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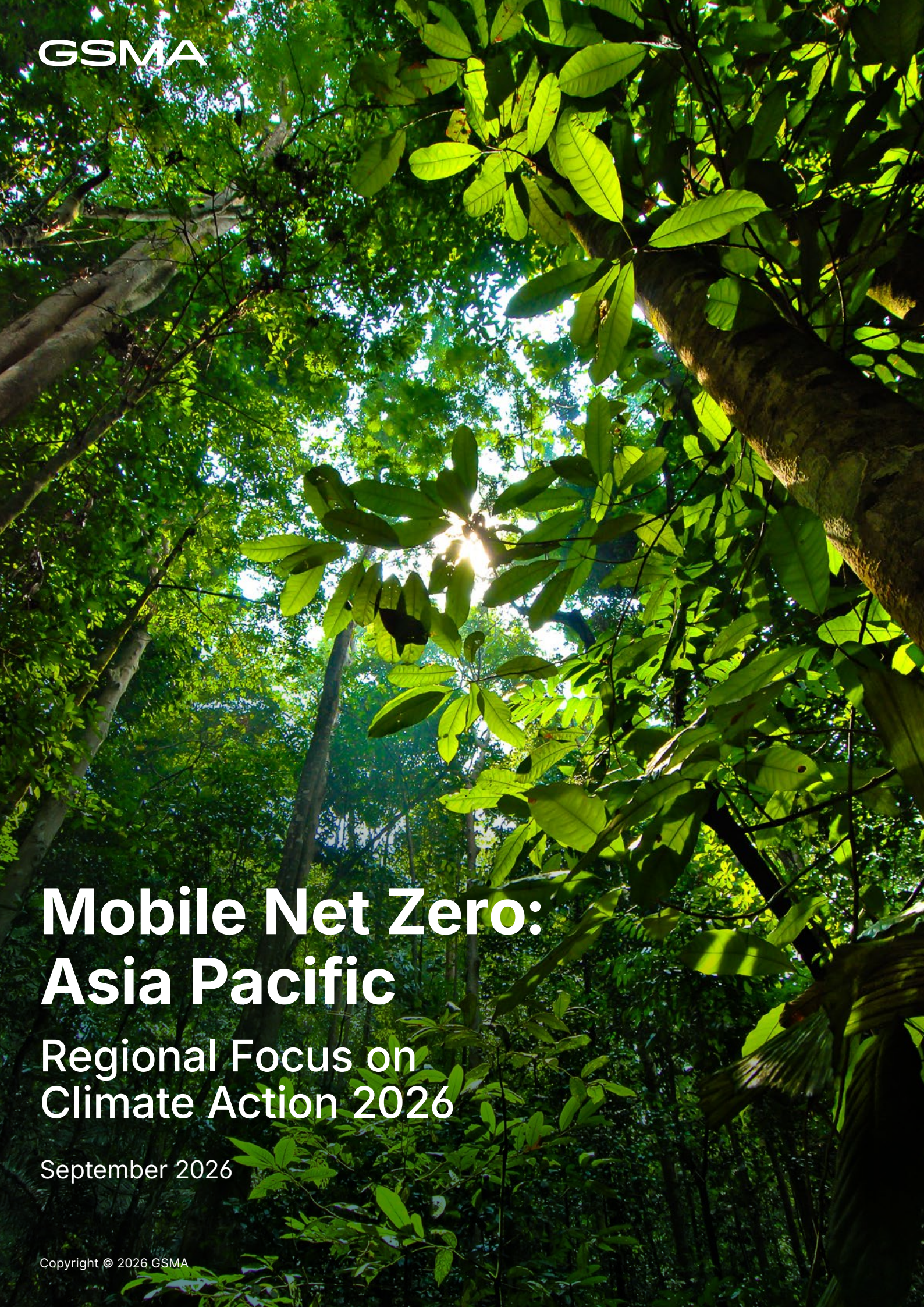

Mobile Net Zero: Asia Pacific

Regional Focus on Climate Action 2026

September 2026

GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

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Acknowledgements

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Executive summary

Mobile operators in Asia Pacific remain committed to climate targets and disclosures

Climate action is a strategic priority for countries and companies in the Asia Pacific region, including mobile operators. The region accounts for a large and growing share of global emissions while also bearing some of the most severe climate impacts, from intensifying typhoons and floods to sea level rise across low-lying coasts and island states. This report provides an in-depth look at the mobile industry's progress on climate action in the region.

A growing number of mobile operators in Asia Pacific have committed to rapidly reduce their carbon emissions. 21 mobile operators have validated near-term science-based targets, representing around 55% of mobile connections in the region and three-quarters of revenues. 13 operators have also validated net zero targets, with the earliest targets aiming for 2040.

Mobile operators in Asia Pacific are leading on climate disclosures, with more than 85% of mobile connections in the region covered by public disclosures of energy and emissions data. 21 operators disclosed to CDP in 2025 (65% of mobile connections), with seven operators receiving the highest score (A) from CDP.

Emissions continue to rise in emerging and developing markets, but are dropping quickly in advanced economies

Operational emissions from mobile operators in Asia Pacific were around 23 million tonnes CO_2e in 2024, one-fifth of global operator emissions and the second largest region behind Greater China. Between 2019 and 2024, operational emissions rose 6% while the number of mobile connections grew by 6% and mobile traffic surged by more than 350%. South Asia accounts for the largest share of regional emissions from mobile operators and tower companies, followed by Southeast Asia and East Asia.

Trends in operational emissions are diverging significantly between subregions. Mobile operators in Japan and Oceania cut their emissions by 30% between 2019 and 2024 due to renewable energy purchases, while operator emissions in South Korea rose 15% due in part to data centre growth and slower uptake of renewables. Strong demand growth and infrastructure buildout in emerging and developing markets have pushed operational emissions up almost 20% in Southeast Asia and 30% in South Asia.

Renewable energy cuts costs and emissions, but further policy support is needed to unlock renewables access

Energy is a large and growing cost for mobile operators. Operators spent around $7 billion on energy in the region in 2024, and costs are likely to be higher in 2026 due to the energy crisis. Many countries in Asia Pacific are net importers of fossil fuels, with heavy dependence on oil and liquefied natural gas (LNG) imports from the Middle East. Mobile operators consumed around 350 million litres of diesel and gasoline, with tower companies consuming an additional 1 billion litres.

Mobile operators used almost 50 TWh of electricity in 2024, equivalent to around 0.8% of regional electricity consumption. Consumption increased by 33% between 2019 and 2024 with growth across all subregions, including an 80% increase in South Asia. There is considerable range in the average electricity use per connection, from around 20 kWh in emerging markets to around 100 kWh in South Korea. The sunsetting of legacy 2G/3G and copper networks is an important energy-saving opportunity for operators.

Some operators in Asia Pacific could see significant growth in energy consumption from planned AI data centres. Nearly a third of announced or planned AI data centre capacity from telcos globally originates in the region. For example, South Korean operators have announced plans to build more than 6 GW of new AI data centre capacity by 2030 and more than 16 GW by 2035. If fully built, these data centres could consume 30–40 TWh of electricity in 2030 – five times more than their current electricity consumption.

Mobile operators in Asia Pacific are buying and generating more renewable energy, but access remains a major challenge in some markets. Operators purchased or generated 7 TWh of renewables in 2024, or around 15% of their total electricity consumption, lower than the global average (24%). The renewables share is considerably higher in some countries, including in Japan (50%) and Australia (25%). In many markets, mechanisms for mobile operators to purchase renewable electricity are limited or the cost of renewables remains high. This issue is explored across 13 Asian markets in a new GSMA white paper, *Renewable Energy for Mobile Networks in Asia*, with deep dives in Malaysia, the Philippines, South Korea and Thailand.

More progress is needed on Scope 3 disclosures, supplier decarbonisation and circularity

A growing number of operators are disclosing Scope 3 emissions, but coverage and methodologies need to be improved. Scope 3 emissions were an estimated 110 million tonnes of carbon dioxide equivalent ($MtCO_2e$) in 2024, making up 80% of the mobile industry's footprint in Asia Pacific. Three-quarters of Scope 3 emissions came from upstream categories, mostly from categories 1 and 2. In India, however, more than 80% of overall Scope 3 emissions came from Category 8 (upstream leased assets), mostly from tower companies. Tower ownership and leasing models can significantly affect how emissions are allocated across Scope 1, 2 and 3. Tower companies operating in the region consumed an estimated 1 billion litres of diesel in 2024, with those in South Asia accounting for the majority.

Circularity is key for Scope 3 decarbonisation, with growing consumer interest in refurbished phones. The ongoing memory crisis could accelerate the shift to refurbished devices in the region. New smartphone shipments in the region are expected to fall by around 14% in 2026 due to surging memory prices, with the heaviest impact on entry-level devices. At the same time, the second-hand market is projected to grow by around 8% globally and 12% in India. Nearly half of consumers in the region are likely to consider refurbished for their next purchase, with six in seven consumers surveyed saying that saving money was an important benefit of buying refurbished.

Networks must adapt to a changing climate

Mobile network infrastructure must become more resilient as climate impacts intensify. More extreme weather directly threatens network assets, with indirect risks from reliance on energy systems, water and complex supply chains. Climate Transition Plans (CTPs) are essential to translate net zero targets into coordinated, whole-of-organisation action. At the time of publication, 15 operators have committed to aligning their next CTP with the GSMA's *Climate Transition Planning Guidance for Telecommunication Companies*.

Achieving net zero requires action and collaboration from operators, tower companies, suppliers and governments

Recommended actions

Operators

- Set science-based climate targets and develop a Climate Transition Plan aligned with GSMA guidance.
- Optimise network energy use, retire legacy networks and increase the use of renewable energy, prioritising additionality.
- Engage suppliers and tower companies on climate action, including disclosures, integrating climate requirements in procurement and contractual agreements and supporting circular economy initiatives.

Tower companies and other suppliers

- Publish energy and emissions data, including fuel use and emissions from towers and product environmental reports for devices and equipment.
- Increase the use of clean energy in operations (e.g. on-site solar and batteries for tower companies) and supply chains and incorporate ecodesign and circularity in products.

Governments

- Urgently prioritise policies to accelerate electricity decarbonisation, including:
  - Streamlining clean energy and grid permitting
  - Reforming electricity market designs
  - Removing fossil fuel subsidies
  - Accelerating coal phase-outs.
- Implement policies and market designs that enable renewable energy procurement and aggregation mechanisms for distributed telecom loads.
- Recognise mobile networks as critical infrastructure in resilience planning and mobilise public and concessional finance to support energy access and decarbonisation in low- and middle-income countries (LMICs).

