2e (2022)	% of global total (2022)	% of global total (2030)
Mobile networks (excl. operator datacentres)	168	0.6%	0.3%	64	0.2%	0.1%
Fixed line networks	132	0.5%	0.3%	50	0.1%	0.1%
Total mobile and fixed line networks	300	1.1%	0.6%	114	0.3%	0.2%
Datacentres						
Operator	19	0.07%	0.04%	7	0.02%	0.01%
Hyperscaler and other	319	1.2%	1.4%	120	0.3%	0.5%
Total datacentres	338	1.3%	1.5%	128	0.3%	0.5%
Global total (all industries)	26,799	100%	100%	37,857	100%	100%

Source: GSMA Intelligence

Energy Dynamics: The 5G Paradox

Highest efficiency...but with highest consumption?

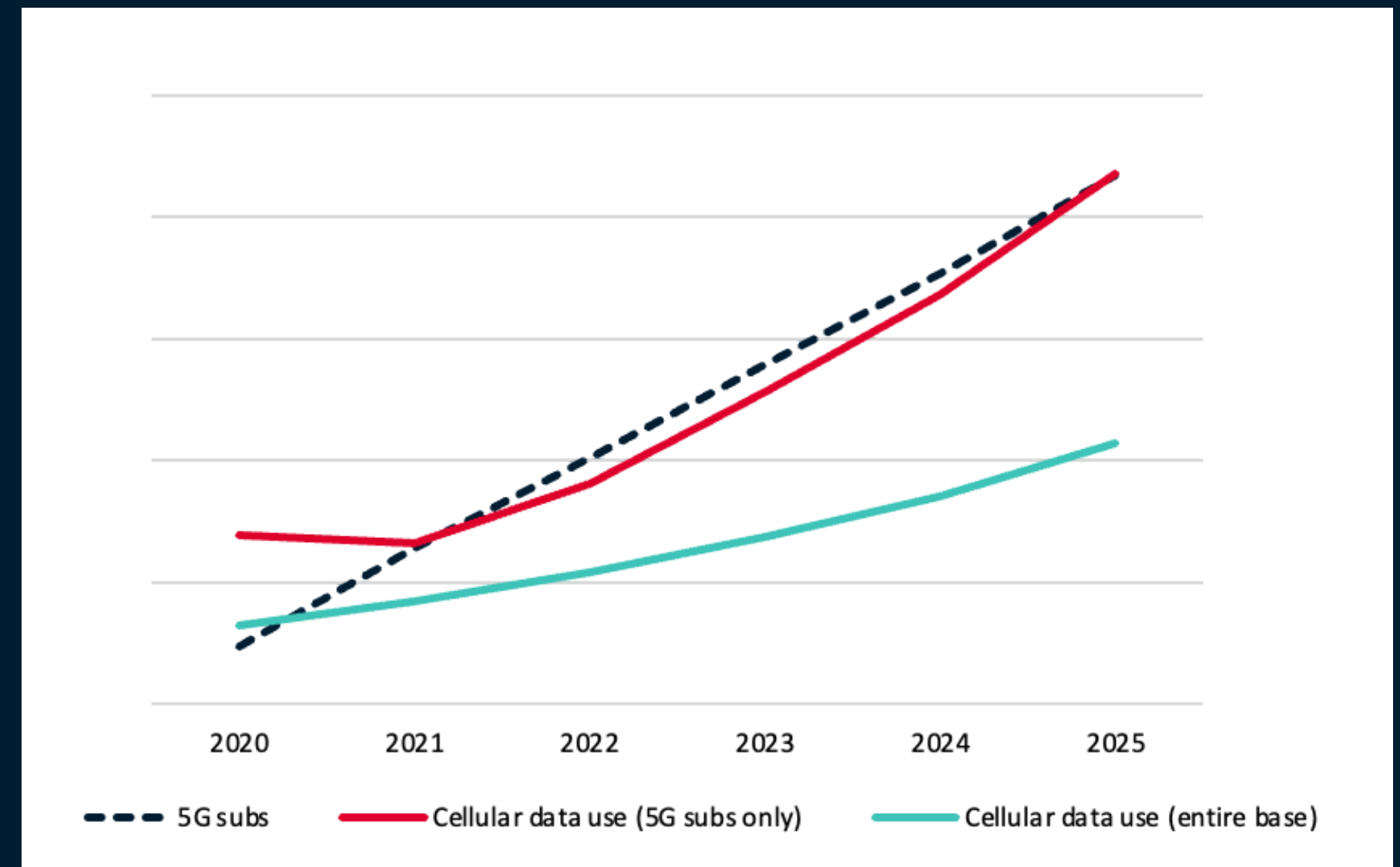
5G will scale to approx. 25% of global mobile customer base by 2025

