

Green Climate Fund Readiness and Preparatory Support (LAO-RS-005)

Development of Action Plan for Designing and Implementing Standards and Labelling Programme in Lao PDR

Assessment of policy, regulatory and institutional gaps in supporting development and implementation of Energy Standards and Labeling

Prepared for

**MINISTRY OF ENERGY AND MINES (MEM), LAO PDR, AND
UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)**

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Acronyms and Abbreviations

AC	Air Conditioner
AHEEER	ASEAN Harmonization of Electrical and Electronic Equipment Regime
ACCSQ	ASEAN Consultative Committee on Standards and Quality
CD	Customs Department
CSPF	Cooling Seasonal Performance Factor
DEPP	Department of Energy Policy and Planning
DSM/EE	Demand-Side Management and Energy Efficiency
EE	Energy Efficiency
EER	Energy Efficiency Ratio
EE&C	Energy Efficiency and Energy Conservation
ESCO	Energy Service Company
EdL	Electricite du Laos
GCF	Green Climate Fund
HEPS	High Energy Performance Standard
INDC	Intended Nationally Determined Contribution
IREP	Institute of Renewable Energy Promotion
kW	Kilowatt
kWh	Kilowatt-hour
LDC	Least Developed Country
LNCCI	Lao National Chamber of Commerce and Industry
MEPS	Minimum Energy Performance Standard
MEM	Ministry of Energy and Mines
MOF	Ministry of Finance
MOIC	Ministry of Industry and Commerce
MONRE	Ministry of Natural Resource and Environment
MOST	Ministry of Science and Technology
MPI	Ministry of Planning and Implementation
NDA	National Designated Authority
NSCC	National Strategy on Climate Chang
MRA	Mutual Recognition Arrangement
MV&E	Monitoring, Verification and Enforcement
RIEM	Research Institute for Energy and Mines

SOE	State-owned Enterprises
S&L	Energy Standards and Labeling
UNEP	United Nations Environment Programme

1 INTRODUCTION

The readiness proposal entitled “Development of Action Plan for Designing and Implementing Standards and Labelling Programme in Lao PDR” was submitted to the Green Climate Fund (GCF) by the National Designated Authority (NDA), the Department of Climate Change under the Ministry of Natural Resource and Environment (MONRE), with the United Nations Environment Programme (UNEP) as the Delivery Partner. MONRE has requested the Institute of Renewable Energy Promotion (IREP), the Ministry of Energy and Mines (MEM), to act as the main counterpart for implementation of the proposed readiness activities. The readiness proposal was approved by GCF in August 2019, and the Implementation was approved by Ministry of Planning and Implementation (MPI), Lao PDR, on 28 November 2019.

This report summarizes findings from Activity 2.1.1 (conduct policy, regulatory and institutional gap assessment) which reviewed policy, regulatory and institutional frameworks related to minimum energy performance standard (MEPS) and energy labeling in Lao PDR, identified gaps in supporting development and implementation of MEPS & labelling in Lao PDR, and provided recommendation and implementation plan detailing how to address the gaps identified as well as capacity building for various stakeholders. This report also serves as Deliverable 2.1.1 of the readiness project.

DRAFT

2 ENERGY EFFICIENCY POLICY, REGULATORY AND INSTITUTIONAL FRAMEWORKS IN LAO PDR

Lao PDR is a land lock country with 7.1 million population and about 1.2 million households¹. Most of the households in Lao PDR are electrified and the electrification rate was 94%. As a result of the economic development in Lao PDR and the government's ambition to transit from a Least Developed Country (LDC) to a middle income country by 2030², demand for electrical appliances and electricity will continue to rise. Considering this, Lao PDR has identified reducing GHG from fossil fuels in electricity generation as one of the key priorities, and the energy sector policy has set a target of 10% reduction in energy consumption by 2030.

The residential and commercial sectors in Lao PDR account for about 52% of the total electricity consumption in 2017, and electrical energy is mainly used for lighting, cooling and refrigeration. As electricity export is key income generating activity, energy efficiency and conservation measures which reduce domestic consumption will also enable Lao PDR to increase electricity export and its economic well-being. Within its National Strategy on Climate Change 2010 (NSCC) and more recently in its Intended Nationally Determined Contribution (INDC), Lao PDR has committed to providing economic, environmental, and socio-economic benefits through the development and integration of integrated mitigation actions, including the improvement of energy efficiency.

2.1 INSTITUTIONAL ARRANGEMENT FOR ENERGY EFFICIENCY IN LAO PDR

In Lao PDR, there are multiple public and private sector stakeholders involved in development and implementation of energy efficiency (EE). Of which, MEM is the main agency responsible for energy policy and overall strategic guidance, as well as management of the energy sector development. Other government agencies being involved in EE include: Ministry of Science and Technology (MOST); Ministry of Industry and Commerce (MOIC); Ministry of Finance (MOF); Ministry of Planning and Investment (MPI); Ministry of Natural Resources and Environment (MONRE); and Electricite du Laos (EdL).

It should be noted that MONRE has not been directly involved in development and implementation of EE in Lao PDR, however it plays a vital supporting role as the national focal point for different international funds for climate change related issues. In addition to government agencies, academia and private sector organizations, such as National University of Lao PDR, and industry associations (Lao National Chamber of Commerce and Industry or LNCCI and air conditioning association) have contributed to EE implementation in Lao PDR. Shown in Table 2.1 are roles and responsibilities of public and private sector stakeholders involved in EE and, in particular, energy standards and labeling in Lao PDR. Additional information on key stakeholders is provide after Table 2.1.

¹ Lao Statistics Bureau, 2019 (<https://laosis.lsb.gov.la>)

² The goal was specified in the 8th Five Year National Socio-economic Plan (2016-2020).

Table 2.1: Energy Standards and Labeling Stakeholders in Lao PDR

Organizations	Roles & Responsibilities
Ministry of Energy and Mines (MEM) <ul style="list-style-type: none"> • Department of Energy Policy and Planning (DEPP) • Institute of Renewable energy Promotion (IREP) – Energy Efficiency and Energy Conservation Division • Research Institute for Energy and Mines (RIEM) 	<ul style="list-style-type: none"> • Integrate energy efficiency matters into the national energy strategic plan • Assess benefits/impacts by energy standards and labeling programs • Lead energy standards and labeling activities • Develop Minimum Energy Performance Standards (MEPS) and High Energy Performance Standards (HEPS) for electrical appliances; • Issue the energy labels • Establish products quality and standards testing laboratory • Adopt and certify testing results from accredited labs • Coordinate with MOIC on market monitoring and surveillance
Ministry of Science and Technology (MOST) <ul style="list-style-type: none"> • Department of Standards and Metrology (Standardization Body) 	<ul style="list-style-type: none"> • Adopt MEPS, HEPS and labeling developed by MEM as national standards
Ministry of Industry and Commerce (MOIC) <ul style="list-style-type: none"> • Department of Enterprise registration and management • Department of Import-export • Department of Domestic trade 	<ul style="list-style-type: none"> • Manage business and product registration • Regulate imported and sold electrical appliances • Establish an online registration system • Conduct market surveillance
Ministry of Finance (MOF) <ul style="list-style-type: none"> • Customs Department • Tax department 	<ul style="list-style-type: none"> • Monitor entry of electrical appliances • Implement import duties or sales taxes to support market of EE appliances
Ministry of Justice (MOJ)	<ul style="list-style-type: none"> • Approve Legislative document format
Electricité du Laos (EdL)	<ul style="list-style-type: none"> • Support implementation of energy standards and labeling and financial instruments (e.g., on bill financing/ repayment)
Ministry of Planning and Investment (MPI) <ul style="list-style-type: none"> • Lao Statistics Bureau 	<ul style="list-style-type: none"> • National survey database e.g. appliance ownership
Industry Association (e.g., Lao National Chamber of Commerce and Industry – LNCCI, Air Conditioning Association)	<ul style="list-style-type: none"> • Network and outreach to importers and distributors of appliances, and other members on energy standards and labeling
Academic (Faculty of Engineering)	<ul style="list-style-type: none"> • Support MEM with product quality and standard testing • Provide training and capacity building (technical training) • Conduct energy audit/market surveys

- | | |
|--|---|
| | <ul style="list-style-type: none"> • Support implementation of public awareness campaign |
|--|---|

2.1.1 Ministry of Energy and Mines

Ministry of Energy and Mines (MEM) is the most government important agency directing and implementing energy related issues, as well as energy efficiency and energy conservation promotion in Lao PDR. MEM with its five energy related departments, two energy research institutes, four State-Owned Enterprises and vertical hierarchy of local counterparts (provincial, capital, district) that all together are responsible for the development of the power sector in Lao PDR (see Figure 2.1). Moreover, under Article 64 of the Electricity Law (Amended), the main duties related to electricity of MEM are described below.

1. Being the secretary in elaborating the strategic plans, electricity development plans, laws and regulations on electricity activities to submit the Government for consideration;
2. Disseminate and publish the laws and regulations on electricity activities and development plans;
3. Direct and monitor the implementation of electricity activities throughout the country;
4. Direct the data collection survey and statistic registration on electricity sources throughout the country;
5. Technically manage and monitor the electricity business of both public and private sectors;
6. Direct the environmental protection and electrical energy source preservation;
7. Study and research and give technical advice on the investment in electricity businesses within the scope of its responsibility;
8. Study on the extension, suspension or withdrawal of the electricity business licenses of the investors;
9. Give instructions to the electricity business operators on the import of electricity, electrical facilities;
10. Build, improve and upgrade the knowledge capacity of technical and managerial staffs on electricity development activities;
11. Approve the appointment of the Chief Engineers under its responsibility on the proposal of the electricity business operators;
12. Study and research the electricity prices and submit them to the Government for consideration;
13. Coordinate with other sectors and relevant local administrations in management of electricity business;
14. Contact and cooperate with international organizations relating to electricity activities and seeking sources of funds for electricity development;
15. Regularly summarize and report the result of the implementation of electricity activities to the Government;
16. Exercise other rights and perform other duties on electricity activities as provided by in the laws and regulations.

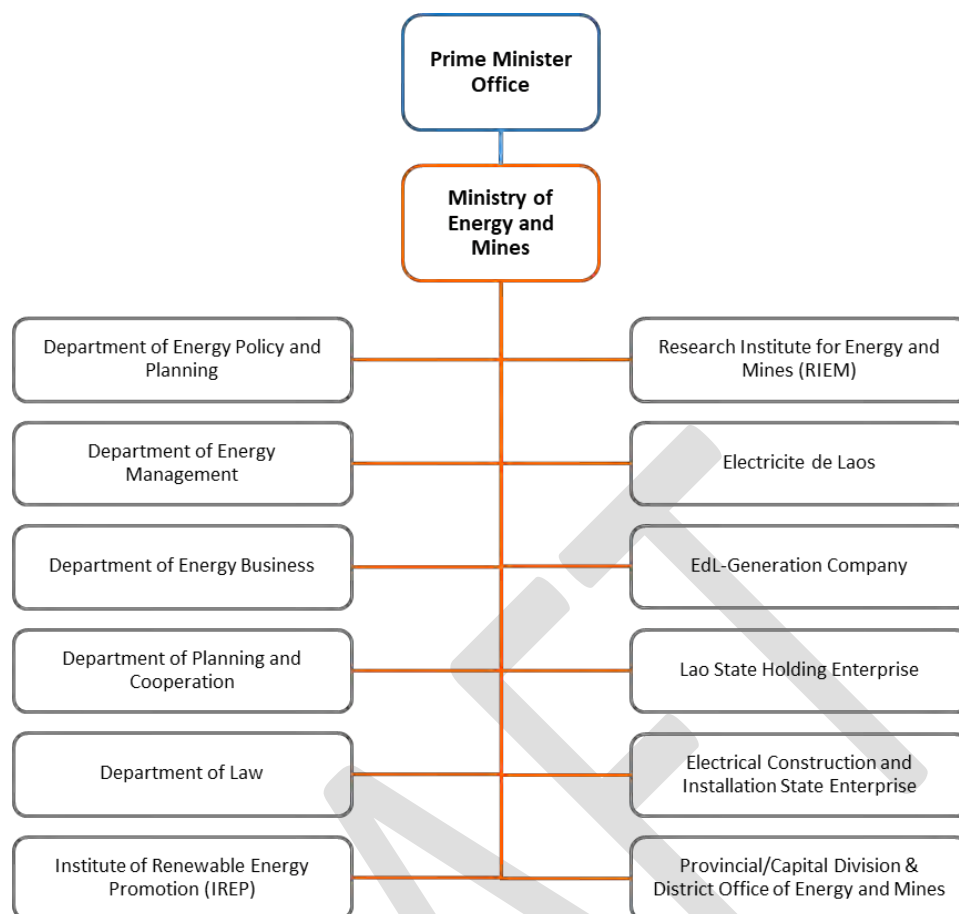


Figure 2.1: Organization Chart of Ministry of Energy and Mines (2020)

Roles and responsibilities of relevant departments under MEM that are involved in development and implementation of EE standards and labelling are briefly described in the following sections.

2.1.1.1 Institute of Renewable Energy Promotion

Although the EE responsibility is not clearly reflected in the department name, Institute of Renewable energy promotion (IREP), IREP is directly responsible for EE standards and labelling development and implementation in Lao PDR. Main responsibilities of IREP are summarized below.

- Promotion of **energy efficiency and energy conservation**
- Promotion of renewable energy: solar energy, wind power, small scale hydropower (below 15 MW), biomass energy
- Promotion of alternative energy sources: fuel cell, electric vehicles, hydrogen,
- Rural electrification (renewable energy sources-based rural electrification)
- Management of Energy Promotion and Development Fund

To date, IREP has developed a number of legislative documents in promotion of energy efficiency and energy conservation (EE&C) activities in Lao PDR, such as National policy on Energy efficiency and energy conservation, Roadmap for policy’s implementation, Prime Minister’s announcement on enforcement of Energy efficiency and energy conservation policy, and the ministerial regulation on energy standards and labelling for air conditioners.

2.1.1.2 Department of Energy Policy and Planning

The Department of Energy Policy and Planning (DEPP) is responsible for policy development and strategic master planning for the energy sector in Lao PDR. DEPP has the following responsibilities that may be relevant to promotion of energy efficiency standards and labelling:

- Develop and adjust national energy policy
- Conduct Energy demand forecasting and adjustment for meeting social-economic development requirement in each period
- Develop and adjust tariff structure for producers and consumers
- Develop sustainable energy sector development policy, including guideline and measures for energy projects evaluation toward sustainable energy sector development of Lao PDR
- Provide comments on energy development projects proposed by the public, private developers from central to local levels
- Study and develop regulation on regional interconnection of grid code and performance standard
- Collect and publish energy data

It is important to engage DEPP in implementation and promotion of energy efficiency standards and labelling, so that energy efficiency matters are integrated into the national strategic energy planning. Comments and inputs should be sought from DEPP on energy efficiency promotion projects as well as the regulatory framework that developed and/or proposed by IREP.

2.1.1.3 Department of Laws

The Department of Laws was recently established under MEM. It is responsible for development of laws related to energy and mining in Lao PDR, and oversee legal disputes related energy businesses. The department may oversee and also provide support in development and enforcement of legislative matters related to EE standards and labeling.

2.1.1.4 Research Institute for Energy and Mines

The Research Institute for Energy and Mines (RIEM) has three following centres:

- Training centre
- Energy research centre
- Research and testing centre

Through the above centers, RIEM may support EE standards and labelling implementation in appliances quality testing and verification, as well as capacity building for government and private sector personnel.

2.1.1.5 State-Owned Electricity Enterprises

There are four (4) state-owned electricity enterprises (SOEs), i.e. Electricité du Laos (EdL), EDL-Generating public company (EDL-Gen), Lao Holding State Enterprise (LHSE) and Electric Construction & Installation (ECI). EdL owns and operates the country's main transmission and distribution assets for domestic consumptions in Lao PDR, and manages electricity imports to and exports of surplus from its grid. EdL also owns some very small generating facilities. EdL manages power supply through its Distribution Departments, namely

- Vientiane capital distribution Department that oversees EdL capital branch specifically.
- Northern-Southern distribution Departments which oversees EdL branches in 17 provinces,
- Demand Side Management is operated under The **Technical Department**

From 2004 to 2015, EdL implemented the World Bank funded project “**Demand-Side Management and Energy Efficiency (DSM/EE) Project**” which was the major activity on EE being undertaken in the country and closed in 2015. The project focused on the following objectives:

- (i) Implementation of EE programs in public and residential sectors
- (ii) Implementation of consumer awareness and behavioral program
- (iii) Assessment and Implementation of Pilot DSM Program Options for Commercial and Industrial Sector
- (iv) Upgrading of the Energy Use Database
- (v) Assessment on Institutional and Legal Framework for energy standard and labeling
- (vi) Establishment of the National S&L Steering Committee
- (vii) Preparation of an Implementation Plan for Large Scale EE Implementation
- (viii) Development of S&L Roadmap

EDL-Gen is a public company. EDL-gen owns electricity generation, mostly full scale power plants to supply domestic load demand Centres of EDL, participating as shareholders of domestic supply and export IPP. LHSE plays a key role in participating as shareholder of export IPP projects. ECI plays a key role in construction for the domestic electricity sector, especially in the areas of distribution and rural transmission. ECI may jointly invest in small IPP projects aiming at supplying electricity to off-grid areas.

2.1.1.6 Provincial and Capital Department/District Offices of Energy and Mines

As shown in Figure 2.1 the local representatives of energy and mines sector include provincial and Vientiane capital departments of energy and mines, and offices of energy and mines in district levels. These departments and offices could provide support for EE standards and labelling promotion and implementation at the provincial, district and community levels.

2.1.2 Ministry of Science and Technology

The Ministry of Science and Technology (MOST) is responsible for coordinating across all sectors issues related to science and technologies, including development of national standards for Lao PDR. MOST

consists of 2 offices, 8 departments and 3 research institutes. Two departments which are directly involved in development national standards are:

- **Department of Standards and Metrology** - responsible for standards certification and quality verification, consumers' protection, and has its own measurement Centre, adoption Centre; standards and measurement information Centre.
- **Department of intellectual properties** - responsible for patenting, trade mark, copy right, intellectual property promotion and development; property right dispute, intellectual property service Centre.

