



Setting effective mandatory energy efficiency standards and labelling regulations: A review of best practices in the Asia Pacific region [☆]



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HIGHLIGHTS

- S&L regulations are needed to materialize the various benefits of energy efficiency.
- S&L regulations can appear in various formats as in the Asia–Pacific region.
- Effective regime has to be clear, authoritative, open, and enforceable.
- Clear policy, customisation, inclusiveness, transparency and flexibility are desirable.

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ABSTRACT

This paper attempts to inform policy makers and legislators on how to set energy efficiency standards and labelling (S&L) regulations. It draws lessons from the literature on S&L regulations in the Asia–Pacific region and from practical experience in drafting the S&L regulations for Brunei Darussalam. The paper proposes necessary components for effective S&L regulations, as follows: clear liabilities, authoritative administration, open principles for technical systems, and enforceable mechanisms. It also recommends some key issues in good practice toward effective S&L regulations, such as policy making in advance, customised legislation, inclusive and transparent legislative procedure, and flexibility in the legislation.

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1. Introduction

This paper attempts to inform policy makers and legislators on how to set energy efficiency standards and labelling (S&L) regulations by studying both the literature on S&L regulations in the Asia–Pacific region and the practical experience of drafting S&L law for Brunei Darussalam (hereafter Brunei). The focus of this study is on how to set effective S&L regulations. The key interest of this paper is to establish the most authoritative basis for S&L programmes so that the goals of energy saving can be achieved through effective S&L regulations.

The paper is motivated by the need to draft the S&L law for Brunei. The use of legislation, i.e. the setting of laws and regulations, is a common measure to create legitimacy for S&L programmes, in

particular, for those S&L programmes which are mandatory. To the best of author's knowledge, comprehensive summaries of practical issues for setting mandatory S&L regulations are rare in the literature. The most comprehensive study that was found is a United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) study [1], which was published in 1999 and thus was not up-to-date for this study. A more recent publication, the 2005 Collaborative Labelling and Appliance Standards Programme (CLASP) guidebook on energy efficiency labels and standards [2], however, does not contain practical details on how to set effective S&L regulations and provides no explanation about why the regulations should be as they are, so there is still a knowledge gap for newcomers to set S&L regulations from scratch. One explanation for the absence of such practical information is that regulation setting is often done by consultants or government officers, who are not interested in sharing or publicising the know-how.

In order to set effective S&L regulations, understanding of theories on the law and practical knowledge of law making are very important, in particular, for countries which have no prior experience with S&L programmes. So far, there is an absence of literature that addresses such crucial issues as: what could be a legal frame-

[☆] Regulations here are limited to those primary regulations that were approved by the legislative authority, such as Parliament, and not to rules and regulations made by an authority under powers given to them by primary regulations.

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work for S&L regulations and why? What are the necessary components of effective S&L regulations; and what procedures should be adopted in the regulation-making process? This paper aims to address those practical issues that future policy makers and legislators will face and can refer in enacting or revising their S&L regulations.

This paper contributes to the literature in a number of ways. Firstly, data collection via international sources, in particular the Asia–Pacific Economic Cooperation (APEC) Energy Standards Information System database [3], has resulted in this study producing a comparatively complete and updated review of S&L legal frameworks in the Asia–Pacific. Secondly, it identifies and elaborates on the key components of effective S&L regulations and thus provides an analytical framework for setting S&L regulations in the future. Lastly, it highlights some practical and theoretical issues in good practice of setting effective S&L regulations. While valuable to academics, the suggestions that it offers could also provide practical guidelines to create new, or revise existing, S&L regulations.

The paper is organised as follows. The next section discusses the rationale of implementing S&L regulations. Section 3 reports on the comparison of S&L legal frameworks among APEC economies and summarises various types of S&L legal framework. Section 4 proposes major components that effective S&L regulations should have. Section 5 discusses findings and implications on setting S&L regulations in future. The last section concludes the paper.

2. Rationale of mandatory S&L regulations

The improvement of energy efficiency (EE), i.e. efficiency in the consumption of energy, is an important component in achieving sustainable development goals in the energy sector, and there are a number of ways in which this can be achieved technical and economic feasibly. However, strong policy action is needed in order to realise the significant potential efficiency gains [4]. Although many EE products are technologically feasible and consumers may be likely to benefit from associated cost savings over the life cycle of the products, this does not prevent less efficient appliances from being sold. Relatively low income consumers are often inclined to buy the cheapest product on the market, even though they may face much higher running costs in the future [5] and the overall costs could be higher than if they had bought the more expensive, but more efficient, alternative. Even if the consumers are aware of the life cycle benefits, factors such as a shortage of upfront funds and low electricity tariffs may lead to consumers choosing the cheaper and less efficient products. Many other factors could also lead to the uptake of less efficient products, such as a lack of information on EE, a lack of incentives for consumers to change their behaviour, and a lack of understanding of the true costs and benefits.

