GSMA Intelligence

Mobile investment gaps

Pacific Islands

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A significant investment gap ahead

Mobile connectivity underpins the digital transformation that can drive economic development and social progress. The Pacific Islands region has experienced significant growth in mobile internet connectivity levels in recent years. Between 2015 and 2024, the number of individuals with access to 3G+ mobile internet connectivity increased threefold. Despite this, more than half the region's population remains unconnected.

The mobile internet usage gap represents the biggest challenge. This refers to those not using the mobile internet despite living in areas with coverage. By 2024, almost 50% of the total population in the Pacific Islands remained unconnected despite living within the footprint of a 3G+ network.

5G is in its infancy in the region, with coverage at less than 2% of the population and 5G accounting for less than 1% of total mobile connections as of the end of 2024. The upgrade of mobile technology and transition process pose both challenges and opportunities for the region.

Mobile operators will continue to improve mobile connectivity. However, under current market conditions, this progress will be limited and will likely fall significantly short of desired targets. Without additional support or intervention, a substantial investment gap will remain by 2030.

- **4G coverage gap** – By 2030, 4G coverage in the Pacific Islands is expected to increase by an additional 14 percentage points (pp), reaching 96% of the adult population. However, achieving 99% 4G coverage will require an additional $250 million in funding. To provide universal coverage (from 99% to 100%), incremental investment of $800 million will be necessary. Due to the high costs involved in achieving full coverage, alternative technological solutions will likely be required.
- **4G usage gap** – Under current market conditions, 4G adoption is forecast to increase by almost 18 pp, reaching 41% by 2030. However, more than half the population in the Pacific islands will remain unconnected. Achieving universal 4G connectivity by 2030 would require adding 6 million users and securing an additional $1.5 billion in funding.
- **5G investment to enable digital transformation** – There is a risk of significant delays to 5G deployment across many markets in the region. By 2030, 5G population coverage is forecast to barely exceed 30%, with adoption at around 15%. Achieving 50–90% 5G population coverage is necessary to support digital transformation across the Pacific Islands. The investment required ranges from $80 million to $320 million, depending on the coverage scenario.

Note: For the purposes of this report, 3G+ mobile internet is defined as any activity that consumes mobile data (i.e. excluding SMS, MMS and cellular voice calls). A person is considered connected when they have access to 3G or above mobile internet connectivity. 4G+ is defined as 4G or above (5G) mobile internet connectivity. 4G+ mobile internet meets the technical standards of 'meaningful connectivity' set by the ITU to unlock the potential of digital transformation offered by IoT use cases, big data, AI and AR/VR.

Policy enablers

To unlock the full potential of connectivity in the Pacific Islands, the following policy enablers can serve as effective levers:

- **Incentivising investment and efficient network use** – Without further investment, mobile network capacity will soon be constrained, as total mobile data traffic will increase fivefold by 2030. However, limited revenue disincentivises new deployments as it weakens return on investment (RoI). Government policies need to prioritise sustainable infrastructure investment and dialogue among stakeholders to identify mechanisms to promote efficient network use, reduce costs and improve RoI for future networks.
- **Affordability, adoption and digital trust** – Several barriers prevent the adoption and use of mobile internet (e.g. lack of digital skills, affordability, safety and security concerns, and lack of relevant content in the local language). Furthermore, there remain structural inequalities, such as differences in income/education, and social norms which translate into disparities in adoption and use. Policy reform must focus on: creating opportunities for participation and inclusion while preserving trust in the digital world; modernising the fiscal framework to reduce affordability barriers; and rethinking universal service fund (USF) frameworks to reach universal adoption.
- **The role of alternative technologies** – By 2030, the coverage gap is forecast to be 4% in the Pacific Islands. Advancements in satellite backhaul capacity and direct-to-device (D2D) connectivity will play a crucial role in addressing this gap. There is significant enthusiasm for driving technology forward, but alternative solutions help close the coverage gap – not the (much larger) usage gap. Furthermore, implementing such services will require care to ensure that their operation does not cause interference with terrestrial mobile networks.
- **Spectrum management best practices** – Effective spectrum licensing is critical to encourage investment and ensure access to sufficient spectrum resources for mobile networks. Spectrum pricing that takes market conditions into account can drive cost-efficient network deployment, help reduce the usage gap and support digital inclusion.

Key numbers

50%
of the adult population

As of 2024, almost 4 million people (50%) in the Pacific Islands were not connected despite living within the footprint of a 3G+ network. The gap increases to almost 60% for 4G+ services.

$1.8
billion

Closing the 4G coverage gap requires additional funding of $250 million. Bridging the 4G usage gap requires $1.5 billion of additional funding.

<1%
of 5G connections

By the end of 2024, less than 1% of mobile connections were 5G, with coverage reaching less than 2% of the population

$80–320
million

Achieving 50–90% 5G coverage will require investment of $80–320 million to unlock the full potential of digital transformation.

Source Source

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The Pacific Islands and its digital nations journey

The widespread adoption of mobile technology around the world over the last two decades has amplified the impact of digital technologies on economic growth and development. Mobile has helped democratise access to digital services and enabled the creation of new industries, while enhancing efficiency and productivity in existing ones. Mobile connectivity and digital technologies are increasingly shifting from platforms in order to access services to the foundation upon which economies are built.

The Pacific Islands region is unique in the specific challenges it faces to achieve comprehensive digital connectivity. Factors such as geographical isolation, vulnerability to natural disasters, limited resources and lack of market scale are among the challenges faced by the Pacific Islands in developing network infrastructure.

The region's long-term development plan (2050 Strategy for the Blue Pacific Continent) highlights technology and connectivity as key drivers for resilience, peace and prosperity. Similarly, the Lagatoi Declaration on Digital Transformation of the Pacific, endorsed by Pacific ICT ministers in 2023, emphasises regional cooperation to create an enabling environment to support and harmonise efforts for digital transformation and to achieve inclusive, accessible, secure and affordable ICT infrastructure and services.

A digital nation has digitalisation at the heart of nation building (see **Digital Nations in Asia Pacific: preserving digital trust**). This requires coordinated efforts across five key components – infrastructure, innovation, data governance, security and people. Strengthening investment in digital infrastructure is a key first step to realising the digital nation aspirations of governments in the Pacific Islands.

Objectives of this study and key research areas

Infrastructure is the bedrock of a digital nation and the foundation upon which other services and applications are built. The pace of transition to a digital nation correlates directly with available digital infrastructure. It is therefore imperative that the right policies are in place to attract investment in the development of digital infrastructure.

This study assesses the mobile investment gap in the Pacific Islands. It outlines policy recommendations and strategic industry actions to help support the region's digital ambitions.

Specifically, the study:

- assesses the state of mobile internet connectivity in the Pacific Islands
- quantifies the mobile investment gap required to achieve policy goals of inclusive connectivity for all
- outlines policy enablers and recommendations to address the mobile investment gap.

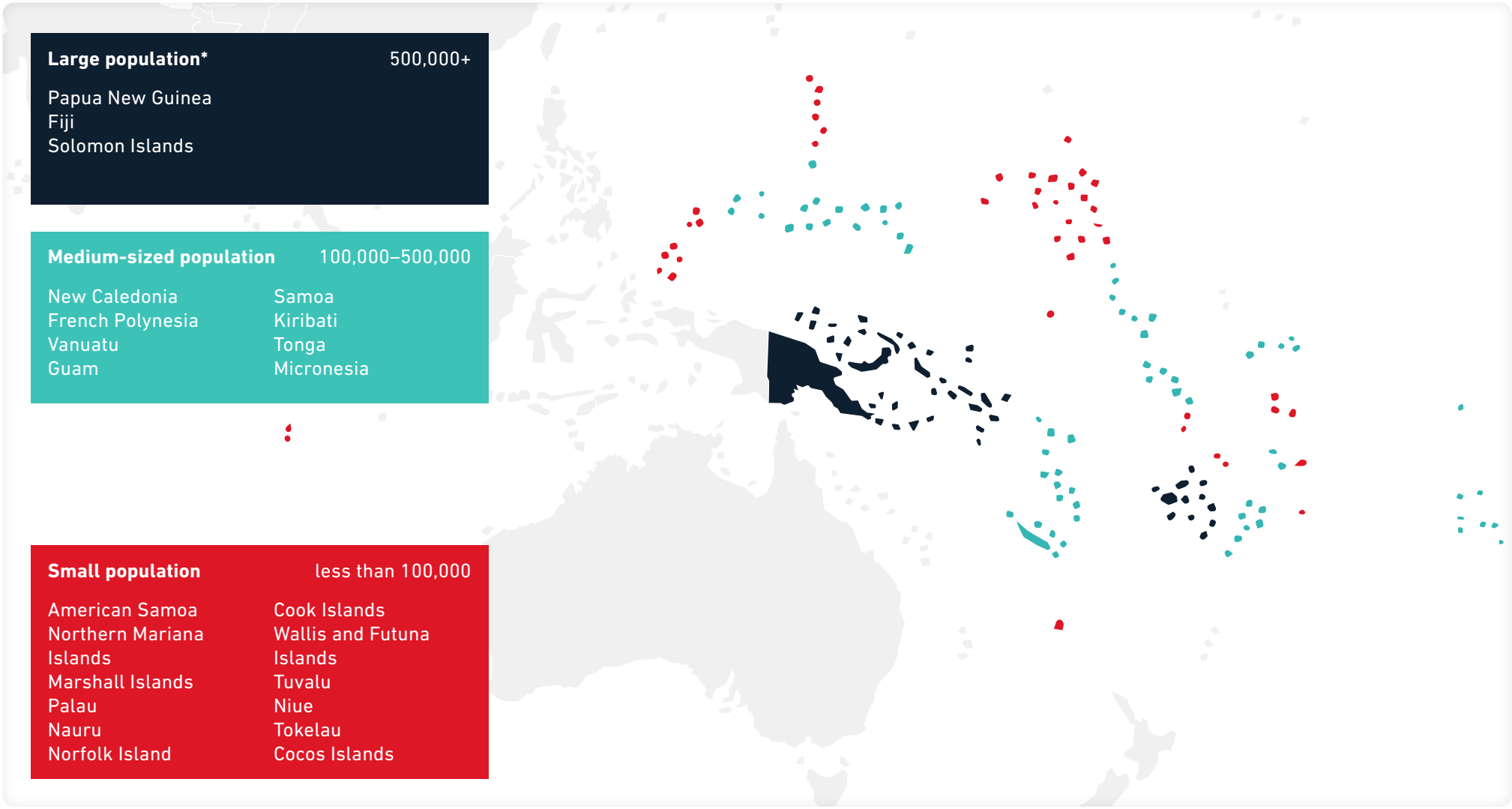
Overview of the Pacific Islands

This study includes 23 markets:

- **Australasia:** Norfolk Island and Cocos Islands (Australia and New Zealand are not included in this study)
- **Melanesia:** Papua New Guinea, Fiji, New Caledonia, Vanuatu and Solomon Islands
- **Micronesia:** Guam, Kiribati, Northern Mariana Islands, Marshall Islands, Micronesia, Palau and Nauru
- **Polynesia:** French Polynesia, Samoa, Tonga, American Samoa, Cook Islands, Wallis and Futuna Islands, Tuvalu, Niue and Tokelau.

Papua New Guinea has a major influence on aggregate results as it accounts for 75% (10.6 million) of the total population in the Pacific Islands (14.3 million).

The Pacific Islands by population size



Note: Papua New Guinea, Fiji and Solomons Islands are assessed individually due their market size

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Why mobile internet matters

- Connectivity is fundamental to work, education, communication and access to essential services. Mobile has become the primary means of online access, enabling more people than ever before to participate in the digital economy. However, significant barriers remain, preventing many from fully benefiting from digital connectivity. Without concerted efforts to close the connectivity gap, the underserved are at risk of being left behind in an increasingly digital world.
- The economic impact of mobile connectivity is well documented. Studies show that a 10% increase in mobile broadband penetration can boost GDP by 1.0–2.5%. While developed countries have experienced the largest absolute benefits, developing economies have gained the most in relative terms. Mobile connectivity currently contributes around $2 billion to GDP in the Pacific Islands (3.7% of total GDP). That figure is expected to grow to around 30% by 2030.*
- The ongoing digital transformation of industries – powered by advancements such as 5G, IoT, big data, artificial intelligence (AI), augmented and virtual reality (AR/VR) – can unlock a new wave of productivity that can help trigger economic development in the region.
- Expanding mobile connectivity has become a priority given its socioeconomic benefits. It plays a crucial role in expanding access to essential services such as healthcare, education, e-commerce and financial services while creating new economic opportunities. Governments must prioritise mobile broadband expansion to drive inclusive growth and improve living standards.

The underserved are at risk of being left behind in an increasingly digital world.