01 Net zero ambition

Mobile operators in Asia Pacific are increasingly setting climate targets, with more than half of mobile connections in the region covered by validated near-term science-based targets.

Tracking the mobile industry's progress on climate action in Asia Pacific

In 2019, the Board of the GSMA made a commitment to transform the global mobile industry to reach net zero carbon emissions by 2050.

Mobile Net Zero 2026: State of the Industry on Climate Action is the GSMA's latest global assessment of the industry's progress towards net zero, including across seven world regions.

This report provides in-depth analysis of progress in Asia Pacific, including how operators in the region are setting climate targets and reducing their emissions through energy efficiency and renewable energy.

The analysis is disaggregated into four subregions: East Asia,[1] Oceania,[2] South Asia[3] and Southeast Asia.[4]

26 members of the GSMA Climate Action Taskforce operate networks in Asia Pacific, representing three-quarters of mobile connections in the region

Progress towards net zero has been strengthened and accelerated through collaboration between operators across the industry. To provide a forum for this collaboration, the GSMA created a Climate Action Taskforce in 2019.

The Taskforce has grown rapidly over the past seven years and now has 82 members, representing more than 82% of mobile connections worldwide with networks in 164 countries and territories.

26 Taskforce members – nearly a third of the global taskforce – operate in Asia Pacific, representing three-quarters of mobile connections in the region (**Figure 1**).

The Climate Action Taskforce has four main purposes:

- To promote and encourage leadership on climate action to move the mobile industry towards net zero carbon emissions by 2050.
- To agree on climate policy frameworks and advocacy engagement to gain support from governments and other stakeholders for a fair and equitable transition to net zero.
- To share best practices on climate action, helping mobile operators support each other and raise their ambitions.
- To provide thought leadership and conduct research on how mobile technologies support climate mitigation and adaptation.

For more information, including how to join, visit the Climate Action Taskforce web page.

Figure 1 Climate Action Taskforce members in the Asia Pacific region

The GSMA Climate Action Taskforce includes 26 members with operations in Asia Pacific, representing three-quarters of mobile connections in the region.

Note: As of July 2026.

Source: GSMA Climate Action Taskforce.

1 East Asia: Democratic People's Republic of Korea (North Korea), Japan, Mongolia and Republic of Korea (South Korea).
2 Oceania: Australia, New Zealand and the Pacific Islands.
3 South Asia: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.
4 Southeast Asia: Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic (Lao PDR), Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste and Vietnam.

21 mobile operators representing more than half of mobile connections in Asia Pacific have validated near-term science-based targets

A growing number of mobile operators in Asia Pacific have committed to rapidly reduce their carbon emissions.

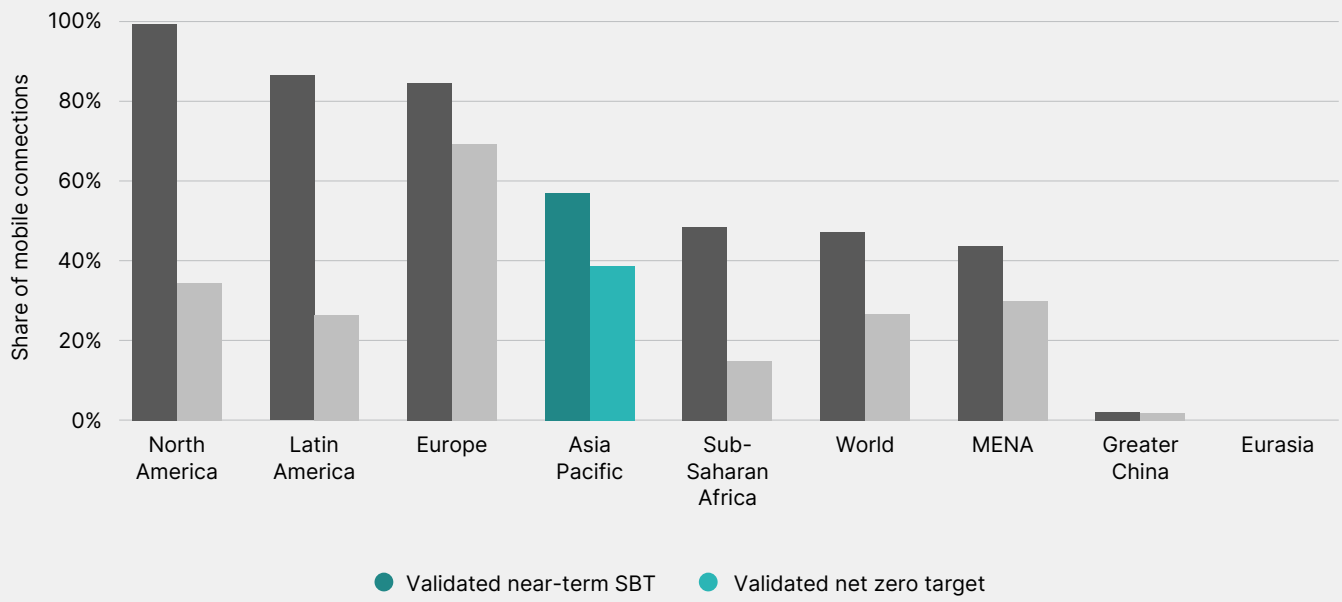
As of July 2026, 21 operators in Asia Pacific have validated near-term science-based targets, representing around 55% of mobile connections in the region and around three-quarters of revenues (**Figure 2**). This compares with 47% of mobile connections globally covered by validated near-term targets and 68% of revenues.

13 operators representing around 40% of mobile connections have validated net zero targets, with most (9) aiming for net zero by 2050. The earliest targets aim for net zero by 2040: 2degrees and KDDI.

For guidance on setting science-based targets for mobile operators, see the GSMA's step-by-step guide, *Setting Climate Targets*.

Mobile operators' climate targets

Figure 2 Mobile connections covered by validated climate targets, by region



21 mobile operators representing around 55% of mobile connections in Asia Pacific have validated near-term science-based targets.

Note: Data as of July 2026. MENA = Middle East and North Africa.

Source: GSMA analysis based on the SBTi Target Dashboard.

Many governments in the Asia Pacific region have committed to net zero

Country net zero targets are a key enabler of climate action for all sectors, including the mobile industry. Net zero commitments and the policies that support their implementation drive energy efficiency, grid decarbonisation and renewable energy access, all of which mobile operators and their suppliers need to reach net zero.

Most countries in Asia Pacific have also committed to net zero, although their legal status and target years vary considerably (**Table 1**).

Most targets aim for net zero by 2050, although two of the largest and highest emitting economies in the region – India and Indonesia – are aiming for 2070 and 2060, respectively.

Progress on formalising these commitments is uneven, with only a handful of countries, including Australia, Japan and South Korea, enshrining their target into law. Most other countries have included their commitments in policy documents or pledges, leaving implementation less certain.

Table 1 **Net zero targets in selected countries in Asia Pacific**

Subregion	Country	Target year	Status	Operators with SBTi-validated net zero targets
East Asia	Japan	2050	In law	KDDI (FY2040) SoftBank (FY2050)
	South Korea	2050	In law	
Oceania	Australia	2050	In law	Telstra (FY2050) TPG Telecom (2050)
	Fiji	2050	In law	
	New Zealand	2050	In law	2degrees (FY2040)
South Asia	Bangladesh	2050	Proposed/in discussion	Robi Axiata (Axiata Group, 2050) Grameenphone (Telenor Group, 2045)
	India	2070	In policy document	Reliance Jio (FY2050)
	Maldives	2030	In law	
	Pakistan	2050	Proposed/in discussion	
	Sri Lanka	2050	Declaration/pledge	Dialog Axiata (Axiata Group, 2050)
Southeast Asia	Cambodia	2050	In policy document	Smart Axiata (Axiata Group, 2050)
	Indonesia	2060	Proposed/in discussion	
	Lao PDR	2050	In policy document	
	Malaysia	2050	In policy document	CelcomDigi (2050)
	Philippines	No target	-	Globe Telecom (2050)
	Singapore	2050	In policy document	Singtel (FY2045) StarHub (2050)
	Thailand	2065	In policy document	True (2050)
	Vietnam	2050	In policy document	

Nearly all Asia Pacific countries have committed to net zero, but their legal status and target years vary considerably.

Note: Data as of July 2026. Definitions of "net zero" vary by country; for example, some cover CO_2 only while others cover all greenhouse gases (GHGs).

Source: GSMA analysis based on Net Zero Tracker and Our World in Data.

02

Tracking progress on climate action

Operators in Asia Pacific are leading on public disclosures of key energy and emissions data.

More than 80% of mobile connections in Asia Pacific are covered by public disclosures of energy and emissions data

Public disclosure of climate impacts is vital for transparency and to track progress towards net zero.

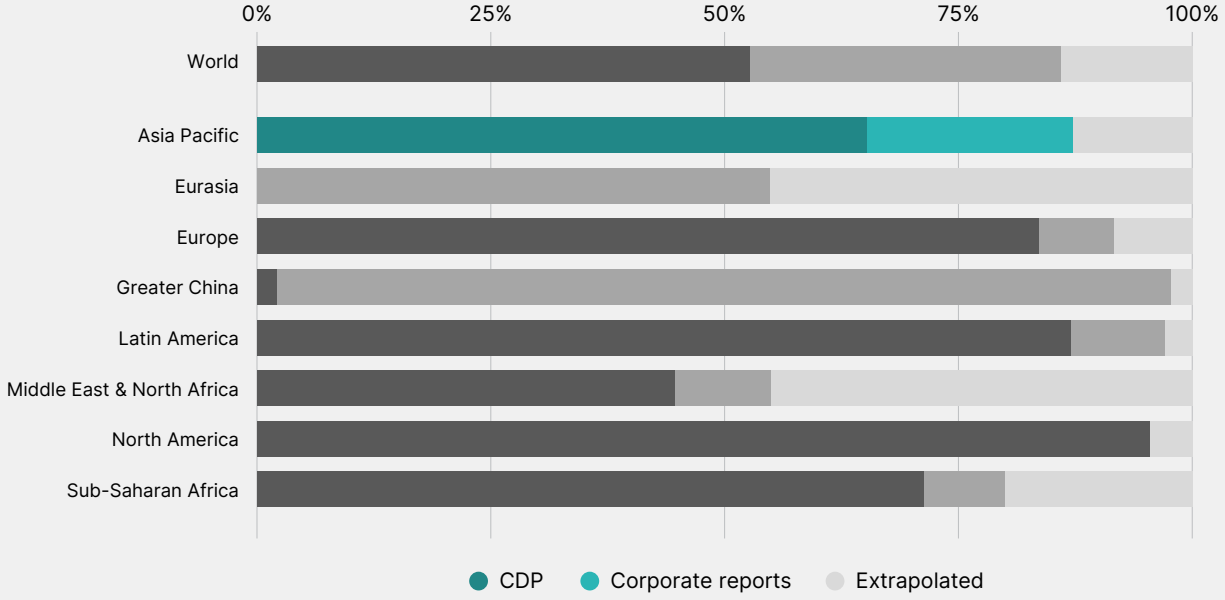
More than 85% of mobile connections in Asia Pacific are covered by public disclosures of energy and emissions data through sustainability reports and CDP disclosures (**Figure 3**).

