

**ExxonMobil**

# PNG LNG Environmental and Social Report – **Annual 2021**





# ExxonMobil

PNG LNG is operated by a subsidiary of ExxonMobil in co-venture with:

**Santos**



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For the purposes of this Report, the currency conversion rate used, between Papua New Guinea Kina (PGK) and United States Dollars (USD) is 0.2850 [PGK1 = USD0.2850]. This rate is as published by the Bank of Papua New Guinea as at 31 December 2021.





# EXECUTIVE SUMMARY

Despite the ongoing global challenges of COVID-19, ExxonMobil PNG Limited continues to manage operations well and is sustaining its commitment to economic and social programs that are helping transform the lives of Papua New Guineans.

Papua New Guinea Liquefied Natural Gas (PNG LNG) achieved two milestones in 2021, with the 700<sup>th</sup> LNG cargo loaded in January and the 800<sup>th</sup> cargo loaded in December. Numerous production records were achieved during the year, including record levels of production for LNG, feed gas and naphtha.

A subsidiary of Exxon Mobil Corporation, ExxonMobil PNG Limited (EMPNG) manages the operation of PNG LNG facilities on behalf of co-venture partners: Santos Limited, Kumul Petroleum Holdings Limited, JX Nippon Oil and Gas Exploration Corporation, Mineral Resources Development Company Limited and their affiliates.

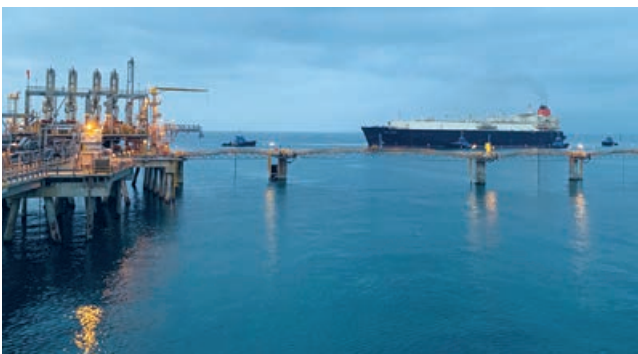
This Environmental and Social Report provides a progress update on EMPNG's environmental and social performance from 1 January to 31 December 2021.

## Production

As part of a new EMPNG 'Big Value, Small Changes' focus introduced in 2021, multiple production optimisation measures were implemented throughout the year. This included extending the LNG Plant's advanced process controls by recommissioning the fractionation system dynamic matrix controller, changing choke valves on the Hides producing wells, and cleaning the LNG Plant air coolers.

Through these optimisation efforts, PNG LNG achieved record monthly production levels that reached the equivalent of 9.0 million tonnes of LNG per year in August, with 1103 million standard cubic feet of gas produced per day and 579 cubic metres of naphtha per day on average.

By the end of the year, 8.4 million tonnes of LNG was produced and 110 cargoes loaded. Since the start of production in 2014, more than 60 million tonnes of LNG and 808 LNG cargoes have been loaded for customers in Asia.



**Long-term charter vessel *Gigira Laitebo* arrives at the LNG Plant Marine Terminal jetty to receive the 750<sup>th</sup> LNG cargo**

## National content

As part of its commitment to building national content and enabling the full contribution of the Papua New Guinean workforce, EMPNG updated reporting processes to include national content data from an additional 11 third-party contractor organisations. The categorisation of data was

also improved to gain better insights into workforce trends and contractor opportunities. These enhancements will help EMPNG and contractors optimise the tracking and stewardship of national content performance metrics and initiatives that are intended to support economic development in Papua New Guinea.

At the end of 2021, the PNG LNG workforce was 3339 workers, of which 2978 were Papua New Guinean citizens. This included EMPNG employees and personnel from 25 third-party contractor organisations working on production-related activities. Women comprised 19 percent of the Papua New Guinean workforce.

Some 45 percent of Papua New Guinean workers are of local origin proximate to PNG LNG facilities, while 25 percent are of regional origin from provinces where PNG LNG operates, and 30 percent originate from other areas of Papua New Guinea.