*Sources: Economic Impact of Broadband, Digitisation and ICT Regulation, ITU, 2018. Mobile Technology and Economic Growth, GSMA, 2020. The Mobile Economy Pacific Islands 2023, GSMA, 2023

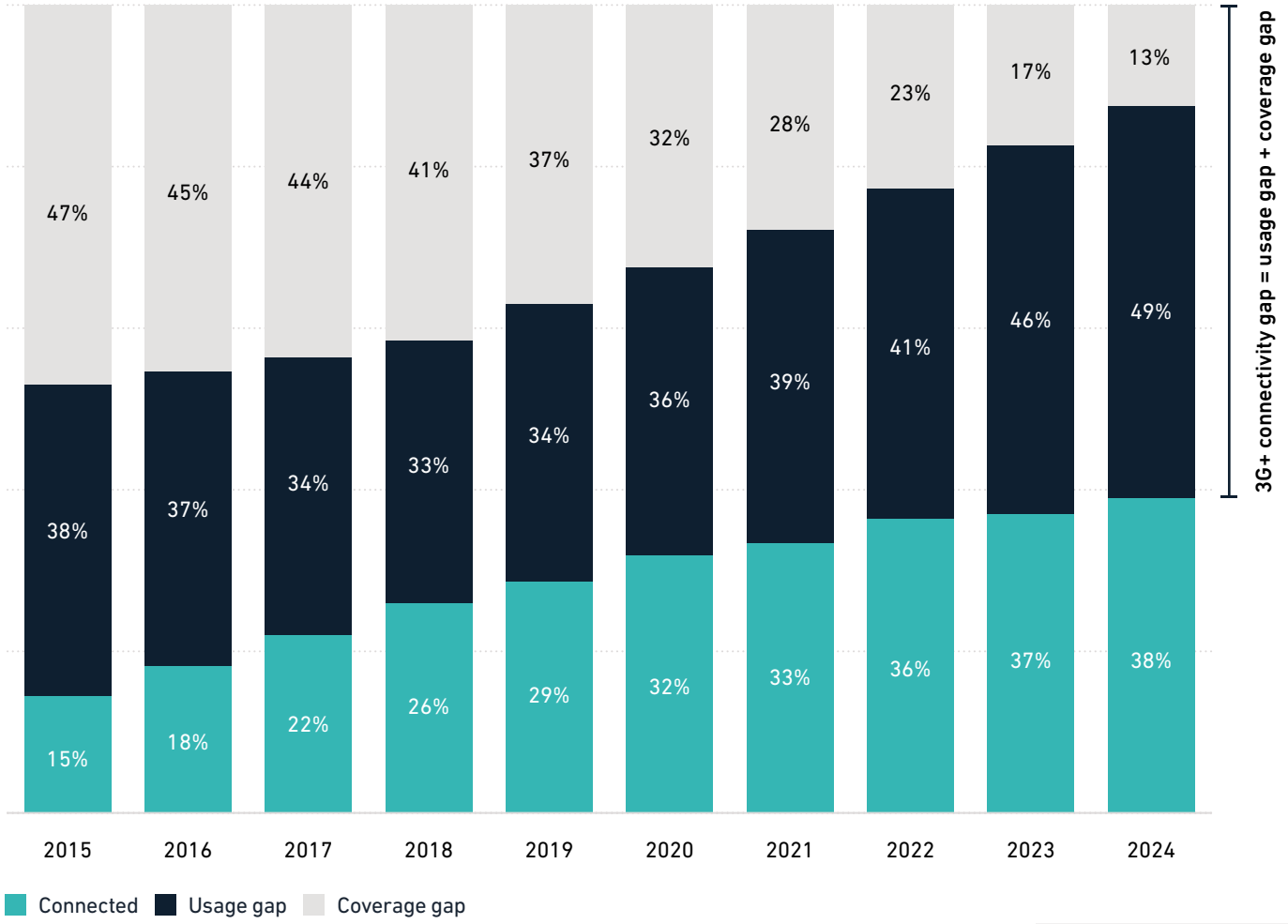
3G+ mobile internet adoption is still lagging, but the coverage gap has narrowed significantly

- 3G+ mobile internet connectivity in the Pacific Islands increased from nearly 1 million adults* connected in 2015 to more than 3.3 million in 2024.
- The 3G+ connectivity gap comprises:
  - **the coverage gap** – those living in areas where no mobile internet services are available
  - **the usage gap** – those living within the footprint of a mobile broadband network but not using mobile internet services.
- The coverage gap reduced from 47% in 2015 to 13% in 2024 (1.1 million).
- As of 2024, more than 4 million – 49% of the total adult population – were not connected despite having coverage (the usage gap). This compares to an average of 25% in Asia Pacific. However, it should be noted that regional average figures mask variation between the different islands.

*18+ years old

State of 3G+ mobile internet in the Pacific Islands

Percentage of adult population



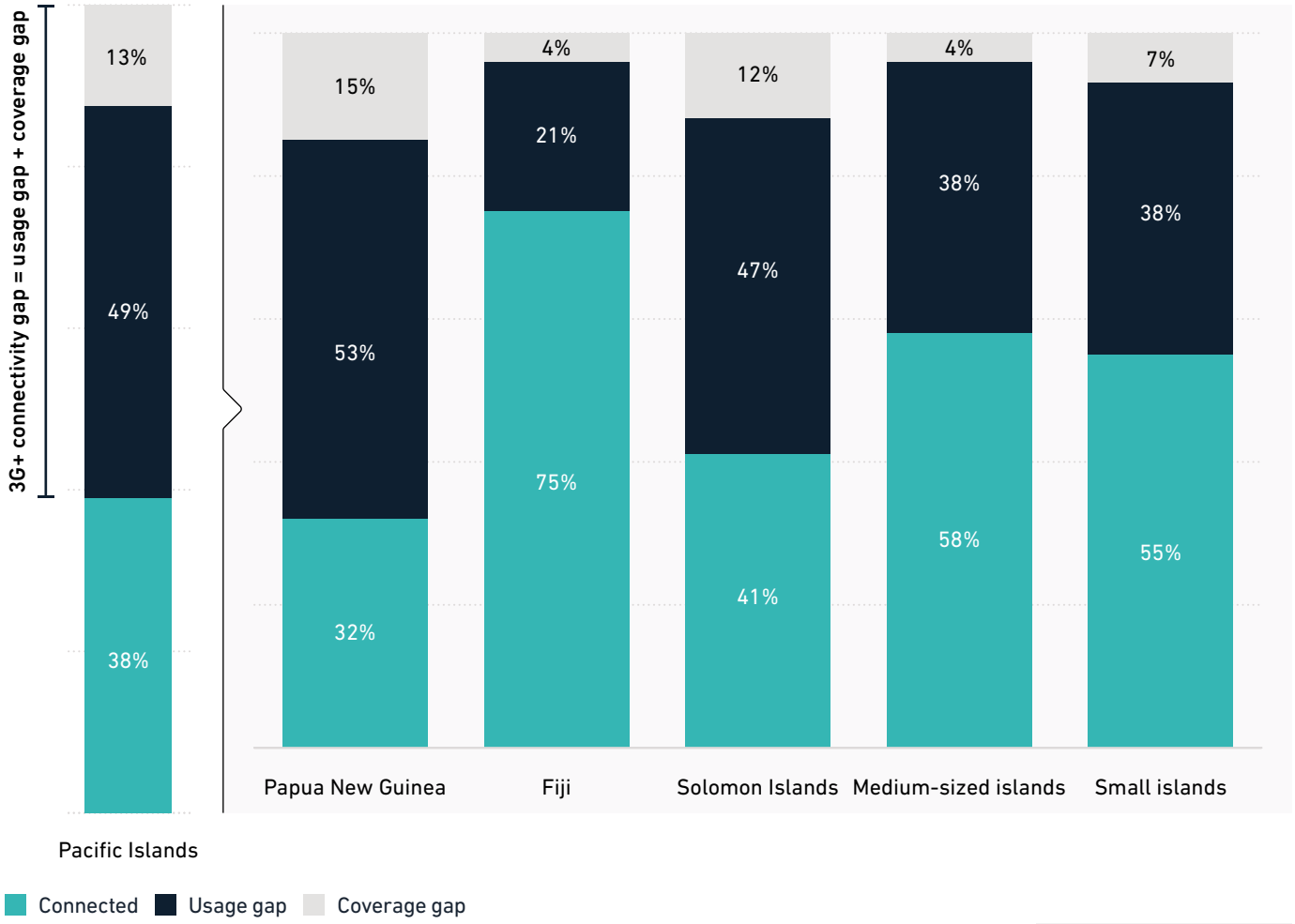
Source GSMA Intelligence

The 3G+ connectivity gap varies by country

- There is a significant disparity in the 3G+ connectivity gap between Fiji and the rest of the region.
- The usage gap is the main challenge in the Pacific Islands. With the exception of Fiji, 35–55% of the population are unconnected despite having coverage.
- 80% of the regional usage gap is due to the unconnected in Papua New Guinea (around 3.4 million), with almost 800,000 from the remaining islands.
- The coverage gap remains a challenge for Papua New Guinea and Solomon Islands. Small and medium-sized islands and Fiji perform better than the regional average in this regard.

State of 3G+ mobile internet in the Pacific Islands

Percentage of adult population, 2024



*18+ years old

Source GSMA Intelligence

4G+ mobile internet offers the potential for digital transformation

- 4G+ mobile internet connectivity meets the technical requirements for unlocking the potential of digital transformation offered by IoT use cases, big data, AI and AR/VR.
- 4G+ mobile internet meets the standards of 'meaningful connectivity' set by the ITU. This is defined as the level of connectivity that allows users to have a safe, satisfying, enriching and productive online experience. According to the ITU's standards, this means reaching a median download speed target of at least 10 Mbps.*
- 4G+ mobile internet can offer the speeds required for low-latency use cases such as those for healthcare or smart cities, as well as data-intensive applications such as HD/4K video, gaming and live streaming.

4G+ mobile internet meets the standards of 'meaningful connectivity'

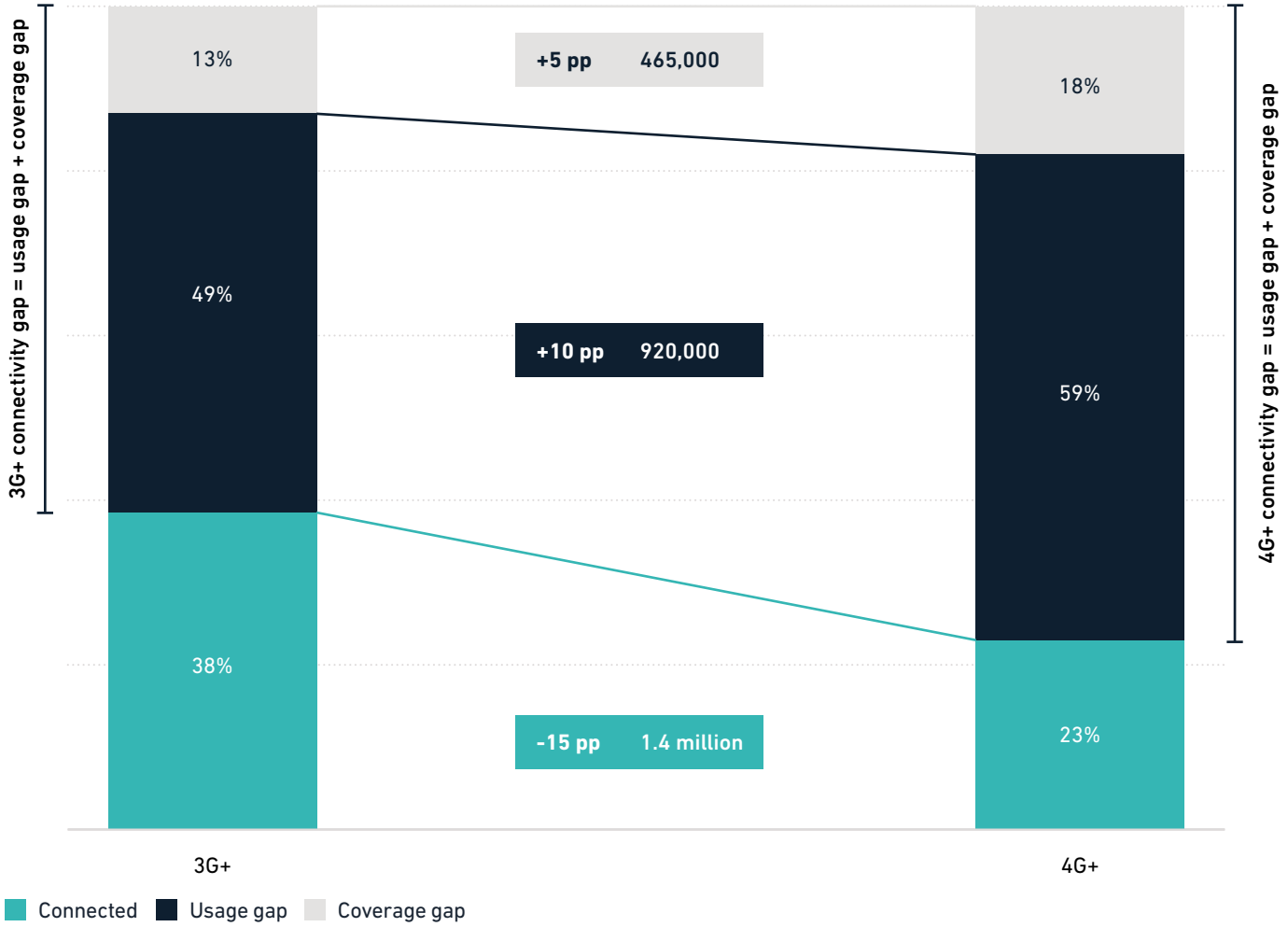
* Achieving universal and meaningful digital connectivity: Setting a baseline and targets for 2030, United Nations, 2022

The connectivity gap increases for 4G+ mobile internet

- For 4G+ mobile internet, the coverage gap increases by 5 pp compared to 3G+. This equates to 1.5 million people living outside the footprint of 4G+ services.
- In 2024, nearly 5 million people were not using 4G+ mobile internet despite living within coverage. This usage gap of 59% affects over 900,000 additional people versus 3G+.
- The 4G+ usage gap for the Pacific Islands (59%) is almost double that for Asia Pacific (28%).
- However, the regional average masks variation among the different Pacific Islands.

