GSMA Intelligence

Green is good for business: embedding sustainability in digital transformation

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GSMA™

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Executive summary

The global fight to tackle climate change is lagging on most indicators. This lack of progress comes despite consensus on the need for urgent action. It is also despite increasing industry commitments, regardless of whether national governments have introduced regulation or legal requirements for net zero.

A key change since the Paris Accord of 2015 has been more assertive involvement from companies in the private sector. This includes committing to net-zero targets, reporting frameworks to track progress and, fundamentally, a reshaping of business practices towards a lower emissions environment. The telecoms industry is a leader in this respect. However, the perception that going green – what we call sustainable digital transformation – makes business as well as environmental sense is not yet pervasive.

The rationale for sustainable digital transformation

1 Consumer perceptions are changing

— Climate change is viewed by the majority of people as the single, most pressing issue the world faces. Inflation is next, followed by economic stability.

— Consumers are voting with their feet. There is a clear correlation between climate worries and sustainability as a key purchasing criterion – particularly for those in countries most exposed to climate change. This also extends to political voting intentions. Some 32% of people already factor climate into their voting and 51% say they are willing to change voting intentions on this basis.

2 The financial case is growing

Costs

— On average, energy accounts for 20–40% of opex for a telecoms operator, remaining stubbornly high over the years despite efficiency improvements. The urgency for cost optimisation is much higher in a low revenue growth environment, given continued pressure on network capex from 5G builds. Removing 5–10% from energy opex would improve cashflow by 2–3 percentage points even if revenue growth does not change.

Revenues

— Consumers are prepared to pay a premium for products with green certifications such as being carbon neutral. In telecoms, 30–60% of consumers claim they would pay a premium for mobile tariffs if they were carbon neutral.

— There is also the prospect of selling new product categories, notably home energy. Telstra, Movistar and Vodafone are examples here; many others are exploring this.

— Some 60% of companies across the six industries surveyed claim to offer products certified with a carbon-neutral status to consumers, but this drops to less than 30% for those targeted at enterprises.

— For operators, this leaves an opportunity on the table, given that the enablement effect on industries from the use of 5G connectivity, IoT and cloud can have an outsized impact on reducing the carbon footprint of enterprise partners (5–15× that of the carbon footprint of operators) – a key, if unsung, selling point for 5G in enterprises.

— The next phase is to translate sustainability into product design and marketing. The circular economy is a big part of this. Device recycling schemes are growing. Major operators have trade-in schemes for customers and are collaborating with suppliers to reduce manufacturing and waste-associated carbon emissions.

3 External relations demand sustainable transformation

— While many operators and industry partners have committed to net zero of their own volition, regulatory requirements are beginning to emerge that compel some companies to follow specific frameworks. These may be accelerated should consumer voting intentions prioritise climate action.

— The GSMA Intelligence survey indicates that 80% of companies see having a clear CO_2 reduction strategy as highly important for customers and staff, while 64% of consumers claim climate action is very or extremely important in their choice of employer.

Efficiencies and renewables: two sides of the same coin

— From the perspective of improving energy efficiency, the RAN accounts for the bulk of energy use in a typical mobile network and will remain the main focus area. The core and datacentres are also significant. Extracting efficiencies here depends largely on innovations in datacentre positioning, power and cooling. As workloads increasingly move to the cloud through partnerships with AWS, Microsoft and other hyperscalers, coordinated investments will be a part of the future with 100% renewable energy.

— Renewables represent less than 25% of energy use for the telecoms industry overall, with traditional grid accounting for the majority by far. On the current run rate, it would be 2030 before renewables reach half of energy consumption. This is not terrible but not ideal in terms of missing out on price stability and lower opex. An acceleration represents a key part of the industry reaching net zero overall by 2050.

The Scope 3 challenge

— The challenge with Scope 3 emissions is first calculating what they actually are, then working with the supply chain to reduce them in a coordinated way. Sustainable procurement policies are one of the most effective ways of coordinating with suppliers by embedding carbon-reduction targets into requests for proposals.

— According to GSMA Intelligence survey data, 65–80% of companies across the six industries studied have a sustainable procurement policy in place. The challenge is enforcement.

— Procurement policies with multiple criteria entail cost and time to roll out. Ultimately, this is more a case of 'when' than 'if'. Having certified carbon reduction pathways is a competitive advantage for suppliers in the short term, but it will soon be a requirement of doing business.

1 Context: urgency growing; time running out

The sustainability pivot

Climate change has historically been the principal driver of moves from telecoms operators (and other industries) to a more sustainable operating model. The Paris Accord of 2015 and its key pledge to limit global warming to a ceiling of 1.5°C above pre-industrial levels by the end of the 21st century remains the central objective for governments across the world. However, a key change since then has been more assertive involvement from companies in the private sector, which became particularly visible during COP conferences in Glasgow and most recently Sharm el-Sheikh. This includes committing to net-zero targets, reporting frameworks to track progress and, fundamentally, a reshaping of business practices towards a lower emissions environment. Investor pressures, from mainstream asset managers as well as activists, have been a further influence on management to act.

Operator network investment priorities now feature sustainability as a core tenet. GSMA Intelligence survey data supports this, with more than 80% of operators rating energy efficiency and sustainability as a top priority for mobile network transformation plans. This places sustainability ahead of traditional must have's such as security and new feature upgrades to network capabilities. Upgrades to network equipment are a major part of investment as it accounts for around 90% of energy consumption. However, the sustainability pivot is holistic, including everything from renewable energy supplies for office premises, to corporate travel policies, product portfolios and supplier procurement.

There continue to be significant differences on a regional level in the pace of change in the telecoms sector. Reasons include the political environment, access to renewable energy supplies, the maturity of the telecoms sector, and corporate strategy.

About this research

This report is the first of a three-part series from GSMA Intelligence in partnership with Huawei on the technological and business implications of sustainability in the telecoms industry. The research aims to give an evidence-based view of why going green makes business sense – and how this can be done effectively. The analysis comprises three areas:

— overall rationale and outlook

— the financial case

— the reputational and external relations case.

