Economic Rent from Hydropower Development in the Case of Lao PDR

Chansaveng Boungnong and Daovong Phonekeo

Abstract— *Hydro Power is the backbone of the Lao economy. The rugged terrain, compounded by the fact that the Country is land locked does not provide much economic advantage to Lao PDR. Transportation costs are high and unless Lao PDR can think of certain niche products, its exports are not going to be competitive. The decision by the Lao Government to exploit its water resources for production of electricity has changed the economic scenario for Lao PDR. The mountainous and rapid rivers have made Lao PDR a natural haven for hydro power production. The neighboring countries have provided the necessary political will and the market for Lao's power, as Thailand and Vietnam has a huge power deficit.*

While electricity has provided the much needed revenue, the Lao Government has also prioritized network expansion in the Country. It is expected that by 2020, the entire Country will have access to electricity about 90%. Industrial activities are expected to increase with the commissioning of Hydroelectric Projects. There is however, a need to ensure that internal electricity tariff is kept affordable so that it becomes the main source of energy in the Country and also to stimulate industrial activities.

This paper highlights the role and importance of hydropower for social and economic development of Lao PDR and covers aspects related to planning and policy initiatives being pursued by the Hydropower sector to fulfill the national objectives. The introductory sections provide the baseline information on hydropower resources of Lao PDR, development potential and existing situation in the supply and demand of hydroelectricity. Subsequent sections cover the planning and policy interventions that the Lao Government is undertaking in order to maximize on the benefits from hydropower development.

***Keywords*— Hydropower, public private partnership investment, concession fee, generation expansion plans, least cost.**

1. INTRODUCTION

Approximately three quarters of the Laotian population has access to an electricity supply; this level is relatively low compared with China, Thailand and Vietnam, but considerably higher than the rates in Myanmar and Cambodia. Laos has a low population density and an overall small population which makes it challenging to expand electrification to the entire population.

Electricity demand in Laos has grown very significantly and steadily in the period since the year 2000. The growth is mainly due to growth of the countrys mining sector. More specifically, in the period between 2000 and 2011, total electricity consumption (in GWh) increased by 15% annually [4]. The trends of consumption in different sectors of Laos are shown in Fig. 1.

The considerable increase in electricity demand has not generally led to further problems in meeting electricity demand. Throughout the period of sustained electricity demand growth the country has enjoyed a relatively stable power supply due to power trading with neighbouring countries. Fig. 2 shows the development of annual levels of electricity generation, imports, exports and total sales, from 2000 to 2012.

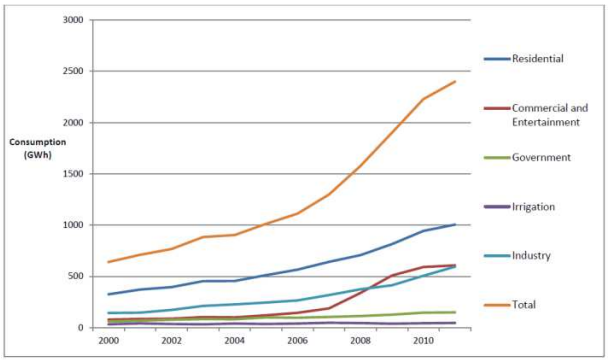

Fig 1: Electricity consumption in Laos (2000 - 2012)

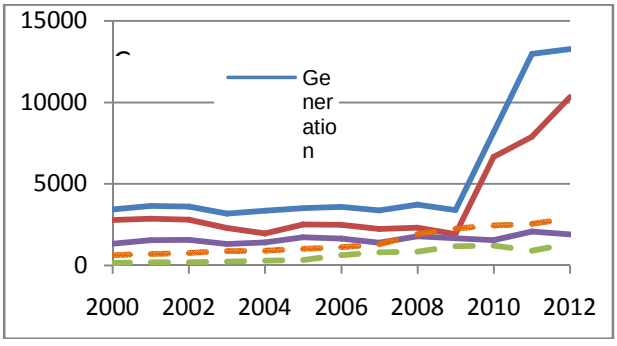

Fig. 2: Electricity generation, imports, exports and domestic consumption

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Without power trades with neighbouring countries, domestic system would have suffered considerable electricity supply problems because of the current limits of its power system. As a general trend, between 2000 and 2012 the volumes (in GWh) of power imported by domestic system from its neighbours has increased annually; this can be seen in contrast with the volumes of power exported by domestic system, which has generally decreased but with more year-on-year variation. One last important point to note from the data shown in Fig. 2 is that total export volumes show strong coupling with generation volumes.