3G+ versus 4G+ mobile internet in the Pacific Islands

Percentage of adult population, 2024



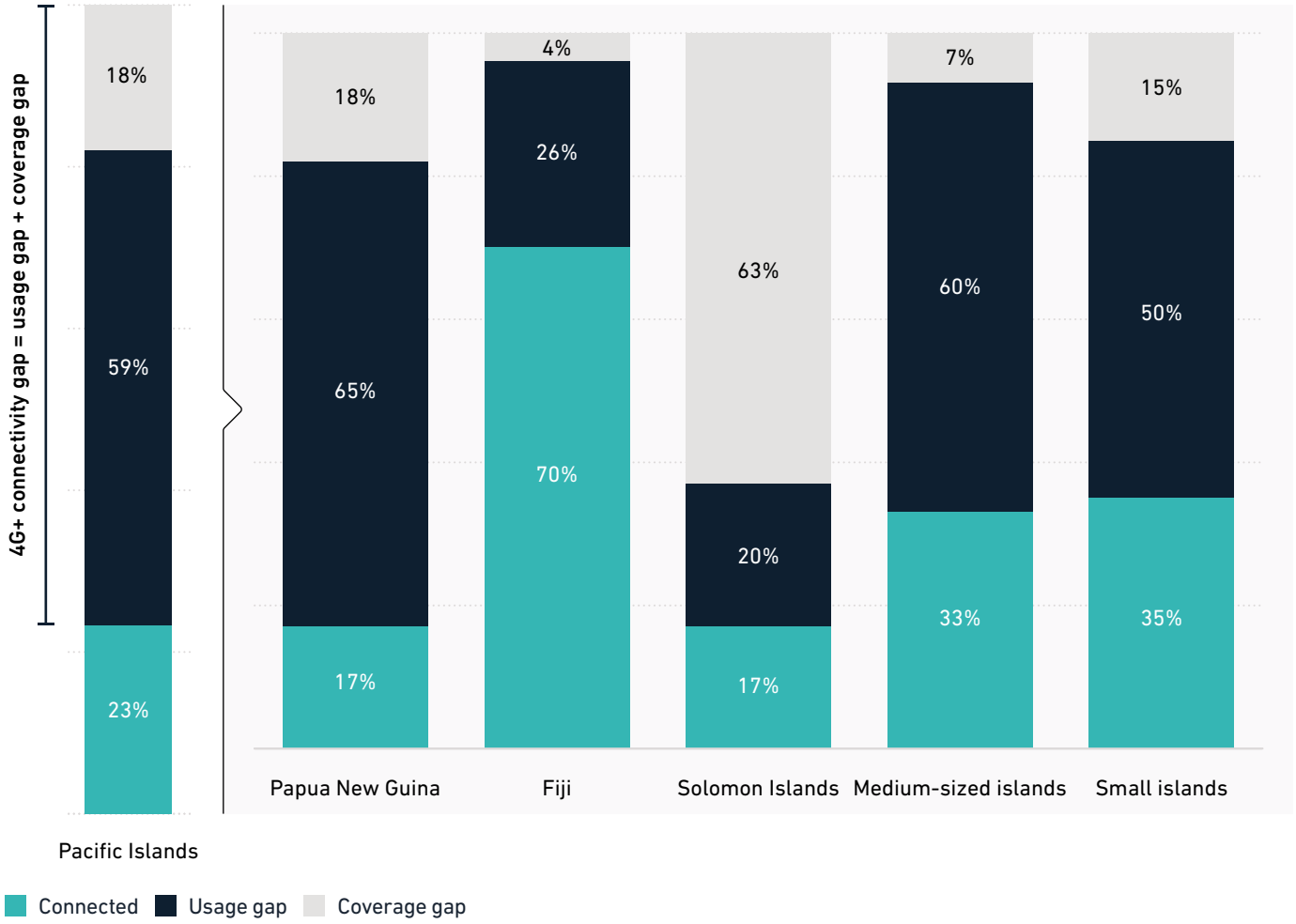
Source GSMA Intelligence

The usage gap increases significantly for 4G+

- Across the Pacific Islands, there is significant variation in the size of the 4G+ connectivity gap.
- The usage gap is the main challenge. Except for Fiji and the Solomon Islands, across the Pacific Islands more than 50% of the population remains unconnected despite having coverage.
- 75% of the regional usage gap is due to the unconnected in Papua New Guinea (around 4 million), but almost 1.3 million are from the remaining Pacific Islands.
- The coverage gap is the main challenge for the Solomon Islands, and to a lesser extent Papua New Guinea and small islands. Medium-sized islands and Fiji perform better than the regional average in this regard.

State of 4G+ mobile internet in the Pacific Islands

Percentage of adult population, 2024

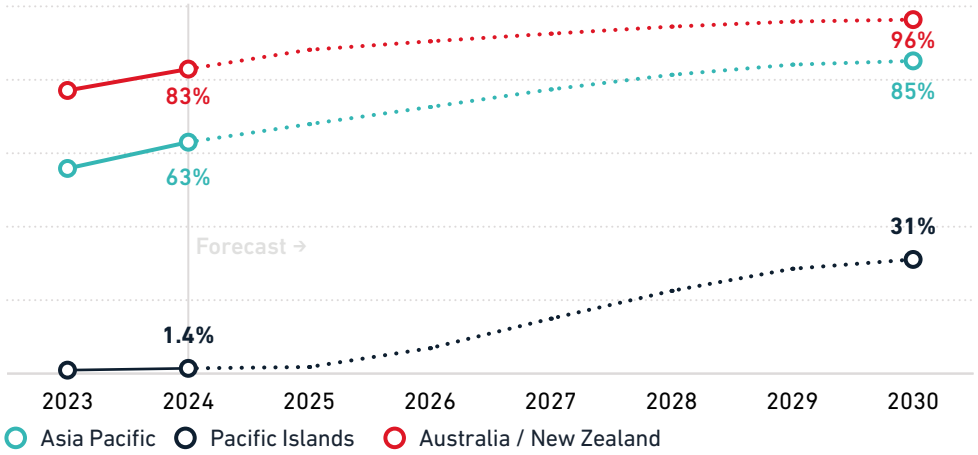


Source GSMA Intelligence

5G deployment in the region is in its infancy

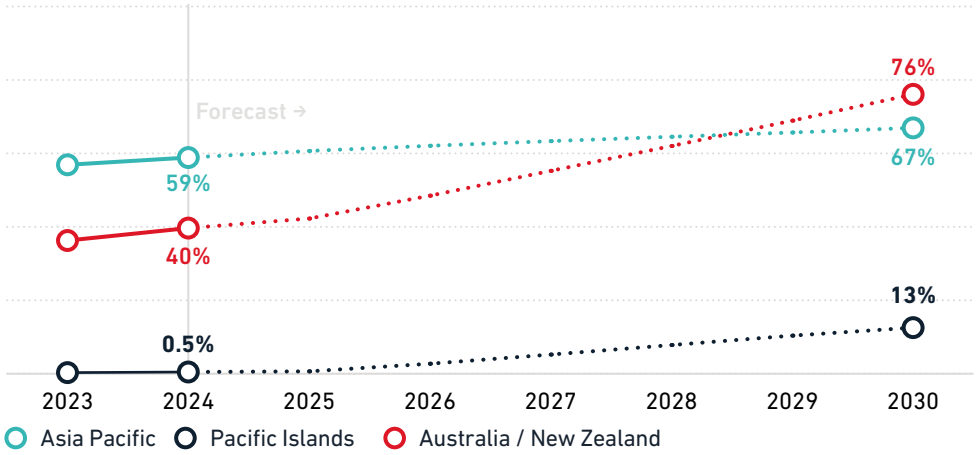
5G coverage

Percentage of adult population



5G adoption

Percentage of adult population



Only five markets in the Pacific Islands had launched 5G services by the end of 2024: Guam, Samoa, American Samoa, Northern Mariana Islands and Marshall Islands.

- **5G coverage** in the Pacific Islands is below 1.5% of the adult population, lagging far behind Asia Pacific and Australia/ New Zealand.
- **5G adoption** among the adult population is below 1%, while adoption in Australia/New Zealand is currently around 40% and almost 60% in Asia Pacific.

Not all markets in the Pacific Islands will be able to catch up by 2030, due to several factors affecting RoI:

- **Supply-side barriers** to deploying new infrastructure, such as scarcity of energy, macroeconomic instability and a shortage of foreign currency to buy network equipment.
- **Demand-side factors** weakening the adoption of service, such as a lack of affordable services and devices for low-income populations, a lack of relevant content, and low levels of digital trust among citizens.

The benefits of 5G will not materialise unless governments implement public policies aimed at closing the meaningful connectivity gap and improving operators' long-term business sustainability to spur investments in 5G deployment.

Source GSMA Intelligence

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Quantifying the investment gap

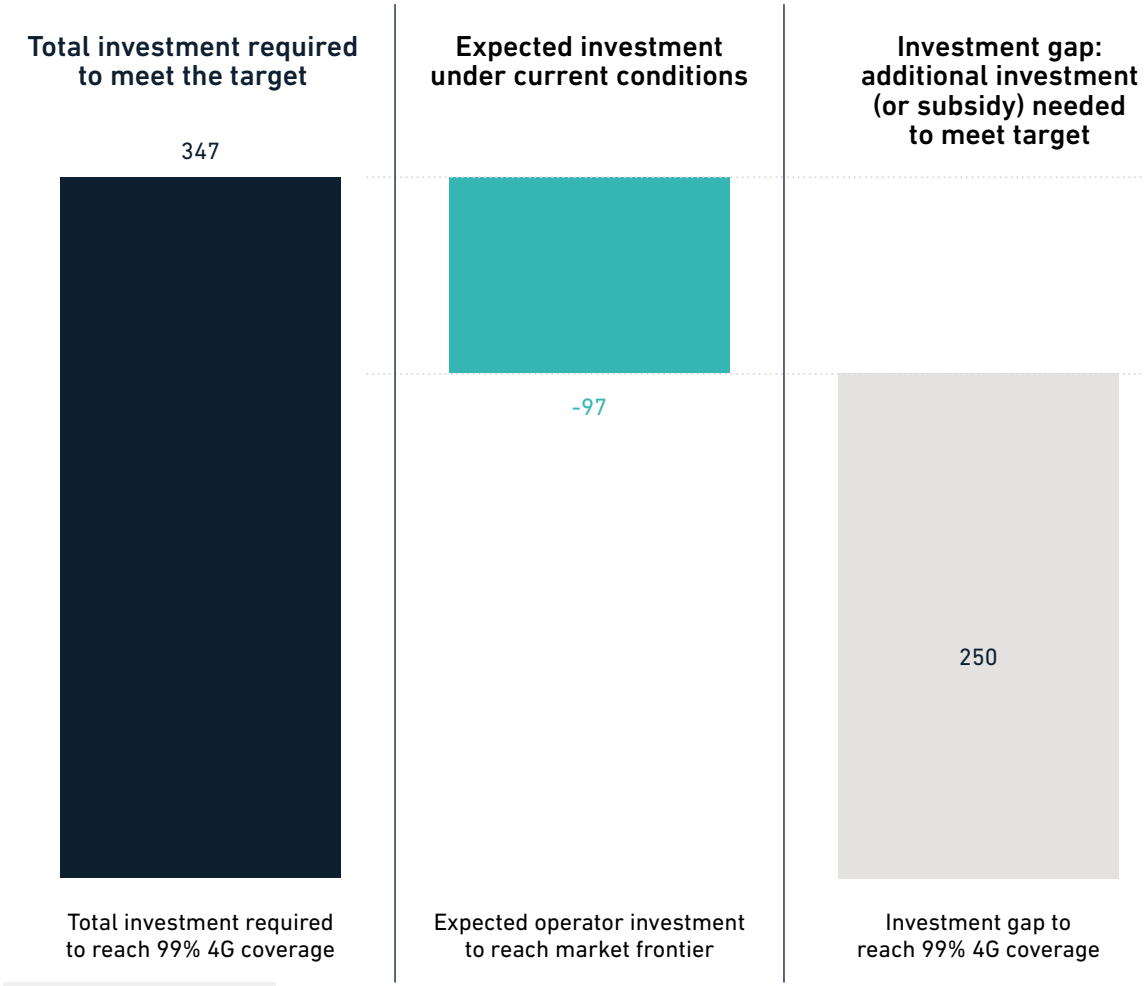
- Quantifying the **coverage gap** entails estimating the funding required to cover populations living in areas where 4G+ service is unavailable.
- Assessing the **usage gap** requires an estimate of the funding required to make the service affordable and improve digital skills in order to achieve universal 4G adoption.
- We considered the coverage and usage targets of global standards* and looked to answer the following questions:
  - How much needs to be invested to achieve the goals?
  - How much will the market deliver in its own right, based on current market conditions?
- The assessment is focused on the deployment and adoption of 4G by 2030, as it is widely expected to meet the minimum speed requirements for low-latency and data-intensive services.

*Achieving universal and meaningful digital connectivity in the decade of action: Aspirational targets for 2030, ITU, 2022. ITU and Connecting humanity: Assessing investment needs of connecting humanity to the Internet by 2030, ITU, 2020. Achieving universal and meaningful digital connectivity: Setting a baseline and targets for 2030, ITU, 2022.

4G coverage gap: the investment requirement and investment gap

4G coverage gap: investment requirement versus investment gap

$ million



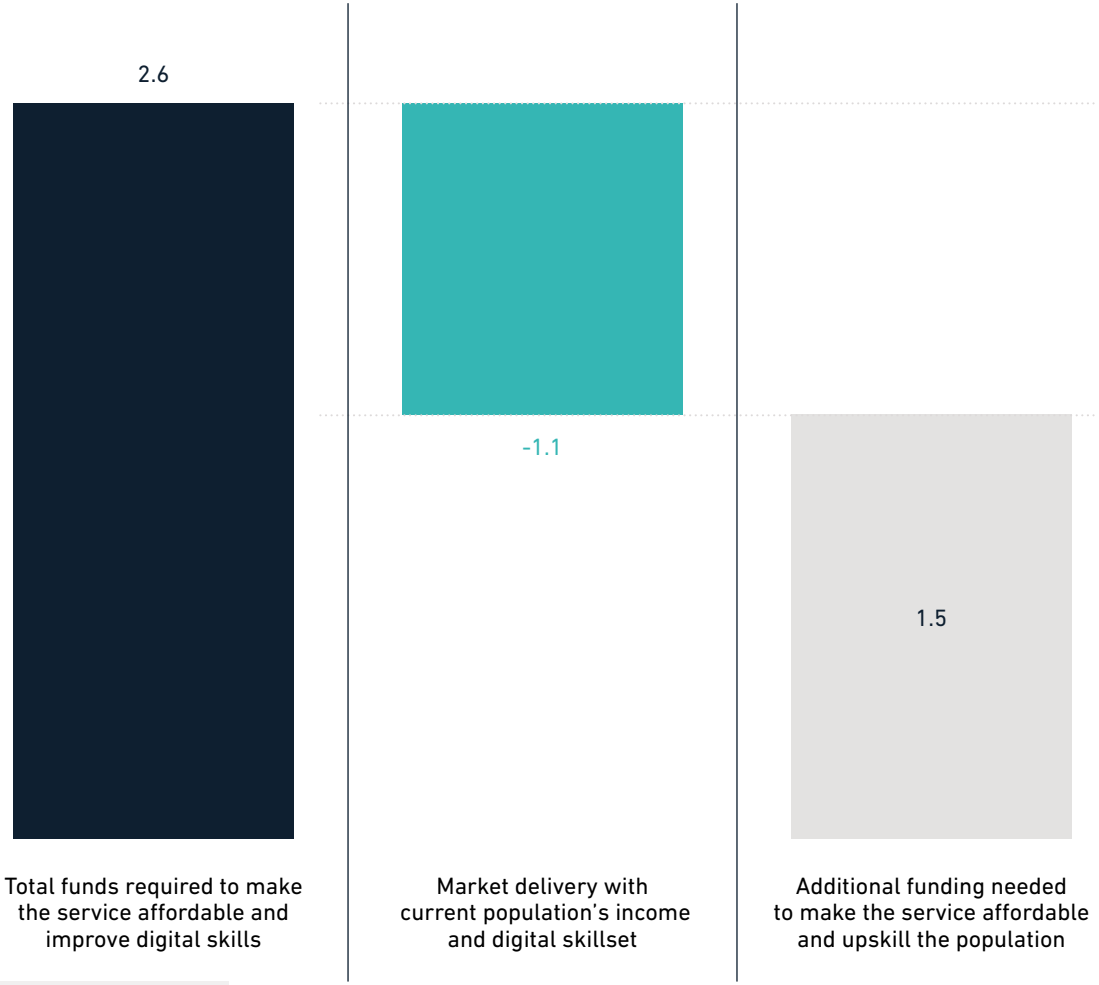
Source GSMA Intelligence

- It is important to distinguish between the investment requirement and the investment gap. This study estimates the investment gap, which necessitates analysis of the total investment required and the expected investment by mobile operators under current market conditions (the 'market frontier').
- The total investment required to reach 99% coverage from the current situation is $347 million.
- Under current market conditions, it is commercially viable to reach 96% 4G coverage (market frontier), which leads to expected investment of $97 million.
- There is a $250 million investment gap to reach 99% coverage. This implies $750 per additional person covered (around 330,000 additional people).
- Reaching universal coverage (connecting the last 100,000 to move from 99% to 100%) requires additional investment of $800 million ($8,000 per new person covered). Given the high costs, alternative technologies will be required.

