

Country Name	The Project for Improvement of Power Sector Management
Lao People's Democratic Republic	

I. Project Outline

Background	<p>In Laos, the power sector played a vital role in national socio-economic development. Many projects were being planned and implemented for power source development and improvement of transmission and distribution networks in order to increase electrification rate in the country. In this context, improvement of administrative structures and legislative provisions were key factors for supply of stable and safe electricity in Laos. Based on the request from the government of Laos, JICA supported two technical cooperation projects: "the Project on Electric Power Technical Standard Establishment (STEP I) (2000- 2003)" and "the Project for Lao Electric Power Technical Standards Promotion (STEP II) (2005- 2008)". Through these projects, the Lao Electric Power Technical Standards (LEPTS), including guidelines, safety rules and inspection manuals for LEPTS were established. Nevertheless the power sector administration at the national level was in the process of capacity development, it was not able to fully act as a powerful engine pulling the provincial authorities forward. Therefore, improvement of power sector administration and capacity for project management on both national and provincial levels were still necessary.</p>												
Objectives of the Project	<p>Through preparation of documents for examination and inspections of power facilities, trainings for the LEPTS trainers and conducting seminars on LEPTS in the target provinces, the project aimed at strengthening regulatory function of the electricity power sector, thereby contributing to an increase in the number of electricity power facilities suiting LEPTS as well as stable supply of electric power.</p> <ol style="list-style-type: none"> Overall Goal: The number of electric power facilities that suit LEPTS increase and the electric power is stably supplied. Project Purpose: Regulatory function of the electric power sector is strengthened. 												
Activities of the project	<ol style="list-style-type: none"> Project site: Vientiane (main project site), Champasak province, Xieng Khouang province and Savanakhet province (pilot sites) Main activities: 1) Preparation of documents for examination and inspections for power facilities and establishment of the Department of Energy Management (DEM) as a regulatory body, 2) delivery of trainings for the LEPTS trainers, 3) Conducting seminars on LEPTS in the target provinces and preparation and revisions of casebooks Inputs (to carry out above activities) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Japanese Side</td> <td style="width: 50%;">Lao Side</td> </tr> <tr> <td>1. Experts: persons: 16 persons</td> <td>1. Staff allocated: 23 persons</td> </tr> <tr> <td>2. Acceptance of trainees in Japan: 14 persons</td> <td>2. Land and Facilities: Project office</td> </tr> <tr> <td>3. Equipment: Portable GPS, video camera and office equipment (printer, scanner, etc.)</td> <td></td> </tr> </table> 					Japanese Side	Lao Side	1. Experts: persons: 16 persons	1. Staff allocated: 23 persons	2. Acceptance of trainees in Japan: 14 persons	2. Land and Facilities: Project office	3. Equipment: Portable GPS, video camera and office equipment (printer, scanner, etc.)	
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Ex-Ante Evaluation	2010	Project Period	August 2010 – January 2013	Project Cost	(Ex-ante) 290 million yen (Actual) 297 million yen								
Implementing Agency	Department of Energy Management (DEM), Ministry of Energy and Mines (MEM)												
Cooperation Agency or Contract Agency in Japan	Chubu Electric Power Co., Inc. The Kansai Electric Power Company, Incorporated												

II. Result of the Evaluation**<Special perspectives considered in the ex-post evaluation>**

The Japanese experts and the implementing agency recognized failure of logics and inappropriate indicators for the Project Purpose and the Overall Goal in the Project Design Matrix (PDM) during the project implementation, but PDM was not modified. Therefore, this ex-post evaluation excluded the following inappropriate indicators to verify the achievement level of the Project Purpose and the Overall Goal

(Verification of the Project Purpose)

- .The indicator 4 for the Project Purpose was inappropriate because the project did not include the activities for substantial capacity development of the Provincial Department of Energy Management (PDEM) though PDEM had limited technical capacity. Therefore, the indicator 4 was not included to verify the achievement level of the Project Purpose.
- The indicator 5 and 6 for the Project Purpose were inappropriate because the Laos Electricity (Electricité du Laos: EDL) was not the main target counterpart of the project and no activities related to technical assistance to EDL was included in the project. Therefore, the indicator 5 and 6 were not included to verify the achievement level of the Project Purpose.

