Pengendalian emisi tambat kapal : studi pustaka dan sebuah studi kasus di terminal peti kemas Semarang (TPKS) = Controlling ships berthing emission literature review and a case study in Semarang container terminal (TPKS)

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Abstrak

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Peningkatan tren perdagangan melalui laut akan mengakibatkan peningkatan aktivitas pelabuhan, sehingga akan makin banyak polusi udara akibat aktivitas tersebut. Untuk menjaga kualitas udara di area pelabuhan dan kota sekitar, diperlukan adanya pengendalian polusi udara di pelabuhan, khususnya untuk emisi dari kapal tambat yang merupakan kontributor polusi terbesar. Dalam studi ini, studi pustaka terkait sumber polusi udara di pelabuhan, dampaknya, cara memantau, dan teknologi potensial penurun emisi disediakan. Lebih lanjut, studi ini juga bertujuan untuk berkontribusi terhadap penelitian polusi udara pelabuhan di negara berkembang, dengan menyajikan sebuah studi kasus di Terminal Peti Kemas Semarang (TPKS), yang terdiri dari estimasi inventarisasi emisi untuk kapal tambat dan potensi penurunan emisi jika TPKS menggunakan cold ironing dan emission after treatment system (AMECS). Terkait studi kasus, ditemukan bahwa pada tahun 2013, kapal tambat di TPKS menghasilkan 22.65 ton PM10, 18.12 ton PM2.5, 186.48 ton NOx, 225.04 ton SOx, dan 5.48 ton NMVOC. Penurunan emisi dapat dicapai dengan menggunakan cold ironing dan AMECS. AMECS diperkirakan dapat mengurangi lebih banyak emisi daripada cold ironing. Namun demikian, studi kelayakan lebih lanjut diperlukan untuk menentukan pilihan terbaik diantara kedua teknologi tersebut.
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ABSTRACT
Increase in trends of seaborne trades will increase the activities in seaports, thus more air pollution will generated from those activities. Therefore, to maintain the good air quality in seaports area and nearby city, it is necessary to control air pollution in seaports, especially from ships berthing emission, the biggest contributor to the pollution. In this study, literature review concerning the source of air pollution in seaports, its impacts, the way to monitor, and potential emission reduction technologies were provided. Furthermore, this study also aims to contribute to seaports air pollution research in developing country, by presenting a case study in Semarang Container Terminal (TPKS), which consist of estimating ships berthing emission inventory and potential reduction if TPKS applies cold ironing and emission after treatment system (AMECS). Concerning the case study, it was found that in 2013, ships berthing at TPKS emit 22.65 tons PM10,

18.12 tons PM2.5, 186.48 tons NOx, 225.04 tons SOx, and 5.48 tons NMVOC. Emission reduction can be achieved by using cold ironing and AMECS. AMECS was estimated capable in reducing more emission than cold ironing. However, further feasibility study is needed to choose the most suitable technology between the two.;Increase in trends of seaborne trades will increase the activities in seaports, thus more air pollution will generated from those activities. Therefore, to maintain the good air quality in seaports area and nearby city, it is necessary to control air pollution in seaports, especially from ships berthing emission, the biggest contributor to the pollution. In this study, literature review concerning the source of air pollution in seaports, its impacts, the way to monitor, and potential emission reduction technologies were provided. Furthermore, this study also aims to contribute to seaports air pollution research in developing country, by presenting a case study in Semarang Container Terminal (TPKS), which consist of estimating ships berthing emission inventory and potential reduction if TPKS applies cold ironing and emission after treatment system (AMECS). Concerning the case study, it was found that in 2013, ships berthing at TPKS emit 22.65 tons PM10, 18.12 tons PM2.5, 186.48 tons NOx, 225.04 tons SOx, and 5.48 tons NMVOC. Emission reduction can be achieved by using cold ironing and AMECS. AMECS was estimated capable in reducing more emission than cold ironing. However, further feasibility study is needed to choose the most suitable technology between the two.;Increase in trends of seaborne trades will increase the activities in seaports, thus more air pollution will generated from those activities. Therefore, to maintain the good air quality in seaports area and nearby city, it is necessary to control air pollution in seaports, especially from ships berthing emission, the biggest contributor to the pollution. In this study, literature review concerning the source of air pollution in seaports, its impacts, the way to monitor, and potential emission reduction technologies were provided. Furthermore, this study also aims to contribute to seaports air pollution research in developing country, by presenting a case study in Semarang Container Terminal (TPKS), which consist of estimating ships berthing emission inventory and potential reduction if TPKS applies cold ironing and emission after treatment system (AMECS). Concerning the case study, it was found that in 2013, ships berthing at TPKS emit 22.65 tons PM10, 18.12 tons PM2.5, 186.48 tons NOx, 225.04 tons SOx, and 5.48 tons NMVOC. Emission reduction can be achieved by using cold ironing and AMECS. AMECS was estimated capable in reducing more emission than cold ironing. However, further feasibility study is needed to choose the most suitable technology between the two.;Increase in trends of seaborne trades will increase the activities in seaports, thus more air pollution will generated from those activities. Therefore, to maintain the good air quality in seaports area and nearby city, it is necessary to control air pollution in seaports, especially from ships berthing emission, the biggest contributor to the pollution. In this study, literature review concerning the source of air pollution in seaports, its impacts, the way to monitor, and potential emission

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