4G usage gap: the investment requirement and investment gap

4G usage gap: investment requirement versus investment gap

$ billion



Source GSMA Intelligence

- The total funding required to make 4G service affordable and improve digital skills in the Pacific Islands is $2.6 billion.
- Based on the current population's income and digital skillset, the market by itself can deliver $1.1 billion in funding.
- Under current market and economic conditions in the Pacific Islands, the investment gap amounts to $1.5 billion.
- Based on 6 million people requiring the additional funding, this equates to an average investment gap of $250 per additional person connected.
- Without significant reform, affordability and other barriers to adoption will persist, slowing adoption and limiting achievement of digital inclusion targets in the Pacific Islands.

The total investment gap for the Pacific Islands is $1.8 billion

Total investment gap = **4G coverage gap** + **4G usage gap**

$1.8 billion to reach 99% 4G coverage and full adoption among adults

$250 million to reach 99% 4G coverage

$800 million to reach 100% 4G coverage

$1.5 billion to reach full adoption among the adult population

The investment required in 5G to enable digital transformation

- The deployment of 5G will represent a milestone in the journey to digital transformation in the Pacific Islands, but 5G rollout in the region is in its infancy.
- By 2030, 5G coverage is forecast to barely exceed 30% of the total population, with 5G adoption forecast at around 13% of the total population.
- This analysis assumes that 5G coverage expansion will be based on 5G non-standalone (NSA). 5G NSA uses existing 4G infrastructure (core, hardware and software) to deliver faster speeds, but it does not unlock the full potential of 5G.
- Our estimates offer a lower bound of the cost required to roll out 5G by focusing on 5G NSA.
- Based on this, the quantitative assessment estimates the investment required to reach 50% and 90% 5G coverage at $80 million and $320 million, respectively.

5G investment required to support digital transformation in the Pacific Islands

Expected coverage % population	**Capex**	**Opex**	**Total investment**
 **50%**	$46 million	$34 million	**$80 million**
 **90%**	$187 million	$133 million	**$320 million**

Source GSMA Intelligence

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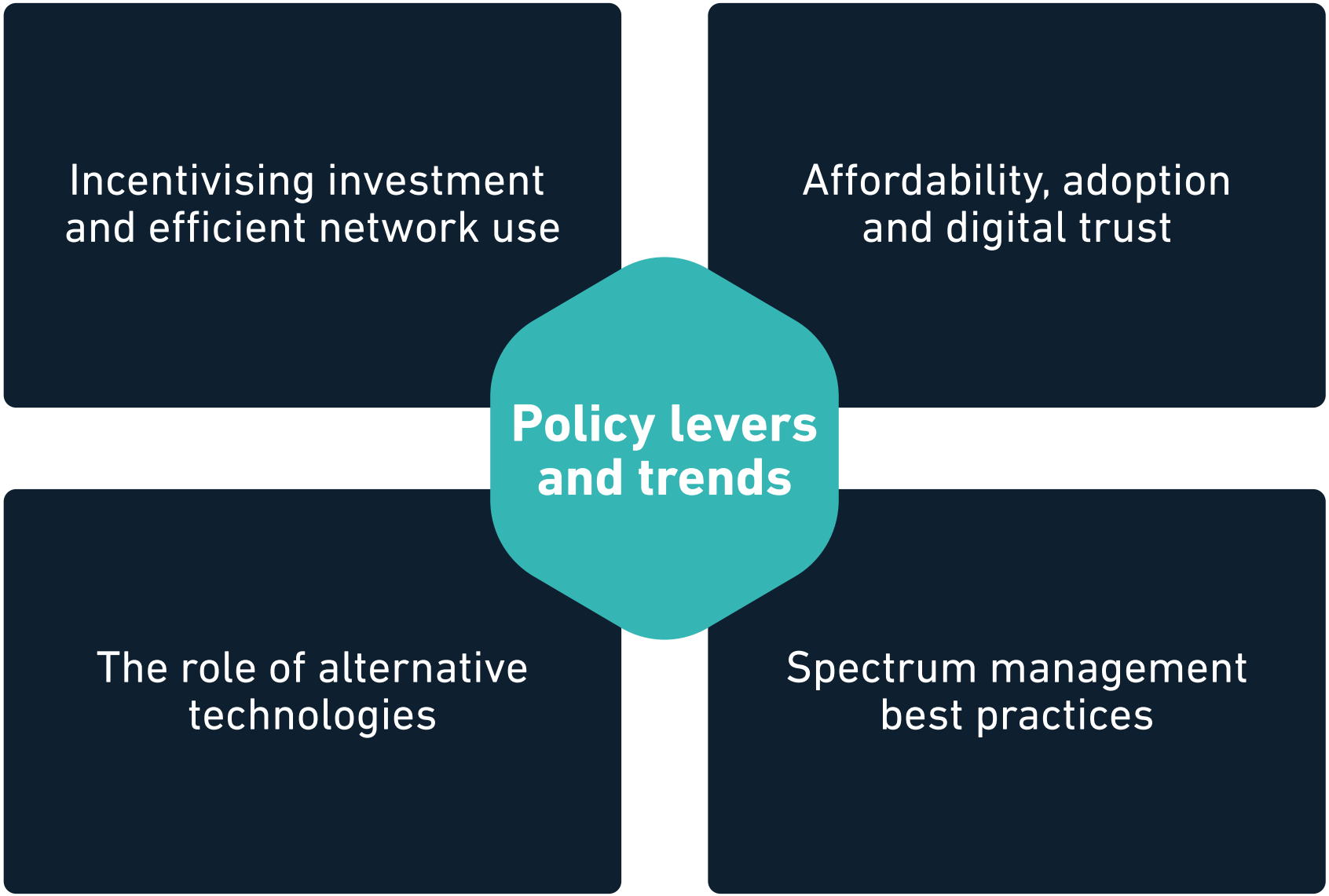
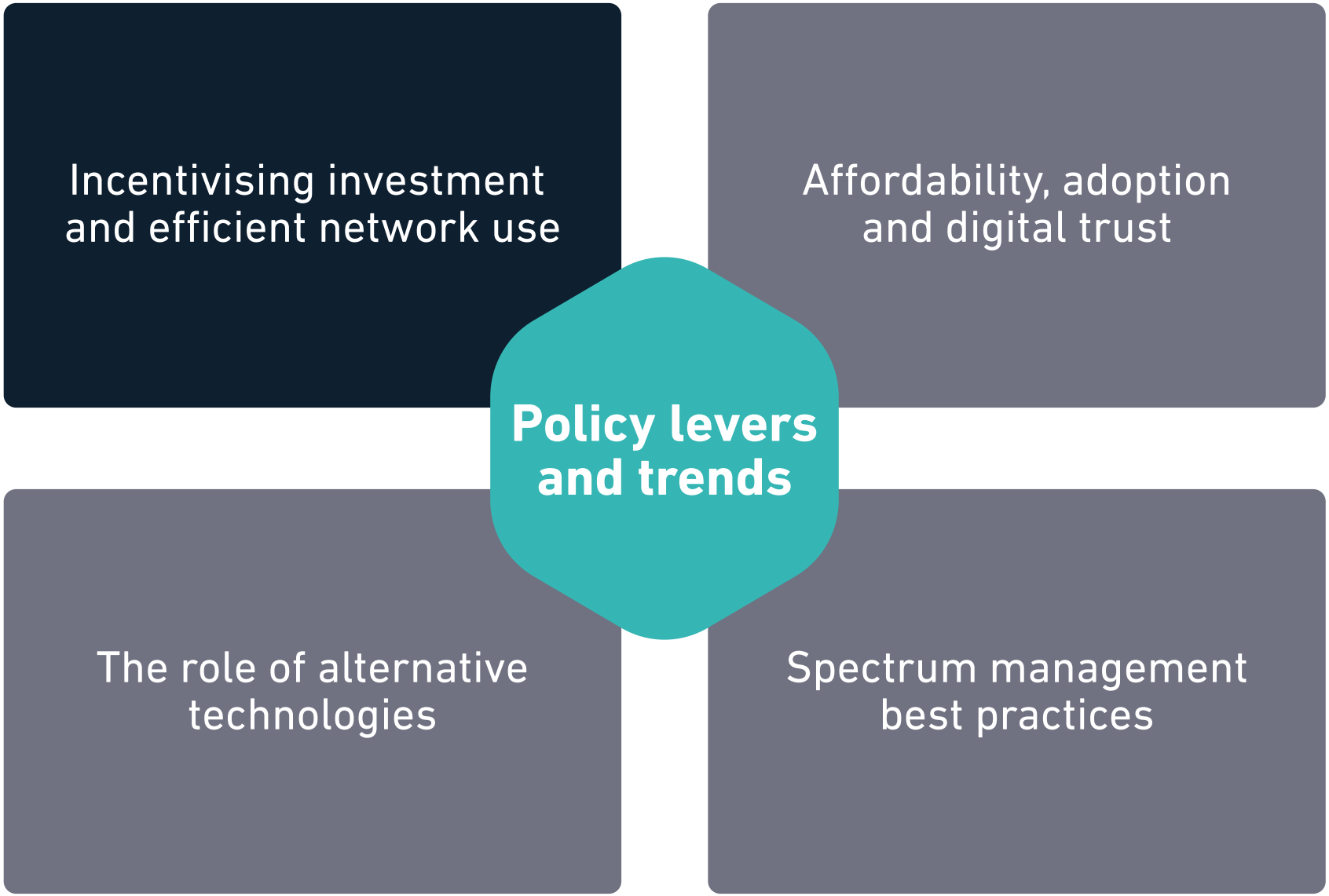

Incentivising investment and efficient network use
Affordability, adoption and digital trust
Policy levers and trends
The role of alternative technologies
Spectrum management best practices

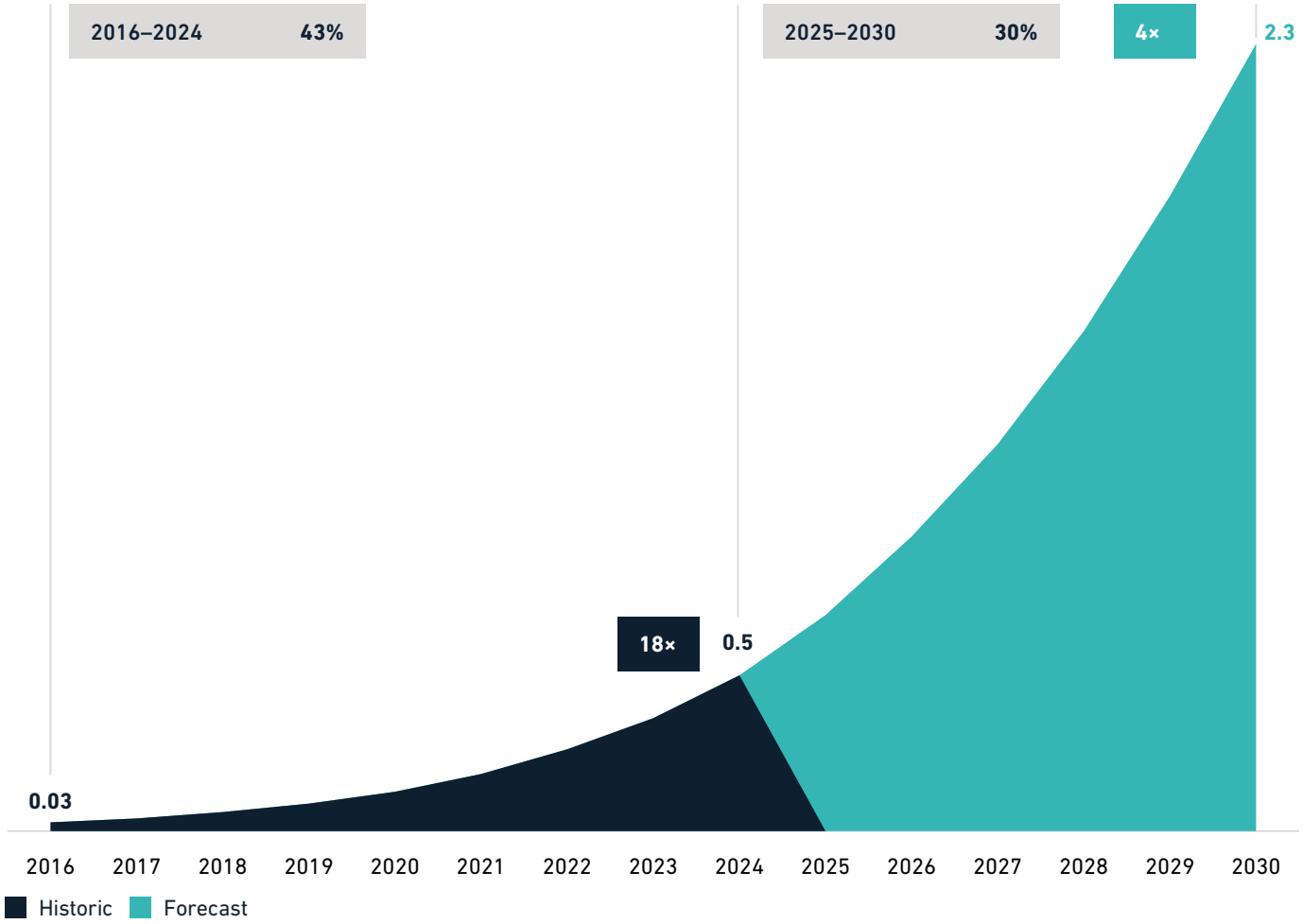

Incentivising investment and efficient network use
Affordability, adoption and digital trust
Policy levers and trends
The role of alternative technologies
Spectrum management best practices

Without further investment, mobile network capacity will soon be constrained

- Between 2016 and 2024, total mobile traffic in the Pacific Islands increased 18-fold, at a CAGR of 43%.
- Growth in 2024 was the largest traffic increase to date. The 2024 increase alone was greater than the absolute traffic level in 2020.
- By 2030, total traffic is expected to multiply fourfold, with an annual growth rate of around 30%.
- This implies similar growth in monthly data usage per connection, which is expected to increase from 5 GB in 2024 to 21 GB in 2030.

