



SEPTEMBER  
2022



# The Pacific Caught in the World Wide Web?

## Geopolitics of Submarine Cables in Oceania

Camille MOREL

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ISBN: 979-10-373-0587-9

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Cover: © Orange Marine

#### **How to quote this publication:**

Camille Morel, “The Pacific Caught in the World Wide Web? Geopolitics of Submarine Cables in Oceania”, *Études de l’Ifri*, Ifri, September 2022.

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# Abstract

This article provides a review of the digital connectivity of the insular Pacific nations (Polynesia, Melanesia, and Micronesia) and the main challenges and prospects arising from it, at a time when the submarine cable market is undergoing profound change, including the entry of new players (American internet giants as investors; Chinese firms as cable manufacturers) and a growing politicization of this technology on the international scene.

In 2022, the 450 fiber-optic cables stretching across the world's seabed carry more than 98 percent of international data and have become essential to the proper functioning of our societies. Submarine cable connection is all the more important to the geographically isolated Pacific islands because it enables them to digitize various sectors of the economy and society (industry, education, health, etc.) and to maintain a virtual link to the rest of the world. When a submarine cable is disabled, satellite links cannot completely offset this loss.

The topic of submarine cables in Oceania is inextricably tied up with the geopolitics of the Indo-Pacific and rivalries between powers. Because of the long distances separating them from the rest of the world and the high cost of cables, the island territories of the Pacific are more liable to be dependent on other countries and subject to outside influence. Cables are also involved in the escalation of maritime competition between states, in a context of military, economic, demographic, and environmental issues, including seabed warfare.

Against the backdrop of growing connectivity in the Pacific region since 2011 and the rise of China, the Pacific Ocean has become one of the three main routes for data in the twenty-first century. Within the region, the insular Pacific has several distinguishing features:

- Because of its particular geography, it appears under-meshed compared with the northern trans-Pacific route and the inter-Asia links. It looks more like a transit zone than a genuine space for investment.
- Its ecosystem and the methods used by public and private actors to commission, manage, and operate submarine links in the region have been adapted to local constraints and challenges.
- The main winners in this scenario are Australia and the United States, while the main loser is China, whose growing ambitions in the region are continuously thwarted.

- As a stage for Sino-American rivalry, the insular Pacific has to adapt to circumvent political difficulties and respond to its population's urgent need for digital resilience.
- This challenge seems likely to result in a number of alternative cable projects emerging, offering new opportunities in the digital domain.

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# Introduction

In January 2022, a volcanic eruption cut the only fiber-optic cable linking Tonga with the rest of the world—the Tonga Cable to Fiji—leaving Tonga in a state of information isolation that caused serious economic losses, as well as making it impossible to coordinate international humanitarian assistance quickly and effectively. In one stroke, it focused attention on the importance of submarine communications cables for isolated Pacific territories.<sup>1</sup>

While it is now common knowledge that submarine cables are the main route by which information travels around the world, their scale is substantially underestimated. In 2022, the 450 fiber-optic cables crossing the world’s seabed<sup>2</sup> carry more than 98 percent of our data and are essential to the proper functioning of our societies, which have become dependent on digital technology. Most of our daily activities—whether they are economic (online shopping and banking, high-frequency trading), administrative (voting, filing tax returns, contacting foreign embassies), or social (social media, phone calls to other countries, email conversations, etc.)—require an internet connection and the movement of data around the world.

Connection by submarine cable is all the more important to the geographically isolated islands of the Pacific. The arrival of international bandwidth did not just enable the digitization of various sectors of the economy and society (industry, education, health, etc.), contributing to gains in productivity, employment, and social progress. It also enabled Pacific islands to establish a constant virtual link to the rest of the world, and when a submarine cable is disabled, satellite links are insufficient to completely offset this loss.

The Pacific did not benefit from the advent of telegraph cables in the nineteenth century, but its situation gradually improved from the turn of the twentieth century. In 1902, the political impetus of the “All-Red Line” led to Australia and New Zealand being connected to the rest of the world by the British telegraph cable network. One line connected Vancouver to Brisbane, via Fanning Island (Kiribati), Fiji, Norfolk Island, and New Zealand. A few years later, the Hawaiian Islands and Guam would be connected to Asia and the United States. Now, in 2022, the Pacific is largely covered by a mesh network and has become one of the three main routes for

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1. W. Qiu, “Tonga Cables Cut After Volcanic Eruption, At Least Four Weeks to Restore”, Submarine Cable Networks, January 19, 2022, [www.submarinenetworks.com](http://www.submarinenetworks.com).

2. According to data provided by TeleGeography, a telecommunications market research and consulting firm.

data. However, it is far from being a uniform whole when it comes to digitization. Looking at the map, three large geographic segments emerge: the northern trans-Pacific route, the intra-Asia routes, and Oceania.

In this paper, we will focus on the submarine cables linking the territories of Oceania. European political and strategic attention has been focused on the Indo-Pacific for some time but is now increasingly turning toward the South Pacific,<sup>3</sup> which is a stage for rivalries between major powers, in particular China and the United States. In the domain of digital technologies, these rivalries appear to be especially acute. The battle for influence between China and the traditional Pacific powers is being played out in Oceania through 5G mobile phone networks as well as through submarine communications cables. In 2018, the Australian government decided to ban the Chinese firms ZTE and Huawei from its 5G mobile network.<sup>4</sup> In the same year, it also rejected a plan for a cable connecting Australia to the Solomon Islands and Papua New Guinea that would have been built by the Chinese firm Huawei Marine Networks (rebranded in 2020 as HMN Technologies).<sup>5</sup>

Cables are also involved in the escalation of maritime competition between states, in a context of military issues such as seabed warfare as well as economic, demographic, and environmental challenges. Since the start of 2022, cables have been the focus of particular attention in several contexts. They are mentioned in the *Stratégie ministérielle de maîtrise des fonds marins*<sup>6</sup> (Seabed Warfare Strategy) published by the French government, which aims to acquire additional capability to monitor infrastructure located on the seabed. Cables have also been discussed in international negotiations under the aegis of the United Nations aiming to establish a treaty to protect biodiversity in the high seas.<sup>7</sup> Further, the conflict in Ukraine has shown that communications infrastructure remains a prime target during international tensions and military interventions.<sup>8</sup>

The topic of cables in Oceania is therefore inextricably tied up with the geopolitics of the Indo-Pacific and the logic of power. Because of the long distances separating them from the rest of the world and the cost of cables, the island territories of the Pacific are more liable to be dependent on and

3. C. Pajon, "Two Shades of Blue: Europe and the Pacific Islands, Strategic Partners in the Indo-Pacific Era", *Briefings de l'Ifri*, April 21, 2022.

4. S. Dumoulin, "Huawei et ZTE exclus du marché australien de la 5G", *Les Echos*, August 23, 2018.

5. J. Loughran, "Huawei's Undersea Internet Cable Banned by Australia Over Spying Fears", *E&T Magazine*, January 2, 2018.

6. Ministère des armées, *Stratégie ministérielle de maîtrise des fonds marins*, February 2022.

7. United Nations, *Intergovernmental Conference on Sustainable Use of Marine Biodiversity to Hold Fourth Session at United Nations Headquarters, 7–18 March*, SEA/2138, March 7, 2022.

8. The Russian army is accused of having carried out a cyber-attack against the commercial satellite network Viasat, disabling tens of thousands of terminals. The Russians also repeatedly threatened to cut submarine cables, particularly in response to the economic sanctions imposed by the West.



subject to outside influence—or, at least, such is the fear expressed by Westerners worried by the arrival of Chinese cable projects in these territories.

This paper will focus on the sea connectivity of the nations of the insular Pacific (Polynesia, Melanesia, and Micronesia). However, because of the essentially international nature of submarine cables, it will use a range of levels of analysis to define the local digital issues. It offers a review of the digital connectivity of the nations of the insular Pacific and the main challenges and prospects arising from it, at a time when the submarine cable market is undergoing profound change, with the entry of new investors (American internet giants) and new cable manufacturers (Chinese firms) and the growing politicization of this technology on the international scene.

# Review of the Digital Connectivity of the Pacific

## An Attractive Ocean Despite the Considerable Geographic and Environmental Constraints

### *Growing Connectivity*

Although growth was restrained for much of the first decade of the twenty-first century,<sup>9</sup> investment in new cables took off in 2011 as the American internet giants Google, Meta, Amazon, and Microsoft, entered the market. These content providers, attracted by the changes in local populations' digital habits,<sup>10</sup> enabled connectivity projects to be launched in the area, leading to increased numbers of cables and a diversification of their routes.

It seems inappropriate, however, to talk about the Pacific Ocean as a whole, as connectivity in the region appears to be developing at different speeds:<sup>11</sup>

- The northern trans-Pacific route is one of the world's three information highways, with more than thirteen high-capacity submarine cables transmitting a total of 657 terabits per second (Tbps).<sup>12</sup> As a result of growing demand for bandwidth and a desire to diversify the routes that data can take, eight new cables are planned for this route by 2024. Its dynamic is similar to that of the northern transatlantic route.
- Australasia<sup>13</sup> also has numerous links, essentially regional in scale but growing strongly since 2008: in 2022, there are more than a hundred cables linking the coastal nations of Asia to each other. The density of cables in this zone is partly explained by the growing connectivity of the populations and of the emerging economies of Southeast Asia.
- The region of Oceania is crossed by a smaller number of submarine cables linking the Pacific islands to each other or to the larger regional

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9. Submarine Telecoms Forum, *SubTel Forum Industry Report, 2021/2022*, p. 116.

