



## 3 Link Vanuatu

Millie Ogden – Founder 3 Link

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# Smart Ports 5G Technology & Renewal Energy:

**A Sustainable and Efficient Future for Island  
Supply Chains via**

- 1) Digitization and**
- 2) Geothermal & Green Hydrogen  
Renewable Energy Production**

### 3 Link Smart Ports and Geothermal in Vanuatu work on:

- **SDG 1: No Poverty**
- **SDG 7: Affordable and Clean Energy**
- **SDG 9: Industry, Innovation and Infrastructure**
- **SDG 13: Climate Action**

Underserved Asia Pacific markets offer an outstanding opportunity for the digital telco.



Pacific markets are characterised by low penetration, poor service and surprisingly high ARPU.

The Pacific has been ignored by tier 1 operators and is dominated by in-trouble Digicel and ATH Fiji (Vodafone). Data use remains pent up through a lack of affordable wholesale internet, while the high cost of traditional networks restricts the profitability of all but the market leaders.

Key Asia Pacific markets represent clear opportunities thru data growth, quality of service, innovation and increased penetration.

### Selected APAC Characteristics

Emerging Asia:  
Population: 80.7M  
Penetration (mean): 72%  
Active SIMS (mean): 73.25M  
ARPU (mean): \$(US)12.14

Myanmar:  
Population: 56,000,000  
Penetration: 86.2%  
Active SIMS: 47,600,000  
ARPU: \$(US)3.02. \$36.24 pa

Laos:  
Population: 7,852,000  
Penetration: 64.96%  
Active SIMS: 4,820,000  
ARPU: \$(US)18.04. \$216 pa



Pacific (average):  
Population: 11,855,900  
Penetration: 48%  
Active SIMS: 4,903,190  
ARPU: \$(US)15.74. \$180 pa

Papua New Guinea:  
Population: 8,503,000  
Penetration: 39.37%  
Active SIMS: 2,789,681  
ARPU: \$(US)14.15. \$163 pa

Vanuatu:  
Population: 286,000  
Penetration: 63%  
Active SIMS: 179,550  
ARPU: \$(US)12.60. \$152 pa

Solomon Islands:  
Population: 630,000  
Penetration: 57%  
Active SIMS: 358,586  
ARPU: \$(US)13.91. \$161 pa

- 10 markets above 200k population.
- 16 smaller markets below 200K.
- 6 markets with visitor segment 2 x larger than population.
- Selected market mean penetration below 50%.
- Regional average annual spend, \$(US)180.51 per customer.
- Data spend \$(US)83.04 – <46% of spend.
- 62% of customers Pacific use 2/3G networks.
- Pacific 4G coverage <26% of populated land mass.

*The dynamics of Asia Pacific connectivity have been driven by a small number of operators in closed markets that operate ageing, uneconomic voice-centric technology*

## A wave of game changing technology.

3 Link's 5G Fixed Wireless Access is a digital disruptor who is changing change the nature of frontier market telecommunications, together we will deliver affordable broadband for social, economic and political good.

# Traditional operators in the Pacific are not addressing the market's potential.

The reasons for the performance of many telcos are varied, but in many cases, stem from over-capitalization of infrastructure and the inability to monetise or extract value from the investment.



Even where a telco such as Digicel is nominally profitable and successful it is burdened with billions of dollars in unsustainable investment. This underperformance is disastrous for investors – and for consumers who are burdened with high costs and poor service levels as a result.

A review\* of Telco's indicate the reasons for underperformance are common, widespread and affect all aspects of operations

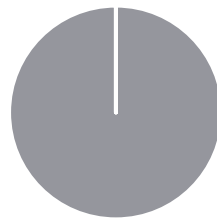
Financial performance of regional operators is nominally sound due a lack of competition –rather than strong performance.

