

# Sustainability Report

Part of Stora Enso's Annual Report 2016





# Everything that's made with fossil-based materials today can be made from a tree tomorrow.

Stora Enso is a leading provider of renewable solutions in packaging, biomaterials, wooden constructions, and paper on global markets. Our aim is to replace fossil-based materials by innovating and developing new products and services based on wood and other renewable materials. We employ some 25 000 people and our shares are listed on the Helsinki (STEAV, STERV) and Stockholm (STE A, STE R) stock exchanges.

Stora Enso's Annual Report 2016 consists of four reports: Progress Book, Sustainability Report, Financial Report, and Corporate Governance Report.



**The Progress Book** explains Stora Enso's strategy, how we create value, and how our work is progressing. The publication is available in English, Finnish, and Swedish.



**The Sustainability Report** covers Stora Enso's social, environmental, and economic sustainability performance.



**The Financial Report** consists of Stora Enso in capital markets, a summary of our sustainability performance, the Report of the Board of Directors, and the financial statements.



**The Corporate Governance Report** covers Stora Enso's governance policy, practices, and actions as well as remuneration in 2016.



You can find the highlights of the year and the online Financial Report at [storaenso.com/annualreport](http://storaenso.com/annualreport), where all reports can be downloaded.



Governance
Social agenda
Environmental agenda
Economic agenda
Data and assurance

# Contents

- Governance** ..... 3
  - Strategy and governance ..... 4
  - Our targets ..... 6
  - Stakeholder relations ..... 7
  - Human rights ..... 9
- Social agenda** ..... 16
  - Employees and wider workforce ..... 17
  - Community ..... 22
  - Business ethics ..... 29
- Environmental agenda** ..... 33
  - Materials, water, and energy ..... 34
  - Carbon dioxide ..... 44
  - Forests, plantations, and land use ..... 50
- Economic agenda** ..... 56
  - Customers ..... 57
  - Suppliers ..... 60
  - Investors ..... 64
  - External recognition ..... 66
- Data and assurance** ..... 67
  - Reporting scope ..... 68
  - Data by production unit ..... 69
  - Assurance report ..... 72

The report contents have been assured by an independent third-party assurance provider with a level of Limited Assurance. A level of Reasonable Assurance has been provided for our direct and indirect fossil CO<sub>2</sub> emissions.

The GRI index is available at [storaenso.com/gri](http://storaenso.com/gri)



**Renewable materials are a solution for combatting global warming.**

Read more on page 44



**Respect for human rights is a top priority across our global operations.**

Read more on page 9



**We help build resilient communities.**

Read more on page 22

Governance
Social agenda
Environmental agenda
Economic agenda
Data and assurance

# Sustainability highlights 2016

**Promoting sustainable forestry**



**90%**


of the lands we own or manage were covered by forest certification schemes.

**Caring about our people**

**6.4%**

Our lost-time accident rate decreased by 6.4%.

Our target is to achieve a gender balance of 70% male and 30% female among senior managers in 2018.




**Combating global warming**

**-39%**

Our CO<sub>2</sub> emissions were 39% lower than the 2006 benchmark level. We also introduced a KPI measuring the carbon intensity of the energy we use.

**Respecting human rights**

**86%**

of all the actions in our Human Rights Action Plan were completed.

**External recognition**



CDP included Stora Enso on its Climate A List, Supplier Climate A List, and Supplier Engagement Leaderboard.

**Sourcing responsibly**

**92%**

of our spending on goods, materials, and services was covered by our Supplier Code of Conduct.

**98%**

**Minimising waste**

The utilisation rate for our by-products and residuals was 98%.




**Resilient communities**

We advanced our community investment work globally. In Uruguay, 170 farmers used the company's lands to graze their cattle.

**170**

**Promoting ethical culture**

We introduced an internal Ethics Ambassadors Programme with 170 employees from 24 countries.



**Transparency towards customers**

26 of our mills were registered with the Supplier Ethical Data Exchange (Sedex).



<b>Governance</b>
Social agenda
Environmental agenda
Economic agenda
Data and assurance



# Governance

- Strategy and governance 4
- Our targets 6
- Stakeholder relations 7
- Human rights 9



Governance
Social agenda
Environmental agenda
Economic agenda
Data and assurance

# Strategy and governance

In 2016 Stora Enso introduced a new framework for the company’s sustainability work, to build on all the work done over many years in this field. The new framework is based on the classic Triple Bottom Line model widely used in corporate responsibility work.

Stora Enso’s Sustainability Agenda encompasses the social, environmental, and economic responsibility of our operations throughout the value chain. The agenda addresses ten sustainability topics identified as material to Stora Enso: Employees and wider workforce; Community; Business ethics; Materials, water, and energy; Carbon dioxide; Forests, plantations, and land use; Customers; Suppliers; and Investors. Human rights are considered to be so integral to our long-term success that these topics are progressed as an overarching theme.

In line with our Sustainability Agenda we have set ambitious targets and selected key performance indicators (KPIs) for our work. Progress is monitored in group-level and division-level business reviews.

Consolidated results on all material sustainability indicators are reported annually in the Sustainability Report. Selected sustainability indicators are also reported quarterly in our Interim Reports.

Stora Enso acknowledges the United Nations’ Sustainable Development Goals as part of a global ambition to end poverty, protect our planet, and ensure prosperity for all. We are in the process of assessing how best to reflect these long-term goals in our Sustainability Agenda.

## Sustainability embedded in strategy

Stora Enso’s sustainability strategy is incorporated into the wider company business strategy.

Our Sustainability Policy describes our overall approach and governance model. At the same time, our Code of Conduct and other policies, guidelines, and statements on specific topics all further elaborate our approach, while



The everyday implementation of our Sustainability Agenda is the responsibility of line management supported by functional experts.

also guiding our employees in their everyday work. These documents are available at [storaenso.com/sustainability](http://storaenso.com/sustainability). In order to ensure alignment with our Sustainability Agenda, Stora Enso conducted a comprehensive review of the company’s existing sustainability policies, guidelines, and statements in 2016. This alignment will continue in 2017.

## Sustainability governance

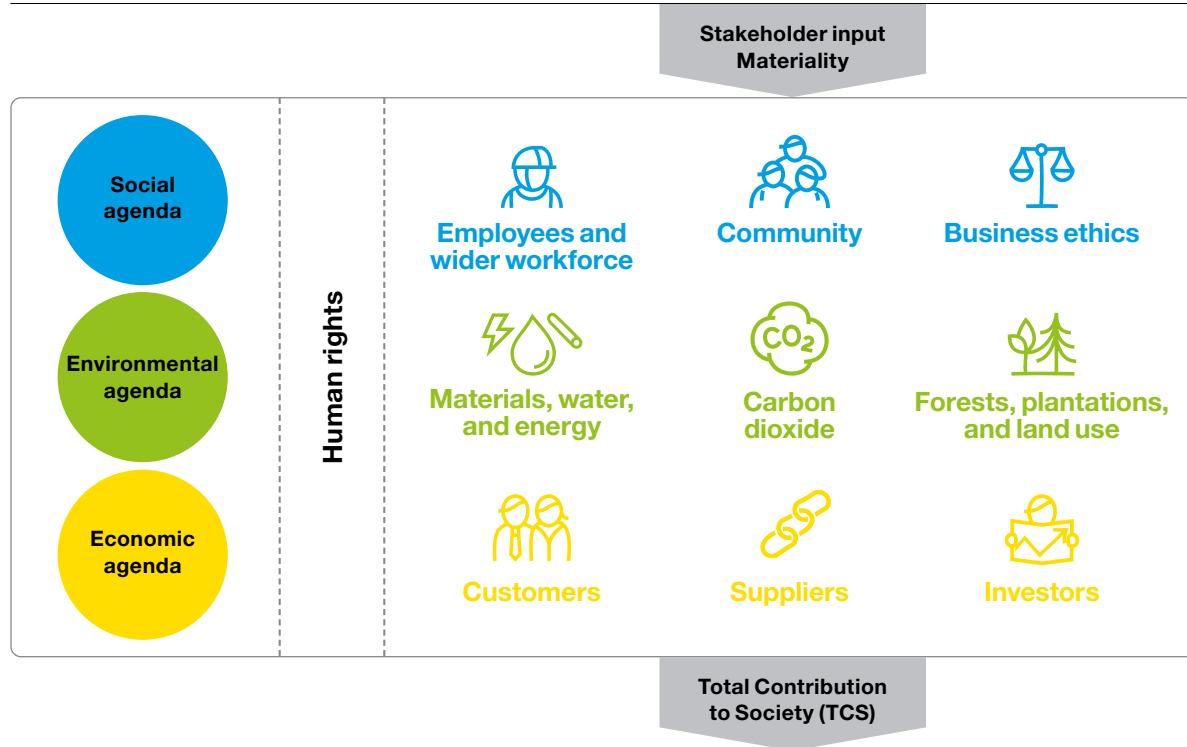
Sustainability is a key element of Stora Enso’s corporate governance, promoted by the Board of Directors, the CEO, and the Group Leadership Team (GLT). The CEO carries the ultimate responsibility for the successful implementation of our sustainability strategy.