Through the ASEAN Consultative Committee on Standards and Quality (ACCSQ), Lao PDR has signed Mutual Recognition Arrangement (MRA) for electrical and electronic products with ASEAN member countries in acceptance of test report and/or product certification (ASEAN EE MRA has been replaced by the ASEAN Harmonization of Electrical and Electronic Equipment Regime or AHEEER). Air-conditioners and refrigerators are included as the priority product for standard harmonization in ASEAN focusing on the electrical safety aspect. This could potentially be a shortcut toward the development goal of appliance standards in Lao PDR.

2.1.3 Ministry of Industry and Commerce

The Ministry of Industry and commerce (MOIC) is responsible for industrial and handicraft production, domestic and foreign trade, import and export, enterprise registration and management, market management and price adjustment, etc. MOIC consists of 12 departments some those may have connection to energy standards and labelling promotion, such as

- **Department of enterprise registration and management:** The business operators who wish to import the energy efficient appliances are to get registered at this department.
- **Department of export-import:** All electrical appliances in Lao PDR are imported, therefore the Import and Export Department under the Ministry of Industry and Commerce can play a vital role in controlling quality of imported appliances. Currently there is no legal framework in place to control importation of energy efficient domestic appliances;
- **Department of domestic trade:** the department is responsible for management, monitoring and control of trade operators as well as trade centres. Therefore, this department may play an important role in monitoring and controlling the energy efficient appliances circulation in domestic market

2.1.4 Ministry of Finance

Some departments of MOF may have relevance to promotion of energy efficiency standards and labelling in Lao PDR, such as:

- **Customs Department.** The Customs Department (CD) has basically responsibility in inspections of import goods and applying import duty and other requirements based on regulation provided. Therefore, MEM shall coordinate with CD in prevention of import of non-compliant (low quality and energy inefficient) electrical appliances/machines/equipment, as

well as negotiation on the taxation exemption-related incentive measures (if any) that may be applied to importation of energy efficient electrical appliances.

2.1.5 Other Organizations

In addition to government agencies and SOEs, there are other social-professional organizations that may have connection to EE standards and labelling promotion in Lao PDR, including:

- Academic Institutions (Universities): The national university of Laos with its Faculty of Engineering can take part in campaign to promote EE standards and labelling, particularly in process of standards set up and products quality testing, as well as the inputs on human resources development, research and development in the field of energy engineering and energy management, electrical engineering.
- Social organization (e.g., Lao Woman Union, Lao Youth, Trade Union, and Gender Development Association under Lao Women Union)
- Industry and professional organization (association/society), e.g., air conditioning industry association,

2.2 ENERGY EFFICIENCY POLICY AND REGULATORY FRAMEWORKS IN LAO PDR

Prior to the 2016 Energy Efficiency and Conservation Policy and Strategy, Lao PDR has neither policy nor legal frameworks on energy efficiency and conservation (EE&C). However, the Law on Electricity approved in 1997 stipulates that that use of natural power resources, as well as supply and use of energy should be efficient. Through the 2016 Energy Efficiency and Conservation Policy and Strategy, Lao PDR aims to reduce its annual energy consumption growth rate from 4% to 3.5% to achieve a future reduction in energy demand of 10% by 2030. The accompanying Roadmap and Master Plan outlines a set of actions to achieve this demand reduction target through an energy standards and labeling (S&L) program, and HEPS for electrical equipment and appliance between 2015 and 2020.

The Prime Minister Decree on the Promotion of Energy Efficiency and Conservation was developed as a step towards establishing the S&L program. The Decree, which was adopted in May 2020, outlines the necessary institutional and financial mechanisms for planning, regulating, and implementing EE&C measures. It covers international cooperation for sharing lessons, research data, information, and alignment with international treaties and agreements.

MEM has also drafted a Ministerial Regulation on Energy Performance Standard and Energy Efficiency Labeling of Air Conditioners in Lao PDR (Ministerial Regulation for ACs), which is currently undergoing a review process. The regulation includes mandatory MEPS levels and labeling requirements for room ACs with cooling capacities below 3.52kW. In addition, MEM also develop the National Roadmap for Implementation of the Regional Policy Roadmap for Harmonization of Energy Performance Standards for Air Conditioners in ASEAN Countries by 2020.

Brief details of the abovementioned policy and regulatory document are described below.

2.2.1 Law on Electricity

The Law on Electricity approved by the National Assembly in 1997 (amended in 2008 and 2012) stipulates that that use of natural power resources should be efficient, as well as supply and use of energy should be efficient. Key features of the Law on Electricity are summarized in the table below.

Table 2.2: Key Features of Law on Electricity

Objective	The Law on Electricity determines the principles, rules and measures on the organization, operation, management and inspection of electrical activities for the high effectiveness of electricity generation and business operation with the aims to use the natural resource potentials in economical and sustainable manners.
Target & Scope	The Law on Electricity applies to all individuals, legal entities and organizations, both domestic and foreign entities, which operates the electricity business and activities, or manages related to the electrical facilities and user' side
Contents	<p>The Law on Electricity consists of 12 Chapters and 81 Articles (see Annex I)</p> <p>Chapter 6 prescribed Rights and Obligations of Electricity producers, Distributor and Users, where in article 52 efficient and effective use of electricity is among the users' obligations.</p> <p>Chapter 9 determined the rights and duties of Ministry of Energy and Mines, provincial and capital departments of Energy and Mines municipal, district and municipal offices of Energy and Mines in managing and inspecting the electricity related activities from central levels to locally.</p>

2.2.2 National Policy on Energy Efficiency and Energy Conservation

Development of the National Policy on Energy Efficiency and Energy Conservation in Lao PDR was started in November 2012 with financial support by ADB under the Grant No. 0195: GMS Northern Power Transmission Project - Energy Efficiency and Conservation Program. The policy was signed by the Prime Minister in October 2016, and announced by the MEM Minister in late 2016. The policy prescribes overall principles and measures in energy management and promotion of Energy Efficiency and Energy Conservation (EE&C) towards Green and Environmental friendly Growth pathway direction to contribute creating of stable and flexible energy supply for ensuring continuous national social–economic development. Key features of the National Policy on Energy Efficiency and Energy Conservation in Lao PDR are summarized in the table below (see more details in Annex II).

Table 2.3: Key Features of National Policy on Energy Efficiency and Energy Conservation

<p>Objective</p>	<p>To encourage, promote and raise public awareness on energy efficiency and energy conservation as the mean for household and national capital saving</p> <p>To propose inclusion of EE&C matters into national social-economic development agendas of Lao Government</p>
<p>Target & Scope</p>	<p>Target: To achieve 10% reduction of final energy consumption by 2030 as compared with the Business-As-Usual scenario. The policy covers four sectors:</p> <ol style="list-style-type: none"> 1. Industrial 2. Residential 3. Building (Commercial and Public Building, including those that to be renovated or newly built) 4. Transportation
<p>Contents</p>	<p>The policy describes the implementation roadmap in three phases, as follows:</p> <ol style="list-style-type: none"> I. Short term (2016-20): focusing mainly on preparatory works, <ol style="list-style-type: none"> 1. Develop National policy on EE&C 2. Issue Prime Minister Decree on EE&C 3. Setup EE&C plans 4. Establish Financial mechanism 5. Develop Energy Management principle & guideline 6. Establish Energy usage database 7. Establish guidelines on Energy efficiency standards (MEPS), energy efficiency standards labels 8. Capacity building for Responsible bodies 9. Raise Public awareness on EE&C 10. Launch EE&C Demo projects II. Medium term (2021-25): including the following tasks: <ol style="list-style-type: none"> 1. Coordination mechanism for EE&C 2. Introduction of financial mechanism for EE&C 3. Promotion of Energy Service Company (ESCO) 4. Introduction of energy efficiency standards, e.g., MEPS, labels, guidelines for industrial, residential, commercial and public buildings and transportation, 5. Follow up demo projects 6. Further Capacity building 7. Awareness campaigns 8. To Develop laws and regulation on EE&C III. Long term (2026-30): <ol style="list-style-type: none"> 1. To Review implementation of EE&C from previous periods 2. To review/upgrade/adjust EE&C laws/regulations/guidelines 3. Implementation of EE&C plans/programs 4. Awareness raising 5. Further Capacity building

2.2.3 Prime Minister Decree on Implementation of Energy Efficiency and Energy Conservation Policy

Preparation of the Prime Minister Decree on Implementation of Energy Efficiency and Energy Conservation Policy (EE&C) in Lao PDR was initiated in 2016 with financial support by ADB under the Grant No. 0195: GMS Northern Power Transmission Project - Energy Efficiency and Conservation Program. The Decree was signed by the Prime Minister on 11th May 2020, and the Public Announcement Notice is under preparation by MEM. Key features of the Prime Minister Decree are summarized in the table below (see more details in Annex III).

Table 2.4: Key Features of Prime Minister Decree on Implementation of EE&C

Objective	The Decree prescribes principle, regulatory and measures on management, monitoring and verification of energy efficiency and energy conservation activities in the following sectors: 1) industrial; 2) buildings (including those to be newly built and renovated); 3) transportation; and 4) machinery-equipment-appliances.
Target & Scope	N/A
Contents	<p>The Decree consists of 12 chapters and 69 articles</p> <p>The contents that may relevant to energy efficiency standards and labelling are briefly described hereby:</p> <ul style="list-style-type: none"> • The Decree determined four designated sectors for energy efficiency promotion and implementation: 1) Industrial; 2) Buildings; 3) Transportation and 4) Machine-equipment-appliances • Article 33 of chapter 6 prescribed energy efficiency management principle for machine-equipment and appliances, which includes: 1) Determination and enforcement of Minimum Energy Performance Standards (MEPS); 2) affixation of energy efficiency labelling and 3) dissemination of energy efficiency information • Prescribed guideline on determination and enforcement of MEPS (Article 34) • Prescribed guideline on energy efficiency labelling (Article 35) • Prescribed management requirement of low energy performance machine-equipment and appliances (Article 36) • Prescribed responsibilities and duties of energy consuming machine-equipment-appliance business operators (Article 37-38) • Chapter 7 (Articles 39-42) outlines policy and promotion of energy efficiency measures: incentives, fund access, etc. • Chapter 8 dedicated energy efficiency and energy conservation business operation, where prescribed general requirements for establishment of EE&C business (Article 44), application submission (Article 45), as well as duties and right of such kind of business operators (Article 46-47) • Chapter 9 prescribed the prohibitions, where included general prohibitions in relation to EE&C promotion; as well as specifically for EE&C business operators/entities prohibitions;

	<ul style="list-style-type: none"> • Management and inspection of EE&C activities are described in chapter 10, where determined MEM and its local levels counterparts as organizations in charges of EE&C management and inspection, with prescription of the rights and duties of each levels; • Chapter 11 prescribed Policies towards Outstanding Achievements and Measures against Violations. <ul style="list-style-type: none"> ○ Any individuals, legal entities and organization with outstanding achievements shall have a right to get rewards accordingly to investment and other relevant laws of Lao PDR. ○ In case of faulty/noncompliance, depending on seriousness and type of violations, there shall be applied different measures of punishment, such as: warning, re-education, disciplinary, penalty charge, civil measure or criminal charge. Detailed figures of penalty fees were given therewith.
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2.2.4 National Roadmap for Harmonization of Energy Performance Standards for Air Conditioners in ASEAN Countries

The National roadmap was initiated by the Regional Policy Roadmap to harmonize air conditioning standards in ASEAN countries by 2020, endorsed by the 33rd ASEAN Ministers on Energy Meeting in a Joint Ministerial Statement “Powering ASEAN towards a Greener Community” on 7 October 2015 in Kuala Lumpur, Malaysia. The National Roadmap was prepared through a consultation process, and two workshops were organized in Lao PDR to discuss the National Roadmap. The National Roadmap was concluded in 2016 but has not yet been formally adopted by the Government of Lao PDR. Key features of the National Roadmap are summarized in the table below.

Table 2.5: Key Features of National Roadmap for Harmonization of Energy Performance Standards for Air Conditioners in ASEAN Countries

Objective	The National Roadmap was developed to support and guide country-level actions with the broad objective to implement the recommendations of the Regional Policy Roadmap to harmonize air conditioning standards in ASEAN countries by 2020 , which aims at facilitating market transformation towards more energy efficient air conditioners. It targets all air conditioners (fixed-speed and inverter) with the cooling capacity of and below 3.52 kW .
Goals and Targets	<ol style="list-style-type: none"> 1. Minimum Energy Performance Standards (MEPS) <ul style="list-style-type: none"> • By 2020, adopt regionally harmonized technology neutral and mandatory MEPS at minimum EER 2.9W/W and CSPF 3.08 W/W for all air conditioners below 3.52 kW by 2020 • Review of MEPS every 5 years. 2. Effective compliance mechanism <ul style="list-style-type: none"> • By end of 2017 adopt ISO 5151-2010 as a uniform testing standard for air conditioners, and adjust import regulations accordingly.

	<ul style="list-style-type: none"> • By 2020, adopt CSPF method of ISO 16358 as a uniform testing standard for all fixed-speed and inverter units, and adjust import regulations accordingly. <p>3. Recognition of the testing results from accredited laboratories in the third countries:</p> <ul style="list-style-type: none"> • By 2018, adopt provisions on recognizing testing results from laboratories certified and accredited based on ISO/IEC 17025. • Participate in development and adoption of the regional Mutual Recognition Agreement on recognition of energy performance testing standards and testing results reports for air conditioners from properly certified and accredited testing laboratories. <p>4. Monitoring, verification and enforcement (MV&E)</p> <ul style="list-style-type: none"> • By 2020, establish and operationalize an efficient national system for MV&E. • Participate in establishing a coordinated regional monitoring, reporting and verification regime in ASEAN. • Participate in the establishment of a Regional Product Database as a tool to support exchange of product information and non-compliance alerts, and to coordinate verification activities.
<p>Contents</p>	<p>The roadmap consists of 10 headings/clauses.</p> <ul style="list-style-type: none"> • In Section V, vision of the roadmap given as: “Progressively mitigate demand for electricity and significantly increase the share of high energy performance air conditioners in Lao PDR through adoption of regionally harmonized Minimum Energy Performance Standards and development of an appropriate regulatory framework for their enforcement”. • Section VI outlines the goals and targets of the roadmap (see the abovementioned Goals and Targets). • The actions and measures of the roadmap were given in Section VII: <ul style="list-style-type: none"> ○ The overall responsibility of the National Roadmap implementation lies with the Ministry of Energy and Mines (MEM) that will coordinate and involve relevant Ministries and agencies in these efforts. ○ Other key Ministries include: Ministry of Science and Technology, Ministry of Industry and Commerce, Ministry of Finance. ○ The roadmap also recommends establishment of other entities that could play important roles in implementation of EE&C policies in Lao PDR, such as: <ul style="list-style-type: none"> – National EE&C Promotion Committee, to be chaired by the Prime Minister (PM) – Lao Energy Management Centre (LEMC) to serve as an implementer and facilitator to execute Master Plan – Energy Efficiency/Conservation fund ○ Other stakeholders that should be involved, informed and consulted in relation to EE&C implementation include Lao National Chamber of Commerce and Industry (LNCCI), business associations and groups ○ Section VII also outlines activities for achieving each specific target, with detailed implementing agencies and timeframes

- Section VIII provides institutional and organizational arrangements, with determination of implementing agencies and timeframes

2.2.5 Ministerial Regulation on Energy Standards and Labeling for Air Conditioners

The Ministerial Regulation on Energy Label and Standard of Air Conditioner in Lao PDR was prepared based on Article 6 of the Prime Minister Decree on Implementation of Energy Efficiency and Energy Conservation Policy (EE&C) in Lao PDR. A series of consultation workshops to discuss the draft regulation was organized in the first half of 2020, and the regulation is expected to be finalized and promulgated by the end of 2020 or early 2021. Key features of the National Roadmap are summarized in the table below (see more details in Annex IV).

Table 2.6: Key Features of Ministerial Regulation on Energy Label and Standard for Air Conditioner

Objective	<p>To set Minimum Energy Performance Standard (MEPS) for AC to facilitate flushing out inefficient AC from domestic market and encouraging import of energy efficient AC</p> <p>To establish an energy labeling scheme that certifies energy efficiency of ACs</p> <p>To establish a management mechanism for promotion of EE ACs through product registration</p>
Target & Scope	<p>The regulation covers establishment of energy standards and labeling for ACs with cooling capacity not exceeding 12,000 W (\leq 42,000 BTU), split type, fixed and variable speed ACs.</p>
Contents	<p>The regulation consists of 5 chapters.</p> <p>Chapter 1 provides general provision where current status of air conditioners (ACs) in the Lao market. The objectives of the regulation, its scope, and definitions are also described.</p> <p>Chapter 2 describes energy performance factor of ACs that has been applied in Lao PDR, its testing, and calculation.</p> <p>Chapter 3 prescribes requirements for energy efficiency standards and labelling, including:</p> <ul style="list-style-type: none"> • Five (5) levels of energy ratings for fixed and variable speed ACs. • Design of the Lao energy efficiency label. • Requirements on affixing the label on ACs and penalties in case on non-compliance. <p>Chapter 4 prescribes management and inspection (of AC Energy performance and labelling implementation) which include:</p> <ul style="list-style-type: none"> • Business and product registration. • Application form and registration procedure. • Test report requirements and certification procedure. • Application fees. • Monitoring (market surveillance), verification and enforcement

Chapter 5 provides information on the lead implementing agency (IREP), and overall implementation work plan (to be implemented in two phases: Phase 1 (the first 2 years) on voluntary basis and, after that, Phase 2 shall be mandatory).

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3 ASSESSMENT OF IMPLEMENTATION CHALLENGES AND GAPS

Establishment of IREP (and its Energy Efficiency and Energy Conservation Division) and the national standard body under MOST has paved a way for Lao PDR in moving forward with the development and implementation energy standards and labeling. However, assessment of Institutional, policy and regulatory frameworks in facilitating and supporting implementation of energy standards and labeling programs in Lao PDR has identified several challenges and gaps, as summarized in the table below.

