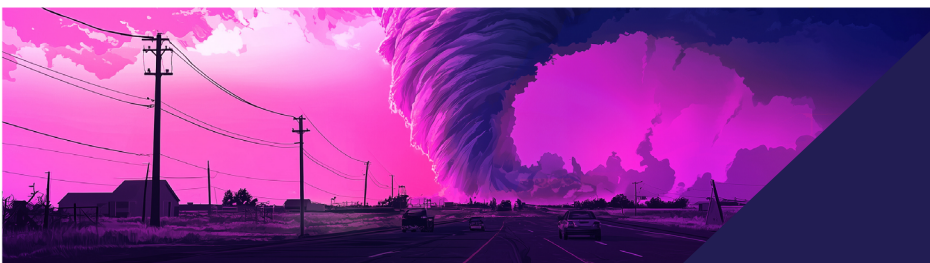
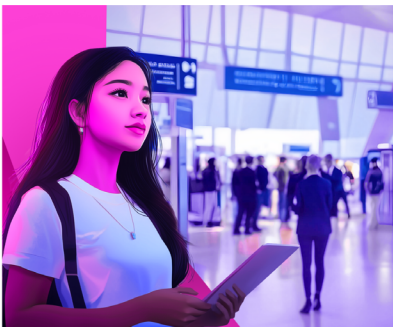
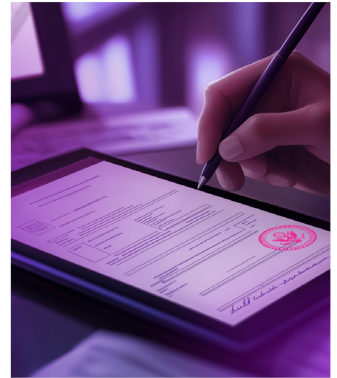
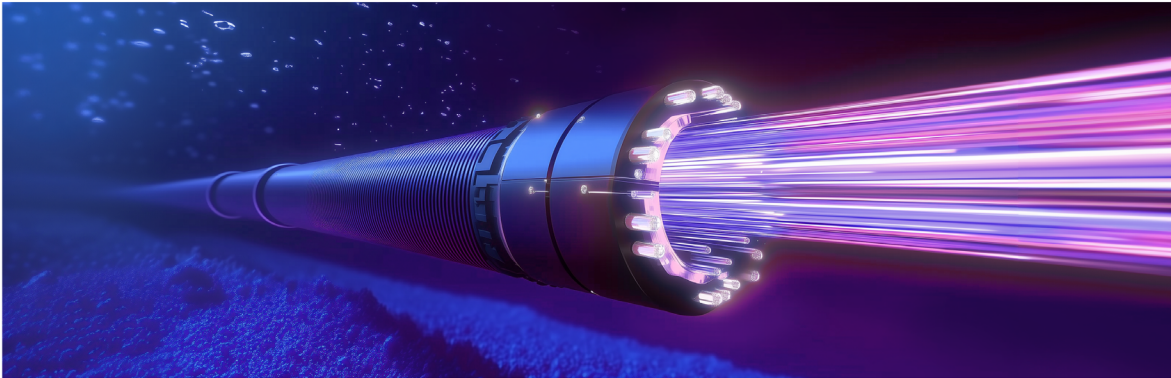


BENEATH THE SURFACE: CRITICAL CONNECTIONS AND REGIONAL FUTURES

The Future of Undersea Cables and
Digital Connectivity in the Indo-Pacific

Cables Futures Toolkit

OCTOBER 2025



ABOUT THE TECH POLICY DESIGN INSTITUTE

The Tech Policy Design Institute (TPDi) is an independent, non-partisan think tank committed to advancing best practice technology policy in Australia and globally. Based in Canberra, TPDi is registered as a not-for-profit with the Australian Charities and Not-for-Profit Commission. TPDi collaborates with all stakeholders in the tech ecosystem. Our mission is to shape technology for the benefit of humanity through rigorous research, innovative education, public commentary, and community building.

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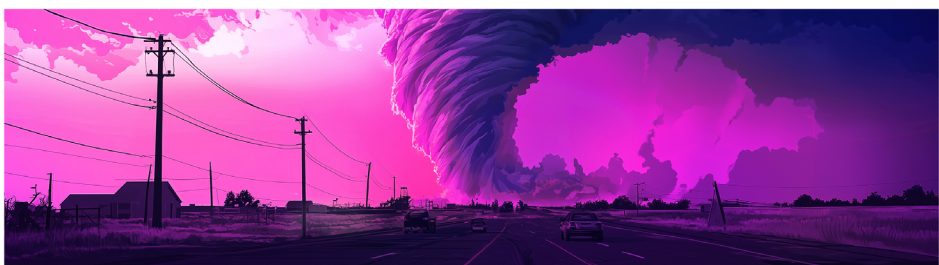
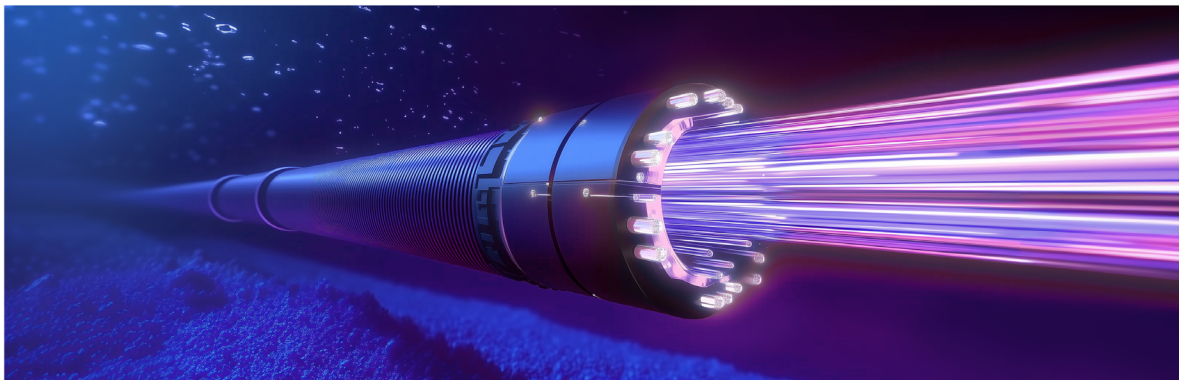
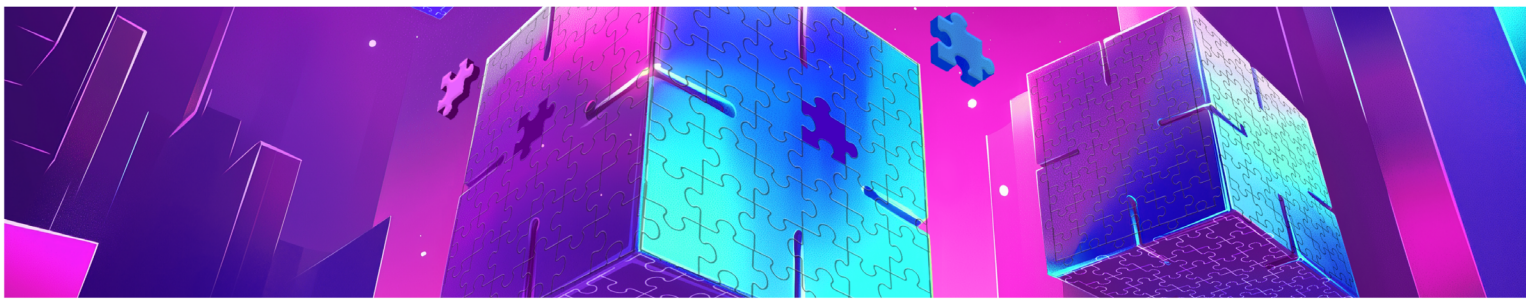
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CABLES FUTURES TOOLKIT

Facilitator's Guide to the Future Scenarios

Here we present a ready-to-go guide for using the scenarios in your own discussions about the future of digital connectivity and the undersea cable network across the Indo-Pacific.

When introducing the scenarios, remember to emphasise that they are not predictions. The three scenarios are intended to be sophisticated conversation starters, designed to explore and challenge the role of governments, industry and civil society in the governance, maintenance and provision of digital connectivity by the undersea cable network.

The three future scenarios can be used to identify possible practical policy interventions, engagement, and collaboration for government and industry in the development of undersea data cable infrastructure across the Indo-Pacific to meet the region's future connectivity needs.

These scenarios are designed as a focal point for future-focused discussion in small (five to eight people), multi-stakeholder groups with a facilitator, guiding the discussion through the four steps provided below. One key advantage of the futures approach is that it provides a lot of flexibility in how it can be used and can be tailored to the size and composition of your audience.

For a small group of less than 10 people, it may be more effective to work through all three in a focused way. For larger workshops, breaking into multiple small groups and examining only one or two of the three scenarios for each table (with the whole room covering all three) could be a more informative approach.

Whatever approach is chosen, the scenarios are designed to provoke discussion and push situations to the extreme to enable a wide-ranging and creative discussion among a diverse group of stakeholders, hopefully find some common ground, and, most importantly, to have some fun.

Facilitators should guide participants through each of the four steps, pausing for reflections and group feedback between each step. Multimedia material have been created to introduce each scenario. They can be incorporated into Step 1 and are available at www.techpolicy.au/cables.

1. Explore

Ask your stakeholders to **watch** the scenario videos, **read** the descriptions, and take some time to situate themselves in the world of each scenario, considering:

- Infrastructure
- Connectivity
- Patterns of data flow or usage

2. Challenge

Ask your stakeholders to **consider** how plausible the scenario is:

- What is likely and **unlikely** about it?
- **What else** would have to happen for it to play out this way?
- What could happen **instead**?
- What do you think the key actors would do **differently**?
- Who would and would not **benefit** in this scenario?