2. HYDRO POWER POTENTIAL IN LAO PDR

Hydropower is the cornerstone for power development in Lao PDR. Currently, more than 99% of the power generated in the country corresponds to hydropower stations. The total installed hydro power generation capacity in Laos is 3,213.25 MW, of which 990 MW are for domestic electricity supply and 2,210 MW is for export purposes. The development of installed hydro power capacity in Laos is shown in Fig.3. Details of hydropower installed (and operating) generation plant are provided in Annex-1.

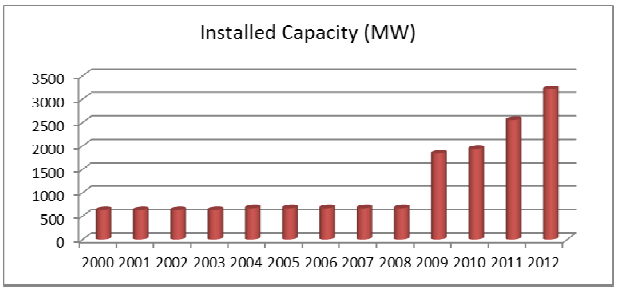

Fig. 3: Existing power generation (Source: Own elaboration of EdL data 2011).

According to the World Energy Council, there is still potential to develop 18 GW of hydropower capacity in Laos, which is equivalent to around 63 TWh per year assuming a 40% capacity factor.

The absolute hydro power potential of Laos is lower than the levels in neighbouring China, Myanmar and Vietnam; however, the per capita generation potential is very significant in that it is around 30 times the size of the country current per capita consumption. This per capita potential (9,844 kWh per year) offers Laos (which has a small population) the opportunity to close its electrification rate gap and substantially increase its levels of electricity exports.

It is currently planned that between 2013 and 2020, 55 new power generation projects will be developed, adding an approximate additional total generation capacity of 5,718 MW to existing Laos power generation capacity. The planned addition of generation plants is shown in Fig. 4: generation capacity additions are shown in terms of annual capacity added (MW/year) and in terms of cumulative total additional capacity in the period 2013 – 2020 are shown in the Annex-2.

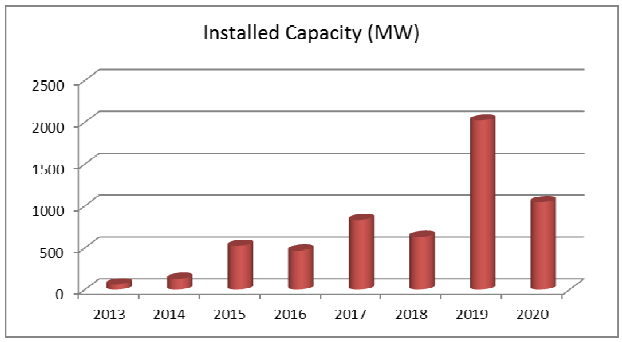

Fig. 4: additional capacity in the period 2013 – 2020 (Source: Own elaboration of data published by EdL, 2013

The detailed plan of project developments, scheduled for the period 2020 to 2030 (as published in the Power Development Plan 2010, formulated in August 2011) is detailed in annex 3.

Regarding the investment process for hydro power plants, developers follow a staged process which involves the agreement and signing of three key pieces of documentation, namely: the MoU, the Project Development Agreement (PDA), and the Concession Agreement (CA). The entire process, including negotiations, is due to take between 6 months and 24 months to complete.

The main fiscal arrangements for hydro power IPP projects are set out within three key pieces of legislation: the Tax Law 2011; the Investment Promotion Law; and the Enterprise Law.

In summary, IPP hydro projects are required to pay the following main taxes:

- Profit tax;
- Salary tax;
- Royalty payments;
- Dividend payments; and
- Customs payments.

General tax exemptions are set out in the Investment Promotion Law, based on the zone in which a project is located and taking into account the socio-economic infrastructure and geographical conditions of the country.