Table 3.1: Identified Challenges and Gaps in EE&C Policy Framework

Institutional and Policy Framework	Challenges and Gaps
<p>National Policy on Energy Efficiency and Energy Conservation (2016)</p>	<ul style="list-style-type: none"> • Actions and measures outlines in the policy have not yet been implemented due to a long delay in development of supporting regulatory frameworks (e.g., decrees and regulations). This has essentially disabled other mechanisms, such as inter-ministerial coordination, financial supports, pilot demonstration projects, and public awareness campaigns. • Although IREP has been appointed to lead EE&C activities in Lao PDR, lack of necessary human and financial resources has undermined the overall progress of EE&C implementation. • Following the approval of the National Policy on EE&C in 2016, allocation of the government budget in the EE&C area has not been adequate to support effective implementation of EE&C activities.
<p>National Roadmap for Harmonization of Energy Performance Standards for Air Conditioners in ASEAN countries by 2020</p>	<ul style="list-style-type: none"> • The national roadmap was developed with participation from IREP, however the national roadmap has never been officially adopted by the Government of Lao PDR. • The nation roadmap did not mention about role of academia in promotion and implementation of EE&C. Lessons learned and practices from other ASEAN member countries have shown that academic institution (such as local universities) could act an important stakeholder, particularly in terms of providing technical expertise, human resource development, etc. • Without a formal adoption process, some activities outlined in the national roadmap have been carried out. For example, Establishment of a working group on energy standards and labeling for ACs by IREP. Representatives from Ministries, State enterprises, Academia, Women union and Private sector (Air conditioning Professional Association) were invited to join the working group which serve as the core task force for developing <u>Ministerial Regulation on Energy Standards and Labeling for Air Conditioners.</u>

Table 3.2: Identified Implementation Challenges and Gaps in EE&C and MEPS & Labeling Regulatory Frameworks

Policy Framework	Challenges and Gaps
<p>Law on Electricity (Amended 2012)</p>	<ul style="list-style-type: none"> • The Law on Electricity has focused mainly on the supply side of electricity sector: generation/transmission/distribution activities, electricity business operators and service providers. • There are clauses in the Law on Electricity on the demand side concerning mostly on technical/safety of electricity use without any references to EE&C
<p>Prime Minister Decree on Energy Efficiency and Energy Conservation (2020)</p>	<ul style="list-style-type: none"> • Development of the Prime Minister Decree began in 2016 and was eventually approved in early 2020. In Lao PDR, the Decree is an important legal framework for policy implementation, and this long delay has significantly affected the progress of EE&C works in the country. • The Decree has included specific statements on EE&C measures/approaches which may not be the most appropriate EE&C solution for a specific problem, and may lead to a limited scope of EE&C implementation. Examples of these specific statements include: <ul style="list-style-type: none"> ○ Key specific energy saving measures are listed for designated factories, building, public facilities and transportation entities (Articles 12, 21, 27 and 29). In practice, energy saving measures to address any inefficiencies should be determined based on techno-economic analysis, therefore, listing specific measures is likely to make the EE&C implementation more challenging as the best solutions may not have been considered. • The Decree includes numbers which may require revisions and adjustment overtime, e.g., penalty for violation. Considering that the overall approval process of the Decree is relatively long, these numbers should be included in a lower level regulatory document, such as Ministerial Regulations, rather than the Decree. • There are many unclear statements (e.g., technical terms, or Lao language grammar) found in the Decree. Interpretation of these unclear statements could make readers confusing, and further complicate the implementation of the Decree.
<p>Ministerial Regulation on Energy Standards and Labeling for Air Conditioners (draft)</p>	<ul style="list-style-type: none"> • The Ministerial Regulation on Energy Standards and Labeling for Air Conditioners is still in a draft form. The draft was presented at the first consultation/dissemination workshop in Vientiane in February 2020. The second workshop was held in Oudomxay Province in June 2020. Two more workshops are expected to be held before conclusion of the regulation (One in Southern part, and final one- in Vientiane).

	<ul style="list-style-type: none">• The regulation is quite comprehensive in nature, however additional guidelines and supporting systems (such as an online registration system for businesses and products) need to be developed before the implementation phase.• MEM/IREP has not indicated a clear timeline when the regulation will be approved. This will impact the local AC industry in terms of preparatory works to meet the regulatory requirements, and willingness to participate in the voluntary phase of the implementation.
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4 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

Lao PDR has developed policy and relevant regulatory frameworks for EE&C promotion. Currently, IREP is finalizing the first ever Ministerial Regulation on Energy Standards and Labeling for Air Conditioners, with rated cooling capacities not exceeding 12,000 W. It should be noted that, most of the existing policy and regulatory framework documents have encountered significant delay during the development phase. Moreover, little implementation progress has been made in comparison with the work plan. Considering that EE&C policy and regulation frameworks are relatively new to public and private sector stakeholders in Lao PDR, additional supporting documents providing interpretation, explanation and guidance may help facilitate the implementation phase.

Although the current policy and regulatory frameworks have served as the cornerstone for implementation of EE&C and specifically the Energy Standards and Labeling programs in Lao PDR, several barriers preventing effective and timely implementation still exist. These include capacity and expertise of the government and private sector stakeholders involved in the implementation phase, and short- and long-term financial resources committed by the Government of Lao PDR.

4.2 RECOMMENDATIONS

Considering the existing institutional, policy and regulatory frameworks pertaining to EE&C, and the upcoming regulation on energy standards and labeling for ACs, the followings are recommended to address challenges and gaps during the implementation phase.

- Prepare a set of supporting documents providing explanations and implementation guidance of all EE&C related regulatory documents. Any unclear statements should be reviewed and consulted with all stakeholders involved. Any specific requirements which need regular updates should be referenced in the easy-to-update regulatory documents rather than high level regulatory documents (such as Decree) to minimize any delay in the updating process.
- Secure commitment from the Government of Lao PDR in EE&C matters in the national development agenda, and ensure sufficient allocation of annual budget to support EE&C implementation, including capacity building, pilot demonstration, and public awareness campaigns.
- Develop comprehensive training and capacity building as well as awareness programs for each of the newly approved regulatory documents, so that all the parties involved understand their roles and responsibilities, and equipped with necessary capacity to support the implementation phase.
- Establish an inter-ministerial coordination mechanism to ensure smooth and seamless coordination during the implementation of energy standards and labeling programs.
- Establish a national think-tank unit on EE&C to support IREP in reaching out to local and international stakeholders, and screen relevant implementation experience and lessons learned for Lao PDR.
- Develop relevant EE&C pilot demonstration projects to serve as on-the-job training exercises for local stakeholders, and also use as the EE&C showcases in the public awareness campaigns.

- Develop and update the action plans on EE&C and energy standards and labeling with clear missions, targets, and activities.

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5 ANNEXES

Annex I	Law on Electricity
Annex II	National Policy on Energy Efficiency and Energy Conservation
Annex III	Prime Minister Decree on Energy Efficiency and Energy Conservation
Annex IV	Ministerial Regulation on Energy Standards and Labeling for Air Conditioners

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5.1 ANNEX I: LAW ON ELECTRICITY

Unofficial Translate



LAO PEOPLE'S DEMOCRATIC REPEOPLE
PEACE INDEPENDENCE DEMOCRACY UNITY PROSPERITY

National Assembly

No. 03/NA
Vientiane Capital, 20 December 2011

LAW ON ELECTRICITY (Amended)

Chapter I General Provisions

Article 1. Objective

The Law on Electricity determines the principles, rules and measures on the organization, operation, management and inspection of electrical activities for the high effectiveness of electricity generation and business operation with the aims to use the natural resource potentials in economical and sustainable manner, to encourage the implementation of the national socio-economic development plan and to improve the living conditions of the multi-ethnic people.

Article 2. Electricity

Electricity is a type of energy which is comprised of electricity power, electricity current, voltage and frequency produced by the sources from natural resources, such as: hydropower, wind power, solar energy, fuel, lignite, biomass energy, thermal, gas, Palm oils and nucleus energy and others.

Article 3 (amended). Definition of Terms

Terms used in this Law shall have the following meanings:

1. **Electricity activities** means activities of data collection survey, planning, designing, construction and installation, generation, transmission, distribution, export, import and other services of electricity;
2. **Electricity business** means business operation of electricity activities for commercial purposes;

3. **Electrical facilities** means dams and reservoirs, water ways, powerhouse, switching station, substation, electricity control center, transmission lines, distribution lines and user's site;
4. **Operator of electricity business** means any individual, legal entity or organization that is legally authorized to operate the electricity business;
5. **Memorandum of Understanding** means an initial document granted by the State to a person who wishes to invest in the development to conduct a feasibility study, such as: economical, technical and financial feasibility studies, including social and environmental impact of project;
6. **Grant of electricity business concession** means a grant of land areas and period of time by the State to the investors for the generation and power transmission under the conditions specified in the contracts;
7. **Rural electricity** means electrical system which is connected to a common electrical system or is any area's separate electrical system which generated electricity by virtue of small scale hydropower by petroleum-operated machinery or by solar energy, or by wind energy or by other energies for use in rural areas;
8. **Biomass** means wastes from plants, human, animals and others;
9. **Biogas** means gas which is produced by biomass, especially the wastes from wood processing and others;
10. **Electricity energy** means multiple result between electrical potential and electrical current which is channeled by electrical conductor;
11. **Installed capacity** means the capacity of electrical production of power plants or electrical generator;
12. **Electricity current** means the movement of electron which is in the same direction of electrical conductor, including the amperage of electrical current;
13. **Voltage** means generated electrical power where the electrical current has channeled from a point to another one of the electrical conductor or the difference between a level of two points of electrical potentials where the electrical current has passed by two points of electrical conductor;
14. **Frequency** means number of cycles moving within one second;
15. **BOT** means build, operate and transfer to the Government;
16. **BT** means build and transfer to the Government;
17. **BOO** means build, own and operate;
18. **Royalty** means levy from natural resources of which the users who has the rights to uses shall pay to the State by calculating in percent of the total incomes received from the sale of electricity power;
19. **COD** means commercial operation date
20. **Force majeure** means event occurred without any expectation and beyond any control, such as: flood, thunderbolt, storm, earthquake and others.

Article 4. Ownership of Electricity Energy Source

Sources of electricity energy throughout the country are the property of the national community that the State centrally and unanimously manages and grants the right of use to individuals, legal entities and organizations.

Article 5. State Policy on Electricity

The State promotes all individuals, legal entities and organizations, both domestic and foreign entities, to invest in electricity activities, such as production, transmission, distribution and services, particularly the hydropower, in junction with the protection of forest-protected water sources and in remote areas where favorable conditions existed by granting appropriated policies, such as duty or tax policy, rights of use of natural resources in accordance with the laws and regulations.

The State protects the legitimate rights of all economic sectors which have invested and paid their contributions in electricity business operation in equal manner.

The State promotes the electricity activities development through the use of electricity energy in economical, effective and sustainable manner and through the use of modern technique and technology in electricity business with mitigation of social and environmental impacts.

The State develops all potentials to meet the electricity need for the national socio-economic development, contributing to national defense and public security and to improve the living conditions of the multi-ethnic people, including the development of electricity as export commodity.

Article 6. Principle of Electricity Activities

Operation of electricity activities and business shall comply with the following principles:

1. Conformity with the national economic and social development;
2. Productiveness, economization and endurance;
3. Protection of environment, society and nature (community, forest and water source);
4. Safety.

Article 7. Scope of Application

This law applies to all individuals, legal entities and organizations, both domestic and foreign entities, which operates the electricity business and activities, or manages related to the electrical facilities and user' site.

This law shall not cover the electricity energy from nuclear source.

Article 8. International Cooperation

State broadens the relation and foreign, regional and international cooperation by exchange experiences and information of electricity activities, such as: generation, transmission, distribution, export-import, transit, development and service of electricity business.

**Chapter II
Electricity Activities**

Article 9. Electricity Activities

Electricity activities include electricity development plan, planning, data collection survey, design, construction and installation, generation, transmission, distribution, export-import, and services.

Article 10. Electricity Development Plan

The electricity development plan shall:

1. Ensure the principles of the use of natural resources source, energy source in appropriated, economical and highly effective manner;
2. Determine the targets, directions, mechanisms and methods in developing the technical and economical base for the electricity project, ensure the safe and regular supply of electricity, and mitigate social and environmental impacts in electricity business development;
3. Ensure the domestic consumption based on economic and social growth in each period and policy on national socio-economic development;
4. Determine the electricity export based on the priority of electricity consumption and needs in neighboring countries.

The electricity development plans consist of strategic plan and long, medium and short terms plans.

Ministry of Energy and Mines is the principal in coordination with the concerned organizations in setting up the electricity development plans and then, submit them to the Government for consideration and approval.

Article 11. Planning

Planning is the research of the stages and steps of the development of electricity project prior to the conduct of data collection survey, design, construction and operation of electricity project.

Article 12. Survey of Data Collection

The survey of collection of initial information on the socio-economy, environment, geology, hydrology and their impacts shall be the responsibility of the energy and mine sector in collaboration with other relevant sectors and local administrations in order to be served as the technical references for the calculation, design, construction and installation of electrical facilities and operation of electricity projects.

Article 13. Design

The design includes the placement of construction structure and electrical facilities installation.

The stages of design include the initial design, detailed and final design of project as provided for in a specific regulation.

Article 14. Construction and Installation of Electricity

Construction and installation of electricity shall ensure the safety, restriction and reduction of harmful effects to the nature and people's property.

Construction and installation of electricity shall be conducted in accordance with the Lao Electric Power Technical Standards.

Article 15. Electricity Generation

The electricity Generation is the process of the generation for electricity energy from Generator by hydropower, wind power, solar power, biogas and other powers.

The electricity generation shall ensure to use of modern equipments with quality and international standards and shall restrict and mitigate the social and environmental impacts.

Article 16. Electricity Transmission

Electricity Transmission is the process of transmission or conveying the electricity from the generation sites to electricity distribution stations, to cities and users or to abroad.

The transit of electricity through the Lao PDR is a transmission of electricity through Lao territory from other countries to the third countries by the decision of the Government of the Lao PDR. Electricity transit will be transmitted through the National Electricity Transmission Grid with service charges. In the case that the National Electricity Transmission Grid are not able to be transmitted through, the Government shall allow the transmitters to establish the transmission lines system by themselves, but such transmission lines shall be under the management and inspection of Ministry of Energy and Mines and other organizations concerned of the Lao PDR.

The establishment of the transmission line system through the Lao PDR shall ensure the reduction of the environmental impacts and harmful effects to the people and, shall pay the fees for the transit through the Lao territory and other service fees, including the compensation for all damage resulting from the establishment of such transmission line system and shall allow the Lao PDR to use such transmission line system as needed and shall ensure the technical aspects.

Article 17. (Amended)The National Electricity Transmission Grid System

The National Electricity transmission Grid is the high voltage transmission lines system which are connected from one region to other regions throughout the country and connected to the foreign transmission line system in order to ensure the management of generation, transmission and distribution, including the protection of the environment and property of the people.

All sources of electricity generation shall transmit the electricity into the National Electricity Transmission Grid, except for the electricity distribution within precinct of power plant, electricity generation small scale or where there is yet no the National Electricity Transmission Grid.

The investment in the development of the National Electricity Transmission Grid systems shall comply with the Law on Enterprises, Law on Investment Promotion and other relevant Laws.

Besides the National Electricity Transmission Grid, there are other transmission lines systems of other economic sectors, both domestic and foreign sectors

In the case that the National Electricity Transmission Grid are of the ownership of other economic sectors, the Government shall have the rights to have shares in such business as deemed appropriated or may buy such systems and include them into the State property.

Article 18. Electricity Distribution and Principles of Distribution

Electricity distribution is the distribution of electricity from distribution system or from the electricity generating equipment to various types of user's sites which are referred to as the electrical network by means of medium and Low Voltages.

Electricity distribution shall be carried out based on the following principles:

1. Continuous and regular electricity distribution;
2. Broad-based, sufficient and economical distribution of electricity;
3. Safe distribution of electricity;
4. Distribution of electricity to ensure socio-economic development;
5. Distribution of electricity to ensure national defense and public security protection activities.

Article 19. Import and Export of Electricity

The electricity export of as exporting goods shall ensure sufficient supply priority for domestic use, including industrial expansion and national socio-economic development.

Electricity can be imported into the Lao People's Democratic Republic, provided that it is necessary for the country's socio-economic development and with the approval of the government.

Article 20. Service

Service will be conducted by installation, maintenance, inspection, repairing, advice of electrical facilities which shall be given to the users and suppliers.

Article 21. Installation of Electrical Facilities

Individuals, legal entities or organizations undertaking the construction, installation, expansion, repair and maintenance of the electrical facilities shall strictly comply with the Lao Electric Power Technical Standards.

Article 22. Establishment and Compliance with Electricity Technical Standards

The Ministry of Energy and Mines is responsible to establish the Electricity Technical Standards in order to standardize the electrical tools, equipment, transmission lines and electrical appliances; and to ensure the safety and economization and to form of unanimous standards throughout the country to be able to control the quality of all electrical appliances domestically produced and imported from abroad.

Any new installation, expansion, repair, design, construction, operation and maintenance or management of electrical facilities shall be complied with the Lao Electric Power Technical Standards.

Article 23. Remedy for conformance to Technical Standards

In the case that it is found that any electrical installation, expansion, repair, design, construction, electrical facilities have no quality, the energy and mines sector or assigned sector has the right to order the electricity business operators to remedy, repair or rehabilitate to be in conformity with the Lao Electric Power Technical Standards or to order to suspend the use of such power facilities.

**Chapter II
Electricity Business**

Article 24. Electricity Business Operation

All electricity activities provided for in Article 9 of this Law can be operated in the form of electricity business. Electricity business is divided into two types i.e., general electricity business and electricity business in the form of concession.

General electricity business includes: planning, data collection survey, design, construction, installation, distribution and general services.

Electricity business in the form of concession includes: generation and electricity transmission by the public and private sectors.

Any individuals, legal entities or organizations wishing to operate the general electricity business shall ask for the authorization with industry and commerce sector and with the approval of the energy and mines sector; and shall comply with the Enterprise Law.

