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DEVELOPMENT OF SUSTAINABLE AND ENVIRONMENTAL FRIENDLY MANUFACTURING SECTOR IN INDONESIA: CHALLENGES AND FUTURE POLICY DIRECTION

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ABSTRACT

Global economic development has been characterized by rapid growth of manufacturing sector and increasing number and variety of outputs produced by each economy. For many countries, development of manufacturing sector has given the opportunity to create more employment and higher income. However, massive utilization of natural resources to support development of the sector not only creates higher income and welfare but also brings negative impact to the welfare of the society by threatening environmental sustainability and human health through environmental degradation and increasing pollution. Although economic growth is necessary for an increase in welfare, the big and clear challenge is how to create positive connection between rapid economic growth and natural resource and environmental sustainability, as a prerequisite for sustainable development. Further specific questions are: (1) what factors that affect development of manufacturing sector vulnerable to environmental degradation: (2) how to encourage effective and efficient natural resource and energy utilization in the economy. This study will answer these questions by employing input-output (IO) analysis and econometric model in the manufacturing sector. The IO model shows an interconnection among industries with different pollution intensity. By using Industrial Pollution Projection System (IPPS) developed by the World Bank, we identify which industries are more or less pollution intensive and choose policy direction accordingly. The econometric model is used to assess the impact of energy utilization on pollution intensity of the industries. This study finds some types of industries especially upstream industries are more pollution-intensive and others, especially in downstream, are less. This study also finds that different structure of manufacturing sector has different impact on total energy used and therefore has different impact on total pollution. In other words, different industrial composition of the sector affects energy intensity and the pollution emitted by the sector. Based on these findings, policy implications and direction are then clearly identified.

Keywords: *manufacturing sector, pollution, energyintensity, sustainability.*