XAYABURI POWER

YOUR SENSE OF ENERGY

GREEN BOND FRAMEWORK

XAYABURI POWER COMPANY LIMITED ("XPCL")

December 2021

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Xayaburi Hydroelectric Power Project

Part A: INTRODUCTION

1.1 Background

Xayaburi Power Company Limited ("XPCL" or "Company") is a limited company incorporated on 22 June 2010 under the laws of the Lao People's Democratic Republic (the "Lao PDR"). It is the first large-scale project on the mainstream of the Mekong River within the Lao PDR and the lower Mekong basin. XPCL operates the Xayaburi Hydroelectric Power Project ("XHPP" or the "Project"), a run-of-river power plant with a limited impoundment. The Project is a Run-of-River type hydropower plant where the outflow from the project is always equal to the inflow into its impoundment. Its registered office is located at 215 Lane Xang Avenue, Ban Xieng Yuen, Muang Chantabouly, Vientiane, Lao PDR. The Project has total installed capacity of 1,285 MW for the average annual energy generation of 7,400 GWh.

On 29 October 2010, XPCL entered into a Concession Agreement with the Government of the Lao People's Democratic Republic (the "GOL") on a BOOT basis (Build-Own-Operate and Transfer) to design, develop, construct, and operate the Xayaburi Hydroelectric Power Project for a period of 29 years commencing from the Commercial Operation Date ("COD"), which is on 29 October 2019. However, in year 2016, XPCL entered into an amendment of the Concession Agreement to extend the concession period to be 31 years from the COD. Therefore, the new concession period would range from year 2019 to 2050.

The Project comprises seven turbine generator units of 175 MW each that will generate and transmit electricity at a total maximum output of 1,225 MW to the Electricity Generating Authority of Thailand ("EGAT") in Thailand under the Power Purchase Agreement ("PPA") for 29 years, starting from the COD. The remaining 60 MW from an additional turbine generator unit will be sold to Electricité du Laos ("EDL") under the PPA between EDL and XPCL for 31 years, starting from the COD, which is equal to the concession period granted from the GOL. However, XPCL has the right to extend the contract period under the terms and conditions as may then be agreed by the parties.

The shareholders of XPCL, as of 30 September 2021, are as follows;

Shareholders	Shares %
1. CK Power Public Company Limited[1]	42.5%
2. Natee Synergy Company Limited	25.0%
3. EDL-Generation Public Company	20.0%
4. Electricity Generating Public Company Limited	12.5%
Grand total	100.0%

[1]CK Power Public Company Limited ("CKP") was founded in 2011 and listed in the stock exchange of Thailand ("SET") in 2013. CKP is one of the leading private power companies in Thailand, who has primarily been involved in development and operation of hydro power plants in Lao PDR and cogeneration power plants and solar power plants in Thailand. As of 30 September 2021, CKP has total portfolio of 2,167 MW installed capacity (1,003 MW equity capacity), 89% of which is renewable energy and remaining 11% of which is conventional energy.

Construction

XPCL started construction work in late 2010, including the construction of a 115 kV transmission line to the site, the access roads, and the site installations.

Stage 1 :

The project implementation lasted up to January 2015 and comprised the construction of the cofferdams and the excavation and concrete works for the Navigation Lock, Spillway, and parts of the Intermediate Block. In parallel, hydro-mechanical equipment such as gates and stop-logs were fabricated and installed.
The electro-mechanical equipment was manufactured and procured. Design, survey, and construction of the 500 kV Transmission Line were conducted.

After closure of the Mekong river on the left side, the diversion of the Mekong River through the largely completed Spillway took place in January 2015, which marked the start of the Stage 2 works.

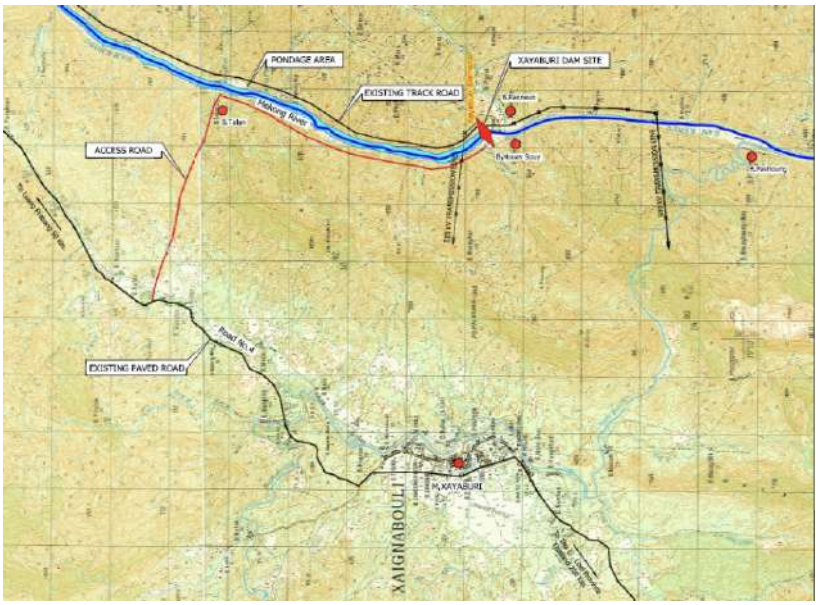
Stage 2 :