Any individuals, legal entities or organizations wishing to operate the general electricity business shall ask for the authorization with the planning and investment sector and with the approval of energy and mines sector; and shall comply with the Law on Investment Promotion.

Article 25. Appointment of Chief Engineers

Individuals, legal entities or organizations operating the electricity business shall appoint chief engineers to be responsible for the technical matter in the field of design, construction, installation and operation concerning the power facilities respectively and submit a notice of such nomination to the Energy and Mines sector.

The energy and mines sector is responsible for the determination of conditions and standards of the chief Engineers.

Article 26(Amended). Investment in Electricity Business

Investment in electricity business may be operated in the following forms:

1. Build, operate and transfer (BOT);

2. Build and transfer (BT);
3. Build, own and operate (BOO);
4. State solely operates and represented by the State electricity company.

Individuals, legal entities or organizations wishing to invest in electricity business shall be registered as legal entity in the Lao PDR in accordance with the laws and regulations.

Article 27. Conditions for Establishment of Electricity Enterprise

The conditions for establishment of electricity enterprise are as follows:

1. Experiences in business operation;
2. Financial stability;
3. Sufficiency of electrical engineers and of other specialist concerned;
4. No subject to court sentences by any intentional offenses, especially by economic offenses.

Article 28. Modification of Electricity Business License

Any operator of electricity business who wishes to modify his/her business license shall submit to the energy and mines sector for consideration an application together the reasons whereof.

Article 29(Amended). Concession Procedures

Procedures of the application for electricity business concession are as follows:

1. Signing of Memorandum of Understanding (MOU);
2. Signing of Project Development Agreement (PDA);
3. Signing of Concession Agreement (CA) and other agreements.

The detailed procedures, contents of each task components and authorization granting shall be complied with the specific regulation issued by the energy and mines sector.

The memorandum of understanding or the project development agreements may be extended by decision of the Government. The request for extension of the memorandum of understanding or the project development agreements shall be made one month before their expiration.

The memorandum of understanding may be extended only if the project developers have shown that they have actively and completely discharged their obligations and have a progress in their activities, but in anyway such extension cannot be more than nine months.

The project development agreements may be extended only if the project developers have completed or have an actual progress in their activities as provided for in the project development agreements, provided that each extension cannot be more than six months. For the electricity export project, the extension cannot be made more than three times. The extension of the electricity projects for domestic use cannot be made more than two times.

In the event that the project developers are not able to comply with the conditions and terms as determined in the memoranda of understanding or the project development agreements, such memorandum of understanding or the

project development agreements shall be considered by the Government as deemed terminated and no any compensation shall be paid by the Government.

The main activities, such as dam construction, power plant or water diverse tunnels, including tree logging from the reservoir of the development project can be operate only when the concession agreement is effective.

Article 30 Technical, Economical and Financial feasibility Study

Technical, economical and financial feasibility study is consisted of the following contents:

1. Technical, economical and financial results;
2. Maximum producible electrical capacity;
3. Estimated project value;
4. Estimated project term and the life of the dam or estimated term and life of some other electrical system;
5. Estimated electricity price and market for distribution;
6. Plans and operation phases: construction, installation, and commencement date of electricity supply.

Article 31(Amended). Social, Environmental and Natural Assessment

The social, environmental and natural assessment consists of the following main contents:

1. Assessment of environmental impact in each case, together with proposals of methods and measures for solving or mitigating any adverse impacts on the environment, water sources, land surface or underground, ecology, biodiversity and aquatic and wildlife animals habitats;
2. An estimate of the damage and resettlement of peoples affected by the electricity project;
3. Means to mitigate the impacts to water volume, including the accumulate impacts in the downstream reservoir of the dam;
4. Expenses for restoration of the impacts provided for in paragraphs 1, 2 and 3 of this Article shall be incorporated into the project cost.

Beside of expenses as stipulated in above, the project developer shall be paid for environment tax in compliance with the Laws.

Article 32. Conditions of Concessionaire

The concessionaire shall have the following conditions:

1. Have financial and technical capacity;
2. Have a good and trustworthy business background.

Article 33(Amended). Concession Term

A concession term shall commence from the date of signing of the Concession Agreement and shall be ended in a period not exceeding thirty years from the commencement of operation date (COD).

After the expiration of the concession term, the concessionaire shall transfer the entire activities to the Government in good and operational conditions which are inspected and certified by an independent engineer.

The above mentioned activities shall be transferred without any compensation whatsoever.

Article 34 (Amended). Approval of Project Size

Electricity projects in the Lao PDR are divided into four sizes as follows:

1. Electricity project with an installed capacity from one hundred kilowatts shall be approved by the district or municipal governor on the proposal of the district, municipality Office of Planning and Investment with technical consent of the provincial, city Division of Energy and Mines;
2. Electricity project with an installed capacity more than one hundred kilowatts to fifteen megawatts shall be approved by provincial, city governor on the proposal of the district, municipal Office of Planning and Investment with technical consent of the Ministry of Energy and Mines;
3. Electricity project with an installed capacity more than fifteen megawatts to one hundred megawatts shall be approved by the government on the proposal of the Ministry of Planning and Investment with technical consent of the Ministry of Energy and Mines;
4. Electricity project with an installed capacity more than one hundred megawatts or has a reservoir area with more than ten thousand hectares or has a severe socio-economic and natural impacts shall be approved by Standing Committee of the National Assembly the proposal of the Government.

Article 35. Safety of Operation and Maintenance

Individuals, legal entities organizations that operated the electricity business shall ensure the safety in operation and maintenance of the power facilities of engineering of power plant construction, such as: dam, reservoir, spillway, power hours, transmission line, substation distribution lines and electrical facilities, including the user's site.

To ensure the above mentioned safety, individuals, legal entities organizations that operated the electricity business shall establish the safety rules for Operation and Maintenance in accordance with the Lao Electric Power Technical Standards and then, submit them to the energy and mines sector for consideration.

Article 36. Rights of Concessionaire

The concessionaire of electricity business has the main rights as follows:

1. Lease or concede land necessary for electricity business operation;
2. Receive benefits from the concession;
3. Receive protection under the laws;
4. Receive technical and technological instructions on electricity;

5. Transfer or to assign the electricity business within the remaining period of concession to other persons with the consent of the Standing Committee of the National Assembly, Government or local administrations under the scope of responsibilities provided for in Article 34 of this Law.

Article 37(Amended). Obligations of Concessionaire

The concessionaire of electricity business has the main obligations as follows:

1. Strictly comply with the laws and regulations relating to labor and other relevant laws of the Lao PDR;
2. Operate the business in accordance with the concession agreement, technical, economical and financial feasibility study and socio-economical and natural impacts;
3. Deposit a guarantee with the banks in accordance with the laws and regulations;
4. Have money or assets in the amount equal to the registered capital; as for foreign investors, shall import the registered capital as foreign currency accordingly to the laws and regulations or contracts;
5. Keep account as provided for in the Accounting Law, except for those projects using foreign loans which shall have to comply with the international accounting system;
6. Completely and timely pay royalty, duty and tax obligations and other obligations in accordance with the laws and regulations;
7. Pay compensation for damage in case of causing damages to life, health and property of the people, to environment and to resettlement of people;
8. Provide trainings and technical capacity building and ensure social welfare of the employees, technicians and workers;
9. Record and report results of the implementation of concession agreements according to the period of time, including detailed expenses of the project;
10. Maintain and repair machinery and electrical equipment in order to maintain them in good condition according to the period of time and technical principles related to electricity;
11. Pay all debts and repair machinery and all components to be in good conditions ready for use before the handover of electricity business together with the technical, economical and financial feasibility study and project documents to the State without any compensation upon the expiration of concession or in the event that the concessionaire ceased to operate the electricity business;
12. Coordinate, cooperate and pay contribution in the socio-economic development of the locality where the project is situated.
13. Perform other obligations as provided by the laws and regulations.

Article 38. Expiration of Concession

The concession shall expire in the following cases:

1. End of the concession term;

2. Cessation of the concession before its term based on the proposal of the concessionaire with the approval of the State;
3. Withdrawal of concession rights due to a serious violation of the laws and regulations or failure to comply with the contractual obligations or other obligations provided for in the laws and regulations;
4. Failure to repair or rehabilitate such activities due to the force majeure;
5. Termination of the concession agreement.

Before expiration of concession shall be evaluated the result of project implementation.

Article 39(Amended). Electricity Project with No Requirement for Concession Agreement

The electricity projects with no requirement for concession agreement are as follows:

1. Construction and installation of electrical facilities which are solely undertaken by the State;
2. Building of the hydropower project with an installed capacity of less than fifteen megawatts and with no serious harmful effects to the environment, society and nature, provided such building shall comply with provisions of the relevant laws and regulations;
3. Building and installation of electrical machinery to generate electricity by means of a heating system of less than five hundred kilowatts and building and installation of renewable energy system, such as: underground heating source, solar energy, wind energy, biogas or biomass energy, palm oil, energy from water streams, wastes from wood processing, sugar or paper manufactories and others, with serious harmful effects to the environment, society and nature, provided such building shall comply with provisions of the relevant laws and regulations;

The procedures on granting of license, development, management, conditions and relevant obligations for the electricity projects with need no requirement for concession agreement are determined in specific regulations.

The investment in hydropower project building as provided in paragraph 2 of this Article shall be reserved for the Lao citizens only.

Article 40 Use of Land for Electricity Project

The use of land for electricity project shall be undertaken a follows:

1. The project developer shall clearly determine the limits of land use and methods of compensation for land use in the course of conducting the technical, economical and financial feasibility study, and the environmental, social and natural impacts from the project;

2. The energy and mines sector shall coordinate and cooperate with the natural resources and environment sector and other relevant sectors and local administrations in the planning of land use within the concession areas;
3. The natural resources and environment sector shall provide the land areas for use to the investor in accordance with the Law on Land of the Lao PDR after the investor has obtained the approval.

Article 41(Amended). Contribution to the Fund

In addition to the payment of royalty, duty and tax, the project developer, shall pay its contribution to the Fund for environment protection within the concession areas and surrounding areas, catchment reservoir protection, project downstream areas and socio-economic infrastructure development of the locality where the project is located.

Article 42. Report

Individuals, legal entities or organizations operating the electricity business shall regularly submit their report on the design, construction, operation and safety relating to electricity to the Energy and Mines sector and relevant local administrations in accordance the applicable regulations.

**Chapter IV
Development of Rural Electricity**

Article 43. Promotion of Rural Electricity

Individuals, legal entities or organizations investing in electricity generation, distribution, electricity purchase and sale, investment in construction of electrical transmission lines and distribution line, electrical services or in electrical generation sources by new energy ,renewable energy in order supply the electricity to the remote areas and upland areas, shall receive special promoted policies relating to investment, the same as of other investment promotion activities in accordance with other law on investment and other relevant laws and regulations.

Article 44. Investment in Rural Electricity Development

Parties who are allowed to invest in the development of rural electricity are as follows:

1. Province, Capital, or District, municipality which invest in the construction and installation of electrical facilities by oneself;
2. Individuals, legal entities or organizations, both domestic and foreign, that invest in construction and installation of electrical facilities by assigning the province, Capital, or District, municipality to manage and use;
3. Units of electrical enterprises which operate business on electrical distribution, construction, installation and services shall be in charge of investment in the construction and installation of medium

Voltage, Electrical transformers, low Voltage to the power metering. With regard to the individuals, legal entities or organizations that use the electricity, they shall be responsible for the payment for such use from power metering to inside their houses or inside their offices;

4. The multi-ethnic people shall contribute their assets and labor force in the development of electricity in their own localities;
5. For the remote rural areas, focal areas or areas with exceptional economic difficulties and where nobody has invested in, the State shall have a promotion policy or shall provide the funds for the building of the medium Voltage distribution lines system, electrical transformer, and low Voltage down to the Power metering.

Article 45(Amended). Approval of Rural Electrification Project

The province, Capital, or District, municipality is responsible for the approval of the rural electrification projects which are under its responsibility in accordance with one-door mechanism depending on the size of installed capacity as determined in Article 34, paragraphs 1 and 2 of this Law.

Article 46. The Fund for Rural Electricity Development

The State encourages the establishment of the Fund for Rural Electricity Development in order to contribute in the construction and installation to be gradually and thoroughly expanded aiming at poverty eradication and improvement of the living conditions of the multi-ethnic people.

Sources of the Fund for Rural Electricity Development come from the State budget, domestic and foreign assistance, loans, electricity service providers' contribution, people and other incomes for various activities.

The management and use of the Fund for Rural Electricity Development are determined in specific regulations.

**Chapter V
Electricity Prices**

Article 47. Electricity Prices

The determination of electricity prices shall ensure the socio-economic conditions of the country and shall be suitable to the targets of use and types of the users.

The electricity prices shall be stable and ensure the electricity investment return and development.

The Ministry of Energy and Mines shall cooperate with other sectors and parties concerned to study the electricity price structure of each type to submit the Government for consideration in each period of time.

The electricity prices for the use targets and user's types shall be determined by the Government.

Article 48. Types of Electricity Price

The electricity prices are divided into the following types:

1. The prices of import purchase and export sale;

2. The prices of domestic purchase and sale.

The Government is responsible for the determination of prices for each electricity type.

Article 49(Amended). Rural Electricity Prices

The prices of rural electricity are as follows:

1. The electricity prices to be used in rural areas which are connected to the on-grid system in compliance with the Article 48 of this Law;
2. The purchase and sale of electricity from the projects invested by the State and which have not yet connected with the on-grid system shall be studied and proposed the price policy by the Energy and Mines sector in collaboration with the local administrations concerned;
3. The purchase and sale of electricity from the projects invested by private sectors shall be proposed by the relevant investors in collaboration with the Energy and Mines sector and other sectors concerned and then, submit to the local administrations concerned for consideration.

Chapter VI

Rights and Obligations of

Electricity Producers, Distributors and Users

Article 50(Amended). Rights and Obligation of Producers

The electricity producers have the main rights as follows:

1. Conclude contracts for electricity purchase and sale with the users in accordance with the laws and regulations;
2. Transfer or handover of electricity activities to other persons with the State's approval;
3. Receive the electricity service charges, and protection of their rights and benefits;
4. Request for cooperation from the Energy and Mines Sector and local administrations concerned in case of necessity.

The electricity producers have the main obligations as follows:

1. Strictly comply with the Safety Rules for Operation and Maintenance, and with the Lao Electric Power Technical Standards;
2. Pay the royalty, duty and tax and other obligations in accordance with the laws and regulations and the concession agreement;
3. Continuously and regularly produce the electricity current;
4. Pay compensation for damage of land and crops, and for resettlement, allocation of residences and places of livelihoods to the people affected by the electricity generation.

Article 51. Rights and Obligations of Electricity Distributors

The electricity distributors have the main rights as follows:

1. Collect fees for electricity distribution and services;
2. Determine measures to ensure the safety of the people and the environment relating to electricity distribution;
3. Inspect the construction, installation and use of electricity of electricity users;
4. Warn and lodge a claim against the electricity users who seriously violate electrical regulations or caused or will cause damage to the electricity distribution;
5. Suspend electricity distribution to users who seriously violate regulations on the use of electricity;
6. Refuse the request of such individuals, legal entities or organizations wishing to use their distribution lines when deemed there is no technical safety.

Electricity distributors have the following obligations:

1. Timely, thoroughly and regularly provide electricity to the users with quality and conformity with the Lao Electric Power Technical Standards;
2. Notify the electricity users in advance each time when electricity supply will be cut off, except for emergency case;
3. Establish and provide the instruction on regulations regarding the use of electricity, give necessary information on safety to the users and responsibly and timely provide service to electricity users;
4. Use modern and qualified electricity equipments;
5. Ensure the safety and social welfare of electricity staffs and social safety;
6. Pay duty and tax and other obligations in accordance with the laws and regulations;
7. Pay compensation for damage caused by electricity distributions which created harmful effects to the life, health and property of the people and environment;
8. Authorize the individual, legal entities or organization to use their electricity distributions lines in accordance with the Lao Electric Power Technical Standards;
9. Regularly summary and report the result of electricity distribution and management in accordance with the Lao Electric Power Technical Standards to the Energy and Mines sector;
10. Perform other obligations as provided by the laws and regulations.

Article 52. Rights and Obligations of Electricity Users

The electricity users have the main rights as follows:

1. Have safety in using the electricity;
2. Obtaining the convenient service in installing and repairing the electricity in the house or office;
3. Obtaining instruction of ~~on~~ electricity usage;

4. Propose the inspection and recalculation of electricity price when it is deemed incorrect;
5. Propose or claim the electricity business operator who has caused damage resulting from the uninsured service and electrical technique.

The electricity users have the main obligation as follows:

1. Be responsible for the maintenance and change of the electrical conductors and electrical appliances in their houses or offices;
2. Comply with the regulations and instructions on electricity usage;
3. Economically and effectively use of electricity;
4. Regularly and fully pay the fees for electricity use and service;
5. Facilitate to the staff and electrical authority to install, repair, inspect and record of electricity usage figures;
6. Immediately notify electricity officials when an electricity-related irregularity is founded;
7. Contribute to the protection of electrical facilities.

Chapter VII

Prohibitions

Article 53. Prohibitions for Electrical Staff and Officers

The electrical Staff and Officers are prohibited to take the following actions:

1. Opportunistically use of position and take bribes from electricity business for personal interests;
2. Abuse of powers which cause damage to the interests of the State or collectives or legitimate rights and benefits of the people;
3. Abandon one's duties and responsibilities relating to electricity business assigned by relevant organizations;
4. Disclose of the State or official secrets on electricity business;
5. Falsify electricity business-related documents;
6. Operate or enter in operation of electricity business in all forms;
7. Use of violence, menace, threat and use of illegal measures;
8. Illegal purchase and sale of electrical facilities;
9. Take other actions which are contradicted with the laws and regulations.