Capitalization & Infrastructure



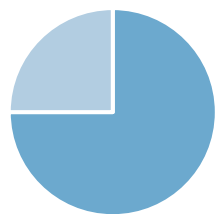
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Network Performance



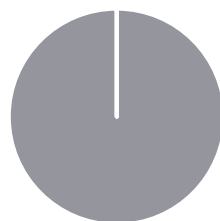
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Product & Marketing



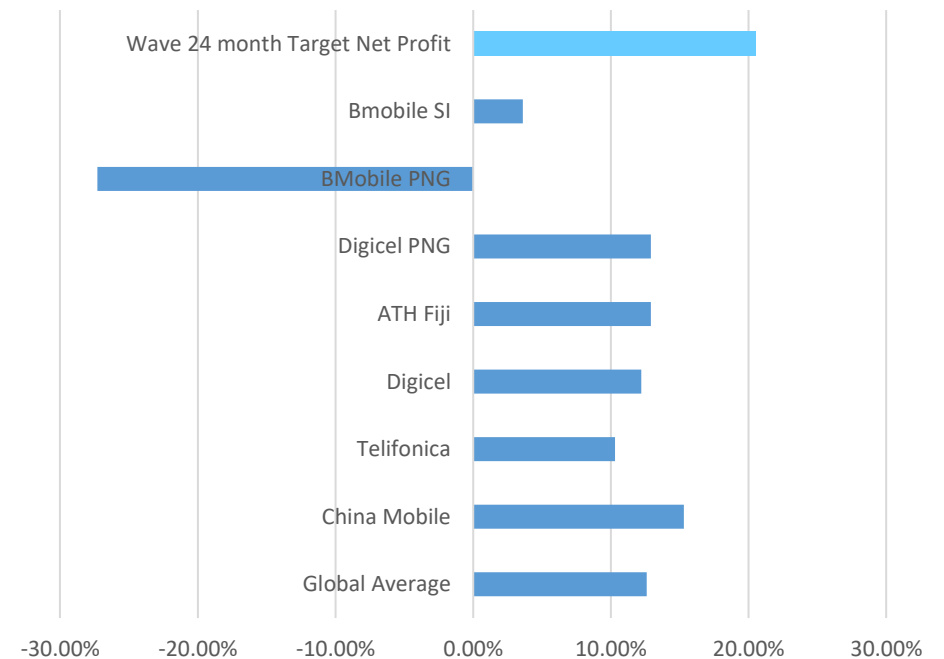
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Operational Effectiveness\*\*



■ Above ■ Under ■ Appropriate

2019 Telco NP



\*Based on a review of 6 Pacific operations compared to APAC benchmarks carried out by Pacific Wave, August 2019.

\*\*Includes employment overhead, site operations, transport & capability.



3 Link will disrupt the traditional, hitherto unsuccessful model, by partnering with investors and governments to champion national ambitions and build valuable telcos.