The works comprised all the remaining civil works of the Intermediate Block, the main Powerhouse, the left bank fish passing facilities including the left bank auxiliary powerhouse and the RCC closing structure as well as the fabrication, installation, and commissioning of all hydro-mechanical equipment. Electro-mechanical equipment was manufactured, procured and installed and the 500 kV transmission line was completed and energized.
Testing and commissioning of the generating equipment with EGAT and EDL started in April 2019 and the contractual Commercial Operation Date was achieved on 29 October 2019 as planned.

Hydroelectric Power Project on the Mekong River

Project Location

The Xayaburi Hydroelectric Power Project is located on the Mekong River, approximately 80 km downstream of the city of Luang Prabang and about 35 km east from Xayaburi in the Lao PDR.



Project Location

Overview of Project Facilities and Equipment Used

XHPP Main Components

The main components of the project are as follows:

1) A two-step Navigation Lock which can accommodate convoys of up to 2 x 500-ton vessels of a total 109 m length
2) A gated ogee Spillway consisting of 7 surface spillway openings and 4 low level outlets
3) An Intermediate Block with pump stations 1 and 2 and the unloading and erection bay of the Powerhouse
4) Powerhouse with 7x175 MW and 1x60 MW vertical axis Kaplan turbines, GIS, and transformer deck
5) Main upstream Fish Migration System with fish ladder, fish locks, upper channel, and monitoring station
6) A 195 km long 500 kV Transmission Line to Thali (EGAT) and a 17 km long 115 kV line to Xayaburi (EDL)

Operation

XHPP comprises of eight main Kaplan turbine generating units. The seven units of 175 MW each have a runner diameter of 8.6 m and are connected via the 500 kV GIS and a 500 kV transmission line to the EGAT grid. The eighth unit of 60 MW with a runner diameter of 5.05 m is connected via a 115 kV open air switchyard and a 115 kV transmission line to EDL.

The power production of the plant follows the river flow. The upstream water level is maintained at 275.00 +/- 0.5 mm asl (normal operating level). Power production for the EGAT units has to be declared in advance following agreed procedures between XPCL and EGAT. In order to maximise declared power, a specific flow forecasting system was installed by XPCL.

Two compact units of 4 MW each are installed in the auxiliary powerhouse at the left bank. They provide flow for the fish upstream migration facilities and electricity for the station operation.

The tailwater level is a function of the river flow. The generating units can operate at heads between 17.2 and 39.0 meters. The upper limit of the operating head range of 39 m corresponds to a river flow of less than 1,000 m3/s, which is very seldom the case. The lower limit of the operating head will be reached at a river flow of approximate 13,000 m3/s or around 1:2 year flood.

In an average year the power production of the plant is 7,400 GWh. Out of this, 7,100 GWh is supplied to EGAT and the remaining portion of around 300 GWh is supplied to EDL.

Purchase Power Agreement and Off-takers

From the total installed capacity 1,285 MW, there are 2 off-takers with 2 PPAs as below;

1) **PPA with EGAT:** 1,220 MW, for 29 years from the Commercial Operation Date;

The PPA with EGAT determines the Annual Supply Target of 5,709 GWh to be purchased by EGAT, divided into:

(a) Primary Energy (PE): 4,299 GWh per year;
(b) Secondary Energy (SE): 1,410 GWh per year; and
(c) If the volume of water exceeds the forecast, Excess Energy (EE) can be produced.

2) **PPA with EDL:** 60 MW, for 31 years from the Commercial Operation Date, which is equal to the concession period granted by the GOL for 31 years.

The PPA with EDL is to provide electrical energy to the EDL system, XPCL shall declare and make available an Annual Supply Energy of 343 GWh.

500 kV Takeoff yard and Transmission towers

1.2 Sustainability Strategy

XPCL recognizes the importance of 17 United Nations Sustainable Development Goals (UN SDGs) and has applied international standard measurement to assure the surrounding community, customers, end-users and relevant stakeholders that XPCL's business would commit to environmental preservation and to support communities to achieve the Sustainable Development Goals. Activities, which are in line with the UN SDGs, undertaken by XPCL include;

Goal 7 : Affordable and Clean Energy
Goal 13 : Climate Action

Producing Clean Energy Equivalent to Absorption of CO2 from 2.1 Million Rai of Forests per Year.