This means...

- Traffic rises
- Higher enterprise 5G workloads
- Cost pressures

= Need to close energy loop

The 5G mix effect will drive up average data usage 4x (and that's before WiFi)



Source: GSMA Intelligence

Energy Dynamics: The Value of Benchmarks

You can't manage what you can't measure

Progress so far? Glass half full/empty...

Glass half full

- Networks becoming more energy efficient (data moving in right direction)
- Priority in network upgrades
- Vendor competition

Gaps to fill

- Full network
- Geographic
- Beyond hardware
-

2023 project kick off in October (results in early Q1 2024)

The energy make-up and performance of mobile networks

		2021	2022	2023
Core network energy yield	kWh per GB data transferred (mobile networks)	0.24	0.17	?
Electricity distribution	RAN	73%	87%	?
	Core	13%	12%	?
	Datacentres and edge	9%		
	Other (e.g. fleet)	5%	1%	?

Fuel split in 2022: renewables (9%), traditional grid (83%), diesel (8%)

Note: data based on GSMA Intelligence Energy Efficiency Benchmarking studies in 2021 (31 networks) and 2022 (56 networks)

Source: GSMA Intelligence

Monetizing Net Zero: Green Premiums

Will consumers pay for efficiency?

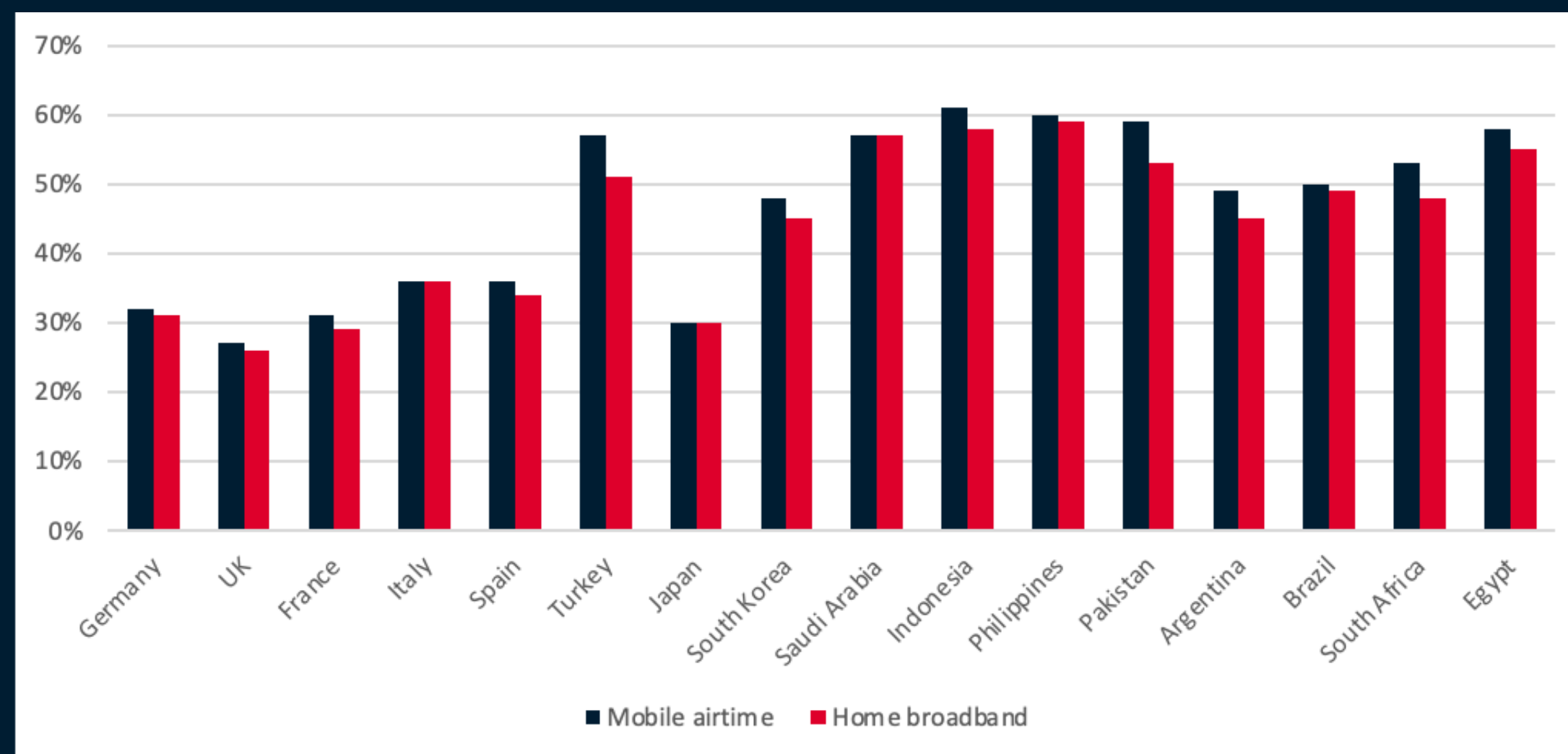
Green tariffs can be linked against several factors