Projects are typically exempt from having to pay import customs for the construction of hydro plant. Royalties are always negotiated on a project by project basis, while profit tax and other taxes in some cases are subject to negotiation, further to what provided in the investment law, and the agreed arrangements are included in the project CA as agreed with the investment committee.

3. METHODOLOGY

One of the main objectives of the relation with hydro development is “Maximizing revenue inflows over time from export projects while still attracting high quality developers”.

This conceptual contradiction (or trade-off) in any case requires some numerical information in order to assess the impact that different kind of royalty policies will have on GoL revenues and investments. In order to get an initial quantitative indication of the trade-off we

developed a simple model of the hydro power development aimed at estimating the impact on return on investments (specifically return on equity - ROE) of different royalty's policies.

3.1 Quantitative Analysis

Base on basic information on 141 hydro sites. This information and some assumptions on financial parameters, we estimated the ROE of each project as a function of the royalty. Assuming that investors will require a minimum ROE to develop a project, the model allowed us to know the total investments and the linked GoL revenue as a function of the percentage of royalty.

We used the following assumptions

- Energy selling price: 65 USD/MWh, flat
- Equity debt relationship: 30/70
- Loan interest rate: 8%
- Load amortization period: 12 years
- Operation and maintenance costs: 20 USD/kW/year
- Concession period: 25 years
- Incomes tax: 24%
- Minimum ROE: 13% (real)
- Calculation in real terms

The quantitative analysis on potential outcomes of taxation arrangements shows how GoL revenues and the amount of investments start to decrease when the royalty percentage overtakes certain levels, on the one side, and they emphasize the risks of reaching a non-optimal royalty level due to changing investment conditions and imperfect information on projects and investors, on the other.

3.2 Approach to Fiscal Options

The analysis can be divided into three main steps:

1. Mapping the Institutional background

Map the institutional background detailing all the instances in which a hydropower project must interface with government entities, in order to determine the procedure that is used in the determination of taxes and revenues sharing.

2. Link Institutions to Legal framework & enforcement

Once the institutional background has been mapped, the following activity is to assess the link between each one of the mapped instances to the corresponding Laws, decrees or regulations that enable each specific office to determine the tax or revenue implications in the project. Under this procedure, the Consultant will be able to clearly identify the specific, corresponding binding regulation, if any.

3. Determine risks, needs and priorities

After this process, it will have a clear perspective of the relationship between institutions and regulations that is being properly determine the risks, needs and priorities from different GoL institutions

The specific project information is: installed capacity, average yearly energy production and overnight costs. Based on this information and assumptions, we made the calculations necessary to create the Fig. 5 This figure shows clearly that as long as the royalty increases, the number of profitable projects go down. In order to quantify the impact on GoL revenues and total investments, collection in concept of royalties and income tax (IT), as a function of the percentage of royalty. For preparing this figure we assumed that investors require a minimum ROE of 13%.

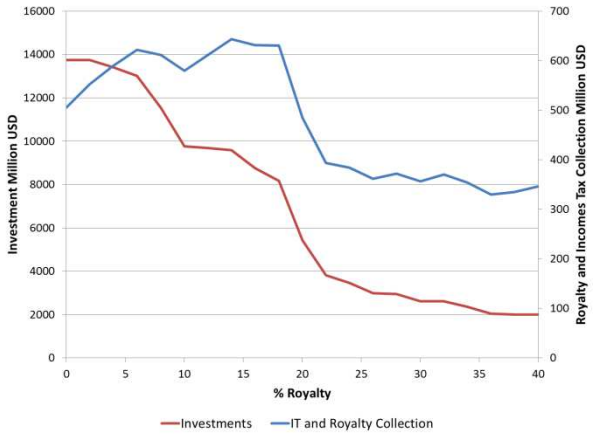

Fig 5 - Investments and GoL Revenues as a function of %Royalty - Minimum ROE=13%

We repeated the analysis for a minimum ROE of 10%, which is presented in Fig 6.