10. TeleGeography, "Content Providers", Global Bandwidth Research Service (data set, accessed 2019).

11. Submarine Telecoms Forum, *SubTel Forum Industry Report, 2021/2022*.

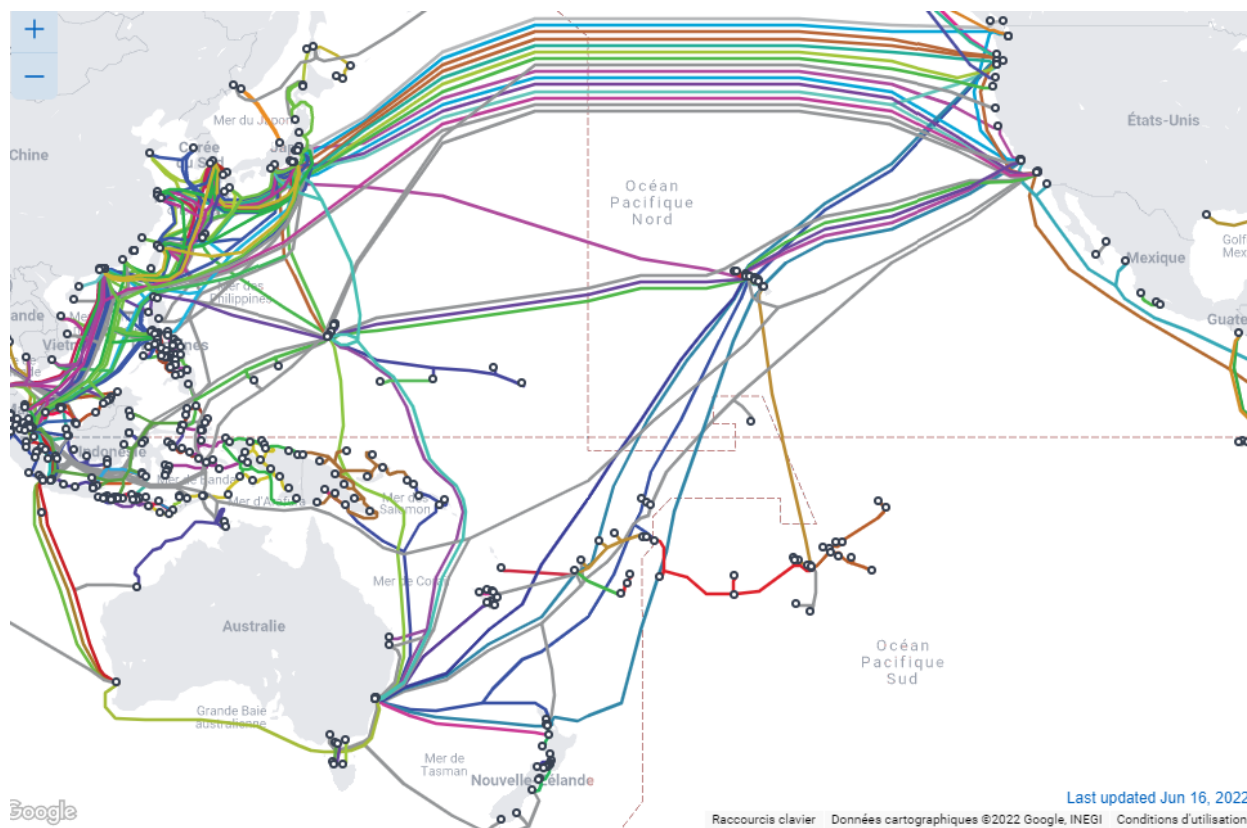
12. The measure indicating the average speed at which data are transferred through the optical fiber: the bit rate is expressed in trillions of "bits" per second.

13. Used here to mean intra-Asia links, with Australia and New Zealand as the southern border.

hubs such as Australia, Hawaii, and Guam. These links have a relatively low capacity of 19.8 Tbps on average, which is partly explained by the low population density (5.06 inhabitants/km<sup>2</sup>)<sup>14</sup> and an internet penetration rate that is lower than in the rest of the Pacific.

Between 2013 and 2022, Australasia has been the most dynamic region, accounting for 37 percent of all projects. However, prospective analyses show that between 2022 and 2027<sup>15</sup> it will account for only 19 percent of new investments, less than the region comprising Europe, the Middle East, and Africa, with 28 percent. The winner will be the trans-Pacific route, which will represent 14 percent of investment in this coming period, compared with 3 percent previously.<sup>16</sup>

### Map of active and planned cables in the Pacific in 2022



Source: [www.submarinecablemap.com](http://www.submarinecablemap.com).

14. Data taken from [www.populationdata.net](http://www.populationdata.net), accessed June 30, 2022.

15. Submarine Telecoms Forum, *Submarine Cable Almanach*, No. 41, March 2022, p. VI.

16. Submarine Telecoms Forum, p. VII.

## ***Distinctive Geographic and Environmental Features***

Installing infrastructure that crosses an area as vast as the Pacific (a third of the Earth's surface) is a major challenge. Cable ships laying and repairing fiber-optic lines work under pressure, as the possibility of putting in at port during these operations is limited or even non-existent, and the deadlines imposed are ever tighter. Submarine cables in the Pacific are generally long and often do not have intermediate connections, especially in the northern Pacific. However, their length can vary considerably, depending on the network topology and their location—around 1,300 km for a regional cable such as the Malaysia-Cambodia-Thailand (MCT) system and up to 17,000 km for a trans-Pacific cable such as the Trans-Pacific Express (TPE), which links the United States, China, Japan, Taiwan, and South Korea.<sup>17</sup>

The marine environment of the Pacific is also very diverse: the wide open spaces of the northern Pacific stand in contrast to the Southeast Asian seas, which are characterized by a series of basins linked by straits, or “chokepoints”.<sup>18</sup> Laying cables is particularly tricky in such areas, especially as the depth of the waters can vary considerably (for example, the southern part of the South China Sea, below an invisible line joining Brunei to Ho Chi Minh City, is very shallow, at less than 75 meters<sup>19</sup>), and the existence of mandatory corridors (such as the Taiwan and Malacca Straits, which are no more than 50 meters deep) leads to a concentration of cables in areas with high levels of shipping traffic. These pressures increase the risk of damage and accidental cuts; already, more than 60 percent of damage to cables is caused by competing maritime activities (for example, cables being cut by fishing nets or anchorage).<sup>20</sup>

Significant natural phenomena can also damage the undersea network. In 2006, the Hengchun underwater earthquake, of 7.2 magnitude on the Richter scale, led to several cables being cut simultaneously in the waters off Taiwan, in the Luzon Strait, affecting the internet traffic of several countries in the region (China, Hong Kong, Vietnam, the Philippines, Singapore, and Japan<sup>21</sup>). Other natural hazards such as volcanic eruptions can also affect cables in the Pacific, as occurred in Tonga in early 2022.

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17. TeleGeography, *Submarine Cable Map*, [www.submarinecablemap.com](http://www.submarinecablemap.com), accessed June 30, 2022.

18. F.-X. Bonnet, “Charting Submarine Routes in Southeast Asia”, *Hérodote*, Vol. 176, No. 1, 2020, pp. 25–41.

19. F.-X. Bonnet, pp. 25–41.

20. “Submarine Cable Frequently Asked Questions”, *TeleGeography*, accessed June 30, 2022, [www.telegeography.com](http://www.telegeography.com).

21. W. Qiu, “Submarine Cables Cut after Taiwan Earthquake in Dec 2006”, *Submarine Cable Networks*, March 19, 2011, [www.submarinenetworks.com](http://www.submarinenetworks.com).

Finally, the richness of the marine ecosystems of the Pacific, and especially those of Oceania, means that biodiversity must be protected during operations to install cables serving the islands and archipelagos. Although the mere presence of fiber-optic cables in the seabed sediment may not necessarily affect infauna species, the laying and repairing of cables can certainly disturb the marine environment.<sup>22</sup> This is particularly likely during trenching, which consists of burying cables in the sand during installation. In a region with numerous protected spaces, there are few places where new cables can be laid.<sup>23</sup> Although certain techniques can reduce these impacts and make cable-laying possible in the sensitive zones, they increase the cost of the cable, which is already a problem.

## A Politicized Network

### ***A Zone Marked by China's Growing Power***

Acknowledging the importance of submarine cables to its national economy, China substantially increased its investment in the market between 2015 and 2019.<sup>24</sup> The Chinese strategy documents on the Belt and Road Initiative also refer to the role of the digital domain and submarine cables in China's axes of influence.<sup>25</sup> This political desire to assert itself in the cable domain is manifested in the development of submarine lines physically linking China to foreign territories, in the installation further afield of lines in which Chinese telecommunications operators are stakeholders (owners, financiers, or ship owners), and in the manufacture of cables in China or by Chinese actors.