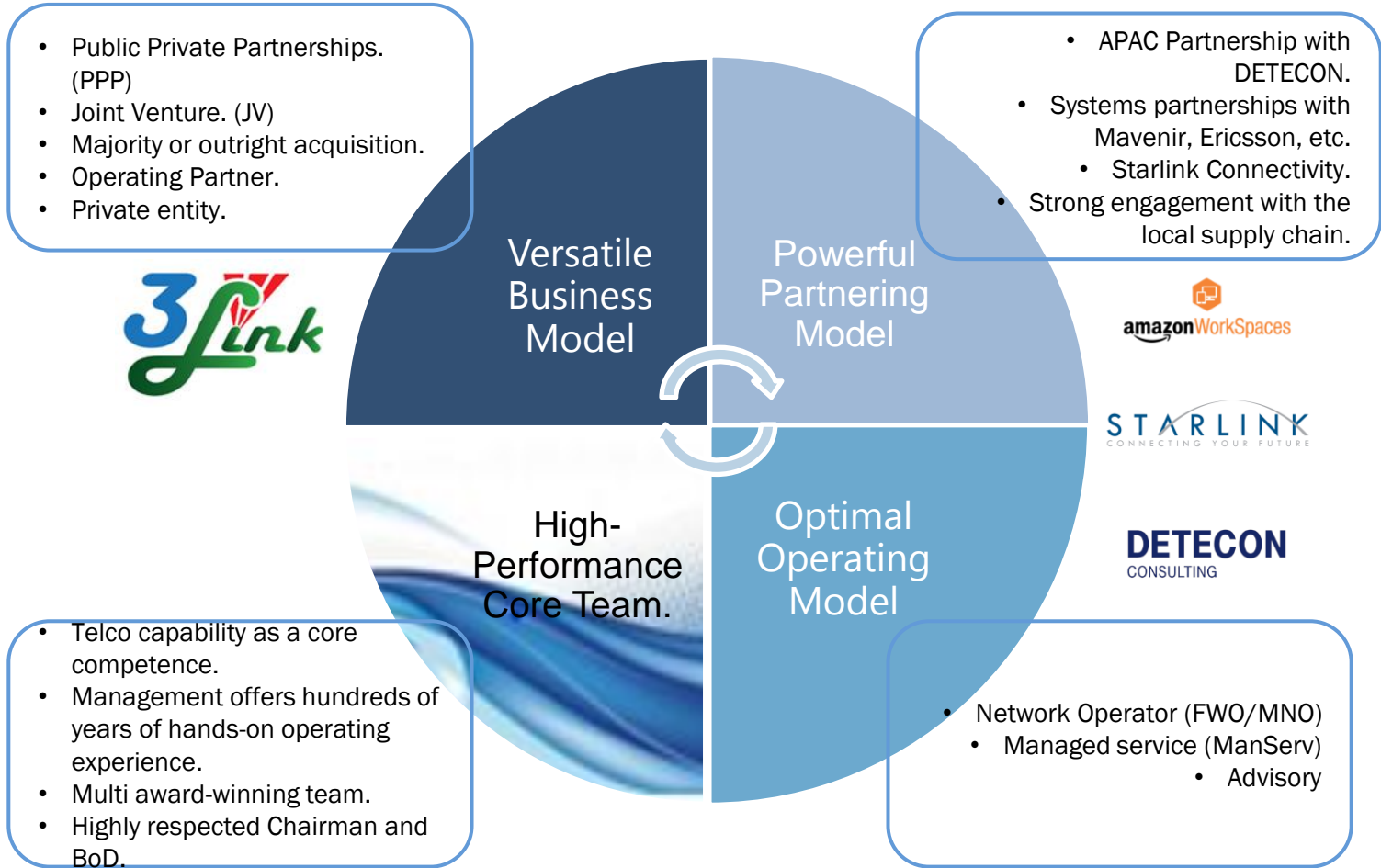


Unlike many international operators, 3 Link explicitly works to deliver connectivity and bridge the digital divide. 3 Link supports governments to realise the potential of national investments in critical infrastructure while ensuring the right technology mix. We builds sustainable businesses through trusted partnerships with local communities and businesses.

3 Link is not another traditional telco. Our operation is tailored to deliver value locally.

3 Link is the product of partnerships with global leaders and hundreds of man years experience in our award winning team.

Experienced in emerging Asia, the Pacific and the Caribbean.





## Traditional networks cannot exploit the emerging APAC opportunity.

The capital required in emerging APAC deters market entry and has constrained traditional telcos, yet ARPU and pent-up data demand are strong.



Most operators continue to build voice-centric networks due to legacy services and products, despite the market analysis clearly indicating growth from 2024 will be driven by 5G/FTTP broadband, IoT driven by video and voice replacements apps driving a six-fold increase in data consumption.

Mobile data revenues surpassed voice revenue in 2017 and have continued to grow, driven by 4G and from 2022, 5G deployment in the populous nations of Thailand, Indonesia and Vietnam.

