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ECONOMIC IMPACT OF GOOGLE'S APAC NETWORK INFRASTRUCTURE

FOCUS ON THE PHILIPPINES

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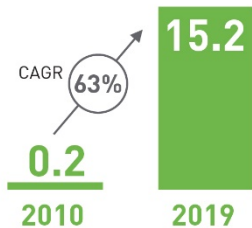
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Economic impact of Google's network infrastructure in the Philippines

DATA TRAFFIC IN THE PHILIPPINES IS GROWING STRONGLY, DRIVEN IN PART BY THE POPULARITY OF GOOGLE'S SERVICES

The Philippines data traffic growth 2010–2019 (EB)

CAGR 63%

15.2
0.2
2010
2019

12% Google services' share of APAC internet traffic

GOOGLE INVESTED OVER USD2 BILLION IN NETWORK INFRASTRUCTURE ACROSS APAC, WHICH SUPPORTS THE INTERNET IN THE PHILIPPINES

>$2bn

Google's APAC network infrastructure investment

The Philippines investments

2 submarine cables (SJC, PLCN)

All bandwidth purchased from telcos

8 cities where GGC nodes are deployed

GOOGLE'S INFRASTRUCTURE INVESTMENT HELPS THE PHILIPPINES REALISE STRONG ECONOMIC BENEFITS FROM INCREASED INTERNET USAGE

Last **10 years (2010–2019)**

93 000 Jobs

$14bn in GDP

Next **5 years (2020–2024)**

162 000 Jobs

$22bn in GDP

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1   All currency in USD, in real 2019 terms

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THESE INVESTMENTS IMPROVE THE CONNECTIVITY ECOSYSTEM WHICH BENEFITS CONSUMERS AND BUSINESSES

2024

39 Exabytes internet traffic

190Tbit/s in additional capacity

48ms reduction in end-user latency

Future improvement of download speeds (currently high in APAC)

Future reduction of IP transit prices (currently high in APAC)

3 new use cases supported

- Video Conference
- Commerce and Transactions
- Cloud Services

REGULATORY AND INVESTMENT REGIMES NEED TO SUPPORT FURTHER INVESTMENT IN NETWORK INFRA DEPLOYMENT TO GENERATE ADDITIONAL ECONOMIC BENEFITS

Deployment and landing of submarine cables

> Transparent and clearly laid out procedure to obtain licences / permits

> Single agency provides a central point of contact to facilitate the process for licence and permit applications

> Open cable landing station provides non-discriminatory and cost-oriented access to landing parties

> Open investment policy allowing majority submarine cable ownership by foreign investors

> Fast-tracked permit application process for inspection and repair works

> Exemption of submarine cable works from cabotage laws

> Implementation and effective enforcement of cable protection laws

Protection and maintenance of submarine cables

Supported by

Strong respect for the law and effective regulatory enforcement

> Government regulations are effectively enforced without improper influence

> Administrative proceedings are conducted without unreasonable delay

> Due process is respected in administrative proceedings

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As of 2019, 73% of the population of the Philippines were connected to the internet. Internet traffic generated across both fixed and mobile networks has been growing strongly at around 63% annually from 2010 to 2019, reaching a total of 15EB in 2019.

There are two main telecoms service providers in the Philippines with an upcoming third entrant:

- **PLDT**, the incumbent operator with both fixed and mobile networks
- **Globe**, currently the largest MNO by subscribers
- **DITO Telecommunity**, a new MNO in the Philippines backed by China Telecom and planning to launch in 2021.

Fixed networks have fallen behind mobile networks in terms of coverage, with only roughly 40% of households[2] having access to fibre broadband, while 74% of the population are within range of 4G mobile services.[3] In terms of international connectivity, the Philippines is connected to eight international submarine cable systems that offered a total of 349Tbit/s in potential capacity[4] in 2019.

1 Google's network infrastructure investments contributed to higher internet usage in the Philippines, equivalent to 29% of internet traffic in 2019

Google's investments in network infrastructure not only improve service performance and reliability of its content and services, they also improve the overall performance and cost-effectiveness of internet infrastructure in the Philippines. Investments in submarine cables bring new supply and improve the diversity of international links. The connectivity improvements include lower latency, faster end-user speeds, lower cost of international connectivity and stimulation of new use cases. These effects translate into more internet traffic generated by both consumers and businesses in the Philippines.