In 2022, sixteen of the many active cables linking China to the rest of the world are located in the Pacific Ocean.<sup>26</sup> Although China's position appears central with regard to existing intra-Asia connections, it remains secondary with regard to trans-Pacific routes, which favor Japan as the main landing point. Japan is the landing point for nine of the fourteen international cables in existence in 2022, while China is connected to only two. In 2020, four trans-Pacific cable projects sponsored by the tech Big Five (Google, Amazon, Apple, Meta, and Microsoft) planned to make landfall in China: Bay to Bay Express (BtoBE), Hong Kong-Guam (HK-G),

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22. L. Carter *et al.*, *Submarine Cables and the Oceans: Connecting the World*, UNEP-WCMC Biodiversity Series No. 31, ICPC/UNEP/UNEP-WCMC, 2009.

23. Including protected marine areas. See É. Largenton, "Décryptage: les aires marines protégées du Pacifique", *Nouvelle Calédonie* 1, January 29, 2016, [www.la1ere.francetvinfo.fr](http://www.la1ere.francetvinfo.fr).

24. Major M. Yeng Seng Chan, Republic of Singapore Navy, "The Undersea Cauldron: China's Rising Challenge to U.S. Undersea Dominance", *The Submarine Review*, December 2018, pp. 7–23; p. 15.

25. S. Siddiqui, "BRI, BeiDou and the Digital Silk Road", *Asia Times*, April 10, 2019.

26. TeleGeography, *Submarine Cable Map*, [www.submarinecablemap.com](http://www.submarinecablemap.com), accessed on June 30, 2022.

Hong-Kong-Americas (HK-A), and Pacific Light Cable Network (PLCN).<sup>27</sup> However, the United States systematically blocked these cables on the grounds that the planned landfall location, Hong Kong, represented a threat to national security, believing that a cable making landfall on Chinese territory risked exposing the data transmitted to surveillance and interception by Beijing.<sup>28</sup>

Only two cables currently connect China to a nation in the Pacific. One is the Sea-Me-We3 cable linking China and Australia and passing through many other territories, including Indonesia, Brunei, and Vietnam. The other is the Asia-America Gateway (AAG) cable, which since 2009 has linked the United States to China, Brunei, Thailand, the Philippines, Vietnam, and the island of Guam. However, there is an industrial strand to Chinese strategy that might lead China to produce and lay future cables to interlink the islands of Oceania. Because of the state support it enjoys, Chinese industry, whose importance in this sector continues to grow, is in a position to develop a commercial offering that is more attractive than its competitors'.<sup>29</sup> For example, the Chinese cable manufacturer Huawei Marine Networks (HMN Technologies) is reported to have responded to a call for tenders for the East Micronesia Cable project with a budget almost 20 percent lower than that of its competitors, Alcatel Submarine Networks (ASN) and NEC.<sup>30</sup>

In 2022, only ten of the cables in the Pacific were made by Chinese manufacturers, and most of these are concentrated in the South Pacific and Southeast Asia:

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27. The following cables were involved:

- *Bay to Bay Express (BtoBE)* This cable was intended to link the United States, Hong Kong, Malaysia, and Singapore. It was sponsored by a consortium comprising Facebook, Amazon, and China Mobile International, but was rejected in 2020.
- *Hong Kong-Guam (HK-G)* This cable would have linked Hong Kong Bay to the island of Guam from 2012, but was turned down by the US government in 2020.
- *Hong Kong-Americas cable (HK-A)* In 2018, Facebook, China Telecom, China Unicom, RTI Express, Tata Communications, and Telstra proposed this plan for a direct cable between Hong Kong, Taiwan, and the United States, but the project was withdrawn in 2021.
- *Pacific Light Cable Network (PLCN)* This cable would have linked Hong Kong to Taiwan, the Philippines, and the United States. Financed by Facebook and Google's parent company, Alphabet, the project was halted in 2021 but resumed in 2022, with a new proposed route avoiding Hong Kong and heading directly toward Taiwan and the Philippines.

28. Other threats were also mentioned, such as a risk of long-term dependency and the potential abuse of this infrastructure. See M. Velliet, "Convince and Coerce: U.S. Interference in Technology Exchanges Between its Allies and China", *Études de l'Ifri*, Ifri, February 2022.

29. Huawei Marine Networks, which was a direct subsidiary of Huawei until 2019, rapidly became established in a sector that had hitherto been the preserve of a small number of actors. It is suspected of having close links with the Chinese government. See Assemblée Nationale, *Rapport d'enquête No.897*, April 19, 2018, [www.assemblee-nationale.fr](http://www.assemblee-nationale.fr).

30. J. Barrett, "U.S. Warns Pacific Islands about Chinese Bid for Undersea Cable Project—Sources", *Reuters*, December 17, 2020.

- Papua New Guinea has had the Kumul Domestic Submarine Cable System since 2019.
- Indonesia has had two Chinese-manufactured domestic cables, the Mataram Kupang Cable System (MKCS) and the Palapa Ring Middle (PRM), since 2018.
- The Philippines have been linked to the Converge Domestic Submarine Cable Network (CDSCN) since 2021.
- Malaysia, Cambodia, and Thailand have been linked by the MCT cable since 2017.
- The Batam-Dumai-Melaka (BDM) cable has linked Indonesia to Malaysia since 2009.

In addition to these completed projects, new projects involving HMN Technologies are expected in the next few years, such as the SIGMAR (Singapore-Myanmar) cable in 2023 and the South-East Asia Hainan-Hongkong Express (SEA-H2X) cable in 2024. Many Chinese telecommunications operators, such as China Telecom, China Mobile, China Unicom, PCCW, and HKBN, also participate in Pacific cable consortia.

Today it is obvious that China is using cables in the Pacific as instruments of its policy of appropriating territory and asserting sovereignty at sea. By favoring Chinese manufacturers and imposing ever stricter limits on permits awarded to foreign private-sector organizations for laying and repairing cables in the South China Sea, China could contribute to a redrawing of the digital map in Asia.<sup>31</sup> At the same time, Beijing is using cable-laying to assert its presence in waters over which it claims sovereignty. For example, China carries out surveys of the seabed in contested exclusive economic zones (EEZ) without notifying the other state concerned. The mapping, feasibility research, and seabed surveys that are essential for identifying the best possible route for a cable allow China to occupy the space and assert its presence on the scene. In June 2022, China is reported to have carried out seabed surveys in Japan's EEZ, near the Senkaku islands over which China claims sovereignty, without requesting Japan's permission beforehand.<sup>32</sup>

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31. C. Morel, Telephone interview with a representative of Alcatel Submarine Networks, December 16, 2021.

32. J. Ryall, "China 'Testing' Tokyo with Underwater Survey off Japan's Coast, Analysts Say", *AsiaOne*, June 7, 2022, [www.asiaone.com](https://www.asiaone.com).



## ***Redrawing the Map: Southeast Asia, the New Center of Gravity***

Because of these two political constraints—on the one hand, the American policy of systematically blocking cable projects to connect the United States to China *via* Hong Kong, and on the other, the restrictive Chinese policy limiting cable-laying in the South China Sea—investors, led by the internet giants, are attempting to identify new routes that will allow them to circumvent the “Chinese problem” over the next few years and connect North America directly to Southeast Asia without passing through China or the South China Sea.<sup>33</sup>

Until now, cables coming from the United States have mainly sought to connect Japan, Hong Kong, and Singapore. In parallel, from 2009 onward, digital infrastructure and equipment, including many data centers, have been built in these locations. Most of the existing cables pass through the Luzon Strait and cross the South China Sea to reach Singapore. Today however, a new map is being drawn, on which alternative routes and new hubs are emerging.

The internet giants’ most recent projects provide a good illustration of this changed map. The Echo<sup>34</sup> and Bifrost<sup>35</sup> cables, launched by Google and Meta in the Pacific and planned for 2023 and 2024, start in North America and make landfall on Guam and Indonesia’s main islands before reaching Singapore. On this new route, the cables pass through the Java Sea and not the South China Sea, while the hubs are Indonesia and the Philippines rather than Hong Kong. By 2024, the Apricot cable sponsored by Google and Meta is set to connect Japan to Singapore, passing through the Java Sea. It will have branches serving Guam, the Philippines, Taiwan, and Indonesia.<sup>36</sup>

This redrawing has several advantages, in addition to circumventing the “China problem”. The first is that it diversifies the routes taken by data in the Pacific, which is a significant asset when there are problems with the traditional routes, and represents an investment opportunity for businesses in the sector. These cables will also make it possible to create direct, low-latency connections and increase transmission capacity by 70 percent between North America and Southeast Asia, where connectivity is growing and internet penetration levels are rising, along with the proportion of the population that uses applications provided by American content providers.

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33. C. Morel, Telephone interview with a representative of Alcatel Submarine Networks, December 16, 2021.

34. B. Koley, “This Bears Repeating: Introducing the Echo Subsea Cable”, *Google Cloud Blog*, March 29, 2021, [www.google.com](https://www.google.com).

35. K. Salvadori and N. Roehrich, “Advancing Connectivity Between the Asia-Pacific Region and North America”, *Engineering at Meta*, March 28, 2021, [www.engineering.fb.com](https://www.engineering.fb.com).

36. B. Koley, “Announcing Apricot: a New Subsea Cable Connecting Singapore to Japan”, *Google Cloud Blog*, August 16, 2021, [www.cloud.google.com](https://www.cloud.google.com).