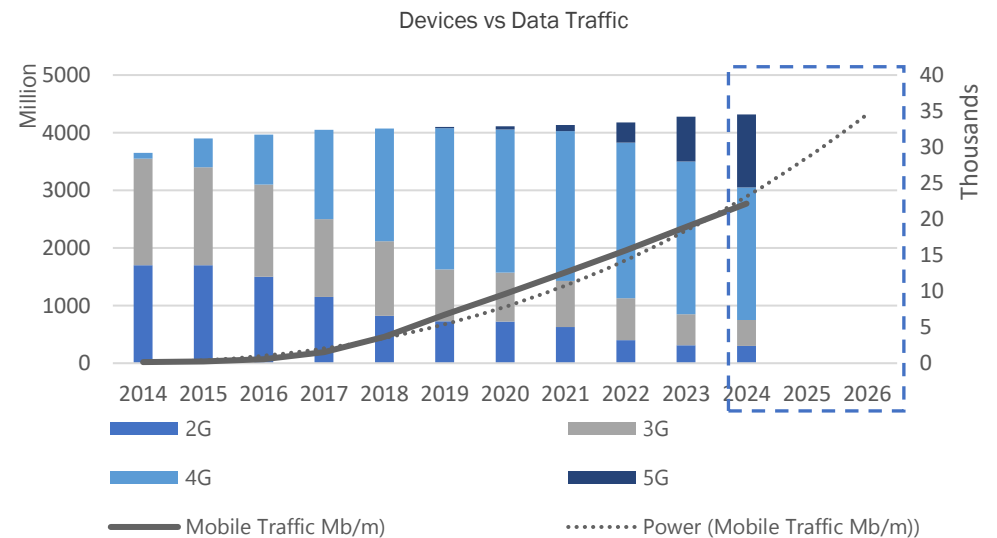
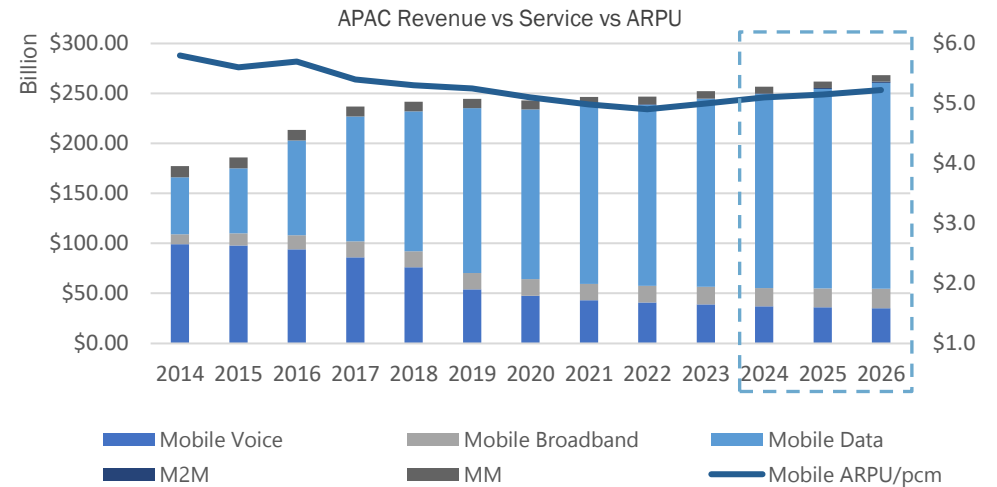
The advent of 5G promises to spur broadband growth using 'Fixed Wireless Access', providing access to high-speed internet in regions that cannot be economically addressed by fibre.

Addressing pent-up data demand in can increase APAC ARPU by 30c per user, increasing average monthly ARPU from \$4.9 (2021) to \$5.2, increasing market value to \$260.1Bn by 2026.

Most frontier and emerging Asia Pacific networks remain 3G & 4G, with little 5G deployed outside major populous nations, where internet access is limited by sub-sea cable capacity and high internet costs charged by state-owned gateways; as a result, data use remains pent-up in these markets.

Unlocking access network speed (leapfrogging 4G and moving directly from 3G to 5G) with the availability of affordable internet can increase data use six-fold and reduce production cost/Mb. This will maintain or improve operating margins.

*"3 Link Wave is the next generation of telco, which solves the constraints of traditional network architecture and promises to leapfrog underserved markets from backwaters into the cutting edge of the 21<sup>st</sup> century;"*







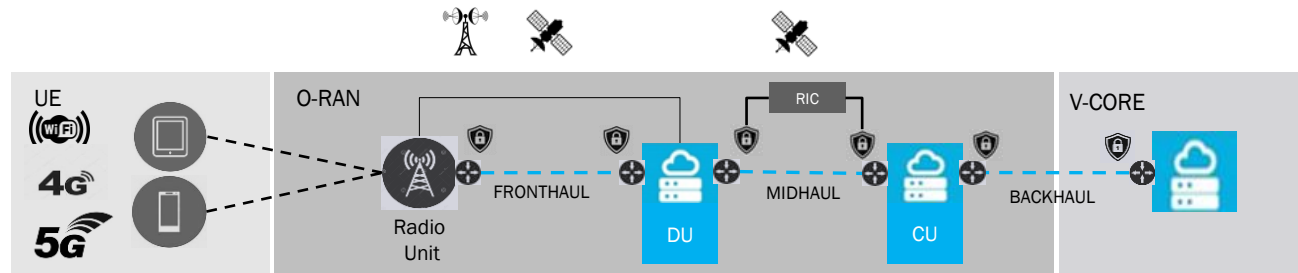
# The digital telco is changing the affordable broadband landscape.

