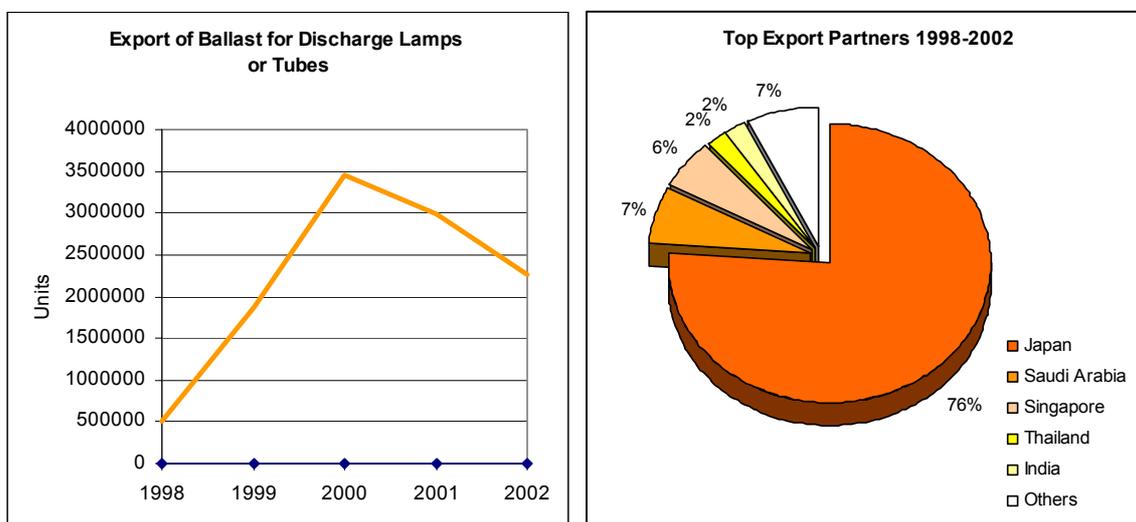


Indonesia exports most ballasts for discharge lamps (or tubes) to Japan. This accounted for 76% of the total ballast exports between 1998 and 2002. About 6% and 2% are exported to Singapore and Thailand, respectively. However, when cross-checking Indonesia's export figures with Singapore's and Thailand's, those exported ballasts are likely for non-fluorescent lamps.



Source: The United Nations Statistics Division (UNSD)

**Figure 10: Indonesia's Export of Ballasts for Discharge Lamps or Tubes, 1998-2002**

### 2.3.3 Institutional Framework

#### Energy Policy and Regulatory Body

The Directorate General of Electricity and Energy Utilization (DGEEU), under the Ministry of Energy and Mineral Resources, is the authority responsible for national energy policy aiming to guarantee domestic energy supply by promoting energy conservation activities and the utilization of new and renewable energy sources. Accordingly, Indonesia had formulated its National Energy Conservation Master Plan (RIKEN) in 1979 that covered energy intensification, energy diversification, and energy conservation in the industry, transport, commercial, and residential sectors. However at the present, energy conservation programs have not yet accomplished the expected objectives because the policies have not been fully implemented and focused on by the various related ministries.

#### Electricity Utility

National Electric Power Limited (or PT PLN, Persero) is a state-owned power company responsible for electricity generation, transmission, distribution, and other support functions. As a result of Asian economic crisis in late 1997, Indonesia's government liberalized its electricity market (in 2002) to attract foreign investment for future development and restore financial viability, competition, and transparency in the electricity sector. (Power generation and retail competition will be open for competition in 2007 and 2008.)

## Standards, Accreditation and Testing Body

Badan Standardisasi Nasional (BSN) or the National Standardization Agency of Indonesia is responsible for development of the national standards in Indonesia (Standar Nasional Indonesia – SNI) as stipulated in Government Regulation No. 102/2000 on National Standardization. Formulation of SNI shall be in accordance with the standard formulation procedure – BSN Guide 8 (ISO/IEC Directives Part 3). (SNIs are normally harmonized with international or regional standards or internationally-recognized national standards by means of adopting or adapting relevant standards.)

SNI standards are basically voluntary. However, SNI related to community safety, security and health as well as environment conservation and economic consideration, can be applied as mandatory by a technical institution, for a part or the whole of the technical specifications and/or parameters stated in SNI.

SNI marks are affixed on products to indicate that they are manufactured and marketed in conformance with the relevant Indonesian National Standards. Implementation of the SNI mark could be either compulsory or voluntary depending upon the types of products. In general, the compulsory SNI marks are required for any product that could affect the health and safety of consumers or communities, while the voluntary SNI could be obtained to authenticate that the product in question is as good a quality. The SNI mark, granted by the accredited product certification body, is given to companies that pass the necessary inspections.

Fluorescent lamp ballasts are covered by the compulsory SNI mark, according to SNI 04-3561-1994, Fluorescent Ballast for 50 Hz Alternating Current, since 1979. In addition to the SNI mark for ballast, Indonesia also has other SNI standards regarding ballasts for tubular fluorescent lamps as shown in Table 8.