The Board of Directors’ Sustainability and Ethics Committee oversees the implementation of our sustainability strategy and Ethics and Compliance Strategy. The committee met four times in 2016. It has reviewed the disclosures in this report. The main focus areas of the committee in 2016 are described in our Corporate Governance Report.

Work on sustainability issues is led by the Executive Vice President, Sustainability, who reports directly to the CEO. Everyday sustainability topics are managed by our group Sustainability function together with our Legal, Human Resources, Sourcing and Logistics, and Wood Supply functions, and our divisions (Consumer Board, Packaging Solutions, Biomaterials, Wood Products, and Paper). Each



<b>Governance</b>
Social agenda
Environmental agenda
Economic agenda
Data and assurance



to follow up on sustainability in the companies where we act as owners. The Board of Directors of our equity-accounted minority investment in Pakistan, Bulleh Shah Packaging, has a Sustainability Committee formed by representatives of top management and parent companies.

**About this report**

This Sustainability Report is structured to reflect our Sustainability Agenda, with the agenda’s ten elements addressed through a common four-level framework:

**Opportunities and challenges**

These sections examine the external factors and global trends currently affecting the topics included in our Sustainability Agenda. Please note that our corporate risk management assessment appears in the parallel [Progress Book](#) and [Financial Report](#).

**Our policies**

These sections set out the relevant strategies and policies we use to address key opportunities and challenges.

**How we work**

These sections describe the processes, procedures, and systems we deploy to realise our strategies and policies.

**Progress**

These sections report on our progress on related topics during 2016.

**External assurance**

The report contents have been assured by an independent third-party assurance provider with a level of Limited Assurance. For the second year running a level of Reasonable Assurance has been provided for our direct and indirect fossil CO<sub>2</sub> emissions (scopes 1 and 2). Stora Enso is one of the few companies in the world that assures its CO<sub>2</sub> reporting for stakeholders at Reasonable Level. The company is developing a roadmap to help further improve the external assurance of our sustainability reporting. For more information on assurance, see page 68.

Our Sustainability Agenda is based on the classic Triple Bottom Line model. It addresses the ten sustainability topics identified as material to Stora Enso.

of our business divisions has its own Head of Sustainability, who reports directly to the Executive Vice President of the division.

Other key units, such as Wood Supply, and Sourcing and Logistics, each have sustainability organisations to support their management teams. The everyday implementation of Stora Enso’s Sustainability Agenda is the responsibility of line management supported by functional experts at all levels.

Stora Enso’s sustainability work is steered by our Sustainability Council, whose members come from our five divisions, our Sourcing and Logistics function, and the group Sustainability team. Chaired by the Executive Vice President, Sustainability, the council met nine times in 2016. Their work involves sharing good practices and identifying longer-term opportunities and challenges that may require a group-wide response. The Group Leadership Team is periodically

informed of developments, as is the Board of Directors, when appropriate, via its Sustainability and Ethics Committee.

**Sustainability governance of joint ventures**

Our joint operations in Brazil (Veracel) and Uruguay (Montes del Plata) and our equity-accounted minority investment in Pakistan (Bulleh Shah Packaging) have their own sustainability teams, and sustainability topics are regularly discussed by their boards, which include representatives from their parent companies. Sustainability topics are also regularly discussed by Stora Enso’s joint venture steering committees for Veracel and Montes del Plata. Stora Enso has a corresponding representation in the boards of the forestry companies Tornator and Bergvik Skog in Finland and Sweden, and one of the aims of our internal joint venture guidelines is



## Our sustainability targets and key performance indicators (KPIs)

	Key performance indicator (KPI)	2016	2015	Targets	Progress	
Governance	<b>Human rights</b> Implementation of Human Rights Action Plan <sup>1</sup>	86% of the actions completed	100% of action plans in place based on the assessment, and 69% of the actions completed	To complete all remaining actions not involving regular review by the end of 2017.	In progress	
	<b>Employees and wider workforce</b> Lost-time accident (LTA) rate <sup>2</sup>	4.4	4.7	3.8 by the end of 2016	Not achieved	
		Leadership Index <sup>3</sup>	80	79	80 by the end of 2018	Achieved
	<b>Community</b> Will be reviewed in 2017	n/a	n/a	To establish a group-wide KPI during 2017	In progress	
	<b>Business ethics</b> Code of Conduct Index <sup>3</sup>	81	80 <sup>4</sup>	Positive trend	In progress	
Environmental agenda	<b>Materials, water, and energy</b> Materials: KPI review will continue in 2017	n/a	n/a	To establish a group-wide KPI during 2017	In progress	
		Water: Reduction in the volume of process water discharges per saleable tonne of pulp, paper and board (m <sup>3</sup> /tonne) <sup>5</sup>	-3%	-2%	-6% from 2005 benchmark level by the end of 2015	Not achieved
		Water: Reduction in chemical oxygen demand (COD) per saleable tonne of pulp, paper, and board (kg/tonne) <sup>5</sup>	-9%	-3%	-7% from 2007 benchmark level by the end of 2015	Achieved
		Energy: Reduction in electricity and heat consumption per saleable tonne of pulp, paper, and board (kWh/tonne) <sup>5</sup>	-4.5%	-4.7%	-15% from 2010 benchmark level by the end of 2020	In progress
	<b>Carbon dioxide</b> Reduction in CO <sub>2</sub> emissions per saleable tonne of pulp, paper, and board (kg/tonne) <sup>5</sup>	-39%	-38%	-35% from 2006 benchmark level by the end of 2025	Achieved	
Fossil CO <sub>2</sub> emissions per total energy consumed (Kg of CO <sub>2</sub> /MWh) <sup>5</sup>		62	67	Will be reviewed by the end of 2017	In progress	
<b>Forests, plantations, and land use<sup>6</sup></b> % of the lands owned and managed by the company covered by forest certification schemes	90%	90%	96% by the end of 2017	In progress		
<b>Suppliers</b> % of supplier spend covered by our Supplier Code of Conduct <sup>7</sup>	92%	90%	90% of total supplier spend covered by the end of 2016	Achieved		
				The target for 2017 will be communicated in the Interim Report for Q1/2017.		

<sup>1</sup> Stora Enso carried out a group-wide Human Rights Assessment during 2014. Action plans to address the findings were defined during the first half of 2015.

<sup>2</sup> Number of lost-time accidents among our own employees per one million hours worked.

<sup>3</sup> Measured in the annual employee survey.

<sup>4</sup> Restated (+1)

<sup>5</sup> Recalculated due to changes in baseline following divestments or accuracy improvements.

<sup>6</sup> Until 2016, Stora Enso kept track of progress on land use efficiency with a group-level KPI that measured the increase in the average volume of fibre produced per hectare in certified tree plantations owned and managed by Stora Enso. In 2016, however, the company gave up following this consolidated summary performance indicator. Instead, we plan to monitor the sustainable intensification of production separately at each plantation, taking into account different local operating conditions.

<sup>7</sup> Performance in 2015 excludes wood supply units.



<b>Governance</b>
Social agenda
Environmental agenda
Economic agenda
Data and assurance

# Stakeholders at the core of our approach

In 2016 we initiated a review of our key stakeholders to ensure that our Sustainability Agenda continues to reflect their expectations and perceptions.

Based on the well-established Triple Bottom Line (TBL) model, the ten elements of our Sustainability Agenda (see page 5) can be considered as the company's materiality matrix. The agenda covers the topics we must get right everywhere, all the time. As the TBL is a dynamic model, we periodically need to assess how well aligned we are with the evolving expectations and perceptions of our key stakeholders.

## Assessing priorities with stakeholders

Having an open dialogue with our key stakeholders is crucial if we are to react successfully to global trends and market expectations. This allows us to keep working effectively on our Sustainability Agenda.

Our stakeholder engagement work is based on both structured and ad hoc interactions, as well as surveys on topics such as customer and employee satisfaction, and investors' expectations. We also obtain important information through formal grievance channels. During 2016 we reviewed the stakeholder and materiality work completed in 2012–2014 with the help of a globally recognised expert organisation. The process will continue during 2017 and provide us with an up-to-date view of our key stakeholders' priorities, which will then be fed into our Sustainability Agenda.

Stora Enso joined the World Business Council for Sustainable Development's (WBCSD) Redefining Value Board (RV) in 2016. The RV Board is made-up of eight WBCSD member company executives, who provide strategic guidance for the Redefining Value programme. The programme's actions involve aligning international reporting frameworks, addressing the corporate governance and risk management systems that shape corporate decision-making, enhancing materiality assessment standards, and improving data assurance and valuation methodologies.