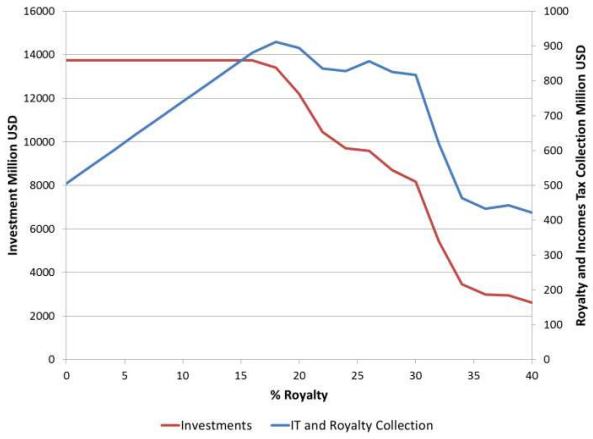

Fig 6 - Investments and GoL Revenues as a function of %Royalty - Minimum ROE=10%

This figure confirms the trend that both GoL revenues through royalties and IT and investments have a decreasing trend when the royalty percentage increases. However a more clever strategy could increase collection and investments (that as shown in these figures are closely interrelated) simultaneously. The most convenient strategy from a purely economic point of view is to assign to each investor a royalty percentage that allows achieving exactly the minimum acceptable ROE

If it were possible to use this strategy, the GoL, under the assumptions of this analysis, could collect 600 million USD annually, against 550 million in case the

fixed royalty were 5%, that which maximize revenues in Fig 5.

The present strategy, based on a project by project negotiation aims to achieve this objective. However this approach has some weak points:

- Lack of transparency,
- Need to agree previously on several assumptions, some of them managed by the developer or the developer financial institution, like financial conditions, indirect costs, etc.
- Impossibility to know the minimum ROE that the developer is willing to accept.

These drawbacks may be eliminated with a tender process awarded to the bidder that offers the highest royalty (or combination of royalty + IT). Tenders properly designed are by nature transparent, and encourage bidders to internalize in the economical offer their expected ROE. However in the Lao PDR's context tenders faces some difficulties:

- a tender awarded based on the royalty + IT requires to know in advance the electricity price, which in the case of exports would require a previous negotiation;
- it is also necessary to have a feasibility study with a tight estimation of costs and a geological survey;
- there is no experience in the use of tenders for this type of projects yet.

Nevertheless it would be possible to identify solutions to the above problems, so tenders are an alternative that deserves to be taken into consideration.

Based on this previous and preliminarily diagnosis, we will pose a set of alternatives that will be assessed in detail. The set of alternatives to be analysed may include, but not limited to [3]:

- fixed royalties and IT;
- fixed royalties and IT, with some flexibility to consider low ROE projects;
- project by project negotiation, with a more transparent procedure;
- tenders were the concession is awarded to the bidder that offers the greater royalty;
- combinations of the above.

Others form of benefits for the GoL will be analysed, as participation in the equity, obtaining of part of the energy for internal consumption, etc. However the methodology of analysis would be the same, as in all the cases the GoL participation leads to a reduction in the project ROE.

The combination of different components and the relative information needs, coordination issues, financing conditions, risks and opportunities will be analysed and clearly presented in the options paper (Fig 8.)

3.3 Optimal of Public Expenditures

How much to consume, save or invest abroad, or invest domestically? The answer to this question depends on the relative rates of return to investments, as well as on the discount rate for the future consumption (the so-called social discount rate) [1]. If the social discount rate is higher than the domestic and international rate of return to investment, then all resource revenues should be consumed today. Otherwise, they should be invested into those activities with the highest returns

The rate of return to investment abroad depends on a country's debt levels and its intention to borrow or pay back external debt from the resource revenues. For Laos, it is probably quite high. The rate of return on domestic investment for a developing economy with high growth rates and scarce investment may be higher than the world interest rate (indeed, Lao interest rates are higher than abroad), but it also depends on a country's risk and its ability to implement projects and thus may be not as high in Laos as it is in an average middle-income developing country.

Assuming a 20 percent equity for projects in the pipeline, the financing needs for taking equity stakes could go up to almost $160 million a year by 2018 (Figure 7). Given the constraints in borrowing that Lao PDR is facing, a financing strategy or a change in approach would need to be taken regarding the equity stakes. There has not yet been any clear indication of the government's IPP investment policy.

