

# Papua LNG Project - Financiers Taking the Risk

Kevin Morrison, Energy Finance Analyst



## Contents

Key Findings.....	3
Executive Summary.....	4
A Highly Risky Financial Proposition .....	6
Emissions Reduction Efforts Ignore the Main Issue .....	11
A Journey Marked by Uncertainty and Controversies.....	16
Conclusion .....	23
About IEEFA.....	24
About the Author .....	24

## Figures and Tables

Figure 1: Papua LNG Project Location.....	6
Figure 2: Qatari LNG Contracts – 2022-40 .....	8
Figure 3: Forecast Liquefaction Capacity Additions (MTPA) 2023-27 .....	9
Figure 4: The Proposed Papua LNG Project .....	12
Figure 5: PNG’s Energy and Industry GHG Emissions (MTCO <sub>2e</sub> ) .....	16
Figure 6: Papuan Basin Geology .....	17
Table 1: Estimated Papua LNG Project GHG Emissions .....	13
Table 2: TotalEnergies’ LNG Projects .....	15
Table 3: Papua LNG Shareholdings .....	20
Table 4: PNG LNG Shareholdings.....	21

## Key Findings

**Financiers of Papua LNG face high risks as no binding or non-binding sales agreements have been made.**

**The project will deliver LNG at a time of projected glut in global supplies and increasing uncontracted volumes.**

**No efforts are being made to reduce the project's scope 3 emissions – expected to add up to 220 million tonnes of carbon dioxide equivalent (MTCO<sub>2</sub>e) over the project's lifespan.**

**The project has a history of uncertainty, political tensions and legal woes.**



## Executive Summary

French energy company TotalEnergies and its partners in the 6 MTPA Papua LNG venture in Papua New Guinea (PNG) are looking to sanction the project by the end of the year and start delivering gas by either late 2027 or early 2028. It would be the second LNG project for the country, making it a major exporter in the region.

The project presents considerable financial risks. As of 22 May 2023, it had secured no guaranteed sales – with no long-term sales and purchase agreements (SPAs) or non-binding heads of agreement supply deals. This is particularly problematic as the world could face a glut of LNG supplies after 2026, following a large expected expansion of new supply between 2025 and 2027. The spot market is likely to be flooded with uncontracted gas by then, as uncontracted volumes from Qatar are expected to increase from zero in 2023 to 68 million tonnes a year (MTPA) by 2028.

The longer-term demand prospects are also in question. The International Energy Agency (IEA), in its Net Zero by 2050 roadmap, states that no new gas projects are required if the world is to reach net zero by 2050. The IEA forecasts gas demand to decline by 55% by 2050.

The Papua LNG partners are looking for external financing to fund the US\$13 billion project, and it is unclear where this funding will come from. Export credit agencies that supported the country's first LNG project are now considering ending finance support for oil and gas. Commercial lenders are also increasingly reducing their exposure to fossil fuel projects. TotalEnergies' second largest lender, the French bank BNP Paribas, announced in May 2023 it would no longer provide any financing for the development of new oil and gas fields.

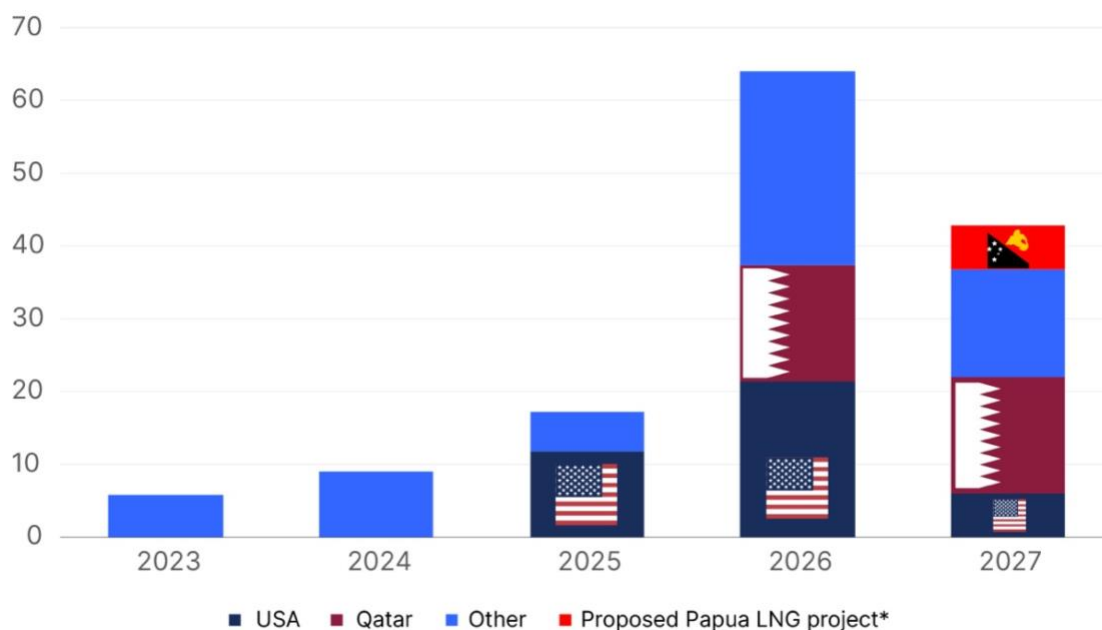
The project's emissions footprint is also a concern. It will increase PNG's energy and industry emissions by more than 7%. While some actions are being taken by the project partners to reduce their operating emissions, those only represent 10% of Papua LNG's total carbon footprint.



**The total scope 3 emissions of the project over its lifespan are estimated at 220 MTCO<sub>2e</sub>. This is about the total annual emissions of Bangladesh – a country of 170 million inhabitants.**

The majority of its emissions are scope 3 – the emissions from consumers burning the gas produced. The total scope 3 emissions of the project over its lifespan are estimated at 220 million tonnes of CO<sub>2</sub> equivalent (MTCO<sub>2e</sub>). This is about the total annual emissions of Bangladesh – a country of 170 million inhabitants. None of the project partners have any ambition to reduce their scope 3 emissions, raising concerns with investors who are starting to ask for more action to align with the

### Forecast Liquefaction Capacity Additions (MTPA) 2023-27



\*Production to start in late 2027 or early 2028

Source: IEEFA estimates from S&P Global Commodity Insights, International Gas Union, news reports and company announcements

Paris Climate Agreement objectives. Keeping global temperatures well below 2 degrees will be critical for PNG, a country particularly vulnerable to the impacts of climate change.

Finally, the project's history has been marred by uncertainty and controversies, some of which remain today. Since their discovery, there have been significant questions about the amount of gas available in the Elk and Antelope fields supplying the project. The total reserves as well as the project capacity have each been downgraded materially.

There have been tense political relations with the government, which questioned several times the pace of development of the project and tried to renegotiate the terms of the agreement. The shareholders have been involved in multiple legal woes, the latest being filed on 21 April this year. There is also a high level of uncertainty on the stake the PNG government will take in the venture. It has a right to acquire 22.5% of the project but faces fiscal challenges where revenue is not keeping pace with spending, and debt is rising.