Wave will drive a paradigm shift in underserved and frontier markets driven by architectural innovation that reduces capital costs to create competitive advantage.



The major technological shifts that Wave have harnessed offer the ultimate opportunity for a new-to-market operator to address critical broadband markets with a **significant production cost advantage** that can be passed onto the consumer to **gain market share quickly** and return **industry-changing NPV and ROCE performance**.

## Waves advanced, OpenStandard(s) Network Architecture.



Convenient, affordable access to service through commonly available mobile, fixed and static devices.

Uses secure, OpenRAN radio systems based on Intel standard platforms and LEO satellites for transport, **reducing radio cost by as much as 40%**.

Waves core can support multiple RAN networks, shattering the traditional model of one core per nation - **reducing core cost substantively**.



Promotes early uptake of service without new device purchase.



Use of OpenSystems and Intel based platforms supports our core strategies of clean networks, cost out and outsourcing.



We are exploring a zero capital (per sub license) option with core system suppliers.



Reduces exposure to retail financial risk, reduces channel related headcount and associated OPEX significantly.



LEO transport allows Wave to deploy quicker and deploy where uneconomic for traditional infrastructure (TTM).



Virtual core reduces expensive core support costs and nullifies local skill gap issue.



Simplifies channels to market and reduces channel costs.



Open RAN can be sourced from non-traditional, underserved suppliers.



Consolidates point of customer experience and doubles down on security.



# Vanuatu currently has the infrastructure Build Largest Port in the South Pacific in Luganville Santo



Million





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# Open RAN Secure Network and leverage AI and autonomous Machinery

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## The 5G Solution: 3 Links's Open RAN Technology

5G offers a secure and high-speed platform for **Port 4.0**, a vision of intelligent and automated ports. 3 Link proposes a solution using