Google is an investor in the **SJC**, a Pan-Asia cable launched in 2013 connecting Singapore, Japan, China, Hong Kong, the Philippines, Brunei and Thailand. In addition, Google has invested in the **PLCN** submarine cable with planned landings in the Philippines, as well as in Taiwan and the USA.

These cables bring a total of 190Tbit/s of potential capacity to the Philippines. While Google is an investor in these cables, it does not have landing points in the Philippines and it needs to purchase capacity provided by telecoms carriers to fulfil their capacity requirements.

While Google does not have capacity landing in the Philippines from these investments, these new cables improve supply of bandwidth and also improve route diversity. End-user latency in the Philippines could also improve. Our modelling found a correlation between Google's network investments and lower end-user latency; in the Philippines, this effect may be linked to end-user latency reductions of 48ms in 2019. IP transit prices in the Philippines are still high compared to well-connected economies in APAC (as seen in Figure 1) and we would expect further stimulation

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[2]   FTTx coverage and capex worldwide: forecasts and analysis 2019–2025, Analysys Mason Research

[3]   Analysys Mason Research

[4]   Refers to the estimated theoretical maximum capacity that a cable could handle with current technology

of submarine cables investments, in particular from non-incumbent telecom operators, to bring down costs of international capacity to the Philippines.

Figure 1: IP transit prices[5] across APAC [Source: TeleGeography, Analysis Mason, 2019]
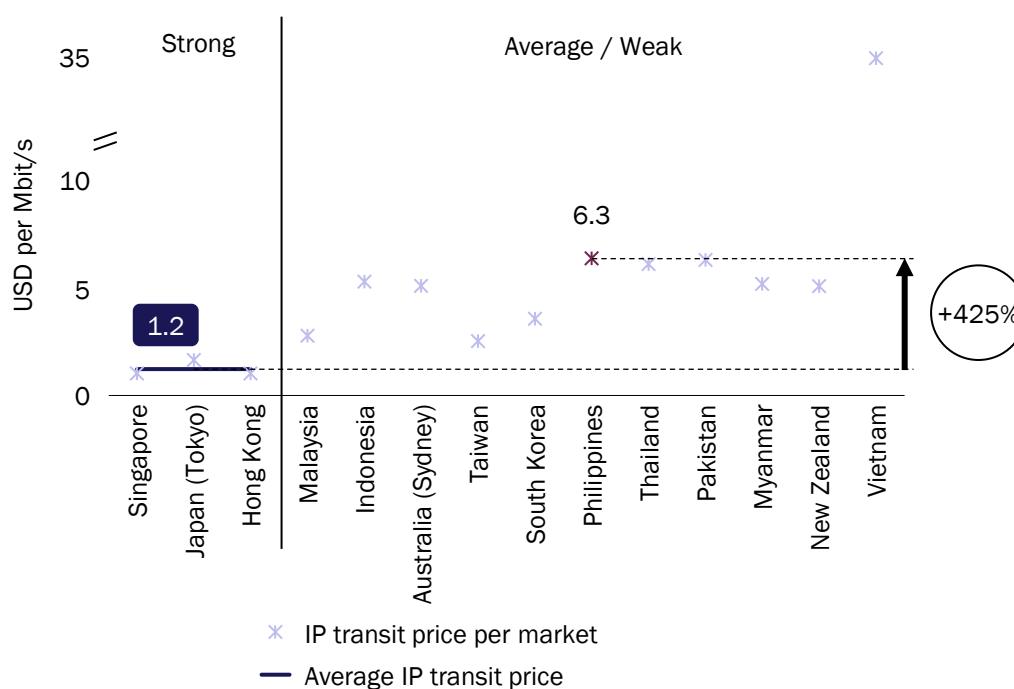
While there are no Google PoPs in the Philippines at present, GGC nodes have been deployed in operator networks in eight cities across the Philippines which bring popular Google content closer to end users. In 2019, the Philippines had an average download speed that was low compared to other APAC economies as shown below in Figure 2. Further stimulation of investments in network infrastructure will help to improve end-user speeds in the Philippines.