**Table 8: Indonesian Standards for Fluorescent Lamp Ballasts**

National Standard Number	Reference Standard
SNI 04-3561-1994 - Fluorescent Ballast for 50 Hz Alternating Current	N/A
SNI 04-6504-2001 – Self - ballasted lamps for general lighting - Safety requirements	IEC 60968, IEC 60061-1, IEC 60061-3, IEC 60238, IEC 60360; IEC 60695-2-1
SNI 04-6509.1-2001 - Ballast for tubular fluorescent lamps - General and safety requirements. Section 1: General requirements	IEC 60920
SNI 04-6510-2001 - Ballast for tubular fluorescent lamps - Performance requirements	IEC 60921

Source: Badan Standardisasi Nasional (BSN)



**Figure 11: SNI Mark**

Komite Akreditasi Nasional (KAN) or National Accreditation Committee is the National Accreditation Body of Indonesia. KAN has direct responsibilities under BSN to accredit certification bodies and testing laboratories. Certification bodies and testing/calibration laboratories being accredited by KAN have the right to issue certificates in accordance with their accreditation coverage. PT PLN (Persero) Jasa Teknik Kelistrikan (JTK) is the electrical testing laboratory accredited to perform electrical equipment tests, including fluorescent lamp ballast testing.

### 2.3.4 Standards and Labeling Program

The Master Plan for Energy Conservation, announced in 1995 by DGEEU, planned to introduce a voluntary label for appliances under the supervision of the DGEEU's Energy Conservation Division. A label design, shown as Figure 12, was proposed for the program. The label displays the average energy consumption of each appliance and a scale of 1-4 stars, (with 1-star as the least efficient and 4-stars as the most efficient). Various types of appliances (including lighting products) have been included in this labeling initiative. However, the future of the labeling initiative in Indonesia remains uncertain due to lack of an official implementation timeline for the program to-date.

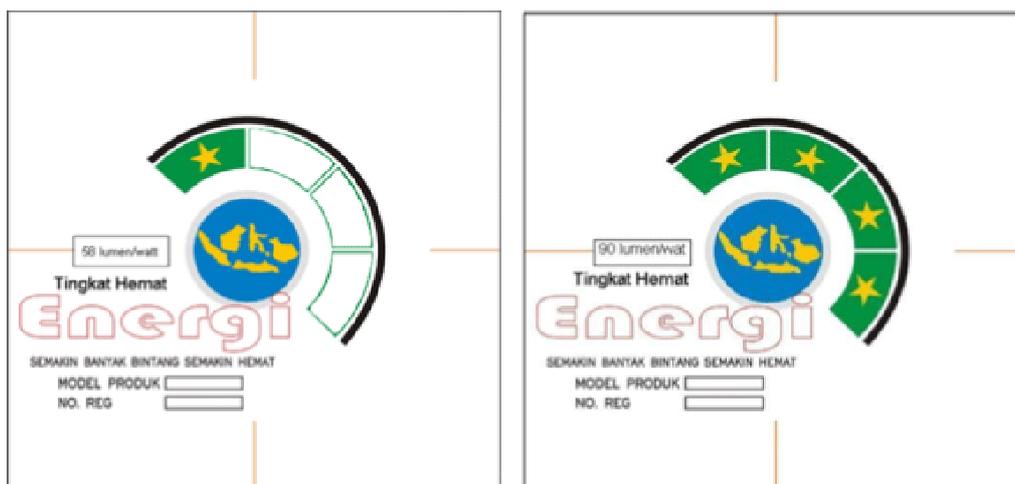


Figure 12: Proposed Label Design for Lamps in Indonesia<sup>7</sup>

<sup>7</sup> The implementation of Energy Standards and Labeling in Indonesia presented in the Inception Workshop of the SOME-METI Work Programme on Promotion Energy Efficiency and Conservation (PROMECC) – Buildings and PROMEEC – Industry, 25-26 November 2002, Singapore

## **2.4 Lao PDR**

### **2.4.1 Overview**

Lao People's Democratic Republic (Lao PDR) has a population of 5.4 million of which 80% dwell in rural areas. Lao's economy is based on agricultural and handicraft production, as well as mineral trades in coal, iron, copper, lead, gold, tin, gypsum, and precious stones. Agriculture contributes to half of the national GDP and accounts for 80% of total employment.

Lao PDR has a deficit of primitive infrastructure like railroads, roads, telecommunications and electrification. However, rural electrification is one of the more impressive achievements in the social-economic development of Lao PDR. The connection rate doubled from just 16% (120,000 households) in 1995 to 370,000 (more than 35% of all households of which about 25% are in rural areas) by the end of 2003. The Government of Lao PDR has an ambitious plan to connect 60% of all households by 2005, 70% by 2010, and 90% by 2020.<sup>8</sup>

Lao PDR has extensive hydroelectric power potential, representing 98% of the total installed capacity of 642 MW. Another 2% is from diesel generation and other sources. The total annual power production accounted for 3,728 GWh in 2000. Domestic electricity consumption was about 574 GWh in 1999 (equivalent to 112.74 kWh per capita<sup>9</sup>) and is growing rapidly due to expansion of grid access and higher consumption by urban consumers. At present, all of Lao PDR's surplus power is exported to neighboring countries like Thailand.