In CDP's 2025 disclosure cycle, 21 mobile operators in Asia Pacific disclosed to CDP, covering 65% of mobile connections in the region. One-third (7) of disclosing operators achieved the highest disclosure score (A) from CDP: KDDI, LG Uplus, NTT DOCOMO, Reliance Jio, Singtel, StarHub and True.[5]

Environmental, social and governance (ESG) data and analysis have also become increasingly important for investors to identify risks and opportunities.

To harmonise ESG reporting across mobile operators, the GSMA published the first-of-its-kind reporting framework for the mobile industry, *ESG Metrics for Mobile*. 23 operator groups, including seven operating in Asia Pacific, participated in the ESG Metrics for Mobile Benchmarking 2025.[6]

Figure 3 **Climate disclosures by region, 2025**



More than 85% of mobile connections in Asia Pacific are covered by public disclosures of climate data, including 65% of connections covered by CDP disclosures

Note: Corporate reports include integrated annual reports, ESG and sustainability reports and other publicly disclosed data.

Source: GSMA analysis.

5 CDP. (2026). *CDP Scores and A Lists*.
6 GSMA Intelligence. (2026). *ESG Metrics for Mobile Benchmarking 2025*.

03

Emissions from operators

Operational emission trends in the Asia Pacific region vary significantly, with rapid reductions from mobile operators that have scaled up their renewable energy purchases and rising emissions in emerging markets where access to renewables remains a challenge.

Operational emissions in Asia Pacific were around 23 $MtCO_2e$ in 2024, the second largest contributor to global mobile operator emissions after Greater China

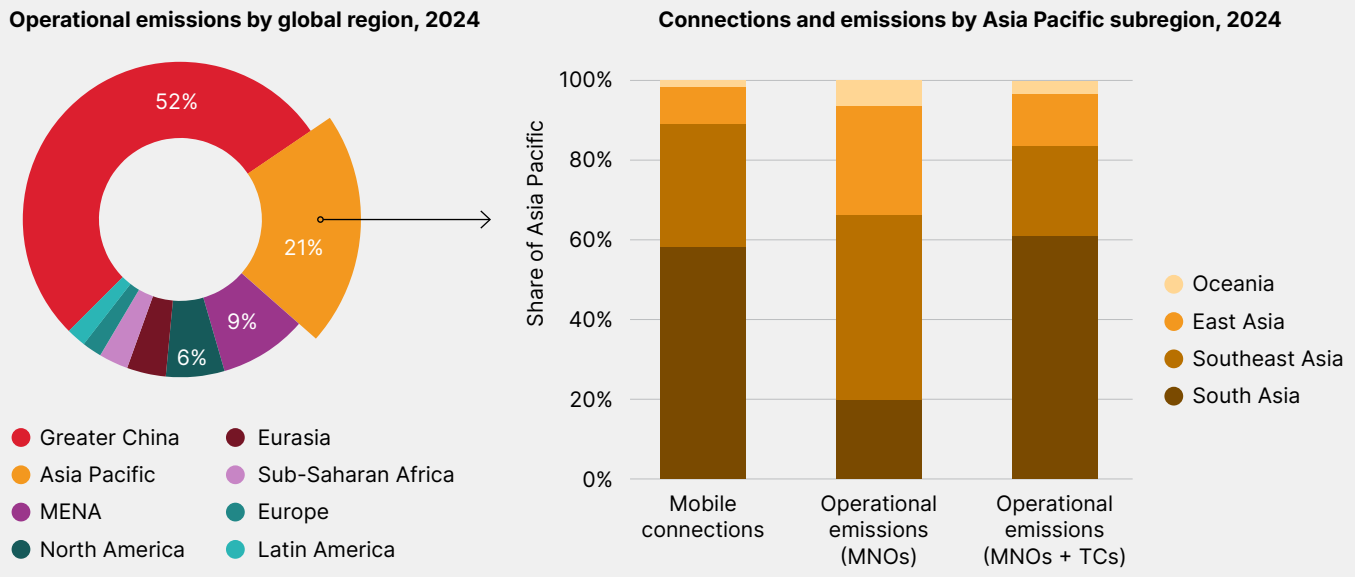
Operational emissions[7] of mobile operators in Asia Pacific were around 23 million tonnes (Mt) of carbon dioxide equivalent (CO_2e) in 2024, equivalent to 0.3% of the region's overall greenhouse gas (GHG) emissions.

The region accounted for 20% of operator emissions globally, second only to the Greater China region (**Figure 4**, left). The 20% emissions share was lower than its share of global mobile connections (29%).

Within the region, South Asia accounts for around 60% of mobile connections, followed by Southeast Asia (30%) (**Figure 4**, right). East Asia accounts for less than 10% of mobile connections but represents around a third of the region's fixed broadband connections.

Among mobile network operators (MNOs), South Asia accounts for just 20% of operational emissions in Asia Pacific (**Figure 4** right, middle column). This low share is largely due to Indian MNOs accounting for emissions from active equipment on leased sites in Scope 3 (Category 8) instead of their Scope 1 and 2. In addition, one MNO in India sold off its towers in 2020 and recently reallocated around 75% of its operational emissions to tower companies in Scope 3 and restated historical emissions.

Figure 4 Regional and subregional breakdown of connections and emissions, 2024



South Asia accounts for around 60% of the region's operational emissions from MNOs and tower companies.

Note: MENA = Middle East and North Africa. MNOs = mobile network operators. TCs = tower companies. Operational emissions include Scope 1 and Scope 2 market-based emissions.

Source: GSMA analysis based on latest CDP disclosures and corporate sustainability reports.

7 Scope 1 + Scope 2 market-based emissions.

When emissions from tower companies are included in the calculations, the share of operational emissions from South Asia is similar to their share of mobile connections (**Figure 4**, right column).

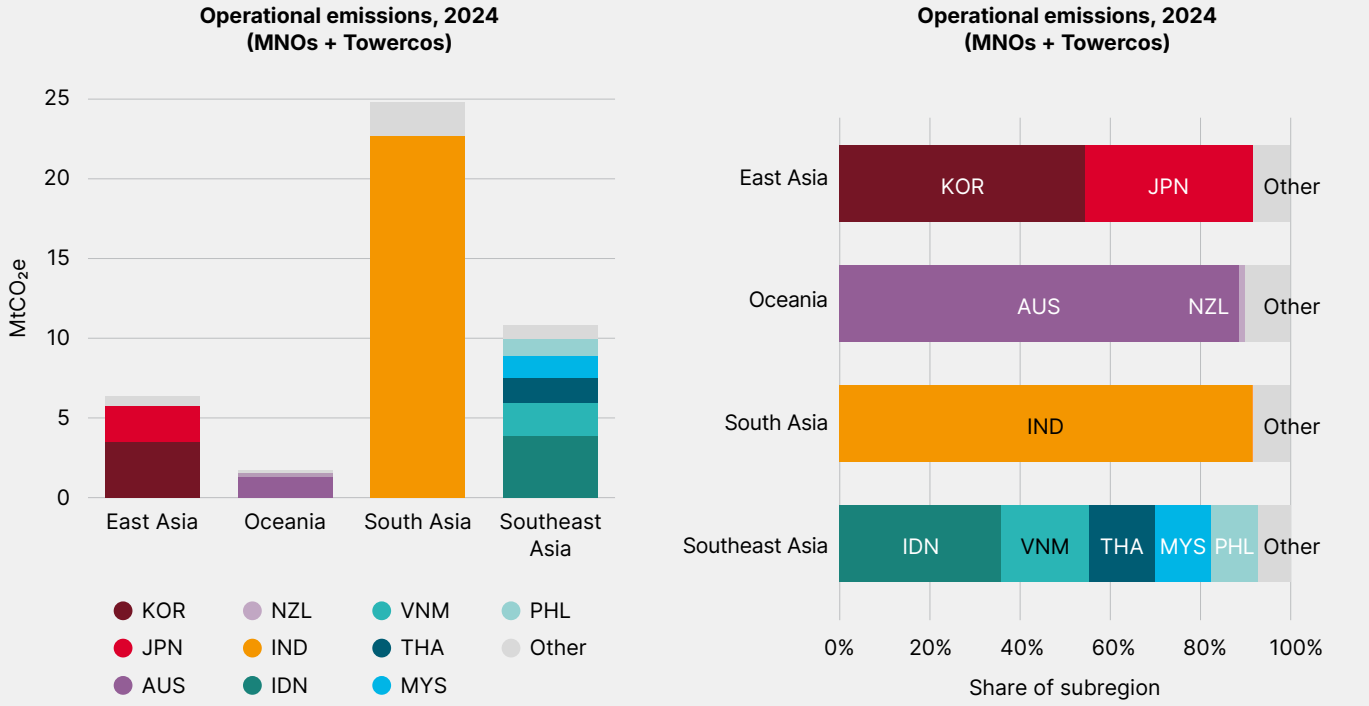
East Asia accounts for a proportionally higher share of emissions due to a high penetration of fixed broadband connections,[8] as well as significant data centre energy use by MNOs in South Korea. In each of the subregions, one or two countries account for the majority of emissions from MNOs and tower companies.

In East Asia, Japan and South Korea account for more than 90% of emissions. In Oceania, Australia accounts for almost 90%.

In South Asia, India accounts for more than 90%. Around 85% of India's operational emissions come from tower companies.

In Southeast Asia, Indonesia and Vietnam account for more than half of emissions, while the combined emissions of Malaysia, the Philippines and Thailand account for more than a third.

Figure 5 Subregional breakdown of operational emissions of MNOs and tower companies, 2024



One or two large countries account for the majority of emissions in each subregion.

Note: KOR = South Korea. JPN = Japan. AUS = Australia. NZL = New Zealand. IND = India. IDN = Indonesia. VNM = Vietnam. THA = Thailand. MYS = Malaysia. PHL = Philippines. Operational emissions in this chart include Scope 1 and Scope 2 market-based emissions from MNOs and tower companies.

