

# ENVIRONMENTAL PERFORMANCE OF ASEAN

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## ABSTRACT

*As far as this study is concerned, there is no existing studies had measured the aggregate index of ASEAN environmental performance. The assessment of eco-efficiency performance is important as it provides sound information to the policy makers to improve the design of their environmental policies at upholding long-term sustainability of a nation. Employing data envelopment analysis (DEA) method, the results of this study reveal that smaller economies such as Laos, Cambodia and Brunei are found to be environmentally efficient. With respect to economic efficiency, larger economies such as Malaysia, Indonesia, the Philippines and Singapore are found to be more efficient than the smaller countries (except Brunei). The findings further discover that technical progress mostly explain the overall environmental performance growth while the relative efficiency changes have been minor throughout the study period of 1990 to 2008.*

**Keywords:** *environmental efficiency; ASEAN; data envelopment analysis*

## INTRODUCTION

Economic production consists of inputs or factors of production, desired outputs and undesired outputs. While desired outputs refers to end products, undesired outputs refers to the emissions to the environment. It has been suggested that the resource use can be halved despite doubling the wealth of a nation by improving the eco-efficiency or resource productivity by a factor of 4 (von Weizsacker *et al.*, 1998); a factor of 10 (Alt, 1997) and by a factor of five (von Weizsacker *et al.*, 2009).

Eco-efficiency denotes the ability of firms, industries, or economies to produce goods and services with less impacts on the environment and less consumption of natural resources, bridging over economic and ecological issue. As far as efficiency is concerned, efficiency is defined as the proportion of the maximum output that can be attained by using the best production techniques to the actual output or the capacity of the firms to produce the maximum output that is possible with the available technology; while eco-efficiency refers to the combination concept of economic and ecological efficiency.

Eco-efficiency refers to the capability to maximize the production of goods and services which causes pollution to the environment but by utilising the minimum requirements of natural resources. Eco-efficiency increases by ‘activities that create economic value while continuously reducing ecological impact and the use of natural resources’ (DeSimone and Popoff, 1997, p. xix). The concept of eco-efficiency can be traced back to 1970s as the concept of ‘environmental efficiency’ (Freeman *et al.*, 1973); Schaltegger and Sturm (1990) were first to coin the ‘eco-efficiency’ term.

The essential theory underlying eco-efficiency is to create a higher economic efficiency with fewer resources and less pollution. The concept of eco-efficiency has received significant attention and risen due to two reasons: firstly, the increasing environmental pressures of firms’ activities which is subject to more rigorous environmental legislation (Kortelainen and Kuosmanen, 2005) and secondly, the