3. React

Ask your stakeholders to **react** to the scenario:

- What do you **like** and dislike about the scenario?
- What do you want to **avoid**?
- What do you **want** to happen?
- How **desirable** is this scenario?

4 Define Actions

Ask your stakeholders what could be done to **avoid** the negative elements and **encourage** the positive elements of the scenario:

- What could be **done today** to shift the future towards or away from elements of this scenario?
- What could be done to **prepare** if it does happen?
- **Who** should be taking action?

SCENARIO 1: THE GREAT DIVIDE

One morning in July of 2038, the world witnessed a moment that would forever change the course of global connectivity. One country called for immediate restriction of data flow through all undersea cables that connect both directly or indirectly to two other countries. The decision was spurred by the discovery of a major espionage operation mediated via undersea cable landing stations, which sent shock waves across governments and industry alike. By 2045, this discovery led to the creation of separate and isolated information spheres, or connectivity 'blocs'. The global internet as the world had known it is dead.

TURNING POINT

2038 – "Cable Conflict".

TECHNOLOGY BREAKTHROUGH

Industrial-scale quantum computing technology.

CONNECTIVITY PROFILE

- Fractured network, with each country in one of three major blocs
- Dominant, state-based control over connectivity and data flow
- Regional instability
- Onerous regulatory environment

Turning Point: 'Cable Conflict' of 2038

Governments were initially baffled at the drastic action by one country to immediately restrict data flows through all undersea cables that connected both directly or indirectly to two other countries. This set off a cascade of frantic calls and negotiations as leaders sought to understand the full impact on international connectivity.

Investigations uncovered an espionage operation powered by a new breakthrough technology – an industrial-scale quantum computer. The discovery raised alarms as countries throughout the region began considering the implications. Serious questions were asked about potential foreign interference in recent national events, including elections. Accusations were made on all sides due to the lack of information available, while tensions and fears continued to rise. The dramatic shift in international connectivity caused by the unilateral restrictions on dataflows led to multi-national businesses and financial institutions reprioritising their regional presences. The 2038 cable conflict led to the formation of three 'blocs' of countries across the region, each led by a major power.

'What do I think? It's a nightmare!

Now, my business can't operate in over half of the countries in the region because of these different connectivity blocs. Half the countries, half the business, half the income! I've been in this business a long time and there's always been new regulations and laws to navigate, but unless I want to operate multiple companies in multiple different blocs using different IT systems, software, privacy and security requirements, and a ton of other things, too, I can only sell within our bloc. Our profit has plummeted, and I'm barely hanging on – I'm worried that I'll go under in a few years.'

Exporter, 56, based in Australia, giving up on working across blocs

The World in 2045: A Digitally Divided Indo-Pacific

By 2045, international cooperation has plummeted with the region fractured into three isolated information blocs. Small and medium countries were forced to choose their alignment to one of the three blocs.

Within some connectivity blocs, quantum cables with superior security and bandwidth are now standard and offer near-zero latency, increased resilience, and enhanced protection against natural disasters and cyberattacks. Satellite networks offer a secure connection for limited and restricted traffic between blocs.

However, countries outside the quantum-enabled zones have fewer new cables being installed and, in some cases, installation and maintenance has slowed almost to a complete stop. Many citizens are becoming frustrated by connection issues, increasing migration to more connected countries. This communication divide and limited information-sharing between the blocs is causing significant instability within the region, splintering economies, heightening geopolitical tensions, and making it harder to coordinate responses to international crises. Societal unrest is mounting due to highly restricted connections between blocs making it difficult for citizens to communicate between friends and family in the other blocs. Meanwhile, the digital economy is thriving between connected countries, but almost non-existent between blocs.

Harsh data localisation laws are now widespread, leading over-the-top (OTT) providers to be highly selective about where they build data centres, favouring countries with larger markets. In countries where cable services have become limited, governments have incentivised satellite network coverage, building the local network and growing their domestic economy.

All governments across the Indo-Pacific now classify undersea cable infrastructure as critical infrastructure, wielding direct sovereign control and heavy regulation of undersea cable networks. The need to protect national critical infrastructure means new cables are predominantly funded by national defence budgets and government-led investments. Regulations that govern cable protection mechanisms continue to be strengthened all around the region, leading to increasingly onerous permitting requirements for installation, repair, and maintenance of cable infrastructure.

The stricter regulatory environment reflects the heightened focus on security including in response to increased maritime activity in areas such as the South China Sea. It is now standard practice for governments to withhold information about the locations of cable assets, causing a rise in accidental damage.

Responding to sky-high expectations for uninterrupted connectivity within quantum-enabled blocs, cable operators have installed new undersea dark cables to increase redundancies and to be activated to provide a back-up when network outages occur from intra-bloc cable damage – further exacerbating the digital divide which, in turn, is entrenching economic, social, and security divides between blocs.

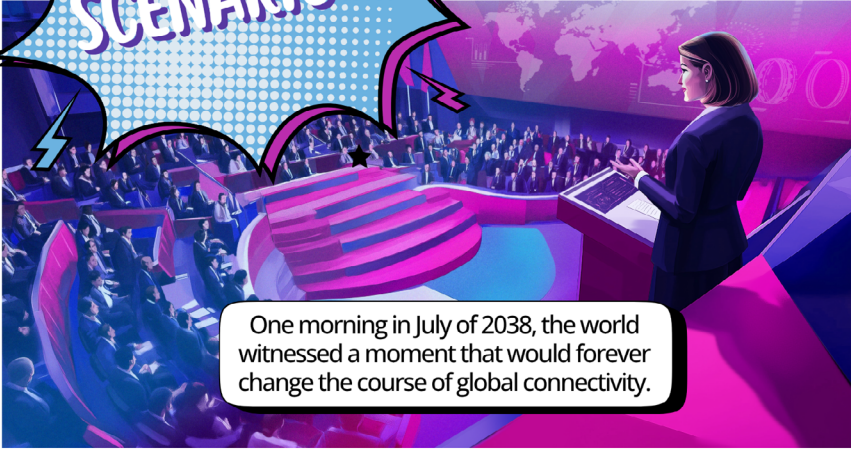
'It's strange—on one hand, we've never had better internet.

In my classroom, everything's online: instant translations, real-time simulations, AI-assisted tutoring. The students love it, and I can do so much more than I could even five years ago. Within our bloc, the connectivity is amazing – fast, stable, secure. But outside? It's a different story. My sister lives just across the border in another bloc, and we can barely stay in touch. Our calls drop constantly, messages don't get through, and half the apps we used to use are restricted now. It's hard to explain to the kids how we're living in this hyper-connected world, yet I can't even reliably talk to my own family. That part hurts. The tech is incredible – but the divisions feel deeper than ever.'

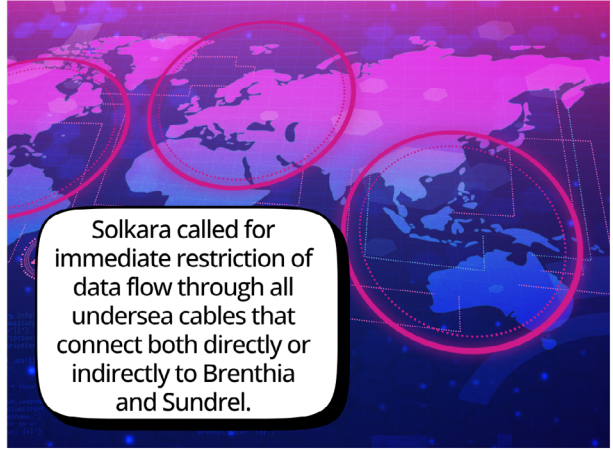
Teacher, 43, thriving at work but cut off from family across blocs

THE GREAT DIVIDE

SCENARIO 1



One morning in July of 2038, the world witnessed a moment that would forever change the course of global connectivity.



Solkara called for immediate restriction of data flow through all undersea cables that connect both directly or indirectly to Brenthia and Sundrel.



Solkara's decision was spurred by the discovery of a major espionage operation mediated via undersea cable landing stations, which sent shockwaves across governments and industry alike.



Governments were initially baffled at the drastic action by Solkara to immediately restrict data flows through undersea cables that connected directly or indirectly, to Brenthia and Sundrel.



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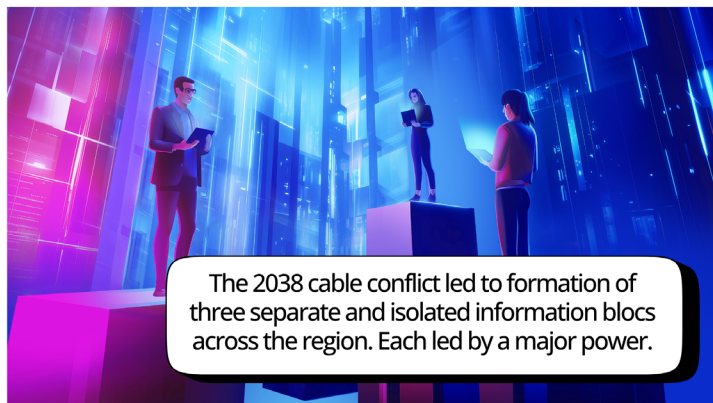
Serious questions were asked about potential foreign interference in recent national events, including elections.