To bring new insights to the debate, GSMA Intelligence commissioned two surveys – one of consumers and one of enterprise sectors. The consumer survey covers 16 countries,[1] each with 500 respondents. The enterprise survey covers six vertical industries,[2] each with a sample of 100 respondents worldwide. Fieldwork was conducted during December 2022 and January 2023. The survey data has been complemented with a mix of research, data analysis and insights from conversations with industry stakeholders from operators, equipment vendors, regulators and financial analysts. The research therefore offers a well-rounded perspective on an issue central to how business is likely to operate over the coming decade.

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1   Argentina, Brazil, Egypt, France, Germany, Indonesia, Italy, Japan, Pakistan, Philippines, Saudi Arabia, South Africa, South Korea, Spain, Turkey and UK.
2   Telecoms, technology & cloud, manufacturing, healthcare, financial services, and transportation & logistics

2 Climate progress lagging, consumer views hardening

Behind the pace on climate change

The global fight to tackle climate change is lagging according to most indicators – most importantly, the central 1.5°C objective of the Paris Accord. This lack of progress comes despite consensus on the need for urgent action (with only a small number of countries holding out) and increasing industry commitments irrespective of governments introducing regulation or legal requirements for net zero.

The cost of inaction could be catastrophic. A cascade of irreversible tipping points is putting at risk the 3.3 billion people that are vulnerable to warming temperatures, mostly through rising sea levels.[3] There is scientific consensus, reflected in UN and IPCC reporting, that current global commitments would place the average warming at 2.4–2.8°C above pre-industrial levels by the end of the 21st century – almost double the Paris goal. How to close the gap and ameliorate the slow rate of change is, of course, the focus of activism but is spreading to the private sector.

A comprehensive, if sobering, example of the state of progress comes from recent analysis by Systems Change Lab.[4] In analysing 40 indicators that collectively measure progress in closing the gap between expected and targeted temperature rises, it found all are behind pace. These metrics are laid out on an industry level with a time horizon to 2030 to be more targeted. Examples include:

— reducing the carbon intensity of cement production to 360–370 kg CO_2 per tonne (it is currently around 650 kg)

— increasing green hydrogen capacity to 81 megatonnes (it is currently a minute fraction of this)

— increasing electric vehicles (EVs) to 20–40% of fleets (they are currently at less than 2%).

Metrics tracked by other organisations paint a similar picture.

> How to close the gap and ameliorate the slow rate of change is spreading to the private sector.

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3 World Energy Transitions Outlook 2022, IRENA, 2022
4 State of Climate Action 2022, Systems Change Lab, 2022
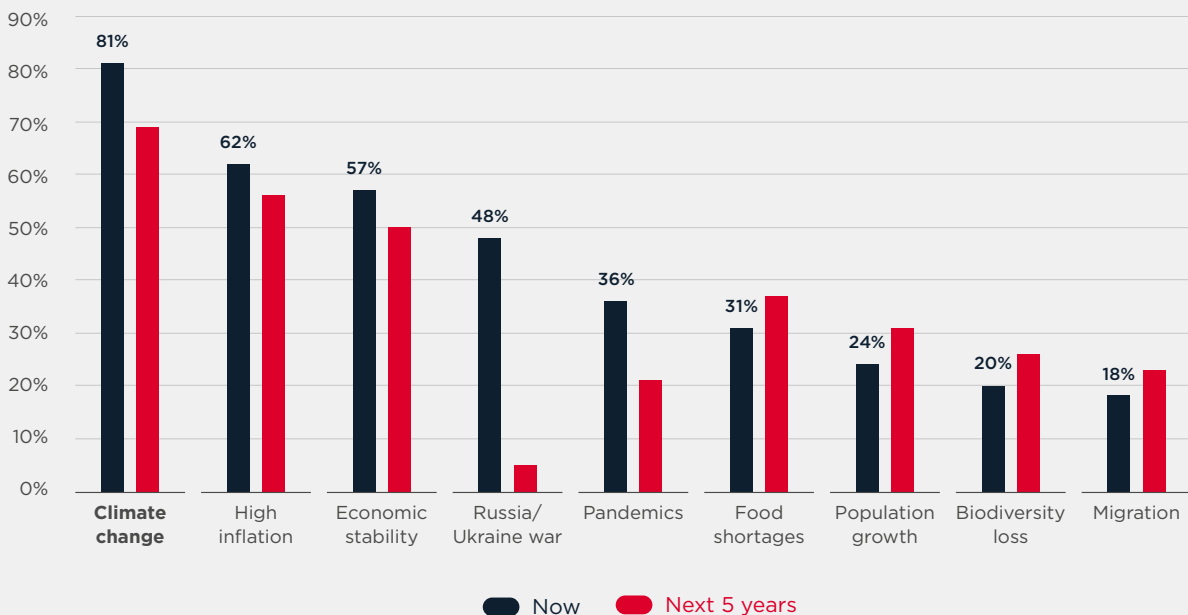
Consumer perceptions

Figure 1 helps understand consumer perceptions of climate change relative to other pressing global challenges. Climate change is viewed by the majority as the single, most pressing issue. Inflation is next, followed by economic uncertainties and geopolitical instabilities, notably the conflict in Ukraine. Many of these factors overlap in their effects, but climate change makes each of the other challenges worse.

Climate's position does not change when we ask the same question but look ahead five years. The only major change is that people expect the conflict in Ukraine to have ended by then.

Climate change is viewed by the majority of consumers as the single, most pressing issue.

Figure 1 **Of all the global challenges, consumers unambiguously view climate change as No.1**

Which of the following global challenges do you feel is most pressing for action?