Total mobile data traffic in the Pacific Islands

Data traffic (EB), CAGR (%)



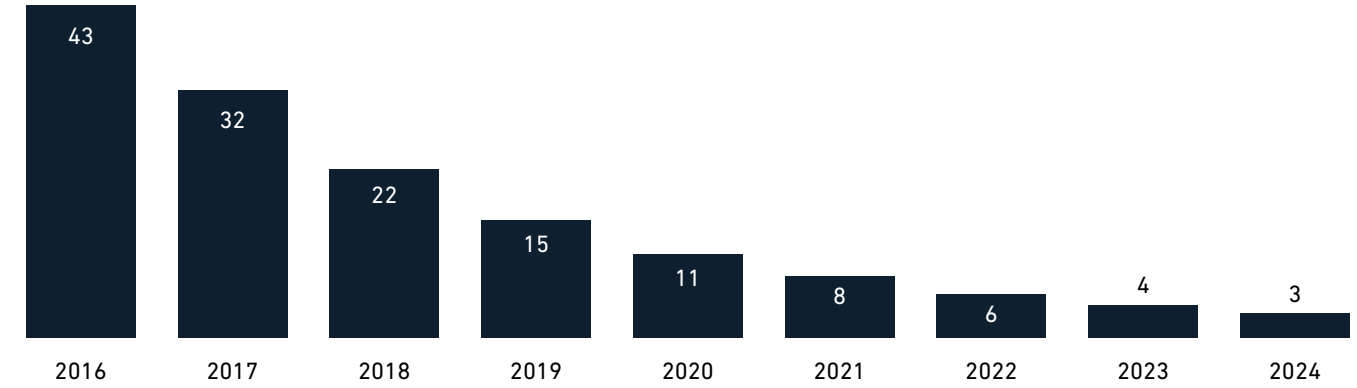
Source GSMA Intelligence

Limited revenue growth weakens the incentive to invest

- Growth in data traffic requires operators to invest in network capacity.
- However, the revenue trend indicates that the return on investment will not be sufficient for operators in the Pacific Islands. Operator revenues have experienced limited growth since 2015, compared to around 280% revenue growth for content and application providers (CAPs) over the same period.
- New operator revenue streams beyond connectivity are not yet sufficient to compensate for the limited growth in traditional connectivity revenue.

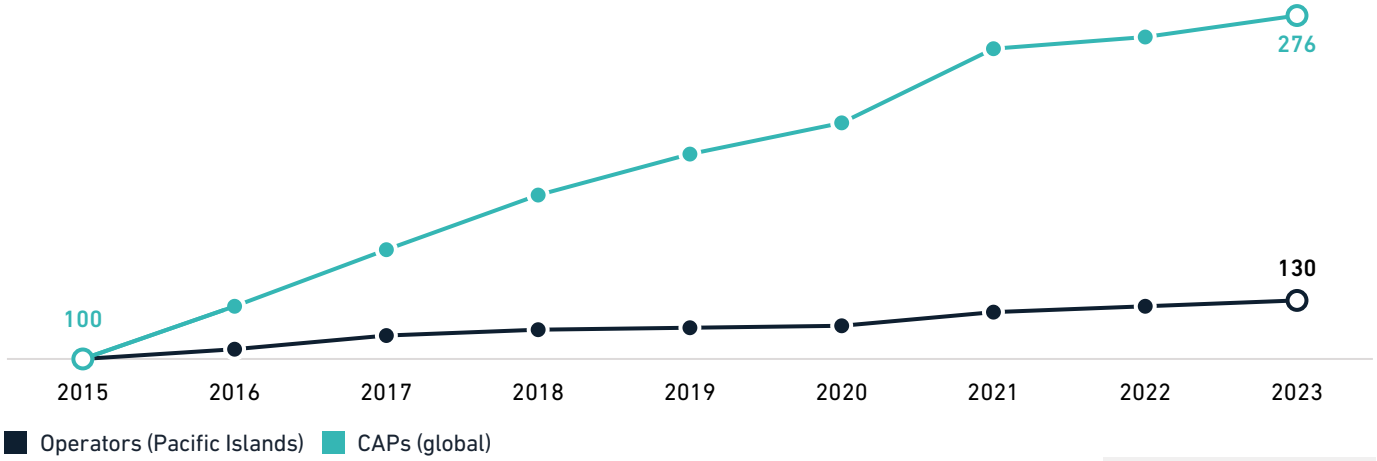
Revenues in the Pacific Islands

$ per GB



Revenue index

2015=100



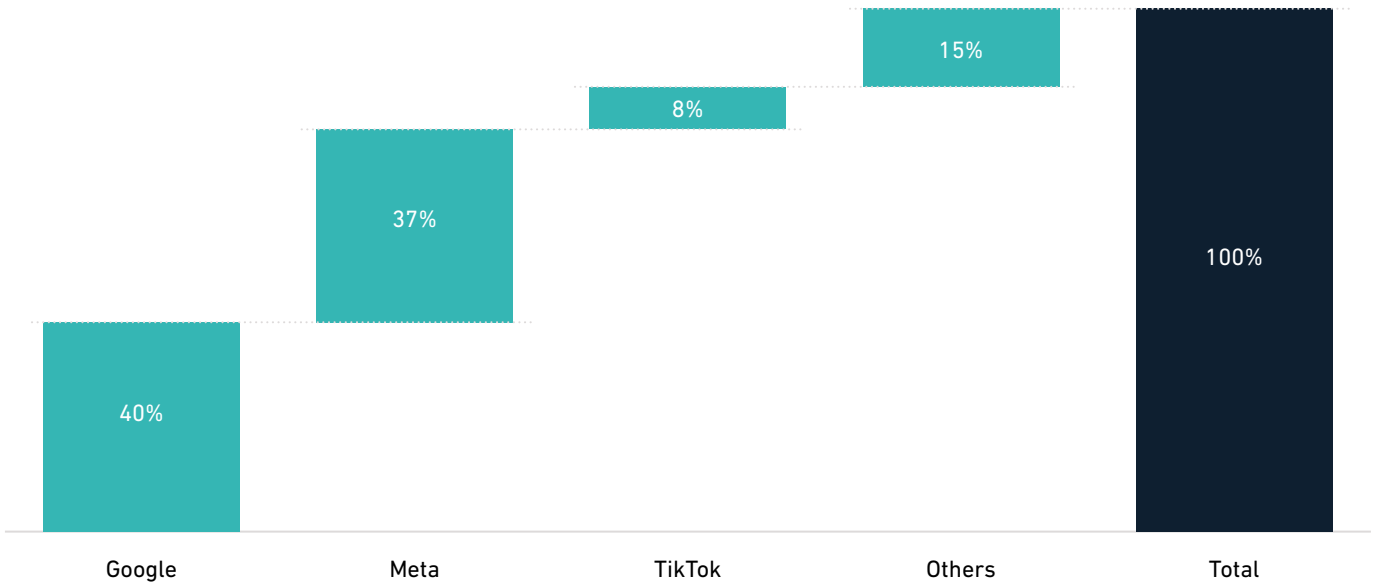
Source GSMA Intelligence

Is network use as efficient as it should be?

- The top three large traffic generators (LTGs) – Google, Meta and TikTok – generated 85% of total traffic in the Pacific Islands in 2024.
- Unsolicited and inefficient traffic account for a significant amount of this traffic:
  - 15–30% of traffic generated by some of the most popular social media applications accessed by consumers is unwanted or unsolicited
  - Traffic reductions of 15–25% are possible if delivery of video is optimised.
- This gives rise to a situation referred to as "tragedy of the commons". Players who do not have an incentive to be efficient can exhaust all the network capacity to the detriment of everyone else, including consumers.

Mobile data traffic in the Pacific Islands by app

Percentage of total mobile traffic, 2024



Source GSMA Intelligence based on operator data

Potential areas for collaboration and policy considerations

Policymakers should monitor developments globally and facilitate dialogue between stakeholders in the internet ecosystem. This should look to identify mechanisms that provide effective incentives to manage traffic volumes and improve investment prospects for future networks.

Government policies need to prioritise sustainable infrastructure investment

The telecoms industry is characterised by substantial fixed costs and economies of scale. While competition generally spurs investments and better market outcomes, the Pacific Islands region presents specific challenges in this regard.

Owing to the region's small market size, remote geography and vulnerability to the effects of climate change, many telcos have to operate below minimum economic scale. Constraints in the pool of digital talent and skilled ICT experts exacerbate this.

Attempts by governments to encourage new entrants into markets with limited scale can be counterproductive, potentially risking higher unit costs of supply and diluting incentives for investment and innovation.

Instead, policymakers should focus on creating an investment-friendly environment that supports the sustainable expansion of telecoms networks, particularly as demand for high-speed connectivity continues to rise.

Policy recommendations to enable investment

Flexibility to operate
- Modernise the licensing framework
- Regulate network deployment more effectively
- Adopt spectrum management best practices

Fiscal burden reduction
- Reform mobile taxation
- Reduce import duties
- Review universal service funds

Fairness of regulatory framework
- Minimise regulatory intervention
- Reduce regulatory compliance costs
- Adopt transparent and evidence-based decision-making

Facilitation by government
- Introduce digital transformation in public service delivery
- Incentivise investment
- Support collaboration and innovation

Papua New Guinea case study

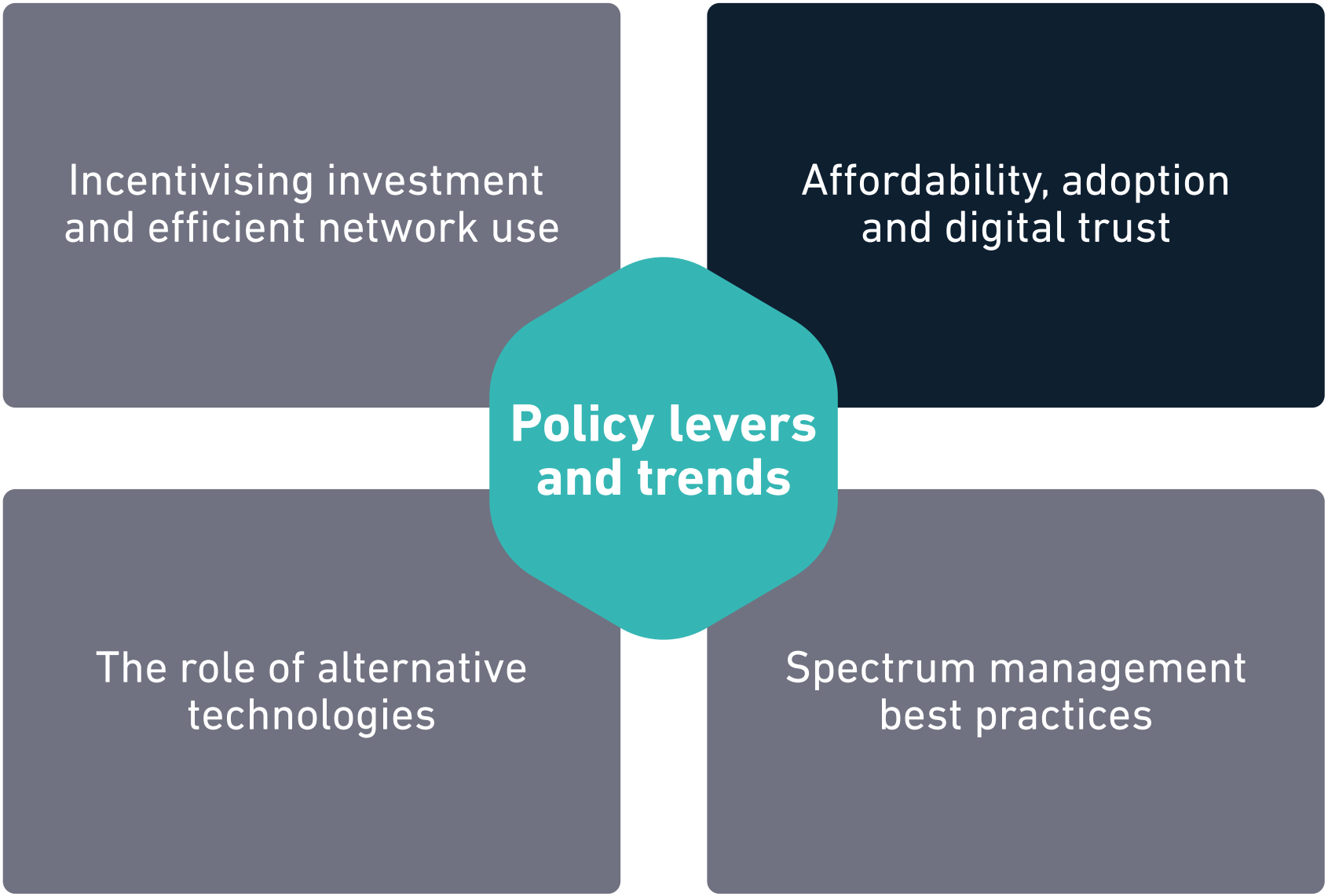
Infrastructure and digital adoption challenges

Papua New Guinea is the largest country in the Pacific Islands in terms of landmass and population, with more than 10 million people. The expansion of 4G coverage over the last decade – from 6% in 2014 to 78% in 2024 – has seen a 10-fold increase in mobile broadband connections, reaching 4.4 million in 2024.