(Verification of the Overall Goal)

- The Overall Goal include "stable supply of electric power" and the indicator 2 for the Overall Goal was set as "the total number of unplanned power cuts." However, since there are various causes to induce unplanned power cuts, such as operational failures other than the quality of power facility development projects, it was difficult or impossible to verify contribution of the project to stable power supply.

1 Relevance**<Consistency with the Development Policy of Laos at the time of ex-ante evaluation and project completion>**

The project was consistent with the Laos's development policy of "the Power Sector Policy" (2001) aiming at stable and continuous domestic power supply at reasonable price and "the National Plan" (2006-2010 and 2011-2015) to achieve socio-economic development,

industrialization and modernization.

<Consistency with the Development Needs of Laos at the time of ex-ante evaluation and project completion >

The project was consistent with the Laos's development needs of strengthening of regulatory function of the power sector since the government of Laos required the power sector operators to comply with the national technical standards for design, construction and operation of the facilities at the time of ex-ante evaluation and the project completion.

<Consistency with Japan's ODA Policy at the time of ex-ante evaluation>

The project was consistent with the Japan's ODA policy stipulated by the Country Assistance Plan for Laos (2006) to prioritize socio-economic infrastructure development and improvement of administrative capacity in public sector.

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Status of Achievement for the Project Purpose at the time of Project Completion>

The Project Purpose was partially achieved by project completion. Only one project document was reviewed by DEM (Indicator 1) and 12 inspections were conducted by DEM (Indicator 2). The indicator 3 was not verified because no project should have been reviewed during the project period. Other indicators of 4-6 were not applicable for verification of the achievement level of the Project Purpose because no activity to enhance relevant capacities of PDEM, DEM and EDL was included in the project

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

The project effects have been mostly continued since the project completion. The number of documents reviewed by DEM base on the practical examination and inspection instruction increased to 10 in 2013 and decreased to 6 in 2014 and 2 in 2015 since it depends on the number of project proposed. At the provincial level, the project documents have been reviewed by PDEMs based on the practical examination and inspection instruction as well. More numbers of project documents have been reviewed by PDEMs in the three target provinces of Champasak, Xieng Khouang and Savanaket than by PDEMs in the non-target provinces of Saravanh and Luangphrabang. The numbers of project documents reviewed by PDEMs have been fluctuated year by year due to the number of actual project application which can be affected by external factors such as the investment environment, including the economic situation. The number of inspection activities has increased to 52 in 2013, 67 in 2014 and 65 in 2015. In addition, on the sites for power facility development sites, LEPTS and the guideline have been reference for EDL and other independent power producers (IPPs) as standards of implementation and management of power facilities and development projects. According to the interviews with 4 IPPs, DEM conducted inspection of the power facilities in compliance with all the steps of LEPTS, preparing minutes of inspection to be agreed by all parties involved and issued permission letter for impounding and certifying completion of project after final inspection. However, LEPTS and its associated documents have not been used or applied for a few power facilities development projects. It is because EDL has mobilized external funds for those projects and project owners or lenders have preferred to apply their own technical standards rather than LEPTS¹. Although the owner of the project is required to nominate the chief technical engineer who is responsible for technical supervision in accordance with LEPTS, EDL has difficulty to assign the chief engineer to projects which EDL owns, but assigned project managers to supervise field work, management and coordination on a project basis.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal has been partially achieved at the time of ex-post evaluation. For the period from 2013 to 2015, 22 power facilities were newly approved by DEM. Since the total installed capacity of power generation in the country increased from 2,985.95 MW to 3,797.95 MW for the same period, the project might have contributed to improvement of quality of power generation facilities newly installed in the country.