Article 54. Prohibitions for Business Operators

The domestic and foreign business operators are prohibited to take the following actions:

1. Conduct the survey and develop electricity business without authorization;
2. Undertake the construction and installation and put in operation of the non-standardized electrical facilities and without authorization;
3. Create the obstruction or delay the implementation of the electricity development projects of which they have obtained authorization;

4. Use or give incorrect information on survey, design, construction and operation of electricity business;
5. Pay or give the bribes to the staff, officers and the people;
6. Use of violence and refer to the names of other persons to threaten the staff, officers and the people;
7. Purchase and sale of electrical equipments illegally and non-standardized;
8. Violate the rights and duties of the local administrations relating to electricity business;
9. Take other actions which are contradicted with the laws and regulations.

Article 55. Prohibitions for the People

The people are prohibited to take the following actions:

1. Trespass or destroy, mainly, the protected forests, water source forests reserved for the electricity production in order to ensure that the water shall not drawn down;
2. Trespass the premises, steal or destroy the electrical equipment and components;
3. Undertake the construction, resettlement or production nearby the surrounding areas of the location of the electrical facilities without authorization;
4. Associate with the business operators, staff or officers to trespass into the premises and steal or destroy the electrical facilities;
5. Obstruct the performance of duties of the electrical staff and officers;
6. Use of violence and refer to the names of other persons to threaten the staff and officers or others_ for personal interests;
7. Illegal purchase and sale of electrical;
8. Take other actions which are contradicted with the laws and regulations.

Article 56. Prohibitions for Organizations and Other Persons

The organizations and other persons are prohibited to take the following actions:

1. Abuse of power, use of violence and refer to the names of other persons to threaten the electrical staff and officers for illegitimate interests;
2. Opportunistically use of position to seek for personal or group interests from electricity business;
3. Operate electricity business by oneself or have partnership without authorization;
4. Authorize survey, design, undertake the construct or operation relating to electrical facilities in contradiction with the procedure and laws and regulations;
5. Delay the case proceedings of the disputes relating to electricity business;
6. Obstruct the performance of duties of the electricity officers;

7. Operate electricity business without authorization in accordance with the laws;
8. Produce, assembly, purchase, sell, distribute, import electrical facilities which are not standardized or with low quality;
9. Take other actions which are contradicted with the laws and regulations.

Chapter VIII Dispute Resolution

Article 57. Forms of Dispute Resolution

The resolution of disputes may be conducted in the following forms:

1. Mediation or conciliation;
2. Administrative resolution;
3. Resolution by arbitration panel;
4. Court decision;
5. Resolution of international characteristic.

Article 58. Mediation and Conciliation

In the event that the dispute on electricity business has arisen, the disputing parties may negotiate, mediate or conciliate between themselves.

Article 59. Administrative Resolution

In case of failure to resolve the dispute by mean of mediation, the disputing parties may present the dispute to the energy and mine sector from which they have obtained the authorization to resolve the dispute.

Article 60. Resolution by arbitration panel

In case when the energy and mine sector failed to mediate or conciliate the disputes, the disputing parties may submit such dispute to the arbitration panel for consideration and resolution in accordance with the laws and regulations.

Article 61. Court Decision

In the case that the dispute relating to electricity business cannot reach an agreement between the disputing parties by mean of administrative resolution or arbitration, any of the disputing parties has the rights to request the people court to consider and decide such dispute in accordance with the laws and regulations.

Article 62. Resolution of International Characteristic

The resolution of disputes relating to electricity business between the domestic investors and foreign investors or between foreign investors themselves in the Lao PDR or between foreign investors and the Lao Government shall be referred to the domestic or foreign or international arbitration bodies as may be agreed by the disputing parties.

Chapter IX Management and Inspection

Article 63. Management Organizations

The Government centrally and unanimously manages the electrical activities throughout the country by assigning the energy and mines sector to be the principal in coordinating with other relevant sectors, such as the sectors of planning and investment, water resources and environment, national defense, public security, finance, local administrations and other sectors concerned.

The electricity activities management organizations are comprised of:

1. Ministry of Energy and Mines;
2. Provincial, City Divisions of Energy and Mines;
3. District, Municipality Offices of Energy and Mines.

Article 64 (Amended). Rights and Duties of the Ministry of Energy and Mines

In the management of the electricity activities, the Ministry of Energy and Mines has the following rights and duties:

1. Being the secretary in elaborating the strategic plans, electricity development plans, laws and regulations on electricity activities to submit the Government for consideration;
2. Disseminate and publish the laws and regulations on electricity activities and development plans;
3. Direct and monitor the implementation of electricity activities throughout the country;
4. Direct the data collection survey and statistic registration on electricity sources throughout the country;
5. Technically manage and monitor the electricity business of both public and private sectors;
6. Direct the environmental protection and electrical energy source preservation;
7. Study and research and give technical advice on the investment in electricity businesses within the scope of its responsibility;
8. Study on the extension, suspension or withdrawal of the electricity business licenses of the investors;
9. Give instructions to the electricity business operators on the import of electricity, electrical facilities;
10. Build, improve and upgrade the knowledge capacity of technical and managerial staffs on electricity development activities;
11. Approve the appointment of the Chief Engineers under its responsibility on the proposal of the electricity business operators;
12. Study and research the electricity prices and submit them to the Government for consideration;
13. Coordinate with other sectors and relevant local administrations in management of electricity business;

14. Contact and cooperate with international organizations relating to electricity activities and seeking sources of funds for electricity development;
15. Regularly summarize and report the result of the implementation of electricity activities to the Government;
16. Exercise other rights and perform other duties on electricity activities as provided for in the laws and regulations.

Article 65 (Amended). Rights and Duties of the Provincial, City Divisions of Energy and Mines

In the management of the electricity activities, the Provincial, City Divisions of Energy and Mines has the following rights and duties:

1. Organize and develop strategic plans, electricity development plans, direct and manage electricity activities within the scope of their responsibilities;
2. Disseminate and publish the laws and regulations on electricity activities and electricity development plans in their locality;
3. Technically manage and monitor the electricity business of both public and private sectors;
4. Organize the data collection survey, collect the statistics and protect electricity energy sources;
5. Study and give instructions on the operation of electricity business of installed capacity of less than fifteen megawatts relating to the electrical facilities;
6. Study and research and give technical advice on the investment in electricity activities within the scope of their responsibility;
7. Approve the appointment of the Chief Engineers under their responsibility on the proposal of the electricity business operators;
8. Protect environment and preserve electrical energy sources;
9. Coordinate with other sectors and relevant local administrations in management of electricity business;
10. Contact and cooperate with international organizations as assigned by Ministry of Energy and Mines or Provincial, City Administrations;
11. Regularly summarize and report the result of the implementation of electricity activities to their higher level organization;
12. Exercise other rights and perform other duties on electricity activities as assigned by Ministry of Energy and Mines or Provincial, City Administrations.

Article 66 Rights and Duties of District, Municipality Offices of Energy and Mines

In the management of the electricity activities, the District, Municipality Offices of Energy and Mines has the following rights and duties:

1. Organize the implementation of plans, projects, laws and regulations, and instructions of the Ministry of Energy and

- Mines and Division of Energy and Mines relating to electricity activities;
2. Disseminate laws and regulations on electricity and regulations of safety rules for operation and maintenance to the electricity business operation in accordance with their responsibilities;
 3. Give instructions on the operation of electricity business of installed capacity of less than one hundred kilowatts relating to the electrical facilities;
 4. Give instructions on the operation relating to the electrical facilities and collect statistics of electrical-related serious accidents;
 5. Coordinate with other sectors and relevant local administrations in management of electricity business;
 6. Regularly summarize and report the result of the implementation of electricity activities to their higher level organization;
 7. Exercise other rights and perform other duties on electricity activities as assigned by Provincial, City Divisions of Energy and Mines or District, municipality Administrations.

Article 67. Rights and Duties of Other Sectors and Parties

In the management of electricity activities, other relevant sectors and local administrations shall have the rights and duties to coordinate with the Energy and Mines Sector in accordance with their roles.

Article 68(Amended). Inspection Organizations

The Inspection organizations are comprised with the internal inspection organizations which are the same organizations as of the electricity activity management organizations as provided for in Article 63 of this Law; and external organizations.

In addition, there is also technical inspection committee.

All expenses in the conduct of technical inspection and audit relating to electricity business shall be calculated and included in the projects costs.

Article 69. Technical Inspection Committee

The technical inspection committee is comprised of the Energy and Mines Sector and other concerned sectors and is appointed by the Minister of Energy and Mine in order to ensure that the construction, installation, and operations of an electricity business are technically sound, ensure safety, and protect the environment, society and nature.

The technical inspection committee shall be automatically terminated after having completed its duties as assigned.

Article 70. External Inspection

The objective of the external inspection is to inspect the performance of duties of the management and inspection organizations in order to make them strengthened, transparent and fair.

The external inspections are as follows:

1. Inspection of the National Assembly as provided for in the Law on Oversight and Supervision of the National Assembly;
2. Inspection of the Government inspection organizations and the anti-corruption as provided for in the Law on State Inspection;
3. Audit of the State audit organizations as provided for in the Law on the State Audit;
4. Monitor and inspection by the Public.

Article 71. Contents of Inspection

The inspection has its aims to render the electricity activities effective, to ensure the technique, safety and environmental protection and to ensure that the electricity business is operated in accordance with the laws and regulations.

The electricity activity inspection has the following contents:

1. Compliance with the procedures of electricity business operation;
2. Compliance with the time schedule of electricity business operation;
3. Compliance with the economical, technical and financial feasibility study on electricity business;
4. Compliance with the action plans on electricity business;
5. Compliance with technical safety standards;
6. Compliance with laws and regulations and agreements on electricity business;
7. Compliance with the standards for electrical equipment;
8. Design, construction, installation and management of electrical facilities;
9. Application of measures to mitigate the environmental impacts;
10. Compensation for damage against the life, health, property of the people and environment;
11. Financial, policy and social welfare systems;
12. Registration and records of the electricity consumption figures.

Article 72. Forms of Inspection

The inspection of electricity activities has three forms as follows:

1. Regular inspection;
2. Inspection with prior notification;
3. Emergency inspection.

Regular inspection is an inspection carried out in regular manner in accordance with the fixed time.

Inspection with prior notification is an inspection conducted out the plans when deemed necessary and with an advance notice to the targets to be inspected.

Emergency inspection is an urgent inspection without any prior notification to the targets to be inspected.

Chapter X

Policies towards Persons with Outstanding Achievements and Measures against Violators

Article 73. Policies towards Persons with Outstanding Achievements

Individuals, legal entities or organizations with outstanding achievement in implementing this Law, such as in carrying out electricity activities and environment protection shall receive rewards and other policies in accordance with the laws and regulations.

Article 74. Measures against Violators

Individual, legal entities or organizations that violated this Law shall be educated, warned, disciplined, fined, paid the compensation for damage or criminally punished depending on the gravity of their acts.

Article 75. Re-educational Measures

Individuals, legal entities or organizations that have violated law on electricity, prohibitions or failed to comply with electricity technical standards causing not serious damages or failed to timely report the result of electricity business operation shall be re-educated and warned.

Article 76. Disciplinary Measures

Electricity officers or staffs who have violated the laws and regulation and prohibitions on electricity by committing not a serious offense and not a criminal offense that cause damage amounted less than one million kips, and have involuntary reported on their own acts and run away from their wrong doings shall be subjected to the disciplinary measures as follows:

1. Warning on the committed wrong doings and record them into the biography;
2. Suspension of upgrade, salary levels and rewards;
3. Removal of position to another lower position;
4. Dismissal without giving any policies.

The disciplined person shall return such property which has been illegally acquired back to the State.

Article 77. Fines

Individuals, legal entities or organizations that have violated electricity laws by which damage has caused, but such violation could not constitute a criminal offense, shall be fined by any one of the following acts:

1. Operating an electricity business without approval;
2. Constructing, installing electrical facilities without approval;
3. Installing electricity into one's home without approval;
4. Allowing others to draw electricity from one's home without approval;
5. Modifying power metering;

6. Failing to adhere to electric power technical standards and safety standards;
7. Failing to adhere to standards to limit adverse environmental impact;
8. Failing to pay taxes and duties and other obligations in accordance with the laws and regulations;
9. Failing to pay compensation for damage caused to the environment, and to people's lives and property.

The fining rates are determined in specific regulations.

Article 78. Civil Measures

Individuals, legal entities or organizations that have violated this law and have caused damage to other persons shall pay compensation for damages caused.

Article 79. Penal Measures

Any individual committing a violation of laws and regulations related to electricity which constitutes an offence shall be prosecuted and punished accordingly to the Penal Law.

**Chapter 12
Final Provisions**

Article 80. Implementation

The government of the Lao People's Democratic Republic shall implement this law.

Article 81(Amended). Effectiveness

This Law shall enter into force after sixty days from the date of the promulgating Decree issued by the President of the Lao People's Democratic Republic.

This Law replaces the Law on Electricity, No. 03/NA, dated 8 December 2008.

This Law has no retroactive effects for such electricity projects which have been approved before this Law takes effects.

Any regulations, provisions contradicted with this Law shall be cancelled.

President of National Assembly

5.2 ANNEX II: NATIONAL POLICY ON ENERGY EFFICIENCY AND ENERGY CONSERVATION



The Lao People Democratic Republic
Peace independent Democracy Unity Prosperity

GOVERNMENT
No.209/gov

Ref.

Vientiane capital, date
04.07.2016

Decree

On endorsement of

National Policy on Energy Efficiency and Energy Conservation of Lao PDR

(Not official translation, for project reference only)

- Based on the Law on Government of Lao PDR (revised version) No. 69/ສພຊ, dated 12 December 2015
- Based on the Electricity Law (revised version) No. 03/ສພຊ, dated 20 December 2011
- Based on resolution of government ordinary meeting for October 2015
- Based on Proposal by Minister of Ministry of Energy and Mines No. 044/, dated 29 February 2016

Government issues decree to:

Article 1. Endorse and announce “National Policy on Energy Efficiency and Energy Conservation of Lao PDR” that Government has considered and agreed in the meeting held on 22-23 October 2015

Article 2. Authorize Ministry of Energy and Mines responsible for coordination with the line ministries, ministry-equivalent organizations and local authorities to ຄົ້ນຄວ້າ ບຸຂະຫຍາຍ ແລະ ຫຼໍ່ລົດ ແລະ ຫຼໍ່ລົດ ແລະ ຫຼໍ່ລົດ ແລະ ຫຼໍ່ລົດ and effectively implement this policy on National Policy on Energy Efficiency and Energy Conservation of Lao PDR

Article 3. All relevant ministries, ministry-equivalent organizations, Vientiane capital, Provinces and other stakeholders must cooperate and implement this decree

Article 4. The decree is enforced from the date ...

On behalf of the
Government
Prime Minister

(Thongloun Sisoulith)
(signed and sealed)

The Lao People Democratic Republic
Peace Independent Democracy Unity Prosperity

National Policy
on
Energy Efficiency and Energy Conservation

Vientiane Capital, 2016

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Preface by Minister of Ministry of Energy and Mines

During the past 40 years of National Protection and Development under leadership of Party, our country has achieved inclusive, stable and continuous development, particularly during recent years, economic development reached average rate of 7-8% per annum. In this relation, GDP of energy sector grew at 9,22% and accounted for 12% of total GDP. At present, power industry has become the important basis for national economic system.

Power resources development is based on exploitation of national water resources, which is the crucial national potential, aiming at effective regulation and utilization of natural resources in direction of environmental friendly development, clean energy production, green and sustainability.

During the past years, rapid and sustainable national development has led to increase of energy demand of the country in average at 3,5% per year, reached 2.510 kTOE in 2014. Of those, traditional biomass accounted for 49,1%, Oil 32,7%, Electricity 12,6%, Charcoal 5,4% and Coal 0,2% and it was estimated that country's energy demand will reach 4.320 kTOE by 2030.

Moreover, development of energy industry should be inclusive and continuous in order to support energy production for meeting increasing domestic demand and power export needs. Meanwhile, development of renewable energy resources should also get further attention.

In the X General Party Congress, our party has defined overall direction and set relatively high targets for 2030, 2025 and 2020 to move country forward. In this relation, national economic structure has been changed to industrialization, modernization and sustainability orientation, giving strong factors and conditions for regional and international economic integration.

Therefore, based on above mentioned needs, government hereby announces "National Policy on Energy Efficiency and Energy Conservation" in order to achieve energy industry development stable, sustainable and renewable.

On behalf of macro management in energy and mining sectors, I do request to all organizations in charges to make this "National Policy on Energy Efficiency and Energy Conservation" implemented consistently and effectively.

Chapter 1 Introduction

Lao PDR is rich of natural resources that to serve a potential for energy production for domestic supply and power export for foreign exchanges. At the same time, there is necessary to import power and other energy sources each year for meeting national social and economic development needs for achieving growth targets as set by government. While social social-economic development reached higher level, the social and economic sectors have higher demand for energy, particularly for period 1990 – 2014, energy consumption of Lao PDR grew at a rate of 3.5% per year, reached 2,510 kTOE in 2014, where biomass accounted for 49.1%, followed by fuel oil (32.7%), electricity (12.6%), charcoal (5.4%) and coal (0.2%). It was estimated that energy demand of Lao PDR will reach 4,320 kTOE by 2030 for meeting national social-economic development needs.

Status of energy consumption for a period 1990-2014 can be summarized as following:

Electricity: electricity consumption grew at 14% per year, reached 3,791 GWh and Power capacity demand of 744 MW in 2014, accounted for 12.6% of total energy consumption. In year 2014, energy consumption by industrial sector accounted for 41.2% of total electricity consumption, followed by residential sector (37.6%), commercial (14.3%), governmental offices (5.4%), agriculture(0.9%), entertainment (0.3%) and International organizations (0.3%). Number of electrified households reached 88% in 2015. At present, Lao PDR has totally 36 generating facilities, including 33 hydropower plants (excluded small scale hydropower with capacity less than 1 MW), 1 coal fired thermal power plant and 2 sugarcane fired thermal power plants, with total installed capacity of 6,264.8 MW and total energy production of 33,315 GWh/year. It is estimated that domestic power demand will reach 7,093 MW by 2030. It is observed from the past statistics on electricity consumption that domestic electricity consumption and power import are both increasing, due to (1) electricity generation sources mostly are hydropower, which, as a rules, have seasonal fluctuation and; (2) current generating capacity for domestic supply cannot cope with rapid increase of electricity demand; (3) some remote bordering areas are cheaper to be connected to neighboring country's grid instead of national grid extension.