Despite progress, several factors complicate further rollout of mobile infrastructure, technology upgrades and the closing of the usage gap and digital divide:

- **A vast terrain covering mountains and islands** – Coupled with poor basic infrastructure such as roads and electricity, this increases the complexity and costs of network rollout and maintenance. For instance, helicopters are often required to deliver fuel and equipment to sites outside urban regions.
- **Lack of reliable and affordable energy supply** – Papua New Guinea has the lowest rate of electrification in the Pacific Islands, with only around 20% of the population connected to the grid. This has implications for not just investment and network operation but also consumers' ability to keep devices charged.
- **Low purchasing power and affordability issues** – Papua New Guinea is among the poorest countries in the Pacific Islands. The affordability of handsets and mobile broadband services remains a major barrier to adoption. Many users remain on basic feature phones that rely on 2G/3G networks.
- **Digital skills and literacy** – Low digital literacy levels, which are linked to lower mobile device ownership and internet use, are a major barrier to digital inclusion, particularly for remote communities.

Tackling the mobile investment gap will require broad government support across several fronts, including improving energy infrastructure and equipping individuals with the skills to navigate an evolving digital world.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Identifying the barriers to mobile internet adoption

Increasing adoption of mobile internet in the Pacific Islands can boost GDP growth and socioeconomic development. Investment in mobile connectivity and efforts to accelerate the reduction of the usage gap are therefore critical.

Several key barriers prevent people from adopting and using mobile internet, as shown below. Furthermore, there are structural inequalities such as differences in income/education and social norms underpinning these barriers, translating into disparities in adoption and use.

Knowledge and skills

Lack of awareness and understanding of mobile internet and its benefits, and lack of digital skills and literacy.

Affordability

Inability to afford an internet-enabled handset, data plans or other service fees.

Safety and security

Concerns about the negative aspects and risks of mobile and the internet, such as harassment, theft, fraud and information security.

Relevance

Lack of relevant content, products and services that meet users' needs and capabilities.

Access

Lack of access to networks and enablers, such as internet-enabled handsets, agents and formal ID, or devices and services are not accessible or easy to use.

Fostering digital trust is essential for a digital nation

Investment in connectivity infrastructure needs to be supplemented by efforts to improve digital services, literacy and skills.

Creating incentives for participation and inclusion

- Creating incentives and opportunities for citizens to participate meaningfully in the digital realm can foster digital trust. High levels of digital trust build confidence among citizens and businesses and justify investments in developing the components of a digital nation.
- Digital public services (e.g. digital ID, healthcare, fintech and mobile money solutions) can improve efficiency and lower barriers to adoption. Examples include Fiji's goverment platform app DigitalFIJI, Tonga's Digital Government Project and Tuvalu's Future Now digital twin initiative.
- Mobile money improves access to banking and payment services and is crucial for financial inclusion. Mobile operators have played a key role in introducing mobile money solutions across the Pacific Islands. Continued innovation in fintech solutions and partnerships to expand the range of use cases will be key.

Preserving trust in a digital world

- Online threats that erode trust can have a significant, adverse impact on victims and wider society. Online threats are diverse and can include network outages, personal data breaches, cyberattacks, deepfakes and online bullying.
- Multi-stakeholder efforts and partnerships are key to strengthening cybersecurity and resilience, and addressing fraud, scams and online safety issues.

Modernising the fiscal framework for the mobile sector

- Licence fees and taxes have a regressive effect on low- and middle-income users, who spend a larger proportion of their income on communication services.
- Evidence shows that licence fees based on revenues have a negative impact on incentives to invest.
- This has a negative impact on both network rollout and user adoption, reducing the number of new users that can be profitably served.
- Achieving universal connectivity not only requires fiscal reforms; funding mechanisms to expand demand are also important.

Potential areas for policy reform

- Supply side
  - Eliminate/reduce sector-specific fees and customs duties on equipment.
  - Broaden the base of USF contributors.
  - Re-invest the USF into the mobile sector.
- Demand side
  - Eliminate customs duties on devices.
  - Develop financing schemes/household subsidies, focusing on devices and tariffs to improve affordability and adoption.
  - Introduce VAT exemptions for low-income groups (for devices and tariffs).

Universal service funds: challenges and recommendations

Challenges

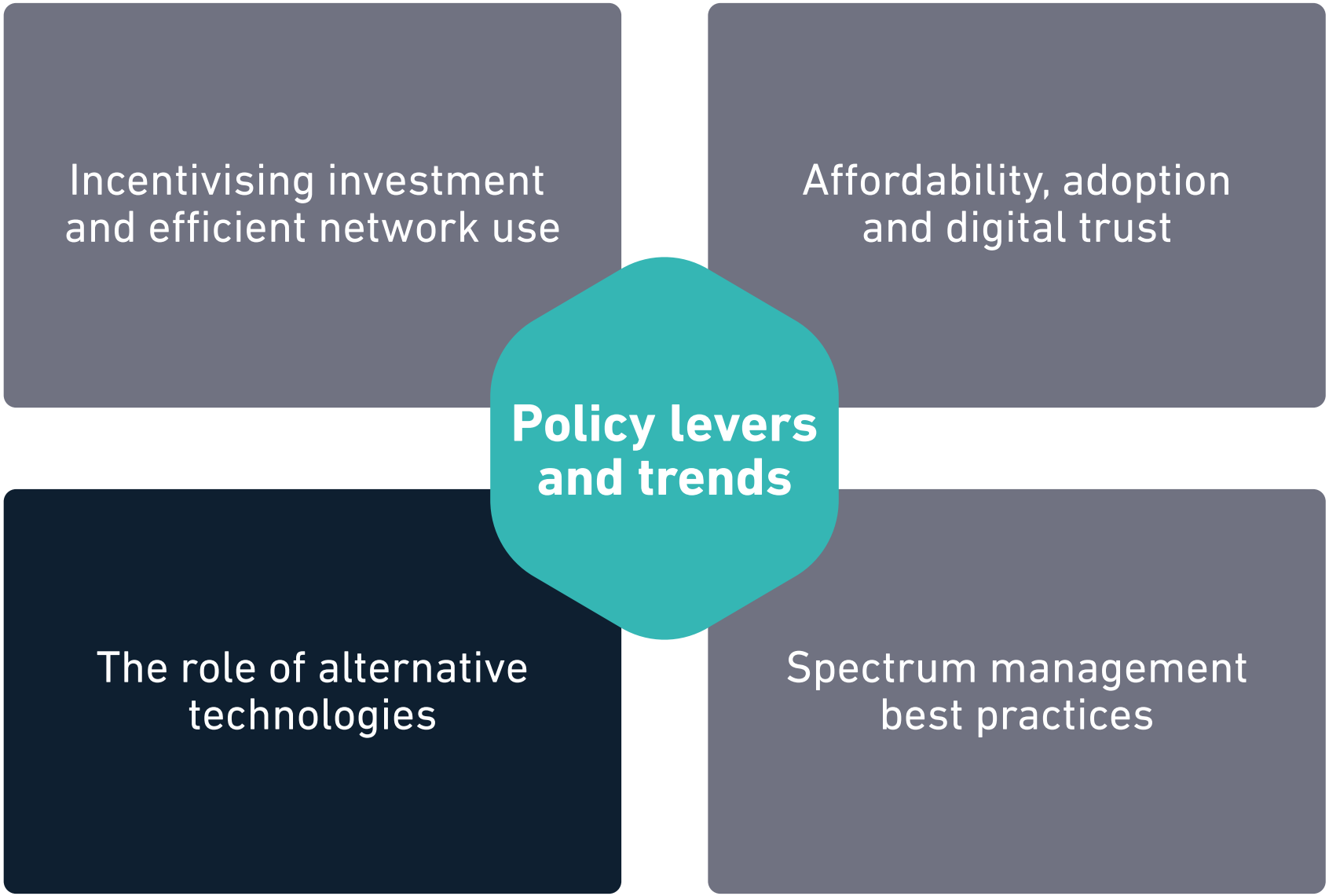
- **Low disbursement rates** – A significant proportion of funds remains unused due to bureaucratic hurdles.
- **Diversion of funds** – Funds can be diverted to projects not related directly to expanding contributors' telecoms infrastructure.
- **Lack of transparency** – There can be a lack of public reporting on fund disbursement and impact.
- **Weak accountability** – There can be an absence of ex-post evaluations assessing effectiveness.
- **Regressive financial burden** – The cost is passed to consumers, disproportionately affecting low-income users.

Recommendations

- **Expand the contributor base to reach the broader digital ecosystem** – This includes not just mobile operators but also satellite operators and LTGs (which generate significant value and revenues from internet access).
- **Maximise effectiveness** – This can be achieved by increasing disbursement, allocating funds based on RoI metrics and improving public transparency and accountability measures.
- **Demand-side stimulus** – The funds can be used to balance a potential tax reduction or financing schemes for low-income users.

Examples from around the world

- **USF in the US** – There is a consensus in the US that telecoms revenues are steadily decreasing, jeopardising the sustainability of the USF model. Based on a presidential request, in 2022 the FCC made two main proposals: reform of the fund contributor base by adding LTGs and reform of the fund distribution.
- **Telecommunications Development Fund in Chile** – The fund is financed by only the national budget. The project portfolio is based on a long-term policy vision. Each project is evaluated, resource allocations are carried out through public tenders, and a public website ensures transparency.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Growing satellite partnerships across the wider region

The main premise of satellite connectivity is to extend network coverage to where terrestrial coverage does not exist or only exists in a patchy state.

Satellite deals in the Pacific Islands

Papua New Guinea

Direct-to-BTS and direct-to-device

STATUS
Commitment/launched (SMS/data/voice)

LATEST DEAL
2024

Palau

Direct-to-device

STATUS
Trial (SMS)

LATEST DEAL
2023

Fiji

Direct-to-BTS

STATUS
Launched (SMS)

LATEST DEAL
2021

Solomon Islands

Direct-to-BTS and direct-to-device

STATUS
Planned/trial

LATEST DEAL
2023

Australia

Direct-to-BTS and direct-to-device

STATUS
Launched (direct-to-BTS)

Trial (direct-to-device – SMS)

Planned (direct-to-device – voice/data)

LATEST DEAL
2024

French Polynesia

Direct-to-BTS

STATUS
Launched (SMS/data)

LATEST DEAL
2018

New Zealand

Direct-to-BTS and direct-to-device

STATUS
Commitment/trial (voice/data), launched (SMS)

LATEST DEAL
2024

Cook Islands

Direct-to-device

STATUS
Beta trial (SMS)

LATEST DEAL
2023

Tonga

Direct-to-BTS

STATUS
Commitment (SMS/data)

LATEST DEAL
2022

A deal is considered when at least one mobile operator has reached an agreement with a satellite provider in a specific market.

Source Satellite and NTN tracker, Q1 2025, GSMA Intelligence, 2025

Alternative technologies can help address the coverage gap, but usage gap challenges will remain

Alternative technologies play an important role in connectivity infrastructure in the Pacific Islands for several reasons, including geographic terrain, gaps in fibre-optic infrastructure and network resiliency.

Advancements such as satellite backhaul capacity improvements and direct-to-device (D2D) connectivity can support operator efforts to expand network coverage.

While there is enthusiasm to drive technology forward, alternative solutions can close the coverage gap but not the usage gap, which is much larger.

The technologies will operate in allocated spectrum and in IMT bands. International and cross-border coordination will be critical for operational sustainability. It is paramount that alternative technologies have a positive impact on mobile connectivity without interfering with terrestrial networks.