<Other Impacts at the time of Ex-post Evaluation>

Some positive impacts of the project were confirmed by the ex-post evaluation. Based on the field inspections, DEM updated the casebook of LEPTS compiling samples of power facilities development projects with photos in order to make DEM and PDEM staffs deeper understandings on the key points and the articles of LEPTS to be referred when they conduct site inspections. Through the Technical Assistance for Capacity Building in the Hydropower and Mining Sectors Project (HMTA) supported by the World Bank (WB), DEM has disseminated the contents and procedures of LEPTS to all stakeholders at the meetings and workshops. No negative impact was confirmed.

<Evaluation Result>

In light of the above, the project partially achieved the Project Purpose and the Overall Goal through application of LEPTS to power facility development projects although there were logical failures of the verifiable indicators for the Project Purpose and the Overall Goal in the project design. Therefore, the effectiveness/impact of the project is fair.

Achievement of project purpose and overall goal

Aim	Indicators	Results						
(Project Purpose) Regulatory function of the electric power sector is strengthened.	(Indicator 1) The number of reviewed project documents (F/S*, D/D**, etc.) by DEM based on the practical examination and inspection instructions. *F/S: Feasibility Study **D/D: Detail Design	<u>Status of the achievement: Partially achieved</u> (Project Completion) ● One project document (basic design report) was reviewed by DEM. (Ex-post evaluation) Continued [No. of project documents reviewed by DEM based on the practical examination and inspection instructions] <table border="1"> <tr> <td>2013</td> <td>2014</td> <td>2015</td> </tr> <tr> <td>10</td> <td>6</td> <td>2</td> </tr> </table>	2013	2014	2015	10	6	2
2013	2014	2015						
10	6	2						

¹ In particular, in case of IPPs funded or owned by foreign investors such as Chinese, it might be difficult for MEM to enforce them to follow LEPTS in some cases.

	(Indicator 2) The number of inspection activities by DEM based on the practical inspection instructions	<p><u>Status of the achievement: Achieved</u> (Project completion) ● 12 inspections were conducted by DOE. (Ex-post Evaluation) Continued. [No. of inspection activities by DEM based on the practical inspection instructions]</p> <table border="1" data-bbox="759 241 1129 304"> <tr> <td>2013</td> <td>2014</td> <td>2015</td> </tr> <tr> <td>52</td> <td>67</td> <td>65</td> </tr> </table>	2013	2014	2015	52	67	65																										
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52	67	65																																
	(Indicator 3) The number of reviewed project documents (F/S, D/D, etc.) by PDEM based on the practical examination and inspection instructions	<p><u>Status of the achievement: Not achieved</u> (Project completion) PDEM did not review any project documents during the project period because of no submission of project document to be reviewed by PDEM (Ex-post evaluation) Achieved. [No. of project documents reviewed by PDEMs based on the practical examination and inspection instructions]</p> <table border="1" data-bbox="759 528 1533 797"> <tr> <td></td> <td>2013</td> <td>2014</td> <td>2015</td> </tr> <tr> <td>Target Province</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Champasak province</td> <td>78</td> <td>95</td> <td>45</td> </tr> <tr> <td>Xieng Khouang province</td> <td>50</td> <td>54</td> <td>56</td> </tr> <tr> <td>Savanakhet province</td> <td>114</td> <td>208</td> <td>159</td> </tr> <tr> <td>Non-target Province</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Saravanh province</td> <td>24</td> <td>10</td> <td>22</td> </tr> <tr> <td>Luangphabang province</td> <td>7</td> <td>6</td> <td>3</td> </tr> </table>		2013	2014	2015	Target Province				Champasak province	78	95	45	Xieng Khouang province	50	54	56	Savanakhet province	114	208	159	Non-target Province				Saravanh province	24	10	22	Luangphabang province	7	6	3
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	(Indicator 4) The number of electric power facilities reports from PDEM to DEM	<p><u>Status of the achievement: Not applicable</u></p> <ul style="list-style-type: none"> No electric power facilities report was submitted from PDEM to DOE because PDEM did not conduct inspection due to their limited technical capacity. Since the terminal evaluation report confirmed that the indicator had not been able to be achieved by the project activities, , this indicator is not applicable. 																																
	(Indicator 5) The number of internal inspection activities by EDL based on the practical inspections	<p><u>Status of the achievement: Not applicable</u></p> <ul style="list-style-type: none"> Since the project did not include any activities for capacity development of EDL on internal inspection, this indicator is not applicable. 																																
	(Indicator 6) Electric power facilities reports from EDL to DEM include the matter related to LEPTS	<p><u>Status of the achievement: Not applicable</u></p> <ul style="list-style-type: none"> Since the project did not include any activities for capacity development of EDL related to submission of the reports from EDL to DEM this indicator is not applicable. 																																
(Overall goal) The number of electric power facilities that suit Lao Electric Power Technical Standard (LEPTS) increase and the electric power is stably supplied.	(Indicator 1) The total number of DEM- approved electric power facilities.	<p><u>Status of achievement: Achieved</u> (Ex-post Evaluation) [The number of power facilities approved by DEM]</p> <table border="1" data-bbox="759 1361 1541 1424"> <tr> <td>2013</td> <td>2014</td> <td>2015</td> <td>Total</td> </tr> <tr> <td>6</td> <td>12</td> <td>4</td> <td>22</td> </tr> </table>	2013	2014	2015	Total	6	12	4	22																								
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(Indicator 2) The total number of unplanned power cuts.	<p><u>Status of achievement: Impossible to verify</u> (Ex-post Evaluation)</p> <ul style="list-style-type: none"> The number of power facilities complying with LEPTS does not directly affect the number of unplanned power cuts and it was difficult to verify contribution of the project to reduction of the number of unplanned power cuts since there were other various causes of unplanned power cuts such as operational failures. 																																	