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[5]   Refers to USD per Mbit/s of IP transit prices in 2019 based on the committed data rate of 10Gbit/s from TeleGeography; calculation is based on averaging the weighted median prices by cities and quarters (up to Q3 2019) to derive 2019 prices; IP transit price data for 10Gbit/s is referenced, as it provides the highest number of available data points (14 APAC economies with submarine cables)

*Figure 2: Download speed comparison [Source: M-lab, 2019]*
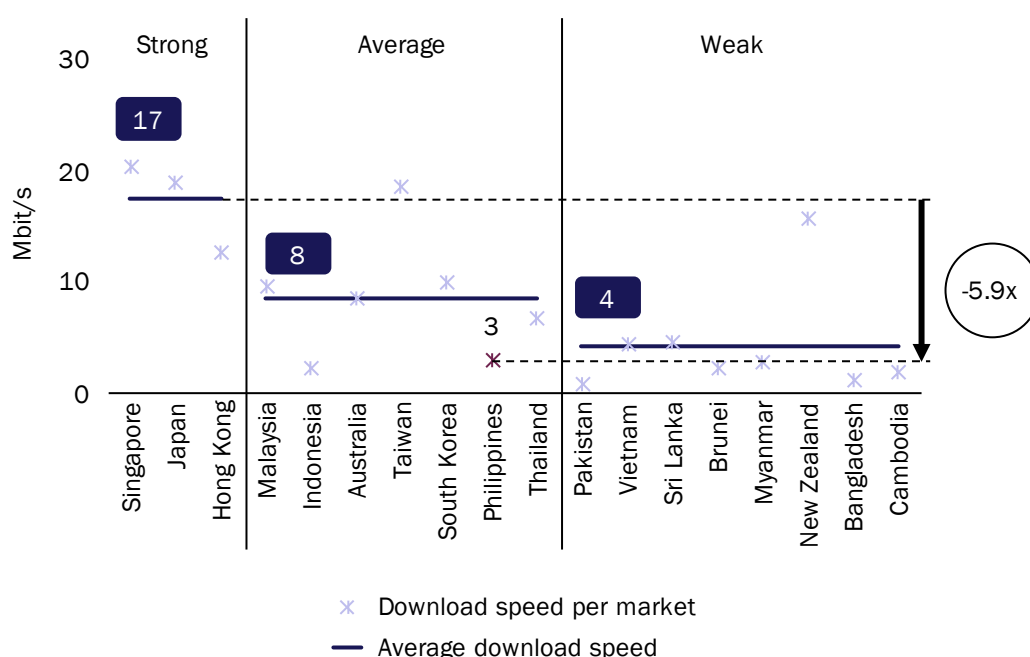
Improvements in latency and internet speed increase ISPs' ability to deliver innovative services such as cloud services, video conferencing and gaming. Low latency is also critical for transactional services, including e-commerce.

The end result of these improvements is greater demand for the internet in the Philippines: based on Analysys Mason's modelling, we estimate that internet traffic in the Philippines would have been 29% lower in 2019 if Google had not made investments in network infrastructure, and this impact could increase to 53% by 2024, as seen below in Figure 3.[6]

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[6]   This takes into account the effect of the entire submarine cable system(s) that Google participates in. As explained in Annex A of the full report, the fact that Google was an investor in these systems appears to have a statistically significant effect on their impact in countries they serve.