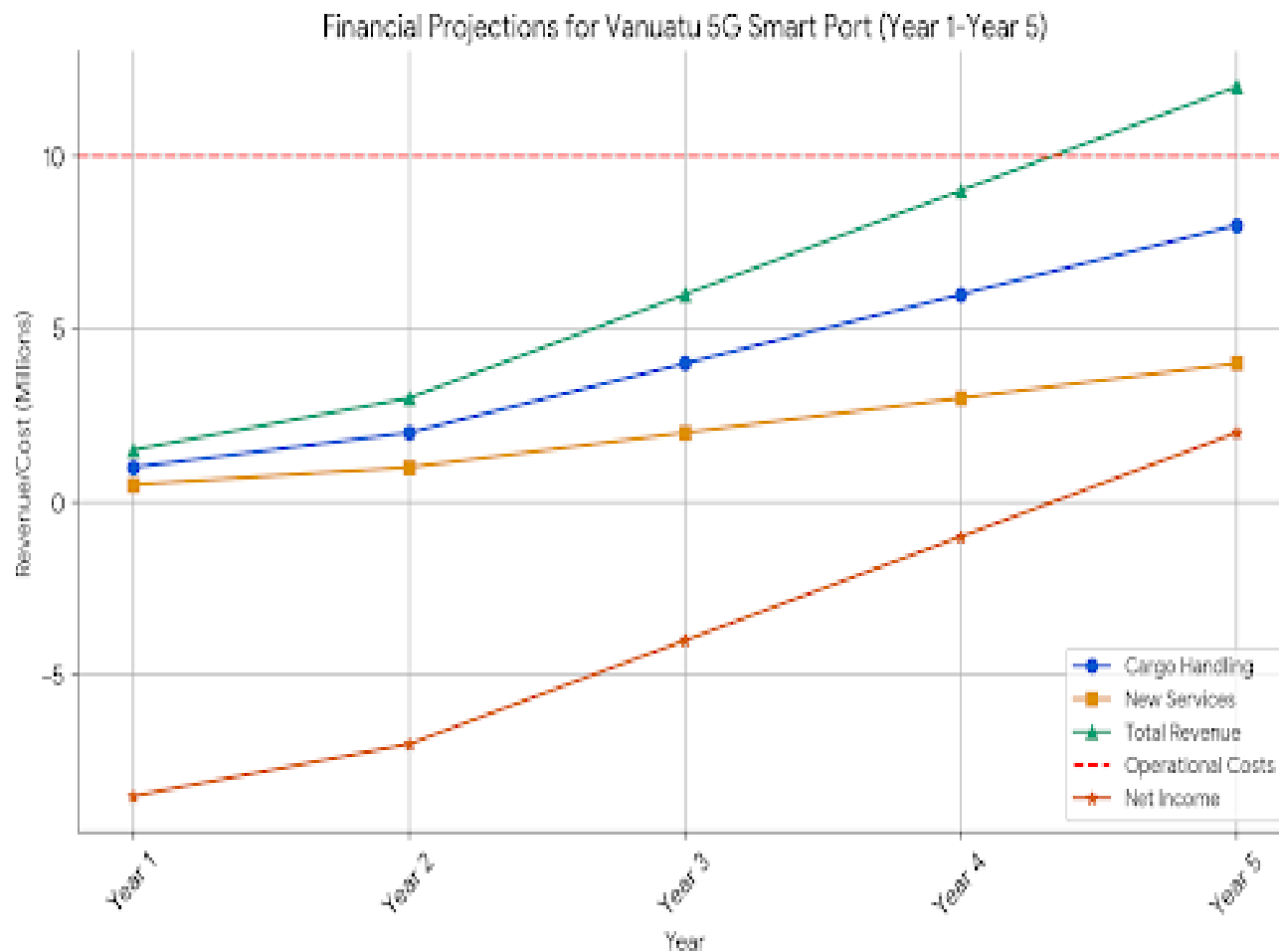
**Open RAN (O-RAN)** technology for a dedicated or virtual private core network. This ensures the highest security standards with 3 Link's commitment to using only Clean Network-approved suppliers. Additionally, 3 Link can provide comprehensive cybersecurity provides a robust defence against cyber threats.

## Transformative Benefits of Smart Ports with 5G:

- **Cargo Management:** ASYCUDA more efficient, 5G-enabled smart tags track cargo
- **Automated Operations:** Remotely controlled cranes and autonomous guided vehicles (AGVs)
- **AI-powered Video Surveillance:** Real-time optimization of container handling
- **Streamlined Clearance:** Faster customs
- **Real-Time Data Analytics:** Optimise operations based on real-time data insights from sensors and devices