Source: GSMA analysis based on latest CDP disclosures and corporate sustainability reports.

8 The average fixed broadband connection (excluding customer premises equipment) consumes around twice as much energy as an average mobile connection.

Trends in operational emissions are diverging significantly between subregions

Operational emissions in Asia Pacific rose 6% between 2019 and 2024.[9] Over the same period, the number of mobile and fixed broadband connections rose 6% and 50% respectively, while mobile data traffic rose 350%. Regional energy-related CO_2 emissions[10] from all sectors rose 9%, driven by strong growth in energy demand, particularly in India and Southeast Asia where coal-fired power generation has increased.[11]

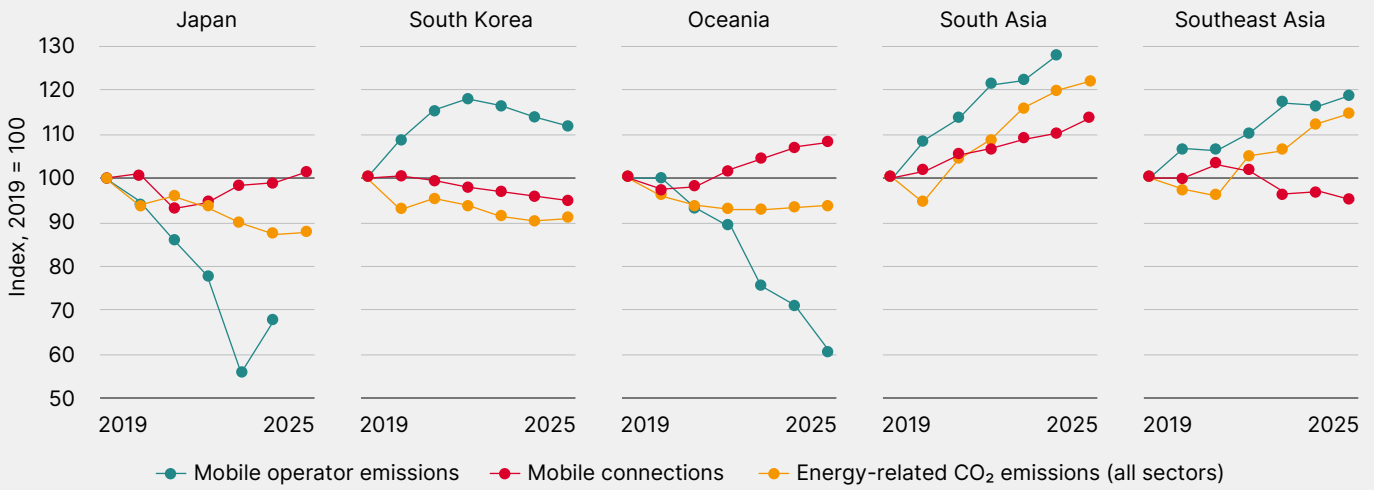
Asia Pacific is a highly diverse region in terms of economic development and growth, adoption of digital technologies and energy and climate contexts. As a result, operational emission trends vary widely across the region (**Figure 6**, green lines).

In Japan and Oceania, mobile operators cut operational emissions by 30% between 2019 and 2024 (**Figure 6**, green lines), significantly outpacing reductions of the wider economy (**Figure 6**, orange lines). These reductions have been driven in large part by operators rapidly scaling up renewable energy purchases, along with the broader decarbonisation of electricity in these markets.

In South Korea, operational emissions have increased since 2019, peaking in 2022 at almost 20% higher than 2019 levels. Emissions have since fallen to around 12% higher than 2019 levels. Compared with operators in other advanced economies, the renewable electricity share for operators in South Korea is low at around 9% in 2025, compared with more than 50% in Japan and 75% in Australia.

In many emerging and developing market economies in South and Southeast Asia, emissions from mobile operators and other sectors have risen steadily since 2019. In South Asia, mobile operator emissions rose by 30% between 2019 and 2024, driven by growing demand for connectivity and 5G deployment. In Southeast Asia, operator emissions increased by around 20% between 2019 and 2025. Although many emerging markets are adding more renewables to their grids each year, the carbon intensity of electricity in these markets has not fallen as quickly as in advanced economies due to faster growth in electricity demand and a younger fleet of coal-fired power plants continuing to operate.

Figure 6 **Trends in emissions and mobile connections by subregion, 2019–2025**



Operational emission trends in the Asia Pacific region vary significantly, with steep reductions in Japan and Oceania decoupling from connectivity demand and emission trends in the wider economy.

Note: Mobile operators' emissions include Scope 1 and Scope 2 (market-based). 2025 estimates for South Korea, Oceania and Southeast Asia cover more than 80% of subregional connections. 2025 estimates for Japan and South Asia are not yet available due to a lack of publicly disclosed data as of July 2026.

Source: GSMA analysis based on CDP and corporate disclosures (mobile operator emissions), GSMA Intelligence (mobile connections) and International Energy Agency (IEA) (energy-related CO_2 emissions).

9 This estimate is based on updated and restated data from several operators that have resulted in a lower 2019 emissions baseline compared with the estimate derived for Mobile Net Zero 2026, where the Asia Pacific region was estimated to have reduced emissions by 3% between 2019 and 2024.
10 CO_2 emissions generated from the combustion of fossil fuels across all sectors, including electricity, transportation, buildings and industry.
11 GSMA analysis based on the IEA's *Global Energy Review 2026*.

Energy is a large and growing cost, with operators spending around $7 billion on energy in 2024, consuming nearly 50 TWh of electricity and 350 million litres of diesel and gasoline

Scope 1 and fuel consumption

Scope 1 emissions totalled nearly 1 $MtCO_2e$ in 2024, around 10% higher than in 2019. Most of these emissions came from diesel generators and fleet vehicles, with operators consuming around 350 million litres of diesel and gasoline in 2024, mostly in South and Southeast Asia. Tower companies consumed an additional 1 billion litres.

The estimated cost of fuels was $400 million in 2024 and this bill is likely to be considerably higher in 2026. The price of crude oil, diesel and other fuels have surged in 2026 as a result of the Iran War and closure of the Strait of Hormuz. Crude oil prices reached nearly $140 per barrel in early April and averaged around $90 over the first half of 2026 – 30% higher than the 2025 average. Asia sources 60% of its oil and gas from the Middle East, with some countries importing more than 90%.

Although many mobile operators and tower companies in the region have significantly reduced their diesel consumption over the past decade through grid connections and on-site solar and hybrid solutions, diesel generators remain the biggest source of Scope 1 emissions and a large and volatile cost.

Transitioning off-grid and weak-grid sites to solar, batteries and hybrid systems can reduce diesel consumption, lowering emissions while also reducing fuel costs, logistics and maintenance costs, and improving network resilience.

Scope 2 and electricity consumption

Location-based Scope 2 emissions totalled 25.5 $MtCO_2e$ while market-based Scope 2 emissions, reflecting renewable energy purchases, were around 22 $MtCO_2e$.

Nearly all operators' Scope 2 emissions came from purchased electricity. Mobile operators[12] in Asia Pacific consumed an estimated 48 TWh of electricity in 2024, or 0.8% of regional electricity use. For most operators, 70–80% of electricity was consumed by mobile and fixed networks with the remainder powering data centres, offices, stores, electric fleet vehicles and other operations.[13]

Mobile operator electricity consumption increased 33% between 2019 and 2024 with growth across all subregions, including an 80% increase in South Asia (**Figure 7**, left). As discussed in the previous section, most emissions and energy consumption from towers are accounted for in Scope 3 in India. If towerco electricity is included, electricity consumption in South Asia is estimated to have been more than three times higher (**Figure 7**, right).

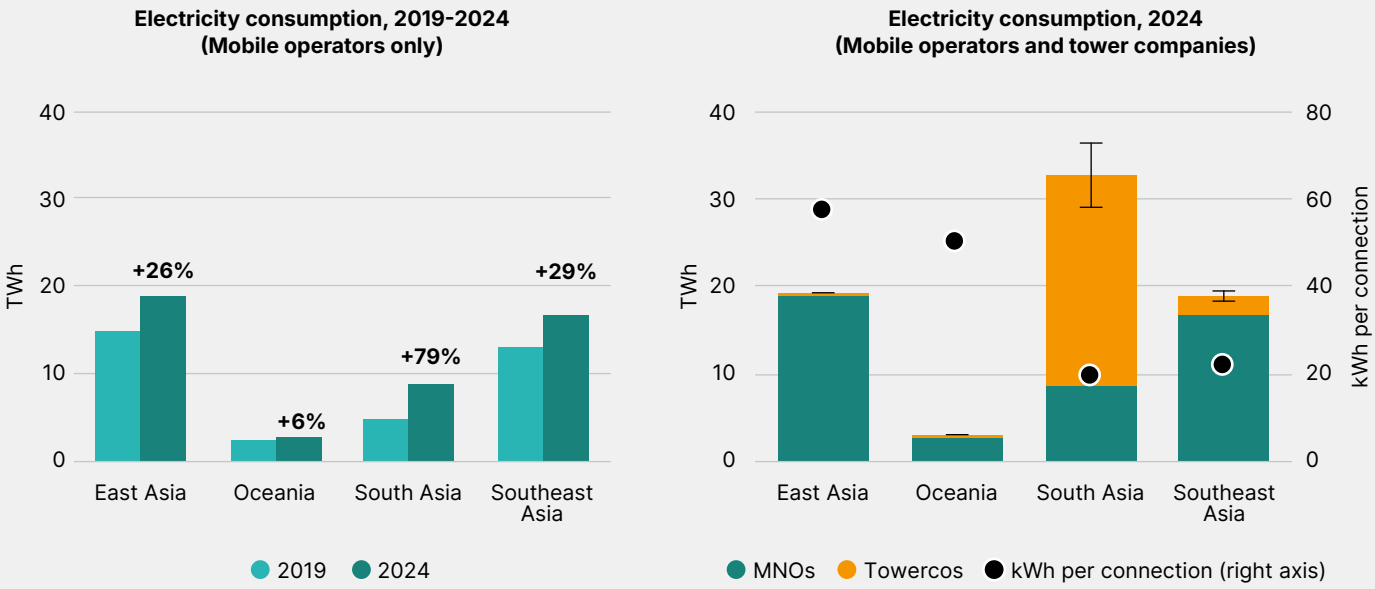
Mobile operator electricity consumption per connection was 16 kWh in 2024 (25 kWh including tower companies) compared with the global average of 29 kWh. The average connection in advanced markets consumed more than 50 kWh (including 100 kWh in South Korea), while in emerging markets, average electricity per connection remains low at around 20 kWh (**Figure 7**, right).