Fuel Oil: According to statistical data for period of 1990-2014, demand for fuel oil products increased 6.5% per year and accounted for 32.7% of total energy consumption of the country in 2014. In 2014 oil import reached 1,192 million liters, where diesel accounted for 78%, followed by gasoline (18.6%), Aviation fuel (2.2%) and boiler oil (1.2%). The main fuel oil consumers include transportation sector (96.3%), agriculture (2.6%) and industry (1.1%).

Coal: During 1997-2014, coal consumption grew at an average rate of 9.8% per year and shared 8% of total energy demand in 2014. Industry is the main coal consumer (100%). Actual Coal production reached 312,000 tons in 2014, including anthracite (50,000 tons) and subbituminous (262,000 tons). It is expected that coal production will reach 21 million tons/year by 2020, including 2 million tons of anthracite and 19 million tons of subbituminous.

Biomass: During a period of 1990-2014, biomass use in term of traditional firewood and charcoal grew at a rate of 1.5% and 3.7% respectively. Biomass energy accounted for 54.5% of total final energy consumption in 2014, where firewood consumption by residential sector shared 81.2%, followed by commercial (14.5%) and industrial (4.3%). Shares in charcoal use by commercial and residential sectors were 51.3% and 48.7% respectively.

Overall energy consumption statues by sectors during period 1990-2014 can be summarized as following:

Residential sector: Residential sector's energy consumption grew at 2% per year and shared 47.4% of total final energy consumption in 2014, and observed with decreasing trend of shares.

Transport sector: Sector's energy consumption grew at an average rate of 6.3% per year and shared 31.3% of total final energy consumption in 2014 with increasing trend.

Commercial: Energy consumption in average grew at 2.8% per year and shared 12.3% of total final energy consumption in 2014, with negligible small changes.

Industrial: Energy consumption by the sector grew in average 7.1% per year, share proportion increased from 3.5% in 1990 to 8.0% in 2014 of total final energy consumption.

Agriculture: Sector's energy consumption grew in average 14.3% per year, having share increased from 0.2% in 1990 to 1% of total final energy consumption in 2014.

Energy is the main and crucial factor for the world's population for meeting the needs of social and economic development. Population increase and economic growth have led to increasing use of fossil fuel, which is being depleted and cause the climate changes. Therefore, many countries in the world have revised their energy policy by making more emphases on energy efficiency and energy conservation, as well as developing energy resources, which are renewable and environmental friendly. Learning from that trend, our country should take more serious consideration on energy efficiency and energy conservation by setting up national policy as the basis for implementation of energy management and promotion of efficiency and energy conservation programs.

1. Objectives

This policy defines overall principles and measures to efficiently and effectively manage and promote energy efficiency and energy conservation toward green growth and environmental friendly, to contribute creation of stable and flexible energy supply, capital accumulation and for ensuring continuous national social-economic development.

The policy is to encourage, promote and raise public awareness of all ethnic and social groups to be conscious and have ownership for efficient use of energy and energy conservation as the mean for household and national capital saving.

The policy is to introduce energy efficiency and energy conservation matters in to agendas of national social-economic development.

2. Targets

This policy aims at 10% reduction of final energy consumption by 2030 as compared to Business As Usual (BAU) case.

3. Benefits of energy efficiency and energy conservation

Energy efficiency and energy conservation is to bring the following benefits:

A. Social-economic benefits

Energy efficiency and energy conservation means using energy properly and maximized benefits, that effective and efficient use of energy shall help reduction of energy costs and hence, to increase competitiveness of Lao products for export and domestic consumption as well.

Moreover, this policy is also to promote cost avoidance/savings for fuel and electricity import, promote and encourage investment by private sector, create jobs, reduce public investment in energy generating facilities and accumulative energy saving costs as contribution to the overall social-economic development needs.

B. Environmental benefits

Energy efficiency and energy conservation shall contribute mitigating environmental impacts associated with reduction of energy use and energy production due to less emission produced, especially greenhouse gases, which are the causes of climate changes, and additional revenue can be created through climate finance mechanism.

Government promotes energy efficiency and energy conservation activities to be able to access to international carbon financing exchange through the mechanism that Lao government has ratified and become membership.

Chapter 2 Contents of Policy on energy efficiency and energy conservation

1. Scope of the policy

This policy concerns all individuals, legal entities, Public organizations from central to local levels, state enterprises, private factories and Lao citizens of all ethnic and social groups in Lao PDR.

2. Policy on Energy Efficiency and Energy Conservation

This policy covers following sectors: a) industrial, b) residential, c) commercial and public buildings, and d) transport.

A. Industrial

Policy on energy efficiency and energy conservation aims at promoting the use of energy appliances, machines and systems which are energy efficient in accordance to Minimum Energy Performance Standards (MEPS), particularly electric motors and other appliances. This policy also promotes establishment of energy service companies (ESCO) as well as improvement of energy management systems in factories, promotion of energy service to medium and small industries in order to reduce energy costs subsidies, energy self-reliance and in long term aim at international carbon credit exchanges.

In order to encourage energy efficiency and energy conservation in industrial sector, there requires policy measures to be implemented, particularly to praise for successes and to punish for failures, to promote investment on energy efficient equipment, machines and production systems by providing incentives appropriately.

B. Residential sector

Adopt of Minimum Energy Performance Standards (MEPS) for household appliances; setup regulations, protocol and mechanism for energy appliances' quality testing, monitoring and verification; establish Energy efficiency labels for energy appliances and adjust import regulations accordingly; promote use of energy efficient appliances by providing incentives appropriately as well as providing of technical service, monitoring and verification of distribution and use of energy appliances for compliance with the set standards.

Promote construction of energy efficient residential housing that compliant with Energy Building Codes and maximally utilize natural energy sources.

C. Commercial and office building

To collect Data and setup database on existing commercial and office buildings as well as planned for improvement and new construction. Determine minimum energy performance standards, development of Building Codes for commercial and office buildings.

Promoting design and improvement of energy efficient commercial and office buildings by providing incentives appropriately, as well as disseminate new energy saving construction materials and technology.

D. Transportation sector

To apply fuel standards and fuel quality testing, promote energy efficient vehicles use by providing appropriate incentives.

To promote energy efficient driving by improving quality of driving schools, providing training on driving awareness and good manners.

To develop and improve efficiency of transportation by applying effective traffic control system, transportation infrastructure improvement, improvement of quality and strictness in vehicle technical control, especially in relation to used vehicles.

To promote and develop transport alternatives, such as biofuel use, electric cars, public transport use, etc.

3. Incentive policy for investor

Government encourages and promotes domestic and foreign investors to invest in to energy efficiency of transport sector, and the investors shall receive appropriate supports and obligations that are compliant to the laws of Lao PDR, such as access to information, capital sources, etc.

4. Energy efficiency and energy conservation funds

Funds for energy efficiency and energy conservation come from different sources, such as government budget, rural electrification fund (REF), which is to be converted to energy development fund), feasible international grants and funding sources.

Chapter 3 Implementation measures

1. Organizational arrangement

Centralized and united government administration over nationwide promotion of energy efficiency and energy conservation by authorizing Ministry of Energy and Mines to coordinate directly with all concerned public and private organizations.

Organizational arrangement for Energy efficiency and energy conservation comprises:

Ministry of Energy and Mines

Provincial and Vientiane capital Departments of Energy and Mines

District Offices of Energy and Mines

2. Implementation roadmap:

Energy efficiency and energy conservation implementation roadmap contains following terms:

Short term (2015-2020): develop National Policy on Energy Efficiency and Energy Conservation; Issue the Prime Minister decree on Energy Efficiency and Energy Conservation; Create and implement coordination mechanism in promotion of Energy Efficiency and Energy Conservation matters; develop strategic plan for Energy Efficiency and Energy Conservation promotion; development financial mechanism for supporting Energy Efficiency and Energy Conservation promotion, develop energy standards, such as Minimum Energy Performance Standards, Energy efficiency labels, Energy Efficiency and Energy Conservation regulations for

industrial, residential, commercial and office buildings and transport sectors; capacity development for responsible organizations, public awareness raising and implementation of pilot Energy Efficiency and Energy Conservation programs.

Midterm (2021-2025): Implement coordinating mechanism for Energy Efficiency and Energy Conservation activities, announce financial mechanism for supporting Energy Efficiency and Energy Conservation implementation, promote energy services, announce energy standards, such as Minimum Energy Performance Standards, Energy efficiency labels, energy regulations for industrial, residential, commercial-office buildings and transportation sectors; expend pilot projects and further develop human resources and raise public awareness on Energy efficiency and energy conservation, develop Energy efficiency and energy conservation law

Long term (2026-2030): review lessons learnt from implementation of Energy efficiency and energy conservation promotion for developing/improving laws, regulatory and guidelines; further implementing EE&C plans, public awareness raising, promote of investment in energy efficiency and energy conservation, develop energy services and capacity building for matching social-economic development levels in each period.

3. Implementation measures (Plan for actions)

- To Create policy, laws, regulation, strategic and action plans for Energy efficiency and energy conservation promotion in cooperation with all organizations concerned;
- To Build capacity of organization responsible for energy efficiency and energy conservation;
- To Conduct public awareness campaigns on Energy efficiency and energy conservation promotion.
- To Develop database energy efficiency and energy conservation
- To Coordinate relevant organization for readjust import of energy appliances
- To Promote Research and Development, conducting demonstration project on energy efficiency and energy conservation technology
- To Increase regional and international cooperation on energy efficiency and energy conservation matters
- To Learn international experiences and adjust for matching Lao PDR context
- To include energy efficiency and energy conservation matters into development agendas of government

Chapter 4 Monitoring and Verification

Ministry of Energy and Mines is responsible for coordination with relevant sectors and local authorities in monitoring-verifying implementation of this policy for ensuring that all energy efficiency and energy conservation programs and projects are compliant with the laws, policies, strategic and action plans of Lao PDR.

5.3 ANNEX III: PRIME MINISTER DECREE ON EE&C

(Unofficial translation, for this project use only)

The Lao People's Democratic Republic

Peace Independence Democracy Unity Prosperity

Government

No.: 232/GOV

Vientiane, May 11, 2020

DECREE

on

Energy Efficiency and Energy Conservation

(Refer to relevant laws on Government, Electricity)

The Government is issuing a decree

Chapter 1

General Provisions

Article 1. Objectives

This Decree determined principle, regulation and measures on management, monitoring and inspection of energy efficiency promotion and implementation activities for the high effectiveness with the aims to reduce energy costs and environmental impacts, to promote green growth development and raise living conditions of Lao people of all ethnic groups, and to contribute savings to national social-economic development.

Article 2. Meaning of Energy efficiency and energy conservation

Article 3. Terminology/Definitions

Article 4. National policy on energy efficiency and energy conservation

Article 5. Principles of energy efficiency and energy conservation

Article 6. Energy efficiency and energy conservation methods

Article 7. Scope and designation

Article 8. International cooperation

Chapter 2

Energy Efficiency and Conservation of Factory

Article 9 The factories are classified in to Undesignated and Designated Factory

Article 10 Undesignated factories are to apply on voluntary basis the EE&C methods as prescribed in article 6;

Article 11 Designated factories are those:

- factories with installed transformer capacity (single or in summary) from 1000 kW or 1,175 kVA up
- Factories that consumes power from thermal power producer from 20 MJ up or total energy consumption of all kinds of energy sources from 478 TOE up

Designated factories are to apply EE&C measure as prescribed in article 12

Article 12 EE&C measures in factories (10 measures):

1. Fuel combustion improvement
2. Production Operation system improvement
3. Thermal and cooling production line improvement, including thermal energy conversion to mechanical
4. Energy losses protection in energy consuming appliances/machine
5. Heat waste recovery and reuse
6. Improvement of thermal-electric conversion process
7. High energy performance substitution (?) or use other energy source with higher energy performance (? *Confusing sentence*)
8. Use electrical equipment or appliances with higher efficiency, including operation control and materials that help improving energy performance or conservation
9. Use renewable energy to conserve traditional energy sources
10. Apply other measures with high energy performance in EE&C

Article 13 Energy management in designated factories (8 steps)

1. Appointment of EM staffs and Establishment of EM team
2. Preliminary assessment of energy management in the factory
3. Development of energy policy and communication to all factory staffs
4. Assessment of energy saving potential
5. Prescribe EE targets and plan, training and action plans
6. Conduct energy audit and evaluation as prescribed under clause 5 of this article
7. Monitoring, verification and evaluation of EE&C implementation
8. Review, analysis and improvement in EM of the factory

Article 14 Targets and action plan set up for designated factories

Designated factory must set up its target and action plan as % of current total energy consumption level or specific energy consumption per product/service, to set timeframe, investment, and expected results from implementation of the plan, as well as organizing participatory training and EE&C promotion activities

Article 15 Responsibility of undesignated factories' owner

1. To organize EE&C appropriately in accordance to EE&C measures

2. Provide relevant information to energy auditors team if necessary
3. To Monitor and verify energy consumption of their own factories and report on regular basis

Article 16 Responsibility of designated factories' owner

1. To appoint factory's energy manager(s) of given number, qualification and responsibilities accordingly to MEM guidelines
2. To establish energy management team at factory
3. To implement EE&C measures accordingly to specific and energy management methods of designated factory as prescribed in articles 12-13
4. To conduct Energy audit, get verification and submit report to MEM by March of every year
5. To cooperate with and provide data to external auditors if will be any
6. To bear all costs of monitoring, technical verification, natural and social environment relevant authorized bodies
7. To comply all regulation of designated factory and all regulations/guidelines/ instruction issued by MEM

Chapter 3

Energy Efficiency and Conservation in building

Article 17 EE&C in buildings

Efficient use of energy in residential, service and entities according to permitted construction and use in accordance to methods prescribed in article 6

EE&C of Buildings divided into two subcategories:

1. Undesignated buildings
2. Designated buildings

All Buildings shall perform EE&C measures in accordance to undesignated and designated building categories

EE&C of buildings must start from building design, construction materials use, building maintenance and energy management.

Article 18 Undesignated buildings

Undesignated buildings are those not met requirements 1 to 3 of designated buildings prescribed in article 19 of this decree to perform EE&C appropriately and to comply with methods prescribed in article 6 of this decree

Article 19 Designated buildings

Energy consumption requirements of designated buildings

1. Having single or several of transformers of total capacity from 1000 kW or 1175 kVA up
2. Consuming steam thermal energy of 20 MJ or all kinds of energy sources in total of 478 TOE or more within a one-year period
3. Having total floors areas of 20,000 sq.m or more

The buildings under these requirements are to perform EE&C accordingly to EM in buildings guidelines as prescribed in article 21 of this decree

For buildings that to be newly built or renovated are obligated to have energy systems plan that was approved and certified by MEM

Article 20 Design of Designated buildings

The requirements for design of designated buildings:

1. Use of Energy efficiency standards construction materials to prevent heat transfer through building envelop, roof and widows
2. Design of heat insolation system that prevent heat transfer into building, air conditioning system in the building, heat transfer in to and out from buildings
3. Use of natural lighting into building design in order to use energy efficiently, safely and environment friendly
4. Consider scientific principles in building design to achieve energy efficiency and conservation

Article 21 Energy management in buildings

1. To reduce heat transfer from outside in to building
2. Efficient utilization of air conditioning systems including maintaining temperature in the building at appropriate level
3. Use an efficient lighting system in the building
4. Installation of energy efficient equipment and appliances in the building
5. To Install automatic device to control use of equipment and appliances
6. Maintenance of equipment/appliances in the building for operation readiness, especially insulation of heat/cool transfer pipes to prevent heat losses,
7. Maintenance of buildings for operation readiness, especially doors, windows glass, walls, ceiling and other components, that may lead to air conditioning heat/cool leakage out or heat transfer in,

Article 22 Targets and action plan setup of designated building

Designated buildings must define targets and action plan for energy consumption reduction in percentage of current energy consumption or to set energy consumption level per indicator of each building type or service as well as set up implementation timeframe for achieving the targets, investment and expected outcomes, as well as training and relevant activities to promote EE&C with participation of all staffs

Article 23 Measures of energy management in designated buildings

Energy management in designated building must follow the measures

1. To Appoint a staff and team to be responsible for EM
2. To carry out Preliminary assessment of energy consumption situation
3. To Define EE&C policy and communicate
4. To assess energy saving potential
5. To define targets, set up action plan and its dissemination, raise awareness and carry out EE&C activities
6. To implement energy audit and evaluation of the targets and plans as prescribed in clause 5 of this article
7. To monitor and evaluate implementation of EM
8. To review, analyze and nonconformities correction

Article 24 Responsibility of undesigned buildings owners

1. To implement EE&C in accordance to principles and measures of energy management in buildings appropriately

2. To cooperate and provide necessary information as requested by external energy auditors if there will be any
3. To monitor energy consumption of their own buildings

Article 25 Responsibility of designated buildings owners

1. To set up Energy manager specifically for the building of the given number, qualification and detailed responsibility in accordance to MEM's guidelines
2. To set up energy management team of the building
3. To implement EE&C measures accordingly to EE&C guidelines for designated buildings, define targets and plan of designated buildings, energy management measures for designated buildings prescribed in article 21, 22 and 23 of this decree
4. Audit energy use in the building and adopt results and submit the certified report to MEM in March of each year
5. To cooperate and provide information as requested by external auditors if will be any
6. To bear expenditures that incurred within technical, natural and social environmental inspection by relevant authorized bodies
7. To comply all regulations of designated buildings, including any notices, orders, guidelines that issued by MEM in each period

Chapter 4

Energy Efficiency and Conservation in public facilities

Article 26 EE&C in public facilities

EE&C in public facilities include the use of lighting systems, equipment set and automatic control facilities for Energy saving and security in accordance to EE&C measures in public facilities as prescribed in article 27 of this decree.

