

ExxonMobil

PNG LNG Environmental and Social Report – Annual 2022





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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 0.2840 [PGK1 = USD0.2840]. This rate is as published by the Bank of Papua New Guinea as at 31 December 2022.



EXECUTIVE SUMMARY

In 2022, ExxonMobil PNG Limited achieved a significant milestone of more than 100 million hours worked since the start of production.

Papua New Guinea Liquefied Natural Gas (PNG LNG) continues to deliver a reliable supply of energy to its customers throughout Asia, while providing career, business and community development opportunities for Papua New Guinean citizens.

As a subsidiary of Exxon Mobil Corporation, ExxonMobil PNG Limited (EMPNG) manages the operation of PNG LNG facilities on behalf of its 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 2022.

Production

PNG LNG continues to optimise production operations through the 'Big Value, Small Changes' focus that was introduced in 2021. This helped the Production team achieve even greater plant efficiencies in 2022, resulting in 8.6 million tonnes of LNG produced and 114 LNG cargoes loaded during the year.

Since the start of production, more than 69 million tonnes of LNG have been produced, with 920 LNG cargoes and 86 naphtha cargoes loaded for customers in Asia.

In July 2022, a new daily LNG production record of 9.4 million tonnes per year equivalent was achieved, and the highest daily level of naphtha production was also recorded at 722 cubic metres per day on average compared to the previous record of 579 cubic metres per day on average. More than 96 percent uptime was sustained throughout the year, which included both scheduled and unscheduled maintenance.

National content

A national content milestone was achieved in 2022 with six of the eight supervisory roles in the Upstream Operations team occupied by Papua New Guinean citizens. Papua New Guineans now comprise 90 percent of the Upstream area Operations team and 100 percent of the Pipeline Operations team. By the end of 2022, the PNG LNG total

workforce consisted of 3770 workers, of whom 88 percent were Papua New Guinean citizens, including 633 women. The PNG LNG workforce includes EMPNG employees, staff contractors and personnel from 25 third-party contractor organisations working on production-related activities for PNG LNG.

Ten engineers were recruited during the year through the Graduate Engineering Recruitment Program. Another three graduates from other disciplines were recruited for the Graduate Management Development Program. The first participants of the Graduate Management Development Program successfully completed their three-year rotation program in 2022, and have settled into their new roles within the company.

Seven engineering students were also engaged through EMPNG's Intern Engineering Recruitment Program to undertake on-the-job training at PNG LNG facilities.

The Operations and Maintenance training program celebrated its first decade in 2022, and welcomed the eighth intake of 28 trainees, including eight women. All 24 trainees from the seventh intake of this program completed their training and began working at EMPNG worksites as Junior Technicians in November 2022.

By the end of 2022, 12 graduates of the Operations and Maintenance training program had advanced to supervisory roles, and five were in lead roles with EMPNG, with 33 percent of these positions occupied by women. Fifty-five percent of all EMPNG field operations leadership roles are now occupied by graduates of the Operations and Maintenance training program, of whom 14 percent are women.

During 2022, EMPNG and its contractors delivered the equivalent of 148,000 hours of training to 9180 participants through 3790 courses.

Online courses continued, and face-to-face learning was reintroduced as pandemic restrictions eased. Ninety-four percent of training participants were Papua New Guineans, of whom 23 percent were women.

EMPNG also continues to help build the capacity of Papua New Guinean businesses. In 2022, nine landowner companies (Lancos) and 143 non-Lanco Papua New Guinean businesses were engaged in production-related activities.



EMPNG's total in-country spend with Papua New Guinean businesses was PGK633 million (USD180 million) compared to PGK645 million (USD183 million) in 2021. Approximately 46 percent of the in-country spend in 2022 was spent on Lanco services, which equates to PGK292 million (USD83 million) compared to PGK185 million (USD52 million) spent on Lanco services in 2021.

Since production began, EMPNG has spent PGK5.8 billion (USD1.7 billion) on Papua New Guinean services, of which PGK1.8 billion (USD538 million) was spent with Lanco businesses.

EMPNG implements strategic community investment programs to help encourage focused, long-term community and economic development.

As part of these programs, construction of a new community resource centre, store building, market building, wash bay facilities, and multi-purpose basketball and volleyball courts were completed near the Hides Gas Conditioning Plant (HGCP) in 2022. The facilities, worth PGK4.6 million (USD1.3 million), were funded by EMPNG and constructed by Lanco Hides Gas Development Company Limited. They will serve as a multi-purpose venue for community meetings, markets, sporting events and social gatherings for Hides communities.

