

# Triple-E will reduce CO<sub>2</sub> emissions by 50 percent

Press Release 4

Its size is remarkable, but the most impressive and important attributes of the Triple-E cannot actually be seen. The Triple-E class of container vessels will emit 20 percent less carbon dioxide per container moved compared to the most efficient container vessel operating today and 50 percent less than the industry average for vessels operating on the Asia - Europe trade.

Its name, the Triple-E, describes the key attributes of the vessel – Economy of scale, Energy efficient and Environmentally improved. To achieve the huge improvement in energy efficiency boasted by the Triple-E, its design is optimised to sail with the maximum possible cargo load at the speeds that the industry practices today, while at the same time reducing the impact on the environment.

One of the biggest challenges the world faces is a growing population and trade and the impact that has on the planet. Trade will continue for the benefit of global development: but for the health of the planet lowering emissions like CO<sub>2</sub> is a must.

“Reducing our CO<sub>2</sub> footprint is a top priority for us and also our customers who depend on us in their supply chain, and a growing number of consumers who inform their decisions with this information,” says Søren Stig Nielsen, Head of Sustainability for Maersk Line.

Maersk Line has committed to reduce its CO<sub>2</sub> emissions per container moved by 25 percent by 2020 (compared to 2007 CO<sub>2</sub> emission levels.) So far, and not including the progress made with Triple-E, the company has reduced its CO<sub>2</sub> emissions by 14 percent. The Triple-E will be a key component in reaching this first goal.

With room for 18,000 TEU (twenty-foot containers), the Triple-E has a capacity for 2,500 more containers than Emma Mærsk, meaning less carbon dioxide emitted per container moved. And despite its size, the Triple-E is no gas guzzler: the vessels use approximately 35 percent less fuel per container moved than the 13,100 TEU ships being delivered to other container shipping lines in the next few years for service on the Asia - Europe trade.

One major reason for its superior efficiency is what is happening in the Triple-E's engine room. The Triple-E is designed for a top speed of 23 knots, compared to Emma Mærsk's top speed of 25 knots. That tiny difference in maximum speed lowers the power output needed from the engine by 19 percent, which allows for slower revolutions in its engines and far greater fuel economy.

The Triple-E has two slow running engines ('ultra-long stroke') and two large propellers, a combination called 'twin skeg'. The reason for using this combination is that Maersk Line studies found that using two of these slower running engines to turn two propellers results in further energy savings of 4 percent compared to a one engine/one propeller design.

Boosting the efficiency of the vessel further is a waste heat recovery system situated in the engine room that captures and reuses heat and pressure from the engine's exhaust that would normally escape as wasted energy. Reusing this waste heat increases the power to the engine by 9 percent, reducing fuel consumption by 9 percent.

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FACTS >>>

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## FACTS: Maersk Line's new Triple-E ships emit 50 percent less CO<sub>2</sub>

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- The Triple-E class of container ships will be the most energy efficient vessels in the world, emitting 50 percent less CO<sub>2</sub> per container moved than the industry average for vessels deployed on the Asia – Europe trade
- The CO<sub>2</sub> emissions are measured in grams of CO<sub>2</sub> emitted per container moved one kilometre (grams of CO<sub>2</sub> / TEU kilometre)
- It is calculated using the internationally recognised methodology developed by the Clean Cargo Working Group
- Maersk Line used this methodology when Lloyds Register verified Maersk Line's CO<sub>2</sub> data in 2010
- The industry average comes from Clean Cargo Working Group, and these are based on CO<sub>2</sub> emission reports from a significant part of the worlds' top 20 shipping lines
- DSME, the shipyard building the Triple-E together with Maersk Line, has estimated the fuel consumption based a roundtrip on the same roundtrip with the same speed that Emma Mærsk is operating today. Using this information, we can estimate that Triple-E is 20 percent more efficient than Emma Mærsk
- The significant 50 percent less CO<sub>2</sub> per TEU kilometre has several explanations:
  - o Scale: The total capacity of 18,000 TEU (16 percent more than Emma Mærsk) is in itself reducing the CO<sub>2</sub> per container
  - o Smaller engine: Compared to the 80 megawatt engine on Emma Mærsk the Triple-E will have a 65-70 megawatt ultra long stroke engine. This type of engine has been chosen because the Triple-E is designed to operate at lower speeds. The ultra long stroke engine uses 8 percent less energy compared to a traditional engine
  - o Waste heat recovery: All Maersk Line vessels on order have a costly waste heat recovery system installed which effectively uses the hot exhaust gas to produce extra propulsion of the ship. If the Triple-E didn't have this system, its fuel consumption and CO<sub>2</sub> emissions would be 9 percent higher in a speed range of 18-23 knots