41% of the adult population in the Pacific Islands will be connected to 4G+ mobile internet on their own device in 2030

55% will have some access to a device

55% of the adult population will live within the footprint of a 4G+ mobile internet network but will not be using it in 2030

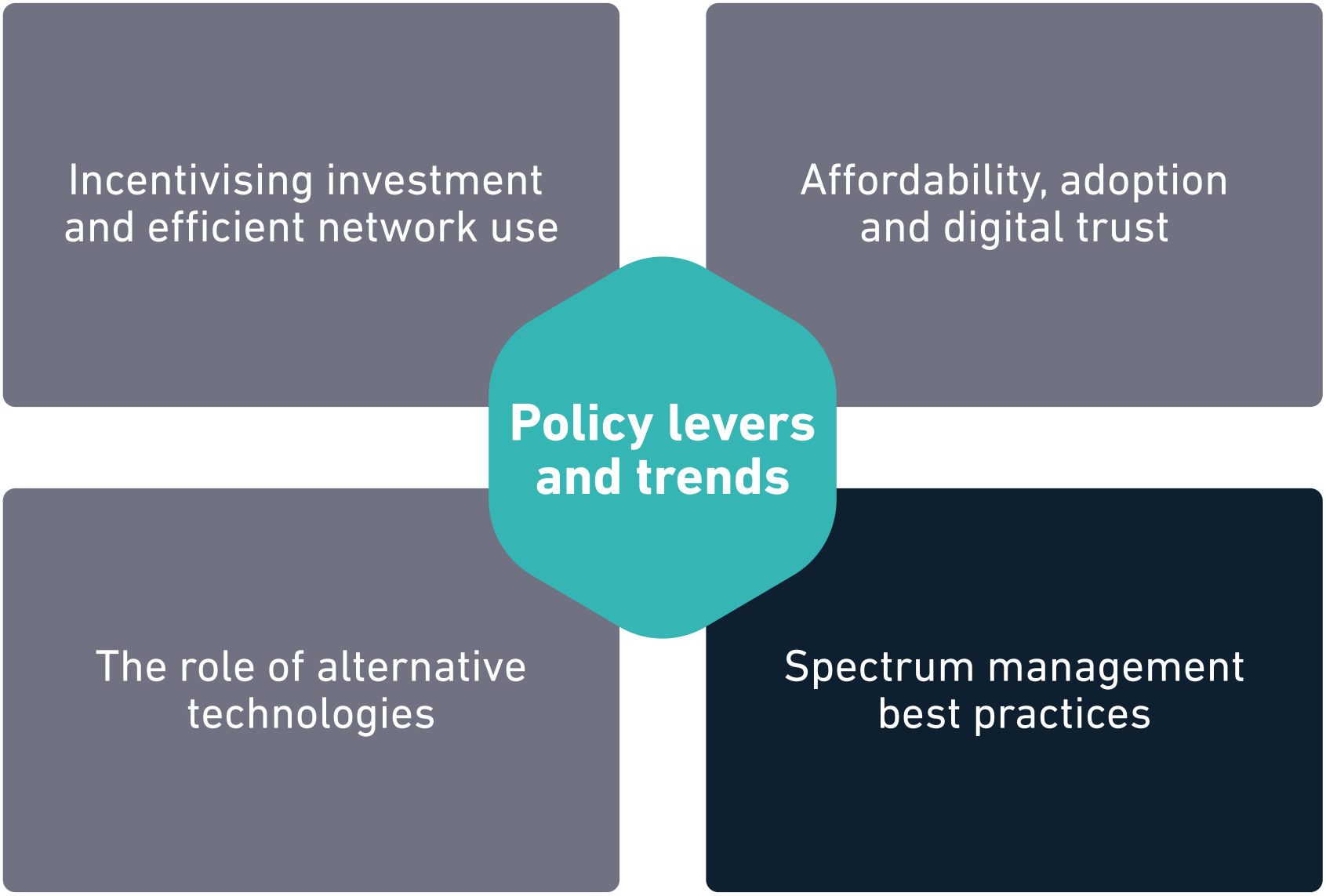
THE USAGE GAP

More than 80% of these do not own a phone

4% of the adult population is forecast to remain without 4G+ mobile internet coverage in 2030

THE COVERAGE GAP

Alternative technologies may be part of the solution for the coverage gap but will not impact the usage gap.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Spectrum management best practices

Effective spectrum licensing is critical to spurring the investment required to expand mobile access, meet the increase in demand for data services, and enhance the quality and range of services offered. At its core, a spectrum licensing framework should:

- ensure operators have access to sufficient spectrum in harmonised bands
- provide predictability to support the new network investment needed
- avoid costly restrictions on the use of spectrum beyond those needed to manage interference.

Spectrum pricing can directly impact a reduction in the usage gap by encouraging high-quality and affordable mobile service. It can also help reduce the coverage gap by encouraging investment from operators.

Policy recommendations for spectrum pricing

Set modest reserve prices and annual fees and rely on the market to set prices.

Consider mechanisms that allow operators to exchange spectrum fees for investment commitments.

License spectrum as soon as needed, as this helps avoid artificial spectrum scarcity.

Publish long-term spectrum roadmaps prioritising socioeconomic benefits over state revenue.

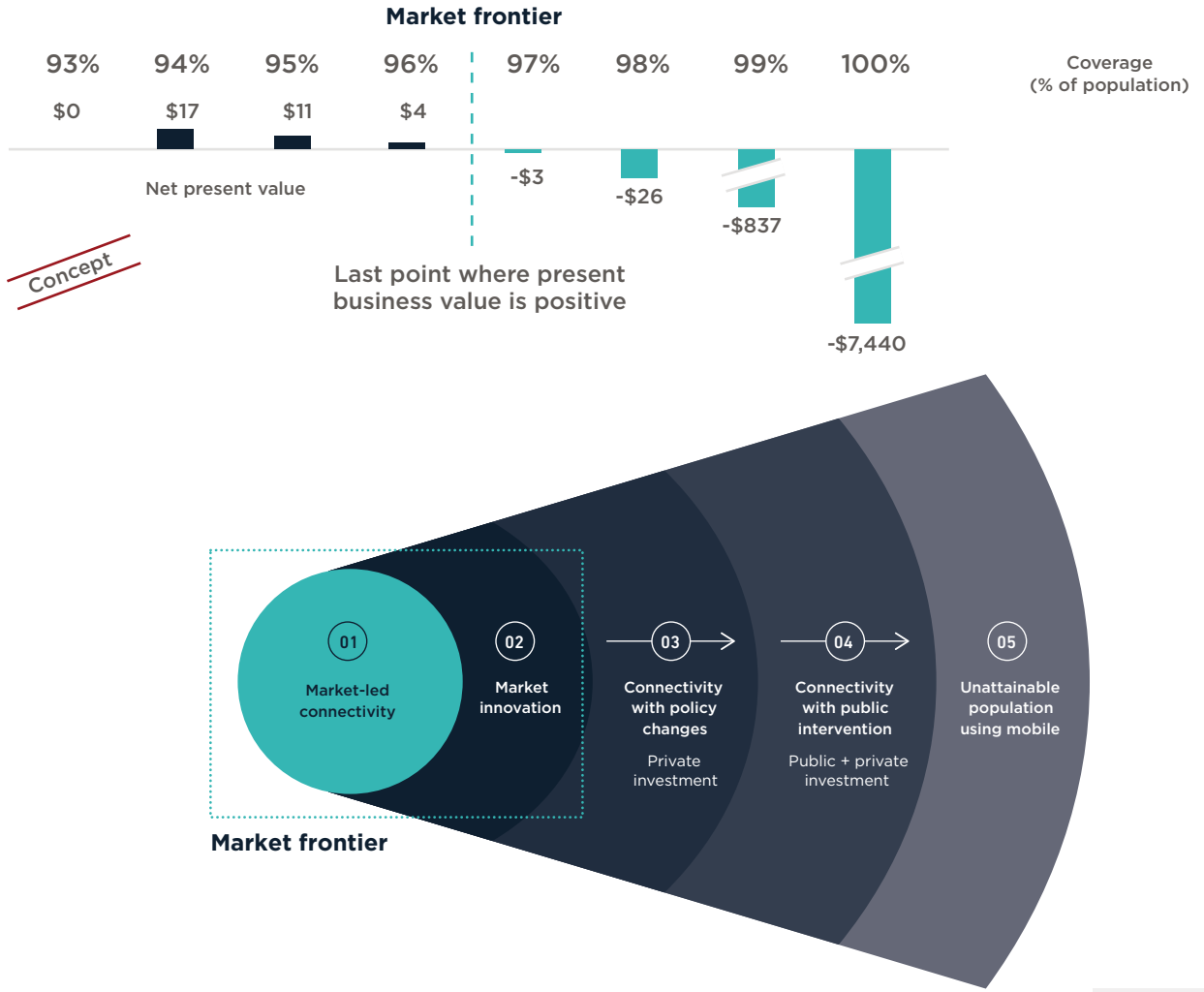
CONTENTS

The market frontier: key to estimating the investment gap

- The market frontier represents the last profitable level of operator investment under current market conditions.
- It is important to identify this threshold because it determines the point when mobile operators will most likely stop investing to expand coverage and adoption.
- Innovation will help to expand the market frontier, but universal connectivity will only happen with additional investment.
- Additional financing from third parties will be needed to continue expanding connectivity to areas and users that will otherwise remain unconnected.
- As the market frontier is the point at which operators may stop investing, it becomes the starting point to calculate the required investment to close the connectivity gap.

Market frontier estimate

Net present value (million), coverage (percentage of population)



Source GSMA

Investment gap methodology

This quantitative assessment of the investment gap is focused on the deployment and adoption of 4G by 2030, as it is widely expected to meet the minimum speed requirements for low-latency and data-intensive services.

Funding required to cover the population living in areas where no 4G+ mobile internet services are available

Funding required to make the service affordable and improve digital skills to achieve universal 4G mobile internet adoption

4G coverage gap: a four-step methodology

Targets and timeframe

Closing the connectivity gap means meeting coverage targets within a specific timeframe

- Assess the current market frontier
- Targets:
  - 99% 4G coverage by 2029
  - Universal coverage by 2030

Investment requirement

Quantify the investment required to achieve the targets

- Quantify the capex and opex required to deploy a network
- Capex does not include backbone infrastructure costs (lower-bound estimate)

Revenues

New customers will generate incremental revenues (devices and services) that must be considered in the business case

- Revenues are generated by adoption in previously unconnected remote areas
- Adoption rate is similar to connected rural areas

Investment gap

The gap arises where the investment required is greater than the expected investment under current market conditions

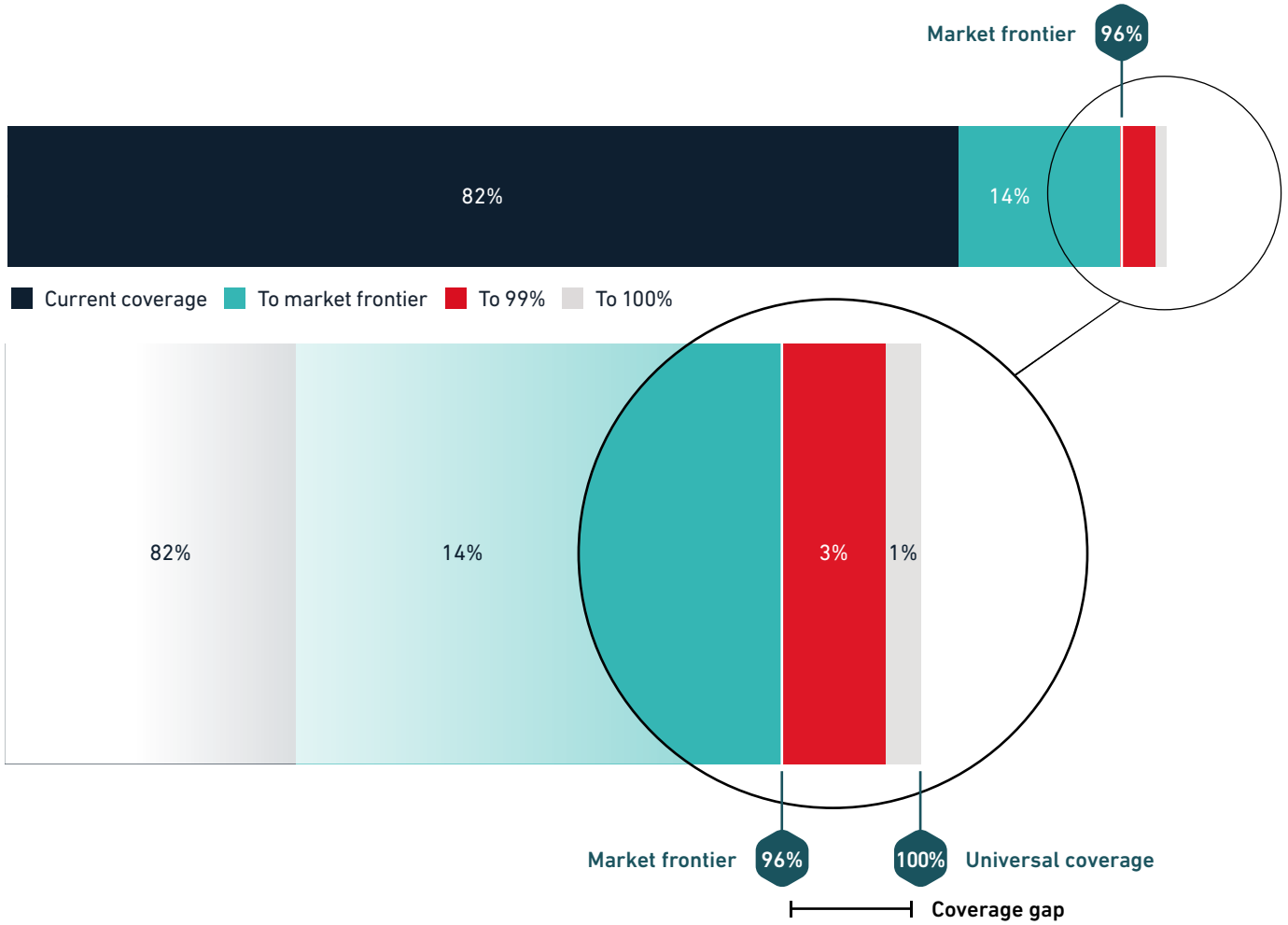
- Total investment required is greater than the expected investment by operators under current market conditions (market frontier)

4G coverage gap: from the market frontier to reaching coverage targets

- 4G coverage in the Pacific Islands was 82% as of 2024.
- Based on quantitative analysis, the market alone is forecast to deliver an additional 14 pp of 4G coverage by 2030, reaching 96% of the population (the market frontier).
- Closing the coverage gap means an increase of 4 pp to reach universal connectivity.
- The methodology to quantify the required investment includes a two-step calculation:
  - from market frontier to 99% coverage (+3 pp), where terrestrial backhaul is considered
  - the last 1% to reach universal coverage, deploying satellite-enabled backhaul as physical deployments become too expensive or unfeasible for extremely remote locations.