Taking equity is risky. Getting a high percentage of revenues from equity stakes rather than taxes and royalties increases the risk taken by the government in each project and could lead to losses in the future. Currently, for Laos it is projected that around half of all government revenues will come from dividends. However, equity stakes, especially if they are taken up-front when the risks of the project have not yet materialized, are the riskiest source available. Instead, shareholding based on a small free carried interest (i.e. 5 percent) could be considered to reduce risk. Moreover, it could consider requiring developers to give it the option of acquiring additional shares when a project is confirmed to be commercially attractive, instead of taking large stakes up-front in projects with potentially high risk. To ensure appropriate participation in export-oriented hydropower projects, the LHSE should be designated as the government's shareholder in these projects (see MacGeorge et al., 2009)

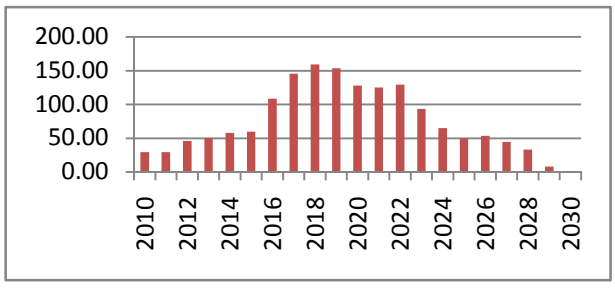

Fig 7: Projected Equity Investments by theGovernment of Lao PDR in Hydropower Projects (million US$)

4. RESULT AND DISCUSSION

To evaluate the fiscal options available for Laos, we propose to adopt the classification of the existing taxation system for hydropower projects that was

proposed in the "Lao PDR Development Report 2010" [2] by the World Bank, in which a distinction was made between Primary and Secondary taxation levels.

Primary taxation level corresponds to those taxes that affect all businesses in Laos, irrespective of their nature; they include: Corporate profit tax, Business turnover tax, Excise tax and Import-Export Duties.

Secondary taxation level corresponds to those alternatives that the Government of Laos can use to extract the economic rents from a specific project. They include: Royalties, Equity participation and/or discount electricity sales.

Within the primary taxation lever, we classify those taxes included in the Lao Tax Law. This law provides clear instructions on the application of the four types of taxes that relate to hydro power projects:

- The business turnover tax on the production of electricity turnover is 5% on domestic production.
- Excise tax applies to some 15 categories of goods and services.
- Profits from the electricity exports are subject to the profit tax. A flat rate of 24 percent applies to total annual net profit.
- Dividend tax is fixed at 10 percent

Further to the Tax Law, the key for understanding the fiscal options is in the Law on the Investment Promotion which grants project developers attractive benefits, including tax holidays on: Profit tax, import and export duties.

Taking into account that most hydropower projects in Laos are aimed to export electricity to neighboring countries, the target of the options to be analyzed below will focus on evaluating alternatives for transferring economic rents from the developer to the Government. On the contrary, when projects are aimed to supply electricity to Laos, the rent extraction process will be mainly made in the PPA tariffs to be signed between the developer and the government, apart from possible revenue sharing requirements. The projected revenue of Lao PDR in Hydropower projects are shown below

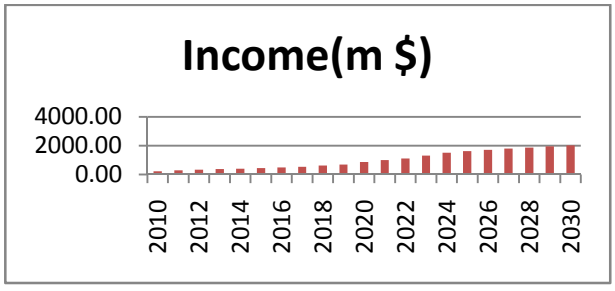

Fig 8: Projected Fiscal Revenue of Lao PDR in Hydropower Projects (million US$)

It is important to mention here that in the case of domestic projects, as the rent extraction process is based on the PPA tariffs, the introduction of primary and / or secondary taxation levels will trigger an increase in the PPA tariff, which in practical terms mean that the electricity consumers will finance the revenue sharing requirements (introduced by primary or secondary taxation tools).

This is the reason why, in the case of domestic projects, it is necessary to distinguish between rent extraction tools and revenue sharing tools. Unlike what happens in the case of projects dedicated to export, the pure rent extraction target should not be part of the taxation framework, but on the contrary, should be delivered by the PPA price level.