### **2.4.2 Ballast Market**

Domestic fluorescent lamp ballast consumption is limited, estimated to be 0.5 to 1 million units per annum (of which 100% are imported from neighboring countries like Thailand and China). The quality of imported ballasts depends solely on the manufacturers in the countries of origin. Standard electromagnetic ballasts have the largest marketshare. Low watt loss electromagnetic and electronic ballasts are not widely used in the market with estimation of less than 1% marketshare.

### **2.4.3 Institutional Framework**

#### **Energy Policy and Regulatory Body**

The Department of Electricity (DOE) under the Ministry of Industry and Handicrafts (MIH) is primarily responsible for formulating policies, preparing strategic plans, and implementing legislation or regulations on electricity generation, distribution, transmission, and use. DOE has two offices (the Hydropower Office or HPO and the Rural Electrification Division or RED) which are responsible for the power industry. HPO is responsible for the development of power generation, transmission, and distribution, strategic power sector planning, IPPs evaluation, and development of small hydropower projects with an installed capacity between

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<sup>8</sup> Project Executive Summary; Southern Provinces Rural Electrification II (SPRE II) Program

<sup>9</sup> ASEAN Centre for Energy

2-5 MW. RED is responsible for development of off-grid electrification (such as thermal, hydropower, and solar photovoltaic).

The Lao National Committee for Energy (LNCE) is responsible for managing the development of electricity to ensure the successful implementation of strategic plans for energy and power sector. The institutional framework relating to energy strategy and policy, power sector, and standards and labeling is shown in Figure 13.

### Electricity Utility

Electricite du Laos (EdL), a state-owned company having its own board of directors, is the implementing government agency under the Ministry of Industry and Handicrafts (MIH) responsible for power projects including the operation of electricity generation, transmission, distribution, and management of electricity import and export.

### Standards, Accreditation and Testing Body

The Science, Technology, and Environment Agency (STEA) under the Prime Minister’s Office has the basic responsibility for coordinating environmental planning and management across all sectors (such as environmental assessment of power plants). In addition, STEA is responsible for standardizing all energy-using equipment (both locally-made and imported). However, Lao has not yet implemented any compulsory or voluntary national standards for appliances domestically sold. Therefore, ballasts imported to Lao perform at different levels of performance and safety depending upon the manufacturers.