Our stakeholder engagement work helps us to define priorities for our collaboration with international and non-



Having an open dialogue with stakeholders is crucial if we are to react successfully to global trends and market expectations.

governmental organisations and industry associations where we are members. Examples of our work can be found in the respective sections of this report. During 2016 we enhanced Stora Enso's governance model regarding interactions with international and non-governmental organisations that have important relationships with the company group-wide. This involved setting up dedicated global relationship managers for each NGO, in order to facilitate more coordinated and sustained engagement.

## Creating value for society

We are continuing to explore ways to define and report on the monetary value associated with Stora Enso's non-financial

We consider anyone interested in our company as a stakeholder. Particularly significant stakeholder groups for Stora Enso include:

- Consumers
- Customers
- Employees
- Forest-owners
- Governments
- Investors
- Local communities
- Media
- NGOs
- Partners and suppliers
- Trade unions



<b>Governance</b>
Social agenda
Environmental agenda
Economic agenda
Data and assurance



sustainability impacts and actions. This involves a focus on external assurance for selected data. For more information, see pages 68 and 72.

For more information about how we create value as a renewable materials company see our [Progress Book](#).

Stora Enso annually reports on the company’s tax footprint in each of the countries where we operate. For details see our [Progress Book](#).

**In 2016, Stora Enso actively collaborated with several organisations.**

For more information, see the following pages:

- BSR, pages [12](#), [20](#), [28](#), [46](#), [61](#), and [63](#)
- International Finance Corporation (IFC), pages [15](#) and [24](#)
- International Labour Organisation (ILO), page [14](#)
- Save the Children and CCR CSR, pages [9](#), [12](#), and [28](#)
- The Prince of Wales’s Corporate Leaders Group, page [46](#)
- Transparency International, page [30](#)
- UN Global Compact, page [68](#)
- We Mean Business Coalition, page [45](#)
- World Business Council for Sustainable Development (WBCSD), pages [45](#) and [46](#)
- WWF, pages [51](#) and [53](#)

We periodically assess how well our Sustainability Agenda is aligned with the evolving expectations of our stakeholders.



Governance
Social agenda
Environmental agenda
Economic agenda
Data and assurance

# Human rights

Respect for human rights is a top priority for Stora Enso. We strive to align our work with the UN Guiding Principles on Business and Human Rights.

## Opportunities and challenges

### A challenging operational environment

When it comes to human rights, Stora Enso's operations extend to challenging markets such as China, Pakistan, Laos, and Brazil. Many of the human rights challenges we face are deeply rooted in local society, and can only be effectively addressed through long-term commitment and close cooperation with global and local stakeholders.

The UN Guiding Principles on Business and Human Rights emphasise that companies have an ongoing responsibility to respect human rights, even where government actions and regulatory frameworks are deficient. They encourage companies to implement human rights due diligence procedures that identify, assess, and address the human rights risks and impacts of their operations, products, and services.

## Our policies

### A deep commitment to human rights

Stora Enso's human rights commitment extends from our employees and on-site contractors, through external suppliers of materials and services and our other business partners, to communities living near our operations. In addition to our commitment to the UN Guiding Principles on Business and Human Rights our Sustainability Agenda is aligned with the ten principles of the UN Global Compact, including its principles on human rights. Stora Enso also respects and follows the legal reporting requirements of the UK Modern Slavery Act.

Relevant Stora Enso policies and statements on human rights include:

- Code of Conduct, which expresses our respect for international human and labour rights



Stora Enso's tree plantations in Laos are located in the vicinity of villages that are culturally and ethnically diverse. Read more on page 15.

- Supplier Code of Conduct, which imposes strict contractual requirements regarding human rights on our suppliers
- Human Rights Statement, which expresses our respect for international and regional human rights instruments including
  - » The UN International Bill of Human Rights
  - » The core labour rights conventions of the International Labour Organisation (ILO)
- » ILO Convention no. 169 on the Rights of Indigenous Peoples, including the principle of Free, Prior, and Informed Consent and Participation
- » The OECD's Guidelines for Multinational Enterprises
- » The Children's Rights and Business Principles developed by UNICEF, the UN Global Compact, and Save the Children.

<b>Governance</b>
Social agenda
Environmental agenda
Economic agenda
Data and assurance

**How we work**

**Due diligence on human rights**

Human rights risks are taken into account across our operations from investment decisions onwards, including mergers, acquisitions, and divestments. Our investment guidelines stipulate that environmental and social risks and impacts, including those related to human rights, must be duly identified, assessed, and addressed prior to any investments in projects with business critical risks. Business ethics risks and specific investments' compliance with our Code of Conduct and Business Practice Policy are also assessed.

We are currently developing a human rights strategy using a best practice methodology. The strategy will be further refined during 2017. The strategy will define a set of prioritised human rights that are the most relevant for Stora Enso.

**Environmental and social impact assessments (ESIAs)**

Significant new investments can entail environmental and social impacts which may directly or indirectly cause substantial changes in local conditions, also with regard to human rights. To map and mitigate these impacts, we conduct ESIAs for all new projects that could cause significant adverse effects in local communities. Such projects include all board, pulp, paper, or sawmills built on greenfield sites, industrial-scale plantation projects, and any large-scale expansions of existing facilities.

One important element of any ESIA involves assessing the operational context from a human rights perspective and establishing dialogues with local residents, members of local organisations, experts, researchers, and other stakeholders. This is done through interviews, meetings, workshops, and public hearings. The results of ESIAs give us valuable information on how local communities may be affected by changes in their socio-economic conditions and any impacts on cultural heritage, while also setting out implications for community health, safety, and security.

**Human Rights Assessment and action plans**

Stora Enso conducted a comprehensive group-wide Human Rights Assessment in 2014, consisting of separate assessments for 93 operational entities in 22 countries, including all of our production, wood supply, and forestry

operations, our joint operations in Brazil and Uruguay, and our equity-accounted minority investment in Pakistan.

As part of this process, Stora Enso and the Danish Institute for Human Rights (DIHR) developed a customised Human Rights Compliance Assessment tool covering 43 human rights issues. The resulting Human Rights Assessment report, consolidated by DIHR, was published in February 2015.

A Human Rights Action Plan was developed during 2015, based on the findings and recommendations of the assessment report. The implementation of the action plan commenced in Q3 2015, and continued during 2016.

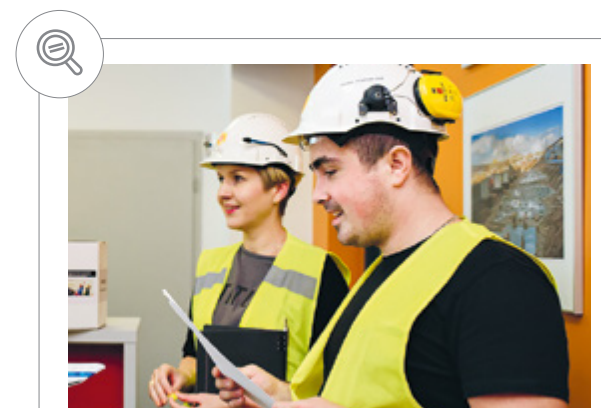
The plan includes actions designed to:

- monitor compliance with labour rights and the working conditions of third-party on-site staff
- promote diversity and inclusion among Stora Enso's workforce
- improve overtime practices and entry-level wages at certain units
- develop guidance and procedures for the protection of employee privacy
- ensure opportunities for supporting and facilitating collective bargaining
- improve occupational health and safety practices at certain units
- strengthen grievance mechanisms
- improve environmental and social impact assessment procedures
- enhance policies and procedures for security management
- continue to implement our Supplier Code of Conduct
- ensure that human rights impacts are duly considered and addressed through responsible supply chain management.

**Progress on the implementation of preventive and remediation actions as of 31 Dec 2016**

	Completed	On track	Not on track	Closed <sup>1</sup>	Regular review <sup>2</sup>
Implementation progress, % of all actions	86%	3%	1%	7%	3%

<sup>1</sup> Issues that were identified in the Human Rights Assessment but closed following reassessment of their validity in specific local contexts.  
<sup>2</sup> Longer-term actions without a targeted end-date that require continuous review.



**How are human rights integrated into our everyday work?**

Human rights issues in a corporate context are often only associated with severe human rights violations. In 2014 Stora Enso conducted a global human rights assessment covering all units. Most of its findings related to general management issues, involving day-to-day occupational health and safety topics, human resources, and supply chain management. At Ostrołęka Mill this process has deepened dialogues between the mill management, employees, and the local community.

➤ Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

**Grievance and remediation mechanisms**

In accordance with the UN Guiding Principles on Business and Human Rights and our own Human Rights Statement, Stora Enso is committed to remedy any situation where our activities have caused or contributed to adverse human rights impacts. In circumstances where human rights violations are committed by third parties with links to Stora Enso through our operations, products or services, we strive to use our influence together with relevant stakeholders to ensure that those impacts are remedied.



<b>Governance</b>
Social agenda
Environmental agenda
Economic agenda
Data and assurance

A third-party-administered grievance channel is available to all our employees, enabling them to report instances where their rights may have been infringed, or where they have observed violations of Stora Enso’s Code of Conduct.