The sunsetting of older, less energy-efficient 2G and 3G networks is an important source of energy savings. Data from operators in Australia, Japan and Singapore show that electricity consumption dropped three times as fast in the year following 3G sunsets compared with the two years preceding sunsets. The switch from copper to fibre in fixed networks also offers significant energy-saving opportunities.

While mobile networks will continue to account for the majority of operators' electricity use, some in the region may see rising electricity consumption from new AI data centres, particularly in South Korea and India. For example, South Korean operators have announced plans to build more than 6 GW of new AI data centre capacity by 2030 and more than 16 GW by 2035. If fully built, these data centres could consume 30–40 TWh of electricity in 2030 – five times more than their current electricity consumption.

12 This figure covers electricity consumed by MNOs, and excludes electricity consumed by tower companies and telecoms operators that exclusively operate fixed-line networks.
13 Electricity consumed by customer premises equipment (i.e. by customers) are not included in these figures.

Figure 7 Operators' electricity consumption, 2019–2024



Electricity consumption has increased in all subregions since 2019, with particularly fast growth in South Asia.

Note: Error bars indicate the likely range of tower companies' electricity consumption. Connections include mobile and fixed broadband.

Source: GSMA analysis based on latest CDP disclosures and corporate sustainability reports.

Mobile operators in Asia Pacific are buying and generating more renewable energy, but access remains a challenge in some markets

Mobile operators in Asia Pacific purchased or generated 7 TWh from renewables in 2024, or around 15% of their total electricity consumption.[14] The share of renewables in Asia Pacific is comparatively lower than the global average (24%) and advanced economies such as Europe (70%) and North America (50%).

In Japan, mobile operators accounted for almost 70% of the regional total, purchasing nearly 5 TWh of renewable electricity. Around half of their electricity consumption was matched by purchased or generated renewables, more than double the share in the grid mix (**Figure 8**).

South Korean operators met around 7% of their electricity use with purchased or generated renewables in 2024. Preliminary data shows this increasing to 9% in 2025.

In Oceania, mobile operators met around 25% of their consumption with renewable electricity. Preliminary data shows a sharp increase in 2025, with operators matching more than 60% of their consumption with renewables due to large increases from Telstra, TPG Telecom and Optus.

Mobile operators in South Asia matched around 8% of their consumption with renewables, while those in Southeast Asia matched just 4%.

Case Study:
Telstra – Powering more renewable energy than consumed

South and Southeast Asia have some of the most carbon-intensive and fossil fuel-dependent electricity grids in the world. While renewable energy is increasing in many of these markets, mobile operators and other companies face challenges in accessing renewable energy. A new GSMA white paper, *Renewable Energy for Mobile Networks in Asia*, shows that market readiness and policy frameworks for renewable energy vary significantly across Asia.

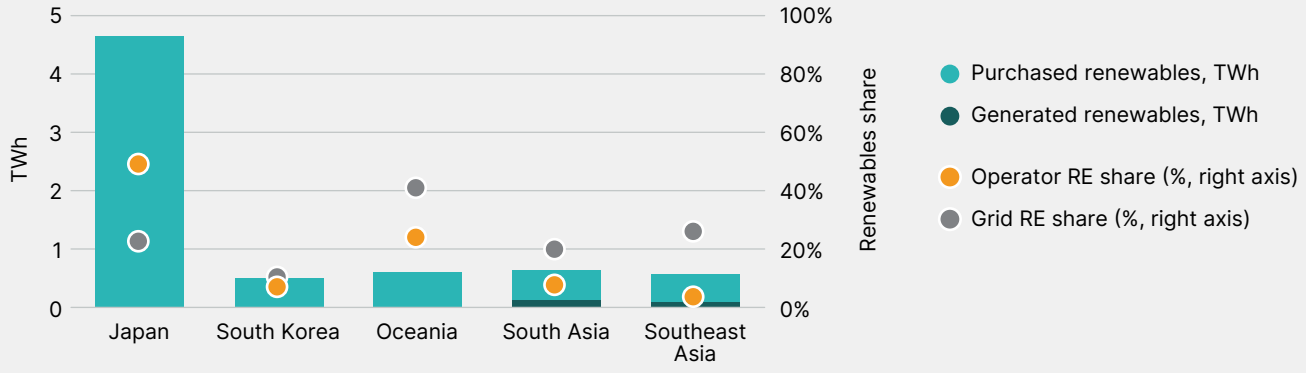
In some countries, procurement mechanisms to access off-site renewables (e.g. power purchase agreements) are limited or under development. In more advanced markets, barriers for mobile operators include high costs or a lack of options for distributed loads such as mobile towers.

Policy progress in some emerging markets has helped some mobile operators meet a growing share of their electricity needs with renewables in 2025, including Globe Telecom (Philippines, 34%), Grameenphone (Bangladesh, 34%), Telekom Malaysia (20%) and True (Thailand, 23%).

Five mobile operators in the region are members of RE100, committing to reach 100% renewable energy: KDDI, KT, Rakuten, SK Telecom and SoftBank.

Case Study:
Globe – Scaling up renewables through site aggregation

Figure 8 Renewable electricity purchased and generated in selected markets, 2024



Mobile operators in Asia Pacific collectively purchased and generated 7 TWh of renewable electricity in 2024, led by Japanese operators that sourced half of their electricity from renewables.

Note: RE = renewable electricity.

Source: GSMA analysis based on latest CDP disclosures and sustainability reports. Grid share of renewables based on Ember's Yearly Electricity Data for 2026.

14 These figures do not include renewable and low-carbon sources on the wider electricity grid.

04

Emissions from supply chains and customers

Scope 3 emissions account for three-quarters of the mobile industry's overall carbon footprint. More engagement with suppliers is critical to improve measurement and reduce emissions.

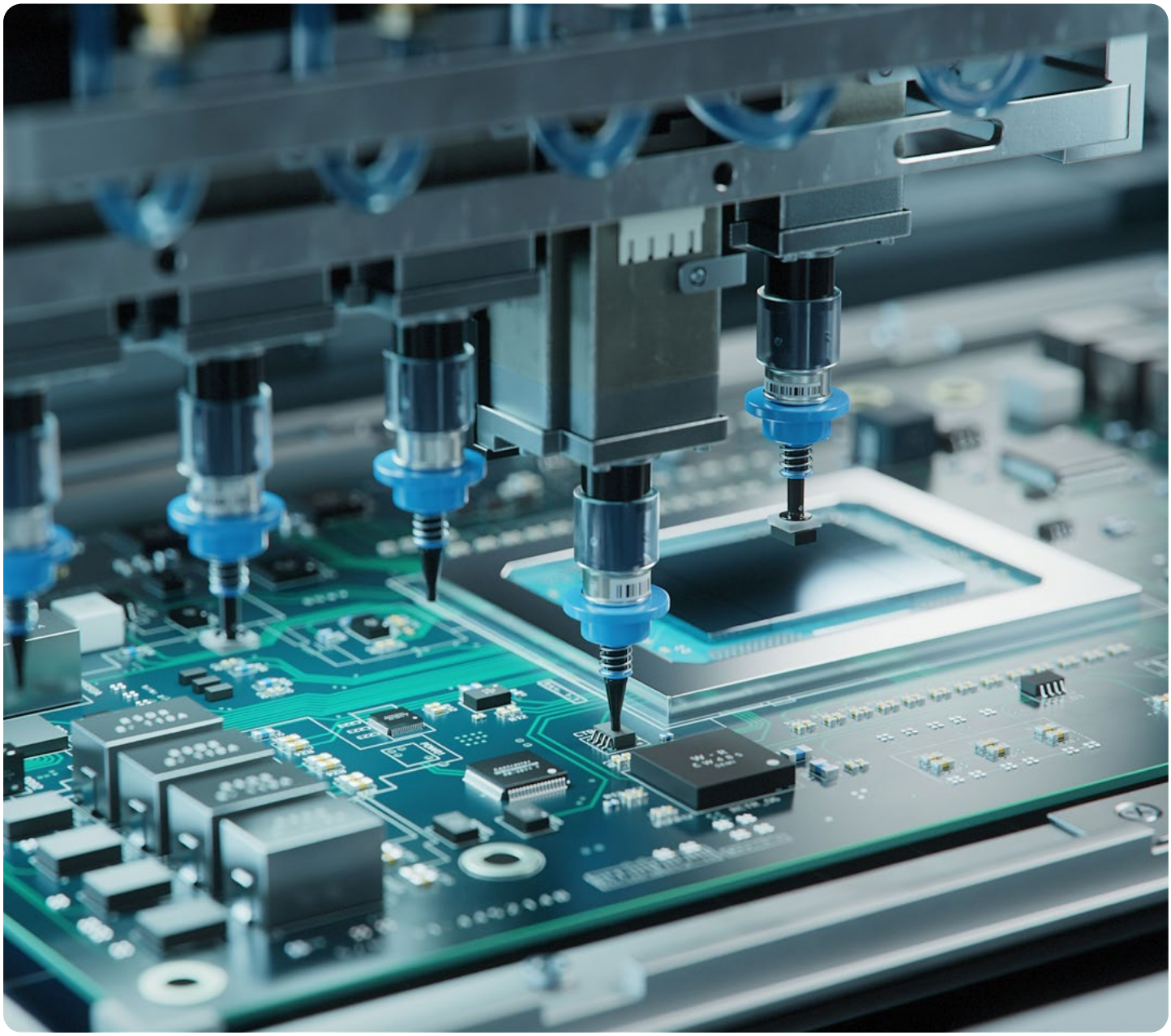
A growing number of operators are disclosing Scope 3 emissions, but improved coverage and methodologies are needed

All operators in Asia Pacific disclosing to CDP in 2025 disclosed Scope 3 emissions, but less than half disclosed on at least 10 categories. Other operators with public disclosures only disclosed on a few less significant categories (e.g. employee commuting, business travel) or did not disclose Scope 3 at all.

To support operators with Scope 3 disclosures and align the industry on methodologies, the GSMA developed *Scope 3 Guidance for Telecommunication Operators* in 2023. In 2025, the GSMA developed a Scope 3 Assessment Tool to help operators improve both the coverage and accuracy of their Scope 3 calculations.

Scope 3 emissions from mobile operators in Asia Pacific were estimated to be around 110 $MtCO_2e$ in 2024, making up more than 80% of the industry's overall footprint in the region. The average Scope 3 emissions per connection was 36 $kgCO_2e$, slightly higher than the global average (31 $kgCO_2e$).