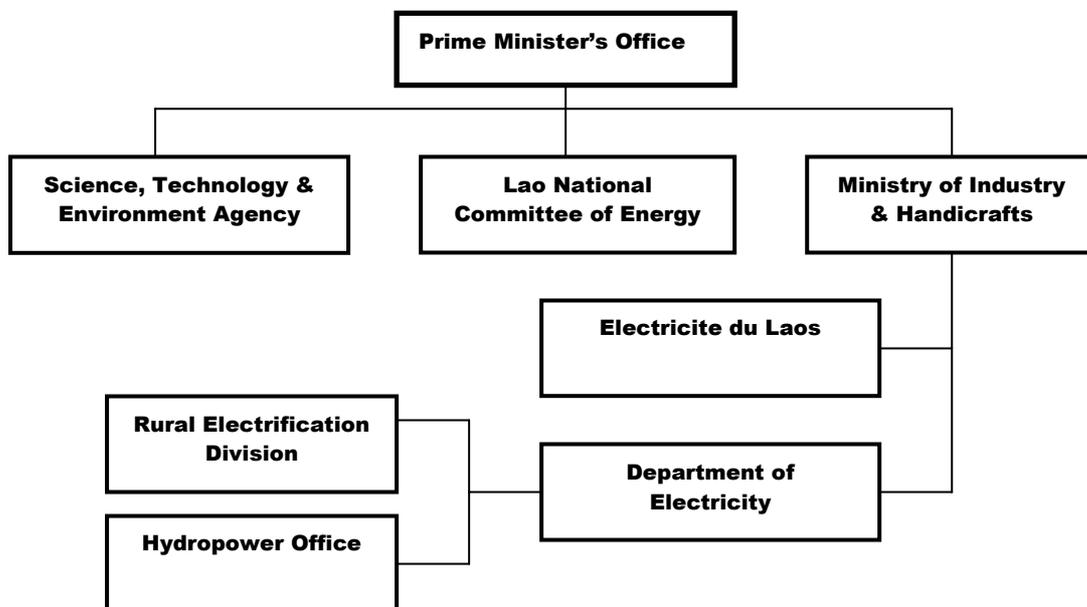


Figure 13: Institutional Framework Relating to the Energy Programs in Lao PDR

#### **2.4.4 Standards and Labeling Program**

To-date, there have not been any standards and labeling programs in Lao PDR. Electrification expansion throughout the country is given a higher priority. However, energy efficiency and energy conservation (EEC) activities have only recently been introduced in Lao PDR through various international and regional cooperation mechanisms, such as ASEAN Centre for Energy (ACE). Most of these EEC activities have focused on public awareness and capacity building for the building sector. However, Lao PDR is planning to expand its current EEC activities as part of larger energy projects including Lao-Thai energy cooperation project on Renewable Energy and Energy Conservation, and Demand-Side Management (DSM) initiative under the Southern Provinces Rural Electrification II Program (SPRE II) supported by the World Bank (GEF fund).

## **2.5 Malaysia**

### **2.5.1 Overview**

Malaysia's geographical area covers 329,750 square kilometers with a population of 23.5 million people. Malaysia's GDP per capita was US\$9,000 (in 2003) and was the third highest in the region behind Singapore and Brunei Darussalam. The service and industrial sectors account for 90% of Malaysia's GDP. The service sector share accounts for 46.3% while the industrial sector share accounts for 45.3%.

Energy consumption in Malaysia is dominated by 42% in the transport sector and 38% in the industrial sector. Indigenous petroleum products are mainly fuel in the final energy use, representing 65% of the total. Electricity's share is approximately 18%.

Electrification rates vary, depending on the pace of development in each area, but the average electrification rate is 93% electrified. Electrification in the peninsular area is 100% but in Sabah and Sarawak electrification is about 75% and 80%, respectively. Electricity consumption is about 68.4 billion kWh per annum, of which 13.24% is generated from oil, 62.77% is generated from indigenous gas, 10.91% is generated from coal, and 13.08% is generated from hydropower. The industrial sector is the largest electricity consumer, using 53% of the total electricity generated in peninsular Malaysia. The commercial and residential sectors account for 28% and 18%, respectively.

### **2.5.2 Ballast Market**

#### **General Situation**

Under the Electricity Regulation 1994, all domestically manufactured ballasts for tubular fluorescent lamps that are sold or advertised in Malaysia (or imported to Malaysia) must obtain certification of approval from the Energy Commission of Malaysia. Ballasts shall also enter the Product Certification Scheme and affix the safety label issued by the local authority, SIRIM Berhad. As of 2001, 221 certificates of approval-to-import have been issued to 24 importers and 187 certificates of approval-to-manufacture have been issued to 21 local manufacturers. These certificates of approval cover both magnetic and electronic ballast types.<sup>10</sup> These local manufacturers together produce and market more than 50 brands of fluorescent lamp ballasts in Malaysia.

According to statistical data supplied by SIRIM Berhad, there were a total of 7.84 million units of electromagnetic and electronic ballasts registered in 2003. Production registrations in the two previous years were close to 8 million units. It is therefore estimated that Malaysia's domestic fluorescent lamp ballast demand is about 8-9 million units per annum. Production capacity of local manufacturers is expected to be able to meet the domestic demand, but Malaysia exports some of its domestic production, and, therefore, importation is required to offset the shortage.

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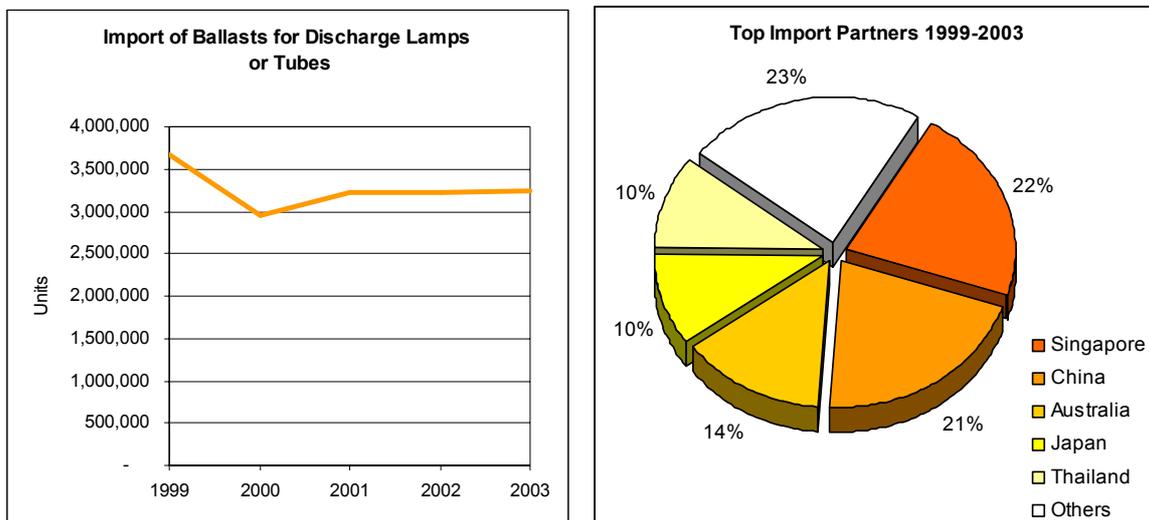
<sup>10</sup> Malaysia country presentation in 1<sup>st</sup> ASEAN Energy Efficiency Standard and labeling Workshop, 31 October-1 November 2001, Pattaya, Thailand.

