

# Fossil carbon emissions

## summary for 2017

### Governance, strategy, policy and targets for combatting global warming

Sustainability, including combatting global warming, is promoted by the Board of Directors, the CEO, and the Group Leadership Team (GLT). The CEO has the ultimate responsibility for the successful implementation of our [sustainability strategy](#). The work is led by the EVP, Sustainability, who reports to the CEO and is part of the GLT. The Board of Directors' Sustainability and Ethics Committee oversees the implementation of our sustainability strategy and the ethics and compliance strategy. For more details on our governance see our [Corporate Governance Policy](#).

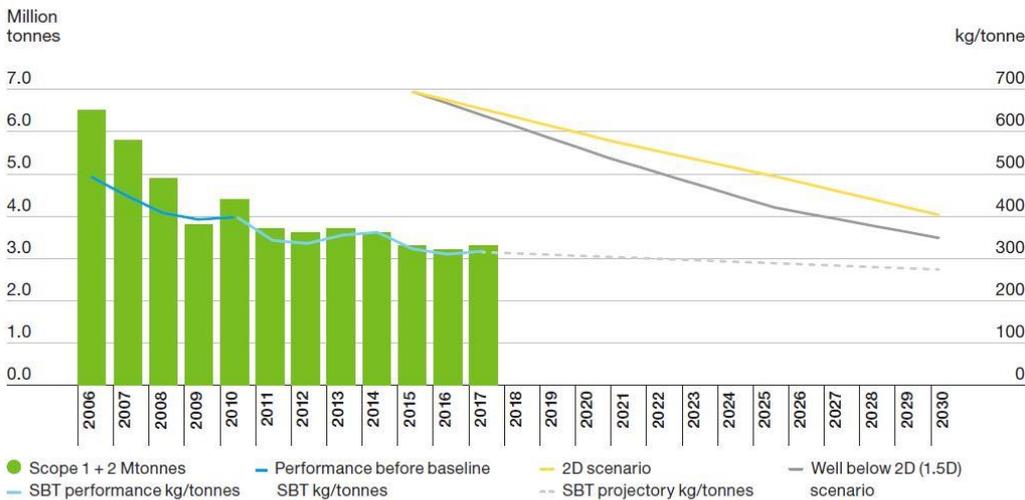
Stora Enso's sustainability agenda, is an integral part of the Group-wide annual strategy process involving all business divisions and key functions. CO<sub>2</sub> impacts are specified and assessed in investment projects, feasibility studies and eventual investment decisions. Our long term strategy for Combatting Global Warming is guided by our [Energy and Carbon Policy](#).

Our Science Based Targets have been informed by IPCCs "well below 2 degree" scenario and the Sectoral Decarbonization Approach (SDA). A key tool in the scenario assessment and the establishment of reduction targets was the Stora Enso internal Carbon Neutrality Roadmap, which contains reduction opportunities in our mill units for the upcoming years.

### Greenhouse gas emission (GHG) reductions targets and performance

Our science-based target (SBT) is to reduce fossil CO<sub>2</sub> and other greenhouse gas emissions from operations by 31% per tonne of pulp, paper, and board produced by 2030, compared to a 2010 baseline.

**Stora Enso's performance<sup>a</sup> vs forest industry data scenarios<sup>b</sup>**  
GHG emissions in absolute and as GHG intensity



**GHG emissions from our value chain**

**Science-based target (SBT):** 70% of our non-fibre suppliers and downstream transportation suppliers in terms of spend to set GHG reduction targets by 2025 with the aim to adopt as SBTs by 2030.

**Our Scope 3\* emissions:** In 2017, our Scope 3 emissions were estimated to 7.11 Mt of GHG emissions. Material impacts have been identified in the following categories; Purchased raw materials, Fuel and energy related activities, Up- and downstream transportation and Processing of sold products.

Updates of our Scope 3 estimates have been carried out biannually since 2007 and we apply WRI/WBCSD's value chain accounting and reporting standard.

\* Our Scope 3 emissions are verified with limited assurance.