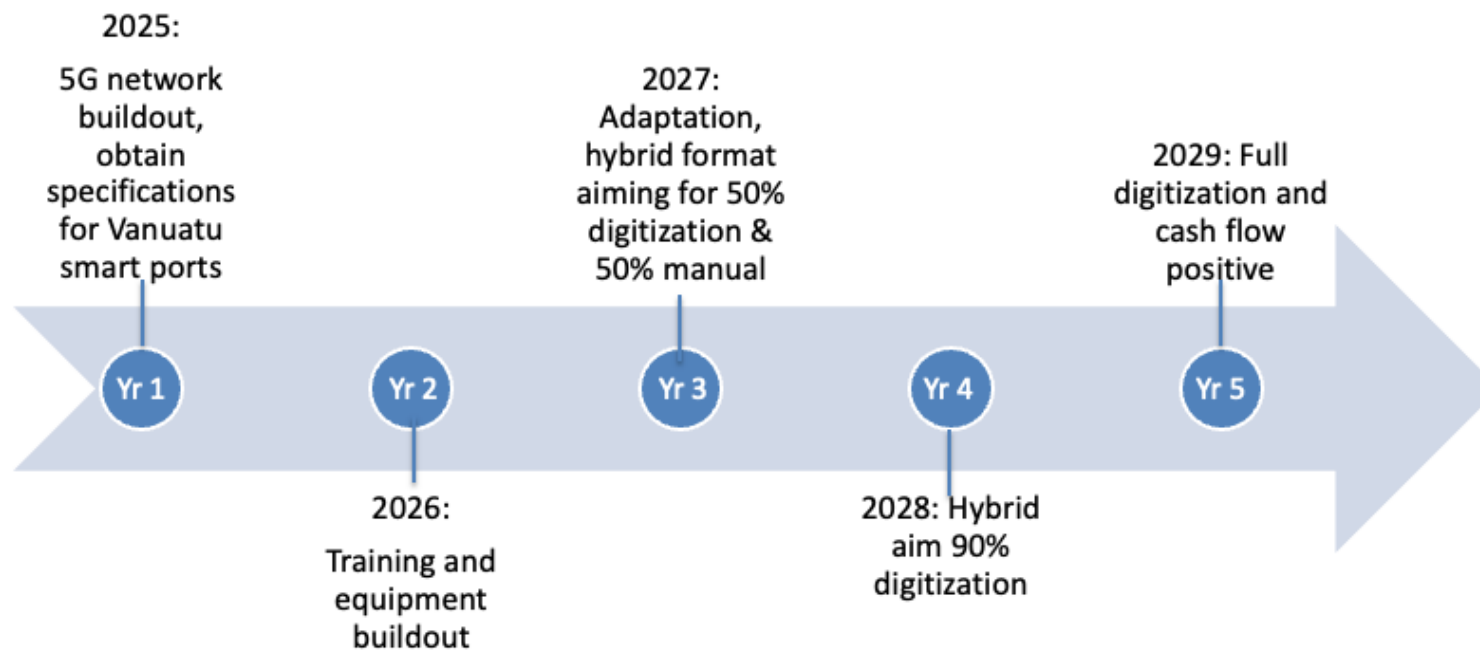


- Operational Costs:** This includes maintenance of 5G infrastructure, data management, staff training, and operational expenses of the smart port. We estimate annual operational costs at \$10 million.



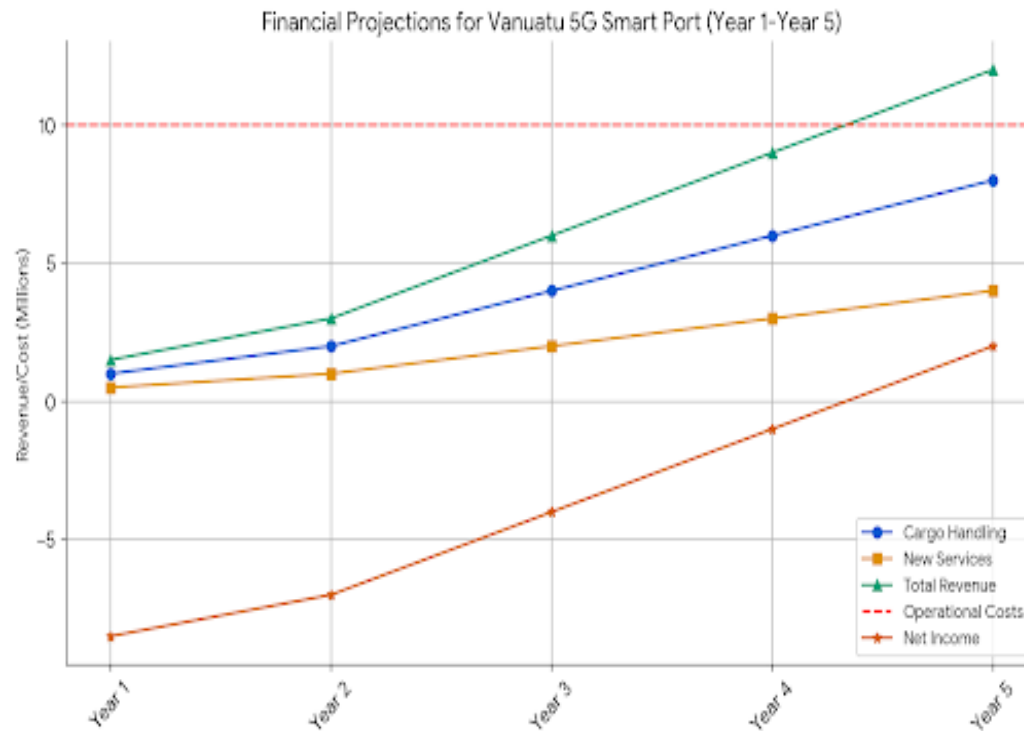


# Timeline of 5G Digitization of Vanuatu Smart Ports





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Year	Revenue (Cargo Handling)	Revenue (New Services)	Total Revenue	Operational Costs	Net Income
Year 1	1	0.5	1.5	10	-8.5
Year 2	2	1	3	10	-7
Year 3	4	2	6	10	-4
Year 4	6	3	9	10	-1
Year 5	8	4	12	10	2