- Carbon neutral certification
- Renewable power
- Others

Demand side shows intent (esp in countries on front line of climate change)

Short term (e.g. cost of living) vs. long term (e.g. meeting demand)

Percentage of consumers who would pay a premium for carbon-neutral products



Source: GSMA Intelligence based on Consumer Sustainability Attitudes survey across 16 countries (November and December 2022)

Monetizing Net Zero: Room to Grow the Story

Going from competitive weakness to strength

Top level = everyone gets it

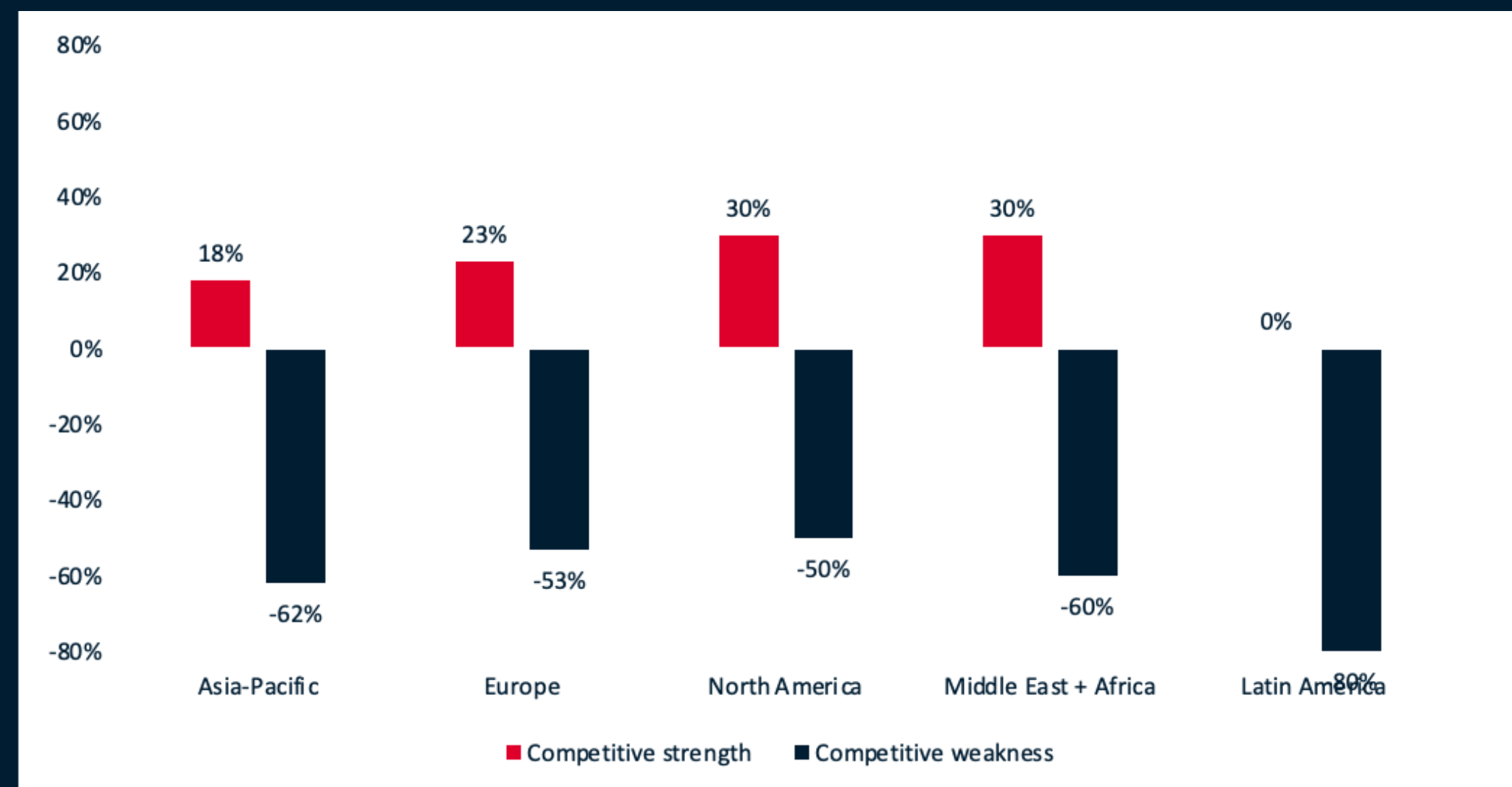
But...most groups see themselves as behind the curve

Why?

- Lag effect: boardroom to strategy to product
- Not historically a selling point
- Sales approach

Window of opportunity

Most telco operators see themselves as BEHIND on sustainability (even though it's a priority)



Source: GSMA Intelligence

Cloud and Open Tech: Connection to Energy?

Network and Open RAN thinking suggests there is one...