Over 75 percent of electricity utilized in Thailand is produced from the combustion of non-renewable fuel. On the other hand, hydroelectricity, such as that produced by Xayaburi Hydroelectric Power Plant, is renewable energy without any use of fuel, and depends on differences in water level and on water flow. Greenhouse gases can therefore be reduced by approximately 0.5 kilograms per unit of electricity (kWh)[2] with the use of hydroelectricity. For comparison, the Xayaburi Hydroelectric Power Plant, with an average production capacity of 7,600 GWh per year, is capable of reducing an emission of Carbon Dioxide (CO2) by up to 3.8 million tons per year, equivalent to an absorption of CO2 by forest by approximately 2.1 million rai every year

Goal 3 : Good Health and Well-being
Goal 11 : Sustainable Cities and Communities

Elimination of Aedes Aegypti, Dengue Fever Campaign : Huen Khiang Hong Xayaburi Power.

XPCL aims to ensure healthy lives and promote well-being for the communities surrounding the XPCL power plant and strives to make communities and human settlements improved, inclusive, safe, resilient and sustainable.

XPCL has realized the significance of good hygiene in relation to disease outbreaks, and is taking steps to care for the communities surrounding the power plant. XPCL organized the "Elimination of Aedes Aegypti, Dengue Fever Campaign: Huen Khiang Hong Xayaburi Power" in collaboration with Mueang Nan Public Health and Ban Noen Sawang Sanatorium, Luang Prabang Province. This involves spraying repellent to eliminate Aedes Aegypti, as well as educating the local residents in precautions and prevention of Aedes Aegypti. This will enable them to apply practical knowledge gained in real circumstances, and to reduce the morbidity and mortality rates from dengue fever among the local residents. The activities were undertaken from October 26 to November 12, 2020. In summary, the results after these activities were that the number of dengue fever patients and the mortality rate from dengue fever declined to 0, and the Aedes Aegypti larval index decreased from 6.9 percent to 2.5 percent. There were 200 residents participating in the activities to gain knowledge on prevention and severity of dengue fever.

Goal 8 : Decent Work and Economic Growth

XPCL continues to play a part in promoting continued, inclusive and sustainable economic growth, as well as creating decent work for all, both males and females, including local labour, in every society in which XPCL has invested. XPCL has been monitoring, developing, building careers for the communities surrounding the Xayaburi Hydroelectric Power Plant ("XHPP").

[2] http://www.eppo.go.th/index.php/th/energy-information/static-energy/static-co2

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POLICY TOWARDS SUSTAINABLE OPERATION

Electricity can be obtained in a variety of ways from renewable and non-renewable sources. There are non-renewable sources of electricity, which will likely be exhausted at a certain time. Among them are natural gas, oil and coal. At the same time, generating electricity from renewable sources is considered an attractive option for the environment. Renewable energy is gaining prominence worldwide and providing clean electricity to the population through technological developments.

The Blueprint of Green Power Plant

Over 75% of the electricity consumption in Thailand comes from fossil fuel power plants burning either gas or coal and thus releasing substantial amounts of CO2. Only a small portion in the energy mix comes from renewable energy sources like hydro, solar or wind. To be more conserving to the sustainable energy sector and the world global warming crisis, hydroelectric power is one of the reliable energy sources which can meet the high demand of electricity for the economic growth of Thailand and the region.

Hydropower is the only available technology which can produce base load energy on a large scale. Solar and wind power are intermittent and depend on the availability of sunshine or wind, thus requiring storage methods if energy is to be made available during night times low-wind periods. The only other method to produce CO2-free energy on a large scale is by nuclear power. However, this is not considered a sustainable form of energy since it produces hazardous waste.