In 2021, two operations and maintenance technicians became the first Papua New Guineans to be appointed as Well Operations Technicians. They support Hides well diagnostics and preparations for Angore drilling activities. Eight EMPNG supervisory roles were nationalised during the year.



**HGCP Operations and Maintenance Technicians, Raymond Wesley, Firmin Lora, Simon Koila, Jefferson Francis, Robinson Kasisie and John Marabe**

The Operations and Maintenance training program continues to recruit and train new technicians for roles at PNG LNG facilities. In 2021, the seventh intake of 24 trainees, including six women, began their training through the Kumul Petroleum Academy. Trainees from the sixth intake began on-the-job training in June after completing their 12-month Junior Technician program at the Academy.

Papua New Guineans now comprise 82 percent of operations and maintenance technician roles with EMPNG. All operations lead roles at the LNG Plant are occupied by Papua New Guinean technicians.

Operations and maintenance technicians are offered opportunities to participate in assignments that extend their skills outside of the operations and maintenance discipline. In 2021, six technicians undertook broadening assignments in areas such as process safety, operations integrity management, contract administration, technical writing, and information technology.





**EMPNG Managing Director, Peter Larden (third from left), and EMPNG Operations Manager, Shameka Nelson (far right), with operations and maintenance trainees from the sixth intake at the LNG Plant site**

Four engineers were recruited during the year, including one Integrity Engineer, one Machinery Engineer, one Surveillance Engineer, and one Electrical Engineer. Five interns were also engaged through the internship program, which involves recruiting graduates in their third year of university study for on-the-job training at PNG LNG facilities.

Throughout 2021, EMPNG and its contractors delivered the equivalent of 117,785 hours of training to some 8840 participants through more than 2570 courses. Online courses continued, and face-to-face learning was reintroduced as pandemic restrictions eased.

In addition to creating employment opportunities and increasing the skills of the workforce, EMPNG contributes to the nation's economy by engaging the services of Papua New Guinean businesses and sourcing fresh produce from local markets for worker camp menus. For example, during 2021, more than 61,700 kilograms of fresh produce from local markets in the Upstream area was sourced through the Pajja Iba Women's Agri Business Group Inc. for Hides Gas Conditioning Plant (HGCP) Camp menus.

Ten Landowner Companies (Lancos) and 110 non-Lanco Papua New Guinean businesses were engaged in production-related activities during the year.

EMPNG's total in-country spend with Papua New Guinean businesses in 2021 was PGK645 million (USD183.8 million) including approximately 29 percent spent on Lanco services, which equates to PGK185 million (USD52.7 million). Since the start of production, EMPNG has spent PGK5.2 billion (USD1.5 billion) on Papua New Guinean services, of which PGK1.6 billion (USD456 million) was spent with Lancos.

To build the capacity of Papua New Guinean businesses, EMPNG provides relevant training and business development opportunities. In 2021, the contractor responsible for maintaining and repairing the marine loading arms at the LNG Plant Marine Terminal recruited three Papua New Guinean workers through Lanco, Laba Holdings Limited, with support from EMPNG. The new recruits are completing mechanical fitter training for ongoing employment with this contractor.

Lanco, Hides Security Services Limited was presented with the Best National Content Contribution of the Year Award at EMPNG's second annual Contractor National Content Awards. Papua New Guinean business FALCK PNG Limited was also honoured for achieving a 100 percent Papua New Guinean workforce, which included replacing non-national workers with local experienced workers in fire chief positions. EMPNG continues to encourage sustainable community and economic development through its strategic community investment programs. These programs encompass education, health, livelihood support, law and justice, environment awareness, key infrastructure improvements and community-based initiatives.

During 2021, a new three-bedroom teacher's house that was funded as part of EMPNG's earthquake response and recovery support program was handed over to Komo Seventh Day Adventist Primary School. The house was constructed by the Adventist Development and Relief Agency PNG.