Figure 3: Impact of Google's investments in network infrastructure on internet traffic served by Google's services in Philippines [Source: Analysys Mason, 2020]
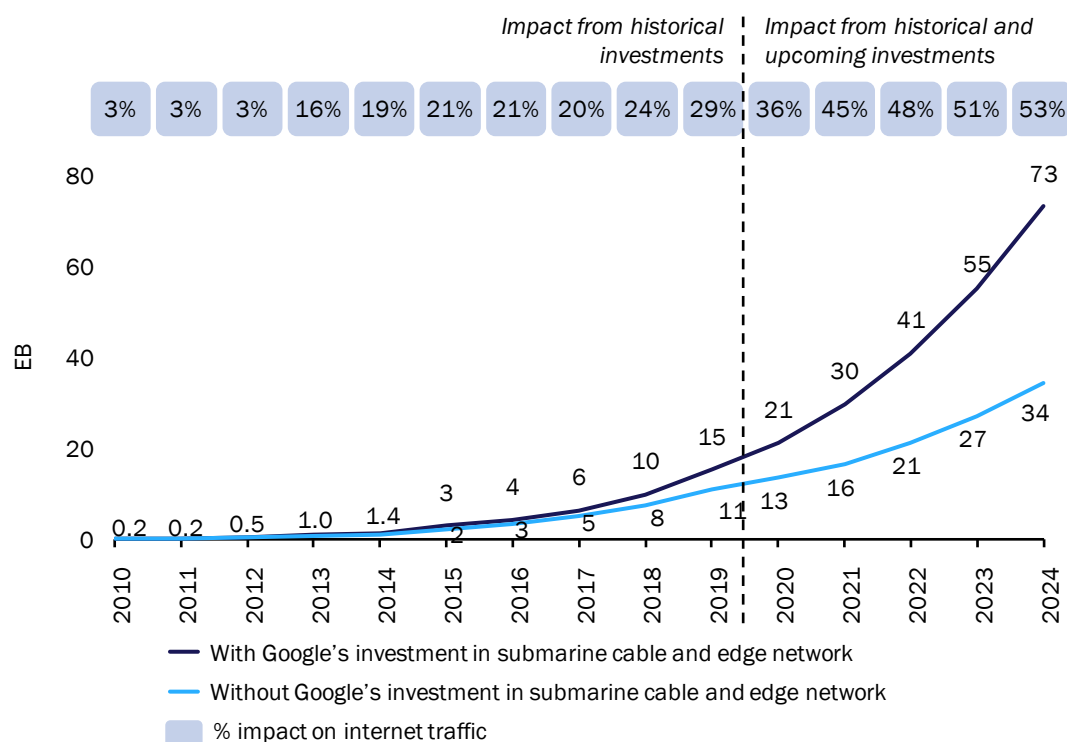
2 The impact of Google's network infrastructure investment benefits the internet ecosystem in the Philippines, supporting 93 000 jobs and led to USD3 billion in additional GDP in 2019

The increase in internet use has a positive impact on economic activity across various sectors, leading to benefits for consumers and businesses. We estimate that the increase in internet usage contributed USD14 billion in GDP impact (in real terms[7]) in the Philippines from 2010 to 2019; in 2019, we estimate that GDP would have been 0.62% lower in the scenario where Google had not made investments in network infrastructure.

Google's continued network investments from 2020 onwards are expected to spur higher internet traffic usage. The historical and continued investments are expected to contribute an additional USD22 billion in GDP impact from 2020 to 2024, of which USD5 billion would be in 2024 alone (see Figure 4 below). This GDP impact represents the mid-range of Analysys Mason's modelling estimates and could range between USD2 billion and USD58 billion from 2020 to 2024 (see Figure 5 below).

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[7]   GDP figures are in constant USD using 2019 as the base year and using a fixed exchange rate to USD in 2019; GDP statistics in USD are sourced from the World Bank and Euromonitor

Figure 4: Increase in real GDP attributable to Google's network infrastructure investments in the Philippines [Source: Analysys Mason, 2020]
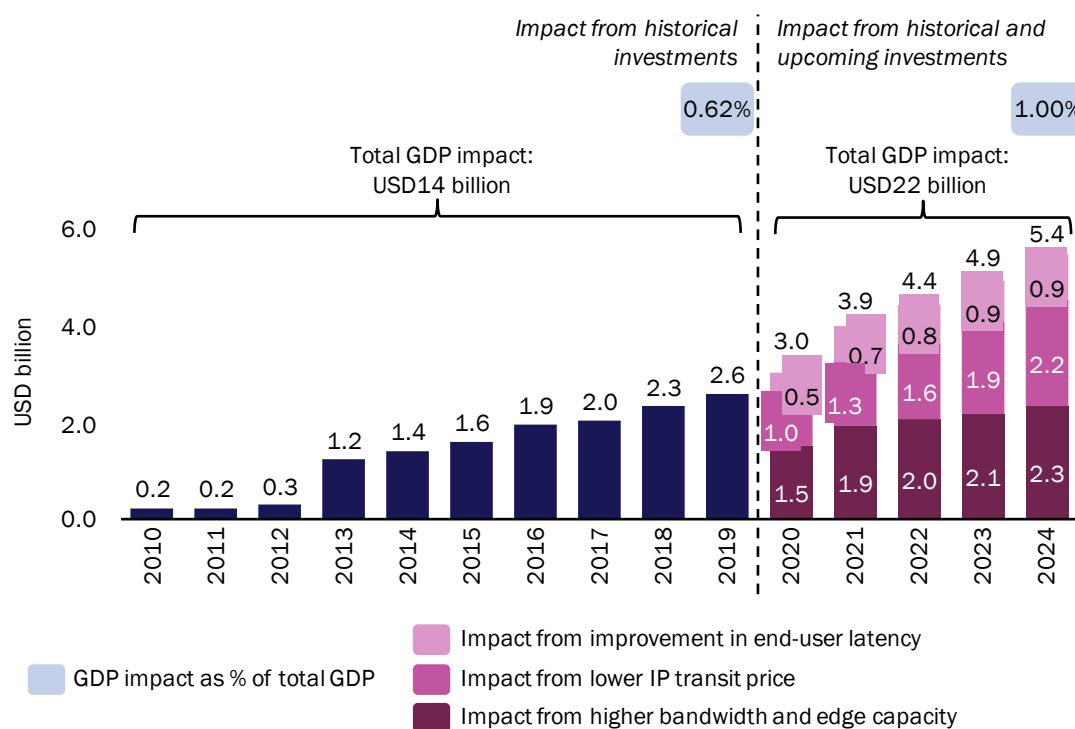
Figure 5: Increase in real GDP from 2020 to 2024 attributable to Google's network infrastructure investments in the Philippines by modelling scenarios and connectivity components [Source: Analysys Mason, 2020]