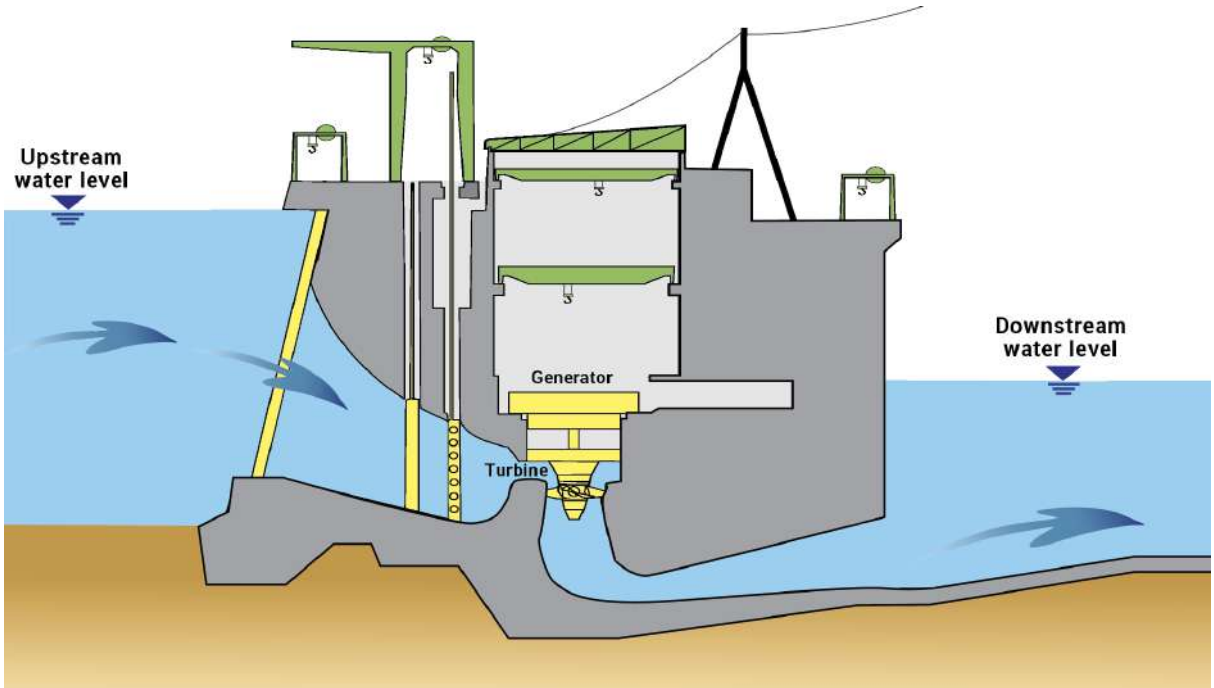
Hydropower is likely to remain a prominent energy option in the global push to decarbonise, due to its potential scale, low GHG emissions, important role in grid support and energy storage capability. While the issue of reservoir emissions has attracted increasing attention over recent years, evidence indicates that on average, acknowledging the highly context-specific nature of the technology, hydropower has one of the lowest GHG footprints of any electricity generation technology e.g., estimates of Run-of-river Lifecycle Emissions are in a range of 3-13 gCO2e/kWh.[3]

The Blueprint of "Run-of-River" Power Plant

The general principle of a Run-of-River ("RoR") plant is to use the flow of a river to produce energy, without storing any water. The outflow from such a project is always equal to the inflow.

The electric power production is therefore directly related to the natural flow of the river (= inflow) and fluctuates accordingly with the natural fluctuations. The barrage (typically all installations including the powerhouse are situated within the river and therefore the term "dam" is not usually used for RoR HPP's) divides the river into a headwater area (upstream, also called backwater area or impoundment) and a tailwater area (downstream which is equal to the river itself). The difference in the water levels, the so-called gross head, is, together with the flow, defining the potential energy which can be converted into electricity. The minimum available gross head determines the type and design of the turbine used. The gross head is very small compared to the one of a storage hydropower power plant and accordingly the potential energy is also comparatively small. RoR hydropower plants compensate for that by using a high flow from a large river.

[3]Climate Bond Initiative's Background Paper for Hydropower Criteria Development of Eligibility Criteria for the Climate Bonds Standard & Certification Scheme, March 2021 Version 1.0



Schematic Cross Section of a Run-of-River Power Plant

The headwater level in this type of hydropower plant is always kept constant during normal operation to ensure that the outflow is equal to the inflow. For flows exceeding the maximum flow, the turbine can be used for energy generation; excess water is released via a spillway.

XPCL is such a low-head run-of-river plant, characterized by:

- Small head range (water level difference between upstream and downstream water level), which makes Kaplan turbines the suitable technology;
- The reservoir is "small" and its footprint is not much bigger than the footprint during natural floods. It does not allow storage of large volumes of water. The total volume is equal to a few days of average flow of the river and no inter-season management of water is possible;
- The water flowing into the reservoir is released at the barrage site, no water is stored during normal operation.

The Blueprint of "Transparent Power Plant"

It is important to reduce the potential impact of the hydropower plant as much as possible. If this is achieved successfully, one can call such a project a "transparent power plant", which means that the conditions upstream and downstream of the plant are in principle the same.

As explained above, the natural flow of the river is not altered by a run-of-river scheme.

Another important aspect of "transparency" is **sediment.** The Mekong river transports large amounts of sediment in the few months of the wet season. This sediment is important to maintain river ban stability downstream of the plant and avoid erosion. Sediment, especially fine sediment, is also an important nutrient for fish. Therefore, the project has designed facilities which allow an effective management of the sediment to ensure that accumulation in the impoundment is kept to a minimum.