The low watt loss electromagnetic ballasts market is not very different from the standard electromagnetic ballasts market. It is estimated that the markets for low watt loss electromagnetic and standard electromagnetic ballasts in Malaysia are approximately 50% and 40%, respectively. Electronic ballasts are not widely used in the domestic market

### Import and Export

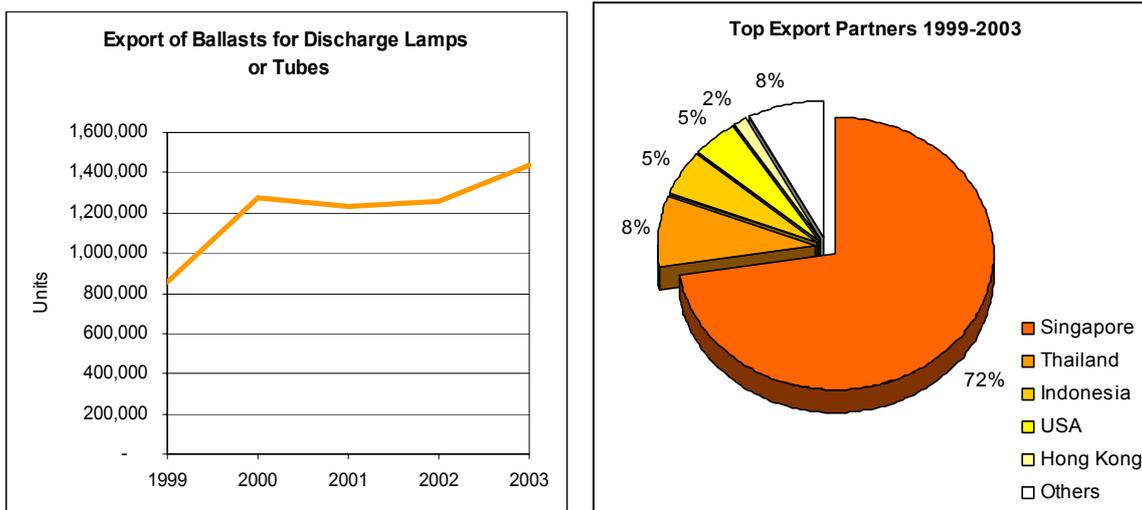
Malaysia imports and exports ballasts for discharge lamps or tubes in quantities of 3-3.5 million and 1.2-1.4 million units per annum, respectively. Most ballasts are imported from Singapore, China, Australia, Japan, and Thailand and the main export destinations are Singapore, Thailand, Indonesia, and Hong Kong. Singapore is the largest export destination for Malaysian ballasts, accounting for 70% of the total ballast exports.

Although there are some discrepancies between import/export statistical data obtained from the United Nations Statistics Division for Malaysia and import/export statistic data from responsible government agencies in Singapore and Thailand, every information resource confirms that among ASEAN member countries, Singapore and Thailand are two major trading partners for ballasts.



Source: The United Nations Statistics Division (UNSD)

**Figure 14: Malaysia's Import of Ballasts for Discharge Lamps or Tubes, 1999-2003**



Source: The United Nations Statistics Division (UNSD)

**Figure 15: Malaysia's Export of Ballasts for Discharge Lamps or Tubes, 1999-2003**

The in-country distribution channels for ballast manufacturers differ depending on their customer groups. Manufacturers who mainly focus on the domestic market distribute their products through dealers/wholesalers and light-fitting manufacturers; whereas manufacturers who focus on export tend to distribute their products through Original Equipment Manufacturers (OEMs).

## 2.5.3 Institutional Framework

### Energy Policy and Regulatory Body

The Ministry of Energy, Water and Communications (MEWC), formerly the Ministry of Energy, Communications and Multimedia, was newly-established in 2004. The energy division (under MEWC) is the main division responsible for formulating energy policies, strategies, and objectives in the energy industry, promoting efficient use of energy and renewable energy, and coordinating policy implementation and strategic planning. The regulatory function of the energy industry is undertaken through its regulatory bodies, namely, the Energy Commission

The Energy Commission began operation in January 2002 and has since taken over all the responsibilities of the Department of Electricity and Gas Supply (including regulation of electricity and gas supply industry, promotion of efficient use and safety of electricity and gas for generation, transmission, and distribution and promotion of renewable energy and the conservation of non-renewable energy).