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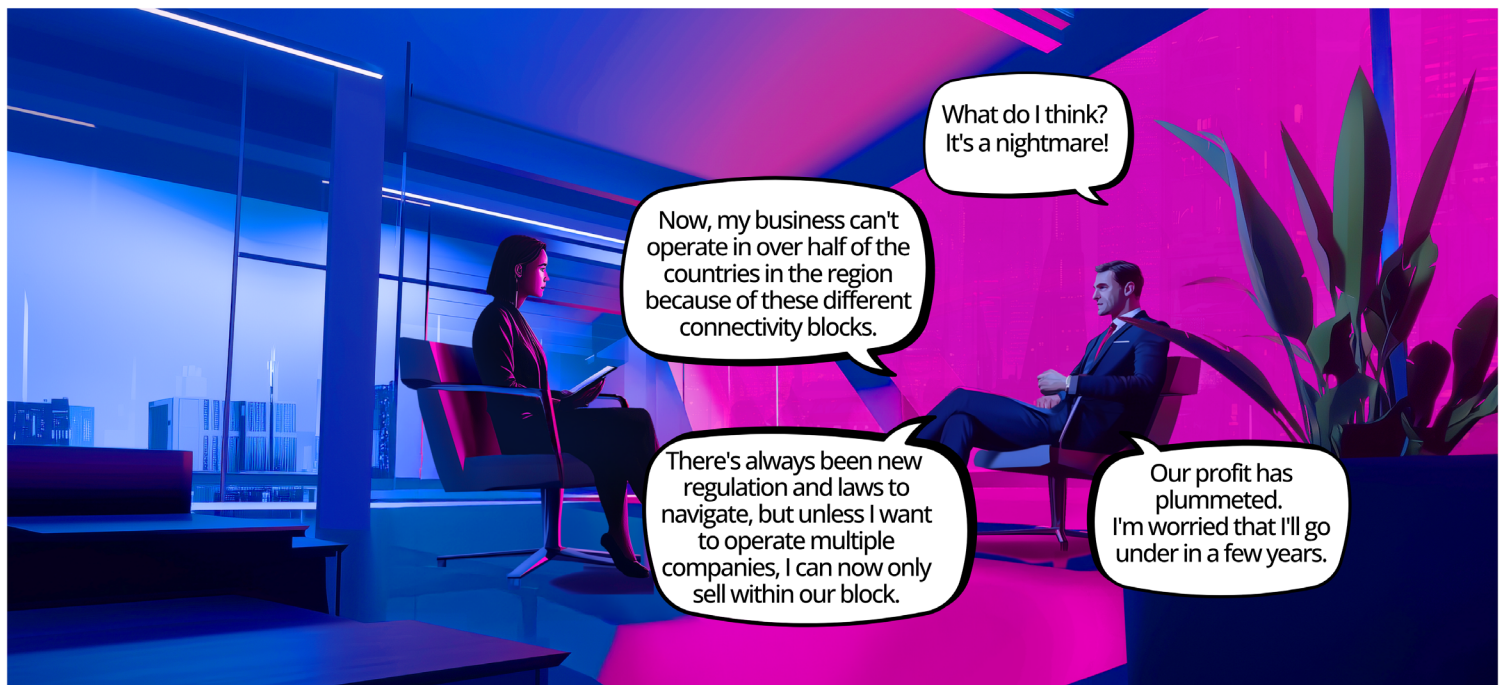
While tensions and fears continue to rise.



The 2038 cable conflict led to formation of three separate and isolated information blocs across the region. Each led by a major power.



By 2040, the global internet, as the world had known it, is dead.



What do I think?
It's a nightmare!

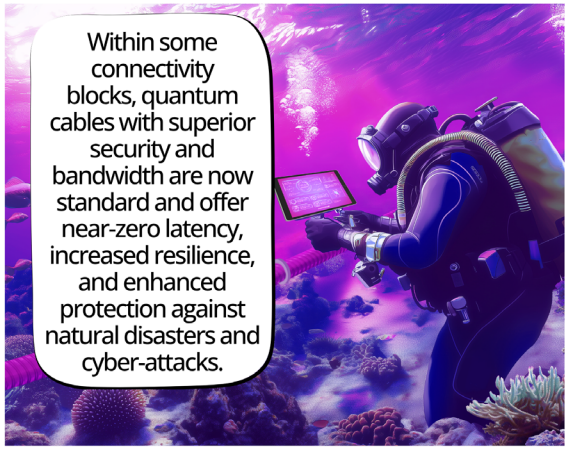
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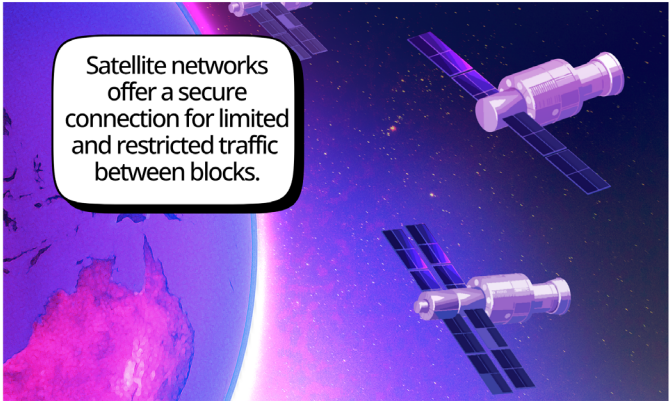
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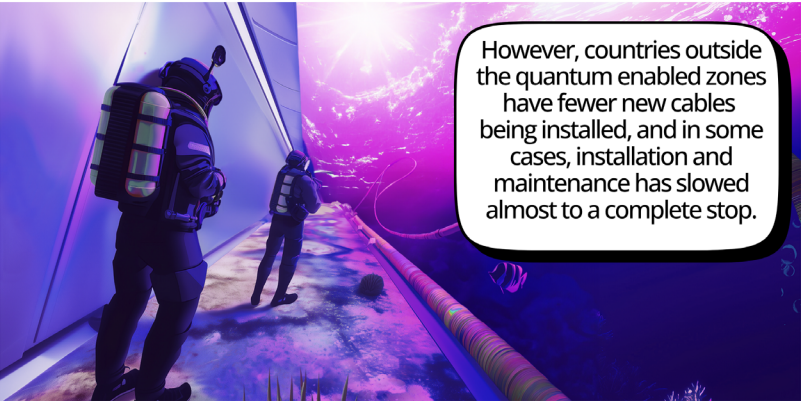
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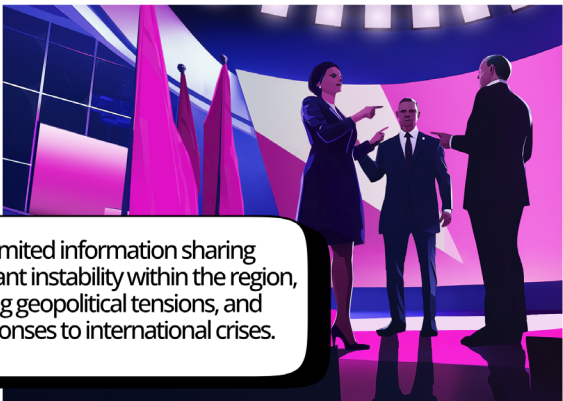
Satellite networks offer a secure connection for limited traffic and restricted traffic between blocks.



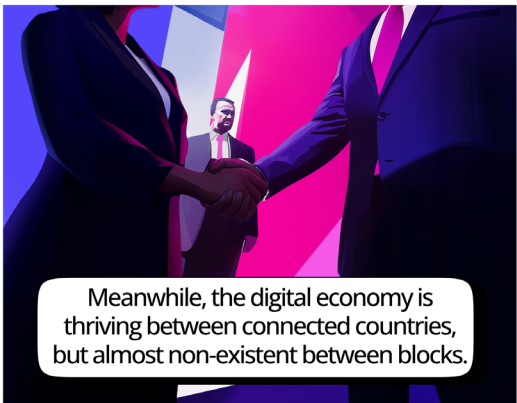
However, countries outside the quantum enabled zones have fewer new cables being installed, and in some cases, installation and maintenance has slowed almost to a complete stop.



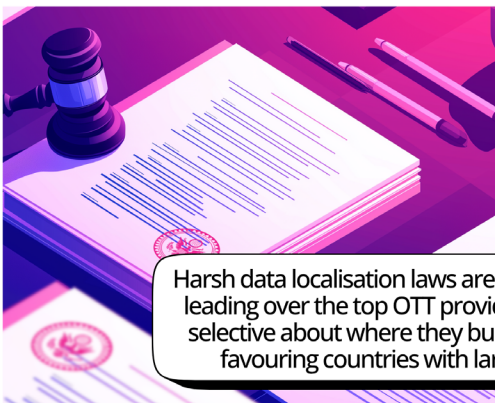
This communication divide and limited information sharing between the blocks is causing significant instability within the region, splintering economies, heightening geopolitical tensions, and making it harder to coordinate responses to international crises.



Societal unrest is mounting due to highly restricted connections between blocks, making it difficult for citizens to communicate between friends and family.

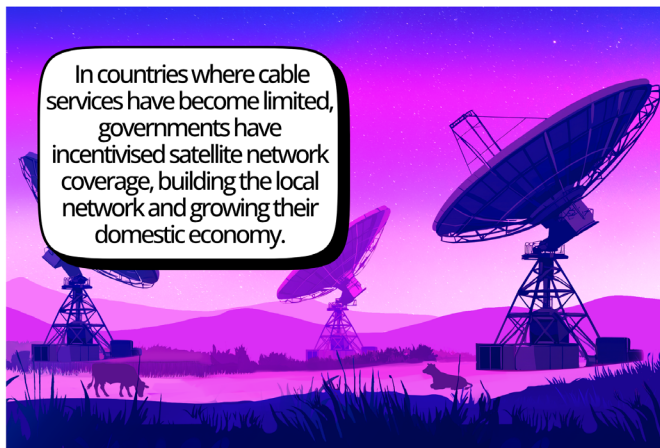


Meanwhile, the digital economy is thriving between connected countries, but almost non-existent between blocks.