Three-quarters of Scope 3 emissions were from upstream categories. Category 1 (purchased goods and services, 30%), Category 2 (capital goods, 13%) and Category 8 (upstream leased assets, 21%) combined to account for two-thirds of the total. Category 15 (investments) accounted for a much higher share (16%) of Scope 3 compared with the global average (9%).



The contributions of different categories to overall Scope 3 emissions vary significantly between operators and subregions. Some of these variations stem from differences in their operations and business models, as well as countries of operation.

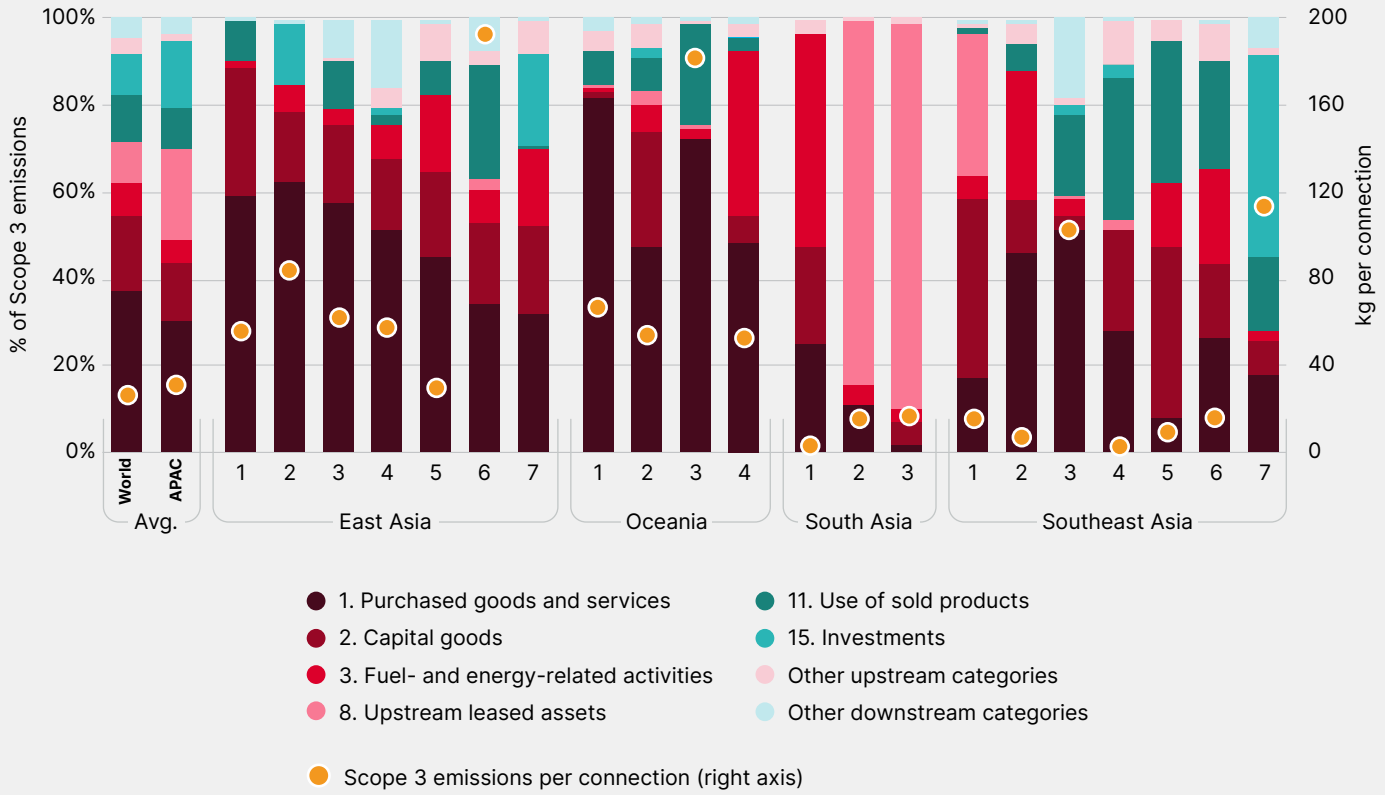
In advanced economies in East Asia and Oceania, Categories 1 and 2 typically accounted for a much greater share of overall Scope 3 emissions compared with South and Southeast Asia.

Case Study:
Singtel – EcoWiFi: Smarter connectivity, lower energy use and reduced Scope 3 emissions

In South Asia, Category 8 (upstream leased assets) – largely emissions from tower companies – accounted for more than 80% of overall Scope 3 emissions for operators in India.

In Southeast Asia, Category 3 (fuel- and energy-related activities) and Category 11 (use of sold products) generally accounted for larger shares of emissions than in other subregions. This is likely due to the higher carbon intensity of electricity in the region, resulting in higher use-phase emissions from customer smartphones and customer premises equipment, as well as embodied carbon in energy.

Figure 9 Scope 3 emissions of selected operators in Asia Pacific, by category



The amount and sources of Scope 3 emissions can differ substantially between operators and regions.

Note: "World" and "APAC" show the industry-level totals based on Scope 3 data disclosed to CDP. Connections include mobile and fixed broadband.

Source: GSMA analysis based on latest CDP disclosures.

Some of the mobile industry's biggest suppliers have headquarters or major operations in Asia Pacific

Mobile operators globally rely on key suppliers in Asia Pacific, making the region an important source of Scope 3 emissions for the industry and critical to helping the wider industry reach its net zero goals.

Mobile Net Zero 2026 analysed 100 key industry suppliers across five supplier groups. Of these, 18 are headquartered in Asia Pacific and half have validated climate targets (**Table 2**).[15]

Tower companies are a particularly important supplier group for Scope 3 decarbonisation, particularly in countries with poor grid access and reliability. Tower companies consumed around a billion litres of diesel in the region, with around half consumed in India.

Other key suppliers also have major operations in the region, including smartphone, network equipment and component manufacturing facilities for Apple, Cisco, Ericsson, Huawei, Nokia and others in India, Indonesia, Malaysia and Vietnam.

Southeast Asia is also a major supplier of critical minerals used for smartphones and network equipment, including nickel, rare earth elements and tin.[16]

Table 2 **Climate targets of suppliers headquartered in Asia Pacific**

Company	Headquarters	Near-term science-based target	Net zero target
edotco (Axiata Group)	Malaysia	1.5°C	2050
Fujitsu	Japan	1.5°C	FY2040
HCL Technologies	India	1.5°C	FY2040
HUMAX Networks	South Korea	Committed	-
Indus Towers	India	1.5°C	2050
Infosys	India	Well below 2°C	-
NEC	Japan	1.5°C	FY2040
Sony Group	Japan	1.5°C	FY2040
Tata Consultancy Services	India	1.5°C	-
Tech Mahindra	India	1.5°C	FY2035

Nine key industry suppliers headquartered in Asia Pacific have validated near-term science-based targets.

Note: Data as of July 2026

Source: GSMA analysis based on the SBTi's Target Dashboard.

15 As of July 2026.
16 IEA. (2026). *Global Critical Minerals Outlook 2026*.

Circularity is key to addressing Scope 3 emissions, and the ongoing memory crisis could accelerate the shift to refurbished devices

Circularity is an important way to reduce upstream Scope 3 emissions. Materials and manufacturing typically account for 70–90% of the life-cycle emissions of a smartphone.[17] This means that longer device lifespans, including through reuse, repair and refurbishment, can deliver substantial emission reductions and cost savings for mobile operators and consumers.

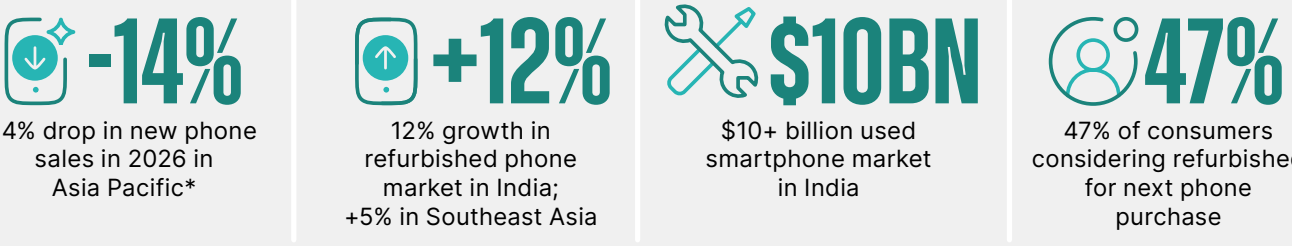
The memory crisis is having a major impact on smartphone pricing and new phone sales. Surging memory demand from AI data centres has resulted in manufacturers shifting production away from the typical memory used in consumer electronics – a critical component in smartphones. Since memory makes up a large share of a budget phone's production cost, prices of low- and mid-tier devices – which make up the majority of the smartphone market in South and Southeast Asia – are seeing the biggest relative cost increase and drop in sales.[18] In India, smartphone shipments fell 10% in Q2 compared with a year earlier, while shipments of sub-$150 phones fell 45%.[19]

Industry analysts expect new smartphone shipments globally to drop by 15% in 2026 and by 14% in Asia Pacific (excluding Japan).[20]

At the same time, the global secondary market (used and refurbished) is projected to grow by 8% annually[21] over the next few years. In India, the refurbished phone market is expected to grow 12% in 2026.[22]

Even prior to the memory crisis, there was growing consumer interest in refurbished phones. The GSMA Global Consumer Survey on Circularity of more than 3,600 consumers across nine Asia Pacific markets[23] showed that 47% of consumers were likely to consider refurbished for their next phone purchase. 86% of consumers said that saving money was an important benefit of buying refurbished.

Figure 10 The growing market for refurbished phones in Asia Pacific



There are strong business, consumer and environmental benefits of circular products and services, and the ongoing memory crisis is pushing more consumers to these options.

* Projection excludes Japan.