Scope 1+2	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017 <sup>d</sup>
Million tonnes	6.52	5.78	4.86	3.85	4.42	3.72	3.62	3.75	3.63	3.27 <sup>c</sup>	3.21 <sup>c</sup>	3.33 <sup>c</sup>
kg/tonne	494	448	407	391	396	341	334	354	361	321	308	315

<sup>a</sup> Covering direct and indirect fossil CO<sub>2</sub> emissions (scope 1 and 2) from pulp, paper, and board production units. Excluding joint operations. Normalised figures are reported per unit of sales production.  
<sup>b</sup> 2 degree scenario and well below 2 degree (1.5) scenarios based on information from the Transition Pathway Initiative (TPI)<sup>2</sup> including scenarios data from the Energy Technology Perspectives report by the International Energy Agency.  
<sup>c</sup> GHG emissions data from our operations are verified with reasonable assurance (2015, 2016 & 2017) and calculated according to the GHG protocol and GHG Scope 2 guidance.  
<sup>d</sup> Adversely affected by the coal-based energy consumption at our Beihai mill in China.

## Risk and opportunity disclosure for global warming

Stora Enso is committed to ensuring that systematic, holistic and proactive management of risks and opportunities is an integral part of all Group activities. Changes in precipitation patterns, typhoons and severe frost periods in the subtropics could cause damage to tree plantations. Increases in average temperatures could lead to changes in the tree species composition of forests. Milder winters could impact harvesting and transport of wood in northern regions and the related costs. Additional demand for biomass fuels and agricultural land may limit the availability of land for fibre production, affecting the price of biomass. The increasing global demand for water may in the long-term impact the Groups operations through our supply chains. The main climate related opportunity for Stora Enso is replacing fossil-based materials by innovating and developing new products and services based on wood and other renewable materials. Sensitivity analyses have been used in support of estimating the order of magnitude financial impacts of risks and opportunities.<sup>1</sup> Our 2017 ERM results in relation to global warming are summarized in our [Financial report](#).

Risks related to global warming are managed via activities related to finding clean, affordable and safe energy sources for production and transportation, and reducing energy consumption. Additional measures include energy efficiency initiatives, the use of carbon-neutral biomass fuels, maximising the utilisation of combined heat and power, and sequestration of carbon dioxide in forests and products. Diligent plantation planning is ensured to avoid frost sensitive areas and non-controversial tree breeding and R&D programmes are applied to increase tolerance of extreme temperatures. Stora Enso maintains a diversity of forest types and structures and enforces diversification in wood sourcing. Wood harvesting in soft soils involves the implementation of best practices guidelines. Agroforestry concepts have been introduced to integrate the different land use forms and to mitigate the competition for land and the effects of increasing food prices.

## 2017 highlights

- In December 2017, Stora Enso signed a new Revolving Credit Facility (RCF) loan where part of the pricing is based on our ability to reduce greenhouse gas emissions in accordance with the Science Based Targets. The facility size is EUR 600 million with maturity in January 2023.
- In 2017, our total energy self-sufficiency rate was 63%. The share of biomass in internal energy production was 82%.
- In 2017, our 10 MEUR energy efficiency fund was used to support 28 projects. The projects financed in 2017 are estimated to generate annual energy savings of at least 247 GWh and will eliminate over 24 000 tonnes of annual fossil CO<sub>2</sub> emissions.
- Informed by the process of establishing a SBT, Stora Enso's sourcing strategy was updated in 2017 to include the objective of reducing greenhouse gas emissions from our supply chain.
- Drivers for sustainable profitable growth include next-generation packaging solutions, MFC, bio-barriers, bio-composites, dissolving pulp, building components and systems, lignin, and future bio-based chemicals, products which provide alternatives to fossil-based materials. Close to seven percent of our sales in 2017 came from new products and services, which is almost twice that of 2016.

## External recognition

The [Transition Pathway Initiative \(TPI\)](#)<sup>2</sup> assessed how 18 of the largest paper producers globally are preparing for the transition to a low-carbon economy. Stora Enso was top-ranked.

<sup>1</sup> Sensitivity analyses for wood, energy, products, and significant assumptions have been published in our [financial report](#).

<sup>2</sup> Asset owner-led initiative supported by Grantham Research Institute and London School of Economics.