The majority of all sediment transported by the Mekong is suspended, i.e., the particles are "swimming" within the water column of the river. Since the inflow is constantly released by the plant, the majority of these sediment are transported to downstream during the normal operation of the turbines during electricity generation. In case the Mekong flows are larger than what the turbines can consume, the excess water is released via the Spillway. Based on requirements of the Mekong River Commission ("MRC") the project has implemented four so called "low level outlets ("LLO")", which allow

the discharge of sediment rich waters from the deepest parts of the river. These LLO's are always opened as soon as the Spillway start operation. In case Mekong flows increase further, beyond the capacity of the LLO's, the other spillway gates are opened to release the floods.

With this system, the dam will reach a transparency of ca. 97% or even higher in terms of sediment passing.

Uninterrupted navigation is ensured by the Navigation Lock, which allows safe and easy passage for all boats on the Mekong from down- to upstream and vice versa. The Navigation Lock has been designed according to the MRC requirements and international standards and is fully equipped with all necessary safety features. The Navigation Lock has been in operation since May 2015 without any problems or incidents. The passage is provided during daylight hours all year round and is free of charge for all users. To facilitate the quick and easy passing of smaller fishing boats, XPCL has established a so called "tractor & trailer" services. This service is provided at two river ramps, one on the upstream and one on the downstream side, at which small fishing boats can directly drive on a trailer parked in the water at the ramp. The boat is then immediately transported to the downstream or upstream without any delay.

Fish-passing is of paramount importance since communities rely on fish for own consumption and for income.

The Blueprint of Highest Safety Standard

XPCL was designed following and complying with the most stringent national and international standards and latest best practice in Hydropower Engineering.

The two main criteria the plant has fulfilled is resistance to earthquakes and the capability to pass large floods.

Extensive studies were carried out to determine the maximum magnitude earthquake possible in the region where the plant is located. This earthquake, also called a Safety Evaluation Earthquake ("SEE"), is the one which creates the strongest possible ground motions with a statistical return period of more than 10,000 years. That means that statistically such an earthquake will occur more seldom than once every 10,000 years. The calculated ground motions from such an earthquake are applied in the design resulting in a structure which will survive such an earthquake largely undamaged and with no uncontrolled release of water from the impoundment.

The other potential risk comes from natural floods which the project has to be able to pass safely via the Spillway. For this, the Probable Maximum Flood ("PMF") is calculated using statistical data and an assessment of the probable maximum storm with the probable maximum precipitation and the resulting run-off into the river.

These floods also have a statistical return period of more than 10,000 years and represent a flow of 47,500 m3/s. For perspective, the largest recorded flood of the Mekong was just over 20,000 m3/s, just half of what the XPCL can pass safely even with one spillway gate not available while still maintaining a freeboard of at least 1m on the upstream side.

The Blueprint of Community Development Power Plant

XPCL respects the ways of living and blends into the local communities surrounding the power plants. XPCL has set the highest standard for the resettlement of the villages and Project Affects People ("PAPs") by not only providing best possible compensation but also by including all PAPs into the resettlement planning and execution.

Particular attention was given to respect local customs and traditions when planning and executing the resettlements.

As well as providing compensation for direct loss of houses, gardens, farmland, or other infrastructure, XPCL also placed a high focus on providing improved infrastructure to the communities, including communal facilities like temples, schools, kindergartens, public offices etc. and improved infrastructure from roads to reliable supply of water and electricity and state of the art sewage systems.

A special focus is put on empowering PAPs to improve their livelihoods by providing a wide array of vocational training in the fields of farming, agriculture, technical skills and commerce.

All activities and measures followed the applicable laws and standards of the Lao PDR and were closely monitored by the GOL's Ministry of Natural Resources and Environment and related line agencies. Key performance indicators were defined for each measure e.g., minimum household incomes, and the achievement of these KPIs was monitored on regular basis.

It is important to note that XPCL's engagement with the PAPs and the communities did not end with the successful relocation or the completion of the construction activities but remains for more than 10 years into the operation of the plant.

1.3 Environmental, Health and Safety (EH&S) Risk Management

In managing the environment during the project development, XPCL carried out a large number of environmental and social studies to gain a deep understanding of the specific conditions in the closer and wider project area.