## Geothermal and Green Hydrogen Net Zero Energy Transition for Vanuatu Supply Chain: Financial Projection (2025-2032)

**Total Investment:** \$100 Million (USD)

**Revenue Projection:** Green Hydrogen Export (20 MW Facility)

- Construction begins in 2025 and is completed by 2 years (2026).
- The facility has a lifespan of 20 years.
- Green Hydrogen selling price: \$5/kg (subject to market fluctuations)
- Annual capacity utilization: 80%
- Operational and Maintenance (O&M) costs: 15% of annual revenue
- Discount rate: 10%

Years	Year	Investment	Revenue	O&M Costs	Profit Before Tax (PBT)	Net Present Value (NPV)
1	2025	\$50 Million	\$0	\$0	(\$50 Million)	(\$50 Million)
2	2026	\$50 Million	\$0	\$0	(\$50 Million)	(\$81.45 Million)
3	2027	\$0	\$76.6 Million	\$11.49 Million	\$65.11 Million	(\$21.46 Million)
4	2028	\$0	\$76.6 Million	\$11.49 Million	\$65.11 Million	\$1.32 Million
5	2029	\$0	\$76.6 Million	\$11.49 Million	\$65.11 Million	\$14.49 Million
6	2030	\$0	\$76.6 Million	\$11.49 Million	\$65.11 Million	\$32.63 Million
7	2031	\$0	\$76.6 Million	\$11.49 Million	\$65.11 Million	\$55.37 Million
8	2032	\$0	\$76.6 Million	\$11.49 Million	\$65.11 Million	82.75Million



## 3 Link and Wave are staffed and led by the best resources available.

Building sustainable and successful telcos in frontier markets requires people and partners of the highest calibre – our collaboration has both.



3 Link and Wave team are all highly experienced and award-winning telco experts with demonstrable records of success in the Caribbean, Africa and Asia-Pacific. 3 Link have built an enviable reputation with the people and government of Vanuatu in the Blue Pacific Continent.



**Paul Hyde – CEO & ED.**

A 30-year veteran of Telecom, specialising in start up’s as well as the transformation and re-launch of distressed telcos. He has a notable track record of success in his field, is a sought-after speaker at industry events and is a Chartered Manager.

**Millie Ogden – 3 Link Founder.**

ISP in Vanuatu connecting the last mile for schools, clinics, government and enterprises. 3rd generation from Santo, Vanuatu passionate about providing digital transformation for financial inclusion. Board of Director for Kacific (Vanuatu) LTD and Vanuatu Rural Development Bank.



**General (Ret) Sir Hugh Blackman – Chairman.**

Hugh is a renowned leader of 30 years of military and diplomatic experience throughout all areas of operation of UK Gov. Hugh is a Chartered Leader and a Fellow of the Institute of Leadership & Management. Hugh brings a ‘will do’ spirit to Wave.

**John Harrington – CTIO.**

John is a degree qualified engineer, working as a CTIO of 15 years throughout the Caribbean, Middle East and Europe. John has unrivaled experience of virtualization and works closely with public cloud providers to drive the new generation of IP networks.



**Shikander ‘Bob’ Gill – CSO.**

As head of sales and customer service, Bob brings a history of growing businesses through channel excellence. An innovator of customer experience, Bob has built and operated retail chains that have attracted awards in the Caribbean and Asia. Masters Degree qualified and a former PWC retail guru.

**Devin Edwards– CMO.**

Devin is a Californian with a passion for brand creation and product marketing, unrivaled in APAC – The creator of several regional brands, Devin has received ACA recognition for Brand Creation, Marketing Campaigns and internet innovation.