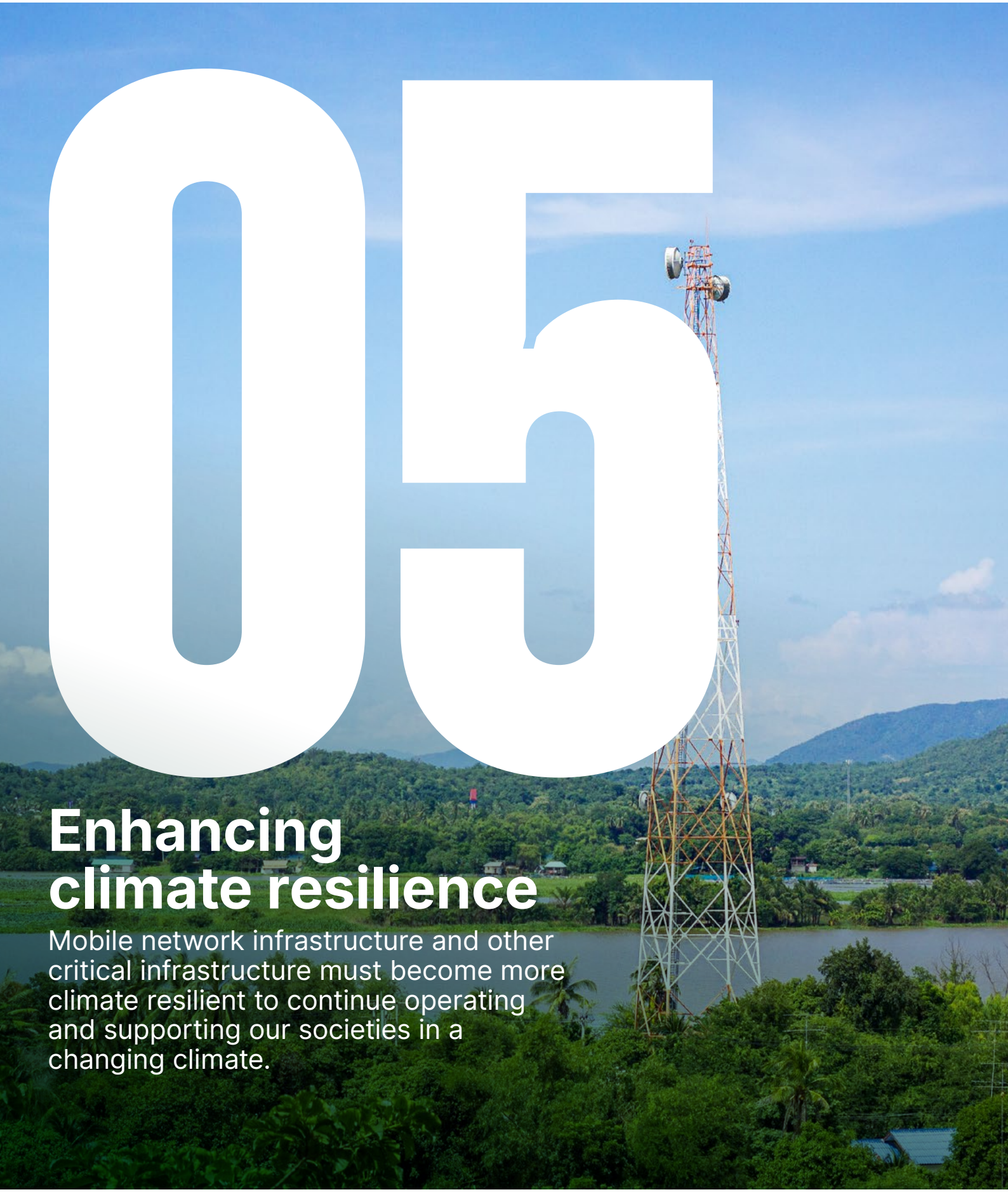
Source: GSMA analysis based on IDC and Counterpoint.

17 GSMA. (2025). *Rethinking Mobile Phones: The Business Case for Circularity*.
18 GSMA analysis based on IDC. (18 December 2025). "Global Memory Shortage Crisis: Market Analysis and the Potential Impact on the Smartphone and PC Markets in 2026".
19 Counterpoint. (16 July 2026). "India Smartphone Shipments Fall 10% YoY in Biggest June Quarter Decline in Six Years".
20 GSMA analysis based on IDC (2026), Counterpoint (2026), Gartner (2026) and Omdia (2026).
21 GSMA analysis based on CCS Insight (2025) and IDC (2025).
22 Counterpoint Research cited in the Times of India (16 July 2026).
23 Australia, India, Indonesia, Japan, Malaysia, Pakistan, Philippines, Singapore and South Korea.

Refurbished mobile devices and other circular products and services can also play an important role in digital inclusion by making devices more affordable. The GSMA is actively working on this through the Handset Affordability Coalition. The GSMA Innovation Fund for Green Transition for Mobile also includes a focus on circularity, providing grants and technical assistance to small and growing enterprises working to advance device circularity, reduce value-chain emissions and improve handset affordability.

Increasing the circularity of network equipment and customer premises equipment are also critical to Scope 3 emission reductions. The GSMA has developed guidance – *Quantifying the Carbon Savings of Circularity: Mobile Phones and Network Equipment* – to help mobile operators align on methods and approaches to calculate the carbon savings of repair and refurbishment.

Case Study:
Jazz – From takeback to trade-in: Jazz's circular approach to sustainable devices



05

Enhancing climate resilience

Mobile network infrastructure and other critical infrastructure must become more climate resilient to continue operating and supporting our societies in a changing climate.

Mobile network infrastructure and other critical infrastructure must become more climate resilient to ensure operations support societies in increasingly extreme conditions

The mobile industry, like all sectors, must continue to reduce emissions rapidly while also adapting to the physical impacts of climate change. Acute and chronic climate risks[24] are already affecting the conditions in which telecoms networks operate, making adaptation and resilience an increasingly urgent priority for mobile operators in the Asia Pacific region.

More frequent and intense flooding, drought, typhoons, wildfires and temperature variability put network assets like base stations and data centres directly at risk, while indirect risks can also arise from operators' reliance on energy systems, water and complex supply chains.

The financial implications of climate threats include infrastructure damage, higher rebuild and insurance costs, service downtime, customer disruption and broader reputational and business impacts. Yet current approaches to assessing and quantifying these risks vary across the industry.

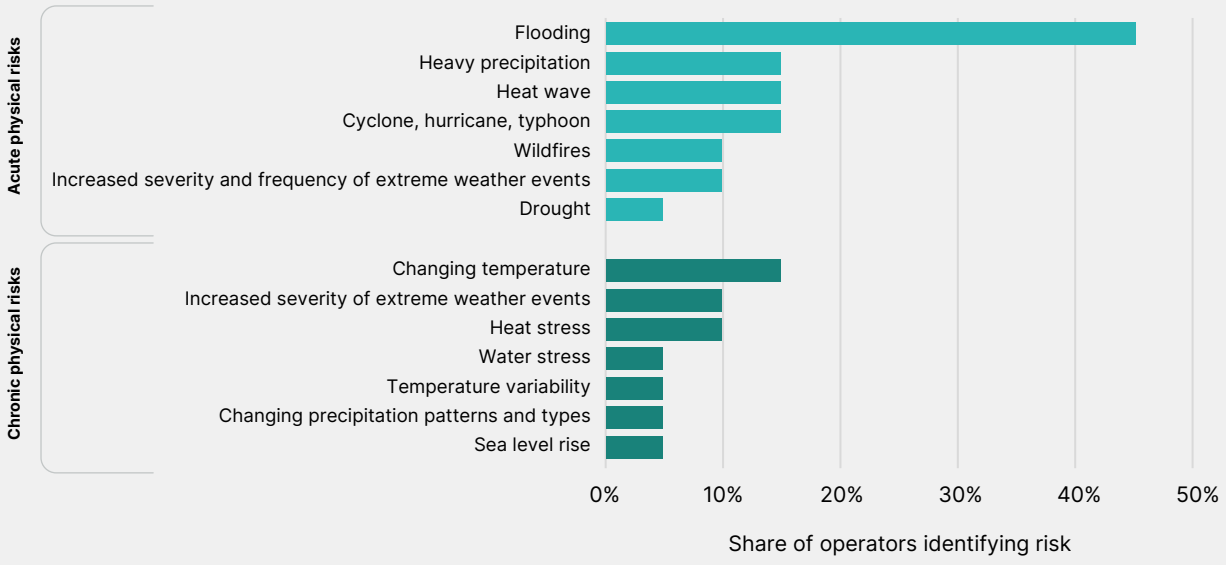
Case Study:
KDDI – Enhancing climate resilience in Japan: KDDI's strategies and contributions

This makes it increasingly important for operators to improve how they assess, report and respond to climate risk. By identifying vulnerabilities, quantifying financial impacts and consolidating best practice in resilience planning, the industry can support smarter investment, improve climate-related disclosures and build stronger networks that are better prepared for a changing climate.

Many operators in the Asia Pacific region have already undertaken short- or long-term climate change risk and opportunity analysis. 20 operators (95%) disclosing to CDP in 2025 identified at least one climate-related risk in their direct operations or value chains. The types of risks varied significantly between operators due to location-specific risks (**Figure 11**), with flooding most frequently identified as an acute physical risk by operators in the region.

Case Study:
Axiata Group – Efforts to strengthen climate resilience of networks

Figure 11 Physical risks identified by Asia Pacific operators in CDP disclosures, 2025



Flooding was most frequently identified as an acute physical risk, while changing temperature was the most frequently identified chronic physical risk.

Note: Share of operators based on 20 operators that identified at least one climate-related physical risk in their Asia Pacific markets.

Source: GSMA analysis of CDP disclosures.

24 Acute climate risks are short-term, event-driven physical hazards (e.g. floods, cyclones, wildfires), while chronic climate risks are longer-term shifts in climate patterns (e.g. temperature rise, sea level rise).

Leading operators are using Climate Transition Plans to implement their net zero strategy and deliver a whole-of-organisation transformation

Climate Transition Plans (CTPs) are essential for organisations to implement their net zero targets. They offer a clear blueprint for strategic delivery and coordinated action across a company. This ensures that senior leaders and teams in all business functions are synchronised in their efforts to meet climate targets.

By disclosing ambitions and actions across three core areas, a CTP articulates how the organisation is decarbonising, how it is responding to climate-related risks and opportunities and how it is contributing to an economy-wide transition.

This information is also valuable for customers, policymakers and investors who are interested in understanding how services, critical infrastructure and investments will adapt as the economy transitions to net zero. Importantly, a CTP can also provide internal stakeholders and investors with the information they need to finance the transition.

Disclosure of a CTP is required under the International Sustainability Standards Board (ISSB)'s IFRS S2 and the new SBTi Corporate Net zero Standard V2, and is becoming part of mandatory sustainability-related financial disclosures around the world.[25] Stock exchanges and security regulators in several Asia Pacific markets are increasingly requiring large, listed companies to disclose climate transition plans, including in Australia, Japan, Malaysia and Singapore.

Aligned with guidance from the Transition Planning Taskforce (TPT), several operators have published a stand-alone transition plan. Existing transition plans vary in their scope and completeness. In 2025, the GSMA published *Climate Transition Planning Guidance for Telecommunication Companies*[26] to provide a complementary, telco-specific interpretation of the TPT Disclosure Framework to harmonise mobile operators' approach to transition planning.