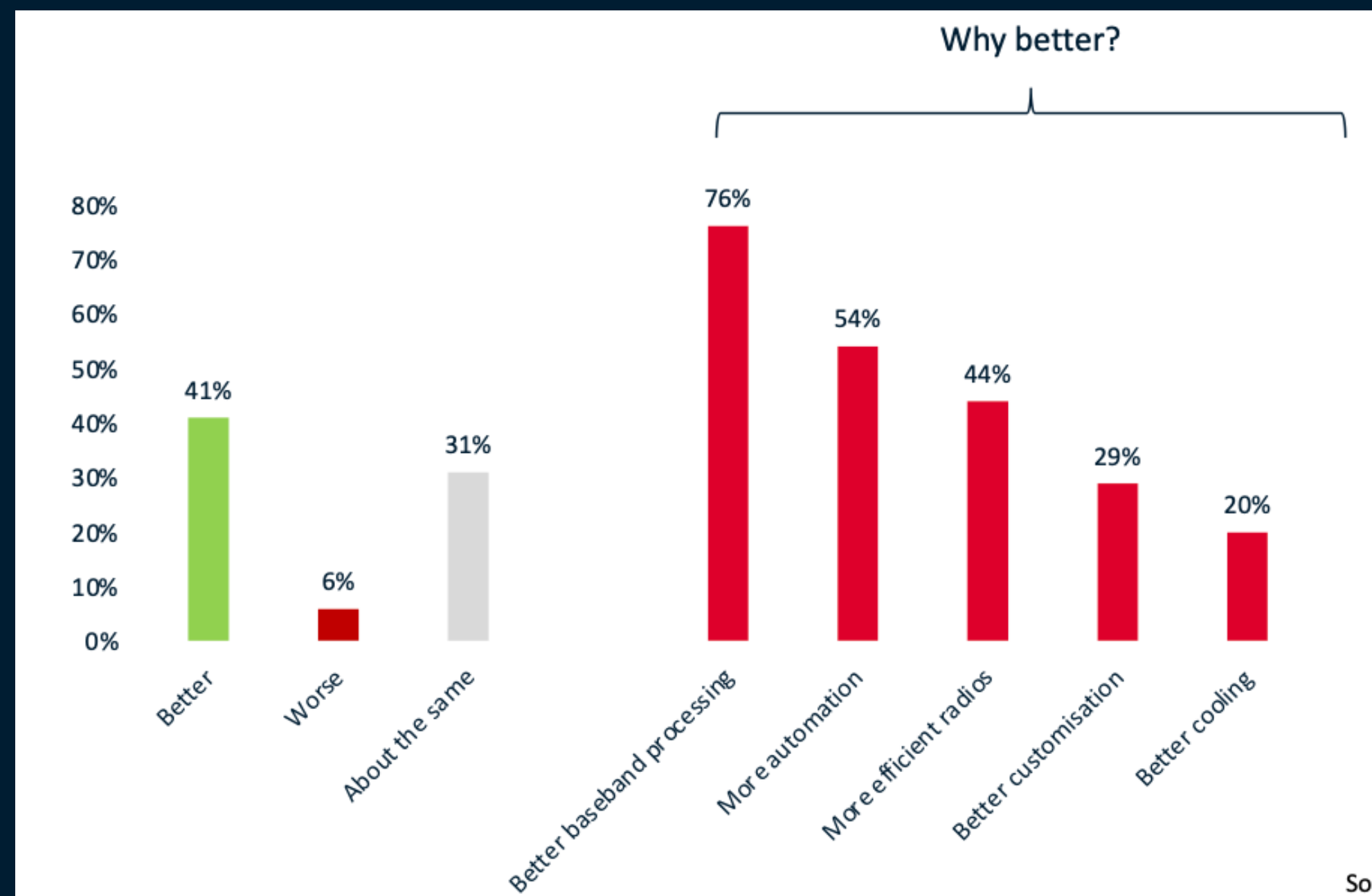
Emerging discussion

Open RAN still minority (15-20% telcos) but growing, and in plans of majority

Energy is key dimension to value prop (along with vendor choice/avoiding lock-in)