We have also established local grievance channels for communities and other external stakeholders associated with our plantations and new mill in Guangxi, China. We encourage anyone with concerns to call an anonymous hotline number, write to us, visit us, or talk to our field personnel. Stora Enso’s employees are trained to distribute information about our operations in local villages, and to duly process any grievances, even in villages not engaged in any kind of business relationship with the company.

Similar local grievance channels exist for our project in Laos, our joint operations Veracel and Montes del Plata in Brazil and Uruguay, and our equity-accounted minority investment in Pakistan.

For more information on the group’s formal grievance mechanism, which is also open to external stakeholders in countries where the law permits this, see page 31.

**Accountability through transparent reporting**

During 2016, details of our progress on implementing our Human Rights Action Plan were published in our quarterly Interim Reports, which also covered other human rights-related topics such as supply chain management.

Stora Enso is additionally following the legal requirements of the UK Modern Slavery Act to enhance our transparency and reporting. This act requires organisations conducting significant business in the UK to publish annual Slavery and Human Trafficking Reports setting out what they do to ensure that slavery and human trafficking do not take place in any of their supply chains, or in any part of their own business. Stora Enso’s first such report will be published in 2017 at [storaenso.com/sustainability](http://storaenso.com/sustainability).

**Progress**

**Our achievements in human rights**

In 2016 our focus was on implementing the Human Rights Action Plan that resulted from our group-wide Human Rights Assessment conducted in 2014 and a related report published in 2015.



Our human rights commitment extends from employees and on-site contractors through suppliers and business partners to local communities.

By the end of 2016 a total of 86% (69% at the end of 2015) of the preventive and remediation actions were completed. Actions were based on the UN Guiding Principles on Business and Human Rights and criteria created in collaboration with the

Danish Institute for Human Rights. By the end of the year a small number of actions remained open. These will be progressed to an appropriate conclusion during 2017 and the reporting on Human Rights Action Plan progress will be stopped.

Certain country-specific actions that have been of special interest to our stakeholders in 2016 are described below.

**Guangxi, China**

Stora Enso’s operations in Guangxi consist of tree plantations in various parts of the province and a new consumer board mill in the municipality of Beihai. Stora Enso owns 83% of the project, the International Finance Corporation 5%, and the remainder is owned by two state-owned organisations: Guangxi

**86% of the actions in our Human Rights Action Plan were completed in 2016.**

<b>Governance</b>
Social agenda
Environmental agenda
Economic agenda
Data and assurance



01

Forestry Group Co Ltd and the Beihai Forestry Investment and Development Company. The construction of Beihai Mill was completed in the second quarter of 2016, and production commenced in May 2016.

Our human rights work in Guangxi during 2016 focused on the implementation of our Human Rights Action Plan.

**Key actions taken in 2016:**

- Human rights training for security service providers, with additional training to be provided to new contractors during 2017
- Developing a Transportation Impact Management Plan including safety guidelines reviewed together with contractors, with a special focus on road safety in local villages

- Implementing and compliance monitoring of our Supplier Code of Conduct and Responsible Sourcing Programme. For more information about responsible sourcing at Beihai Mill, see page 62.
- Auditing and enforcing decent living standards in contractors' camps
- Advancing children's rights among migrant families working for Stora Enso's forestry contractors, in cooperation with the Centre for Child Rights and Corporate Social Responsibility (CCR CSR), by conducting training for field personnel about children's rights and how to support effective parenthood
- Ensuring compliance with Stora Enso's anti-corruption and bribery policies and procedures in mill construction and land contracting.

- 01 Advancing Free, Prior and Informed Consent (FPIC) in land leasing is a key element of our human rights work in Guangxi.
- 02 Stora Enso's operations in Guangxi consist of eucalyptus tree plantations and a new consumer board mill.



02

During 2016 CCR CSR helped us to establish guidelines to ensure our employees can identify high risk areas with regard to child labour, and take action accordingly.

We also collaborated with the non-profit organisation BSR and the Netherlands Centre for Indigenous Peoples in advancing Free, Prior, and Informed Consent (FPIC) processes in land leasing, when applicable. This is a key element of our human rights work in Guangxi. BSR helped us to design and implement a strengthened FPIC process, and provided related training for our forestry employees. Together with BSR, the Netherlands Centre for Indigenous Peoples also conducted a gap analysis of our FPIC processes to ensure they address ethnic minorities properly. By the end of 2016 our new FPIC programme, consisting of processes, documentation, and training, was ready and tested, and its implementation will continue in 2017.

During the year we also continued to focus on sustainable land management in Guangxi (for more details see page 54).

**Pakistan**

Stora Enso has a 35%-owned equity-accounted minority investment in Bulleh Shah Packaging (Private) Limited in Pakistan. The majority owner is the Pakistani company Packages Limited. Bulleh Shah is Pakistan's largest fibre-based packaging producer, and the country's only liquid packaging board producer. The company's offices and production facilities are located in Lahore, Karachi, and Kasur, in Punjab Province.

Bulleh Shah Packaging (BSP) sources various raw materials, such as fibre, chemicals, fillers, and agricultural by-products, mostly from Pakistani markets. The fibre used

**In China we work with the non-profit organisations BSR, CCR CSR, and the Netherlands Centre for Indigenous Peoples.**



<b>Governance</b>
Social agenda
Environmental agenda
Economic agenda
Data and assurance



In Pakistan Bulleh Shah Packaging combats human rights violations through a rigorous supplier auditing programme.

for packaging production mainly consists of recycled paper and board, and agricultural by-products, such as wheat straw. The recycled paper and board is largely sourced from post-consumer sources, i.e. vendors who procure it from suppliers, who in turn typically source it from shops and households. Wheat straw is an agricultural by-product sourced from vendors who collect it from farms. BSP's human rights work during 2016 focused on implementing Stora Enso's Human Rights Action Plan.

**Key actions taken in 2016:**

- Systematically addressing child labour in supply chains
- The implementation of BSP's Supplier Sustainability Requirements, which were revised in 2016 with all direct suppliers asked to sign the new version. By the end of 2016 all direct suppliers of domestic fibre and agricultural

by-products and 67% of all direct suppliers had signed the requirements.

- Establishing a new whistleblowing channel as a grievance mechanism. In 2017 BSP will further publicise this channel in local communities, and enhance grievance remediation procedures.
- Providing training for employees on workplace harassment and discrimination through an ethics training programme. BSP's human resources handbook, which is given to all employees, also covers harassment issues.
- The revision of contractors' wages and working conditions to ensure they exceed minimum levels. Contracts signed with suppliers require them to pay minimum salaries and ensure decent and safe working conditions. Contractors' employees working at BSP's premises receive one free meal per day as a guaranteed benefit, as do all BSP employees.

**Bulleh Shah Packaging's direct suppliers of domestic fibre and agricultural by-products**

	31 Dec 2016	31 Dec 2015
Number of direct active suppliers	276	335
Audit coverage year-to-date (%) <sup>1</sup>	15%	45%

<sup>1</sup> The share of direct suppliers of old corrugated cardboard (OCC) and agricultural by-products that are audited during the calendar year. Excluding institutional OCC suppliers identified as low risk.

**Systematically combatting child labour**

Child labour in supply chains in Pakistan remains a challenge for BSP, and will continue to be a key element in the company's human rights due diligence work in 2017. Human rights violations including child labour are prevalent in the agricultural sector in Pakistan, and also exist in the recycled fibre collection business in urban areas. The root causes of child labour and other human rights violations in Pakistan include widespread poverty, the lack of formal employment opportunities, ineffective law enforcement, and a lack of awareness of human rights. BSP does not employ children in its own operations, and does not accept child labour in its suppliers' operations. BSP has put processes in place to identify and eliminate child labour in the operations of its direct suppliers.

BSP combats child labour through a rigorous supplier auditing programme, awareness-raising and sensitising measures, and BSP's Child Labour Remediation Policy. It also works with suppliers through its public-private partnership with the International Labour Organisation (ILO). For more information see page 14.

During 2016 BSP's audit team conducted a total of 108 supplier audits (395 during 2015). Out of these audits 56 (82) were audits of suppliers of recycled paper products (old corrugated cardboard). Out of all the audits 12 were follow-up audits.

Due to a sufficient stockpile of biomass and less sourcing, suppliers of agricultural by-products were not audited during 2016. Mainly for this reason the audit coverage of the direct suppliers of domestic fibre and agricultural by-products was lower in 2016 compared to the previous year.

In addition to the audits conducted by BSP's in-house audit team, the external assurance provider SGS realised nine further third-party audits during 2016 (30).

<b>Governance</b>
Social agenda
Environmental agenda
Economic agenda
Data and assurance

In addition to seeking out child labour, the audits look into other human rights issues such as labour conditions and occupational safety. They also aim to increase awareness and sensitise suppliers to human rights.

