Convertion of Dual Fuel Opportunities in Indonesia Waterways

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Abstract. Indonesian shipping generally used heavy fuel oil (HFO) or Marine diesel oil (MDO) as diesel engine fuel. Exhaust gas emission produced by fossil fuel such as SO_X, NO_X, CO_2, and PM, contributed total global emission during 2007–2012 period as much as 3% of CO_2, NO_X for 12%, and SO_X for 13%. To comply Emission Control Area (ECA), and high fuel efficiency is Dual fuel, where this method is combined from fuel oil with gas such as LNG or CNG. This paper analyzes dual fuel conversion in container ship 368TEU. Payback period and Rate Of Interest (ROI) have been adopted as method adopted for analyzing investment. From payback period, the results show that if dual fuel 80:20 is faster than dual fuel 70:30, and single fuel, where in 9th years get profit 257.743, and 10th years for single fuel and dual fuel 70:30. From the ROI method, the results show that for each methhod is 18.65% for dual fuel 80:20, 17.43% for dual fuel 70:30, and 16% for single fuel.

Keywords: Convertion · Dual fuel opportunities · Indonesia waterways

1 Introduction

Indonesian shipping generally uses HFO or MDO as diesel engine fuel. Exhaust gas emission produced by fossil fuel is SO_X, NO_X, CO_2, & PM. This fossil fuel contributed total global emission during 2007–2012 period is 3% of CO_2, NO_X for 12%, and SO_X for 13%. Due to the global warming issue, International Maritime Organization (IMO) as maritime regulator makes regulation to control emission from maritime activity. The IMO TIER III is implemented on 1st January 2016, where ECA (Emission Control Area) restricted value of sulphur from ship fuel in 0.1%.

Many kinds of method to reduce emission from exhaust gas [1–3]. They usually divided into three methods i.e. the first method is prior to combustion with using fuel oil with low sulphur to reduce SOX and PM [4]. The second method is during combustion, for reduce NO_X use EGR (Exhaust Gas Recirculation) [5–7]. The third method is after combustion, if want to reduce SOX used wet scrubber, else if want to reduce NOX used SCR (Selective Catalytic Reducer) [8, 9], and if want to reduce PM used dry scrubber.

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