Go big

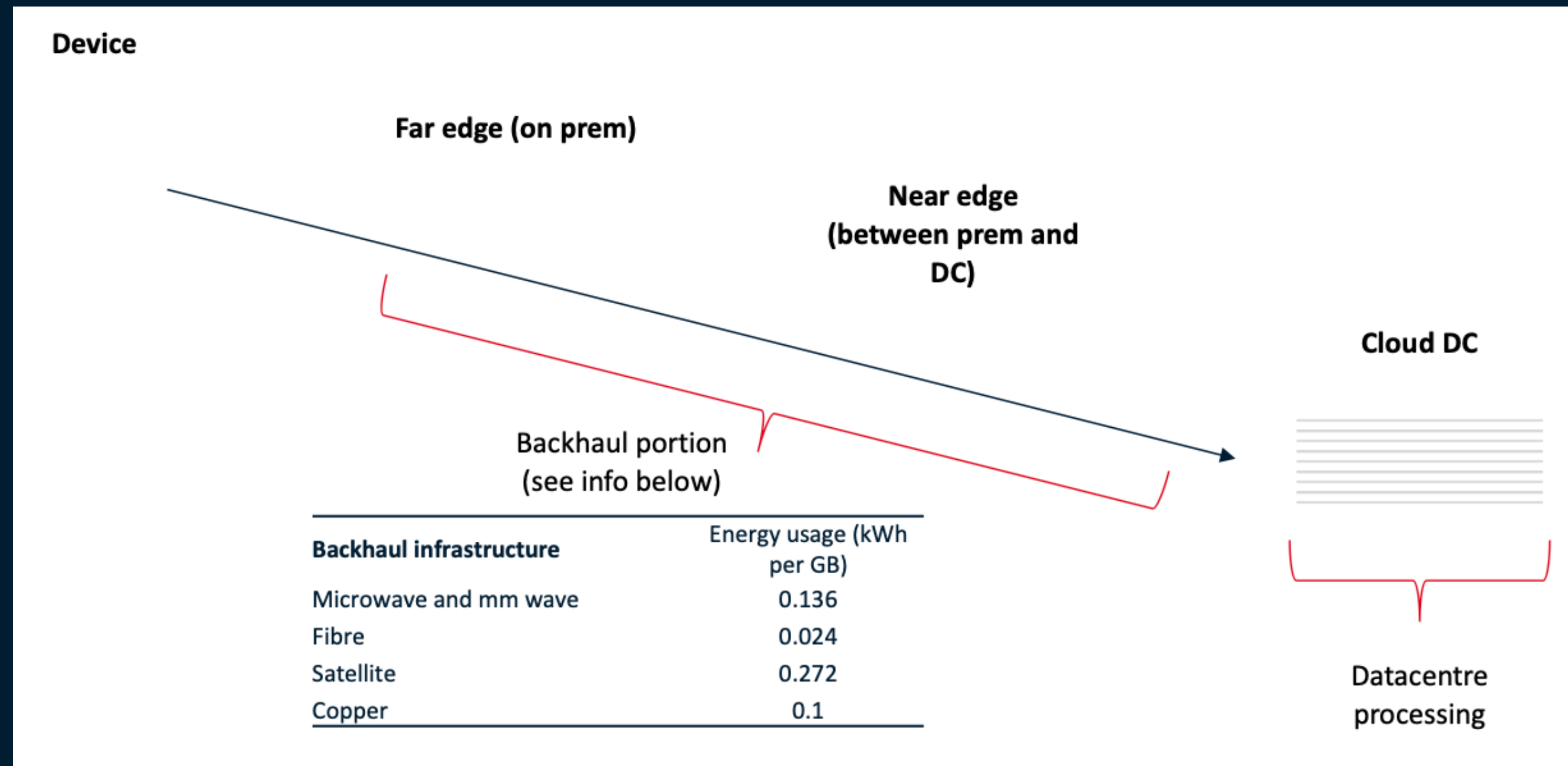
Will open RAN be better or worse on energy compared to traditional networks?



Source: GSMA Intelligence

Cloud and Open Tech: What About Edge?

Edge vs. cloud dynamics are important too



Two main aspects to cloud energy cost if shifting from edge:

1. Backhaul
2. DC processing (and cooling)

Variability based on type of backhaul used

Where do we go from here?

Embedding sustainability into the product

Technology

- Energy efficiencies: do the numbers keep moving in the right direction as 5G scales? How is AI best used?
- Chips story: how do you extract energy efficiencies when Moore's Law slows and processing demands grow?
- Energy-as-a-service: new models for accessing renewables + streamlining passive infra ops. Can these go mainstream? Role of tower co's and energy groups?

Partnership / Business Model

- Scope 3: lion's share of emissions (70%), but how to coordinate up/down supply chain?
- Network buyers and sellers: how can network design be co-architected between telcos and suppliers?
- Circular economy: does recycling go beyond smartphones? How to form a proper secondary trading market (e.g. network equip, metals)?

Regulatory

- Standards: can (and how can) energy requirements be embedded in 6G standards?
- Investors and exchanges: do stock exchanges impose listing req's?
- Procurement: only 1% of companies screen 75%+ of their suppliers on sustainable criteria. When does this change?
- Government action: under 30% of nation states have legislated net zero. When does this change?