Indonesia should therefore play an important future role in the digital architecture of the Pacific.<sup>37</sup> Already connected by many domestic cables and several regional and international ones, Indonesia is now preparing to receive even more. In March 2021, a decision by the Ministry of Marine Affairs and Fisheries<sup>38</sup> allowed public policy on the management of submarine infrastructure to be rationalized, including creating corridors reserved for landing cables and providing technical guidelines. Two further new projects, the Hawaiki Nui cable and the Asia Connect Cable (ACC-1), should also come to fruition in the near future. Other digital infrastructure continues to be developed in parallel, facilitating Indonesia's transition to a cable hub despite its complex geography.

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37. A. Falak Medina, "Indonesia's Palapa Ring: Bringing Connectivity to the Archipelago", *Asean Briefing*, January 28, 2020, [www.aseanbriefing.com](http://www.aseanbriefing.com).

38. No. 14/2021. See D. Dinarto, "The Security Challenges Facing Indonesia's Submarine Cable Communication System", *The Diplomat*, June 4, 2021, [www.thediplomat.com](http://www.thediplomat.com).

# The Insular Pacific: an “Exceptional” Zone in the Digital Domain?

## Review of the Oceania Cable Network

### *An Under-Meshed Zone*

Connectivity levels in the islands of the Pacific are currently, like the population density, relatively low. There are few cable routes serving the islands of Oceania, which are mostly connected by just one or two submarine cables that have lower capacities than those in other parts of the Pacific—19.8 Tbps on average, compared with an average of 24.64 Tbps for the cables connecting Australia and 40 Tbps on average for those connecting France—as the demand for bandwidth is lower there.

Oceania has around twenty-five active bilateral and multilateral submarine cables in total, i.e., excluding those that are purely domestic. Many of them are regional in scale, meaning they serve one or more additional territories within Oceania, while some are truly international, connecting with one or more territories outside our area of study, such as North America (Southern Cross Cable Network (SCCN) and Hawaiki), Asia (Australia-Japan Cable) or Europe (Sea-Me-We3).<sup>39</sup>

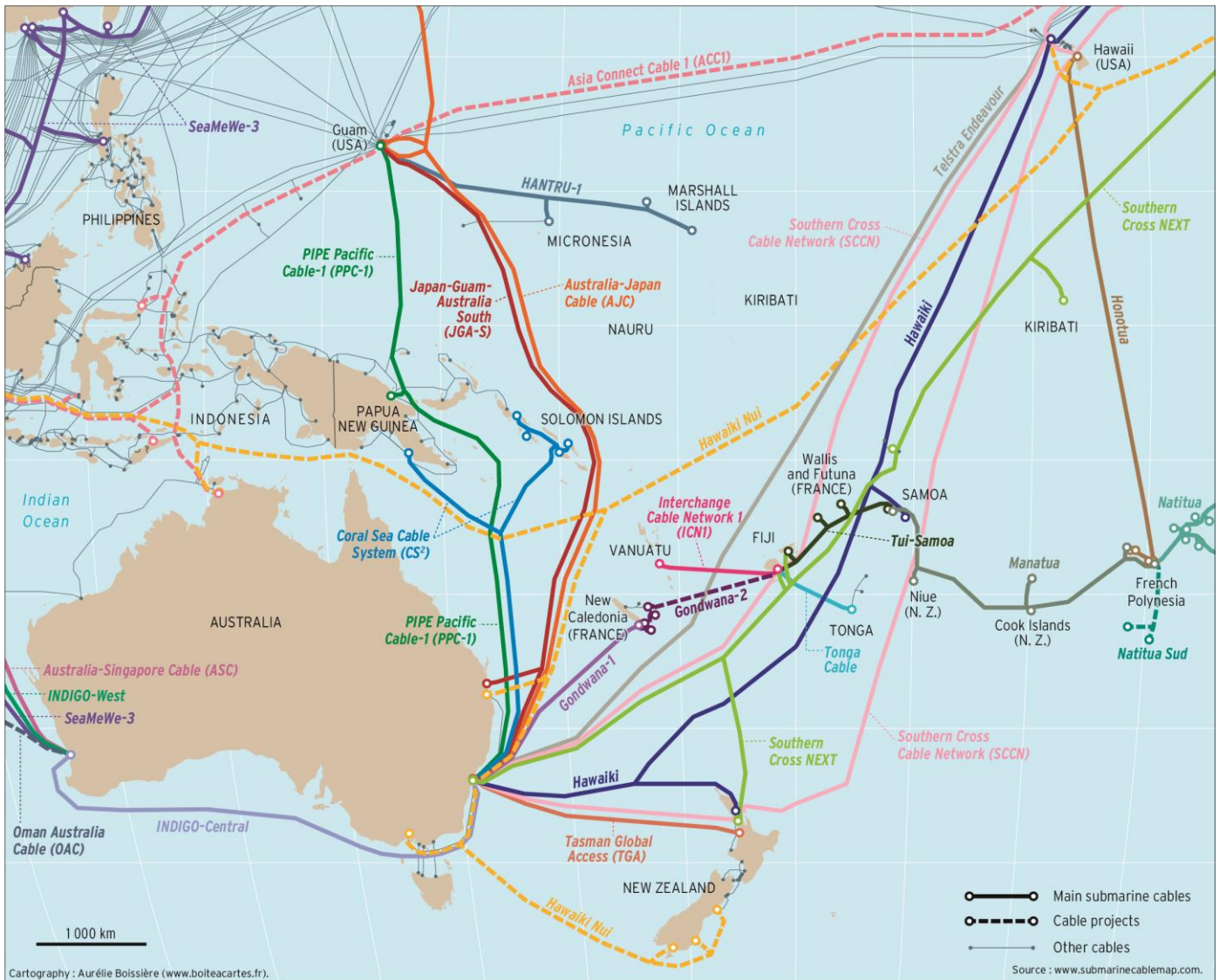
Connectivity in the different regions of Oceania varies.<sup>40</sup> The number of lines a territory has depends on its level of development, its sociodemographic characteristics, its geographical location, and its integration into the insular Pacific community. A higher level of connectivity boosts a territory's economic, diplomatic, and geopolitical status, giving it an advantage over less well-connected territories.

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39. The names of cables located in the insular Pacific, dates on which they entered service, theoretical capacity, the countries they serve, their owners and manufacturers are given in the annexed table. The table also lists the projects planned for this part of the world in the coming years.

40. [www.submarinecablemap.com](http://www.submarinecablemap.com), accessed on June 30, 2022.

## The main submarines cables of the Pacific Islands region, in 2022



In **Polynesia**, connections among the French overseas territories form a web of dashes, each territory being connected first to its closest neighbor or neighbors by a small-scale cable. Wallis and Futuna has just one cable (Tui-Samoa to Fiji and Samoa), while French Polynesia has two, Honotua (to Hawaii) and Natitua (to Samoa). French Polynesia is therefore indirectly connected to Wallis and Futuna via Samoa. Samoa is thus connected to other countries by these two cables and also has a third link, with American Samoa, via the American Samoa Hawaii Cable. New Zealand currently has four submarine connections with other nations, as well as one sizable project in the pipeline: having recently been connected to the international Southern Cross NEXT cable (in 2022), it is due to be connected to Hawaiki Nui from 2025.

In **Melanesia**, New Caledonia has access to a single cable, Gondwana-1, linking it to Australia. However, it will soon be connected to other French overseas territories: the Gondwana-2 cable will soon connect it to Fiji, which will enable it to link to the Tui-Samoa and Natitua cables. Fiji has a higher level of connectivity, with five connections to other nations, now including two to North America thanks to the recently completed international cable, the Southern Cross NEXT. This meshing puts Fiji in an advantageous position compared with other nations, who find themselves in a state of dependence because their only connection is *via* Fiji. This applies to Tonga and Vanuatu in particular. The Solomon Islands and Papua New Guinea have been linked to Australia since 2020 by the Coral Sea Cable System. A second cable, the PIPE Pacific Cable 1, connecting Papua New Guinea to Australia and Guam, reinforces this orientation. Australia plays a central role in the region, as it has cable connections to New Caledonia, Fiji, New Zealand, the Philippines, and the Solomon Islands. It is also the gateway between Oceania and the rest of the world.

**Micronesia** has lower levels of connectivity. Most states in Micronesia, including those which are in free association with the United States,<sup>41</sup> are dependent on the island of Guam, which is a regional hub for submarine cables. This is the case for the Marshall Islands and the Federated States of Micronesia, whose only connection is the HANTRU-1 cable to Guam; for the Mariana Islands, which are linked to Guam by two cables (ATISA and Mariana-Guam); and for Palau, which only has one cable connection, though it is international (the SEA-US cable, which serves Guam and the United States in one direction and the Philippines and Indonesia in the other). The island of Guam is thus a hub for around ten regional- or international-scale cables, including AAG toward China and the United States since 1999, and Tata TGN-Pacific toward Japan and the United States since 2002.

A feature of the insular Pacific is the large number of “domestic” cables that allow the islands of an archipelago or two parts of a very spread-out territory to be connected. This is particularly the case in Australia (Indigo Central, North West Cable System, Bass Strait-1 and -2, Basslink, etc.), Tonga (Tonga Domestic Cable Extension), French Polynesia (Natitua, since 2018), Indonesia (JaSuka, since 2006; Tarakan Selor Cable System (TSCS), since 2014; MKCS, since 2011; PRM, since 2018), Micronesia (Chuuk-Pohnpei Cable, since 2019), Papua New Guinea (Kumul Domestic Submarine Cable System, since 2019), and the Philippines (CDSCN, since 2021).