5. CONCLUSIONS

Further to the rent extraction process, equity participation in the project presents some advantages that may be interesting for the Government of Laos. A significant advantage is that the government backs the development of a strategic sector which is key for Laos, both in terms of exports and social improvement.

Also, becoming a shareholder gives the government access to voting rights and detailed cost information which can be used to benchmark the performances of their generation portfolio. Moreover BOT/BOOT projects will be transferred to the GOL after the concession period.

One additional advantage is represented by the revenue stream coming from the dividends; most probably, this flow of revenues will not directly enter into the national budget but would remain in LHSE and EdL. Under this assumption, the revenue flows could be used either to reduce electricity costs in Laos or to promote development in Laos, for instance, through the electrification of the country and further investments in the sector

Based on the Lao PDR's fiscal profile and projections until 2030, an "optimal" fiscal strategy would allow for higher investment than the pure "permanent income strategy" but would also allow for a buildup of modest savings. Specifically, if primary expenditure was around 17 percent of GDP after the spike in 2010 and gradually was increased to 20 percent of GDP, then 1 percent of GDP could potentially be saved each year, as well as will help reduce foreign debt below the LIC threshold by 2020. Such a strategy takes into account the country's development needs as well as the macroeconomic challenges related to managing large resource revenues.

Most importantly, the revenues need to be used effectively for poverty reduction and in public investment programs as part of the implementation of the government's development program under the NSEDP. For example, rural infrastructure has been shown to be the single most important driver of growth in Lao PDR. Other investment options that increase growth in the long run, such as human capital (including education and health as well as professional training) also should be considered.

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ABBREVIATIONS

Abbreviation	Words
Lao PDR	Lao People's Democratic Republic
GOL	Government of Lao
IPP Producer	Independence Power
BOT Transfer	Build Operate
BOOT Transfer	Build Own Operate
GDP Product	Gross Domestic
EDL	Electricity du Laos
IT	Income Tax
ROE	Return on Equity
USD	United State Dollar
MWh	Mega Watt hour
KW	Kilo Watt

Annex-1

No.	Project	Location (Province)	Installed capacity (MW)			Energy	Commercial Operation date	Ownership	Planned market
			Total	Domestic	Export	GWh			
1	Nam Dong	Luangprabang	1	1		5	1970	EdL	Laos
2	Selabam	Champasak	5	5		21	1970	EdL	Laos
3	Nam Ngum 1	Vientiane	155	155		1002	1971	EdL	Laos / Thailand
4	Xeset 1	Saravane	45	45		134	1990	EdL	Laos / Thailand
5	Nam Ko	Oudomxay	1.5	1.5		8	1996	EdL	Laos
6	Theun Hinboun	Bolikhamxay	210	210		1620	1998	IPP	Laos / Thailand
7	Houay Ho	Champasak/Attapeu	152.1	2.1	150	617	1999	IPP	Laos / Thailand
8	Nam Leuk	Vientiane	60	60		218	2000	EdL	Laos / Thailand
9	Nam Ngay	Phongsaly	1.2	1.2		5.2	2003	EdL	Laos
10	Nam Mang 3	Vientiane	40	40		150	2004	EdL	Laos / Thailand
11	Xeset 2	Saravane	76	76		300	2009	EdL	Laos / Thailand
12	Nam Theun 2	Khammouane	1,088	75	1,000	6,000	2009	IPP	Laos / Thailand
13	Nam Lik 1-2	Vientiane	100	100		435	2010	IPP	Laos
14	Nam Ngum 2	Vientiane	615		615	2218	2011	IPP	Thailand
16	Nam Tha 3	Luangnamtha	1.25	1.25		5	2011	IPP	Laos
17	Nam Nhone	Bokeo	3	3		12	2011	IPP	Laos / Thailand
18	Nam Song	Vientiane	6	6		25	2012	EdL	Laos
19	Nam Ngum 5	Xiengkhuang	120	120		507	2012	IPP	Laos
20	Theun Hinboun Exp.	Bolikhamxay	220		220	1440	2012	IPP	Thailand
21	Tad Salen	Savannakhet	3.2	3.2		17	2012	IPP	Laos
22	Nam Gnuang	Bolikhamxay	60	60		316	2012	IPP	Laos
23	Xe Kaman 3	Xekong	250	25	225	982	2012	IPP	Laos/Vietnam