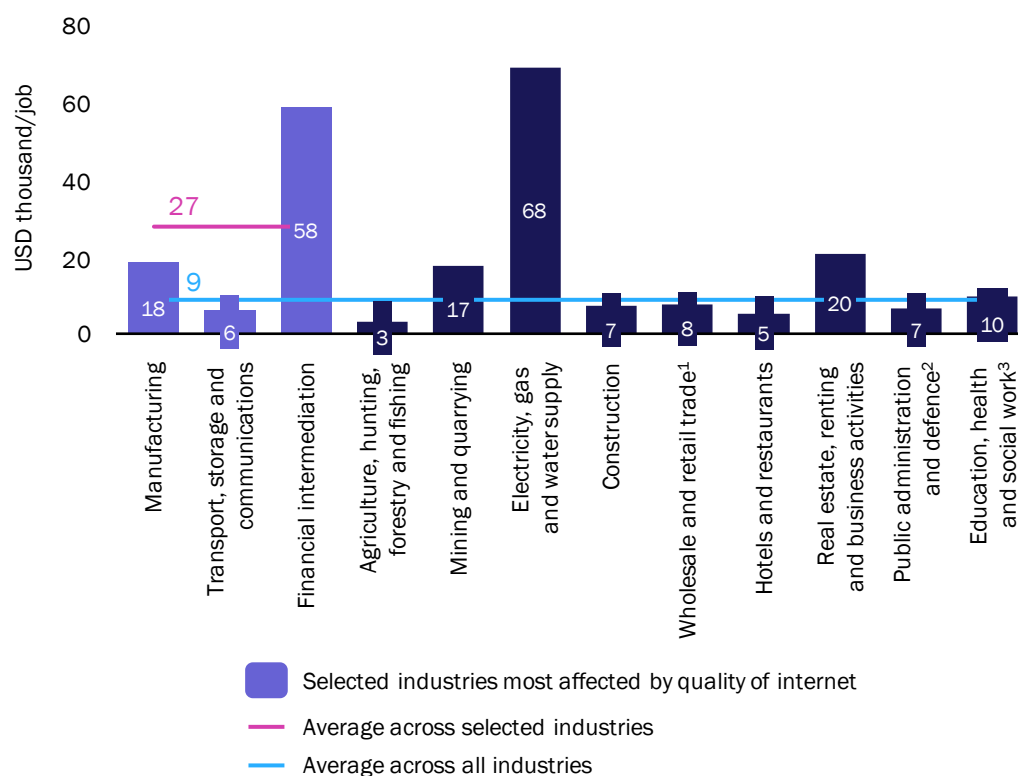| Drivers of data traffic impacting GDP	Conservative[8]	Base case[9]	Aggressive[10]
Bandwidth and edge impact + IP transit price + Latency impact	9	22	58
Bandwidth and edge impact + IP transit price impact	8	18	47
Bandwidth and edge impact only	2	10	33

The economic benefits arising from Google's network infrastructure investments translate into jobs: direct jobs in the construction and telecoms sector and indirect jobs driven by the improvement of broadband connectivity across the broader economy, particularly in industries such as IT, financial services and manufacturing. Based on an assessment of gross value added (GVA) across industries in the Philippines, we estimate that, in 2019, the average GVA per job was USD27 000 in industries most affected by the quality of the internet (see Figure 6 below).