### Electricity Utility

The electricity generation industry is comprised of three main integrated electricity generation utilities: TNB in Peninsular Malaysia, TNB Sabah (formerly known as SESB) in the State of Sabah, and SESCO in the State of Sarawak. There are also various independent power producers (IPPs), and co-generators. The total installed generating capacity in Malaysia was 15,838 MW (in 2003) of which 90% was in peninsular Malaysia and 5% on Sarawak and Sabah.

Tenaga Nasional Berhad (TNB) is the largest electricity utility in Malaysia in terms of assets and generation capacity (about 10,000 MW in 2003). In peninsular Malaysia, TNB generates electricity accounting for 61% while the remaining generation (39%) was supplied by 6 IPPs with a capacity of 4,449 MW. In the State of Sabah, TNB Sabah, owned by TNB and the State Government of Sabah, supplies 493 MW (62%) of the electricity while the remaining 305 MW (38%) is supplied by 5 IPPs.

In the state of Sarawak, the Sarawak Electricity Supply Corp. (SESCo) established by the State Government of Sarawak, is a statutory authority with 55% owned by the Sarawak Government and 45% owned by Sarawak Enterprise Corporation Bhd (SECB). SESCO supplies 499 MW (61%) of the installed capacity while the remaining 320 MW (39%) is supplied by 2 IPPs.

### **Standards, Accreditation, and Testing Body**

The Department of Standards Malaysia (DSM) is the national standards body in Malaysia. DSM was established, following the corporatization of the Standards and Industrial Research Institute of Malaysia (SIRIM) to be SIRIM Berhad in 1996, to undertake the statutory roles in national standardization formerly carried out by the Institute. In addition, DSM also has a responsibility as the national accreditation body to carry out accreditation activities, which were previously undertaken by the Malaysian Accreditation Council (MAC).

The structure and objectives of national standardization are defined in the Standards of Malaysia Act (Act 549 of 1996) and development of the national standards in Malaysia, known as Malaysian Standard (MS) are basically the joint responsibility of DSM and SIRIM. MS standards are developed through a consensus process that includes input from stakeholders, and takes into consideration the views of all sectors of society. Ballasts for tubular fluorescent lamp domestically manufactured, sold or advertised in Malaysia (or imported to Malaysia) must comply with the safety requirement stipulated in the Electricity Regulation 1994. The provision of safety labeling requirements is also covered in the 1994 regulation. Shown in Table 9 are MS standards with respect to ballasts for tubular fluorescent lamps referred by the Electricity Regulation 1994.

**Table 9: Malaysian Standards for Fluorescent Lamp Ballasts**

<b>National Standard Number</b>	<b>Reference Standard</b>
MS 141 : Part 1: 1993 - Specification for ballasts for tubular fluorescent lamps : Part 1 : General and safety requirements (First revision)	IEC 60920
MS 141 : Part 2: 1993 - Specification for ballasts for tubular fluorescent lamps : Part 2 : Performance requirements	IEC 60921
MS IEC 60928: 1995 - Specification for a.c supplied electronic ballasts for tubular fluorescent lamps-general and safety requirements	IEC 60928
MS IEC 60929: 1995 - Specification for a.c supplied electronic ballasts for tubular fluorescent lamps-performance requirements	IEC 60929
MS IEC 61000-3-2 : 2000 - Electromagnetic compatibility (EMC) - Part 3 : Limits - Section 2 : Limits for harmonic current emissions (equipment input current less than or equal to 16 A per phase )	IEC 61000