- Climate change: 81%
- High inflation: 62%
- Economic stability: 57%
- Russia/Ukraine war: 48%
- Pandemics: 36%
- Food shortages: 31%
- Population growth: 24%
- Biodiversity loss: 20%
- Migration: 18%

Legend: ● Now ● Next 5 years

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

Consumer perceptions are therefore firmly aligned with the scientific consensus that climate change is the single, most crucial, long-term challenge faced by the world. From a business perspective, it also means people are increasingly voting with their feet.
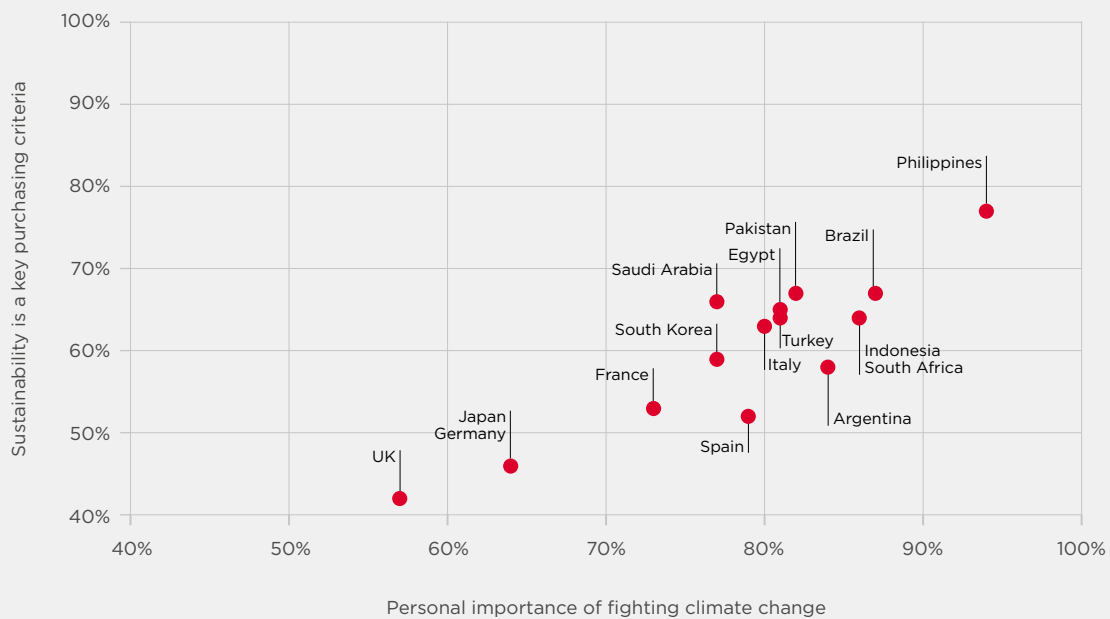
Figure 2 illustrates some correlation analysis between the personal importance attached to fighting climate change and whether people factor green credentials into their purchasing decisions. It shows that there is a clear correlation and that sustainability is more important as a purchasing criterion for those in countries most exposed to climate change (e.g. Indonesia, Pakistan and the Philippines).

This is a general picture of product purchasing rather than one specific to a particular industry, but it signals that green credentials matters. For brands, sustainability is becoming a competitive differentiator – just as price, quality and location have traditionally been. This opens up a new opportunity in product design and potentially pricing related to green credentials – particularly among millennials and Gen Zs as the demographic segments most clearly aligning themselves to brands that reflect their own values.

Figure 2 Consumers are increasingly 'walking the walk' to effect climate action

How important is fighting climate change to you?
How often do you consider climate and environmental sustainability when selecting a brand of product or service?

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

3 The case for operators: green is good for business too

How can the telecoms industry adapt to and benefit from the sustainability pivot? There are multiple angles to examine, including the financial rationale (costs versus revenues) and the reputational case involving relations with external stakeholders (customers, staff, investors and regulators).

Financial rationale

Costs

For mobile operators, the most pressing and immediate rationale for investing in more sustainable network equipment and technology is to reduce costs. The industry continues to operate in a relatively low revenue growth environment. The current growth rates in the US and Europe of 4–5% and 1–2% respectively have improved since the pandemic, which took around 4–8 percentage points off growth. However, the conflict in Ukraine alongside other geopolitical tensions, associated volatility in energy prices and the rise in inflation (hitting discretionary

spend) have strengthened the headwinds buffeting that recovery.

5G upgrades in the consumer segment, which continue to be the main source of incremental revenue growth, have been delayed. Selling 5G, cloud and edge compute into enterprises to capitalise on the wave of industrial digitisation is taking place, but it remains early days and at a lower share of revenue such that the overall picture has not been materially affected.

Figure 3 **Although wages are rising, the average household isn't feeling the benefit, because of inflation (Europe example)**
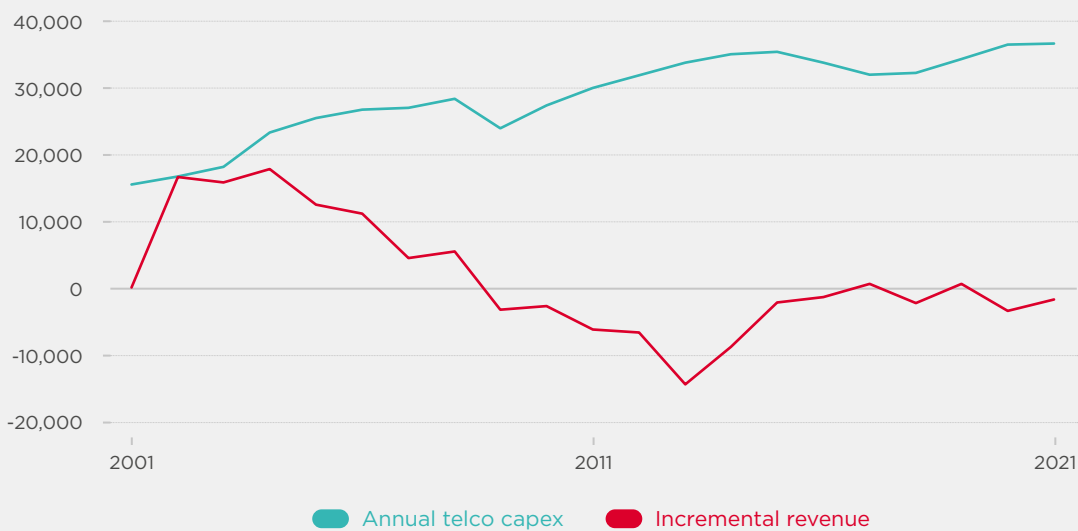
Data as of June 2022