Minimum energy performance (efficiency) standards (MEPS)[†] and energy labels for appliances are two of the most frequently used tools of any energy conservation programme [1]. EE standards, in particular MEPS, which was first introduced in Poland in 1962 [1], are the minimum standards for products and any products that fall below the MEPS are eliminated from the market. MEPS may also encourage suppliers to bring in more energy efficient appliances in order to gain comparative advantages over less efficient counterparts since more efficient products will be distinguished by EE standards. Mandatory measures, such as MEPS, are frequently used to compel ('push') consumers to use more energy efficient appliances. Energy labels, being arguably the best way to implement EE standards and the main instrument of market transformation [1], will 'pull' energy producers and users to improve EE.

[†] MEPS is also frequently referred to as 'minimum energy efficiency standards'. In this paper, both terms are used interchangeably.

S&L has been widely used around the world for appliances, equipment and lighting [2]. According to information obtained from CLASP [6] in November 2013, S&L programmes covered more than 80 different categories of appliances and products. According to an earlier report in 2008 [7], more than 60 countries had implemented S&L programmes for energy-consuming equipment.

Mandatory S&L programmes may lead to conflicts between government and the business sector and thus clear regulations are necessary [2]. MEPS will restrict the business activities of companies selling regulated products and will impose immediate costs on stakeholders, who may challenge the S&L regulations. Without enforceable regulations, S&L is unlikely to be effective. For example, it has been argued that in China, due to a lack of clear and dedicated regulations for S&L, and no severe penalties for non-compliance, MEPS was not implemented effectively [8].

S&L programmes for appliances and equipment may be the most cost-effective energy efficiency programmes in delivering the largest quantity of energy savings at the lowest cost [9]. S&L regulations can achieve win–win outcomes for the environment, government and consumers. S&L creates a level playing field for manufacturers, distributors and retailers, and it allows governments to prescribe performance requirements while not specifying any specific technologies [5]. S&L programmes will enable consumers to have more chance to obtain appliances which can have savings over the products' lifetime, with, in most cases, little or no additional purchase costs [5]. Early studies in the US have also shown that through the implementation of Energy Star efficiency standards, with one dollar invested in an energy efficient appliance, the consumer saves \$3.50 in energy costs over the life time of the appliance [10,11].

S&L programmes are a highly cost-effective way for governments to achieve key environmental, energy security and economic policy objectives. The reduction in demand for energy, which ultimately results from S&L programmes, brings benefits in postponing investment in energy generation and related infrastructure projects. According Meyers et al. [12], MEPS that were introduced in 1990 and updated in 1993 in the US will contribute toward avoiding the need for 20% of the country's planned new power generation by 2020, resulting in a total expected savings of more than \$100 billion, or a net saving of \$1000 per household [12]. This study also identifies that the size and service of refrigerators would increase out to 2020, while the purchase cost of fridges would go down. An International Energy Agency (IEA) report [13] found that the average energy consumption of refrigerators in Australia dropped by 40% following the introduction of EE regulations in 1993, and in the US, energy consumption of refrigerators and freezers was 60% lower in 2001 than it had been in 1980, due primarily to the introduction of MEPS in 1993 [13]. A 2007 study by the United Nations Department of Economic and Social Affairs (UNDESA) showed that one dollar of taxpayer money spent by the US government on existing efficiency standards would, over the life of those products, result in \$610–\$760 net savings from fuel reductions [14]. The Malaysian Sustainability Achieved via Energy Efficiency (SAVE) programme that has a budget of RM45 million is expected to have a life cycle saving of up to RM382.1 million [15]. McNeil et al. also estimated that S&L programmes would reduce cumulative CO₂ emissions from 2010 through to 2030 globally by 21.3 GT, an amount that is equal to 85% of the total estimated global energy-related emissions in 2005 [7].

3. Lessons from the Asia–Pacific region

3.1. S&L programs in the Asia–Pacific

S&L programmes are in place in 19 of the 21 APEC economies (the two exceptions are Brunei and Papua New Guinea [PNG])

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