Eighteen *haus wins* have also been constructed across the Upstream area with funding from EMPNG to provide community meeting places and easier access to clean water for people who live and work in the surrounding communities. Each of the *haus wins* consists of two large rainwater tanks and a shaded structure that provides a space for community meetings and social gatherings.

In October, work started on a new Komo Rural Local-Level Government chamber building funded by EMPNG. The building is being constructed by Lanco Hides Energy Services Limited, Komo Airfield Development Company and Hides Management Services. When completed, it will provide a meeting and conference room, as well as an administrative hub for 24 ward counsellors of the Komo Rural Local-Level Government.

Following the success of the rugby league competition in Komo, EMPNG is helping Angore communities establish their own rugby league competition through supporting the new Angore Hayapuga Football Association to register with the Papua New Guinea Rugby Football League. In addition, EMPNG has provided Angore communities with an expanded rugby league field at Idaui Primary School and supplied jerseys for 11 local teams.

A new staff house has been completed at the newly established Undupi Primary School in Angore. The school serves nearby communities in Kindipa and has a current enrolment of 195 students. The staff house, funded by EMPNG, is intended to make it easier for teachers to get to and from their classes, which helps support better educational outcomes in Angore.

In Hela Province, a new Community Piggery Enterprise, which includes a large piggery facility, is now in operation through funding and community training support provided by EMPNG.

The Enterprise involves a piggery for up to 200 sows and a training farm to raise piglets to six weeks of age. It includes the provision of training to local farmers in pig feeding, housing and health management, as well as guidance on developing local, regional and national markets for Highland Village pork.

Ten schools in the Upstream area, 18 primary and high schools in the Central Province and National Capital District (including six schools in LNG Plant site villages) and the Port Moresby Nature Park have received computer laboratories through the LiteHaus Digital Infrastructure Program, which receives funding from EMPNG. Each laboratory contains 15 desktop computers with software, an e-library, access to a Digital Skills Passport, a 50-inch display screen with connectivity to devices that support teaching, and 24-hour remote technical support, as well as in-person support.

LNG Plant site communities received a new pharmacy and medical storage facility from EMPNG. The facility was constructed using two refurbished shipping containers.

It will be used to supply rural health centres throughout the Central Province. EMPNG also provided medical equipment for an ambulance, and first aid training for health care workers and ambulance drivers at Porebada Sub-Health Centre during 2022.

Two newly constructed community halls funded under the Community Infrastructure Trust Fund through the Mineral Resources Development Company Limited were officially opened in 2022. In March, a two-level community hall was opened in Boera Village to provide local communities with two meeting rooms, four offices, a kitchen and other facilities. In Lea Lea Village, a community hall consisting of an open meeting space, four offices and a kitchen was opened in April.

EMPNG continues to work with Buk bilong Pikinini libraries on activities such as Literacy week programs to help build numeracy and literacy skills in Papua New Guinean children. Among many activities supported during 2022, EMPNG donated a school bus to help Buk bilong Pikinini take its educational programs into Papua New Guinean communities.

EMPNG's Science Ambassador Program returned to full capacity in 2022 with 818 students from three schools in the Upstream area and six schools in the LNG Plant site villages participating during the year.



Science Ambassador, Gabriel Kila (right) conducting a practical experiment with students from Papa Junior High School as part of the Science Ambassador Program

The program encourages high school students to consider careers in science, technology, engineering and mathematics (STEM) through practical experiments and classroom lessons on topics such as rocks and geology, and the origins of oil and gas. Some 5870 students have participated in the Science Ambassador Program since its inception in Papua New Guinea.

In 2022, EMPNG commemorated its 10th year of sponsoring and working together with the PNG LNG Kumuls.

The PNG LNG Kumuls have been working with EMPNG to build rugby league capabilities for youths in local communities to help them develop lifelong skills, which are transferable to academic and career success.

During the year, EMPNG appointed PNG LNG Kumuls Centre, Justin Olam, as its new PNG LNG Community Ambassador. Justin's integrity and leadership, coupled with his commitment to education and improving lives through opportunities, mirror the values of EMPNG.