Source: GSMA Intelligence, national statistics agencies, IMF

The challenge with this is that, as a scale industry, cashflows come under pressure, which in turn can constrain the pace of network rollouts. This can also include negative operating leverage if revenues are declining, as is the case in European countries such as Italy. Operators in Africa, India, Latin America and parts of Asia (excluding China) have higher revenue growth but generally lower ARPU,[5] and are exposed to additional capex pressure through FX devaluations as inflation rises (as network equipment is often sold in US dollars or other reserve currencies).

The result is a situation where 20–25% of revenues is spent on network capex every year, but revenues are broadly flat and not adequately compensating for this. Figure 4 presents Europe as an example. Capex shows a repeating pattern of peaking during the infrastructure build-outs for each generation of mobile technology (3G/4G/5G). Meanwhile, the revenue change was positive in the 2000s (during the 3G phase) but has been on a downward or flat path since, with one exception in 2015–2017 when operators successfully monetised 4G.

Figure 4 The perennial challenge in telecoms of compensating for infrastructure investment with revenue growth

$ million, Europe

Source: GSMA Intelligence

Opex accounts for a much larger proportion of the operator cost base. Energy accounts for 20–40% of opex for an average telecoms operator, remaining stubbornly high over the years despite efficiency improvements. This has been exacerbated by recent wholesale market volatility. The shift to renewables is the main means of tackling this challenge, and European telecoms groups are the global leaders in this regard, with BT, Vodafone, Telefónica, Orange and Deutsche Telekom – the bellwethers of the region – operating at above 80% renewable power (some are substantially 100%). This has been helped in Europe by a relatively large and expanding supply of renewable energy on national grids.

Power purchase agreements (PPAs) have taken root as a means of supplementing renewable access from the main grid (or lack thereof) and locking in long-term supply and price stability. A long list of

European groups, along with Verizon, AT&T, T-Mobile and some from Asia, have signed PPAs with local providers. However, for those operators without access to PPAs or renewable supply from the grid, there is greater exposure to energy price fluctuations, making it difficult to sustainably reduce energy opex. Network efficiency improvements (described in more detail in the next section) are therefore important, as is the retirement of 2G and 3G networks that carry a higher energy burden than 4G or 5G. There are around 100–125 2G and 3G shutdowns planned (involving 10–15% of operators), which entails moving subscribers up to the next generation or in some cases 'leapfrogging' to the one after that (2G to 4G, or 3G to 5G). We estimate that removing 5–10% from energy opex would improve cashflow by 2–3 percentage points even if revenue growth does not change.

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5   Average revenue per user – the amount someone pays for their mobile phone tariff and any attached services each month
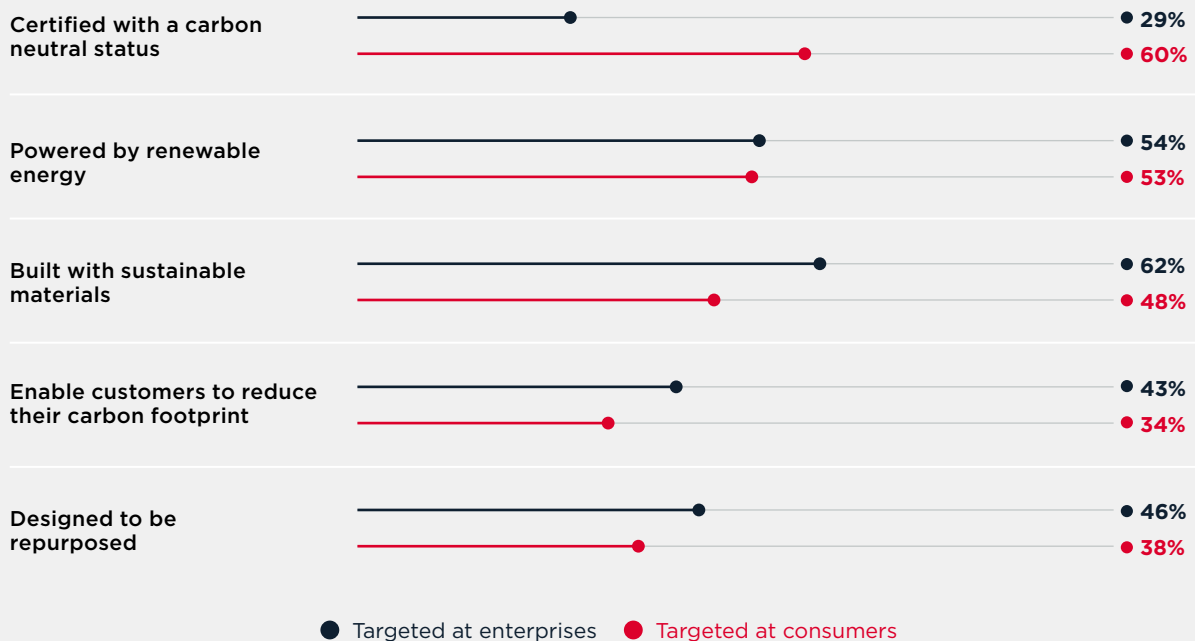
Revenues

Sustainability also offers new revenue opportunities. In the consumer segment, this can include products that are carbon neutral, powered by renewable energy, or built to be repurposed or recycled (part of the circular economy).

Across the industries covered in the GSMA Intelligence survey, there are clear differences in how companies think about marketing green products to consumers versus enterprise segments. Some 60% of companies claim to offer products certified with a carbon-neutral status to consumers, but this drops to less than 30% for enterprises. Conversely, 62% offer products built with sustainable materials to enterprise customers, while less than half do so for consumers. Products powered by renewables are offered equally across both the consumer and enterprise segments.