In conclusion, the sum of the financial, environmental, political and legal risks facing the Papua LNG project are issues financiers to the project must carefully consider.

## A Highly Risky Financial Proposition

Papua New Guinea entered the global gas exporters market when its PNG LNG project began production in 2014.<sup>1</sup> Now the country's second proposed LNG project – Papua LNG – could make it a major exporter in the region, to rival its neighbour Indonesia. However, by the time Papua LNG comes online it may be entering a declining and flooded LNG market without any revenue certainty.<sup>2</sup> External funding might be difficult to source amid increasing restrictions on fossil fuel finance.

### No Revenue Certainty

The operator of the Papua LNG venture, the French oil energy company TotalEnergies, in March 2023 approved preliminary works on PNG's second gas exporting project, and signalled it intended to fully sanction the 6 MTPA project by either the end of 2023 or early 2024 (Figure 1).<sup>3</sup>

Figure 1: Papua LNG Project Location



Source: PNG Chamber of Mines and Petroleum

<sup>1</sup> ExxonMobil. [PNG LNG Project ships first LNG cargo](#). 26 May 2014.

<sup>2</sup> Institute for Energy Economics and Financial Analysis. [Global LNG Outlook 2023-27](#). Page 6. February 2023.

<sup>3</sup> TotalEnergies. [Papua New Guinea: TotalEnergies launches integrated engineering studies for the Papua LNG project](#). 7 March 2023.



As of 22 May 2023, there had been no announcements of any sales and purchase agreements (SPAs) or heads of agreement supply deals signed by TotalEnergies or its venture partners, ExxonMobil and Australian gas producer Santos. It has been standard practice for sellers to try to lock in buyers through binding and non-binding pacts.

Long-term SPAs have underpinned the financing for large LNG projects, and this was the case for the country's first LNG project, the PNG LNG venture operated by ExxonMobil, which includes Santos among its shareholders. ExxonMobil and its partners had reached a commercial agreement with three LNG customers for a total of 4.3 MTPA, about 62% of the project's nameplate capacity, almost six months before reaching a final investment decision (FID).<sup>4</sup>

No SPAs mean there are no guaranteed sales and no asset financiers can lend against. Large LNG producers and investors often try to downplay this risk with their message of “portfolio gas”, saying that because they have many customers around the world willing to buy the gas, they don't need to sell a specified volume to a specific customer. ExxonMobil and TotalEnergies may boast of a global customer base, but that is not the case for Santos. It is interesting to note that InterOil, the previous owner of the Elk-Antelope fields which supply the Papua LNG project, had secured a number of heads of agreements. Those non-binding sales agreements, however, failed to materialise and turn into SPAs.



**No SPAs mean there are no guaranteed sales and no asset financiers can lend against.**

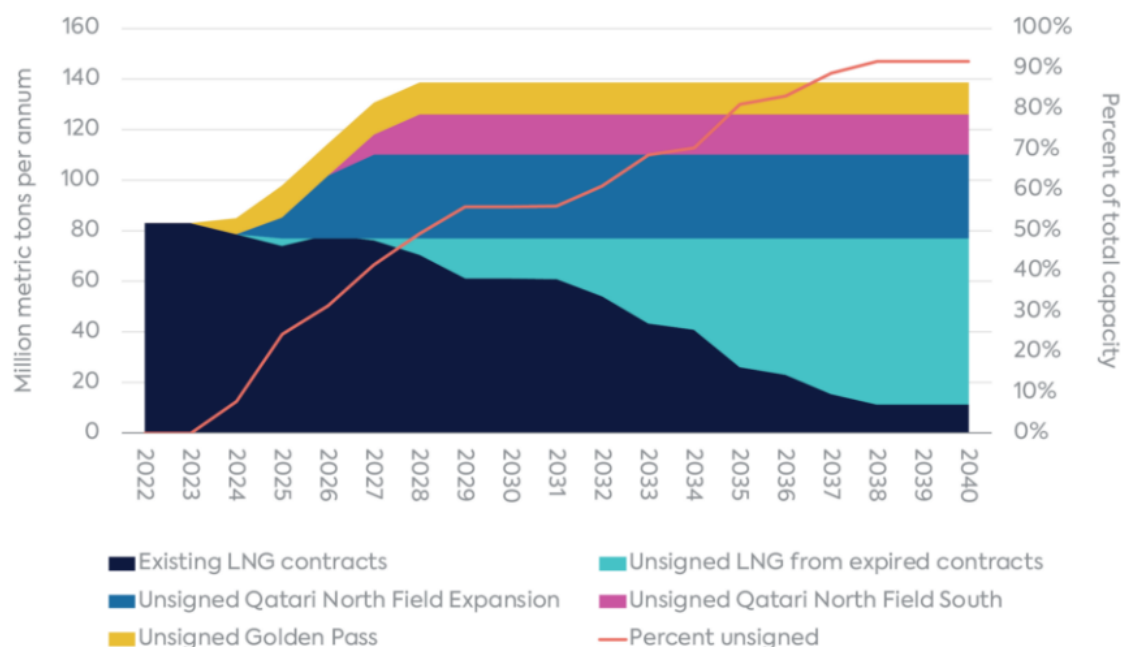
The lack of SPAs is becoming a common feature in new LNG capacity under construction. LNG export capacity controlled by the Persian Gulf state Qatar will increase from 77 MTPA in 2023 to 138.6mtpa by 2028 through new LNG trains to be built in Qatar and in the U.S. at Golden Pass, which is 70% owned by Qatari state-owned gas producer QatarEnergy.<sup>5</sup> The other 30% of Golden Pass is owned by Papua LNG investor ExxonMobil.<sup>6</sup> Uncontracted volumes from Qatar are expected to increase from zero in 2023 to 68 MTPA by 2028 due to a combination of expiring LNG contracts from existing capacity and unsigned LNG capacity from the additional capacity. The unsigned volumes will account for 49% of Qatar's LNG production capacity in Qatar and the U.S. by that date.<sup>7</sup>

<sup>4</sup> Santos. [PNG LNG reaches significant marketing milestone](#). 22 June 2009.

<sup>5</sup> Columbia Center on Global Energy Policy. [Qatar's Contract Quandary](#). 26 April 2023.

<sup>6</sup> Golden Pass LNG. [About Golden Pass](#).<sup>7</sup> Columbia Center on Global Energy Policy. [Qatar's Contract Quandary](#). 26 April 2023.

<sup>7</sup> Columbia Center on Global Energy Policy. [Qatar's Contract Quandary](#). 26 April 2023.