During 2016, five young workers (14–18 years<sup>1</sup>) employed in contravention of ILO conventions were confirmed in the operations of BSP’s suppliers of wheat straw, corn stalk, spare parts and waste paper (14 young workers and three underage workers below 14 years during 2015). All the cases were identified in BSP’s own audits. In audits run by SGS no cases were identified during 2016. Underage labour is unacceptable for Stora Enso and BSP. The hiring of underage workers violates suppliers’ contractual obligations under BSP’s Supplier Sustainability Requirements. The suppliers involved were immediately instructed to take corrective action in accordance with BSP’s Child Labour Remediation Policy. This policy requires suppliers to find a long-term solution for the child and the family in the best interest of the child, including facilitating access to education. All of the suppliers involved in these cases were re-audited in 2016.

Stora Enso supports six schools in cooperation with the Pakistani non-governmental organisation Idara-e-Taleem-o-Aagahi, as well as a maternity and child health care clinic and a mobile medical health care clinic. For more information about these community investment actions, see page 27.

**Public-private partnership with ILO**

In April 2015 Stora Enso entered into a public-private partnership with the International Labour Organisation (ILO) to strengthen our global policy, to promote decent work, and to combat child labour in the supply chain of BSP in Pakistan.

The ILO is supporting BSP’s efforts to systematically address the issue of child labour through research into root causes, community-level awareness-raising measures, and capacity building among suppliers, families and young workers.

During 2016 ILO commissioned a formative ground research in the Punjab province. During the project’s first phase, BSP’s waste paper and agricultural by-product supply chains were mapped. During the second phase, communities

<sup>1</sup> Cases involving workers below 14 years of age are referred to as child labour cases and workers between 14–18 years of age are referred to as young workers in accordance with Pakistan-specific implementation of the ILO Minimum Working Age Convention (ILO C138).



- 01** In 2016, Veracel employed 755 people directly and 2 552 people through contractors.
- 02** Veracel’s community engagement focuses on local economic development and sustainable land use.

were studied to provide a situational analysis in relation to child labour and decent work deficits in supply chains.

The final report by ILO on the formative ground research on child labour and decent work deficits in Punjab Province, Pakistan is expected in early second quarter 2017. Due to the time required for the field research work, the parties have agreed to extend the partnership until the end of 2017.

ILO and its Pakistani partners also started to hold community events in Punjab during 2016, bringing together local communities, BSP’s suppliers, and employees. The idea behind these events is to increase awareness of why children should not be working, and of the importance of education. Seven such events took place in 2016, attracting a total of approximately 200 participants.

**Veracel, Brazil**

Veracel, our 50/50 joint operation, owned together with the Brazilian company Fibria, runs a pulp mill and eucalyptus plantations in southern Bahia. Veracel’s community engagement focuses on land ownership and land use, and local social development. Veracel’s large-scale land ownership and the consequent rises in land prices have been a major concern among some stakeholders. We strive to engage actively with local stakeholders, to be an active member of local communities, and to help address these challenges.

During 2016 Veracel implemented various elements of Stora Enso’s Human Rights Action Plan.



<b>Governance</b>
Social agenda
Environmental agenda
Economic agenda
Data and assurance



01

- 01 Veracel has a toll-free grievance hotline for employees and local communities.
- 02 Veracel supports programmes designed to strengthen the cultural identity of 27 Pataxó and three Tubinambá indigenous communities.



02

**Key actions taken in 2016:**

- Improvements in environmental monitoring. An Environmental and Social Management and Monitoring Plan was created based on the previous Environmental and Social Impact Assessment (ESIA) largely carried out by the International Union for Conservation (IUCN), the Swedish University of Agriculture (SLU), and the United Nations Development Programme (UNDP). The new plan also takes into account local legislation and ISO 14001 standards. The implementation of the plan began in 2016 and it will be completed during 2017.
- The formalisation of local hire contracts, including measures to prevent the employment of underage workers with the help of an age verification process.
- Measures to enhance safety practices.
- Implementing Stora Enso’s Supplier Code of Conduct, which was signed by suppliers in connection with supplier training and auditing.
- The creation of new internal and external grievance mechanisms, with support from the International Finance Corporation (IFC).
- Measures to enhance stakeholder engagement and communications to ensure that Free, Prior, and Informed Consent (FPIC) procedures are duly followed in Stora Enso’s land use and land leasing when applicable. This involved incorporating FPIC elements in the land leasing process and all other related procedures. Stora Enso also cooperated with IFC and the Laos-based NGO Village Focus International to improve stakeholder dialogues and FPIC processes.

**Key actions taken in 2016:**

- Further monitoring of compliance with Veracel’s Supplier Code of Conduct
- Human rights training for security personnel
- Improvements in the monitoring of on-site contractors
- Measures to increase awareness of Veracel’s formal grievance mechanism, and the launch of a toll-free grievance hotline
- The continuing implementation of a Sustainable Settlements Initiative for land disputes.

villages, and also supports programmes designed to strengthen the cultural identity of 27 Pataxó and three Tupinambá communities. Local indigenous communities are calling for the expansion of the Barra Velha Indian Reserve. The extension would encompass hundreds of land properties, including 3 219 hectares of land acquired by Veracel before the indigenous peoples first made claim to the land. At the end of 2016 this case was still being processed in the regional federal court. Veracel remains committed to fully comply with the court’s eventual decision. For more information about landless people’s social movements in Bahia and Veracel’s community engagement, see page 24.

**Laos**

Stora Enso has continued to develop trial plantations in the Saravane and Savannakhet provinces of southern Laos in areas totalling 3 900 hectares (3 900 in 2015), of which 2 995 (2 332) are planted with eucalyptus. Stora Enso Laos has approximately 130 employees (140). Our human rights work in Laos during 2016 focused on completing the elements of the Human Rights Action Plan.

By the end of 2016, all contracts with existing suppliers were updated to include Veracel’s revised Supplier Code of Conduct, which was launched in 2016.

Additional human rights training is provided annually to employees working as guards for Veracel’s security service provider.

Veracel has been criticised in the past on issues related to landless people’s social movements and the rights of indigenous peoples. Veracel maintains good relations with local indigenous

Stora Enso’s tree plantations in Laos are located in the vicinity of villages that are culturally and ethnically diverse. This makes it essential for us to engage in community dialogues and follow FPIC as part of our human rights due diligence work in Laos. During 2016 IFC and Village Focus International provided training for Stora Enso employees on stakeholder engagement and community consultation, especially considering the interests of women and vulnerable groups. Stora Enso and Village Focus International also jointly obtained a grant from Mekong Regional Land Governance to develop and test a set of community consultation tools. These tools will be designed to improve Stora Enso’s land acquisition processes by ensuring that important information reaches villagers in a culturally appropriate form. If proven successful, these tools can later be adopted by other companies with land-based investments in Laos.



Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance



# Social agenda

- ▶ **Employees and wider workforce 17**
- ▶ **Community 22**
- ▶ **Business ethics 29**



Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance

# Employees and wider workforce

Stora Enso strives to provide a safe and rewarding workplace for employees and contractors, and to be an attractive employer to potential recruits. This report section introduces the occupational health and safety (OHS) and human resources (HR) policies and practices that we apply to reach these goals.

## Opportunities and challenges

### Change through people

As Stora Enso transforms from a traditional paper producing company into one that focuses more widely on renewable materials, the work that our employees do, and the skills they need, are also changing. Different demographics affect our workforce in different regions. In new markets where we are growing, we have a new, younger workforce, while in Europe our employees tend to be older on average. Carefully planned people management, starting with responsible leadership, is important wherever we operate. This is particularly true when it comes to safety management. At the same time, promoting diversity among our employees can help to make us more competitive and innovative.

Differences in operating contexts, such as the availability of a suitable workforce, challenge our operations; but at the same time, the higher educational level of emerging middle classes in growing markets provides an expanding pool of potential employees. Increasing public awareness of health and well-being issues can help us to enhance our employees' health and safety globally. Digitalisation also offers opportunities to make working conditions safer by using new applications and innovations.

## Our policies

### Leadership in the forefront

Our Occupational Health and Safety (OHS) function works to realise Stora Enso's Health and Safety Policy and our OHS Mode



We measure our employees' perceptions of their leaders in our annual employee survey. We reached our target rating of 80/100 in 2016.

of Operation. These policies define how we manage OHS topics in practice and integrate them into annual planning and reporting.

Stora Enso's People Strategy guides our efforts to provide employees with a safe work environment where they are engaged and able to perform. The People Strategy focuses on five themes: leadership; workforce planning and employer branding; align and engage; HR Services; and occupational health and safety. Read more about our People Strategy in our [Progress Book](#).

Other key policies applied in our people and safety management include:

- Code of Conduct
- Supplier Code of Conduct
- Minimum requirements for labour conditions
- Diversity Policy.

Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance

**How we work**

**Everybody home safe, every day**

In occupational health and safety Stora Enso's main goals are to have a workforce that is motivated, healthy and capable; and to become a workplace free from accidents and work-related illness. While this work begins with our leaders, building up a company-wide safety culture means that everyone is responsible for making every workday healthy and safe.