Figure 5 **To what extent are businesses actively selling products with green credentials?**

Share of companies that sell products or services with the following credential

Source: GSMA Intelligence based on Sustainability Enterprise Attitudes Survey across six industries (November and December 2022)

The data in Figure 5 is aggregated for all six industries. There is broad uniformity, with the exception of banking and financial services, which scores considerably lower on all measures.

So far, much of the commercial activity from operators has focussed on the supply side: extracting energy efficiencies in the network, growing renewables, and retiring older technologies. The demand side is less developed; efforts are conc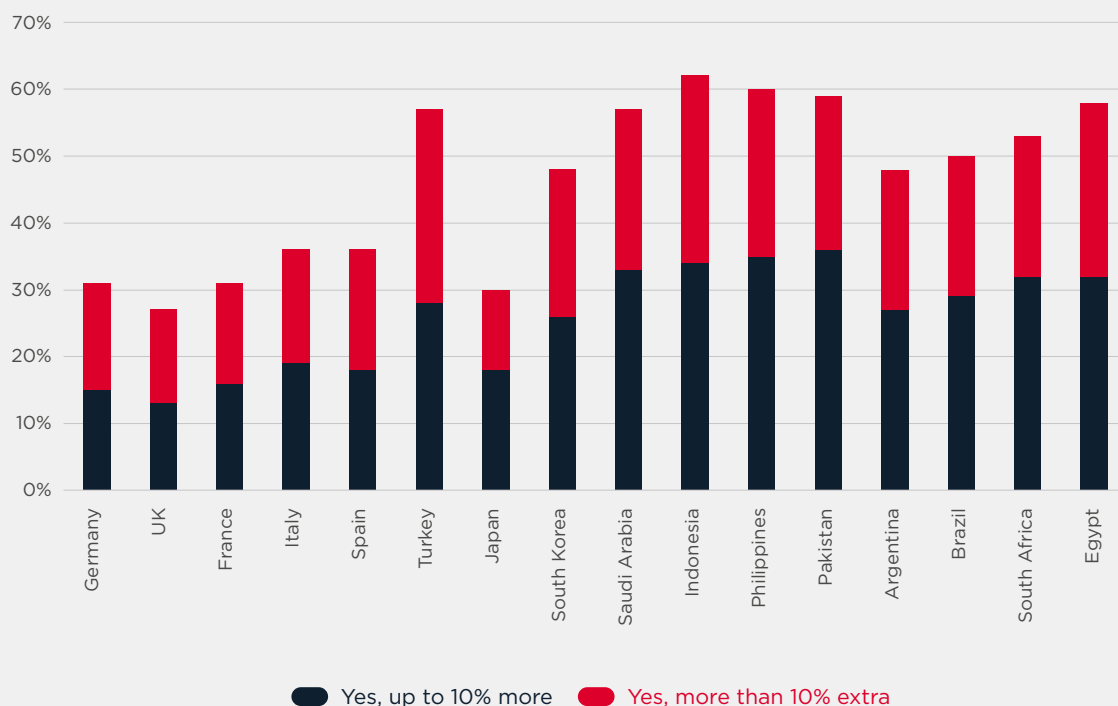entrated on working sustainability into marketing and being clearer on company commitments to net zero. The next phase is to translate this into product design and marketing. The circular economy is clearly a big part of this. Device recycling schemes are growing, particularly in Europe. Major operators such as Orange and Vodafone (among others) have trade-in schemes for customers and collaborate with suppliers to reduce manufacturing and waste-associated carbon emissions.

Product-level certifications, such as carbon-neutral tariffs, are a logical next step, though most examples so far come from smaller groups or sub-brands. Felix Mobile, part of TPG in Australia, is an example of a carbon-neutral certified operator with a 100% renewable energy objective. Meanwhile, Honest Mobile, an MVNO in the UK, competes primarily on environmental credentials and claims to be carbon negative by double offsetting the emissions related to each customer's use of their mobile phone. We expect larger operators to start to incorporate carbon-neutral ratings into individual tariffs and devices – in the same way airlines have started to do so for flights. The pace of this will be influenced by how quickly consumers demand it. This extends to direct retailing of energy. Telstra, Movistar and Vodafone have trialled this for retail customers in Australia and Spain, while several others are exploring this product area as a complement or service-attach to monthly mobile and/or fixed-line tariffs.

There is potential revenue upside. GSMA Intelligence asked consumers whether they would pay more if a product or service was certified as carbon neutral. Between 30% and 60% of respondents said they would (see Figure 6). To a certain extent, this must be caveated as survey responses can be aspirational and level out when it comes to an actual purchase decision. It is also clear that the highest premiums come from lower spend countries with a high share of the customer base on prepaid tariffs (e.g. Egypt, South Africa, Philippines and Indonesia). However, even if we entirely discounted those who said they would pay more than 10% and assumed any premium payers would only tolerate a rise of up to 10%, in Europe this would still represent 15% of the customer base. This is not to be overlooked, particularly as 5G has a pricing premium that is likely to be competed away as penetration reaches a majority.

Figure 6 Between 30% and 60% would pay more for a mobile service certified as carbon neutral

Would you pay a premium for a mobile phone service that was certified as carbon neutral?

● Yes, up to 10% more   ● Yes, more than 10% extra

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

The enablement effect

The enterprise segment is particularly interesting because of the enablement effect. This refers to how mobile connectivity and other digital technologies can help other industries reduce their carbon emissions by an order of magnitude (5–15×) more than the telecoms operators emit themselves. GSMA Intelligence analysis suggests that mobile and digital technologies – including anything from leased lines to private 5G networks, IoT sensors and EV charge points – can enable 40% of the CO_2 savings needed by 2030 for the four industries that account for 80% of the global carbon footprint (manufacturing, power & utilities, transportation and buildings).