**Figure 2: Qatari LNG Contracts – 2022–2040**

Source: Columbia Center on Global Energy Policy. *Qatar's Contract Quandary*. 26 April 2023

## Papua LNG Faces Possible Supply Glut

The portfolio approach might work in a time of rising demand, but the Papua LNG venture partners plan to start producing four years after construction starts in late 2023 or early 2024.<sup>8</sup> That means by the time Papua LNG starts production in late 2027 or early 2028,<sup>9</sup> the market is expected to be saturated following a large projected expansion of new supply between 2025 and 2027.<sup>10</sup>

“Liquefaction projects targeting in-service after 2026 may be entering a much smaller demand pool than bullish market forecasts anticipate. As new supply floods the market, today’s tight markets may give way to a supply glut, with lower than anticipated prices, smaller netbacks [export parity prices], tighter margins, and lower profits for LNG exporters.”<sup>11</sup>

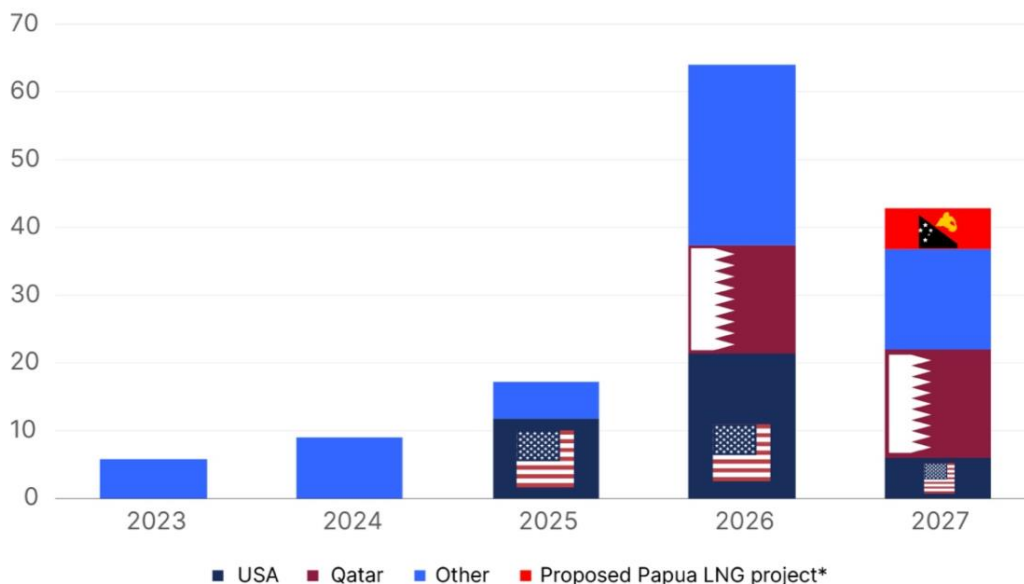
<sup>8</sup> TotalEnergies. [Papua New Guinea: TotalEnergies launches integrated engineering studies for the Papua LNG project](#). 7 March 2023.<sup>9</sup> Santos. [First quarter report for period ending 31 March 2023](#). 20 April 2023. Page 1.

<sup>9</sup> Santos. [First quarter report for period ending 31 March 2023](#). 20 April 2023. Page 1.

<sup>10</sup> Institute for Energy Economics and Financial Analysis (IEEFA). [Global LNG Outlook 2023-27. High prices create new risks to demand growth](#). February 2023.

<sup>11</sup> IEEFA. [Global LNG Outlook 2023-27. High prices create new risks to demand growth](#). February 2023. Page 5.



**Figure 3: Forecast Liquefaction Capacity Additions (MTPA) 2023-27**

\*Production to start in late 2027 or early 2028

Source: IEEFA estimates from S&P Global Commodity Insights, International Gas Union, news reports and company announcements

## Declining Demand in a Decarbonising World

In a market that could be saturated with new supplies, financiers of the project that don't have the security of a SPA face greater risk on their loans. Furthermore, by 2027 and certainly over the 15-year life of the project, global policies on reducing greenhouse gas (GHG) emissions may result in tighter restrictions on emissions, most of which come from the burning of fossil fuels such as gas and coal.

The International Energy Agency (IEA), in its Net Zero by 2050 roadmap, states that no new gas projects are required if the globe is to reach net zero by 2050: "Beyond projects already committed as of 2021, there are no new oil and gas fields approved for development in our pathway, and no new coal mines or mine extensions are required. The unwavering policy focus on climate change in the net zero pathway results in a sharp decline in fossil fuel demand."<sup>12</sup>

Gas demand, under the IEA net zero pathway, declines by 55% by 2050, heightening the risks that new gas projects will become stranded assets (i.e., the project will not see out its economic life).

<sup>12</sup> International Energy Agency. [Net Zero by 2050: A Roadmap for the Global Energy Sector](#). May 2021. Page 21.

## Don't Bank on it

The Papua LNG partners are looking for external financing to fund the US\$13 billion project,<sup>13</sup> with Santos saying it was considering project finance for the project.<sup>14</sup> The major source of financing for the PNG LNG venture was from export credit agencies in Australia, Japan, South Korea, the United States and Italy. Between them they provided US\$8.3 billion in financing, or almost 60% of the US\$14 billion in total funding for the PNG LNG venture, which was the first gas exporting project to be built in the Pacific nation.<sup>15</sup>



**There has been greater scrutiny on lenders funding fossil fuels projects and the risk of stranded assets due to the impact of rising GHG emissions and climate change.**

There has been greater scrutiny on lenders funding fossil fuels projects and the risk of stranded assets due to the impact of rising GHG emissions and climate change. Hence any participation by lenders in the Papua LNG project, particularly state-funded export credit agencies, needs closer examination.

In February 2023, more than 175 organisations launched a proposal for the Organisation for Economic Co-operation and Development (OECD), which governs export credit agencies, to end export finance support for oil and gas.<sup>16</sup> This proposal follows the agreement in October 2021 among OECD members to end export credit for unabated coal-fired power stations.<sup>17</sup> The agreement was not signed by all OECD members, but was agreed upon by the group that represents the participants to the OECD arrangement on officially supported export credits. This includes Australia, Canada, the European Union, Japan, South Korea, New Zealand, Norway, Switzerland, Turkey, the United Kingdom and the United States – countries all involved in the Papua LNG venture, except the host nation, PNG. So far, no decision has been made on export credit agencies stopping funding for oil and gas projects.

Commercial lenders have also committed to reducing their exposure to fossil fuel projects. Whether Papua LNG meets their lending criteria based on its environmental social and governance (ESG) metrics, which vary from bank to bank, is yet to be determined. TotalEnergies' second largest

<sup>13</sup> Snowcap Research. [Reform Santos, Reduce growth capex. Return capital. Realign incentives.](#) March 2023. Page 15.

<sup>14</sup> Santos. [Santos reports record underlying earnings and higher shareholder returns.](#) 22 February 2023. Page 22.

<sup>15</sup> IJGlobal. [Papua New Guinea LNG.](#) 29 April 2010.

<sup>16</sup> Oil Change International. [Over 175 organizations launch proposal for the OECD to end export finance support for oil and gas.](#) 27 February 2023.

<sup>17</sup> OECD. [Agreement reached at OECD to end export credit support for unabated coal-fired power plants.](#) 22 October 2021.

lender,<sup>18</sup> the French bank BNP Paribas, announced in May 2023 it would no longer provide any financing for the development of new oil and gas fields, regardless of the financing methods.<sup>19</sup>

Two BNP Paribas directors are also on the board of TotalEnergies: BNP Paribas chairman Jean Lemierre and Jacques Aschenbroich, who is a member of the French energy company's governance and ethics committee.<sup>20</sup>

## Emissions Reduction Efforts Ignore the Main Issue

While some efforts are made to reduce operational emissions associated with the Papua LNG project, the bulk of the emissions associated with the project are not addressed. With an estimated 220 MTCO<sub>2e</sub> of scope 3 emissions over the project's lifespan, this exposes its proponents to increasing investor scrutiny.