Environmental and Social Studies and Assessments

Date	Assessment
August 2010	The Environmental & Social Impact Assessment ("ESIA") was completed. The GOL submitted the project documents to the Mekong River Commission ("MRC") in compliance with the Procedures for Notification, Prior Consultation and Agreement ("PNPCA"), the first time MRC implemented these procedures under the 1995 Mekong Agreement.
Mid - 2011	Compliance Review was carried out and completed by Pöyry Energy Ltd, which formulated a set of actions for XPCL to implement for the project to be fully compliant with the MRC's Preliminary Design Guidance (2009). A set of actions had to be verified whether the GOL and XPCL had taken into consideration the comments submitted by each of the MRC member countries during the PNPCA process. Based on the Compliance Report, technical solutions were developed and implemented including; improvements related to fish passage, sediment management and changes to the Navigation Lock.

A subsequent independent assessment by the Government of Lao Engineer demonstrated that XPCL had successfully addressed all requirements from the Compliance Report and implemented the required mitigation measures.

During the stage 1 works, XPCL continued with a large number of specific studies related to the presence of fish and their specific characteristics. This information was crucial to the successful design of the fish migration facilities which allow an uninterrupted passage of fish from downstream to upstream and vice versa. In detail, the following studies were undertaken:

Fish Species and Abundance

At the beginning of the project, a large study was undertaken to identify the fish species present in the Mekong at the Xayaburi site. The objectives of this study were:

- To investigate the existing stock of fish at the project site;
- To examine fish species and abundances during migratory periods; and
- To supplement the information collected during the hydro-acoustic surveys.

Various fishing gears (gill net, hook, cast net, etc.) were used during stationary and mobile surveys. Captured fish were identified, weighted, measured and photographed. A total of 120 different species from 25 families were caught during this work.

Fish Migration Patterns and Biomass

A specific study was conducted at site between March 2012 to March 2013 to investigate the patterns and timing of fish migration within the Mekong river. The work utilized a DIDSON hydroacoustic camera to monitor and record fish movements during ten different sampling periods. Key findings of this work were:

- The peak upstream migration season corresponds to the build-up of the rainy season between March and late June.
- Peak upstream biomass migration was estimated as high as 5,000 kg/h (May) during the peak flood season (August to October). Upstream migration is significantly reduced compared to the beginning of the flood season.
- Downstream migration was highest in March, April and May but occurs throughout the year.

Fish Swimming Ability

A critical component of any fish pass design is knowledge of the swimming abilities of the fish for which the pass is designed. Upstream migrating fish swim instinctively against the flow. Therefore, the water velocity in the fish pass has to be sufficient to attract them but should not be too high to prevent fish from entering or becoming exhausted.

An extensive field work was conducted in spring 2014 to investigate the swimming ability of Mekong fish species present at the site to determine the following parameters:

- The burst swimming speed of target species which are representatives of the wider fish fauna at the project area; and
- The volitional swimming response to different water velocities within an open channel.

During this work, more than 1,500 wild fish belonging to 23 species were tested in a facility specially designed and built for this purpose on site.

Beside fish, sediment is a major environmental factor

It is a necessity that the sediment transported by the river is passed to downstream unhindered. Sediment starvation can affect downstream river stretches causing riverbank erosion. Furthermore, on a country wide scale, the Mekong sediments are important for the river delta in Vietnam. Sediment also represents crucial nutrient for fish and is hence important to maintain the ecological balance downstream of the project

In the historic context, the current sediment loads in the Mekong river are considerably reduced by the retaining effects of large Chinese storage dams on the Lancang River and by new dams realized in several tributaries in Laos.

Environmental, Health and Safety (EH&S) Risks and Mitigation

XHPP has been appropriately designed using the best available technologies in hydropower development to prevent and minimize all environmental and social risks. In particular, these include fishery resources conservation, sediment routing, navigation and riverbank erosion.

Fisheries

To minimize impacts on valuable fishery resources in the Mekong River, multiple fish passages systems have been selected as the appropriate measure to alleviate impacts on local migratory fishes in both the upstream and downstream directions throughout the year. Moreover, a Fishery Management Unit is to be established for aquaculture and fish stock enhancement along the Mekong River.

The project has sourced one of the latest fish-friendly turbines to assure a higher fish survival rate than is achieved with older kinds of turbines. These turbines have fewer blades and turn slowly, allowing fish to swim through with less risk of injury, whilst generating large quantities of electricity.

Sediment

XHPP is a run-of-river barrage which will trap substantially less sediment than conventional storage schemes. Moreover, spillways and low-level outlet gates at the barrage will facilitate transportation of sediment downstream. As such, Xayaburi HPP will not cause significant change in the continuous supply of sediment and nutrients to the downstream ecosystem.

Navigation

The Mekong River also serves as a major transport channel. This stretch of the river is particularly treacherous in the dry season when the water level is low, and it is impossible for large ships to pass through. The project enables year-round shipping to be greatly enhanced. The upstream water level will be higher than the current level and will be maintained at this level throughout the year.