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41. This is true of Palau, the Marshall Islands, and the Federated States of Micronesia, which are linked to the United States by Compacts of Free Association. See “Compacts of Free Association: Implications of Planned Ending of Some U.S. Economic Assistance”, U.S. Government Accountability Office, February 14, 2022, [www.gao.gov](https://www.gao.gov).

## ***An Adapted Ecosystem***

The European firm ASN built thirteen of the twenty-five active cables currently crossing Oceania; the American firm Subcom was responsible for seven of them, while the Japanese firm NEC was responsible for just three. The European manufacturer is clearly dominant in this region, unlike in the rest of the Pacific: NEC and Subcom share most of the northern Pacific market. The rising Chinese manufacturer HMN Technologies is a notable absentee from the insular Pacific. However, it was responsible for the Kumul Domestic Submarine Cable System serving Papua New Guinea and is also attempting to position itself in bilateral or multilateral cable projects, particularly in Micronesia and Melanesia, which are subject to American and Australian influence but geographically closer to China.

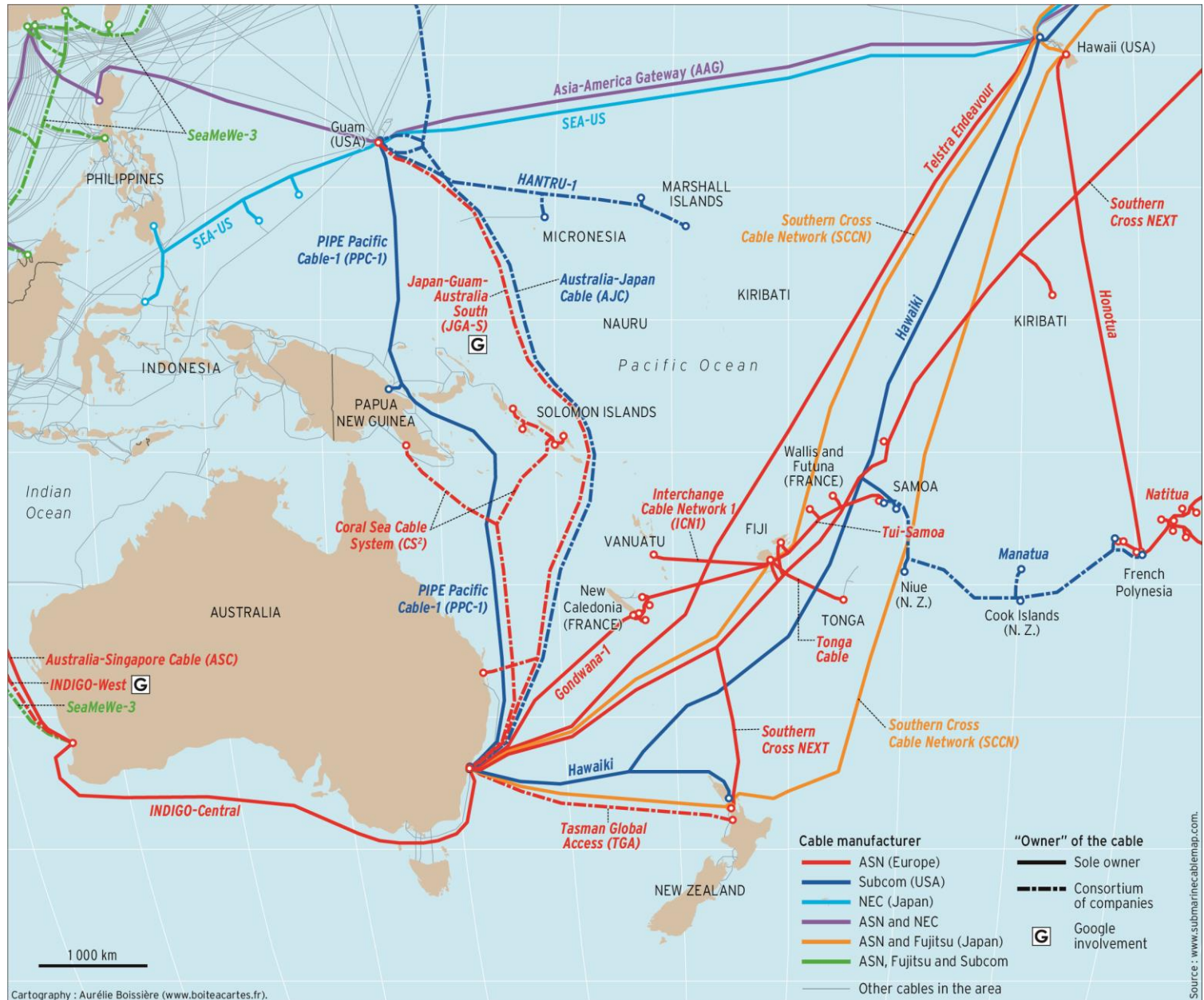
In terms of ownership of cables, Chinese telecommunications operators do not appear to be involved in cable projects in the insular Pacific. Consortia are limited both in numbers and in their composition in the region, and there is significant participation by public entities such as governments and national operators. To date, and in contrast with the rest of the Pacific, the Big Five have not been active in Oceania, with the exception of two links between Australia and Asia financed by Google (the Japan-Guam-Australia South (JGA-S) cable, between Guam and Australia, and the Indigo West cable). Their absence is explained by the fact that content providers' investments in infrastructure are primarily a response to internal demand: they target emerging markets where the population consumes their applications, and they aim to connect their data centers to each other. Thus, until now, they have had no real presence in Oceania,<sup>42</sup> except in Australia.

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42. For Google data centers, see: [www.google.com](http://www.google.com).



## Players in the submarine cable systems of the Pacific Islands region, in 2022



## A Mere Transit Zone?

### *The Financial and Political Price of Isolation*

If Oceania appears to be underserved by cables, this is partly because the demand for international transfer of data does not appear to be strong enough to encourage investment. The internet penetration rate in the South

Pacific is limited by the cost of access to international bandwidth, which remains very high.<sup>43</sup> In the absence of commercial interest, due to unprofitability, new cables are laid mainly in the context of the economic and social development of territories and resilience building among local populations. Given that an international submarine connection generally costs several hundred thousand euros, external funding is required for any new submarine cable project in the insular Pacific. Costs are particularly high as the long distances increase the cost of cables and the geographic isolation of the territories in the region limits opportunities to create secondary branches.

As a result, most of the lines connecting the insular territories of the Pacific have received public or private subsidies. The Tui-Samoa cable between Samoa and Fiji received funding from the World Bank, which provided nearly \$16 million for the Samoa Connectivity Project in 2015, in addition to funding from the Asian Development Bank (ADB) and the Australian Department of Foreign Affairs and Trade.<sup>44</sup> The World Bank and ADB also provided subsidies for the Tonga Cable, which cost a total of \$36 million.<sup>45</sup> Similarly, the ADB contributed around \$25 million to the project to connect Palau to the SEA-US cable<sup>46</sup> and announced in 2018 that it would subsidize the construction of a cable between the Federated States of Micronesia.<sup>47</sup> Government calls for tender have also allowed new links to be established in the region. This has been the case in New Caledonia, where the “territory of innovation” plan, launched in 2018 by the Secretariat-General for Investment<sup>48</sup> with the aim of making biodiversity an engine of growth for the local economy alongside digital technology, will fund a SMART submarine communications cable between New Caledonia and Vanuatu.

While funding for cables may be a driver for the region, it also raises important political questions. First, there are problems with corruption, in a region with many “national” telecommunications operators. In 2021, the French financial public prosecutor opened a preliminary investigation into offenses of granting an unjustified advantage, unlawful acquisition of an

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43. World Bank, “ADB, World Bank, Australia-Supported High-Speed Broadband Goes Live in Samoa”, press release, February 9, 2018, [www.worldbank.org](http://www.worldbank.org).

44. World Bank, “Independent State of Samoa – Pacific Regional Connectivity Program – Phase 3: Samoa Connectivity Project”, June 19, 2015, [www.worldbank.org](http://www.worldbank.org).

45. Asian Development Bank, “Tonga-Fiji Submarine Cable Project 44172-022”, accessed June 30, 2022, [www.adb.org](http://www.adb.org).

46. Submarine Cable Networks, “Palau cable 1”, accessed June 30, 2022, [www.submarinenetworks.com](http://www.submarinenetworks.com).

47. The Financial, “ADB, World Bank Support High-Speed Internet For Micronesia”, *Submarine Telecoms Forum*, April 2, 2018, [www.subtelforum.com](http://www.subtelforum.com).