### Token Effort to Lower Total Emissions

TotalEnergies has attempted to reduce the greenhouse gas emissions from the liquefaction plant and the extraction of the gas from the onshore Elk and Antelope gas fields, which will provide most of the feedstock for the Papua LNG venture. The French company reconfigured the design of the project from two trains with a nameplate capacity of 5.6 MTPA, powered by gas turbines that chill the gas to shrink its volume for export on an LNG carrier, to four electric trains each with a nameplate capacity of 1 MTPA, all powered by electric turbines.<sup>21</sup> The remaining 2 MTPA of LNG will be sourced from the PNG LNG venture. All the trains will be located within the existing PNG LNG site.<sup>22</sup>

This is a relatively new development in the LNG sector as most trains use gas turbines to chill the gas. However, TotalEnergies has not stated what fuel source will power the electric trains. If it is gas, the savings in CO<sub>2</sub> emissions are minimal as the gas-fired power plant will still emit CO<sub>2</sub> into the atmosphere. If the electric trains are powered by renewable energy, this would lead to greater savings of CO<sub>2</sub>. In both cases, those savings target a minor part of the LNG value chain as about 90% of total GHG emissions come from consumers burning the gas.

Elk and Antelope contain about 5% CO<sub>2</sub> in their respective reservoirs, among other impurities that must be removed before the gas is chilled for export.<sup>23</sup> TotalEnergies plans to inject the CO<sub>2</sub> from the Elk and Antelope gas fields back into the reservoirs. This acts as an enhanced recovery process, which means it will be able to squeeze out more gas from the field by pumping more CO<sub>2</sub> into it.

<sup>18</sup> Reclaim Finance. [TotalEnergies' AGM](#).

<sup>19</sup> BNP Paribas. [BNP Paribas details and strengthens its energy transition ambitions](#). 11 May 2023.

<sup>20</sup> TotalEnergies. Universal Registration Document 2022, including the Annual Financial Report. Pages 182, 193.

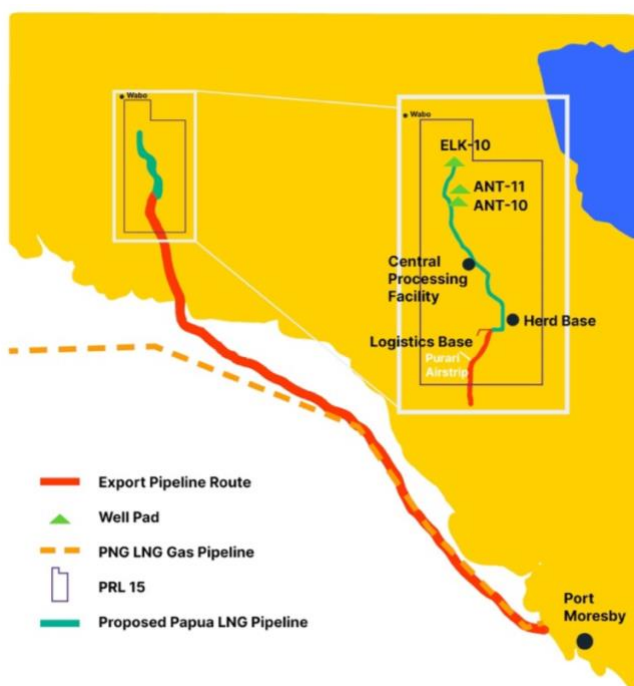
<sup>21</sup> TotalEnergies. [Papua New Guinea: TotalEnergies launches integrated engineering studies for the Papua LNG project](#). 7 March 2023.

<sup>22</sup> Santos. [First quarter report for period ending 31 March 2023](#). 20 April 2023. Page 7.

<sup>23</sup> Total E&P Limited, Papua LNG. Upstream Environmental Impact Statement. Volume 1: Main report, Chapter 4; Project description. Page 4-2.

Enhancing gas production is not a climate solution.<sup>24</sup> In December 2022, TotalEnergies said it planned to use carbon capture and storage (CCS) on its Papua LNG venture, but further details are yet to be announced.<sup>25</sup>

**Figure 4: The Proposed Papua LNG Project**



Source: Total E&P PNG Ltd. Papua LNG Project, Upstream Environmental Impact Statement. Volume 1. Chapter 1

TotalEnergies has so far not updated the environmental impact statement (EIS) for the project since its initial filing in December 2019. It estimated the total scope 1 and 3 emissions over the 25-year life of the project would be almost 241 MTCO<sub>2</sub>e (Table 1).<sup>26</sup> Scope 1 emissions are those generated directly by the project's operations. (Scope 2 emissions are those generated by energy purchased by the project for its operations. These are not included in the calculations.)

The French company plans to reduce scope 1 and 2 GHG emissions by 35% to 46% by 2030 from the 46 MTPA of CO<sub>2</sub> emitted from its operations in 2015.<sup>27</sup> These efforts to reduce GHG emissions by TotalEnergies only address about 10% of the total emissions, and this reflects the company's approach to emissions which largely ignores the biggest segment of total emissions.

<sup>24</sup> IEEFA. The Carbon Capture Crux, Lessons learned. September 2022. Page 2.

<sup>25</sup> Reuters. [TotalEnergies plans to capture 1mt/yr carbon in PNG megaproject](#). 7 December 2022.

<sup>26</sup> Total E&P Ltd, Papua LNG. Upstream Environmental Impact Statement. Volume 3: Technical studies, Part 5. Greenhouse gas and climate change for impact assessment, August 2019. Page 42.

<sup>27</sup> TotalEnergies. [Strategy, sustainability & climate. Global strengths, global results, more energy, less emissions](#). 21 March 2023. Page 99.

**Table 1: Estimated Papua LNG Project GHG Emissions**

Project Year	Estimated Annual GHG Emissions (kt CO <sub>2</sub> -e)		
	Scope 1	Scope 3	Scope 1 + Scope 3
Construction Year 1	152	22	173
Construction Year 2	233	41	274
Construction Year 3	330	184	514
Construction Year 4	309	287	596
Construction Year 5	103	46	149
Operations Year 1 – HP phase, acid gas venting via TO (start-up year)	399	6,726	7,124
Operations Years 2 to 5 – HP phase, acid gas venting via TO (average)	1,489	11,710	13,199
Operations Years 6 to 10 – HP phase, acid gas injection (average)	597	11,710	12,306
Operations Years 11 to 15 – MP phase, acid gas injection (average)	818	11,667	12,485
Operations Years 16 to 23 – LP phase, acid gas injection (average)	760	6,140	6,900
Decommissioning Year 1	25	68	93
Decommissioning Year 2	25	68	93
<b>Total Life of Project GHG Emissions</b>	<b>20,682</b>	<b>220,286</b>	<b>240,968</b>

Note: Columns may not add up exactly due to rounding

Source: Total E&P Ltd, Papua LNG. *Upstream Environmental Impact Statement, Volume 3: Technical studies, Part 5. Page 42*

## Lack of Action to Reduce Scope 3 Emissions

Total scope 3 emissions over the project’s lifespan are estimated at about 220 MTCO<sub>2</sub>e ([Table 1](#)). This is about the total annual emissions of Bangladesh<sup>28</sup> – a country of about 170 million people.<sup>29</sup>

TotalEnergies estimates its total emissions, including scope 3, will be less than 400 MTCO<sub>2</sub>e in 2030, compared with 410 MTCO<sub>2</sub>e in 2015.<sup>30</sup> This represents a fall of less than 3% over a 15-year period.