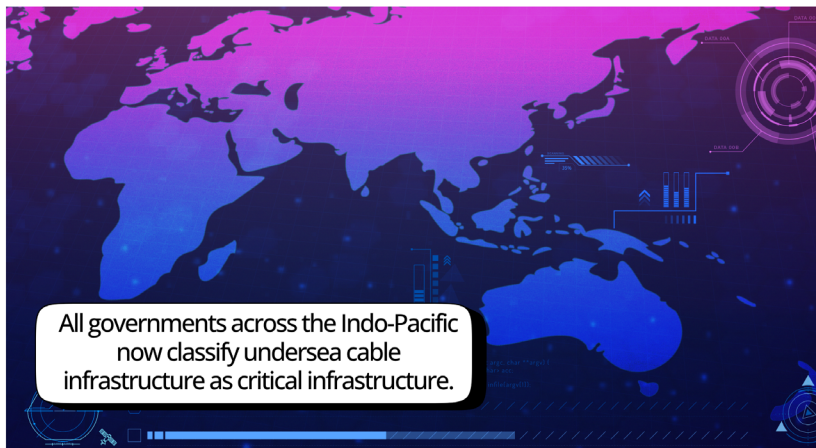


Harsh data localisation laws are now widespread, leading over the top OTT providers to be highly selective about where they build data centres, favouring countries with larger markets.

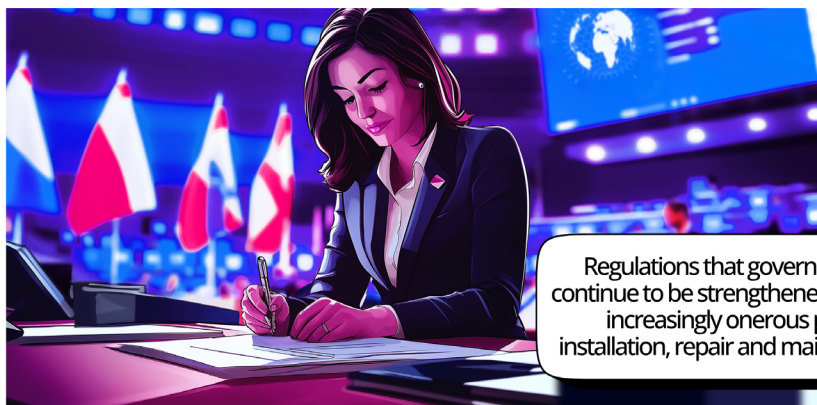




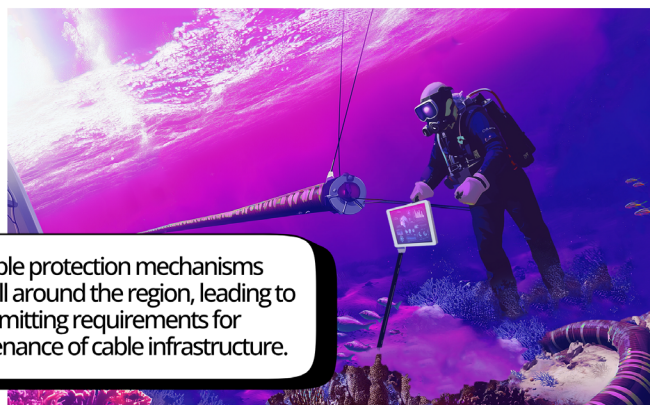
In countries where cable services have become limited, governments have incentivised satellite network coverage, building the local network and growing their domestic economy.



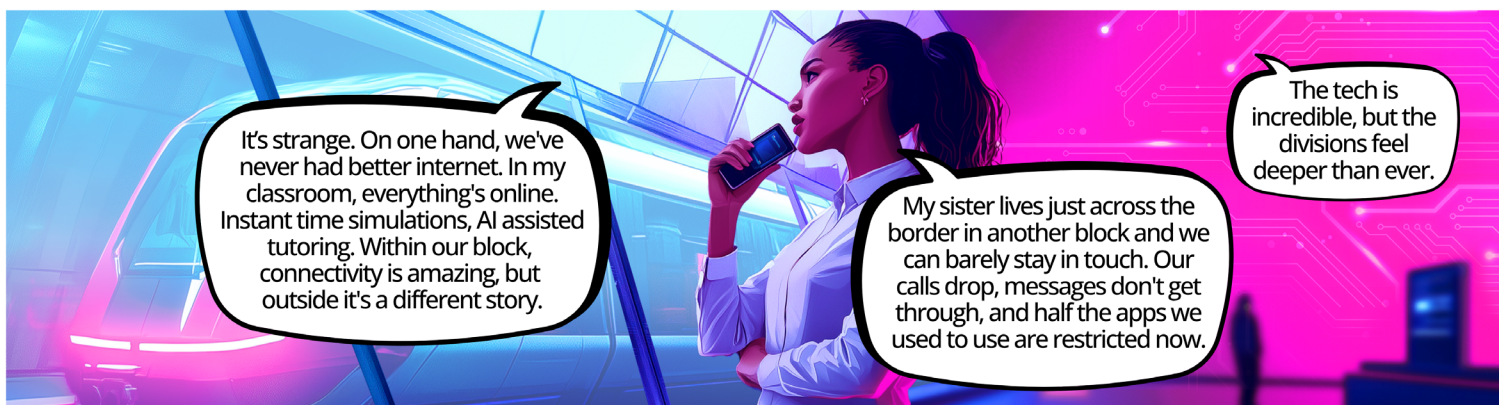
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Regulations that govern cable protection mechanisms continue to be strengthened all around the region, leading to increasingly onerous permitting requirements for installation, repair and maintenance of cable infrastructure.



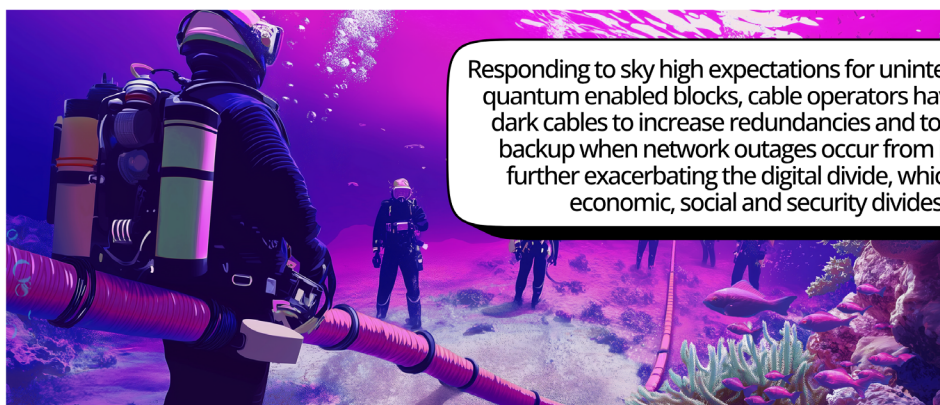
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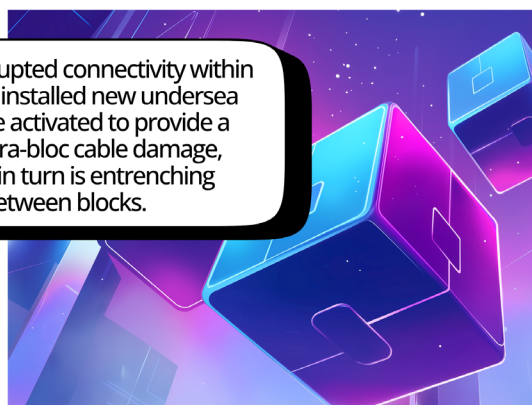
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Responding to sky high expectations for uninterrupted connectivity within quantum enabled blocks, cable operators have installed new undersea dark cables to increase redundancies and to be activated to provide a backup when network outages occur from intra-bloc cable damage, further exacerbating the digital divide, which in turn is entrenching economic, social and security divides between blocks.



SCENARIO 2: PLATFORM POWER

Through the 2030s, undersea cable ownership gradually moved into the hands of only a few over-the-top (OTT) providers, which have now become cable operators. Control of this essential infrastructure shifted away from telecom carriers to a small group of companies in the private sector, the 'Cable Kings'. By the 2040s, decisions about establishing and maintaining international cable connections are driven primarily by private sector interests – a country's connection quality, access, and speeds are now determined almost completely by its commercial attractiveness to cable owners.

TURNING POINT	CONNECTIVITY PROFILE
2037 – Influence of the “Cable Kings” exposed.	▪ Excellent cable connections between commercially attractive jurisdictions – “hotspots”.
TECHNOLOGY BREAKTHROUGH Cost-effective and sustainable satellite technology.	▪ Privatised connectivity (big tech) ▪ Minimal regulation ▪ Rising inequality

Turning Point: Influence of the 'Cable Kings' Exposed

Through the 2020s, the integration of cloud computing and artificial intelligence rapidly increased consumer demand for higher bandwidth and faster connection. In the 2031 annual market reports, analysts were shocked to learn that four OTT service providers had consolidated ownership and now controlled more than 60% of the global cable market – traditional consortia models had been largely replaced by single company ownership. As legacy cables were retired, governments had become increasingly reliant on OTT providers (now cable operators) to build and maintain new cable infrastructure, giving them significant influence in international diplomacy. They became known informally as the 'Cable Kings'.

In 2037, two countries were vying for a significant cable bid to establish direct connectivity with multiple surrounding jurisdictions, essentially becoming a new data hub in the region. Surprisingly, the bid was won by the country that was a less favourable location for cable end points. Strict cabotage laws, or the law that a country's domestically owned vessels must carry out repairs and maintenance within their maritime zones, were widely blamed for losing the bid, as well as lack of readily available, affordable green energy. This undersea cable deal in 2037 exposed to the world how much power had shifted to the 'Cable Kings', who could favour countries that they viewed as having 'business-friendly' cable permit laws.