For example, **Ford** now uses IoT sensors at manufacturing plants in the UK to monitor vehicle production and pre-empt repairs, reducing the need for manual call-outs and the emissions those generate. **ASE**, a semiconductor maker in Taiwan, has worked with Qualcomm and Chungwa Telecom to deploy a 5G private wireless network that allows automated vehicles to conduct maintenance and fault repair on the manufacturing floor. **Verizon** has partnered with Fermata Energy to extend V2X technology to EVs. Fermata's technology is bidirectional, meaning EV owners can supply power to the charge point from their residential premises and vice versa, as well as sell excess electricity back to the grid.

Vodafone's public reporting indicates that it expects to help its business customers reduce their carbon footprint by a cumulative 350 million tonnes over the 10 years to 2030. This equates to an enablement effect of 5–15×, and has been driven by investments in enterprise IoT installations, private 5G and the use of renewables. **NTT Group** recently launched a sustainability 'as a service' offering that customises the use of its various products (such as private networks, edge compute and digital twin software) for companies based on their net-zero commitment year and the profile of their supply chain. This marries a business and sustainability goal with one service. **Telstra** was one of the first companies in the telecoms sector to disclose CO_2 emissions and has since made several moves in the area of circularity to help reduce costs and e-waste in the supply chain. According to its own estimates, Scope 3 emissions account for 70% of its footprint. Improvements include more compact packaging of TV and enterprise modems, and devices with reusable components.

Reputational case

The financial case is paramount and will be the basis of most investments not mandated by regulatory or compliance requirements. Beyond this, the energy and sustainability rationale also stretches to corporate reputation and compliance.
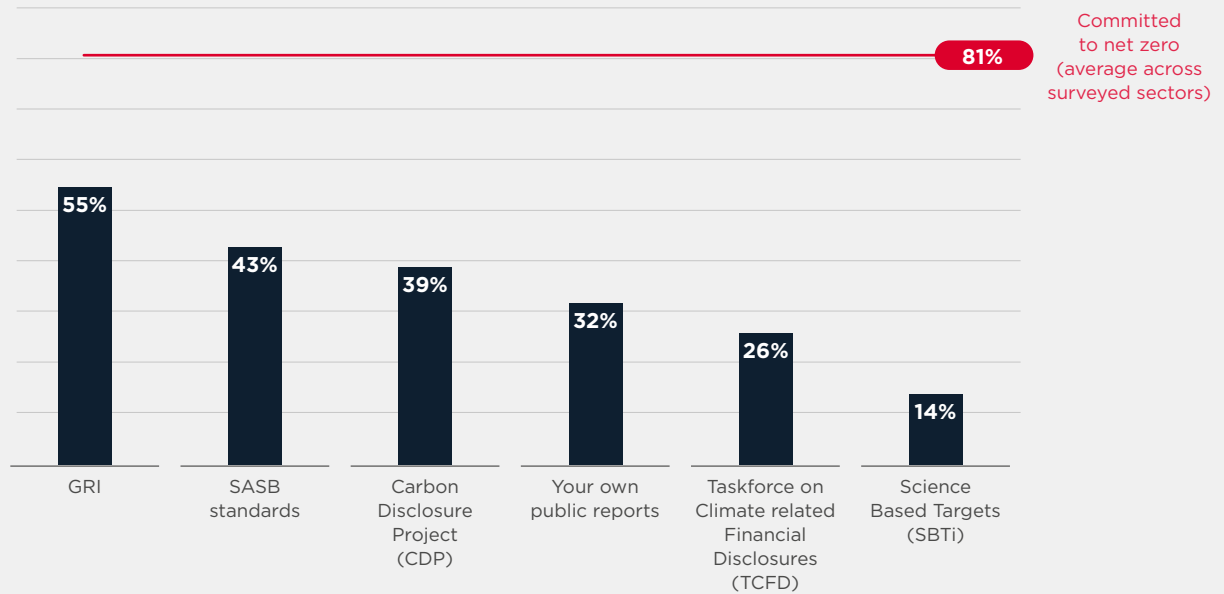
There are a range of globally recognised frameworks for monitoring progress on carbon emission reductions, including the Science Based Targets initiative (SBTi) and the Task Force on Climate-related Financial Disclosures (TCFD). SBTi is the most established reporting system in the telecoms industry, used by 40–50% of operators (measured by global subscriber share), though this is lower in other industries (see Figure 7 for a weighted average). In most cases, commitments to follow recognised

international reporting frameworks have been made voluntarily as a means of conferring transparency and accountability to publicly made net-zero goals. However, regulatory requirements are beginning to emerge that compel all large companies to follow specific carbon emissions reporting frameworks. In the UK, in 2022, the government mandated companies above a certain size to follow the TCFD in their reporting. This will extend to New Zealand and Singapore in 2023. The US, Canada and the EU all have proposals for TCFD reporting in the works.

Carbon reporting is likely to become a requirement as countries legislate their own net-zero plans. Getting ahead of the curve now has clear business and regulatory merit.

Figure 7 Industries make commitments to follow recognised international reporting frameworks

Which carbon reporting frameworks has your company committed to?

Committed to net zero (average across surveyed sectors): 81%

- GRI: 55%
- SASB standards: 43%
- Carbon Disclosure Project (CDP): 39%
- Your own public reports: 32%
- Taskforce on Climate related Financial Disclosures (TCFD): 26%
- Science Based Targets (SBTi): 14%

Source: GSMA Intelligence based on Sustainability Enterprise Attitudes Survey across six industries (November and December 2022)

Institutional investors and stock markets have incorporated environmental, social and governance (ESG) criteria into core asset allocation decisions. The Sustainable Stock Exchanges Initiative (SSEI), a UN partnership programme, reports that stock markets accounting for 20% of publicly traded assets now have ESG listing requirements. Similar requirements are now being introduced by major institutions. For example, the Norwegian sovereign wealth fund, which manages $1.2 trillion of assets, has implemented a plan in which its investees will be required to submit sustainability reporting with specific targets, including on climate change.