Annex 2

No.	Project	Location (Province)	Installed capacity (MW)			Energy	Commercial Operation date
			Total	Domestic	Export	GWh	
1	Nam Long	Louanamtha	5	5		30	2013
2	Nam Ngiep 3A	Xiengkuang	44	44		145	2013
3	Xe Nam Noy 1	Attapeu	15	15		110	2013
4	Nam Kong 2	Attapeu	66	66		263	2014
5	Nam kong 3	Attapeu	45	45		170	2014
6	Xe Nam Noy 6	Champasack	5	5		40	2014
7	Nam Sana	Vientiane	14	14		49.6	2014
8	Nam Phanai	Vientiane	15	15		126	2015
9	Nam Sim	Huaphan	8	8		29.4	2015
10	Nam Hao	Huaphan	15	15		110	2015
11	Nam Peun 1	Huaphan	27	27		127	2015
12	Nam Peun 2	Huaphan	12	12		56	2015
13	Nam Samouay	Vientiane	5	5		28	2015
14	Nam Khan 2	Louangprabang	130	130		558	2015
16	Houylamphan	Xekong	85	85		452	2015
17	Nam Chiane	Xiengkuang	104	104		448	2015
18	Nam Mang 1	Vientiane	64	64		224	2015
19	Nam Lik 1	Vientiane	60	60		249	2015
20	Xe Kaman 1	Attapeu	290	32	258	1096	2016
21	Xe Kaman Xanxay	Attapeu	32	32		121	2016
22	Nam Beng	Oudomxay	34	34		137	2016
23	Xe Set 3	Saravan	23	23		86	2016
24	Nam Khan 3	Louangprabang	60	60		240	2016
25	Nam Hinboun	Khammouan	30	30		197	2016
26	Nam Ou 2	Louangprabang	120	120		546	2017
27	Nam Ou 5	Phongsaly	240	240		1049	2017
28	Nam Ou 6	Phongsaly	180	180		739	2017
29	Nam Ngiep 2	Xiengkuang	180	180		723	2017
30	Nam San 3A	Xiengkuang	69	69		277	2017
31	Nam San 3B	Xiengkuang	45	45		168	2017
32	Xepian-Xenamnoy	Attapeu	410	40	370	1788	2018
33	Nam Nga 2	Oudomxay	14.5	14.5		62.5	2018
34	Nam Mo 2	Xiengkuang	120	20	100	503	2018
35	Nam Phay	Vientiane	86	86		420	2018
36	Xayaburi	Xayabury	1285	60	1225	7370	2019
37	Houykapeu	Saravan	5	5		38	2019
38	Houaypo	Saravan	9.5	9.5		60	2019
39	Xelabam Exp.	Saravan	7.7	7.7		37	2019
40	Nam Tha 1	Bokeo	168	168		756	2019
41	Nam Ngiep 1	Bolikhamxay	272		272	1515	2019
42	Nam Ngiep reg.	Bolikhamxay	18	18		105	2019
43	Donsahong	Champasack	256	56	200	2000	2019
44	Nam Ngum 1 Exp.	Vientiane	40	40		56	2020
45	Xe Set 4	Saravan	10	10		110	2020
46	Nam Ou 1	Louangprabang	160	160		800	2020
47	Nam Ou 3	Louangprabang	150	150		710	2020
48	Nam Ou 4	Phongsaly	116	116		570	2020
49	Nam Ou 7	Phongsaly	190	190		915	2020
50	Houaykapeu 2	Saravan	5	5		22	2020
51	Nam Pha	Bokeo	195	195		735	2020
52	Nam Phoun	Xayabury	60	60		280	2020
53	Nam Pot	Xiengkuang	14.5	14.5		70	2020
54	Nam Phouan	Vientiane	52.5	52.5		205	2020
55	Xe Katam	Champasack	62	62		380	2020