There appears little to deter gas companies from developing more gas fields despite the [IEA warning](#) that no new fields are to be developed to keep global average temperatures from rising more than 1.5 degrees Celsius from pre-industrial averages.

For TotalEnergies, Papua LNG is one of three LNG projects it plans to sanction this year. The others are: the expansion of the Cameron LNG venture in the U.S., in which TotalEnergies has a 16.6% stake in the project that plans to add 7.4 MTPA of capacity, and; North Field South in Qatar, in which TotalEnergies has a 9.4% stake, and will add a further 16 MTPA. This represents an equity interest for TotalEnergies of 4.47 million tonnes of LNG volumes ([Table 2](#)).

<sup>28</sup> World Resources Institute. [This Interactive Chart Shows Changes in the World's Top 10 Emitters.](#)

<sup>29</sup> World Bank. [Population, total – Bangladesh.](#) 2022.

<sup>30</sup> TotalEnergies. [More Energy, Less Emissions: Sustainability & Climate 2023 Progress Report.](#) 21 March 2023. Page 100.

These proposed LNG projects are in addition to the three TotalEnergies has under development in which it has a minority interest. The Papua LNG project is the only one of the six LNG projects it is either developing or has under development in which TotalEnergies will be the operator.<sup>31</sup>

A perceived lack of ambition from TotalEnergies to reduce its total emissions prompted some shareholders to file a resolution calling on the company to do more to cut emissions by 2030. The move could impel TotalEnergies to trim some of its gas projects, and invest more in renewables.<sup>32</sup>In the resolution, the *Financial Times* reported that the investors said TotalEnergies' 2030 targets did not align with the Paris Climate Agreement to keep the average rise in global temperatures below 2 degrees Celsius above pre-industrial levels.<sup>33</sup>

The other two partners in Papua LNG have no plan to reduce scope 3 emissions. ExxonMobil aims to achieve net-zero GHG emissions from its operations by 2050, but has no defined pathway to reach net zero for its scope 3 emissions.<sup>34</sup> The third partner, Santos, has a net zero emissions target for scope 1 and 2 emissions by 2040.<sup>35</sup> It has no clear pathway to reach net zero scope 3 emissions.



**For Santos, Papua LNG represents one of four projects it will have under development.**

For Santos, Papua LNG represents one of four projects it will have under development. The other three are: the Barossa gas project in the Bonaparte Basin offshore the Northern Territory, which is stalled due to legal action by Tiwi islanders; the Pikka oil project in Alaska, and; the Moomba CCS project. Santos plans to spend about US\$1.84 billion in 2023 on new projects and a further US\$1.2 billion on maintaining existing operations.<sup>36</sup> This is about US\$700 million more than Santos spent on capital expenditure in 2022 for new and existing projects.<sup>37</sup> Santos also plans to sanction at least two more projects in 2024. The Dorado oil and gas project offshore Western Australia (WA) and the onshore Narrabri gas project in New South Wales are both earmarked to reach FID next year.<sup>38</sup>

<sup>31</sup> TotalEnergies. [TotalEnergies 2022 results and 2023 objectives](#). 8 February 2023. Page 29.

<sup>32</sup> Financial Times. [Investors to press TotalEnergies over climate goals](#). 6 April 2023.

<sup>33</sup> Ibid.

<sup>34</sup> Argus Media. [Scope 3 target would boost emissions: ExxonMobil](#). 7 March 2023.

<sup>35</sup> Santos. [Climate Change](#).

<sup>36</sup> Santos. [2022 Full-year results](#). 22 February 2023. Page 21.

<sup>37</sup> Ibid. Page 38.

<sup>38</sup> Ibid. Page 29.



**Table 2: TotalEnergies' LNG Projects**

LNG Projects	Country	Capacity Mt/y	Stake	FID date	Start-up
Energia Costa Azul	Mexico	3.3	16.6%	2020	2025
North Field East	Qatar	32	6.25%	2021	2025
Nigeria LNG Train 7	Nigeria	7.6	15%	2019	2026
Cameron Expansion	USA	7.4	16.6%	2023	2025-27
Papua LNG	PNG	5.6	31.1% op.	2023	2027
North Field South	Qatar	16	9.375%	2023	2027

Source: TotalEnergies 2022 results and 2023 objectives presentation. 8 February 2023

Santos also targets having carbon capture and storage facilities ready for the Bayu-Undan gas field in the Timor Sea and the Reindeer gas field offshore WA by 2027 and 2028 respectively. This implies that they will have to make investment decisions on these projects within the next two years to be ready for the set timeline. Activist investor Snowcap Research said in a report that the increased capital investment by Santos in new projects signalled an aggressive growth strategy that appeared to be driven by executive pay incentives.<sup>39</sup>

Papua LNG represents a smaller part of ExxonMobil's oil and gas portfolio, given it is the world's largest non-government-controlled oil and gas producer. ExxonMobil has allocated US\$23-\$25 billion in capital spending this year,<sup>40</sup> 9% more than last year.<sup>41</sup>

## A Big Impact on a Vulnerable Country

The increase in PNG's energy and industrial emissions correlate strongly with the development of its LNG resources (Figure 5).<sup>42</sup> The addition of Papua LNG will materially increase PNG's GHG emissions, adding about 1 MTCO<sub>2</sub>e a year, or more than 7% of current national energy and industry emissions. Over the life of the project, PNG may have to reduce emissions to abide by any update of the 2015 Paris climate agreement. That could put pressure on the LNG projects or other parts of the economy.

PNG is also vulnerable to climate change. The World Bank said in a report that PNG was already prone to numerous natural hazards, and climate change could increase their incidence. These include landslides, soil erosion, deforestation, loss of biodiversity, as well as recurrent floods and droughts.<sup>43</sup>

<sup>39</sup> Snowcap Research. [Reform Santos, Reduce growth capex. Return capital. Realign incentives.](#) 9 March 2023. Page 46.

<sup>40</sup> ExxonMobil. [2022 Financial results presentation.](#) 31 January 2023. Page 18.