The reputational aspect extends to customers and staff – the lifeblood of any company. The GSMA Intelligence survey indicates that 80% of companies see having a clear CO_2 reduction strategy as highly important for these two cohorts, while 64% of consumers put climate action as very or extremely important in their choice of employer (skewing high in countries most exposed to climate change, such as the Philippines, Pakistan and Brazil). While we do not have directly comparable survey data going back several years, it would be safe to surmise this sentiment would have been much lower even after the Paris Accord. To take one example, a study at Yale of US consumers reported that the share of people believing climate was an 'emergency' increased from 18% to 33% over the five years to 2021.[6] That GSMA Intelligence's own survey in recent months now rates this at 90% reflects how quickly consumer attitudes are changing.

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6   Global Warming's Six Americas, Yale programme on Climate Change Communication, 2021
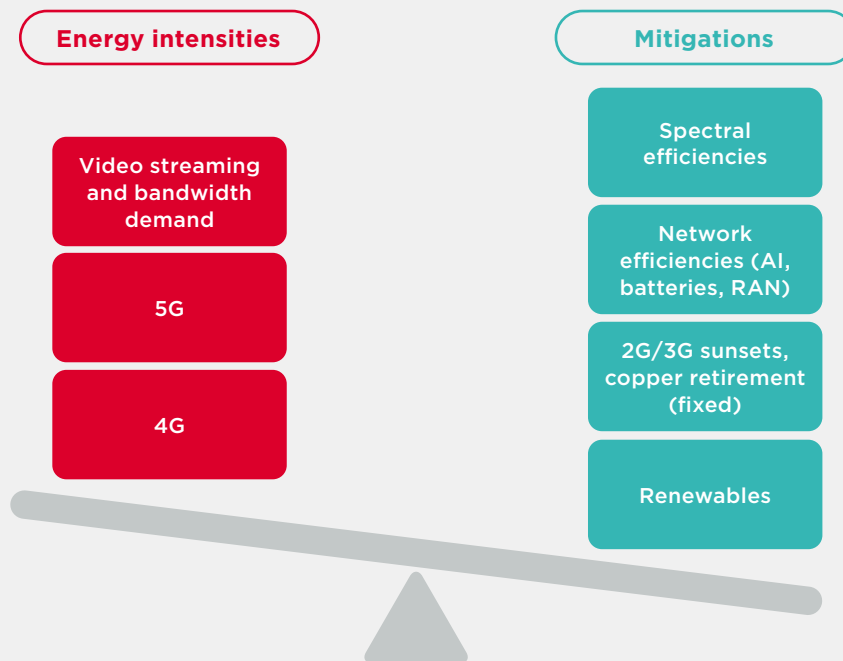
4 Outlook and implications

Squaring the 5G paradox and preparing for 5G-Advanced and 6G

The network represents the lowest hanging fruit for operators to target, as it is still an outsized energy cost line (20–40% of opex). 5G is sometimes referred to as a paradox because, while it is much more spectrally efficient than 4G, overall energy use for a company can (and often does) still rise. This comes down to whether operators have invested in more energy-efficient network equipment, the spectrum portfolio and the ongoing consumption from legacy 2G/3G networks. For 5G and eventually 6G to be the 'green generation', overall energy use will need to decline at the company and industry levels.

Figure 8 5G efficiencies are part of a holistic toolkit to reduce energy across the operator footprint

Source: GSMA Intelligence

The RAN accounts for the bulk of energy use (75–80%) in a typical mobile network and will remain the main focus for finding energy efficiencies. The core and datacentres (at 10–15%) are also significant. Extracting efficiencies here depends largely on innovations in datacentre positioning, power and cooling. RAN liquid cooling matters here given the potency of gases emitted from existing air conditioning systems used, which in many cases account for a disproportionate share of operator CO_2 emissions. As workloads increasingly move to the cloud through partnerships with traditional infrastructure suppliers and hyperscalers such as

Microsoft and AWS, coordinated investments will be a part of the future. This includes liquid or natural cooling for datacentres and dynamic traffic shaping to reduce the intensity of energy use on a small number of points of presence.

Sustainability also extends to fixed networks in terms of retiring legacy copper lines as fibre is laid. Many converged European operators, including BT, Deutsche Telekom and Telefónica, have already made significant progress with fibre expansion in line with national objectives and the European Digital Decade goals that espouse universal, high-speed broadband access by 2030.

Progressing to net zero

Net-zero commitments among operators continue to rise. GSMA Intelligence calculates that around a third of the sector by mobile market share have committed to a net-zero target by 2050. A higher share (more than 40%) have committed to Science Based Targets – a key indicator upon which achievement of net zero on an industry level will depend, given the need for progress audits.

Momentum is building. While a third of the sector may sound low, in reality the impending share will be higher as many operators will be in the process of laying out a net-zero commitment without having made it publicly. This takes a significant level of carbon forecasting and internal process change, from direct operations (Scope 1), to how renewable access and consumption will happen (Scope 2), to coordination with suppliers (Scope 3). The latter is challenging because of the different standards for how different companies calculate their emissions.

Commitments continue to be concentrated in Europe, the US and other higher income countries. There are large gaps in Africa and Southeast Asia, where the bulk of the global subscriber base resides, despite a groundswell of consumer support for action. The lack of commitments among operators in these regions is due to reasons including a lack of political leadership, poor renewables supply, high investment costs, and it not yet being a corporate priority.

The renewables issue is probably the most pressing, though largely out of operators' control, except for PPA access. Renewables represent less than 25% of energy use for the telecoms industry overall, with traditional grid accounting for the majority by far. On the current run rate, it would be 2030 before renewables reach half of energy consumption. This isn't terrible but it is also not ideal in terms of missing out on price stability (less exposure to OPEC pricing and wholesale market volatility) and lower opex. An acceleration represents a key part of the industry reaching net zero overall by 2050.