Several countries in the region were left behind in the cable network boom. They were forced to rely on foreign aid from economically advanced allies, who invested in advancing satellite technology to build it as a capability that was a competitive and viable alternative to undersea cable networks. The funding boost drove significant advancements in reusable rocket technology and mass production of micro-satellite components, which led to a more cost-effective launch and maintenance of low earth orbit (LEO) satellites. New companies began to invest in research and development of satellite technology in the 2020s, which increased significantly by the 2030s as countries wanted to supplement cables connectivity with satellite connectivity for greater coverage.

The World in 2045: Commercially Driven Network Growth

'I love being part of a satellite nation!

I can do all my schoolwork, play games, video chat with my friends from school really easily. It just sucks when I try to do metaverse meet-ups with my friends overseas who have that quantum cable connection. It's so slow at our end by comparison that they just get annoyed and hang up! But it's still pretty cool to be able to see all the satellites in the sky. At night, they look like giant stars, which makes for an amazing selfie background!

School student, 15, in satellite network connected, geographically remote jurisdiction

In 2045, excellent high speed undersea cable network services are available to countries with strong markets, favourable regulatory environments, and ready access to low-cost renewable energy sources. Seventy percent of the global undersea cable infrastructure is owned by tech giants, resulting in 80% of new investments directed towards routes connecting strong economies across Asia and the United States. Across the region, operators concentrate their cable endpoints in a few countries – the United States, Indonesia, Singapore, and Australia – to reduce the cost of maintenance and energy requirements, turning them into central data hubs.

The rise of satellite networks to complement undersea cables and provide coverage in remote areas is seen as a worldwide success story. However, the digital connectivity gap continues to widen and worsen, as the 'Cable Kings' prioritise cable connectivity to commercially attractive countries while neglecting to build this infrastructure for other regions. This results in less commercially attractive countries to rely on satellites as their only way of connecting to data centres, which leads to slower connectivity speeds due to increased congestion and affect their ability to support advanced tech like smart cities and autonomous networked transport. The digital connectivity gap – lack of infrastructure to support increased demand on internet connectivity – is recognised by the United Nations as a major underlying cause of negative impacts on population health, education, and employment outcomes for people outside of core cable hotspots.

The increased reliance on cable infrastructure is leading to growing reluctance from governments of smaller economies to impose regulations on cable companies due to the fear of retaliation – such as their internet connections being deliberately slowed. Parties across the political spectrum in all countries are raising concerns about the erosion of state sovereignty and the shift in power to private companies.

Carbon emission targets are far more challenging to reach due to the energy requirements for the expected exponential growth of cable infrastructure. As such, some governments are incentivising innovation in satellite communications technology, related to the sustainability and carbon accounting of all network-related research, development, manufacturing, and operations, with sustainably produced batteries and energy sources, to reduce the amount of space debris and increase the longevity of the satellite.

'I just turned 18 and you would think I'd be excited about finally getting a right to vote.

It's true that I used to be excited about the possibility of having a say in who is elected to run our country. But what is the point in voting when it's not really governments who decide some of the most important stuff that controls how we live and talk to each other and how we access stuff we need like healthcare and transport and whatever. I wish I could cast my vote for one of the 'Cable Kings' instead. And, if I could, I'd vote for the 'Cable Kings' that are serious about finalising the full global transition to a decarbonised world economy. This is my future you are messing with.'

Frustrated teenager, 18, in a country dominated by the 'Cable Kings'

PLATFORM POWER



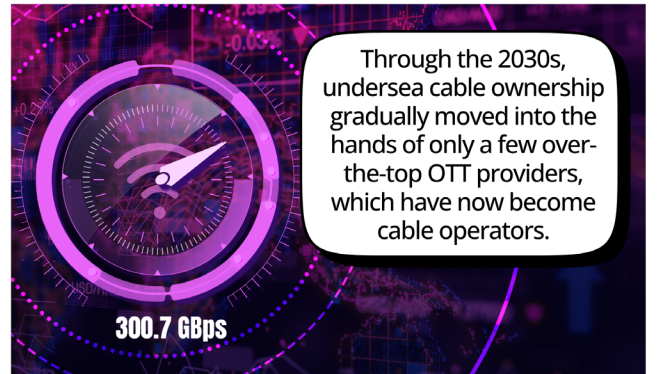
Through the 2030s, undersea cable ownership gradually moved into the hands of only a few over-the-top (OTT) providers, which have now become cable operators.



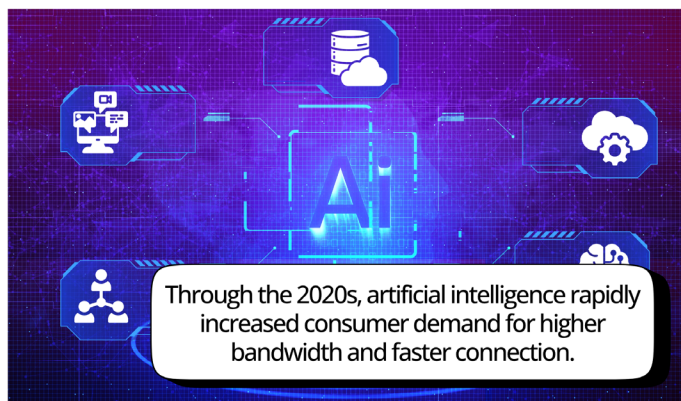
Control of this essential infrastructure shifted away from telecom carriers to a small group of large multinational technology companies.



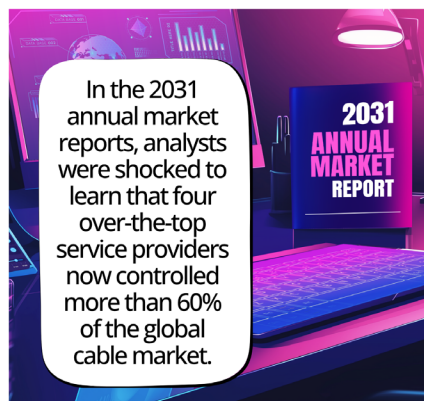
By the 2040s, decisions about establishing and maintaining international cable connections are driven primarily by private sector interests.



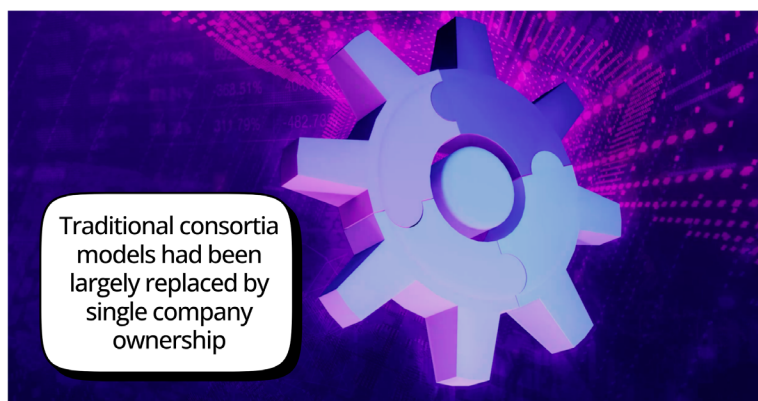
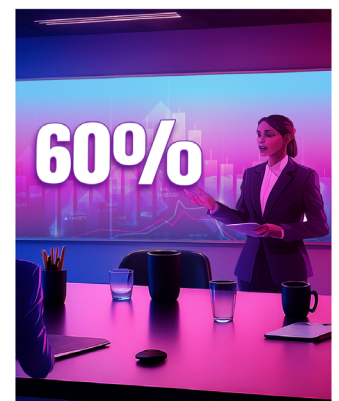
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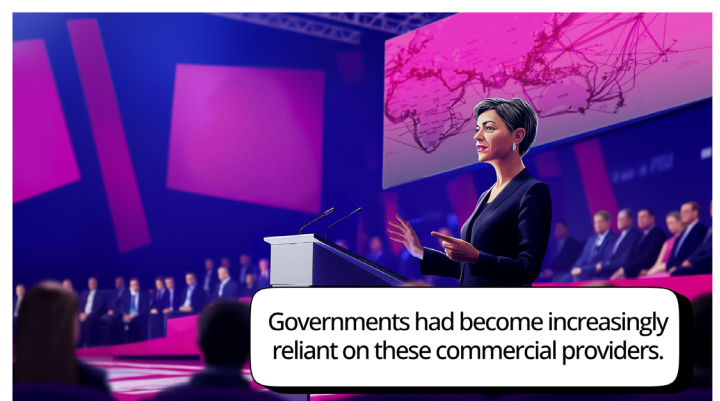
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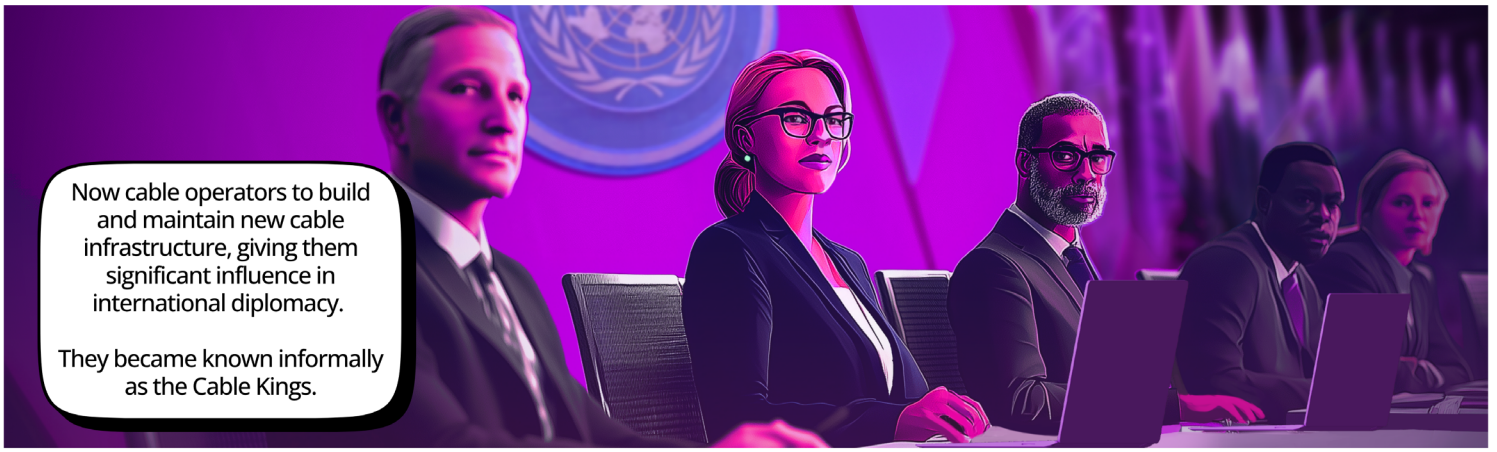
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Traditional consortia models had been largely replaced by single company ownership