Public facilities that will be newly constructed or renovated must get certification of entire energy system installation by MEM

Article 27 EE&C measures in public facilities

EE&C of public facilities must comply with the following measures

1. To Design a lighting system that comply standards and prescription of MEM
2. To install and use efficient lighting system equipment that compliant to adopted national and international standards appropriately to each public facilities
3. To install automatic control equipment
4. To perform regular maintenance of lighting system in public facilities
5. To use renewable energy in to public lighting system appropriately by places and seasons

Chapter 5

Energy Efficiency and Conservation in transportation

Article 28 EE&C in transportation

EE&C in transportation implies to use vehicles and transportation system that consume energy appropriately, effectively and with highest benefits into passengers and good transportation to reduce or substitute the use of fossil fuels by using vehicles and transport systems that consume natural gas, electricity, (hybrid fuel) or biofuel

Article 29 EE&C Measures in transportation

1. To improve and promote use of public transport
2. To improve transport and traffic routes appropriately to increase energy consumption efficiency
3. Define and enforce regulation on repair and maintenance of vehicles of their own responsibility to reduce energy consumption
4. To apply technology and management
5. To define and enforce EE&C measures of energy saving and efficient use of energy in transportation
6. All construction activities and improvement of transportation and communication infrastructure that contain energy system installation, such as street lights or any other electrical service must get standards and technical certification of relevant energy and mines offices of respective responsibility level before execution

Article 30 EE&C responsibility of owner of transportation entities and facilities

1. To comply all standards and technical requirements that established by relevant authorities
2. To apply advanced technology in to research, equipment / spare parts production for energy saving vehicles
3. To use clean fuel, electricity, alternative and other fuels that can substitute petroleum fuels
- 4.

Article 31 Responsibility of government in EE&C of transportation

1. Ministry of public work and transportation (MPWT)
 - To develop the regulations that effectively promote the use of low energy consuming vehicles
 - To apply EE&C standards in planning and management of air, water, rail and road transportation
 - To coordinate with relevant sectors to define and issue license on energy saving standards and technique of vehicles
 - To guide transportation entities on improvement of energy use efficiency
 - To encourage more investment in to public transportation especially to use railroad, hybrid and other vehicles
2. Ministry of Industry and commerce (MOIC) is to control production and import of vehicles that compliant with standards, technique of transportation vehicles use
3. Ministry of Science and Technology (MOST) is to cooperate with relevant sectors and other authorized organizations to define national standards on energy efficiency of transport vehicle and environmental friendly?

Chapter 6

Energy Efficiency and Conservation in energy consuming equipment and appliances

Article 32 EE&C in energy consuming equipment and appliances

EE&C imply the use of energy consuming equipment and appliances of high energy performances, use energy as necessary, installation of advanced control systems, good management approach and appropriate for use to reduce energy losses, environmental friendly and safety assurance

Article 33 EE&C measures in energy consuming equipment and appliances

EE&C in energy consuming equipment and appliances is compliant to the following measures:

1. To Define and enforce Minimum energy performance standards (MEPS) for each type of energy consuming equipment and appliances
2. To apply EE labels to each type of energy consuming equipment and appliances
3. To disseminate necessary information on energy efficiency of energy consuming equipment and appliances of each type

Article 34 Establishment of MEPS for energy consuming equipment and appliances

Establishment of MEPS for energy consuming equipment and appliances include the following issues:

1. Energy saving and environmental friendly
2. Policy, plans national, regional and international social-economic development plans
3. Promotion of research, production and distribution of energy saving and highly efficient equipment and alliances in the markets

MEPS for energy consuming equipment and appliances must be reviewed in each 5 years period

Article 35 EE labelling

EE labelling includes the following:

1. All designated energy consuming equipment/appliances must have Energy and Mines EE labels attached before importation/distribution in Lao market
2. Designated energy consuming equipment/appliances are requested to have technical standard testing and certification by authorized bodies to get labels accordingly to proposed amount of equipment/appliances

Ministry of energy and mines (MEM) is responsible for

- Identification of properties and components of the labels
- Establishment of testing lab to verify quality for adopting MEPS of energy consuming equipment/appliances
- Development of issuing procedure of EE labels certification for energy consuming equipment/appliances
- Establishment of adoption procedure of EE labels of imported equipment /appliances

Article 36 Control over low energy efficiency energy consuming equipment/appliances

MEM cooperates with MOIC and other relevant authorized bodies to control an import of low energy efficiency equipment/appliances accordingly to levels of national social-economic development, science and technology in each given period

Article 37 Responsibility of business entity that is dealing with energy consuming equipment/appliances

1. To assure energy saving of energy consuming equipment/appliances, high use efficiency, safety and environmental friendly
2. To disseminate the relevant information on efficiency and energy saving capacity of energy consuming equipment/appliances of each type to the society
3. To bear all expenditures incurred in testing of energy consuming equipment/appliances

Article 38 Duty of business entity who is dealing with energy consuming equipment/ appliances

1. To comply MEPS that MEM has issued for in each certain period
2. To register products with relevant authorized bodies

3. To affix labels and products' name plate in Lao language
4. To comply other duties that prescribed in respective laws and regulations

Chapter 7

Policies towards outstanding achievements and punishment measures for violations

Article 39 Policies towards outstanding achievements

The entity owner who is efficiently and effectively implementing EE&C shall reserve a right to receive appropriate rewards such as business protection and promotion, access to the market, technology, tax/duty reduction/exemption (fiscal incentives) that prescribed in the Laws on investment and other relevant laws/regulations that encourage EE&C

Article 40 Access to funding sources

The entity owner who is efficiently and effectively implementing EE&C shall reserve a right to access to favor funding sources by financial institutions and commercial banks that government encourages Ministry of Finance, bank and financial institution to provide incentives in term of investment capital with appropriate interest rate for EE&C promotion

Article 41 Promotion

Government promotes business entities and implementation activities for efficient and effective EE&C as following:

1. To apply new and advanced technology that appropriate to current status as well as providing support for capacity building and demo project
2. Scientific Research and development, innovation application, environmental friendly, conservation of natural and energy resources
3. To disseminate information by creating of manuals, brochures and posters on EE&C, broadcasting on TV/radio/internet and other online social media for public acknowledge and awareness,
4. To develop coordinating mechanism between sectors such as science and technology, industrial and commerce, financial for joint management of business entities that dealing with low quality of energy consuming equipment/appliances
5. To develop and establish network of the entities in implementation of EE&C by encouraging establishment of enterprises network and technology transfer as well as utility service providers, manufacturers, distributors and importer-exporters of high efficiency energy consuming equipment/appliance

Article 42 Promotion of transport entity

Government promotes the following transport entities:

1. Promotion of development of highly efficient transport system by applying transport service management, traffic control, replacement and improvement of transport infrastructure, particularly changing from road transportation to rail,
2. Promotion and development of alternative transportation modes such as the use of vehicles running on fuel cell, hydrogen, electricity and public transport.
3. Promotion of utilization of environmental friendly energy sources, such as biofuel, fuel cell, hydrogen, electricity.

Chapter 8 EE&C business

Article 43 Type of EE&C business

There are two types:

- Business that provide service on energy consultation, training and audit
- Business that provide service on Innovation and technology of high efficiency and environmental friendly

Article 43 Requirements for establishment of EE&C business

Establishment of EE&C business must meet the following requirements:

- Have business running experiences
- Stable financial statement
- Have technical staffs of high specific qualification
- Readiness with transport vehicles, machine, tools and equipment for running business

Article 45 Proposal for establishment of EE&C business

Any individual, entity and organization of national or international that aim to establish a business on EE&C must be fulfilled the requirements as prescribed in article 44 of this decree and to submit proposal for investment to single window office at central or local level as prescribed in the Laws on investment promotion and get technical approval from energy and mines sector

Article 46 Duty of the owner of EE&C business

The owner of EE&C business bears the following duties:

1. To register business with the sector in charge
2. To run business accordingly to relevant laws and regulations
3. To search for, use energy efficient and environmental friendly equipment and technology,
4. To give advisory, guideline on energy management and measures of efficient use of energy
5. To provide guideline on energy auditing and installation of energy efficient equipment/appliances
6. To search for, introduce technology and operation of high energy efficiency, safety and environmental friendly
7. To implement energy audit, installation of energy consuming equipment/appliances and prescribe the measures, manners for efficient use of energy
8. To cooperate and provide information to relevant authorized bodies
9. To fulfill other duties as prescribed in the relevant laws and regulations

Article 47 the Right of the owner of EE&C business

The owner of EE&C business has reserved the rights:

1. To receive support from respective relevant bodies and/or to access funding sources
2. To receive certification by relevant bodies on contracting with factory, building, energy consuming equipment, appliances and transport business entities
3. To register copy right of own products as prescribed in the Intellectual Property Laws
4. To apply any other rights that prescribed in the relevant Laws and regulations

Chapter 9 **Prohibitions**

Article 48 General prohibitions

It is prohibited individuals, legal entities and organizations to have the following activities:

1. To run a business without permission from relevant bodies
2. To deny facilitation or cooperation without sound reasons on EE&C
3. To produce, distribute and import-export energy consuming equipment, appliances of low energy performance and quality
4. To offer or be intermediate of offering or receiving any kind of corruption to/from relevant government officials
5. To have any other behaviors that violate the laws/regulations

Article 49 Prohibitions for EE&C business operators

1. To run a business without permission
1. To drawback or hold out implementation of EE&C measures
2. To ignore monitoring, inspection of relevant authorized officials
3. To have any other behaviors that violate the laws/regulations

Article 50 Prohibitions for owners of factory, buildings and business entities on energy consuming equipment/appliances and transportation

1. To provide fake information on energy consumption
2. To prevent or do not cooperate with performing duties of relevant authorized officials
3. To make fake documentation of energy consumption
4. To have any other behaviors that violate the laws/regulations

Article 51 Prohibitions for government officials and state owned enterprises
(6 prohibitions)

Chapter 10 **Management and Inspection**

Article 52 Management and Inspection organizations

MEM is authorized to have direct responsibility for implementation of EE&C in cooperation with line ministries, equivalent agencies and local relevant authorities

Management and inspection organizations for EE&C matters are comprised of:

1. MEM
2. Provincial and capital city divisions of Energy and Mines (PDOEM)
3. District and municipality office of Energy and Mines (OEM)

Article 53 Right and duties of MEM

MEM is authorized to have following rights and duties:

1. To Develop and derive the policy, strategy into the laws, action plans, concrete projects on EE&C
2. To establish regulation, guideline and manuals on EE&C for factories, buildings and entities
3. To disseminate the Acts and Regulations on EE&C for purpose of public acknowledge and awareness raising
4. To supervise implementation of EE&C matters nationwide by coordination with related authorities of central and local levels
5. To develop action plans on EE&C accordingly to real national social-economic status and to submit for adoption by government in each period
6. To issue business establishment permission, amendment, stop or withdrawal EE&C business running permission

7. To establish and prescribe MEPS and high energy efficiency use measures as well as development of energy efficiency labels
8. To Retrain, develop and upgrade capacity of technical, administration staffs who are responsible for EE&C matters
9. To supervise technical management of EE&C business runners, including notification or penalty in case of violation or fails to comply energy efficiency and conservation measures
10. To Issue permission and adopt an individual, legal entity and organization of both national and international who wish to become the energy auditor and energy manager of facilities and business including amendment, stop and withdrawal of mentioned permission and adoption
11. To collect information on facilities and businesses where implemented EE&C measures, including energy service providers in order to facilitate efficient use of energy in accordance to national and regional standards
12. To coordinate with MOIC, MOST, MOF, MPWT and other related sectors to establish mechanism and tools for energy consuming equipment/appliances quality testing as well as establishment the standards for blocking out and control over import of low energy performance and low quality of equipment and appliances
13. To seek regular cooperation with regional and international partners in EE&C activities as entrusted by the government
14. To perform any other rights and duties as prescribed by the laws

Article 54 Right and duties of PDOEM and Capital DOEM

PDOEM and CDOEP have the right and duties:

1. To organize implementation of EE&C policy, strategy, plan, concrete projects
2. To disseminate information on EE&C policy, strategic plan and regulations for purpose of raising public knowledge and awareness in practice
3. To oversee and promote implementation of EE&C by coordinating with other related sectors within province or capital
4. To retrain, build and upgrade capacity of technical and admin staffs in charges of EE&C works
5. Regularly summarize and report the result of the implementation of EE&C activities to MEM including the business operators that promote efficient use of energy
6. To cooperate with Departments of Science and Technology, Industry and Commerce, Finance of province and capital to control the business operators who have a deal with energy consuming equipment and appliances of low energy performance standards
7. To summarize and report EE&C implementation outcomes to MEM on regular basis
8. To apply any other right and responsibilities as prescribed by the Laws and entrusted by central levels

Article 55 Right and responsibility of the Energy and Mines offices of district, capital and city

1. To organize implementation of plan, projects, the Laws, regulation and guideline of MEM, PDEM and CDEM on EE&C
2. To disseminate the Laws, regulation and guideline on EE&C to public for purpose of raising public knowledge and awareness on EE&C actual implementation
3. To collect and summarize information on factories, buildings and entities that efficient use of energy including the business runners to promote efficient use of energy and to report to DOEM of province and capital on regular basis
4. To summarize and report EE&C implementation results to Provincial or Capital department of EM on regular basis
5. To apply any other right and responsibilities as prescribed by the Laws and entrusted by upper levels

Article 56 Right and responsibility of other sectors and the local authorities

Other sectors and the local authorities have a right and duty to coordinate and cooperate with energy and mines sector in management, monitoring, inspection and implementation of EE&C according to their responsibility as prescribed by the Laws

Article 57 Contents of inspection

Contents of EE&C inspection include

1. Implementation of the Acts, regulation and contracts on EE&C
2. Performed standards, technics, requirements and energy management measures in factories, buildings, public facilities, transport entities and energy consuming equipment/appliances business entities
3. Application of measures to reduce and limit impacts to human and natural environment
4. Other tasks as prescribed by the relevant Laws

Article 58 Inspection methods

1. Regular inspection: inspection in accordance to planned tasks at certain period
2. Irregular inspection with prior notice: it is an inspection that seems necessary but with prior notification
3. Sudden inspection: it is urgent inspection without giving prior notice

Article 59 Reporting and resolution on inspection results

Inspection results recording and reporting

Article 60 Right and duty of inspected targets

Chapter 11

Policies towards Outstanding Achievements and Measures against Violators

Article 61 Policies towards outstanding achievements

Article 62 Measures against violators

Article 63 Reeducation Measures:

Article 64 Discipline Measures: government officials

Article 65 Penalty measures:

1. Affixed Fake labels: penalty not more than 1 million kip
2. Have no cooperation in reporting energy consumption facts (<3 million)
3. Handled permission to someone else for hire (< 5 million kip)
4. Operate EE&C business without permission (< 10 million)

Article 66 Fines for damages measures

Article 67 Criminal measures

Chapter 12

Final Provisions

Prime Minister
(Signature and seal)

5.4 ANNEX IV: MINISTERIAL REGULATION ON ENERGY STANDARDS AND LABELING FOR ACS

1

(The First Draft) Ministry of Energy and Mines regulation on energy label and standard of Air Conditioner in Lao PDR

(Unofficial translation, for project reference only)

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Chapter 1. General provision

1.1. Introduction

Some points: benefits of energy efficient AC, current situation of AC market in Lao PDR, government policy on energy efficiency and energy conservation (in brief)

1.2. Objectives

This regulation is based on an article 6 of Prime Minister Decree on EE&C (Energy efficient machine/equipment/appliances):

- To Set Minimum Energy Performance Standard (MEPS) for AC to facilitate flushing out inefficient AC from domestic market and encouraging import of energy efficient AC
- To Establish label that certifies actual efficiency of AC
- To Establish management mechanism for promotion of energy efficient AC through products' registration

1.3. Scope of the regulation

The regulation covers establishment of MEPS and label for AC of cooling capacity of and below 12,000 W, split type

1.4. Definitions

Chapter 2. AC Energy Performance factor, its Testing and Calculation methodology

2.1. Cooling Seasonal Performance Factor (CSPF)

CSPF can be adapted from tested Energy Efficiency Ratio (EER) by the formula:

$$CSPF(Non - Inverter) = 1.062 \times EER$$

2.2. Testing methods

ISO 16358-1:2013 Air-cooled air conditioners and air-to-air heat pumps – Testing and calculating methods for seasonal performance factors – Part 1: Cooling seasonal performance factor.

ISO 5151:2012 Non-ducted air conditioners and heat pumps - Testing and rating for performance

2.3. Energy Efficiency Ratio (EER)

$$EER = \frac{\text{Cooling capacity}(W)}{\text{Power Input}(W)}$$

Unit's conversion

- 1 Btu/h = 0.2931 w;
- 1 w = 1 J/s;
- 1 w = 3.412 Btu/h (0.8598 Kcal/h);
- 1 HP = 746 w ;
- 1 Kcal/h = 1.163 W

Chapter 3. Energy efficiency Standards and labeling

3.1. Energy efficiency standards

Energy-efficiency standards are a set of procedures and regulations that presented the energy performance of manufactured products. Introduction of energy efficiency levels is to prohibit the sale of products that are less efficient than a minimum level.