A new Papa Community Resource Centre funded by EMPNG was officially opened during the year. The Centre was constructed by Lanco, Laba Holdings Limited. It includes a large conference room, office space, kitchen and restroom facilities. The Resource Centre has become a place where local community members conduct social events, meetings and training.

Porebada Elementary School received a new school building and classroom furniture also funded by EMPNG and constructed by Laba Holdings Limited. The building consists of eight student classrooms and a staff office, which are all fully furnished with desks and chairs. The new facility also has a 9000-litre water tank. It caters for more than 500 students from Porebada Village and nearby communities.

In partnership with the Hela Provincial Government, EMPNG launched a PGK2.5 million (USD712,500) Hela Education Program in 2021 to cover student tuition costs for more than 3000 secondary students in Hela. This helps keep students in school, as secondary student engagement became challenging due to the economic impacts on families following the 2018 earthquake and onset of COVID-19.

EMPNG continued to support the Papua New Guinean Government's COVID-19 emergency response throughout the year, with a PGK4.3 million (USD1.2 million) commitment for pandemic relief efforts across the National Coordination Centre, and provincial health authorities in the National Capital District, Hela and Central provinces. This provided much needed supplies and equipment to health authorities such as medical supplies, mobile clinics and vehicles for contact tracing. For example, a mobile health clinic and transport bus were donated for the Motu Koita Assembly's vaccination program in the National Capital District. Ten new vehicles, consisting of two 25-seater buses, six mini-vans and two station wagons, were donated to Papua New Guinea National Control Centre's COVID-19 response for contact tracing, community education, and the transportation of personal protective equipment and COVID-19 test samples. EMPNG also donated 1500 GeneXpert testing cartridges to the Hela Provincial Health Authority to boost COVID-19 testing capabilities across the province.

Twenty-three healthcare workers from Hela Province completed three days of intensive training on the diagnosis, treatment and management of tuberculosis, HIV and malnutrition in children during the year. The training was delivered in August through a partnership between EMPNG, the Paediatric Society of Papua New Guinea, Baylor College of Medicine and Texas Children's Hospital.

In 2021, 47 participants from Lae, Lorengau, Goroka, Alotau and Port Moresby attended Early Childhood Refresher Training delivered by Buk bilong Pikinini with funding support from EMPNG. The training covered topics such as class management and behaviour strategies, inclusive education and sign language, digital learning, early childhood development, child protection, library management, phonics, and first aid. Participants received tablets to help them deliver Buk bilong Pikinini's digital learning program in their local Library Learning Centre. Since 2011, EMPNG has donated more than 15,000 books, provided teacher training, delivered teaching resources and supported the development of Papua New Guinea's first early childhood learning app.

EMPNG funded community grants worth more than PGK385,960 (USD110,000) in 2021 to support the work of organisations including Cheshire disAbility Services, the Business Council of Papua New Guinea, the Institution of Engineers Papua New Guinea Inc., Femili PNG, St John Ambulance, and the Sir Theo Foundation, which provides financial support to Port Moresby General Hospital. The funding also included continued support for the Rotarians Against Malaria health program in the National Capital District.

## Environment

EMPNG has helped to enhance the management effectiveness of the Lake Kutubu Wildlife Management Area (WMA), which is managed by the Lake Kutubu WMA Committee. In 2021, an initial meeting was held with

Sanumahia clan members for a proposed new protected area in Kutubu.

During the year, one continuous stakeholder engagement was conducted over 20 days across 18 communities from the Lower Kikori Delta. The sustained engagement approach helped residents and local fishers gain a deeper understanding of the importance of conservation.

Communities also began driving their own conservation efforts. For example, Doibo community used their own resources to build a community conservation hall, and allocated land for a refuse centre for Kikori Station. Doibo community members continue to conduct environmental awareness raising activities with surrounding communities and businesses.

The biennial biodiversity survey was completed over 24 days in July by a field team of Papua New Guinean fauna experts. The survey included the collection of imagery from 80 camera traps placed in forest habitats on Hides Ridge and in the Moro area. An analysis of the data collected will be undertaken during 2022.