48. Government of New Caledonia, *La Nouvelle-Calédonie, lauréate du projet Territoires d'Innovation*, press pack, September 16, 2019, <https://gouv.nc/>.

interest, and corruption of public officials,<sup>49</sup> in connection with a contract awarded by the New Caledonia Postal and Telecommunication Service for the provision of a second cable connecting New Caledonia to Fiji.<sup>50</sup> Second, there are issues around resilience. The low level of meshing means that the populations of Oceania are less digitally connected, compared with those elsewhere in the world. Island territories often have no alternative route for data if a cable in their area is damaged, and their satellite coverage lacks capacity for all the communications carried to other countries daily, as well as being slower than cable. When confronted with their own vulnerability and the difficulty of funding digital infrastructure projects, these territories are more likely to accept the lowest-cost tender, to the detriment of other criteria such as communications security.

### ***The Big Winners: Australia and the United States***

The network configuration makes two major hubs in the South Pacific stand out: the Hawaiian archipelago, in the far east, is a mandatory point of passage to reach the United States, while Australia, in the far west, acts as a pivot toward Southeast Asia and the Indian Ocean. This state of affairs renders the island nations of the Pacific highly dependent on the United States, which governs Hawaii, and on Australia. The United States and Australia therefore enjoy significant influence in the region. In this capacity, since 2011, they have been encouraging working groups within the Asia-Pacific Economic Cooperation forum to guard against the risks they have identified on submarine cables.<sup>51</sup> Moreover, they are members of the “Five Eyes”, a cooperative intelligence alliance with the United Kingdom, Canada, and New Zealand that has enabled the American National Security Agency to acquire massive quantities of information from the submarine network, particularly in the Pacific.<sup>52</sup>

The Hawaiian archipelago is the main landing point for cables crossing the Pacific, followed in second place by the island of Guam, further west. This American state and territory have become established digital platforms because of their convenient geographical positions and their American digital culture. Thus, in 2022, all five cables that cross the Pacific diagonally toward Oceania—SCCN, Telstra Endeavour, American Samoa Hawaii

49. “Câble sous-marin : l’OPT n’en a pas fini avec la justice” Actu.nc, No. 410, January 27, 2022, [www.scci.nc](http://www.scci.nc)

50. C. Mannevy and F. Tromeur, “Câble sous-marin : l’OPT visé par une enquête du parquet national financier” Nouvelle Calédonie 1, April 22, 2021, [www.la1ere.francetvinfo.fr](http://www.la1ere.francetvinfo.fr).

51. Asia-Pacific Economic Cooperation (APEC) Telecommunications and Information Working Group, *Submarine Cable Information Sharing Project: Legislative Practices and Points of Contact*, March 2012.

52. Observatoire du monde cybernétique, *Rapport trimestriel*, No. 4, December 2013, p. 30.



(ASH), SEA-US, and Hawaiki<sup>53</sup>—make landfall at Hawaii. The Hawaiki Nui cable project, to be completed by 2025, will also make landfall there. However, there is a new international cable and an international cable project that both take the diagonal route without making landfall in Hawaii: the Southern Cross NEXT cable, which since July 2022 links the United States and Australia via New Zealand, Fiji, Tokelau, and Kiribati, and the Asia Connect Cable 1, which will be laid by 2024 and will connect Australia and the United States via Indonesia, Singapore, and Timor-Leste. Guam also has two trans-Pacific connections, AAG (since 2009) from the United States to China and Tata TGN-Pacific (since 2002) from the United States to Japan. It is also a landing station for several connections between Australia and Japan and serves the islands of Micronesia through several smaller cables.

Australia also plays a central role in the regional web. Thirteen cables currently make landfall in Australia (three on its west side and ten on its east), and three more are due to be added by 2025. At the regional level, it has direct cable connections to New Caledonia, Fiji, New Zealand, Papua New Guinea, and the Solomon Islands. At the international level, it receives all the cables that cross Oceania toward Asia and North America. It is thus directly linked to the United States, Japan, Singapore, and China. It is also a natural staging post on routes to the Indian Ocean, to which it is already connected by the international Sea-Me-We3 cable and several regional lines (Indigo West, Australia Singapore Cable). Australia's central role in the Indo-Pacific's digital capacity is set to grow over the coming years, in particular as a result of the growth in India's digital market.<sup>54</sup>

53. "Câble transpacifique : les grandes manœuvres sont terminées", Tahiti-infos.com, January 16, 2017.

54. See TeleGeography's Pricing Suite (database).

# The Cables of the Insular Pacific, a New Geostrategic Issue

## Oceania, a Stage for Sino-American Rivalry

### ***A Reaffirmation of Chinese Ambitions***

Although the manufacturer HMN Technologies has had limited involvement in the production of the insular Pacific's submarine network until now, Chinese ambition must not be underestimated. HMN Technologies expressed an interest in two cable projects in Micronesia and Melanesia, but these were eventually withdrawn because of the security-related problems they would have posed for the traditional powers in the region. The projects were:

The Solomon Islands Cable: in 2018, Australia became concerned about Huawei Marine Networks' plans for a cable with a theoretical capacity of 2.5 Tbps between Sydney and the Solomon Islands.<sup>55</sup> It is reported that on the advice of the Australian Security Intelligence Organisation, the Australian government refused to permit the planned cable to make landfall on its territory to connect with the national network.<sup>56</sup>

The East Micronesia Cable System: in June 2021, the United States became concerned about plans for a Chinese cable linking the Federated States of Micronesia to Kiribati and Nauru and connecting with the HANTRU-1 cable that has a landing point on the American territory of Guam. This World Bank-financed project, for which HMN Technologies was the lead bidder, was canceled. The bids submitted by HMN Technologies, ASN, and Subcom were all deemed non-compliant with the specification given in the call for tenders, but the real reason for the failure

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55. R. Perper, "Australia Snubbed Huawei and Completed its Undersea Cable Project to Bring High-Speed Internet to Pacific Islands", *Business Insider*, August 28, 2019.

56. J. Loughran, "Huawei's Undersea Internet Cable Banned by Australia Over Spying Fears", *E&T Magazine*, January 2, 2018.

of the project was the pressure applied by Washington on the governments awarding the contract.<sup>57</sup>

Beyond these specific projects by manufacturers, Chinese political will to get involved in Oceania's digital web seems to have been reaffirmed in 2022. Draft agreements between the Chinese government and the nations of the insular Pacific include a digital section that refers to submarine cables, explicitly or implicitly.

For example, the security agreement between China and the Solomon Islands, confirmed in May 2022 by the signing of a Memorandum of Understanding on Deepening Blue Economy Cooperation, provides for cooperation between the two nations on maritime infrastructure, among other things.<sup>58</sup> The final version of this document has not yet been published, but Article 3 of a leaked working draft mentioned shared investment in the construction of submarine cables.<sup>59</sup>

This shift can also be seen in a recent project—or a five-year action plan, to be more exact—for cooperation between China and ten island states in the insular Pacific.<sup>60</sup> Although the plan failed (after the island states refused the Chinese proposal en bloc, on May 30, 2022),<sup>61</sup> a document leaked to the press ahead of the meeting of the leaders concerned revealed China's ambition: to increase cooperation on security (traditional and non-traditional) with these island nations, including in terms of telecommunications, with stronger links on matters of cybersecurity and communications networks.<sup>62</sup>

## ***Implementing a Strategy of Circumvention***

To counter China's growing influence in the insular Pacific and secure the region's communications networks, the traditional powers use a range of levers. The first of these is funding cable projects that compete with those backed by Beijing. To counter the Solomon Islands Cable project, Australia offered to fund a fiber-optic link that would connect it with Papua New Guinea and the Solomon Islands. This cable, the Coral Sea Cable, was

57. J. Barrett and Y. Lun Tian, "Exclusive-Pacific Undersea Cable Project Sinks After U.S. Warns Against Chinese Participation", *Reuters*, updated June 18, 2021, [www.reuters.com](http://www.reuters.com).

58. Solomon Islands Government, "Solomon Islands and People's Republic Of China Deepened Relations With the Signing Of More Development Cooperation", updated May 27, 2022, [www.solomons.gov.sb](http://www.solomons.gov.sb).

59. "China's Maritime Plans for Solomon Islands Revealed in Leaked Memorandum", *Sky News Australia*, May 9, 2022.

60. Kiribati, Samoa, Fiji, Tonga, Vanuatu, Papua New Guinea, Timor-Leste, Micronesia, the Cook Islands, and Niue.

61. M. Julienne, "Un coup d'épée dans l'océan. La tournée de Wang Yi dans le Pacifique insulaire", *Lettre du Centre Asie*, No. 97, Ifri, June 3, 2022.