In the design process, the Xayaburi Hydroelectric Power Plant planned for a 12-metre wide, 700-metre-long ship passage that can handle vessels weighing up to 2x500 (DWT) Dead Weight Tonnes to facilitate regional trade and tourism activities, which in turn will significantly strengthen the socio-economic well-being of the Mekong Sub-region.

Riverbank Erosion

After commissioning of the Project, the water level in the reservoir will be maintained at a constant level with only very minor fluctuations. This will avoid any negative impacts on the reservoir banks.

Due to its nature as a run-of-river project, the water inflow into the reservoir is the same as the outflow. Therefore, outflows will be similar to the natural flows in the Mekong River mimicking the natural variations between dry and wet season. No negative effects beyond those naturally occurring are expected.

Social Safeguards

As XHPP is a run-of-river type without a large reservoir, the number of households to be resettled is relatively small. The land usage for the construction and operation of XHPP has directly affected 15 villages located on both sides of the Mekong River bank in Xayaburi and Luang Prabang provinces.

Thirteen villages are affected by the higher water level along the riverbank upstream of the barrage site and two are in the construction area. Based on the Social Impact Assessment (SIA), the Resettlement Action Plan (RAP) was formulated in compliance with the provisions of the Lao PDR's National Policy on Resettlement and Compensation, Decree on the Compensation and Resettlement of the Development Projects, the Environmental Management Standards for the Electricity Projects and the Technical Guidelines on Compensation and Resettlement in Development Projects. These principles underline that the XHPP's RAP must enhance the quality of life for the project affected people (PAPs) and to minimize and mitigate adverse social impacts. The XHPP's RAP was formulated using the participatory approach through intensive studies, field surveys and consultation meetings with PAPs, and all levels of concerned, government officials on central, provincial and district levels. The RAP was developed with 3 main programs:

1) The Compensation Program for the directly affected people, entitlement, properties, and assets;
2) The Resettlement Program for relocation of the affected households to new resettlement villages where housing, infrastructure and public facilities are provided; and
3) The Social Development Program for community development, livelihood restoration for PAPs and host communities towards a better quality of life and environment.

There are total 15 villages directly affected by the development of XHPP with 7 villages requiring resettlement to new resettlement sites with full provisions of housing, infrastructure, public facilities, compensation and supports. Meanwhile, in 8 other villages, only some PAP households require relocation to higher ground not far from the old settlement.

Resettlement of the Development Project

Part B:
GREEN BOND FRAMEWORK

As part of the broader sustainability strategy, XPCL has established this Green Bond Framework (the "Framework"). The purpose of this Framework is to have a single robust methodology in place for all future Green Bonds issuance. The Framework is aligned with the Green Bond Principles ("GBP"), issued by the International Capital Market Association ("ICMA") in June 2021[4] and with the ASEAN Green Bond Standards ("ASEAN GBS") issued by ASEAN Capital Markets Forum ("ACMF") in October 2018[5], which are a set of voluntary guidelines that recommend transparency and disclosure and promote integrity in the development of the sustainable finance market.

The Framework is presented through the following 4 core components:

1) Use of Proceeds
2) Process for Project Evaluation and Selection
3) Management of Proceeds
4) Reporting

2.1 Use of Proceeds

The net proceeds from XPCL's green bonds issued under the Framework (the "Green Bonds") will be used exclusively for refinance, in whole or in part, including but not limited to, the exploration, development, construction, rehabilitation, and/or acquisition of existing eligible project ("Eligible Green Project") as detailed below.

Eligible Green Category	Scope of Eligible Green Project	Numerical Criteria
Renewable Energy 7 AFFORDABLE AND CLEAN ENERGY 13 CLIMATE ACTION	Investments in or expenditures for the exploration, development, construction, rehabilitation, and/or acquisition of existing project.	**Hydropower** For hydropower facility in operation before 2020 Power density > 5W/m2; or GHG emissions intensity < 100g CO2e/kWh

2.2 Process for Project Evaluation and Selection

The evaluation and selection process ensures that the Green Bonds net proceeds are allocated to projects that meet the criteria set out in the "Use of Proceeds" section.
XPCL has established the Green Bond Committee (the "GBC") comprising of representatives from the Finance Team, Operation Team, Engineering Team and Sustainability Team, to evaluate and be responsible for the assessment of Eligible Green Project.

The GBC has already selected, evaluated, and approved the Eligible Green Project that will be refinanced with the proceeds raised from the Green Bonds issuance. The evaluation and selection process comprises, but is not limited to the following main steps:

1) Evaluation & Selection: The GBC has already selected, evaluated, and approved the selection of Eligible Green Project in accordance with the defined Eligible Green Project Description in the Use of Proceeds section.
2) Monitoring: The GBC will review and monitor the Eligible Green Project throughout the life of each Green Bonds. XPCL will continue to identify and assess environmental, health and safety (EH&S) risks during evaluation process to ensure that the EH&S risks are appropriately managed.

