

GEOSEA THORNTON AND HAY POINT PROJECT

Thornton Value Chain Carbon Footprint Hay Point LCA insights



By [Futureproofed](#) For [GeoSea](#), November 2012

VALUE CHAIN CARBON FOOTPRINT OF THE THORNTON OFFSHORE WINDFARM PROJECT

Three months ago GeoSea decided to complete the value chain carbon footprint of the Thornton offshore wind farm project. This value chain carbon footprint offers a cradle-to-cradle view of the Thornton project from GeoSea’s contractors perspective. The main goal is to gain perspective on the impact of GeoSea as contractor in the entire Thornton project. This study offers new insights on offshore wind farm projects. These insights can be used as a starting point to further develop GeoSea’s offshore wind farm business, sector guidance and support GeoSea’s brand activation. This study can also be used for Deme’s ambition to move to level 5 on the CO₂ performance ladder.

Highlights:

1. The direct CO₂ emissions of GeoSea as a contractor in the value chain carbon footprint of the Thornton project **is limited to 4%**. Including subcontractors, GeoSea’s direct and indirect emissions amount to 20%.

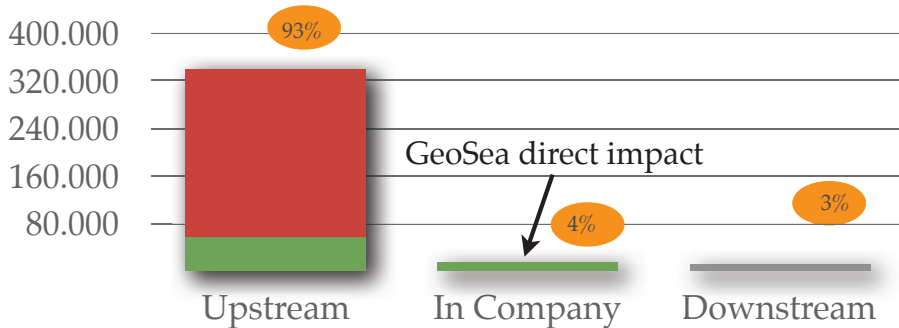


Image Executive summary.1 Direct impact of GeoSea in the value chain emissions of the Thornton project

2. Steel for **jackets and pinpiles** is the main emission (24,6%), followed by 20 years of **maintenance & operations** (21%). Materials for **wind turbines** (17,6%) and **fuel from subcontractors** (14,8%) are emissions number 3 and 4. These emissions represent almost 80% of the total value chain emissions.
3. Dismantling of the wind farm and **recycling of the materials** result in an estimated **reduction of 30%** of the GHG value chain carbon footprint. This results in a **value chain carbon footprint of 366.399 ton CO₂**. In the global context of resource scarcity, recycling the materials from offshore wind farms could be a business opportunity for GeoSea.

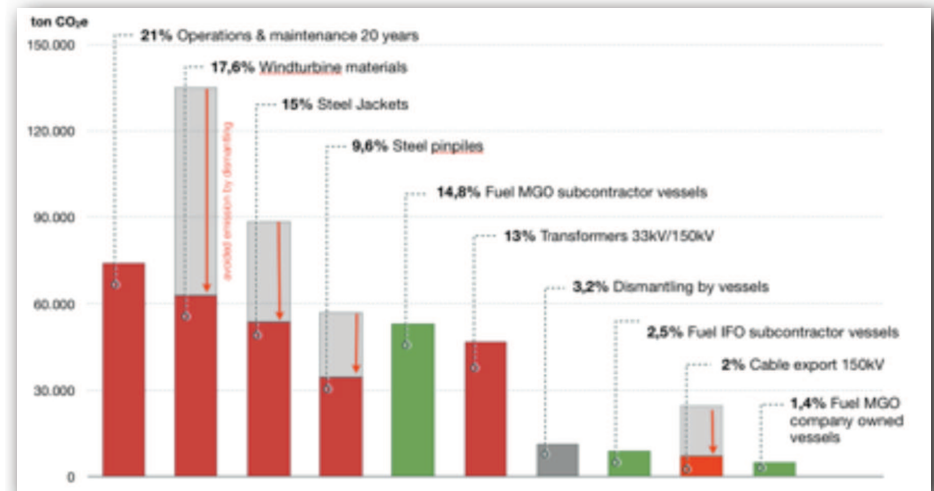


Image Executive summary.2 Top 10 of value chain emissions and avoided emissions when dismantling the windfarm after 20 years

4. During 20 years the Thornton project will produce a total of 19 million MWh. The value chain carbon emission of Thornton electricity amounts to **19g CO₂/kWh**. That is 13,5 times less than the average Belgian electricity mix (260g CO₂/kWh). This avoids **potentially 4.578.420 ton CO₂ emissions** over a period of 20 years. An average **yearly potential avoided emission of 228.921 ton**. This is equal to the **yearly emission of 23.000 Belgian citizens**.