4G coverage in the Pacific Islands

Percentage of adult population

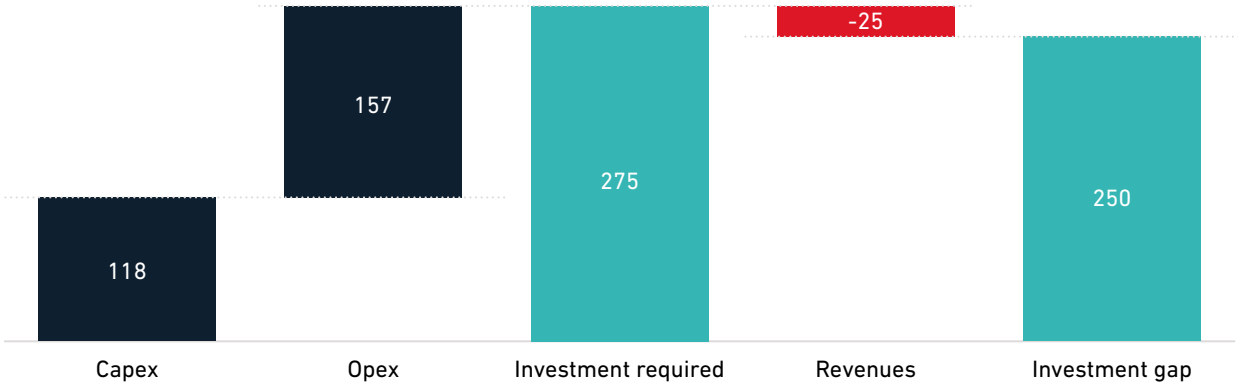


Source GSMA Intelligence

4G coverage gap: the investment required and investment gap

4G coverage gap in the Pacific Islands: reaching 99% coverage

$ million



4G coverage gap in the Pacific Islands: reaching universal coverage

$ million

Source GSMA Intelligence

To reach 99% coverage

- Moving from the market frontier to 99% coverage means expanding connectivity to more than 330,000 additional people.
- This requires investment of $275 million, which can generate revenues of $25 million.
- The investment gap is $250 million, which implies $753 per additional person covered.

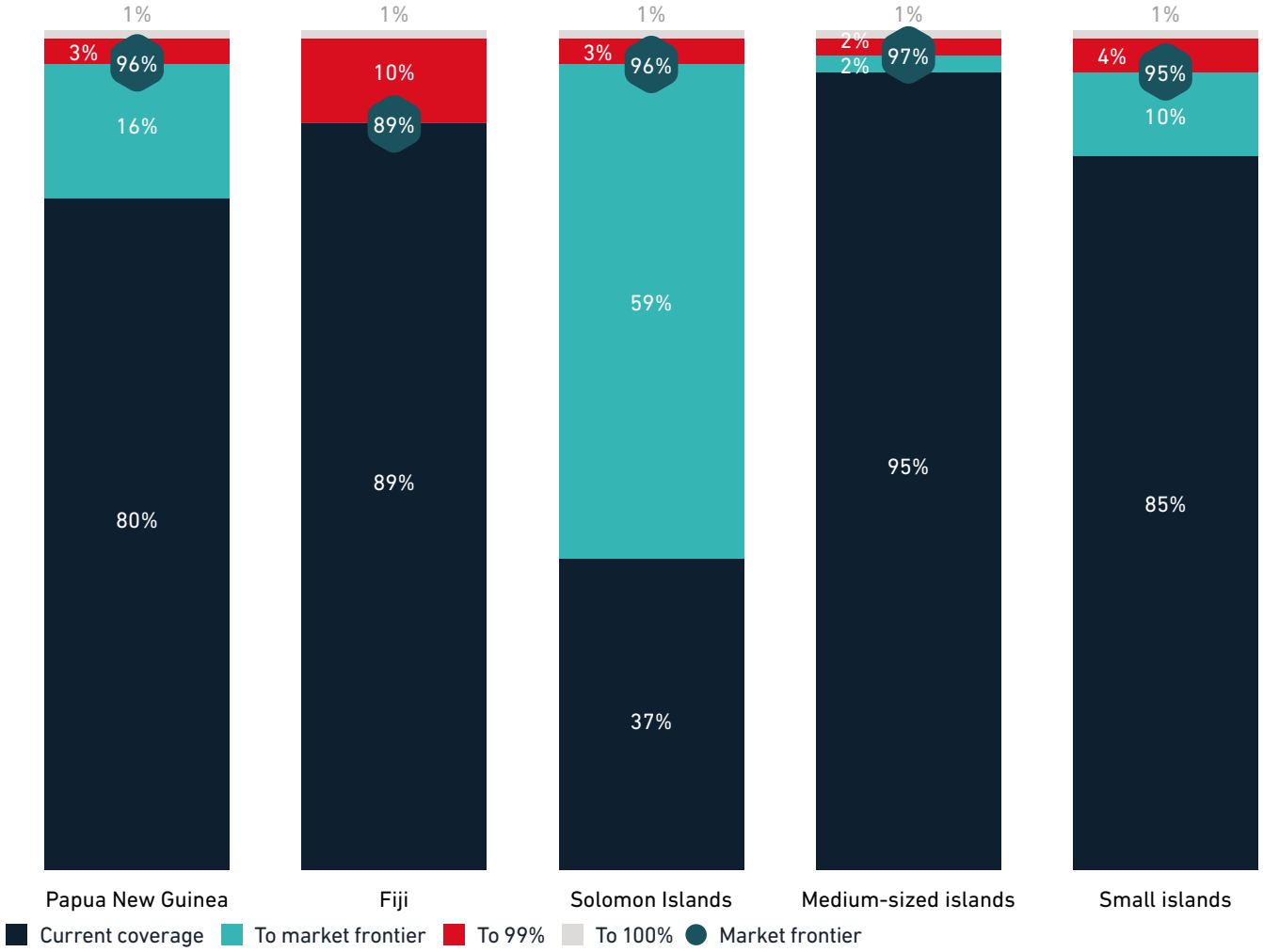
To reach universal coverage

- Reaching universal coverage in the Pacific Islands means connecting the last 1%, moving from 99% to 100%. It means expanding connectivity to a further 100,000 people.
- This requires investment of $804 million, which can generate revenues of only $4 million.
- The universal coverage investment gap is $800 million, or $8,000 per additional person covered.

4G coverage gap: bigger challenges in Papua New Guinea and Solomon Islands

Expected 4G coverage gap in 2030

Percentage of adult population



Source GSMA Intelligence

- Papua New Guinea currently has 80% coverage, with the potential to reach 96% under market conditions, leaving a 4% gap by 2030.
- Fiji has achieved 89% coverage, nearing its market frontier, but faces the largest challenge with a gap of 11 pp to reach full coverage.
- Solomon Islands has the lowest 4G coverage at 37%, but can potentially reach 96%, resulting in a gap of 4 pp for universal coverage.
- Medium-sized islands have 95% coverage, with conditions to reach 97%, leaving a 3 pp gap for full coverage.
- Small islands have 85% coverage, with the potential to reach 95%, resulting in a 5 pp gap for full coverage.

4G usage gap: adoption target, new subscribers and cost drivers

Adoption target

- As a target and for the purposes of this analysis, we define 100% 4G adoption within the adult population by 2030 as equivalent to universal 4G mobile internet.
- This is in line with two ITU objectives as outlined in:
  - *Achieving universal and meaningful digital connectivity in the decade of action: Aspirational targets for 2030*
  - *ITU and Connecting humanity: Assessing investment needs of connecting humanity to the Internet by 2030.*

New subscribers and cost drivers

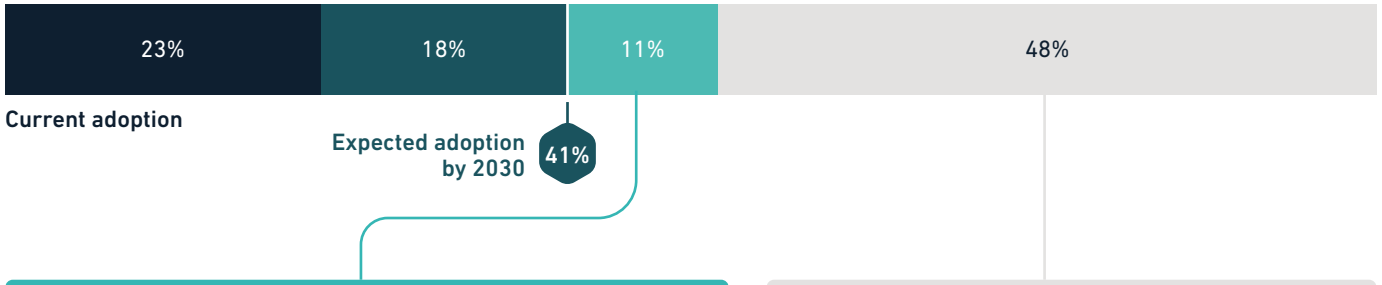
- The population to connect to 4G mobile internet comprises users to migrate from 3G to 4G and the unconnected.
- We estimate the adoption level that the market can deliver by 2030 under the current framework (adoption market frontier).
- Quantifying the funding required to make the service affordable and improve digital skills to achieve universal 4G mobile internet adoption by 2030 implies:
  - measuring the additional funding needed for lower-income segments to access the service affordably (the cost of mobile internet access should not exceed 2% of monthly income per capita, according to the UN Broadband Commission's affordability threshold)
  - upskilling/training, mostly focused on the unconnected.

4G usage gap: from expected adoption by 2030 to achieving the adoption target

- The results of this quantitative analysis show that closing the gap by 2030 requires around 6 million new users to adopt 4G service.
- The analysis reveals an average investment gap of $250 per new person connected.
- In total, the investment gap (the funding required to make the service affordable and improve digital skills to achieve universal 4G connectivity objectives by 2030) amounts to $1.5 billion.
- Without substantial reforms, affordability and other barriers will persist, slowing adoption and limiting accomplishment of digital inclusion targets in the Pacific Islands.

4G adoption in the Pacific islands

Percentage of adult population



User migration from 3G to 4G

- Reaching the target requires migrating around 1.1 million users from 3G to 4G.
- This requires additional funding of $300 million to make adoption affordable and to upskill 3G users ($270 per additional migrated user).

Connecting the unconnected

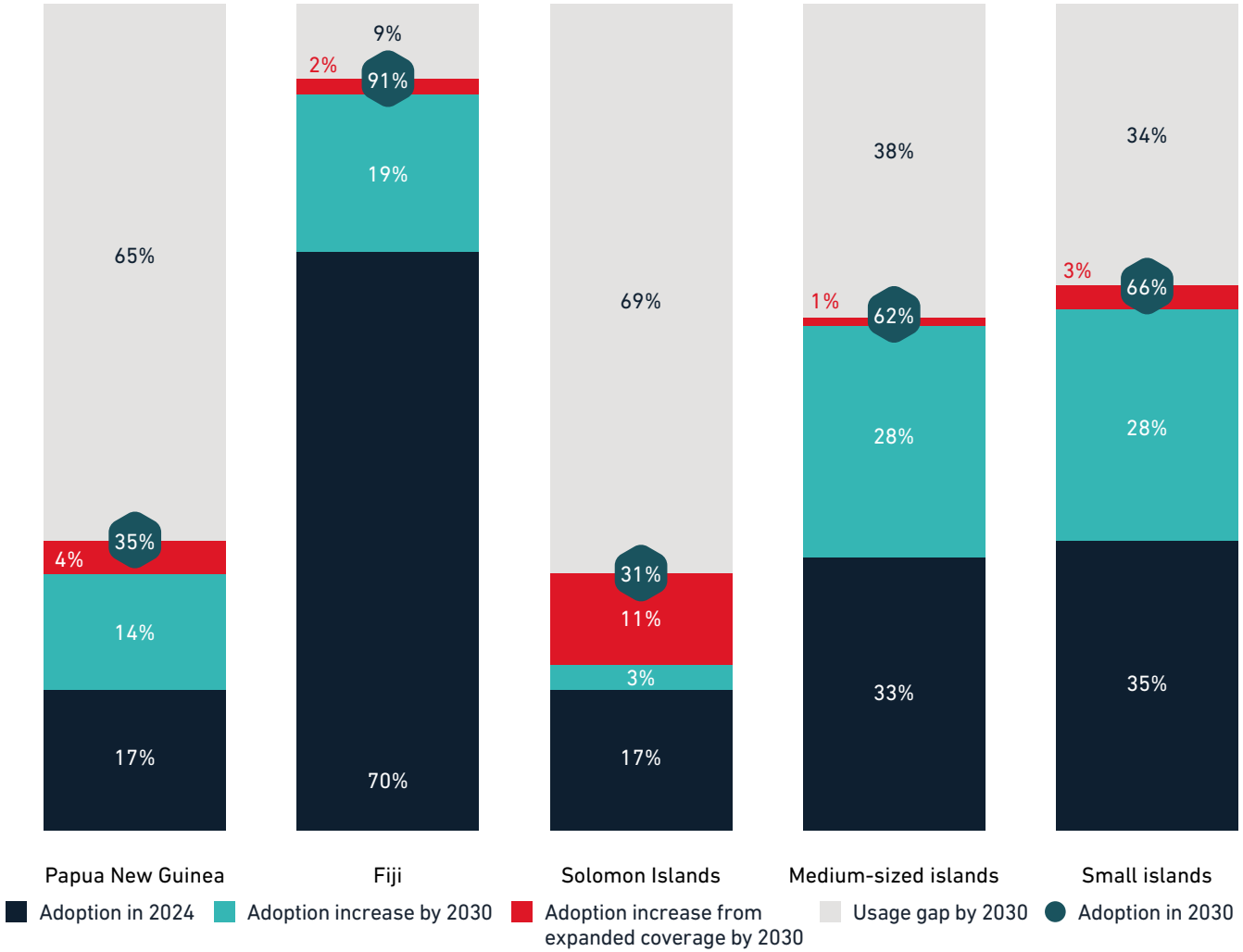
- Reaching the target means connecting around 4.9 million users.
- This requires additional funding of $1.2 billion to make adoption affordable and upskill the unconnected ($245 per additional user connected).

Source GSMA Intelligence

4G usage gap: variation across the Pacific islands

Expected 4G usage gap in 2030

Percentage of adult population



- With the exception of Fiji, the usage gap in the Pacific Islands will be the main challenge in 2030.
- Papua New Guinea and Solomon Islands are forecast to have usage gaps above 65% of the adult population, which means less than 40% of the population will use 4G mobile internet.
- In small and medium-sized islands, the gap is narrower but no less important. More than 30% of the population will remain unconnected by 2030.
- Regulators and mobile operators must work on an action plan to attract new mobile customers with relevant content and affordable prices.

Source GSMA Intelligence

GSMA Intelligence

Further reading

The Mobile Economy Pacific Islands 2023

The Mobile Economy Asia Pacific 2024

Digital Nations in Asia Pacific: preserving digital trust

The State of Mobile Internet Connectivity 2024

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