Justin Olam with members of the Koita Sisters Rugby League team during a visit to Papa Village in Central Province

Environment

Work on the Lake Kutubu Wildlife Management Area (WMA) Management Plan progressed with the first full draft of the Management Plan completed based on the collection of data about environmental, biodiversity and cultural values of the region through surveys conducted with WMA Committee members and local communities. A workshop will be held with stakeholders from the district provincial administration, relevant Papua New Guinean Government departments and civil society organisations to review the draft Plan before it is finalised and adopted for implementation.

Following an initial meeting in 2021, a second meeting for the proposed new conservation area on the Sanumahia clan lands located west of the Lake Kutubu WMA was held by members of the clan at Lorogobai'u Village.

Office bearers were elected to coordinate community awareness and other conservation-related activities.

The office bearers will eventually establish a community-based organisation for the new conservation area.

EMPNG continues to engage with Lower Kikori communities for conservation initiatives.

In 2022, an environmental lawyer was engaged to initiate the conservation deeds process. The lawyer completed the first drafts of 10 conservation deeds that were reviewed and agreed with the Kerewo and Kibiri tribes in 2021. Second drafts of these conservation deeds will be shared with the respective communities in 2023.

EMPNG is also working with the Papua New Guinea Social Research Institute to create a cultural heritage children's storybook based on oral histories collected during the community engagement and resource mapping process undertaken as part of Component 5 of EMPNG's Biodiversity Offset Program. The book is expected to be published in 2023.

Results of the biennial biodiversity monitoring survey conducted during 2021 were published in 2022. The survey, which documents trends in flora and fauna species diversity and abundance, included the collection of imagery from 80 camera traps placed in forest habitats at two permanent Biodiversity Assessment Areas at Hides Ridge and the Agogo Range near Moro.

The published report showed 35 frog species documented in the 2021 survey. There has been relatively little change detected in bat and rodent communities or the forest structure adjacent to the pipeline Right of Way (ROW) during the past seven years of survey activity, which suggests that the removal of forest for the pipeline ROW has had no detectable impact on the native rodent population.

The HGCP recorded its lowest flaring emissions since the start of production due to ongoing flare reduction initiatives. As part of these initiatives, EMPNG is replacing nine diesel generators with eight gas-powered microturbines to reduce greenhouse gas emissions in the Upstream area. During 2022, PNG LNG facilities generated 2096 kilotonnes of carbon dioxide equivalent, which was primarily from gas turbine fuel consumption at the LNG Plant and HGCP. Greenhouse gas performance continues to align with ExxonMobil's 2030 Greenhouse Gas Emission-Reduction Plans.

EMPNG is improving long-term waste management solutions at all worksites. Following successful trials, the Papua New Guinea Conservation and Environment Protection Authority has approved a new onsite treatment process for wastewater effluent from equipment washdown at the HGCP.

The new process involves pre-treatment through a carbon filtration unit and secondary treatment through the vetiver grass reed bed system at the Hides Waste Management Facility in Kopeanda. By the end of 2022, almost 5 tonnes of process wash water from the HGCP was treated through the reed bed. Verification groundwater monitoring at the Hides Waste Management Facility showed that the treated water had no impact on groundwater quality.

Waste reuse initiatives continue to prove successful. For example, during 2022, some 43 tonnes of timber was reused from EMPNG worksites for community infrastructure projects in Porebada Village near the LNG Plant site.

In the Upstream area, an opportunity identified in 2021 to reuse waste oil in onsite operations equipment resulted in 11 tonnes of waste oil and fuel being reused in 2022.

As part of EMPNG's commitment to 'Protect Tomorrow. Today.', 60 LNG Plant site volunteers planted 100 mangrove seedlings on the tidal flats surrounding the LNG Plant site perimeter to commemorate World Environment Day in June.



EMPNG and contractor volunteers plant mangroves near the LNG Plant site for World Environment Day

Social

EMPNG is maintaining its industry-leading safety performance, achieving more than nine years of work without a Lost Time Incident at the LNG Plant. More than 18.7 million hours were worked in 2022.

The Upstream area has achieved more than five years of work without a Lost Time Incident. A safety milestone was reached with the Environmental and Property Solutions Facilities team at ExxonMobil Haus achieving five years without a recordable injury.

EMPNG regularly conducts both table-top and field-based emergency drill scenarios to reduce the risk and impact of a major event. In 2022, 12 major event scenarios involving field-based deployments were conducted to provide emergency responders with the knowledge and practical experience to manage a major event. Twenty-seven medical emergency response drills were also conducted across EMPNG worksites during the year.