62. "China Wants Closer Security, Trade Links With the Pacific", *Al Jazeera*, May 26, 2022.

completed in 2020. It was built by the European firm ASN and its main project manager was Vocus, an Australian telecommunications provider.<sup>63</sup>

The traditional Pacific powers also collaborate to combat China's growing importance in the digital domain. Within the framework of the Trilateral Partnership for Infrastructure Investment in the Indo-Pacific, launched in 2018, the United States, Australia, and Japan agreed early in 2022 to jointly fund an alternative to the Chinese East Micronesia Cable project. The alternative project envisages improving connectivity between several islands in Micronesia,<sup>64</sup> linking Kosrae, Nauru, and Kiribati, but the project budget and completion date are not yet known. Joint investments were also announced in October 2020 to assist with the construction of a cable to improve connections to Palau.<sup>65</sup> Similar discussions take place within the Quadrilateral Security Dialogue or Quad, with the United States, Australia, Japan, and India recently reaffirming their desire to cooperate on infrastructure projects to strengthen the Indo-Pacific's digital connectivity.<sup>66</sup> The Partners in the Blue Pacific initiative, launched in June 2022, brings together the United States, the United Kingdom, Australia, Japan, and New Zealand, with the aim of increasing cooperation in the insular Pacific. This group could also become a framework for launching rival submarine cable projects in the region.<sup>67</sup>

Governments also use diplomacy to raise island states' awareness of the Chinese threat in the digital domain and rein in China's growing influence in the region. For example, in late 2020, the United States, which had already held informal meetings around the world to lobby its allies on this topic,<sup>68</sup> shared with the Federal States of Micronesia its concerns about the participation of Chinese firms in the East Micronesia Cable System project. This sharing of concerns apparently led the government of the island nation to abandon this infrastructure project, which ended abruptly in 2021. It is also reported that following the Chinese proposal for a five-year plan, Micronesia sent a letter to the other territories in the South Pacific to alert them to the dangers of signing this type of agreement, specifically citing the risk that the Chinese would monitor regional communication infrastructure.<sup>69</sup>

63. R. Perper, "Australia snubbed Huawei".

64. U.S. Department of State, "Joint Statement on Improving East Micronesia Telecommunications Connectivity", December 11, 2021, [www.state.gov](https://www.state.gov).

65. H. Channer, "Revitalizing the Trilateral Partnership", Reconnecting Asia, Center for Strategic and International Studies, May 26, 2021, [www.reconasia.csis.org](https://www.reconasia.csis.org).

66. See the Quad Joint Leaders' Statement of May 24, 2022 [www.mofa.go.jp](https://www.mofa.go.jp).

67. See the Statement by Australia, Japan, New Zealand, the United Kingdom, and the United States on the Establishment of the Partners in the Blue Pacific (PBP), June 24, 2022, [www.whitehouse.gov](https://www.whitehouse.gov).

68. France, Japan, the United Kingdom, and Australia in particular.

69. "China Wants Closer Security".

Similarly, Penny Wong, the new Australian minister for foreign affairs, visited Fiji shortly after her Chinese counterpart to restate her country's commitment to the Pacific Island Forum. By reaffirming its engagement in this way, Australia hoped to counter Beijing's growing influence in the region.

## New Opportunities for the Future

### ***Toward Alternative Cables***

To circumvent problems related to Sino-American rivalry in the region and increase the resilience of isolated territories in the Pacific despite the existing structural constraints, public and private actors are proposing imaginative “alternative” projects that distinguish themselves as much by their routes as by their underlying business model.

The Hawaiki cable is one of the region's flagship projects, with a capacity of 67 Tbps. It entered service in 2018 and runs between the United States, Australia, and New Zealand, also serving Hawaii and American Samoa. Constructed by Hawaiki Submarine Cable LP, it is one of the first cables in the world to have been funded by private equity, using “project finance” methods, a type of financial arrangement where finance is provided to special-purpose entities on a non-recourse or limited recourse basis. This high-risk approach is necessary when there is a lack of commercial interest in developing significant infrastructure that provides essential services. In May 2022, once this inclusive model had proven itself, Hawaiki Submarine Cable LP was acquired by BW Digital, a business based in Singapore that funds and develops digital infrastructure projects (connectivity and data storage) in the Asia-Pacific region and Australasia.<sup>70</sup> The success of this economic model is further confirmed by plans for a follow-up to Hawaiki: the Hawaiki Nui cable, which should connect Los Angeles to Sydney, Christchurch, Jakarta, and Singapore by 2025. This link would extend the existing network by adding direct connectivity with Southeast Asia, with a nominal capacity of 240 Tbps.<sup>71</sup>

Alternative routes, in particular “south-south” routes, are emerging around the world, driven by the desire to avoid the traditional routes for data created by the dominant actors in the market. For example, a cable project initiated by Chile, already under discussion for several years, intends to connect South America to Asia without passing through the United States. In 2017, HMN Technologies put forward a proposal for this project that favored a direct route to China, subject to a desktop study.

70. W. Qiu, “BW Digital Completes Acquisition of Hawaiki Cable”, *Submarine Cable Networks*, May 16, 2022, [www.submarinenetworks.com](http://www.submarinenetworks.com).

71. “L'ajout d'un câble à Hawaiki relie l'Asie du Sud-Est, l'Australasie et les États-Unis”, *L'Entrepreneur*, accessed November 5, 2021, [www.lentrepreneur.co](http://www.lentrepreneur.co).

However Chile later ruled out this option on the grounds of costs, but also following pressure from the United States seeking to limit the development of Chinese cables in the Pacific.<sup>72</sup> In parallel, discussions had begun between Chile and French Polynesia, with a view to the latter becoming an intermediary landing point.<sup>73</sup> The proposal finally accepted by Chile however was Japan's:<sup>74</sup> the Humboldt cable is set to link Chile directly to Sydney, with a possible branch to Auckland.<sup>75</sup> This southern trans-Pacific route would be the first of its kind and avoid any involvement in the rivalries between China and the United States in the Pacific.<sup>76</sup> It remains to be seen whether the project will be completed. As the demand for international bandwidth along that route is relatively low, the connection would primarily have a symbolic value, strengthening links between Australia and South America, and diversify the routes that data can take when problems arise.

### ***Toward SMART Cables***

The rich marine environment of the islands of the insular Pacific lends itself to projects for so-called SMART cables. In addition to enabling the transfer of communications, these sensor-equipped undersea links also enable data to be gathered about the seabed, to study climate change or the marine environment or to prevent natural disasters (tsunami alerts). This technology provides hydroacoustic data and information about cable tension, making it possible to measure pressure, temperature, salinity/conductivity, and seismic activity, among other things.

Several such scientific projects are in the pipeline for Oceania. Mixed observation systems of this type are particularly relevant because of the geographical location of some islands and the presence of rich coral reefs and numerous natural hazards. They could also contribute to the resilience of these relatively isolated Pacific territories. One such project, the Gondwana-3 cable linking Vanuatu and New Caledonia, is led by an international joint task force under the aegis of the United Nations.<sup>77</sup> Created by the International Telecommunication Union, the UNESCO

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72. A. Vedovi, "From Santiago to Sydney: Opening Latin America with Fibre-Optic Cable", *The Interpreter*, August 14, 2020.

73. This project was referred to when the president of French Polynesia, Édouard Fritch, visited Chile in 2019.

74. Y. Hirose and N. Toyama, "Chile Picks Japan's Trans-Pacific Cable Route in Snub to China", *Nikkei Asia*, July 29, 2020.

75. Transport and Telecommunications Ministry (Chile), "Gobierno escoge ruta mediante Nueva Zelanda y hasta Australia para implementar el cable transoceánico", press release, July 27, 2020, [www.mtt.gob.cl](http://www.mtt.gob.cl).

76. Even though one of the project stakeholders, Desarrollo País, a state-run infrastructure fund majority-owned by the Chilean government, has links with BW Digital, the firm that owns Hawaiiki.

77. J. Aucan, J.-F. Rolin, and L. Loubersac, "Vers des câbles sous-marins « intelligents » : Pourquoi la Nouvelle-Calédonie est-elle concernée?", *Science*, 2017, pp. 22–36.

Intergovernmental Oceanographic Commission, and the World Meteorological Organization, this task force has been working since 2011 on a strategy and a route map to bring this project to fruition.<sup>78</sup>

However, these mixed infrastructures also pose challenges because they involve occupying spaces that are not subject to any sovereignty—in this case, the occupation of the sea *via* its beds. If deployed in the South Pacific for observation and disaster prevention, they could encourage the current trend for some states to assert their presence and sovereignty in maritime spaces and contested island territories by building infrastructure. There is also the risk that these SMART cables, intended to serve scientific aims, will be put to dual use: a state deploying them for military purposes would gain an unprecedented level of knowledge of the maritime activity—military activity in particular—occurring along the route.<sup>79</sup>

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78. See the International Telecommunication Union's dedicated webpage: [www.itu.int](http://www.itu.int).

79. J. Keller, "Navy to Take a Page from Commercial Undersea Cable Industry for New Ocean Surveillance Technology", *Military + Aerospace Electronics*, June 9, 2014.



# Conclusion

For good or ill, the digital connectivity of the insular Pacific has attracted the attention of the main powers in the region. While this new interest will increase the digital resilience of island territories, it will also lead to growing intervention in this sector by state actors, whose involvement complicates the processes of laying and repairing cables, leads to international rivalries being played out at regional level, and contributes to the emergence of new threats from the network.

In Oceania, as in other parts of the globe, nations are adopting a range of strategies to deal with the growing politicization of communications cables. Some of them are encouraging the construction of new links so as to increase the redundancy<sup>80</sup> of international communications in the region. This is the case with France, which is rationalizing its administrative procedures in an attempt to make its overseas territories more attractive to new submarine cable projects.<sup>81</sup> Others are endeavoring to give their international connections better protection: New Zealand and Australia have established zones specifically for landing submarine cables on their territory, to provide better security. Several countries are using the law to protect their interests, such as the United States, which only permits particular destinations and actors to land cables on its territories,<sup>82</sup> or Indonesia and the Philippines, which have put cabotage policies<sup>83</sup> in place to allow them to develop national fleets of cabling ships.