3.2. MEPS

Minimum Energy Performance Standards (MEPS) is set for all products to comply:

- MEPS is set in accordance to type and size of AC by considering CSPF that to be equal or higher than value in table 2 column 3 of CSPF
- EER and CSPF must not be lower than 93% of the value stated in product name plate
- In case of incompliance with MEPS the products should be allowed to import
- EER and CSPF (or SEER) are tested by ISO 5151:2010 and ISO 16358-1:2013 respectively

Table 1. MEPS ranges for different type and size of AC

AC type	Cooling capacity (CC) W	MEPS (CSPF)
Fixed speed	$CC \leq 3520$	3.08
	$3520 < CC \leq 8000$	3.03
	$8000 < CC \leq 12000$	2.97
Variable speed (Inverter)	$CC \leq 3520$	3.4
	$3520 < CC \leq 8000$	3.3
	$8000 < CC \leq 12000$	3.2

3.3. Energy efficiency levels of AC

Energy performance of different type and size of AC is divided into 5 levels (1 to 5), as shown in Table 2 and Table 3:

Table 2 MEPS levels for fixed speed AC

Type of AC	Cooling capacity (W)	MEPS levels (CSPF)				
		No. 1	No. 2	No. 3	No. 4	No. 5
Fixed speed	CC ≤ 3520	3.08-3.18	3.19-3.28	3.29-3.39	3.40-3.49	≥ 3.5
	3520 < CC ≤ 8000	3.03-3.12	3.13-3.23	3.24-3.34	3.35-3.44	≥ 3.45
	8000 < CC ≤ 12000	2.97-3.07	3.08-3.18	3.19-3.28	3.29-3.39	≥ 3.40

Table 3 MEPS levels for variable speed AC

Type	Cooling capacity (CC), W	Levels of MEPS (CSPF)				
		No 1	No 2	No 3	No 4	No 5
Variable speed (inverter)	CC < 3520	3.40-3.79	3.80-4.19	4.20-4.59	4.60-4.99	≥ 5
	3520 < CC ≤ 8000	3.30-3.69	3.70-4.09	4.10-4.49	4.50-4.89	≥ 4.9
	8000 < CC ≤ 12000	3.20-3.59	3.60-3.99	4.00-4.39	4.40-4.79	≥ 4.8

3.4. Energy Efficiency labeling

All AC that produced in, imported to and distributed in Lao PDR must have energy efficiency label attached on the right side corner. The labels must contain important information that adopted and certified by MEM¹, and controlled through products registration and attached QR code.

Format, color, size and letters of the label are shown in Figure 1

- The Energy efficiency information on the label must match the testing results documentation by the accredited lab
- The label's contents are inerasable and must have resolution not below 118 pixels per sq. cm or 300 pixels per sq. inch
- Label materials must comply with standards, approved by MOST

Error! Reference source not found.

¹ MEM: Ministry of Energy and Mines

Figure 1 Format, sizes and color of the label

3.4.1. Energy efficiency levels

Energy efficiency of AC is divided in to 5 levels (1-5) accordingly to CSPF values, separately for non-inverter and inverter types. Calculation methods are presented as attachment to this document.

Energy efficiency levels for fixed speed and variable speed AC are presented in Table 2 and Table 3 respectively. Meanings of each level are presented in Table 4.

Table 4 meaning of levels in the label

Level (No.)	Efficiency	Color
1	Low	red (lowest standard)
2	Fair	Orange
3	Medium	Yellow
4	Good	Green
5	Very good	Blue

3.4.2. Contents of the label

The energy efficiency label for AC clearly divided in to three parts and each consists of the following information:

- 1) Part 1 with white back ground: 5 strips of different colors with a number in lower ends are representing 1-5 energy efficiency levels. There are golden stars next to lower ends of the strips, where number of golden stars is equal to number in the big cycle in the center (which is energy efficiency level in a given label). For example, on the left side picture (Figure 1), this AC has level 5 of efficiency and there are 5 golden stars. On the right figure, there is level 3 and shown 3 golden stars, while two remaining stars have grey color. On the background of this number there is filled with crossing thin lines of purple color for purpose of label copy prevention.
- 2) Part 2 with green background consists of the following information:
 - a. A logo of adopting organization (i.e. MEM),
 - b. Serial number of label: product code(AC), production year, registration number;
 - c. Name and type of appliance: split type fixed speed AC (in this sample)
 - d. A box of white color background: electricity costs(kip/year), energy usage (kWh/year) and notice that actual electricity costs depend on appliance use and electric tariff;
 - e. QR code:

- 3) Part 3 with yellow color: CSPF value, brand, series, cooling capacity, rated power and testing serial number

3.4.3. Energy efficiency information

1. Energy Performance level: a large number in the circle and number of golden stars indicate energy performance level of the appliance;
2. Adopting organization: MEM is a legal adopting organization
3. Electricity tariff: electricity tariff rate of respective year used for energy costs calculation
4. Product Registration code: Air Conditioner of respective production year
5. Type of AC: Fixed speed or variable speed (Inverter)
6. QR code: scan QR code for showing all relevant information contained in the label,
7. Electricity cost(kip/year) is estimated on the base of AC usage of 8 hours per day and electricity tariff of respective year
8. Consumed Energy (kWh/year) refer to electric energy usage for a year (in average 8 hours a day, as stated in testing documentation
9. Energy efficiency (CSPF): cooling seasonal performance factor
10. Brand, series, cooling capacity (kW) and rated power (W)
11. Testing code contains testing number and registration number

(Additional explanation):

- QR code contains all necessary information such as: serial number of label, year of label produce, produce location and other information that shall be show up when QR code scanned by QR scanner or mobile phone with QR code scanning application. Besides, QR code is used for preventing copy or fake energy efficiency label that the users/buyers can preliminarily check if shown information has been approved by relevant authority or not, and must match product's information.
- Annual energy consumption (kWh/year) is calculated as following:
 $AEC (kWh/y) = CSEC (kWh) \times 2920 (hours) / 1817 (hours) (*)$
 Where AEC (Annual Electricity Consumption) refers to annual energy consumption; CSEC refer to Cooling Seasonal Energy Consumption which obtained from testing documentation;

note: * annual working hours = 8 hrs/day x 365 days = 2920 hours.

- Annual Energy costs:

$$Annual\ energy\ costs \left(\frac{kip}{year} \right) = AEC \left(\frac{kWh}{y} \right) \times tariff \left(\frac{kip}{kWh} \right)$$

3.4.4. Label affixation requirements

The proposal for energy efficiency label must be accompanied with appliance's performance testing certification. There two pieces of label are required for an air conditioner set: one to be attached to indoor unit, and another-to outdoor unit. The labels must be attached to right side upper corner.

The registered AC distributors must have MEM's approved energy efficiency labels and then get products' registration certificate at MOIC² before products to be distributed in Lao market.

3.4.5. Labelling violations

- (1) Any distributors, who affixed unproven labels, as prescribed in 3.4.4., shall get criminally charged and fined not more than 10 million kip (10,000,000 kip)
- (2) Any distributors, who are failed with presentation of EE labels on their products, damaged labels or removed labels from their products, shall get criminally charged and fined not more than 10 million kip (10,000,000 kip)
- (3) Distributor, who violated labelling regulation or affixed fake labels, shall get criminally charged and fined not more than 10 million kip (10,000,000 kip), or be imprisoned not more than 3 months, or both fined and imprisoned.

3.5. Product Nameplate

3.5.1. Indoor unit nameplate

Each indoor unit must have metallic or any other materials that heat and humidity resistant nameplate attached, where should have clear numbers and letters (Lao or English) and symbols, accurate and permanent for indicating the following information:

- (1) Name of model and type
- (2) Name of model and type of accompanied condenser unit (outdoor unit)
- (3) Serial number of product
- (4) CSPF
- (5) Climate class: T1
- (6) Cooling capacity (W)
- (7) Rated voltage (V)
- (8) Phase Quantity of power supply
- (9) Frequency (Hz)
- (10) Rated power (W or kW)
- (11) Refrigerant name and amount (g or kg)
- (12) Production month and year of production

² MOIC: Ministry of Industry and Commerce (Lao PDR)

(13) Name Manufacture or manufacturing plant or registered trade mark of distributor

3.5.2. Outdoor unit (condensor)

Each outdoor unit must have metallic or any other materials that heat and humidity resistant nameplate attached, where should have clear numbers and letters (Lao or English) and symbols, accurate and permanent for indicating the following information:

- (1) Name of Model and type
- (2) Name of model and type of accompanied indoor unit
- (3) Serial number
- (4) CSPF
- (5) Climate class: T1
- (6) Cooling capacity (W)
- (7) Rated voltage (V)
- (8) Phase Quantity of power supply
- (9) Frequency (Hz)
- (10) Rated power (W or kW)
- (11) Refrigerant name and quantity (g or kg)
- (12) Production month, year
- (13) Manufacture or manufacturing Plant or registered trade mark

3.5.3. Safety warning sign

AC must have safety warning sign and use instruction attached to AC component or any position that easily visible

3.5.4. User manual

Each AC unit must carry user manual that contains information on electricity use, installation, refrigerant filling, relevant operation and maintenance notice for indoor and outdoor units.

Chapter 4. Management and Inspection

4.1. Management

4.1.1. Product quality management

All air conditioners manufactured in, imported to and distributed in Lao market must comply with MEPS and have energy efficiency labels affixed, as described in chapter III of this document.

4.1.2. Product registration

There are two type of registration: entrepreneur registration and product registration

- Entrepreneurs who produce, import air conditioners that fulfill conditions described in heading 1.3 must be registered at MOIC by following application procedure for entrepreneurship establishment, and MOIC shall establish database of entrepreneurs in coordination with MEM for management and monitoring purposes.
- The goods that belong to designated category must be registered at MOIC before being imported and distributed in Lao PDR market

4.1.3. Application Form and registration procedure

1. **Entrepreneur registration:** individual, legal entity that want to register as producer, importer and distributor of electric appliances in Lao market must submit application form to enterprise registry office at Ministry of Industrial and Commerce. Then the enterprise registry office shall check if the proposing business is listed in designated category or not. If not, the enterprise registry office shall approve the registration by issuing the registry code or ID number of business operator. But if yes, the enterprise registry shall forward the application for consideration of relevant office.
2. **Products registration:** according to clause 1.3 of this decree, Air Conditioners belong to designated category. Therefore, production, import and distribution of AC in Lao PDR must be registered in accordance to products registration procedures, where business operator shall submit product registration application included testing results documentation of the products (see details in appendix 2 about product testing) to MOIC. Then MOIC shall officially coordinate with MEM for verification of relevant information and standards of the products. Only after that, two organizations shall jointly issue a Certificate Of Registration (COR) before the products shall be distributed in Lao PDR. This procedure shall be applied either to domestically produced products. Detailed information to be submitted are shown include:

Table 5 Entrepreneur and Product registration documentation

No.	Entrepreneur information	Product information
1	Registration ID	Brand
2	Name	Country of Producer
3	Address	Serial number
4	Telephone/Fax	
5	Email
6	Importer	
7	Product code	Production year
8	Mean of testing	Accredited testing laboratory

3. Registration for products' changes

Entrepreneur must inform about any changes in registered products to MOIC at least for 14 working days before importing product for distribution in Lao market. In case of noncompliance, the entrepreneur shall be charged penalty of 10 million kip (10,000,000 kip)

4. Change in registered products

In case the entrepreneurs do want to make the changes in their products that have already been registered, they must follow the procedure:

- a) To submit a written notice about the changes in the products that have been registered to MOIC
- b) To specify the changes together with energy performance of the registered products and submit the testing certificate on the energy performance of changed products and other relevant information to the MOIC. After that, MOIC shall dispatch these documents to MEM.
- c) To adjust technical information of the changed products, such as: details on the changes accompanied by testing results certification
- d) In case of non-compliance, the entrepreneur shall be charged with penalty not more than 10 million kip (10,000,000 kip)

5. Document archive

Registered entrepreneurs must keep all relevant documentation of their registered products, such as:

- a) Certificate of entrepreneurship registration issued by MOIC;
- b) Testing results documentation that accompanies registered products
- c) Detailed report on registered product's changes inclusive testing results certification
- d) ?

4.2. Application for label

- 1) Registered entrepreneur must submit testing certification (as determined in heading 4.4) to MEM for obtaining product's energy standards labels (accordingly to MEPS). This stage is to present certified MEPS by MEM accredited testing Lab (details in heading 4.3.1)
- 2) For purpose of adoption and additional reference, every time, registered entrepreneur must attach testing results accordingly to products quantity. If the presented information matched prescribed requirements, MEM shall consider issuing EE labels accordingly to initially proposed products quantity;
- 3) The energy performance levels that shown on the Energy efficiency level must match the information presented in AC testing results certification and application form for EE level label, including the details on serial name, code of indoor and outdoor units, energy performance value and must be as the same figures as shown to customers;

- 4) The Registered entrepreneur must inform AC code to MEM for obtaining energy efficiency label, which shall be inserted in to QR code and database of MEM, and then on energy label before issuing the labels to registered entrepreneur to attach to respective AC model within 1 month period. Such kind of information will be used for randomly checking and verification of product's energy efficiency in the future;
- 5) Registered entrepreneur must affix the labels to product model that MEM has approved;
- 6) Once received labels, the registered entrepreneur is to affix the labels to respective product model that have been tested and with two pieces, one for attaching to indoor unit and the another one – to outdoor unit; label affixation location: right upper conner;
- 7) Registered entrepreneurs must not develop their own labels for any reasons. The labels should be adopted by MEM only;
- 8) It is allowed to distribute AC without energy efficiency label in Lao market;
- 9) Proposing for label must be in continue manner but not big lot in one time for accumulation purpose, must change the label contents accordingly to actual electric tariff, year, but name of proposing distributors and products model shall be stored in the database, if any model that failed with obtaining labels for two (2) years or 24 month the respective models shall be terminated;
- 10) In case registered entrepreneur wants to change model name he/she must submit a proposal letter to MEM for making the changes before printing of the labels.
- 11) Testing results shall be accepted only for specific model (sample models) that have been tested. In case of any changes of a given model it must be submitted for retesting according to recognized procedure otherwise it shall be considered as illegal.
- 12) Registered entrepreneur must inform quantity of proposed labels within 20 working days from the date of received testing results certification (COR). In case if the registered entrepreneur has received the testing results certificate but failed with application for respective labels; MEM shall reserve a right to keep the testing results certificate validity for three months long period. After that the testing results certificate shall be unusable.

4.3. Test results certification

- 1) Electric appliances' Testing results are certified at Research Institute for Energy and Mines (RIEM, MEM), and/or using uniform ASEAN harmonized testing stadards of ASEAN, international standards or any third country's standards on the base of unilaterally recognition;
- 2) In case registered entrepreneur does not have testing results for energy efficiecny of model that proposing for label as defined in heading 3.3, the entrepreneur must submit form 8 (form in appendix AIR-02, list of information for testing/results submission) and document 02 (detailed

information of AC that entrepreneur must show) including accompanied documents of sample product for testing by accredited internationally or third country that Lao PDR recognized by unilateral agreement

- 3) Registered entrepreneur must submit testing results that has been tested less than two years old from the date of submission of application with all relevant documents to MEM for adoption of testing results and labels approval before importing or distributing the goods in Lao PDR

4.3.1. Testing results report

The report must comply any of the testing lab requirements, as followed:

- a) Laboratories which accredited by the National Centre for Standards and Quality Certification (Unilateral Agreement)
- b) Laboratories which are accredited by the accreditation body that have signed the APAC³ Mutual Recognition Arrangement (MRA)
- c) Laboratories which are accredited by the accreditation body that have signed the ILAC⁴ MRA
- d) Laboratories listed as Designated Testing Laboratory under ASEAN Electrical and Electronic Equipment, EEE MRA
- e) JATL, Japan Air conditioning and Refrigeration Testing Laboratory
- f) Manufacturer's laboratories accredited by JATL, Japan Airconditioning and Refrigeration Testing Laboratory

4.4. Required documents for label application

The registered entrepreneur must compile the documents listed in appendix 3.

4.5. Expenditures on label application process

- 1) MEM is certification body for testing results from accredited both national and international laboratories. Testing fees are to be beared by the registered entrepreneur.
- 2) Products that are not meet MEPS shall not be allowed to import to and distribute in Lao PDR
- 3) Printing of label is under responsibility of MEM, the registered entrepreneurs must bear the following expences for obtaining the labels:
 - MEM prints the labels in accordance to application form of entrepreneur, and the entrepreneur shall receive the labels within 15 working days from

³ APAC: Asia Pacific Laboratory Accreditation Cooperation

⁴ ILAC: International Laboratory Accreditation Cooperation

the date of notice from MEM on labels readiness. The entrepreneur shall pay for printing costs.

- In case MEM has printed the labels in accordance to an entrepreneur application form but later the entrepreneur wants to change model name in the labels, the entrepreneur must return already printed labels to MEM and to pay for the reprinting costs;
- In case MEM has printed the labels accordingly to entrepreneur's application form but later on it was found some incorrect information in the application form, the entrepreneur shall have to pay for reprinting costs

4.6. Monitoring and inspection

4.6.1. Random inspection without prior notice

- 1) MEM in cooperation with relevant authorized bodies shall conduct a random inspection of AC that have already approved energy efficiency labeling and being distributed in the market to check energy efficiency that was presented to MEM while proposing for labels, as a consumer protection measure.
- 2) The random inspection process starts with selection of a sample of each model from the market for testing for energy efficiency at that accredited by MEM laboratory;
- 3) In case testing results shown matched information presented in the label and application form, MEM shall be responsible for all expenses incurred. In case tested energy efficiency did not match information presented in the label application form, the respective entrepreneur shall have to bear all costs that incurred with the testing process, application for new labels. At the same times, to temporarily stop distributing products of that model until the labels shall be renewed. In case if the entrepreneur failed with obtaining new labels within 60 working days from the date of receiving notice on verification test results the respective model of products shall not be allowed for distribution in Lao market and shall be fined if found that the products still distributing in the market.

4.6.2. Consideration of random verification testing results

Consideration (interpretation) of randomly verification testing results includes the following details:

- (1) CSPF should have value not less than 93% of the value that presented in the label;
- (2) Total Cooling capacity (W) should not lower than 95% of value that presented in the label;
- (3) Rated power (W) should not higher than 110% of the value presented in the label;
- (4) Energy Efficiency level matches level in the label;

- (5) MEM shall dispatch a letter of notice about verification testing results to respective entrepreneur. The entrepreneur must react within 7 working days from the date of received the letter of notice and to take responsibility in case of faulty found, as described in clause 3 of heading 4.6.1 above.
- (6) If respective entrepreneur failed to take responsibility, as determined in clause 3 of heading 4.6.1, within 30 days from the date of receiving the letter of notice on verification testing results, MEM shall disseminate and publish the verified energy efficiency levels of respective models on social media, such as Newspapers which have AC related column.

4.7. Fees

Variety of fees are presented in appendix 4

Chapter 5. Final Provisions

5.1. Implementation measures

MEM entrusts IREP to coordinate with all relevant sectors and local authorities for purpose of dissemination and effective implementation of this regulation

All individuals, legal entities, both public and private organizations must beware and strictly implement this regulation

5.2. Enforcement

Signature (to be signed by Minister, Ministry of Energy and Mines)