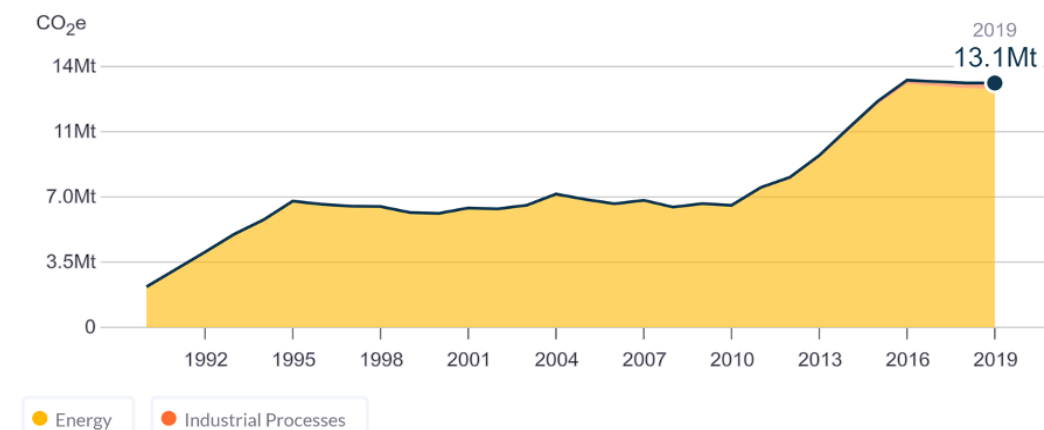
<sup>41</sup> Ibid. Page 5.

<sup>42</sup> Total E&P Limited, Papua LNG. Upstream environmental impact statement. Volume 3. Technical studies, part 5: Greenhouse gas and climate change for impact assessment. August 2019. Page 46.

<sup>43</sup> World Bank Group. [Climate Risk Country Profile Papua New Guinea.](#) 2021.

**Figure 5: PNG's Energy and Industry GHG Emissions (MTCO<sub>2</sub>e)**

Data source: Climate Watch; Location: Papua New Guinea; Sectors/Subsectors: Energy, Industrial Processes; Gases: All GHG; Calculation: Total; Show data by Sectors.



Source: Climate Watch. Global

TotalEnergies and its Papua LNG partners are not contributing to climate action or adaptation in PNG. With a [lack of action](#) on their global scope 3 emissions, it could be expected of the project partners that they contribute to funding adaptation measures to the Pacific nation whose fossil fuel resources generate their profits.

## A Journey Marked by Uncertainty and Controversies

The Papua LNG project has had an eventful journey since the Elk gas discovery in onshore Gulf province in PNG, marked by downgrades of the gas reserves, tense relations between the government and the project partners, and legal woes between shareholders.

### How Much Gas?

The Elk gas discovery was made in 2006<sup>44</sup> by InterOil, a U.S.-listed, Canadian-incorporated and PNG-focused oil and gas company founded by American Phil Mulacek. Two years after the Elk find, the Antelope discovery was made nearby in the same petroleum retention licence (PRL-15) ([Figure 4](#)).<sup>45</sup> Mulacek was a vocal promoter of InterOil's prospects, and never missed an opportunity when speaking publicly about the company's large gas finds in a relatively unexplored region of PNG. He claimed the combined certified hydrocarbon reserves of the Elk-Antelope discoveries were 10-15 trillion cubic feet (TCF),<sup>46</sup> at least double the proven and probable reserves of 5 TCF<sup>47</sup> for the

<sup>44</sup> InterOil. Management discussion and analysis for the quarter ended September 30, 2008. Page 11. 10 November 2008.

<sup>45</sup> InterOil. InterOil announces gas discovery. 1 May 2008.

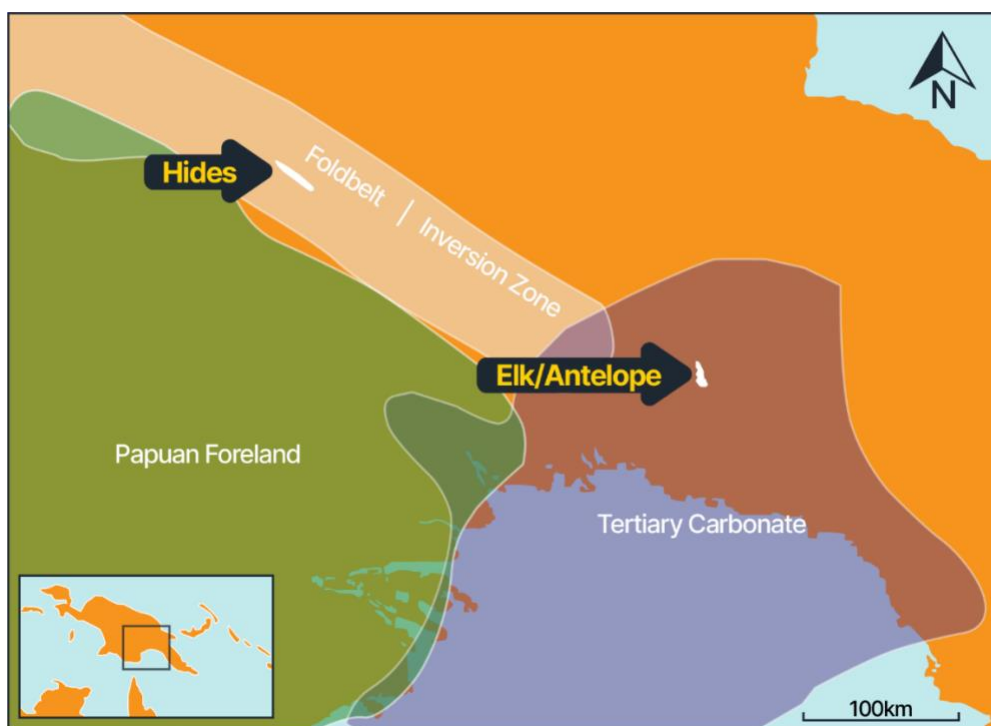
<sup>46</sup> Australian Financial Review: [Unhappy InterOil investors say Oil Search bid 'materially undervalues' their company](#). 8 June 2016.

<sup>47</sup> Bernstein Research. Neil Beveridge and Angus Chan. On the ground in PNG: Assessing prospects for LNG growth. 15 December 2010.

Hides gas field that underpins ExxonMobil’s 6.9 MTPA PNG LNG project. These gross resource estimates for Elk-Antelope have since been scaled back to about 7 TCF.<sup>48</sup>

There are questions about the amount of gas that can be commercially extracted from the Elk-Antelope fields. The reserves lie in carbonate rock<sup>49</sup> (Figure 6) where extraction rates can be hard to predict due to its permeability, the rate at which fluids can travel through the rocks to the surface.<sup>50</sup> Since taking over the project in August 2015, TotalEnergies has said very little about the Elk-Antelope reserves in public presentations. In its 2019 environmental impact statement (EIS), it estimated the combined Elk-Antelope fields held 7.2 TCF.<sup>51</sup>

**Figure 6: Papuan Basin Geology**



Source Santos: *A Summary of the Petroleum Distribution and Potential of PNG*. February 2022

Questions are compounded by the fact the fields are in the Eastern Papuan Basin, a region that has had little oil and gas exploration activity.<sup>52</sup> Its geology is different to the Western Papuan Basin, where the Hides field is the main gas-producing source for ExxonMobil’s PNG LNG plant.<sup>53</sup>

<sup>48</sup> Oil Search. [Strategy update and investor briefing 2020](#). Page 10. 19 November 2020.

<sup>49</sup> Marine and Petroleum Geology. [Development of a Papua New Guinean onshore carbonate reservoir: a comparative borehole image \(FMI\) and petrographic evaluation](#). June 2013.

<sup>50</sup> Ibid.