Governments had become increasingly reliant on these commercial providers.



Now cable operators to build and maintain new cable infrastructure, giving them significant influence in international diplomacy. They became known informally as the Cable Kings.



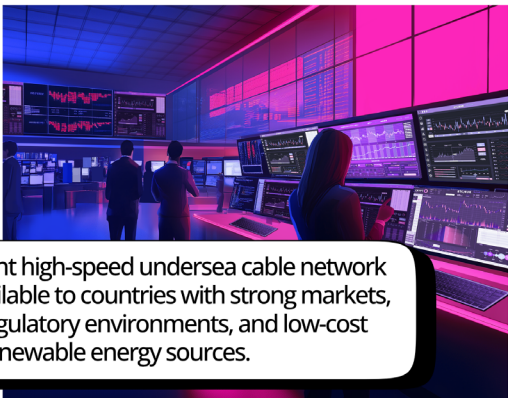
In 2037, two countries - Solkara & Brenthia - were vying for a significant cable bid to establish a new data hub in the region. Surprisingly, the bid was won by Brenthia despite it being a less favorable location for cable endpoints.



Commentators attributed Solkara's loss of the bid to its lack of affordable green energy and strict cabotage laws that require Solkara's domestically owned vessels to carry out any cable repairs within their maritime zones.

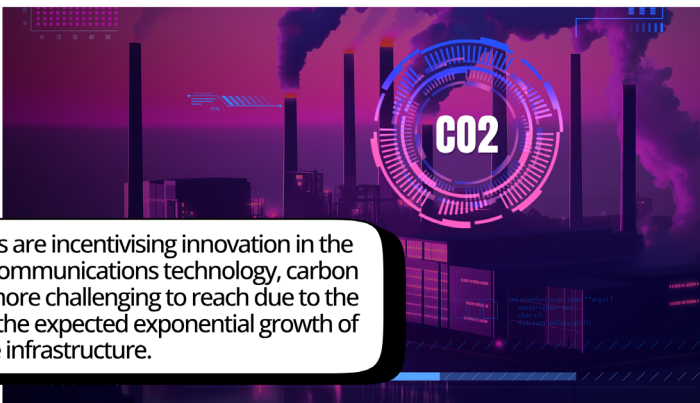
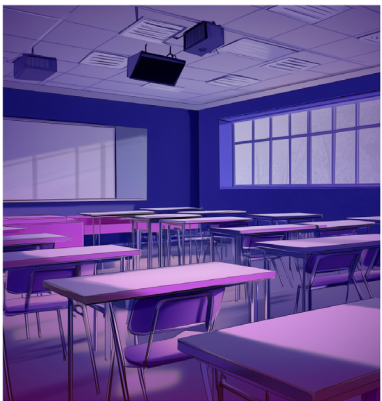
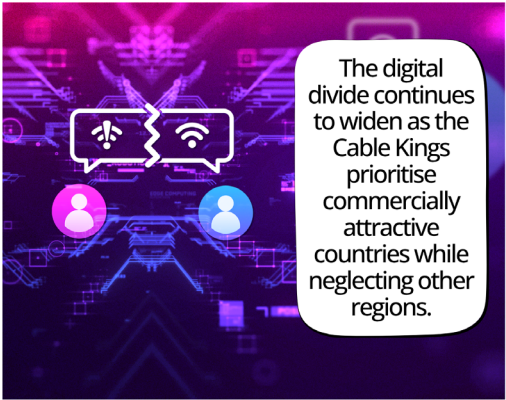
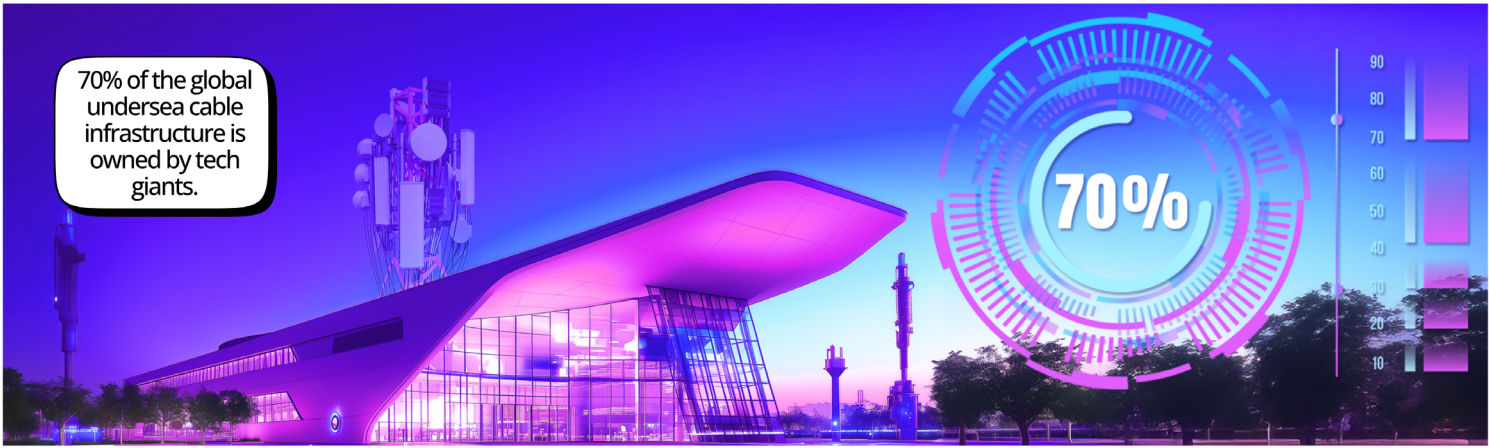


Investment in research and development of satellite technology increased during the 2030s as countries wanted to supplement cable connectivity with satellite connectivity.



In 2045, excellent high-speed undersea cable network services are available to countries with strong markets, favourable regulatory environments, and low-cost renewable energy sources.







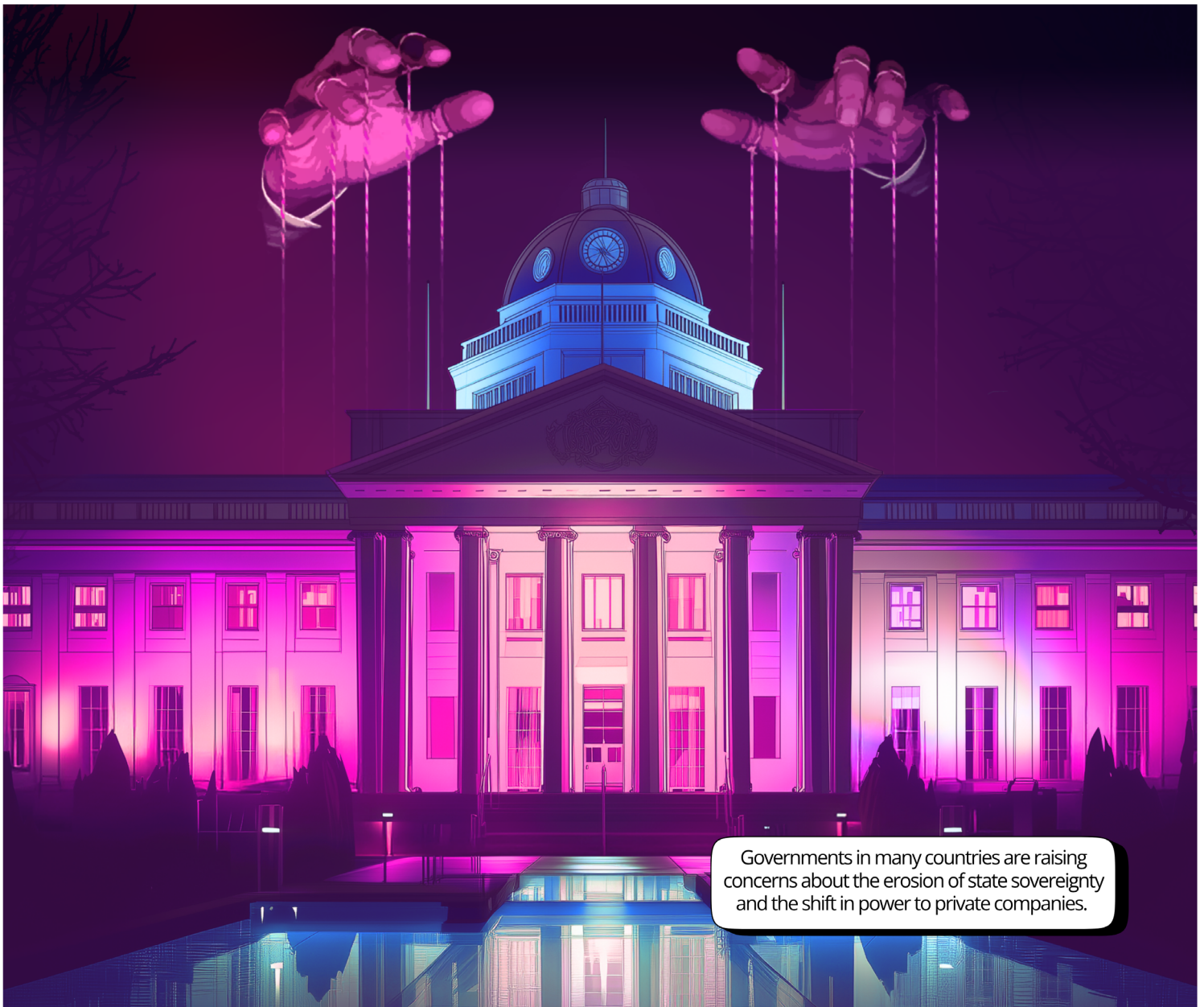
The increased reliance on cable infrastructure is leading to growing reluctance from governments of smaller economies to impose regulations on cable companies due to the fear of corporate retaliation.