[4]ICMA's GBP 2021: https://www.icmagroup.org/assets/documents/Sustainable-fnance/2021-updates/Green-Bond-Principles-June-2021-140621.pdf
[5]ASEAN GBS 2018: https://www.theacmf.org/initiatives/sustainable-finance/asean-green-bond-standards

2.3 Management of Proceeds

The Eligible Green Project will meet the Eligibility Criteria throughout the terms of the Green Bonds.

The proceeds from the issuance of Green Bonds will be deposited into a segregated account within the company's finance and reporting system. The Green Bonds proceeds will be mapped to and reported along the categories of investments per Use of Proceeds in 2.1 above.

1) Accounting team of the issuing company will establish a segregated account to disburse and track the use of net proceeds of its Green Bonds via its internal information systems on a quarterly basis.
2) Any balance of Green Bonds proceeds not allocated to Eligible Green Project will be:

   i. held in cash or cash equivalents; or
   ii. invested in short and liquid marketable securities which are not inconsistent with the delivery of a low carbon and climate resilient economy; or
   iii. applied to temporarily reduce indebtedness of a revolving nature, where the original loan of which is not inconsistent with the delivery of a low carbon and climate resilient economy, before being redrawn for investments or disbursements to Eligible Green Project.

3) Internal Audit will verify the use of Green Bonds proceeds annually and until the maturity of Green Bonds.

XPCL intends to disburse funds to Eligible Green Project within a maximum of 12 months from the issue date of each Green Bonds.

2.4 Reporting

XPCL will publish the reports on its website within 12 months after the Green Bonds issuance. The reporting is split into two parts (i) the 'Allocation Reporting' and (ii) the 'Impact Reporting', whereby each report will disclose information including, but not limited to:

1) Allocation Reporting. The section aims to disclose the use of Green Bonds proceeds which will be updated annually until full allocation.

a. Brief description and summary of projects financed by Green Bonds
b. Total amount of outstanding Green Bonds
c. Use of proceeds for re-finance/ finance purposes
d. Balance of the unallocated proceeds

2) Impact Reporting

XPCL will report on the environmental impact of Eligible Green Project financed by Green Bonds net proceeds annually until bond maturity. On a best effort basis and subject to data availability, the impact reporting may include, but is not limited to, impact (KPI) metrics as outlined in the details below. Any assumptions made in relation to the units used or the relevant benchmark emissions will be clearly stated in the reporting:

Examples of Indicators and Metrics:

Category	Eligible Projects	Examples of impact indicators
Renewable Energy 	Xayaburi Hydroelectric Power Plant ("XHPP)	• Annual renewable energy generation (MWh) • Annual GHG emission avoided in tonnes of CO2 equivalent per annum (tCO2e)

The reports will be made available on XPCL's website at http://www.xayaburi.com

3) External Reviewer Reporting

XPCL will appoint and engage an external auditor or other third party to verify internal tracking and allocation of funds from the Green Bonds proceeds to Eligible Green Project, post issuance until fully allocated.

Part C:
SECOND PARTY OPINION

XPCL has engaged DNV, an independent expert in assurance and risk management, to provide an independent Second Party Opinion on this Green Bond Framework. The selected independent party will be engaged to provide pre-issuance verification. It should be noted that there is no ongoing periodic external review required.

Part D:
AMENDMENTS TO THIS FRAMEWORK

XPCL's GBC will review this Framework on a regular basis, including its alignment to updated versions of the Principles as and when they are released, with the aim of adhering to best practices in the market. Such review may result in this Framework being updated and amended. The updates, if not minor in nature, will be subject to the prior internal approval of XPCL. Any future updated version of this Framework that may exist will either keep or improve the current levels of transparency and reporting disclosures, including the corresponding review by an External Reviewer. The updated Framework, if any, will be published on XPCL's website at http://www.xayaburi.com and will replace this Framework.

APPENDIX:
Abbreviation and Unit List

1.	MW	=	Megawatt
2.	GWh	=	Gigawatt hours
3.	kWh	=	Kilowatt hour
4.	MWh	=	megawatt hour
5.	kV	=	Kilovolt
6.	m	=	Meter
7.	m2	=	Square meter
8.	m3	=	Cubic meter
9.	m3/s	=	Cubic meter per second
10.	kg/h	=	kilograms per hour
11.	DWT	=	Deadweight tonnage
12.	w/m2	=	Watt per square metre
13.	Gram CO2e/kWh	=	Grams of carbon dioxide equivalent per kilowatt-hour of electricity generated