<sup>51</sup> Total E&P Limited, Papua LNG. Upstream environmental impact statement, Volume 3: Technical studies, part 5 Greenhouse gas and climate change for impact assessment. August 2019. Page 12.

<sup>52</sup> Organic Geochemistry. [Origin of oils in the Eastern Papuan Basin, Papua New Guinea](#). Abstract. 10 June 2012. Page 1.

<sup>53</sup> Ibid.

InterOil originally marketed the project as a 7.6 MTPA venture.<sup>54</sup> That project proposal from 2012 may have reflected InterOil's overconfidence in the commercial gas resources in the Elk-Antelope fields. InterOil estimated the fields would supply 26% more LNG volumes each year than the prevailing project proposal by TotalEnergies.

## Tense Political Relations

InterOil had a close relationship with former prime minister Michael Somare's government, but this changed when Peter O'Neill became prime minister in 2011. His government sought clarification on whether the proposed LNG project was proceeding to the framework of the agreement signed with his predecessor in December 2009.<sup>55</sup> The O'Neill government had further concerns about the pace of development at InterOil's project, and in May 2012 said it planned to cancel the LNG agreement signed in December 2009.<sup>56</sup> Within a year, Mulacek resigned from InterOil,<sup>57</sup> and a new management team led by former Woodside and BP executive Michael Hession was brought in.

The change in management marked a change in tone from InterOil. Gone were the endless announcements of a new agreement that did not materialise. Instead, it announced it was in exclusive talks with ExxonMobil to develop the Elk-Antelope fields,<sup>58</sup> followed by another announcement in December 2013 that it was selling a majority stake in Elk-Antelope to French company TotalEnergies.

TotalEnergies was welcomed by the PNG government when it took over the project,<sup>59</sup> as the investment by a major international oil and gas company was an endorsement of investor confidence in the Pacific nation where more than 80% of the population has no electricity.<sup>60</sup>

The PNG government still had issues with the pace of the project's development under TotalEnergies. In August 2019, PNG's National Executive Council sent a team led by petroleum minister Kerenga Kua to Singapore to try to renegotiate the terms of the Papua LNG agreement signed on 19 April that year.<sup>61</sup> A month later, the government said it would abide by the deal,<sup>62</sup> and the relevant legislation was passed in the PNG Parliament in November 2020 to ensure the project could proceed.<sup>63</sup>

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<sup>54</sup> InterOil. InterOil provides Gulf LNG project update. 17 April 2012.

<sup>55</sup> The National. [Trouble ahead of InterOil](#). 25 November 2011.

<sup>56</sup> InterOil. PNG government suspends notice. 29 August 2012.

<sup>57</sup> InterOil. InterOil Corporation announces the retirement of CEO Phil Mulacek. 23 April 2013.

<sup>58</sup> InterOil. InterOil and Pacific LNG Group enter into exclusive negotiations with ExxonMobil on development of the Elk and Antelope resource. 24 May 2013.

<sup>59</sup> Papua New Guinea Today. [PNG PM welcomes Total commitment to gas project](#). 8 October 2014.

<sup>60</sup> The World Bank. [Papua New Guinea: Improved access to reliable, affordable energy](#). 5 April 2021.

<sup>61</sup> Reuters. [Papua New Guinea sends team to Singapore to renegotiate Total LNG deal](#). 15 August 2019.

<sup>62</sup> Oil Search. Papua LNG Project – Update. 3 September 2019.

<sup>63</sup> Office of the Prime Minister. Statement by Prime Minister Hon. James Marape on Passage of the Papua LNG Project Amendment Bill. 11 November 2020.

## A History Peppered with Legal Woes

The new shareholders in Papua LNG didn't get off to a good start, with Australian-listed oil and gas company Oil Search claiming in early 2014 it had pre-emptive rights over the Elk-Antelope stake InterOil was selling to TotalEnergies. The challenge was ultimately unsuccessful after an 18-month legal tussle.<sup>64</sup> Oil Search, which has been operating in PNG since 1929, bought a 23% stake in PRL-15 for US\$900 million, just before TotalEnergies completed its purchase of its 40% stake in PRL-15.<sup>65</sup>

Once ExxonMobil became a shareholder in Elk-Antelope after it bought InterOil in 2016, it was a further two years before the three shareholders in Elk-Antelope and Papua LNG were able to reach agreement with the PNG government on a framework for the fiscal terms of the project.

A new shareholder emerged in the Papua LNG project when Santos completed its acquisition of Oil Search in December 2021. Santos is also a shareholder in PNG LNG. It may be the newest shareholder in Papua LNG, but it does not seem able to escape the history of the project.

A filing to the Federal Court of Australia by Asian Gas Partners against Oil Search, now a subsidiary of Santos, on 21 April 2023 further complicated Santos' involvement in the Papua LNG project.<sup>66</sup>

Asian Gas Partners is associated with Carlo Civelli, a former investor in the Elk-Antelope field who has had a long-running legal feud with fellow investor Phil Mulacek over the sale of the project.<sup>67</sup> Asian Gas Partners has asked the Federal Court to freeze additional payments to some of the parties involved in the sale of the gas-field stake in 2014,<sup>68</sup> the year Oil Search and TotalEnergies bought into the project.

## Uncertain Involvement of PNG's Public Petroleum Company

Once the Papua LNG project has been approved, it triggers the right of the PNG state to acquire a 22.5% stake in the project.<sup>69</sup> This level of state ownership of oil and gas projects in PNG is written into the country's Oil and Gas Act 1998.<sup>70</sup> The acquisition is done through Kumul Petroleum Holdings

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<sup>64</sup> Oil Search. PRL 15 notice of dispute. 28 March 2014.

<sup>65</sup> Oil Search. Oil Search to acquire interest in PRL 15 (Elk/Antelope), providing core strategic position in future LNG developments in PNG. 27 February 2014.

<sup>66</sup> Federal Court of Australia. [Asian Gas Partners Limited \(BVI Company No. 1796425\) v Oil Search Limited ARBN 055 079 868](#). 21 April 2023.

<sup>67</sup> The Australian. [Santos freezes bid as PNG LNG scandal returns](#). 2 May 2023.

<sup>68</sup> Ibid.

<sup>69</sup> TotalEnergies. [Total and the Government of Papua New Guinea confirm the remobilization and the planning of the Papua LNG project](#). 5 May 2021.

<sup>70</sup> Independent State of Papua New Guinea. [Oil and Gas Act 1998, s.165 State Equity Entitlement](#). November 2007. Page 109.

**Table 3: Papua LNG Shareholdings**

Shareholder	Current %	Post Kumul sale*
TotalEnergies	40.1	29.08
ExxonMobil	37.1	28.72
Santos	22.8	17.7
Kumul	0	22.5
JX Nippon	0	2
<b>Total shareholding</b>	<b>100%</b>	<b>100%</b>

\*Includes additional 2% stake to be acquired by JX Nippon of Japan

Limited, which is wholly owned by the PNG state. In 2015, the PNG government ruled that all state petroleum assets would be held by Kumul’s group of companies.<sup>71</sup>

However, there is uncertainty on whether, to what extent, and when this acquisition will be pursued due to the state of the government’s finances.

Adopting the US\$13 billion cost estimate for the Papua LNG venture in the Snowcap report,<sup>72</sup> a 22.5% stake will cost Kumul US\$2.9 billion.