Fire Officer, Hisiu Sere (foreground) and Firefighter, Guba Mea undertaking firefighter training at the LNG Plant site

In June, EMPNG implemented human performance fluency training with 500 supervisors completing the training by the end of the year. The training challenged safety leaders to expand their safety awareness regarding how and why mistakes occur in the workplace. It also empowered participants to transfer this knowledge back to the general workforce.

Human performance fluency training is designed to help workers gain a stronger understanding of how different individuals interact with plant, processes and each other as part of an overall workplace system to better manage risks and keep people safe.

To help workers support each other in dealing with stress due to personal, family and broader community and global issues, in August EMPNG introduced a Mental Health First Aider training program with the St John Ambulance Service Papua New Guinea. This program supports EMPNG's *Wik bilong lukautim tingting*, the 'week for taking care of one's mental wellbeing', mental health awareness program by providing workplace Mental Health First Aiders with tools to help support colleagues who may be struggling.

EMPNG conducted specific lunch-and-learn sessions and toolbox talks to commemorate internationally-recognised days such as World Tuberculosis Day, World Malaria Day, World Diabetes Day, and World AIDS Day during the year. Workers were provided with mosquito bed nets for World Malaria Day, free diabetic screening for World Diabetes Day, and free HIV/AIDS testing and counselling for World AIDS Day.



Matilda Manesseh receiving free blood testing from Health Extension Officer, Jubilee Paru, in support of World Diabetes Day

As part of its National Content Strategy, EMPNG actively and regularly engages with community stakeholders, all levels of government and civil society organisations.

During 2022, some 12,310 engagements were conducted with communities throughout the PNG LNG area of operations. Of these, 3390 were formal engagements and 8920 were informal engagements involving 49,900 stakeholders.

In the Upstream area, engagements focused on employment and business development opportunities from EMPNG activities in Angore and along the pipeline ROW, Clan Caretaking Agreements, and community investment programs. LNG Plant site community engagements mainly focused on community development support projects, employment and business opportunities, and marine safety exclusion zones.

In addition to community engagements, 33 advocacy workshops were held with 360 representatives from national government agencies, provincial governments and co-venture partners during 2022.

Another 365 people from local schools and communities participated in site visits to the HGCP and LNG Plant during the year.

At the HGCP, tours included the launch of the annual Family Community Tour, which involved a tour of the HGCP by 27 participants from the Hides Seventh Day Adventist Youth Group, and the launch of an annual Thanksgiving Day tour involving 35 women from seven women's groups from the Upstream area. Students from EMPNG's Science Ambassador Program also visited the HGCP as part of their program in 2022. Four tours of the LNG Plant site were conducted for students from the Port Moresby Technical College, Kumul Petroleum Academy and University of Papua New Guinea. In addition to EMPNG achieving numerous production, workplace and safety milestones during the year, EMPNG celebrated the 100th year of ExxonMobil in Papua New Guinea, of which more than a decade has involved the construction and operation of PNG LNG.



National Content Advisors, Mary Daure and Debbie Maraki with Upstream Community Development Support Analyst, Marsha Ikau celebrating the 100-year anniversary of the ExxonMobil affiliate in Papua New Guinea

The solid workplace, business and community initiatives and working relationships that are now in place with EMPNG's stakeholders, along with consistent revenues generated by LNG production, provide a foundation to support the social and economic development of Papua New Guinea in the future.

2022 PERFORMANCE HIGHLIGHTS

EXECUTIVE SUMMARY

114 LOADED IN 2022  **920**

LNG CARGOES LOADED TO DATE



PGK5.8 billion

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

PGK633 million IN 2022

3770 TOTAL WORKERS OF WHICH  **88%** ARE PAPUA NEW GUINEANS

18.7 million WORK HOURS IN 2022

100 million WORK HOURS SINCE THE START OF PRODUCTION



12,310 ENGAGEMENTS WITH 49,900 STAKEHOLDERS

90% OF UPSTREAM OPERATIONS TEAM ARE PAPUA NEW GUINEANS



100% OF THE PIPELINE OPERATIONS TEAM ARE PAPUA NEW GUINEANS

148,000 HOURS OF TRAINING OF PNG LNG WORKERS



LNG PLANT

9+

YEARS WITHOUT A LOST TIME INCIDENT

UPSTREAM
5+

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Image captions:

Cover EMPNG HGCP Control Room Operator, Roman Bukuru and Operations Technician, Elaine Baking at the HGCP

Executive Summary EMPNG LNG Plant Electrical Technician, Graham Pohai at the LNG Plant site



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