However, new risks are emerging<sup>84</sup> that threaten the physical integrity of cables in the ocean (like the increased presence of surface vessels close to communications lines, the development of submarine drones able to take action against them) and the information systems that monitor submarine cables, as recently demonstrated by a cyberattack on a submarine network

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80. Here, “redundancy” refers to the extra capacity created by duplicating components or critical functions of a system, with the aim of improving reliability. In the context of international communications, the goal is to have alternative routes along which data can travel, if there is a problem with a submarine cable.

81. Secretariat General for the Sea, Prime Minister’s Office, French Republic, Instruction No 142, November 13, 2020.

82. Steptoe, “The Long-Pending Team Telecom Reform May Have Begun”, *International Compliance Blog*, May 13, 2016 [www.steptointernationalcomplianceblog.com](http://www.steptointernationalcomplianceblog.com).

83. G. Llanto and A.M. Navarro, “Relaxing the Cabotage Restrictions in Maritime Transport”, 2014, [www.pidswebs.pids.gov.ph](http://www.pidswebs.pids.gov.ph). V. Bellamy, “The Implementation of Cabotage Principle in Indonesia”, *Hg Legal Resources*, accessed August 30, 2022.

84. C. Bueger, T. Liebetrau and J. Franken, *Security Threats to Undersea Communications Cables and Infrastructure— Consequences for the EU*, Directorate General for External Policies, European Union, June 1, 2022.



in Hawaii.<sup>85</sup> Thus, a small number of powers are now adopting a more active stance towards the undersea network. The United States, Russia, China and, to a lesser extent, Japan, Australia and the United Kingdom are developing civilian and military capacities to travel into the depths to monitor maritime infrastructure and take action if required.<sup>86</sup> France also recently entered the race: its new seabed strategy, published by the French Ministry for Armed Forces on February 2022<sup>87</sup>, aims to increase national undersea research, surveillance and intervention capacities that can go down to 6,000 meters deep.<sup>88</sup> Therefore, this progressive “conquest” of the seabed will lead to an increasing number of challenges and tensions carried by submarine cables in the Oceania region.

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85. “HSI Agents Stop Cyberattack on Hawaii Submarine Cable”, *Submarine Telecoms Forum*, April 13, 2022, [www.subtelforum.com](http://www.subtelforum.com).

86. See T. Rohfritsch, “Abysses : la dernière frontière ?”, Information Report No. 724, June 21, 2022, [www.senat.fr](http://www.senat.fr).

87. French Ministry for Armed Forces, *Stratégie ministérielle de maîtrise des fonds marins*, February 2022.

88. The strategy specifies that the technology should help in the detection and classification of small objects located in deep seas (offensive gear, listening device, remote sensor) by underwater means (AUV, ROV) equipped with sensors.

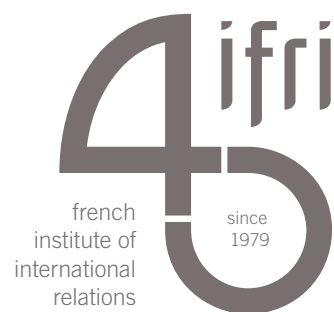
# Annex – Referencing Table of the Submarine Cables Connecting the Pacific Islands Region

Name	Dimension	Countries connected	Year	Theoretical capacity	Length	Provider	Owner/s
Mariana-Guam Cable	Bilateral	-Guam -Mariana Islands	1997	?	?	?	Pti Pacifica
Sea-Me-We-3	Multilateral	-Australia -Europe -Africa -Asia	1999	4,6 Tb/s	39,000 km	ASN, Fujitsu, Subcom	Consortium with more than 40 operators
Southern Cross Cable Network (SCCN)	Multilateral	-Australia -New Zealand -Fiji -Hawaii -United States	2000	22 tb/s	30,500 km	ASN, Fujitsu	SCC Limited
AJC	Multilateral	-Australia -Guam -Japan	2001	25,6 Tb/s	12,700 km	Subcom	AT&T, NTT, Softbank Corp, Telstra, Verizon
Tata TNG-Pacific	Multilateral	-Guam -United States -Japan	2002	?	22,000 km	Subcom	Tata Communications
Endavour	Bilateral	-Australia -Hawaii	2008	1,28 Tb/s	9,125 km	ASN	Telstra
Gondwana-1	Bilateral	-Australia -New Caledonia	2008	0,64 Tb/s	2,151 km	ASN	OPT
PPC-1	Multilateral	-Australia -Papua New Guinea -Guam	2009	2,56 Tb/s	6,900 km	Subcom	TPG Corporation
AAG	Multilateral	-United States -Hawaii -Guam -Philippines -China -Vietnam -Thailand -Malaysia -Brunei -Singapore	2009	?	20,000 km	ASN, NEC	AT&T, Airtel (Bharti), BT, BayanTel, Eastern Telecom, Ezecom, Indosat Ooredoo, National Telecom, PLDT, Saigon Postel Corporation, Spark New Zealand, Starhub, Telekom Malaysia, Telkom Indonesia, Telstra, Unified National Networks (UNN), VNPT International, Viettel Corporation
Honotua	Bilateral	-French Polynesia -Hawaii	2010	0,64 Tb/s	4,805 km	ASN	OPT Polynésie française

Hantru-1	Multilateral	-Micronesia -Marshall Islands -Guam	2010	?	2,917 km	Subcom	Federated States of Micronesia Telecommunications Company, Hannon Armstrong, Marshall Islands Telecommunications Authority
Tonga Cable	Bilateral	-Tonga -Fiji	2013	?	827 km	ASN	Digicel Tonga, Government of Tonga, Tonga communications Corporation
GOKI	Bilateral	-Guam -Japan	2013	?	4,244 km	Xtera	AT&T
Interchange Cable Netwok 1 (ICN1)	Bilateral	-Fiji -Vanuatu	2014	0,32 Tb/s	1,259 km	ASN	Interchange
Tasman Global Access	Bilateral	-Australia -New Zealand	2017	20 tb/s	2,288 km	ASN	Spark NZ, Telstra, Vodafone
SEA-US	Multilateral	-United States -Indonesia -Micronesia (Yap) -Palau -Philippines -Guam	2017	?	14,500 km	NEC	GTA TeleGuam, Globe Telecom, Hawaiian Telcom, RTI, Telin
Atisa	Bilateral	-Guam -Mariana Islands	2017	?	279 km	?	Docomo Pacific
Hawaiki	Multilateral	-Australia -New Zealand -American Samoa -Hawaii -United States	2018	67 Tb/s	14,000 km	Subcom	Hawaiki Submarine Cable LP
Tui-Samoa	Multilateral	-Fiji -Samoa -Wallis and Futuna	2018	17,6 Tb/s	1,693 km	ASN	Samoa Submarine Cable LP
Australia- Singapore Cable (ASC)	Multilateral	-Australia -Christmas Island -Indonesia -Singapore	2018	60 Tb/s	4,600 km	ASN	Vocus Communications
Indigo-West	Multilateral	-Australia -Indonesia -Singapore	2019	36 Tb/s	4,600 km	ASN	Australia's acameci and research network (AARNET), Google, Indosat, Ooredoo, Singtel, Superloop, Telstra
JGA-S	Bilateral	-Australia -Guam	2020	36 Tb/s	7,081 km	ASN	Australia4S Academic and Research Network (AARNET), Google, RTI
JGA-N	Bilateral	-Guam -Japan	2020	?	2,600 km	NEC	RTI
Coral Sea Cable System (CSCS)	Multilateral	-Australia -Papua New Guinea -Solomon Islands	2020	20 Tb/s	4,700 km	ASN	PNG DataCo Limited, Solomon Island Submarine Cable Company
Manatua	Multilateral	-Cook Island -French Polynesia -Samoa	2020	3.634 Tb/s	3,643 km	Subcom	Avaroa Cable Ltd, OPT Polynésie française, Samoa Submarine Cable Company,

		-Niue					Telecom Niue
Southern Cross Next	Multilateral	-Australia -Fiji -Kiribati -New Zealand -Tokelau -United States	2022	72 Tb/s	13,700 km	ASN	Southern Cross Cable Limited
Gondwana -2/ Picot-2	Bilateral	-Fiji -New Caledonia	2022	?	?	ASN	OPT
Echo	Multilateral	-Guam -Singapore -Indonesia -United States	2023	144	17,184 km	NEC	Meta, Google, Transpacifis Networks, LCC
Humboldt (HCS)	Multilateral	-Chile -Australia -New Zealand	2024	?	13,180 km	?	?
Bifrost	Multilateral	-United States -Singapore -Philippines -Guam	2024	?	15,000 km	ASN	Meta, Keppel T&T, Tellin
Asia Connect Cable 1 (ACC1)	Multilateral	-Australia -Guam -Indonesia -Singapore -Timor-Leste -United States	2024	?	18,000 km	?	Indigo Networks
Apricot	Multilateral	-Japan -Taiwan -Guam -Philippines -Indonesia -Singapore	2024	?	12,000 km	?	Chungwa Telecom, Google, Meta, NTT
Hawaiki Nui	Multilateral	-Australia -Indonesia -New Zealand -Singapore -Hawaii -United States	2025	240 Tb/s	25,000 km	?	Hawaiki Submarine Cable
East Micronesia Cable System	Multilateral	-Micronesia -Kiribati	?	?	?	?	?





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