Source : Terminal Evaluation Report, Data provided by DEM and PDEMs of Champasak, Xieng Khouang, Savanakhet, Saravanh, and Luangphabang, interviews with IPPs (Nam Ngum V Hydropower Company, Nam Pay Hydropower Company, Nam Ngiep I Hydropower Company, and Nam Ngum II Hydropower Company)

3 Efficiency

Although the project period was as planned (ratio against the plan: 100%), the project cost slightly exceeded the plan (ratio against the plan: 102%). Therefore, efficiency of the project is fair.

4 Sustainability

<Policy Aspect>

According to the Article 22 and 23 of the Laos Electricity Law which was amended in 2017, the new installations, expansions, rehabilitations, designs, constructions and operation and maintenance of power facilities and infrastructure are required to comply with LEPTS. Also, the guideline for implementation of “the Policy for Sustainable Hydropower Development of Lao PDR” clearly defines the compliance with LEPTS by the Article 5.5 and 5.6. In addition, concession agreements (CAs) for power development projects between the government of Laos and project owners who will own power facilities to be constructed need to define on the obligation of the both parties for compliance with LEPTS, including examination and inspection of the developed power facilities by MEM.

<Institutional Aspect>

[DEM]

There was no change in responsibilities and roles of DEM related to compliance with LEPTS for the power facility development

project. DEM assigned 25 staffs and the number of staff has been sufficient to conduct the related activities to supervise compliance with LEPTS by EDL and IPPs. MEM checks the compliance of LEPTS at planning (F/S) and design stage, construction stage and operation stage. When the project is not properly designed, constructed or operated in accordance with LEPTS, MEM requests the project owners or the power operators to revise the design or suspends to give approval for further step forward.

[PDEMs]

PDEMs were restructured in accordance with the Ministerial Decree of MEM issued in August 2012. However, overall role and function of PDEMs has remained same and most of the staffs trained by the project have continued their works in the target provinces. On the other hand, in the target provinces, while PDEM Champasak has a sufficient number of staffs (9 staffs), PDEMs Xieng Khouang and Savanakhet have the insufficient number of staffs (6 and 5, respectively). The recruitment of staff depends on the quota provided by MEM, and thus, it is difficult for PDEMs to obtain the sufficient number of staffs as their requirement.