I just turned 18, and you would think I'd be excited about finally getting the right to vote.



But what is the point in voting when governments are no longer the ones who decide how we live and talk to each other, and how we access health care and transport?



Governments in many countries are raising concerns about the erosion of state sovereignty and the shift in power to private companies.

SCENARIO 3: REGIONAL RESILIENCE

2030 is known as the 'year of disasters' across the Indo-Pacific. It marked a turning point for the region as it faced the consequences of escalating climate emergencies on regional connectivity, prompting countries to prioritise the resilience of undersea cables. By 2045, countries across the Indo-Pacific adopted 'Regional Resilience' as their motto for connectivity, resulting in flourishing international cooperation. However, some influential governments have begun to use the increased international trust to strengthen their power. Citizens in some countries are becoming increasingly concerned about potential government overreach into their daily lives.

TURNING POINT

2030 – Year of disasters 'climate crisis'.

TECHNOLOGY BREAKTHROUGH

Routine automated cable maintenance by underwater repair drones.

CONNECTIVITY PROFILE

- Different quality dependent on a country's resources
- Regional cooperation is top priority
- Harmonised regulation
- Public-private co-investment

Turning Point: Climate Catastrophe Brings 'Year of Disasters'

A series of devastating climate events hit countries across the Indo-Pacific in 2030, resulting in prolonged connectivity blackouts, region-wide economic downturn, and declaration of a regional emergency. As part of a cooperative international response, governments across the region agreed to expand the International Cable Protection Committee's (ICPC) role to spearhead cable connectivity recovery efforts through the next two decades. Resilience of undersea cable infrastructure came to be seen as essential for maintaining regional stability and responding to the climate crisis.

A new climate event affected the region nearly every month in 2030. Category 5 hurricanes devastated coastal areas from the Bay of Bengal to the South China Sea, causing extensive damage to the undersea cables and their branch stations. A major undersea earthquake along the Pacific Ring of Fire triggered a tsunami that severely disrupted cable landing stations between South-East Asia and the Americas, leading to prolonged communication blackouts.

'You kids keep complaining about how high the cost of living is now, but I lived through the worst of the financial crisis in 2030 – every company was in a deficit, workers couldn't get paid, and money didn't move at all for almost a year.'

I remember spending every Sunday in the queue at the bank for hours a day just to deposit our paycheques or to withdraw money because none of our online payment systems worked. Thankfully, the international powers that be learned from that disaster and put some decent money and effort into cables resilience. Today's young people should be thankful that we won't ever have to worry about a situation like that again!

Retired senior citizen, 74, Australia

Digitally advanced countries with more cables connections only suffered brief connectivity blackouts whereas countries with fewer cable connections lost almost a year of connectivity. At the brink of reaping the economic benefits of artificial intelligence and the digital economy, the disasters of 2030 pushed regional connectivity agendas back. An international review into disaster response and recovery identified that billions of dollars and countless lives could

have been saved if connectivity had been maintained throughout the crisis. Leaders of most countries in the region came together in 2031 to discuss how to navigate the way out of the disaster and pledged that they would prioritise regional connectivity resilience.

The World in 2045: Connectivity Resilience Through Cooperation

'Regional Resilience' is now the motto across the Indo-Pacific. The ICPC is now the regional regulator – with teeth – that enforces stringent standards for cable installation, maintenance, and disaster response. Governments across the region established a new body, the Cable Consortium of Asia and the Pacific (CCAP), to coordinate international collaborative efforts to improve the resilience of undersea cable networks.

The CCAP now mandates that cable operators have comprehensive disaster preparedness plans, and use of environmentally friendly materials and technologies. Permit processing for installation of new cable connections and landings has now been streamlined into regional agreements. The region has also set, and agreed to, a guideline for monitoring and patrolling maritime areas that affect undersea cable infrastructure. However, worsening food shortages are leading to an increase in national fishing vessels illegally operating in restricted zones.

More digitally advanced governments regularly offer assistance to those with fewer resources to establish and maintain their infrastructure. Through an expanded Quad ++ network, advanced economies invest into a regional fund that aims to support connectivity and resilience for the whole region, providing much-needed support and economic incentives for private sector developments in less connected neighbouring countries, as well as fostering research and development.

Public-private co-investment in new technologies has accelerated development of self-managing cable repair systems that are highly effective at ensuring uninterrupted connectivity. Redundancy measures, such as having dark fibres and including spurs for greater connectivity reach, are now expected when building new cables. Other resilience-building initiatives such as bundling undersea power cables with data cables and expansion of satellite networks are underway – all of which helps to establish redundancy and streamline monitoring, maintenance, and repair.

Scientific research grants have facilitated several new innovations including new cable designs incorporating self-healing materials that can automatically seal minor breaks and cuts, reducing the risk of downtime. These designs include real-time monitoring using AI and autonomous underwater drones equipped with advanced sensors and repair tools perform maintenance and minor repairs without human intervention. However, use of the new drones is challenging conventional maritime law and exclusion zones, as the drones are able to move undetected in areas where conventional ships and vessels are not allowed.

'Building this cohesive international cooperation has overall been a good thing, but there is that underlying feeling that it's us against them.'

"Us" being the people that governments are there to serve and "them" being the governments, who are now working together. They say they are acting in our interests, but what's the incentive for that? The way the undersea network has developed means that your government can control your data flow and what you do and don't see online. We haven't seen the full potential of this new multi-government power structure and it would be wise to keep our decision-makers accountable for what they now control.'

Professor of Digital Transformation, Leading National University, 52, USA

Yet, even with the heightened regional cooperation, digitally advanced governments throw their weight around through the ICPC. Competition to offer development assistance for state-of-the-art submarine cable and satellite packages is common and countries seeking to bridge the digital divide to boost bilateral trade and relationships are often used as pawns. There is also growing concerns among civil rights groups about the consolidation of power and data by governments.

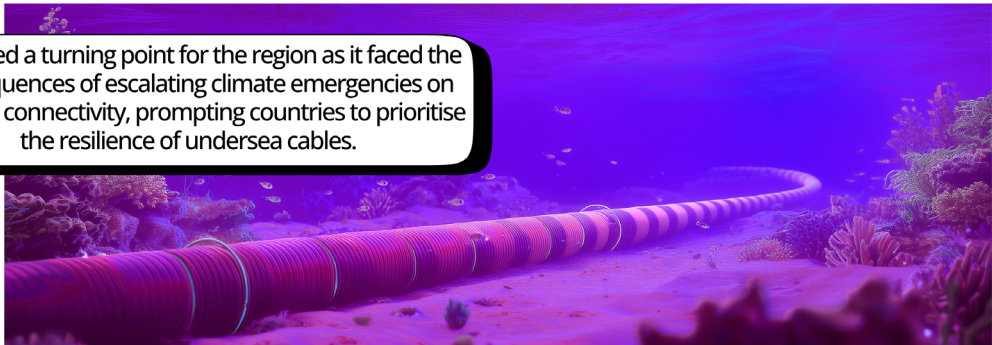


REGIONAL RESILIENCE

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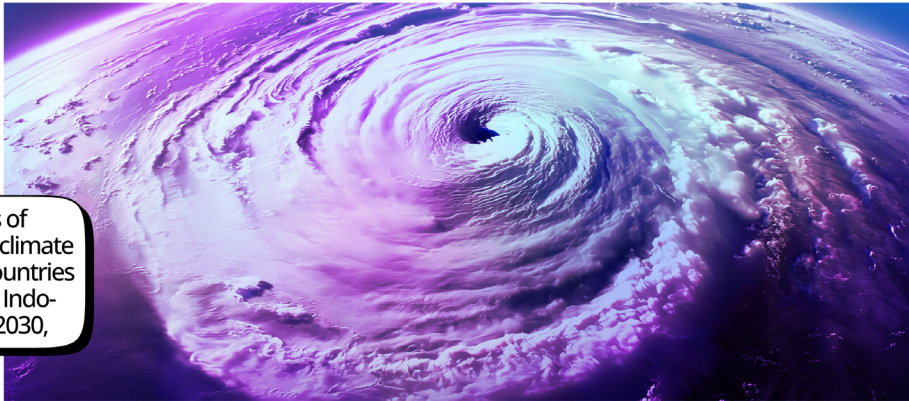
However, some influential governments have begun to use the increased international trust to strengthen their power.