Source: SIRIM Berhad

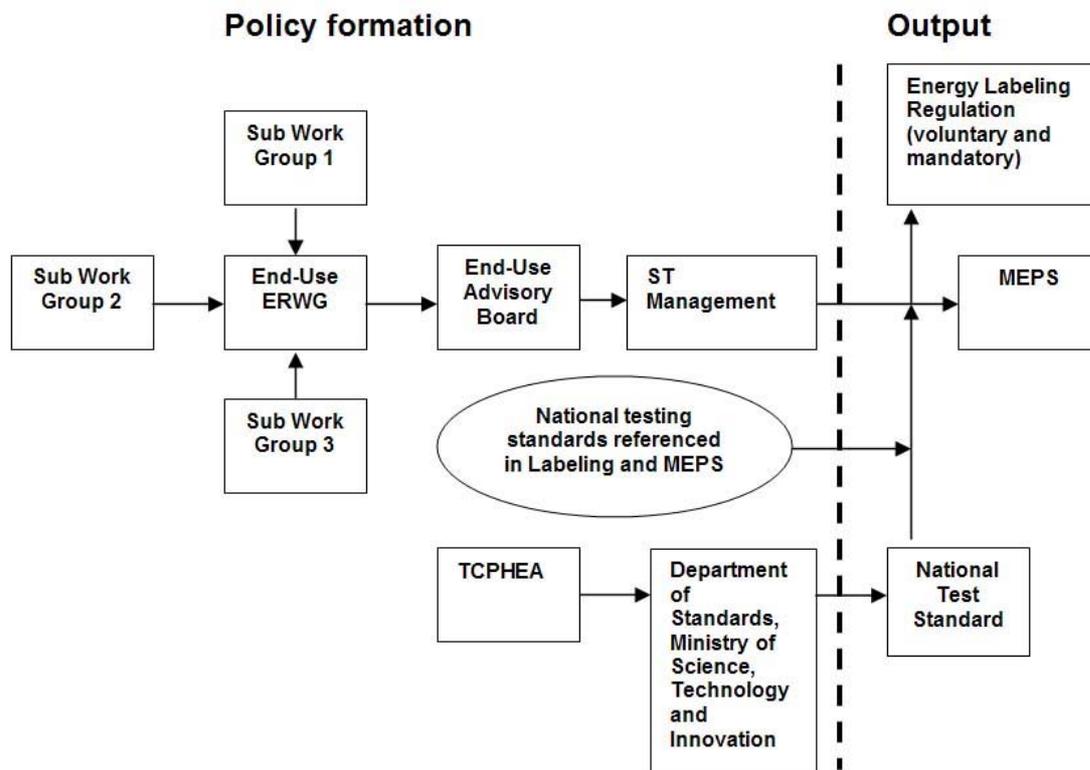
Malaysia's national laboratory accreditation scheme (based on ISO/IEC 17025 and known as Skim Akreditasi Makmal Malaysia SAMM) was initially administered by a SAMM National Council under the authority of the Ministry of Science, Technology and Innovation. Following the establishment of the Department of Standards Malaysia (DSM) on 28 August 1996 under the Standards of Malaysia Act 1996, all accreditation activities of the former Malaysia Accreditation Council were transferred to and come directly under the responsibility of DSM.

SIRIM QAS Sdn. Bhd., a wholly-owned subsidiary of SIRIM Berhad, is responsible for the certification, inspection, and testing activities covering chemical, mechanical, communication equipment, electro-technical, electromagnetic compatibility (EMC), construction and building materials and fire engineering. The company is accredited for ISO 9000 and ISO 14001 by the DSM. The testing laboratory is also accredited for ISO/IEC 17025 under the SAMM. Currently, SIRIM QAS has performed ballast testing at 60% of their full testing capacity.

#### **2.5.4 Standards and Labeling Program**

In the past, the Directorate General of Electricity and Gas (Jabatan Bekalan Elektrik dan Gas, JBEG) initiated energy labeling for three products: refrigerators, fans, and air-conditioners by assigning SIRIM to form a working group under the Industrial Standards Committee–Group E (ISCE) for developing “Energy Efficiency Standards”. Then, ISCE was upgraded to the Technical Committee on Performance of Households and Similar Electrical Appliances (TCPHEA) which further developed performance standards for other appliances.

When the Energy Commission (or Suruhanjaya Tenaga, ST, under the Ministry of Energy, Water and Communications) was formed, the TCPHEA's responsibility for energy efficiency labeling was transferred to a new End-Use Energy Rating Work Group (ERWG). The development of energy performance testing, energy labeling, and minimum energy performance standards have been clearly defined. Figure 16 illustrates the relationships of these organizations and their roles.



**Figure 16: Current Framework for the Development of Testing Standards, Energy Labeling Regulations, and MEPS**

Minimum Energy Performance Standard (MEPS) have been proposed by the Department of Electricity and Gas Supply (JBE). The program indicated that all ballasts to be sold in Malaysia beginning January 1, 2001, must meet the MEPS set at 6-watt losses acceptable for electromagnetic ballasts.

## **2.6 Myanmar**

### **2.6.1 Overview**

Myanmar is a resource-rich but finance-poor country with a population of 50 million people. Electrification is the lowest in the region, covering approximately 10% of all households nationwide. Myanmar is also data-poor, and therefore the official statistics are often outdated and inaccurate. Published estimates of Myanmar's foreign trade are underestimated due to the size of informal markets which may account for twice the official accounts. (As a result of this lack of data, the ballast market data herein have been gleaned from interviews).

The installed electricity generating capacity in Myanmar was close to 1,200 MW in 2000. The generation mix was dependent on natural gas (60%) and hydropower (20%). The remaining 20% was from thermal power plants and diesel generators. Electricity consumptions in the residential and industrial sectors were nearly equal, with about 30% consumed in each sector out of the total energy supplied by the electricity company. Transmission and distribution losses may be as high as 30%.

### **2.6.2 Ballast Market**

The domestic fluorescent lamp ballast demand is estimated to be 2.5 million units per annum of which 1.5 million units are electronic ballasts. The annual domestic production is 0.6 million units. Based on interviews, the market for electronic ballasts surpassed the electromagnetic counterparts due to lower market pricing of the electronic ballasts. This market situation is quite unique in all of ASEAN. (To-date, the information on the quality of the electronic ballasts sold in Myanmar is not available).