Annex-3

No.	Project	Location	Installed capacity (MW)			Energy	Commercial
		(Province)	Total	Domestic	Export	GWh	Operation date
1	Nam Ken	Vientiane	5	5		19.7	2021
2	Nam Sum1	Huaphan	94	94		323	2021
3	Nam Sum3	Huaphan	197	196		635.8	2021
4	Xanakham	Vientiane	660	60	600	3696	2021
5	Pakbeng	Oudomxay	921	121	800	4775	2021
6	Phou Ngoy	Champasack	651	151	500	3278	2021
7	Nam Suang1	Louangprabang	90	90		167	2022
8	Xe Kaman-4A	Attapeu	80	80		315.8	2022
9	Nam Phak	Champasack	150	150		511	2022
10	Xe Kong 3A	Attapeu	105	105		419.8	2022
11	Xe Kong 3B	Attapeu	100	100		393.6	2022
12	Xepian-Houaysoy	Attapeu	115	115		283	2022
13	Nam Bak1	Vientiane	160	116		744.2	2023
14	Paklay	Xayabury	800	100		4476	2023
16	Louangprabang	Louangprabang	1200	200		6500	2023
17	Nam Ngiep-Mouangmai	Bolikhamxay	25	25		160	2023
18	Nam Mouan	Bolikhamxay	124	124		524	2023
19	Xekong Downstream	Attapeu	76	76		387	2023
20	Xelanong 1	Savannakhet	60	60		300	2023
21	Nam Et1	Huaphan	93	3	90	333.9	2023
22	Nam Et2	Huaphan	160		160	641	2024
23	Nam Et3	Huaphan	107		107	447	2024
24	Nam Sum4	Huaphan	40	40		170	2024
25	Xe Xou	Attapeu	60	60		280	2024
26	Nam Leng	Phongsaly	50	50		240	2024
27	Nam Theun1	Bolikhamxay	600	100	500	2370	2024
28	Nam Nga1	Louangprabang	100	100		420	2025
29	Xe Banghieng 2	Savannakhet	12.5	12.5		68	2025
30	Xelanong 2	Saravan	45	45		170	2025
31	Nam The	Xiengkouang	12	12		50	2025
32	Nam Ngiep 2A	Xiengkouang	12.55	12.55		60	2025
33	Nam Ngiep 2B	Xiengkouang	8.94	8.94		31.7	2025
34	Nam Ngiep 2C	Xiengkouang	14.5	14.5		44.7	2026
35	Nam Ham	Xayabury	5	5		16	2026
36	Xedon	Saravan	20	20		80	2026
37	Nam Boun2	Phongsaly	15	15		60	2026
38	Xepon3	Saravan	54	54		222	2026
39	Nam Ang-Tabeng	Attapeu	25	25		176	2026
40	Nam Ngum 3	Vientiane	460		460	2047	2026
41	Nam Suang2	Louangprabang	96	96		442	2026
42	Nam Pui	Xayabury	60	60		294	2026
43	Houay Champi	Champasack	5	5		27	2026
44	Nam Ngao	Bokeo	20	20		85	2026
45	Ban Khoum	Champasack	1872	272	1600	8430	2026
46	Nam Ngum4	Xiengkouang	220	220		822	2026
47	Nam Mo1	Xiengkouang	55		55	222	2026
48	Xebanghieng2	Savannakhet	52	52		180	2026
49	Xetanouan	Savannakhet	30	30		118	2026
50	Xekong Downstream-B	Attapeu	80	80		315	2027

51	Nam Emuen	Xekong	70	70		276	2027
52	Nam Theun4	Bolikhamxay	54	54		200	2027
53	Xenea	Khammouan	53	53		209	2027
54	Nam Bak2	Vientiane	40	40		205	2027
55	Xekong5	Xekong	330		330	1613	2027
56	Nam Kong1	Attapeu	75	75		469	2027
57	Xe Kong4A	Xekong	153	153		670	2028
58	Xe Kong4B	Xekong	258	258		1130	2028
59	Nam Neun1	Huaphan	80	80		318	2028
60	Nam Neun2	Huaphan	50	50		250	2028
61	Nam Neun3	Huaphan	20	20		78	2028
62	Nam Feuang	Vientiane	28	28		113	2028
63	Nam Ma1	Huaphan	44	44		180	2029
64	Nam Ma1A	Huaphan	39	39		156	2029
65	Nam Ma2	Huaphan	30	30		117	2029
66	Nam Ma2A	Huaphan	18	18		74	2029
67	Nam Ma3	Huaphan	18	18		76	2029