Safety management at Stora Enso is based on international standards such as OHSAS 18001, but our processes go beyond those requirements. Our Safety Toolbox is a set of tools designed to be used throughout the company. Responsibility for implementing each tool and programme in our units lies with line management, supported by local staff and the group-level OHS function.

Local OHS committees and working groups at our units provide forums for taking up safety-related topics and suggestions. Our country-level OHS networks in Finland, Sweden, Germany, and China also share good practices and organise training to enhance our safety procedures and competencies. Our OHS Management Team, consisting of division representatives, acts as a cross-functional body, developing and aligning group-wide OHS programmes. The OHS Steering Group, established in 2015, directs strategic long-term planning at the group level, and steers the implementation of our OHS roadmap.

Our units report monthly on safety performance data including lost-time accident (LTA) rates, absenteeism statistics, and the numbers of safety observations. Stora Enso also follows up on the safety performance of on-site and forestry contractors.

**We believe that a diverse workforce combined with an inclusive culture is the key to driving innovation.**



**Can sustainability be a recruitment asset for companies?**

The ageing of the workforce, particularly in Europe, is a challenge today for companies like Stora Enso as many older employees approach retirement. At the same time, getting a job that corresponds with your personal values has become more important for millennials. Can a company's ambitious sustainability work be an asset in recruiting and motivating top talents?

Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

**Promoting safety among contractors' employees**

Stora Enso's approach to safety extends also to contractors, suppliers, and on-site visitors. We encourage everyone to give feedback and provide ideas on how to further improve our safety practices. We also cooperate closely with our joint ventures to improve safety. For more information about how we work with our suppliers and contractors see page 60.

**Leadership – the focal point of our human resources work**

Leadership on topics such as safety management is a top priority for Stora Enso, since it is the strongest driver behind company performance and our winning culture. We measure our progress in this area using an overall Leadership Index that measures employees' perceptions of their leaders. Stora Enso's approach to leadership is described in more detail in our [Progress Book](#).

Improving our employee performance management and engagement is another priority for us. We set targets for both our business and our people, and follow up on them during annual performance appraisals. We provide training for our employees on compensation and benefits in order to be transparent about the way we use compensation to reward performance.

**Strength in diversity**

We believe that a diverse workforce combined with an inclusive culture is the key to winning in the marketplace and driving

innovation. When we refer to diversity we mean various aspects of diversity including gender, age, skills, educational levels, culture and personality. During 2016 Stora Enso set targets that intensify our focus on diversity. The first target is to achieve a gender balance of 70% male and 30% female among senior managers by the end of 2018. At the end of 2016 the ratio was 79% male, 21% female. The second target is related to our employees' perception of diversity, which we measure through our employee survey. Our target is that 80% of our employees should respond positively to a question related to their management's ability to create diverse teams.

**Hiring locally**

It is important that our new investment projects are staffed with managers and employees who are well grounded in local cultures. While there is often an initial need for expatriate employees, we make every effort to hire locally wherever possible, especially for senior management positions. Local hiring is usually initiated as early as possible during the construction phase, bringing economic benefits to the local community right from the start.

In Guangxi, we aim to increase the number of locally hired people. At the end of 2016, 77% of our employees in Guangxi were local (77% at the end of 2015), while local management teams included 14 managers of Chinese origin (four) and 12 expatriates (nine).



Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance

In Uruguay, our joint operation Montes del Plata has a local workforce development programme that focuses on recruiting from nearby communities for mill operations. By the end of 2016, 78% of Montes del Plata’s own personnel and contractors’ employees working at the mill site were from the region where the mill is located.

**Fair working conditions**

All Stora Enso units are expected to work systematically to ensure that employees are treated with respect and fairness. All Stora Enso units should additionally comply with a set of minimum requirements for labour conditions, to create an environment where workers are both willing and able to perform their tasks. We are continuously working to make sure that all our units comply with these requirements.

**Progress**

**Enhancing performance on safety and leadership**

In our safety work, lost-time accident rates (LTA) function as our key performance indicator (KPI). Stora Enso’s short-term milestone for the LTA rate was 3.8 by the end of 2016. In 2016, the group-wide LTA rate declined further to 4.4 (4.7 in 2015). The milestone for 2017 will be communicated in the Q1 Interim Report. In 2016, our Total Recordable Incident (TRI) rate rose to 11.7 (11.0).

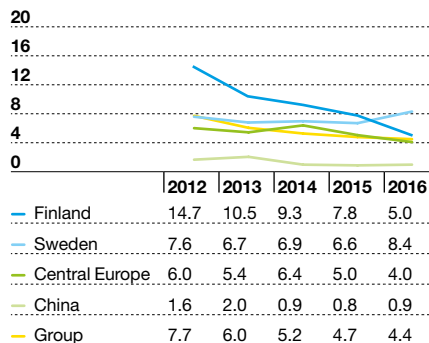
With regard to occupational health, Stora Enso started to measure illness-related absenteeism in the beginning of 2016. This focus has been designed to encourage the units to invest in proactive health management. In 2016 illness-related absenteeism amounted to 2.9% (3.0%) of total theoretical working hours.

By the end of the year, 73 Stora Enso units had appointed joint safety committees (74), covering 77% (81%) of our total workforce. The average number of safety observations reported per employee was 8.9 (17.4). This figure decreased from 2015 because in 2016 our safety observations only included observations related to safety behaviour, whereas earlier we included all types of safety observations in this figure.



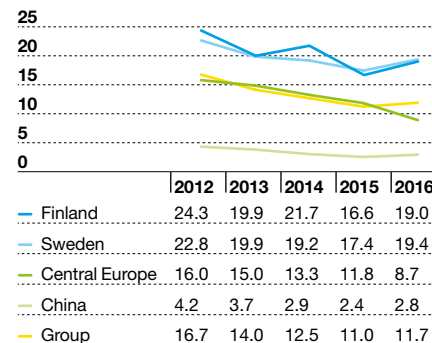
**Lost-time accident rates (LTA)**

Number of lost-time accidents among our own employees per one million hours worked



**Total recordable incident rates (TRI)**

Number of incidents among our own employees per one million hours worked



While safety begins with our leaders, building up a company-wide safety culture means that everyone is responsible for making every workday healthy and safe.

Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance

**Other focus areas in our OHS management work during 2016**

- Continuation of our Safety Leadership training programme as part of the Lead Through People 2.0 programme, targeting managers at Stora Enso. This training aims to highlight the importance of leadership in enhancing the company’s safety culture.
- Launch of the new group OHS reporting tool in order to improve data quality and reliability.
- Implementation of the updated Safety Toolbox. This is a collection of tools proven to make mills and units safer. It was introduced in 2012 to establish consistent minimum requirements for our units globally. The new version of the Safety Toolbox further supports the implementation of best practices and cultural change with regard to safety.



We measure illness-related absenteeism to encourage the units to invest in proactive health management.

**Contractor accidents**

Stora Enso’s reporting practices concerning the scope of accidents involving contractors have changed in recent years. In 2016 Stora Enso decided to revert to reporting such safety incidents in separate categories for on-site accidents and logistics incidents, to ensure better comparability with the statistics of other companies. Differentiating contractor accidents helps us address the necessary improvements in the right forums with internal and external stakeholders. The new reporting practice will apply from the beginning of 2017.

In 2016, a fatal accident involving a contractor occurred at our Fors Mill, when a contractor’s employee was hit by a wheel loader in the mill yard. Safety improvements were subsequently realised at the mill site, by separating heavy traffic from other traffic, for instance.

All accidents are unacceptable to Stora Enso, and the causes of any accidents will always be thoroughly investigated by our units in collaboration with the authorities.

**Enhancing contractor safety in Guangxi, China**

During 2016 safety has continued to be a top priority for our operations in Guangxi, and robust follow-ups of corrective actions were conducted, particularly in our plantations. Our intense focus on safety issues has paid off, and during the construction of Beihai Mill only one LTA case occurred during a total of 18 million working hours. Out at harvesting sites, moving from manual harvesting to mechanical harvesting has improved safety.

**Taking care of human resources**

Stora Enso’s key performance indicator (KPI) for leadership, the Leadership Index, measures employees’ perceptions of their leaders. The index is calculated based on our annual employee survey. Our goal has been to reach an index of 80/100 by 2018. In 2016 this target was reached ahead of schedule, with a Leadership Index of 80 (79 in 2015). In 2016 the response rate to our employee survey was 90% (91%).

Our target is that all Stora Enso employees should be involved in at least one performance review meeting with their manager annually. In 2016, 90% of our employee survey respondents stated that they had taken part in a performance review during the past 12 months (91%). When asked about diversity, 78% (76%) of our employees reported that their management was able to create diverse teams.