To support biodiversity restoration as part of EMPNG's commitment to *'Protect Tomorrow. Today'*, 57 LNG Plant site volunteers participated in mangrove planting at mudflats near the LNG Plant site in July.



**LNG Plant Camp Facilities Coordinator, Bart Kasen volunteers his time to plant mangroves at the mudflats near the LNG Plant site**

EMPNG aims to mitigate environmental impacts associated with production activities by operating in accordance with three Environmental Management Plans. These Plans outline EMPNG's approach to managing air, noise, water and waste impacts, as well as the company's commitment to

preserving cultural heritage, managing invasive plant and pest species, controlling access to sensitive areas and reinstating native vegetation.

During the year, 29 emissions sources were tested at the HGCP and LNG Plant site with 27 meeting emissions criteria. EMPNG's Engineering team and the equipment manufacturer are making corrective adjustments to the two low severity non-compliant HGCP gas turbine generators.

Biannual noise monitoring continued in the Upstream area and LNG Plant site during both daylight and evening hours. Baseline noise monitoring was also undertaken for pre-construction noise levels at Angore Wellpad C. All results were within Environment Permit criteria.

Approved third-party facilities are used to recycle operational waste, with reuse initiatives implemented wherever practicable, to reduce the amount of waste sent to a landfill. During the year, approximately 90 tonnes of operational waste from the Upstream area was sent to Total Waste Management's Roku facility for recycling and reuse. Approved facilities were also used to recycle 160 tonnes of waste from the LNG Plant site, including scrap metal, plastic and batteries. In 2021, an opportunity was identified to reuse waste oil from Upstream area operations. As a result, more than 10 tonnes of waste oil and fuel was processed on-site and reused during the year.

There was a 30 percent decrease in the number of spills, and an 89 percent reduction in spill volume in 2021 compared to 2020. This was due to EMPNG's ongoing commitment to spill prevention and response.

Long-term support continues to be provided for Upstream area communities and the Papua New Guinean Government with repairing roads, bridges and other critical infrastructure that was damaged by the 2018 earthquake. In 2021, earthquake repair works focused on erosion and sediment control measures including drainage and micropiling works along the pipeline Right of Way (ROW), and runway and infrastructure repairs at Komo Airfield.

EMPNG conducts biennial surveys to monitor the regeneration of plant species following temporary disturbance from construction activities. Surveys cover elevation zones from 24 to 2721 metres above sea level along the entire pipeline ROW. The 2021 survey was conducted between March and April covering low, medium and high elevation zones. An analysis of survey results was completed in December and showed that pipeline ROW vegetation regeneration had progressed well towards natural primary and secondary forest.

## Social

EMPNG maintained its industry-leading safety performance with no Lost Time Incidents recorded for more than four years at any PNG LNG operation. More than 85.9 million hours have been worked since the start of production, with 15.6 million hours worked during 2021.

The annual Contractor Safety Leadership Workshop was held in October. The workshop theme 'Connecting the DOTS for a Safe Future' highlighted the importance of understanding safety systems and tools, and how they worked together to keep personnel safe. It also emphasised process safety critical safeguards. At the workshop, Laba Security Services Limited, Smit Lamnalco and Baker Hughes PNG Limited received the Best Safety, Security, Health and Environment (SSHE) Performance Contractor of the year award 2021 for outstanding safety performance.

There was an increased focus on process safety as part of the Enhancing Process Safety framework during the year. Field teams were actively engaged in verifying and maintaining critical safeguards for higher consequence process safety scenarios. To further promote process safety, signs were installed at worksites to help workers identify and communicate the safeguards critical for continuing safe operations. EMPNG's broader safety programs continue to cover high severity near misses and learning opportunities from 2021.

Workplace screening for COVID-19 continues, with more than 25,500 test samples collected across worksites in 2021. Upstream and LNG Plant clinics received upgraded testing equipment to ensure the safe and timely processing of COVID-19 samples. This included new polymerase chain reaction (PCR) testing machines to detect COVID-19, and biosafety cabinets for safely preparing samples for testing. All site clinics also received oxygen concentrator machines to increase their capacity to manage COVID-19 cases.