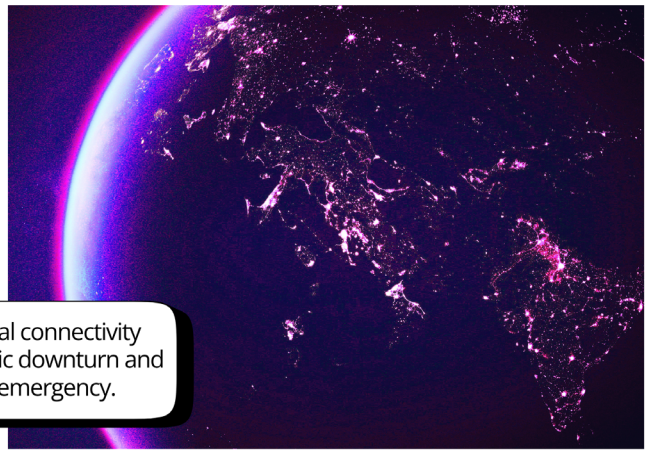
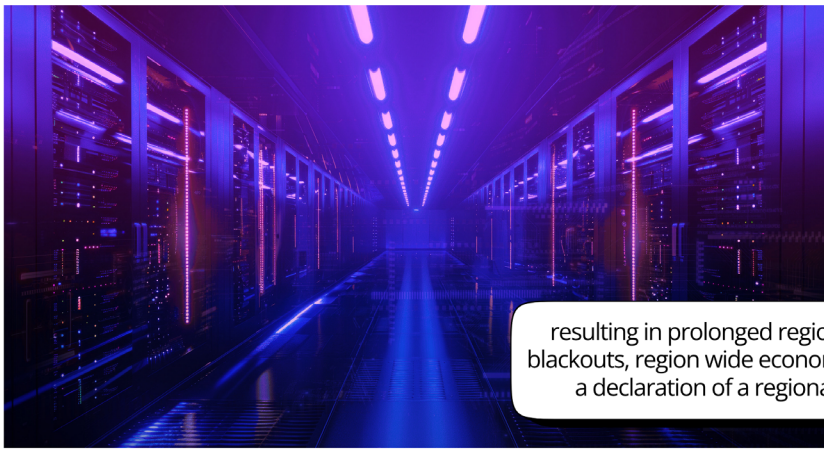


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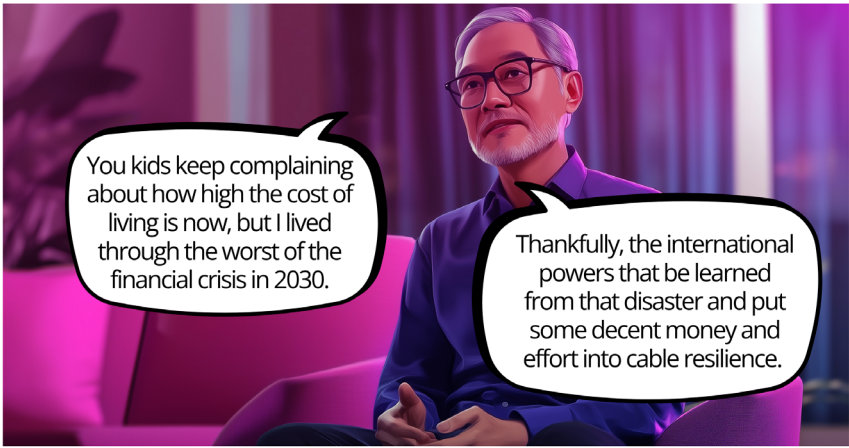
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CCAP

Cable Consortium of Asia and the Pacific

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EMERGENCY PLAN



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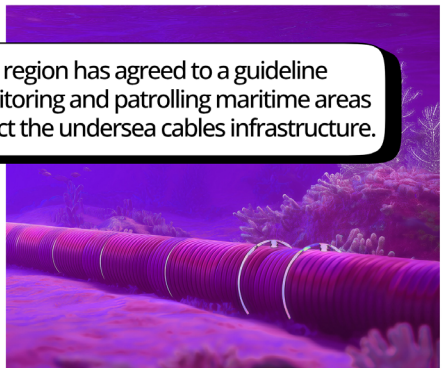
ENVIRONMENT FRIENDLY MATERIALS & TECHNOLOGY



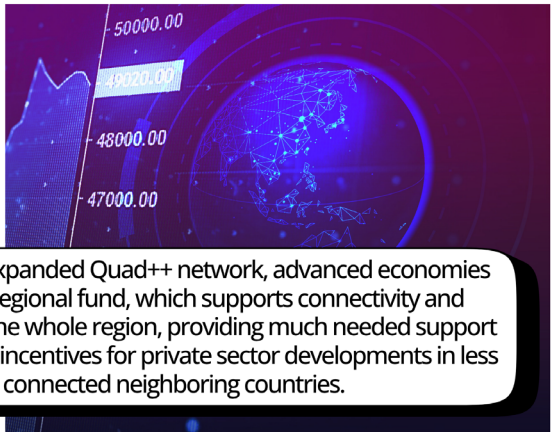
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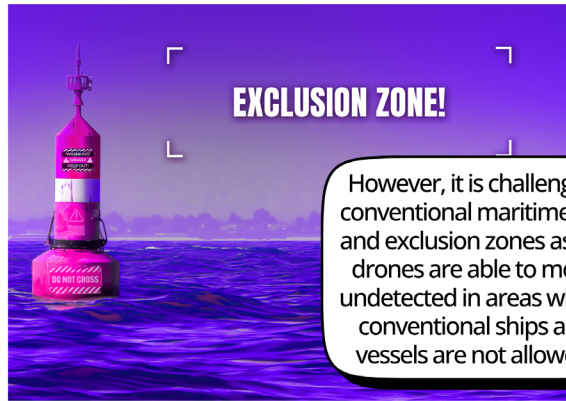
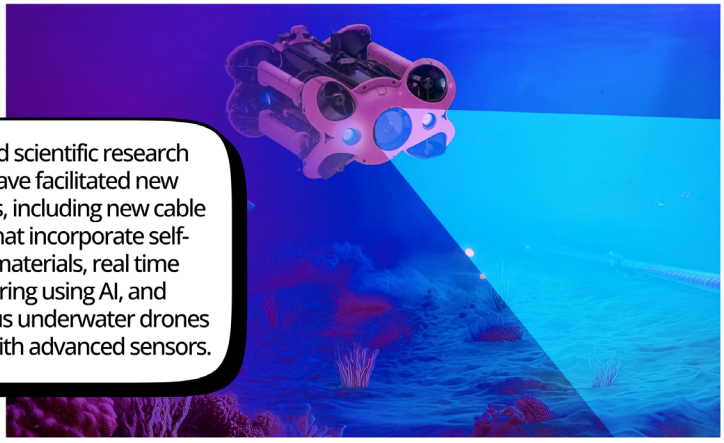
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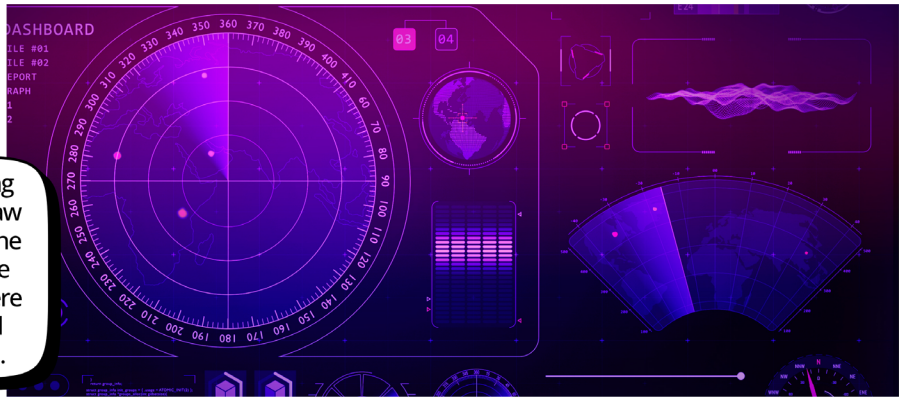


Supported scientific research grants have facilitated new innovations, including new cable designs that incorporate self-healing materials, real time monitoring using AI, and autonomous underwater drones equipped with advanced sensors.

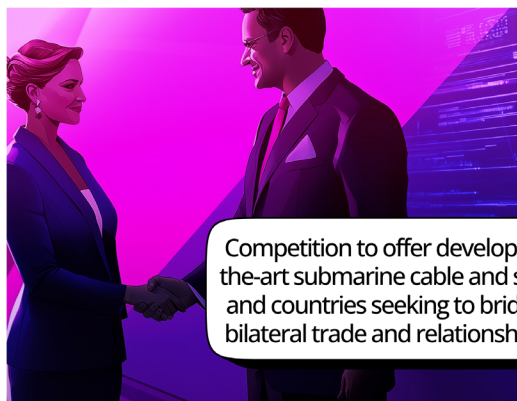


EXCLUSION ZONE!

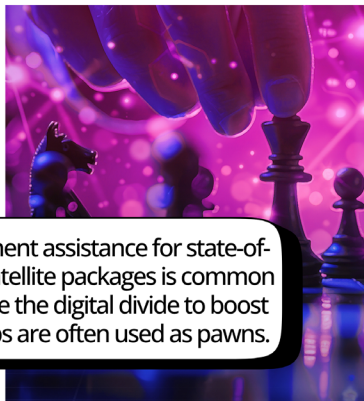
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