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[8]   The conservative modelling scenario refers to the use of coefficients (within the 95% confidence interval) in the supply and demand side equations to provide the lowest GDP impact. Specifically, the highest coefficient values are used in the supply side equation for latency and both latency and IP transit price variables in the demand side equation for mobile data usage; the lowest coefficient values are used in the supply side equation for internet bandwidth and internet bandwidth variable in the demand side equation for mobile data usage

[9]   The base case modelling scenario refers to the use of mid-point coefficients (within the 95% confidence interval) in the supply side equations (coefficients for submarine cable count and Google submarine cable percentage variables) and demand side equation (coefficients for internet bandwidth); Latency and IP transit price variables in the demand side equation are kept at the highest coefficient values which provides the lowest GDP impact

[10]   The aggressive modelling scenario refers to the use of coefficients (within the 95% confidence interval) in the supply and demand side equations to provide the highest GDP impact while keeping latency and IP transit variables unadjusted (see above base case modelling scenario). Specifically, the lowest coefficient values are used in the supply side equation for latency; the highest coefficients are used for the supply side equation for internet bandwidth and the internet bandwidth variable in the demand side equation for mobile data usage

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Figure 6: 2019 GVA per job by industry in the Philippines [Source: Analysys Mason, national statistics authority via Euromonitor, 2020]

Selected industries most affected by quality of internet

Average across selected industries

Average across all industries

[1] Includes repair of motor vehicles, motorcycles, personal and household goods

[2] Includes compulsory social security

[3] Includes other community, social and personal service activities

Based on this assessment, we estimate that Google's network and its impact on GDP translated to around 93 000 jobs by 2019, which will grow to 162 000 jobs by 2024 (see Figure 7 below).

Figure 7: Impact of Google's network investments on job creation in the Philippines [Source: Analysys Mason, 2020]
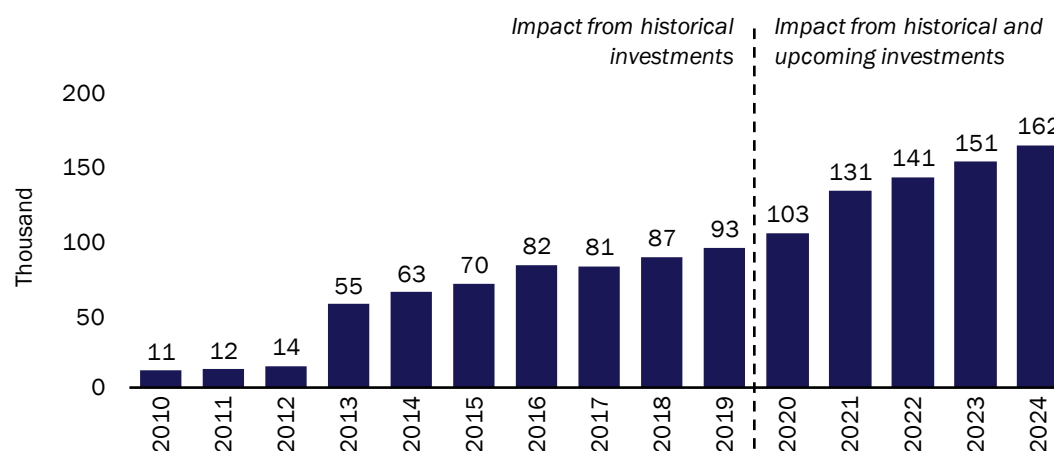
3 The Philippines could consider adoption of regulatory best practices to stimulate more investment in network infrastructure

The Philippines is viewed as one of the most restrictive jurisdictions with regards to deployment and landing of submarine cables in the APAC region, as revealed through interviews with submarine cable owners. Uncertainties on the licensing and permit application process as well as difficulties in negotiating access to cable landing stations are some of the main issues encountered in the Philippines. In order to unlock the economic benefits brought about through the stimulation of more investments in network infrastructure, the Philippines could consider the adoption of best practices from jurisdictions with strong international connectivity.

These other jurisdictions in the region typically have favourable regulatory conditions, including clear licensing procedures, relatively straightforward licensing processes, fair and cost-oriented access to cable landing stations, investment policies that are open to foreign investors, cable protection laws and flexible cabotage provisions for cable repairs and maintenance. They also have strong regulatory enforcement principles with adherence to lawful procedures.