Network efficiencies are within operators' control. Here, indicators are positive. The GSMA Intelligence 2022 Energy Efficiency Benchmarking study includes a core efficiency yield, which improved to 0.17 kWh per GB of data transferred, from 0.24 in 2021 (see Table 1). We can also express performance on the metric aligned with ITU reporting, in the form of GB per kWh.

Table 1: Mobile network energy efficiency: gradual improvement

		2020/21	2021/22
Energy yield on mobile network	kWh per GB data transferred (mobile networks)	0.24	0.17
	GB per kWh	Not calculated	5.88

Source: GSMA Intelligence

Aligning the supply chain

Scope 3 emissions are those in the supply chain that arise from consumer use of a company's products. These are estimated to be the largest share of the carbon footprint, at 65–75% of the total (35–40 gigatonnes per year). The challenge with Scope 3 emissions is first calculating what they actually are, before working with the supply chain to bring them down in a coordinated way. Changing behaviours to result in lower emissions is a harder task. Part of the Scope 3 challenge will come down to making the circular economy pervasive. Sustainable procurement policies are another lever – specifically, coordinating with suppliers on embedding carbon-reduction targets (among other requirements) into requests for proposals.
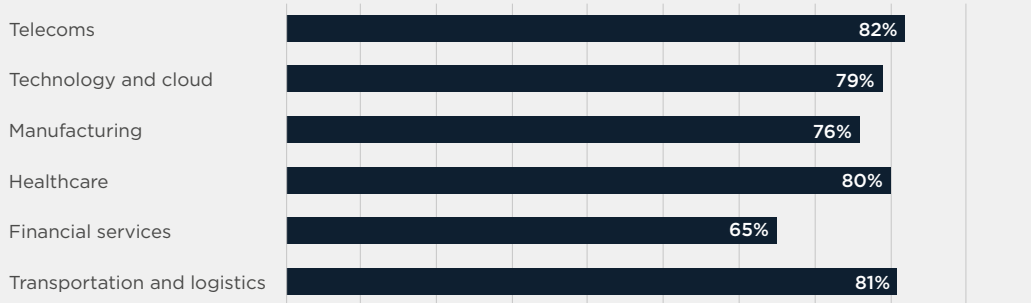
A procurement policy may include features such as:

— organisational governance
— human rights
— labour practices
— carbon-reduction targets
— energy efficiency standards
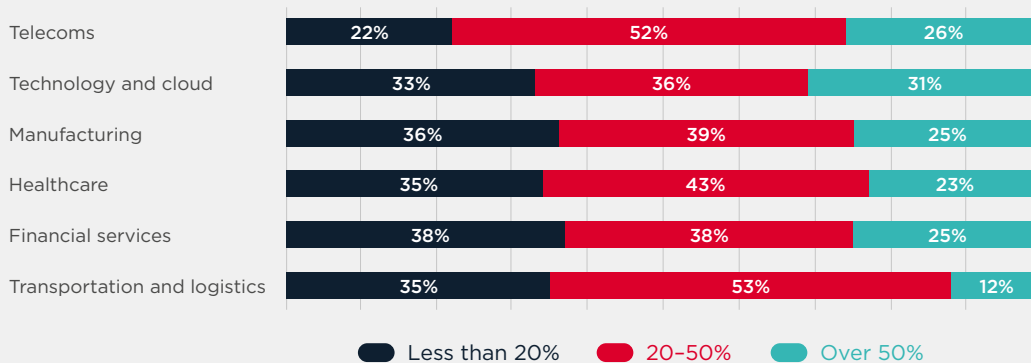— banning the mining or use of conflict minerals.

According to GSMA Intelligence survey data, 65–80% of companies across the six industries studied have a sustainable procurement policy in place (see Figure 9). In reality, this is likely to over-represent the true number as a result of survey error, or at least the true number of companies with comprehensive procurement policies – but it is nevertheless indicative of a majority. The challenge is enforcement. When asking these same companies that have a sustainable procurement policy how often it is actually used, the numbers fall considerably. Indeed, the majority only screen up to half of their suppliers on the sustainability criteria, with telecoms no different.

Figure 9 The majority of companies have a sustainable procurement policy in place but most are only screening a small proportion of suppliers

Percentage of companies with sustainable procurement policy in place

Industry	Percentage
Telecoms	82%
Technology and cloud	79%
Manufacturing	76%
Healthcare	80%
Financial services	65%
Transportation and logistics	81%

Percentage of suppliers screened

Industry	Less than 20%	20–50%	Over 50%
Telecoms	22%	52%	26%
Technology and cloud	33%	36%	31%
Manufacturing	36%	39%	25%
Healthcare	35%	43%	23%
Financial services	38%	38%	25%
Transportation and logistics	35%	53%	12%

● Less than 20% ● 20–50% ● Over 50%

Source: GSMA Intelligence based on Sustainability Enterprise Attitudes Survey across six industries (November and December 2022)

To some extent, this is to be expected. Procurement policies with multiple criteria entail cost and time to roll out. With large, consumer-facing companies such as banks, supermarkets and telecoms operators dealing with hundreds or even thousands of suppliers, there is a logistical reality that a phased implementation is the most realistic way of bringing in new supplier standards. BT, for example, requires new suppliers on contracts over £25 million to commit to net zero. Deutsche Telekom has introduced a new requirement for suppliers to disclose third-party verified scope 1/2/3 emissions in CDP (Carbon Disclosure Project) or a suitable alternative scheme. NTT's recent creation of a cross-industry hub for sharing Scope 3 emissions within a supply chain is an interesting proposal for breaking down siloes that may otherwise slow progress because of things like data formats and sharing permissions.

Governments are also acting. For example, the US government has enacted legislation requiring major (though not all) suppliers to disclose their carbon emissions and have verified pathways to reduce them to net zero by 2050.[7]

Alignment in the supply chain is an essential means of reducing Scope 3 emissions. Early warning to suppliers is important, as this should result in a cascading effect through the supply chain. For suppliers, having certified carbon reduction pathways will become a competitive advantage in the short term and ultimately a requirement of doing business.