Vaccination awareness was provided to workers and over 5000 vaccine doses delivered at EMPNG clinics throughout the year.



**EMPNG Public and Government Affairs Administrative Assistant, Stella Lamboku, after receiving her COVID-19 vaccination**

The Culture of Health program continued to focus on worker biometric screening at site clinics and the delivery of mental health and well-being programs. More than 1200 workers participated in biometric screening during the year, which involved blood pressure, weight and blood sugar testing to help identify and address any underlying health issues.



In 2021, EMPNG updated its Emergency Response Plans for all worksites. The updated Plans are consistent with ExxonMobil's 'One Plan' concept. This means that all Emergency Response Plans are now streamlined to only contain key information necessary for response teams. Common information in previous Plans is captured in the new EMPNG Emergency Reference Guide.

A total 7498 community engagements were conducted during 2021 with communities throughout the PNG LNG area of operations. These involved 2470 formal engagements and some 5028 informal engagements with nearly 38,000 stakeholders. Face-to-face engagements increased as pandemic restrictions eased and construction activities progressed in Angore and Hides.

In the Upstream area, engagements included Clan Caretaking Agreements, as well as engagements that led to the establishment of exclusion zones around areas identified during land access surveys as at risk of potential landslips. Other engagements addressed business participation and employment requests.

At the LNG Plant, engagements predominantly focused on community investment projects including donation and care pack deliveries, as well as awareness raising about marine safety exclusion zones, mangrove conservation, and grass fire risks. Ten billboards were erected by Lanco, Laba Holdings Limited along the beachfront at Caution Bay to educate local communities about marine safety exclusion zones.

Advocacy workshops were also held to share information about PNG LNG's operations, community development programs, biodiversity programs and national content initiatives. Due to pandemic restrictions, the advocacy program could not be conducted during the first half of the year. In the second half of the year, 15 advocacy workshops were held with more than 150 representatives from national government departments, as well as provincial and local-level governments. Attendees found the sessions informative and a good opportunity for relationship-building.

In early December, EMPNG Managing Director, Peter Larden, presented at the Papua New Guinea Chamber of Mines and Petroleum's annual conference. The conference theme was 'Resource Industry - Making it Work for PNG'. Mr Larden spoke about the benefits that PNG LNG brought to Papua New Guinea through workforce development and collaborative partnerships with government. He also outlined the work that EMPNG had done with government and community partners to combat COVID-19.

As EMPNG enters the next phase of operations, it maintains a firm commitment to maximising the benefits of LNG production for Papua New Guinean communities. This is being achieved by working closely with communities, government and non-government organisations to support social and economic growth and development for the nation.

## 2021 PERFORMANCE HIGHLIGHTS

### EXECUTIVE SUMMARY

**110** <sup>LNG</sup> CARGOES  
LOADED IN 2021  **808**  
LNG CARGOES LOADED TO DATE



**PGK5.2**  
billion

SPENT IN-COUNTRY  
WITH PNG BUSINESSES  
SINCE THE START OF PRODUCTION

**PGK645 million** IN 2021

**3339** <sup>OF WHICH</sup>  
TOTAL WORKERS  **89%**  
ARE PAPUA NEW GUINEANS

**15.6 million**  
WORK HOURS IN 2021  
INCLUDING  
**117,785**  
HOURS OF TRAINING



**61,700+**  
KILOGRAMS OF FRESH  
PRODUCE SOURCED LOCALLY

**7498** ENGAGEMENTS CONDUCTED  
WITH ~38,000 STAKEHOLDERS



**0** LOST TIME INCIDENTS  
IN 2021

**4+**  
YEARS WITHOUT A LOST  
TIME INCIDENT



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*Image captions:*

**Cover** EMPNG Operations Technician, Elaine Baking, at the HGCP

**Executive Summary** EMPNG Operations Technician, Anthony Lohia, with Facilities and Process Surveillance Engineer, Elijah Lavai, at the LNG Plant



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