As of July 2026, 15 operators[27] globally have committed to publishing their next CTP in alignment with the GSMA guidance, including three from Asia Pacific: Globe Telecom, Singtel and True.

25 International Transition Plan Network. (2026). *Global Transition Plan Requirements – Interactive Map*.
26 GSMA. (2025). *Climate Transition Planning Guidance for Telecommunication Companies*.
27 For the latest list of committed MNOs, see *Climate Transition Planning Guidance for Telecommunication Companies*.

Mobile and digital technologies can enhance resilience to growing climate impacts

Mobile and digital technologies hold enormous potential to help people and businesses become more climate resilient – to better anticipate and prepare for natural disasters, limit damage during disasters and accelerate response and recovery.

For example, satellite data and geographic information systems (GIS) can aid in hazard mapping and assessing damage after disasters have occurred. In the event of a disaster, mobile text alerts can help communicate emergency information to populations quickly and effectively. Virtual and mixed reality can also play an important role in visualising climate impacts and promoting adaptation strategies. AI and the Internet of Things (IoT) can improve the ability to predict disasters and provide early warnings to populations. Early warning systems save lives, and just 24 hours' notice of an impending hazardous event can cut the ensuing damage by 30%.[28]

In 2022, the United Nations Secretary-General launched the Early Warnings for All (EW4All) Initiative to ensure that everyone in the world is protected by an early warning system. The mobile industry has played a crucial role in the development and implementation of early warning systems for decades.

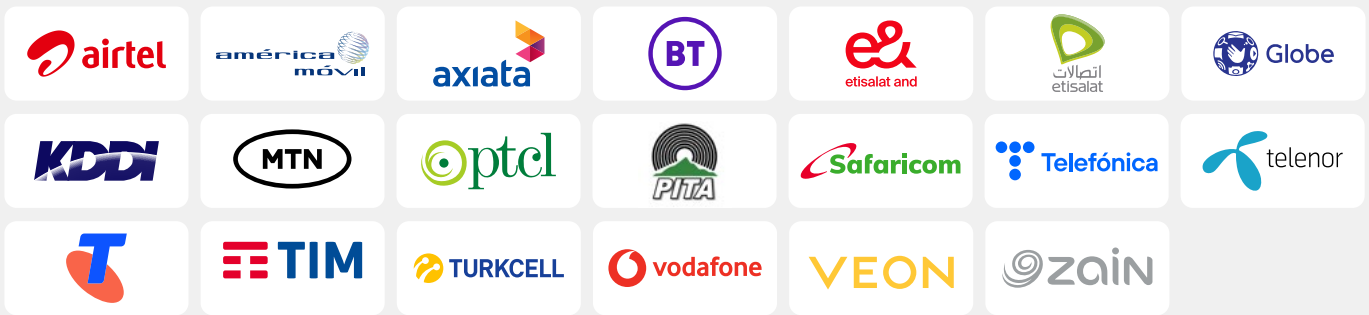
The GSMA is playing a leading role[29] in the initiative by profiling industry leadership, hosting multistakeholder convenings, providing technical assistance to members and publishing demand-driven research.

An example of technical assistance is recent work in the Pacific Islands region to support a regional partnership model with MNOs, governments and other stakeholders to advance scalable, mobile-based early warning systems, including assessing cell broadcast (CB) readiness and strengthening cross-country coordination.

As part of this work, the GSMA supported the Solomon Islands to conduct the first live CB test in the Pacific. Using this as a blueprint, the GSMA, along with partners, is now supporting more countries to implement CB across the region.[30] GSMA research includes a series of case studies[31] on the role of MNOs in early warning systems and guidance[32] on how to make risk alerts inclusive for all.

In support of the EW4All Initiative and to demonstrate the vital role of the mobile industry, the GSMA and International Telecommunication Union (ITU) announced an Industry Pledge at COP28. All MNOs are encouraged to join the pledge to leverage and promote the lifesaving power of mobile networks.

Figure 12 Mobile Industry Pledge: Early Warnings for All



The mobile industry has long-standing experience in the development and implementation of early warning systems and is committed to the goal of the EW4All Initiative for everyone to be protected by 2027.

Source: GSMA. (2026). Mobile-Enabled Early Warning Systems.

28 Brown, K. (30 October 2024). "Saving lives through Mobile-based Early Warning Systems". GSMA Mobile for Development Blog.
29 GSMA. (2024). Mobile-Enabled Early Warning Systems: The GSMA and the Early Warnings for All Initiative.
30 Tillekeratne, D. and Pearlstone, E. (24 May 2026). "Advancing Mobile Early Warnings at Scale: A regional partnership model for the Pacific Islands". GSMA Mobile for Development Blog.
31 GSMA. (2026). Japan's Early Warning System: The Role of Mobile Network Operators; GSMA. (2026). France's FR-Alert: The Role of Mobile Network Operators in Early Warning Systems; GSMA. (2025). Chile's Emergency Alert System: The Role of MNOs in Early Warning Systems.
32 GSMA. (2025). Making Early Warnings Work for All: People Centred Design.

06

Recommendations to accelerate progress

Achieving the mobile industry's goal of net zero emissions by 2050 while enhancing climate resilience requires strong and concerted action from operators and suppliers, supported by enabling policies and investment from governments.

Recommended actions

Transitioning the entire mobile industry to net zero emissions by 2050 requires concerted effort and action by all stakeholders.

For **mobile network operators**, setting climate targets and developing climate transition plans are key building blocks to secure buy-in across the company and drive coordinated action.

Reducing operational emissions requires action on two main levers: energy efficiency and renewable energy. Operators need governments to implement enabling energy policies and regulations, particularly to support access to renewable energy and grid decarbonisation.

With suppliers responsible for the majority of the industry's overall emissions, operators also require action from suppliers to decarbonise value chains and increase circularity of devices and equipment.

For **suppliers**, including network equipment and device manufacturers, priority actions include setting climate targets, developing more energy efficient and circular equipment and devices, and decarbonising their supply chains. For tower companies, a key action is to reduce diesel consumption by increasing the use of on-site solar and batteries and grid electricity.

Governments can play a key enabling role on climate action for the industry, particularly on renewable energy and decarbonising electricity systems. This includes implementing renewable energy procurement and aggregation mechanisms for distributed telecom loads and streamlining permitting for renewable energy and grid projects.

Case Study:
MCMC – Enabling sustainability across Malaysia's mobile sector

Case Study:
Asia-Pacific Governments – Enabling renewable energy access for mobile operators

Table 3 outlines key recommended actions to enhance climate resilience and accelerate the industry's progress towards net zero. The highest priority recommendations are indicated in bold.

Table 3 Key recommendations

Area of action	Operators	Suppliers	Governments
Climate disclosure	Assess and publicly disclose energy and emissions data and climate risks and opportunities. Calculate Scope 3 emissions using supplier-specific and/or product-specific emission factors where possible.	Assess and disclose carbon emissions and climate risks and opportunities. Publish life-cycle assessments (LCAs) or product carbon footprints of devices and equipment. Towercos: disclose energy and emissions data to support MNO emissions disclosures.	Consult with operators to harmonise and streamline reporting of key energy and emission indicators aligned with national frameworks and IFRS S2. Support harmonised emissions accounting methodologies and reporting boundaries for shared and leased infrastructure, including between MNOs and tower companies.
Climate targets and strategy	**Set science-based and net zero targets aligned with the 1.5°C pathway under the SBTi ICT Sector Guidance.**[33] **Develop a climate transition plan aligned with the GSMA's Climate Transition Planning Guidance for Telecommunication Companies.**[34]	**Set science-based and net zero targets aligned with a 1.5°C pathway.** Develop a climate transition plan that clearly outlines the ambitions, actions and accountability needed to meet climate targets.	**Commit to net zero emissions by 2050 at the latest, strengthen nationally determined contributions (NDCs) and implement climate, energy and industrial policies to achieve these targets.** Support the private sector in their decarbonisation efforts, including through policies and incentives.
Energy efficiency and electrification	**Optimise the energy use of networks by adopting energy-efficient hardware, software and best practices.** Retire 2G/3G and copper-based legacy networks where possible. Electrify fleet vehicles.	**Develop more energy-efficient equipment, devices and systems.** Develop improved energy reporting metrics at the equipment level.	**Expand grid infrastructure in off-grid and weak-grid areas in low- and middle-income countries (LMICs) to reduce reliance on diesel generators.** Support the retirement of 2G/3G and copper-based legacy networks in consultation with industry.
Clean energy	**Purchase and use clean and renewable energy.** **Assess and invest in on-site renewables and/or battery storage to reduce operating costs and emissions while increasing resilience.**	**Purchase and use clean and renewable energy in operations.** **Tower companies: switch from diesel generators to solar and batteries.** Advocate for energy policies and regulations that support renewable energy access.	**Enable renewable energy procurement and aggregation mechanisms for distributed telecom loads**. **Implement policies that support power sector decarbonisation**, including streamlining renewable energy and grid permitting, removing fossil fuel subsidies, and accelerating coal phase-outs.
Supply chain and circularity	Engage suppliers on climate action and integrate climate requirements into procurement. Develop circular economy initiatives and offers across all products and services, including refurbished devices and equipment and repair services.	Incorporate circularity principles in design and support, including longer software support and access to spare parts. **Encourage suppliers to use renewable energy and recycled materials.**	**Develop circular economy and extended producer responsibility frameworks** that promote take-back, repair, reuse, refurbishment, and responsible recycling of devices and equipment. Implement ecodesign and right-to-repair regulations.
Adaptation and resilience	Integrate climate risk assessment in network planning, investment and technology deployment decisions. Deploy clean backup power solutions (e.g. solar, batteries). Disclose physical climate risks and opportunities.	Design equipment for greater operational resilience. Provide climate scenario specifications for equipment to support resilience planning. Disclose physical climate risks aligned with the Taskforce on Climate-related Financial Disclosures (TCFD) and the International Sustainability Standards Board (ISSB).	Recognise mobile networks as critical infrastructure in climate adaptation planning and establish emergency operating protocols. Facilitate cross-sector collaboration to address interdependencies during climate-related disasters. Work with operators to finance and develop early warning systems.

Note: Highest priority actions are in bold.

33 SBTi. (2020). *Guidance for ICT Companies Setting Science Based Targets*.
34 GSMA. (2025). *Climate Transition Planning Guidance for Telecommunication Companies*.

GSMA Head Office
1 Angel Lane
London
EC4R 3AB
United Kingdom