According to data supplied by the Myanmar Ministry of Industry, 70% of the fluorescent lamp ballasts (approximately 1.8 million units) are imported. And of this total, 60% are electronic ballasts. Myanmar neither imposes local requirements for energy performance or safety nor does it conduct local ballast testing. (This may be due to a lack of domestically-qualified local testing facilities for ballasts). Given the lack of control mechanisms, the quality and reliability of ballasts in Myanmar are solely dependent on the ballast manufacturers. This situation may attract poor quality products from other regions or countries to penetrate into the market; however, there are yet no statistics on this impact.

### **2.6.3 Institutional Framework**

#### **Energy Policy and Regulatory Body**

The Ministry of Energy under the guidance of the government is responsible for energy policy and strategy. Their main objectives are to utilize energy efficiently and conserve non-renewable energy resources. Their current strategy emphasizes the development of all available energy resources of the country to increase the production levels of existing energy sources. Due to dramatic energy demand growth, energy conservation measures and improvement of the efficiency of equipment are becoming essential components of the country's energy policy and strategies. To date, there are several energy efficiency programs that have been implemented (the Feasibility Study for Energy Conservation Model, ECMP,

and the Demand-Side Management). Following completion of these programs, Myanmar aims to implement energy conservation measures in selected plants and factories.

### **Electricity Utility**

The Ministry of Electric Power was established in 1997 for the promotion and effective operation of the power sector. The Myanmar Electric Power Enterprise (MEPE), a state owned utility previously under the Ministry of Energy, is now under the Ministry of Electric Power and is the implementing agency responsible for power generation, transmission, and distribution throughout the country. A new department (the Department of Electric Power or DEP) was also formed to act as a planning and policy-making body as well as act as secretariat to the Ministry.

### **Standards, Accreditation, and Testing Body**

Following the ASEAN Mutual Recognition Arrangement (EEMRA) for electrical and electronic equipment initiated in 2000, Myanmar agreed to harmonize their national standards toward IEC standards and consider establishing a testing facility to serve the domestic requirements on electrical and electronic equipment testing. Product standards development is performed by the Electrical Inspection Department under the Directorate of Industrial Supervision and Inspection (DISI) under the Ministry of Industry. (There is no information available to confirm whether Myanmar will develop national standards regarding ballasts for tubular fluorescent lamps or enforce a regulation to control the quality of ballasts sold in the domestic market).

## **2.7 The Philippines**

### **2.7.1 Overview**

The Philippines is an island nation with abundant natural resources and a wealth of trained, educated workers. The Philippines consists of an archipelago of more than 7,000 islands. The three main islands are Luzon, Visayas and Mindanao. Luzon and Mindanao are the largest, making up 66% of the country's landmass. In 2003, the Philippines total population was 82 million people and its GDP per capita was estimated to be about US\$4,600.

The Philippines has achieved reasonable economic growth (4% annually over the past two years) despite a global economic downturn. Continuous economic growth and rapid industrialization emphasizes importance of the energy market, especially in the electricity sector. The installed electricity generating capacity is approximately 14,000 MW, generated from coal (26%), oil (24%) and hydropower (19%), gas (18%) and geothermal (14%). The Philippines is the world's second largest producer of geothermal power (after the United States) with a current installed capacity approaching 2,000 MW.

Due to its geography, the country has problems linking all its islands in one electrical grid. Electrification (June 2003) was nearly 88%. The government aims to reach 100% electrification by 2006 and have 90% of households connected to the grid by 2017, utilizing both new and renewable energy resources. Interestingly, the Philippines is the only country in the region with a 60-Hz electrical supply.

### **2.7.2 Ballast Market**

Typical lighting technologies used in the Philippines are incandescent, tubular fluorescent, compact fluorescent and High Intensity Discharge (HID) – Mercury. Tubular fluorescent lamps (T12) occupy the largest marketshare of all end-use sectors. The 20-watt and 40-watt models occupy 49% of the residential sector. The 40-watt model accounts for 52% and 61% of the commercial and industrial sectors, respectively. Low efficiency incandescent lamps are still popular in the residential sector, occupying 44% of the market. HID-Mercury lamps are commonly used in commercial and industrial applications. Higher efficiency T8 fluorescent lamps are not widely used, as they have less than 1% marketshare in the residential sector and roughly 10% each in the commercial and industrial sectors.

Given the electricity grid constraints and the proliferation of incandescent lamps, Philippine government officials estimate the domestic ballast demand at around 20 million units per annum, of which 50% is supplied by local manufacturers while the remainder is imported.

There is no market data available to reference the marketshare of various ballast technologies. However, based on the official ballast importation statistics, standard electromagnetic ballasts account for 95% of the market. Low loss electromagnetic ballasts and electronic ballasts capture small portions (2% and 1%, respectively). The normal power factor ballasts (90% of the total ballast sales) are widely used by the residential sector. Industrial and commercial buildings are the main users of high power factor ballasts.

According to the survey and data supplied by the Philippines Department of Energy, there are about 10 domestic manufacturers of fluorescent lamp ballasts with their combined annual