Furthermore, Kumul has its own ambitions to build a wholly owned 1 MTPA LNG train beside the Papua LNG liquefaction plants at Caution Bay,<sup>73</sup> which it said would cost US\$3 billion to build.<sup>74</sup> “Kumul Petroleum has approximately 2.5 TCF of gas resources in the Kimu, Barikewa, Uramu and Pandora fields in licences where it is operator. We intend to aggregate this gas to feed into our own 1 MTPA train at Caution Bay. Like all plans, this is subject to engineering and commercial discussions amongst joint venture parties, government approvals and market conditions, that is international LNG prices, between now and 2030.”<sup>75</sup>

In a further signal of closer alignment between the Papua LNG and PNG LNG projects, TotalEnergies announced on 7 March 2023 that that it would sell a small stake in the venture to another partner in

<sup>71</sup> Kumul Petroleum Holdings. [Our History](#).

<sup>72</sup> Snowcap. [Reform Santos, Reduce growth capex, Return capital, Realign incentives](#). March 2023.

<sup>73</sup> Kumul Petroleum. [Papua LNG full FEED announcement gets Kumul Petroleum’s full support and creates opportunity for additional LNG train for PNG](#). 6 March 2023.

<sup>74</sup> The Australian Financial Review. [PNG hatches \\$4.5b plan for new LNG train, gas fields](#). 23 March 2023.

<sup>75</sup> Kumul Petroleum. [Papua LNG full FEED announcement gets Kumul Petroleum’s full support and creates opportunity for additional LNG train for PNG](#). 6 March 2023.



the PNG LNG project, Japanese upstream company JX Nippon, which is wholly owned by Japanese group ENEOS.<sup>76</sup> The sale will take place after the project has been sanctioned for development.

However, Kumul has delayed a planned purchase of an additional 5% stake in the PNG LNG venture from project partner Santos several times. Initially, Kumul made a binding offer to acquire the 5% stake for an asset value of US\$1.4 billion, with the deal to conclude on 31 December 2022.<sup>77</sup> The acquisition was extended to 30 April 2023 and then again to 31 August, some 11 months after the deal was announced.<sup>78</sup>

**Table 4: PNG LNG Shareholdings**

Shareholder	Current %	Post Santos sale to Kumul
ExxonMobil	33.2	33.2
Santos	42.5	37.5
Kumul	16.8	21.8
JX Nippon	4.7	4.7
MRDC	2.8	2.8
<b>Total shareholding</b>	<b>100%</b>	<b>100%</b>

PNG Prime Minister James Marape has blamed the high interest rate environment and financial market volatility for the delay.<sup>79</sup> The additional stake in PNG LNG is the least costly item in its plans – the funding of its entitled stake in Papua LNG and its own LNG plans. The lengthy delay raises the question: Do Kumul and the PNG state have the financial muscle to undertake all of their LNG ambitions? The combined cost of its own 1 MTPA LNG train and its entitled share of Papua LNG amounts to a large bill for a state-owned company in a country that has gross government debt three times the government’s annual revenue, according to the International Monetary Fund (IMF).

In March 2023, the IMF, the Washington D.C.-based multilateral lending institution, approved a new credit facility of US\$918 million to PNG to help the Pacific nation “on strengthening debt sustainability, alleviating foreign exchange (FX) shortages, and enhancing governance and operationalizing the anti-corruption framework”.<sup>80</sup>

<sup>76</sup> TotalEnergies. [Papua New Guinea: TotalEnergies launches integrated engineering studies for Papua LNG project](#). 7 March 2023.

<sup>77</sup> Santos. [Kumul offers to acquire 5% of PNG LNG](#). 27 September 2022.

<sup>78</sup> Santos. [PNG LNG sell-down exclusivity period with Kumul extended](#). 1 May 2023.

<sup>79</sup> Ibid.

<sup>80</sup> The International Monetary Fund. [IMF Executive Board Approves US\\$918 million Under the Extended Credit Facility and Extended Fund Facility for Papua New Guinea](#). 22 March 2023.



**If the PNG government decides to go ahead with the investment, it may also have negative impacts on its ability to support social and economic spending critical to the country's development and population's wellbeing, given the state of the government's finances.**

If the PNG government decides to go ahead with the investment, it may also have negative impacts on its ability to support social and economic spending critical to the country's development and population's wellbeing, given the state of the government's finances.

The IMF estimated PNG's gross debt was US\$47.9 billion at the end of 2022, and would rise to US\$51.2 billion at the end of 2023. Government revenue and grant income was US\$15.8 billion last year, and is estimated to rise to US\$17.1 billion this year, of which resource revenue is estimated to be US\$3.5 billion. PNG's state income is lower than annual expenditures, which was estimated at US\$21.2 billion in 2022 and US\$21.4 billion in 2023. This results in an estimated fiscal deficit of US\$5.4 billion in 2022 and US\$4.3 billion in 2023.<sup>81</sup>

Kumul may want to avoid a repeat of its funding choice for the PNG LNG project for Papua LNG. A PNG royal commission was set up to inquire about the A\$1.3 billion loan by Swiss investment bank UBS to the PNG state to fund its share of the PNG LNG project.<sup>82</sup> The loan cost the PNG state A\$432 million.<sup>83</sup>

<sup>81</sup> The International Monetary Fund. [IMF Executive Board Approves US\\$918 million Under the Extended Credit Facility and Extended Fund Facility for Papua New Guinea](#). 22 March 2023.

<sup>82</sup> Royal Commission of Inquiry into processes and procedures followed by the government of Papua New Guinea into obtaining the off-shore loan from the Union Bank of Switzerland and related transactions. [Press statement No.2 of 2022](#). 11 February 2022.

<sup>83</sup> Australian Financial Review. [PNG commission into UBS loan seeks cross-border co-operation](#). 22 August 2021.

## Conclusion

The sum of the financial, environmental, political and legal risks facing the Papua LNG project are issues its prospective financiers must consider.

The lack of binding sales agreements struck for the project represents a great risk to financiers looking to extend loans to the consortium developing the project. The timing of the first LNG shipments from the project coincides with a potential glut of global gas shipments as LNG capacity is expected to surge in 2026 and 2027, which increases the prospect of lower prices and returns for the project's investors.

The project's history is also marked by uncertainty about the amount of gas actually available, tense relations with the PNG government and legal woes among shareholders, some of which are unresolved.

Furthermore, the lack of effort by the project partners to reduce scope 3 emissions puts them at risk of investor repercussions. It also poses great threats to poorer countries such as Papua New Guinea, which are vulnerable to the impacts of climate change.

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## About the Author

### Kevin Morrison

Kevin Morrison is an energy finance analyst, Australia LNG/Gas. Kevin works closely with analyst Bruce Robertson and the global oil and gas team to examine issues facing the Australian LNG and gas sector.

Prior to joining IEEFA, Kevin worked for more than 30 years as a financial journalist for Reuters, *The Sydney Morning Herald*, *Financial Times* (FT) and Argus Media. Half of this working period was covering the energy and resources sector both in Australia and the UK. [kmorrison@ieefa.org](mailto:kmorrison@ieefa.org)

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