<Technical Aspect>

[DEM]

The staffs of DEM have sustained their skills and knowledge to conduct review project documents for power facility development projects and inspections on the project sites in accordance with LEPTS. DEM has conducted in-house trainings and technical transfer in order to apply LEPTS. Also, technical officers of DEM have enhanced their capacity to check designed documents and to conduct inspection of power facility development projects in accordance with LEPTS under HMTA.

[PDEMs]

Although the technical staffs of the target PDEMs trained by the project continued their works at the target provinces, PDEMs of Xieng Khouang and Savanakhet faced lack of some basic technical knowledge, such as civil engineering and mechanical engineering, for checking project documents in accordance with LEPTS. On the other hand, DEM delivered trainings for PDEM staffs in order to maintain and improve their technical knowledge and skills based on LEPTS. Also, MEM delivered 3 times of a theoretical training on LEPTS and 14 time of On-the Job training (OJTs) on practical inspection for PDEMs and EDL for the period from 2013 to 2015². In addition, PDEMs have organized in-house technical exchanges, such as technical transfer from senior engineers to junior engineers.

<Financial Aspect>

[DEM]

The annual budget of DEM increased from 10 million kips in 2013 to 110 million kips in 2015. For conducting the LEPTS related activities, the budget has not been sufficient but the project owners provided financial support to conduct necessary activities by DEM for inspections and examinations. Also, DEM has received a support by WB for dissemination, trainings, and workshops on LEPTS.

[PDEMs]

No budget data was available for PDEMs except PDEM Xieng Khouang. The annual budget of PDEM Xieng Khouang increased from 126 million kips in 2013 to 160 million kips in 2015. However, since the budget allocated to PDEMs covered only cost of administrative works and did not cover cost for the activities related to LEPTS because of the fiscal constraints of the government of Laos. PDEMs also received financial support by the project owners to conduct necessary activities, including visit the project sites by the PDEM staffs for inspection of the construction works.

<Evaluation Result>

In light of the above, slight problems have been observed in terms of the institutional, technical and financial aspects of the implementing agencies. Therefore, the sustainability of the effectiveness through the project is fair.

5 Summary of the Evaluation

The project partially achieved the Project Purpose for application of LEPTS by DEM and PDEMs for power facility development projects and also partially achieved the Overall Goal for the increase in the number of power facilities in compliance with LEPTS. As for sustainability, the number of technical staffs of PDEMs and their technical skills to apply LEPTS have not been sufficient and the budgets allocated to DEM and PDEMs have not been sufficient to conduct the necessary activities to apply LEPTS. As for efficiency, the project cost slightly exceeded the plan.

In the light of above, this project is evaluated to be partially satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

[For MEM]

Although DEM and PDEM have tried to comply with the requirement of LEPTS, there is not fully sufficient budget and allocation of human resource with good knowledge and understandings on LEPTS as well as actual experiences on civil works or mechanical operation of hydropower facilities to implement the necessary activities and improve the capacity of relevant agencies, such as DEM and PDEMs, for compliance with LEPTS from the government of Laos. Appropriate allocation or effort should be made by MEM continuously.

Lessons learned for JICA:

[Necessity of appropriate logics in PDM]

As mentioned above, there were logical failures in PDM of this project, including casual relations between the Project Purpose and the Overall Goal, the scope of project activities and the Project Purpose and appropriateness of the verifiable indicators. However, although the logical failures were recognized by the counterparts and the Japanese experts, the PDM was not modified. As a result, those logical failures made difficulties to verify project effects and impacts based on the PDM at the time of ex-post evaluation. Therefore, at the stage of project design, it is essential to make PDM logically appropriate in order to ensure project effects led by the planned project activities within the project scope and to adequately verify project effects based on PDM. Also, it is inevitable to timely modify PDM when logical failures are identified during the project implementation.

² 35-40 officers from PDEMs and EDL participated in each training.



Nam Ngum 2 Power Company Limited which is one of the IPP company and was received examination and inspection by DEM



PDEM Luangprabang