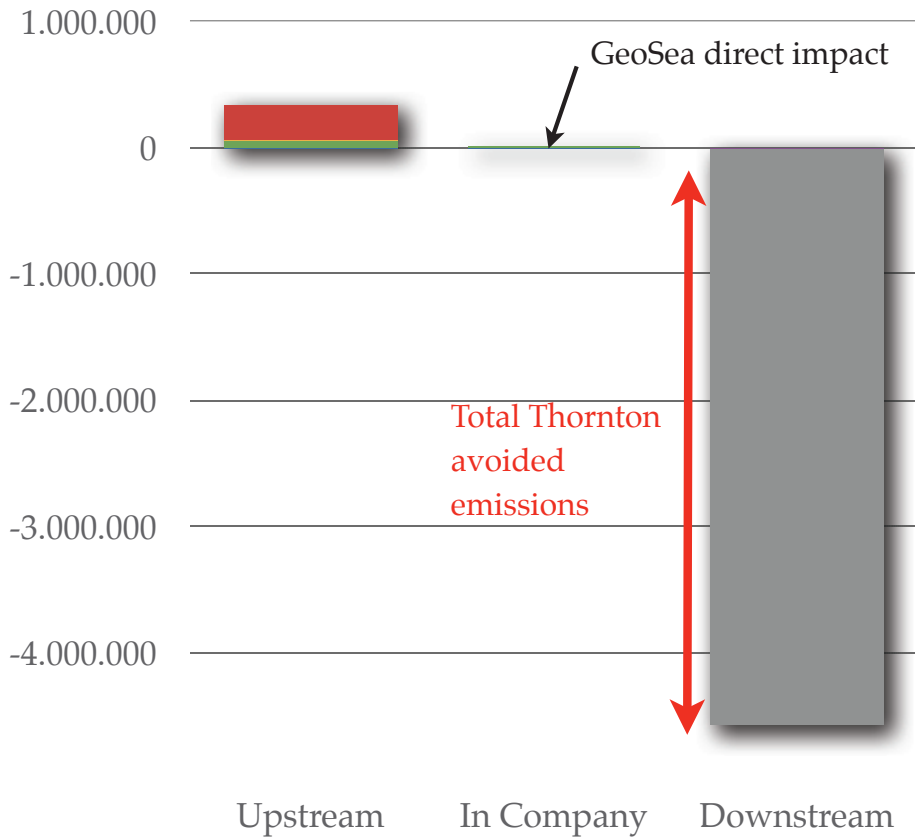


Image Executive summary.3 Downstream avoided emissions from 20 years Thornton electricity production (19g CO₂/kWh)

5. The value chain carbon footprint emissions of the Thornton project are 366.399 ton CO₂. The Thornton project avoids 228.921 ton/year. This results in a **carbon payback time of 19 months** compared to Belgian electricity mix.

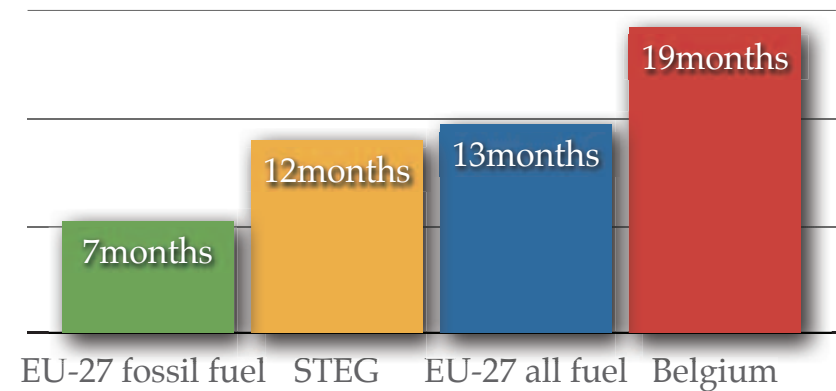


Image Executive summary.4 Carbon payback time of the Thornton project compared with average CO₂ electricity production mix: EU-27 fossil fuel (651g CO₂/kWh), STEG: Steam and gas (400g CO₂/kWh), EU-27 all fuel (364 g CO₂/kWh), Belgian (260g CO₂/kWh)