In 2016 we continued our efforts to further develop our leaders and high-performing teams through our own management training programme Lead Through People 2.0. During the year this programme also focused on practical ways to improve safety culture. During 2016 approximately 1 500 managers and team leaders took part in the programme. In 2016 many other human resources activities related to leadership continued. Read more in our [Progress Book](#).

**Providing living wages**

In 2015 we worked with the global non-profit sustainability organisation BSR to define and calculate living wages in Brazil, India, China, Pakistan, Russia, Laos, and Uruguay. BSR defines a living wage as a level of earnings that best corresponds to the actual costs of acquiring the goods and services that are necessary for a basic standard of living, in line with internationally accepted definitions. In beginning of 2016, our current minimum salary levels exceeded the living wage estimates in all of these seven countries.

**Our lowest wages compared to local minimum wages<sup>1</sup>**

Ratio of our lowest wage to the local minimum wage

	2016	2015
Brazil <sup>2</sup>	1.1	1.1
China <sup>3</sup>	1.4	1.4
Estonia	1.1	1.3
Laos	1.1	1.1
Latvia	1.2	1.1
Pakistan <sup>4</sup>	1.3	1.1
Poland	1.0	1.0
Russia	1.0	1.0
Uruguay <sup>5</sup>	1.1	1.6

<sup>1</sup> In material locations of operations, compared to minimum wage levels set at national, state, or provincial level as applicable. The ratio shows how many times larger our lowest wage is compared to the local minimum wage.

<sup>2</sup> Including employees of our 50%-owned joint operation Veracel.

<sup>3</sup> Due to variations in regional minimum wages the ratio is calculated as a weighted average for Stora Enso’s units in China. The weighting is based on the units’ total number of employees.

<sup>4</sup> Including employees of our 35%-owned equity-accounted minority investment Buleh Shah Packaging.

<sup>5</sup> Including employees of our 50%-owned joint operation Montes del Plata.

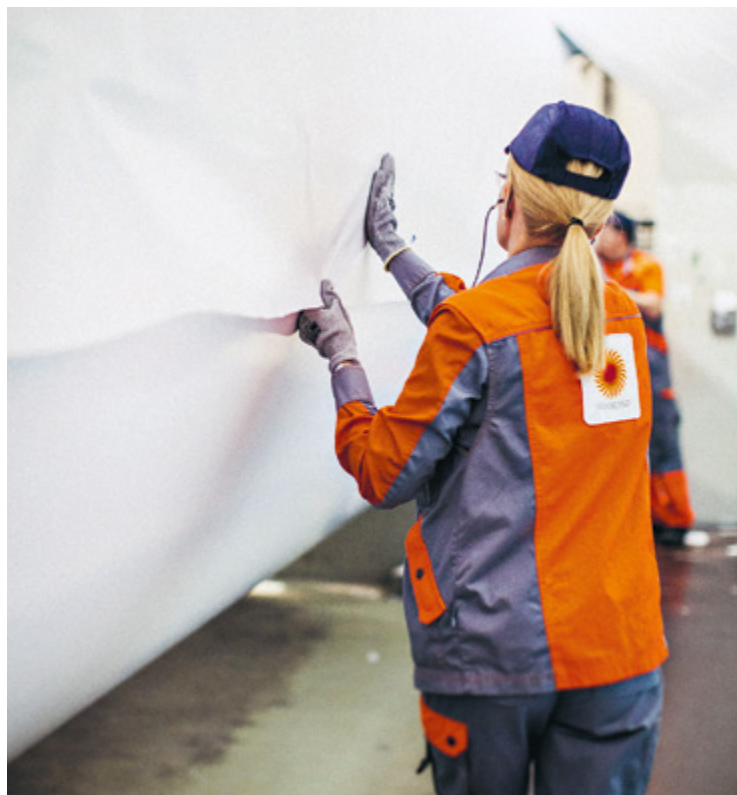


Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance

### Share of female employees at Stora Enso

	2016	2015
Total number of employees at year-end <sup>1</sup>	24 723	25 011
Share of women among all employees (%)	26%	24%
Share of women among senior managers (%)	21%	21%
Women in the Group Leadership Team	4 out of 13	3 out of 13
Women in the Board of Directors	2 out of 8	2 out of 8

<sup>1</sup> Excludes employees of our 50%-owned joint operations Montes del Plata and Veracel.



When asked about diversity, 78% of our employees reported that their managers were able to create diverse teams.

### Employee distribution by gender and employee turnover

	Americas		Asia <sup>3</sup>		Europe		Group total
	Female	Male	Female	Male	Female	Male	
Employees by gender	35%	65%	48%	52%	19%	81%	
Employee turnover	10%	18%	100%	81%	6%	5%	23%
Number of hires <sup>1</sup>	<10	20	2 130	1 300	250	850	4 560
Number of leavings <sup>2</sup>	<10	20	2 480	2 180	220	760	5 670

<sup>1</sup> Hires: numbers of permanent employees joining the company. Excludes hires due to acquisitions. Rounded to the nearest 10.

<sup>2</sup> Leavings: numbers of permanent employees leaving voluntarily or due to restructuring, retirement or death. Excludes leavings due to divestments. Rounded to the nearest 10.

<sup>3</sup> The high employee turnover in Asia is due to very high employee turnovers at our Inpac units in China, which employed 3 600 employees at the end of the year.

### Compensation and equal opportunity<sup>1</sup>

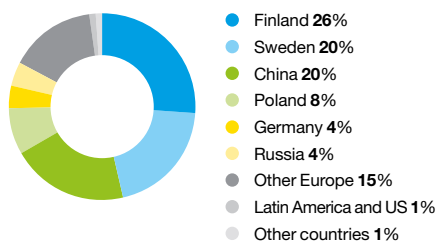
	Ratio of highest individual salary to median salary <sup>2</sup>		Female employees' remuneration as a proportion of male employees' <sup>3</sup>	
	2016	2015	2016	2015
China	57	52	100%	100%
Finland	12	11	97%	95%
Germany	6	14	96%	91%
Poland	21	21	n/a	n/a
Russia	27	n/a	n/a	n/a
Sweden	27	27	100%	99%

<sup>1</sup> Figures for the six largest countries in terms of the total number of employees.

<sup>2</sup> The ratio shows how many times larger the highest individual salary is compared to median salary.

<sup>3</sup> Calculated using weighted averages based on gender comparisons within each country's employee categories as applicable. Figures in Finland and Sweden are based on evaluations covering approximately 40% (Finland) and 70% (Sweden) of the total workforce.

### Employee distribution by country<sup>1</sup>



<sup>1</sup> Excludes employees of our 50%-owned joint operations Montes del Plata and Veracel.

### Employee distribution by age and region

Age	Americas	Asia	Europe	Group by age
Up to 30	20%	49%	14%	22%
31–50	61%	48%	52%	51%
51 and over	20%	3%	34%	27%
Group by region	1%	21%	78%	

Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance

# Community

Local communities living near our mills and forestry operations form one of our most important stakeholder groups. We aim to promote economic, environmental, and social development in these communities.

## Opportunities and challenges

### Partnering with local communities

In many localities Stora Enso is a major employer, tax-payer, and partner for local entrepreneurs. To ensure that our production, raw material sourcing, and labour supply remain both sustainable and competitive, the communities which we depend on must be able to thrive economically, socially, and environmentally.

Stora Enso’s mills are heavily dependent on energy and raw materials, and they generate emissions that may impact adjoining communities. Our tree plantations in China, Brazil, and Uruguay influence local land use, livelihoods, and ecosystems. Our socio-environmental impacts must be managed responsibly, in order to maximise their positive influence, maintain cooperative community relations, and ensure our long-term license to operate.

Procuring wood as raw material for our mills creates value for everyone within the regional forestry cluster, including forest- and landowners, wood supply intermediaries, local entrepreneurs, and logistics providers. In Continental Europe, where paper for recycling (PfR) is an important raw material for our mills, we strive to create value by working in partnership with PfR suppliers, the public sector, and non-governmental organisations who promote recycling.

Restructuring and closure of operations can create difficulties not only for our employees and suppliers, but often also for the affected communities as a whole. Responsible restructuring practices realised in cooperation with the authorities can support these communities through the related changes, and create opportunities for new business initiatives.



We engage with the communities around our operations by supporting education and young people, social welfare and the environment.

## Our policies

### A comprehensive approach to community investment

The policies that guide Stora Enso's community relations include our

- Code of Conduct
- Social Responsibility Guidelines

- Stakeholder Guidelines
- Business Practice Policy
- Human Rights Statement
- Tax Policy
- Sponsorship and Donations Policy.

Our joint operations have each developed formal procedures for their respective community investment work.



Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance

**How we work**

**Helping build resilient communities**

Stora Enso implements various precautionary management actions in response to the potential environmental and social impacts that our activities may have on neighbouring communities. These include:

- Environmental and social impact assessments (ESIAs) conducted for all new projects that could cause significant adverse effects in local communities. For more information see page 10.
- Due diligence assessments, which are invariably realised as part of Stora Enso’s acquisition and investment processes prior to any decision. These assessments cover relevant factors related to environmental, social, and business practices. They play an important role in building our understanding of local operating environments, while also helping us to build constructive relationships with stakeholders such as governments, business partners, local communities, and NGOs. Any subsequent investment decision must take due account of our ability to mitigate and manage any identified adverse impacts.
- Environmental management systems such as ISO 14001 for our production units.
- Sustainable forest management certification of our own forestry operations and suppliers.
- Restructuring processes planned in cooperation with the authorities.

Contributing to the vitality of the communities around our operations is high on Stora Enso’s agenda. We do this through various actions, including investments in capacity building, local nature conservation, agroforestry programmes, and socio-economic development projects.

**Progress**

**Developing a strategic framework**

Building on the local community investment work Stora Enso has done over the years, we have put in place a new group-level framework for our community investments. The framework incorporates systematic monitoring and later careful evaluation of outcomes of our activities. This work started in 2016 with global baseline mapping, covering all our production units and



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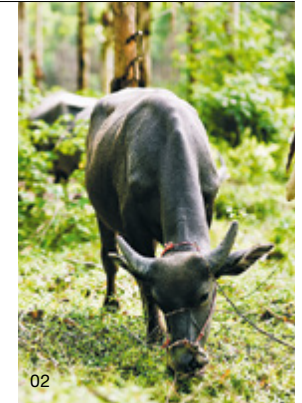
other key functions. The results were analysed with support from an external community investment expert and the London Benchmarking Group, a global leader in community investment best practice. During 2017 we will implement the new corporate community investment framework and related guidelines. Community investment has also now been explicitly included in our Sponsorship and Donations Policy, which was revised in late 2016.

**Focus on communities in growth markets**

During 2016 we engaged with the communities around our operations in various ways. Details of our progress in the locations that have most interested our stakeholders during 2016 are presented below.

**Guangxi, China**

Engagement with local communities is a key element of our everyday field operations. Our field staff and social engagement officers speak regularly with people living in areas impacted by our plantations and mill, as well as along our transportation routes, to inform them about Stora Enso’s operations and to enable them to express their concerns



02

- 01** Our field staff speak regularly with people living in areas impacted by our plantations, mill, and transportation routes.
- 02** The Resettlement Action Plan provided assistance to enhance local livelihoods in Beihai, China.

and contribute ideas. Our aim is to understand social risks in advance, so we can ensure proper mitigation and remediation.

We strive to promote gender inclusivity, and also consult vulnerable groups and less vocal villagers. For this reason during 2016 we conducted socio-economic profiling of local villages in order to better understand and address their gender and ethnic structures, opportunities for development, and other characteristics that can help us to optimise the positive impacts of our operations, and mitigate any negative impacts.

During the year we also advanced Free, Prior, and Informed Consent (FPIC) processes in land leasing. For more information see page 12.

**Resettlement Action Plan completed in 2016**

As a result of the development of the industrial zone in Beihai where Stora Enso’s mill is located, approximately 6 000 people were relocated from their previous homes to nearby locations, with new housing and compensation offered by the authorities. Of these people, 1 236 were displaced from Stora Enso’s mill site. Including people relocated from adjoining areas acquired by the authorities for road-building, this number rises to 1 530 people classified as Relocated People. On top of the compensation

Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance

received from the authorities, these people also received support through Stora Enso’s three-year Resettlement Action Plan (RAP), which was completed in March 2016.

Stora Enso also supported and monitored the well-being of people who have lost part of their land and are left with less than 0.3 mus of land (a “mu” is a local unit of area equal to 0.02 hectares). This means the company supported a total of 2 332 people classed as Affected People, including the Relocated People. On top of this Stora Enso has also maintained continuous dialogues with Impacted People, a category that

includes people who have lost part of their land but still have more than 0.3 mus of land.

Based on indicators identified by the International Finance Corporation (IFC), the RAP met its objectives: to minimise the impact of the project on local residents; to compensate those affected by the resettlement and land acquisition activities; and to pay special attention to safeguard the rights and interests of vulnerable groups, taking special measures to settle them in a reasonable manner to ensure that their livelihood is not lower than that of local residents.

The actions taken under the RAP included:

- Educational support for local children and young people, including financial support for a nursery school and the education of schoolchildren and students aged 6–21
- Assistance designed to help people improve their livelihoods, including job training, local hiring, and support for local business development
- Support provided for Relocated People to help them obtain land tenure documentation such as housing certificates.

**Veracel, Brazil**

In 2016 Veracel continued its long-term efforts to enhance the livelihoods of local communities. This work also involved dialogue with the landless people’s social movement.

**Supporting family farming**

Since 2012 Veracel has been involved in a major initiative together with the state government, known as the Pact for the Development of the Discovery Coast. Under this agreement the government has committed to reimburse Veracel ICMS tax credits paid by the company between 2011 and 2015, in return for the company’s commitment to invest in local development programmes.

By the end of 2016 this pact had resulted in investments benefiting local communities amounting to EUR 660 000 (EUR 490 000 by the end of 2015). The pact’s projects contribute to the sustainable development of family farming by forming associations for small producers and indigenous communities.

Veracel is also supporting local livelihoods by making some of its land available for family farmers, and by providing training and technical support. The Agrovida farming programme aims to produce food for the local community and to trade surplus production in regional markets, especially for use in school lunches and municipal institutions. The Roça do Povo project supports local families cultivating cassava and other crops. By the end of 2016 the Agrovida initiative involved 150 farmers cultivating 208 hectares, while the Roça do Povo scheme assisted 79 farmers cultivating 80 hectares.

Veracel also enables local beekeepers to keep their hives on the company’s land, and financially supports local honey production. In 2016, a total of 136 honey producers, mostly working through local cooperatives, benefitted from this

**Guangxi in numbers**

Stora Enso’s operations in Guangxi consist of a consumer board mill in the municipality of Beihai and 83 600 hectares of tree plantations. The mill commenced operations in May 2016.

	2016	2015
<b>Direct employment</b>		
Stora Enso employees <sup>1</sup>	1 088	1 176
Total remuneration for Stora Enso employees (EUR million)	34.0	31.9
Lost-time accident rate for Stora Enso employees <sup>2</sup>	1.9	2.0
<b>Contract management in forestry operations</b>		
Number of contractors	74	121
Number of contractor employees <sup>3</sup>	3 576	2 499
Lost-time accident rate for contractor workers in forestry operations <sup>4</sup>	3.2	4.8
<b>Contractor management in mill construction</b>		
Number of contractors	12	22
Contractor employees <sup>5</sup>	2 383	5 801
Lost-time accident rate affecting contractor workers in mill construction	0	0

<sup>1</sup> At year-end the new board mill directly employed 426 employees and forestry operations had 662 employees.

<sup>2</sup> Number of lost-time accidents per one million hours worked.

<sup>3</sup> Working hours estimates converted to full-time equivalents. Forestry contractors’ employees worked an estimated 4 917 065 hours during 2015.

<sup>4</sup> Number of accidents per one million hours worked based on the working hours estimate.

<sup>5</sup> Working hours estimates converted to full-time equivalents. Contractors’ employees worked an estimated 4 689 736 hours during 2016.

**Veracel supports local livelihoods by making some of its land available for family farmers.**



Veracel’s Sustainable Settlement Initiative provides farming land and technical and educational support to help hundreds of local families improve their income.



Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance

support, producing approximately 87 tonnes of honey and 400 kg of pollen.

**Investing in social welfare**

Veracel takes actions to strengthen the labour market in the surrounding communities by providing training within its industrial and forestry operations. These courses give young people opportunities for valuable work experience as well as knowhow, preparing them for the labour market. Training varies from a comprehensive 12-month programme to awareness-building events lasting one day.

Since 2013 Veracel has been cooperating with the NGO Instituto Mãe Terra on a project designed to train local young people to act as agents for local development in their communities. The training has covered topics such as citizenship, human rights, education, environment, community development, drugs, violence, sexuality, family issues, and information technology. It also helps participants to network and gain support from partners and public policies. Most participants have also been trained to act as volunteers in mapping investment opportunities related to local infrastructure.

Veracel continues to engage actively with local indigenous communities, while also working closely with the NGO Tribo Jovens to improve the living conditions of indigenous people. For more information on Veracel's engagement with indigenous communities see page 14.

**Continuous dialogue with the landless people's movement**

Dialogue with landless people is important for Veracel, particularly since certain groups have occupied some of the company's land since 2008. During 2016 Veracel continued to engage in dialogue with the Government of the State of Bahia, the National Institute of Colonisation and Agrarian Reform (INCRA), and the representatives of six officially recognised landless people's social movements:

- The Movement of Landless Workers (MST)
- The Federation of Agricultural Workers (Fetag)
- The Movement for the Struggle for Land (MLT)
- The Peasant Resistance Movement (MRC)
- The Front of Free Workers (FTL)
- The Association Unidos Venceremos (Aprunve).

Work continued on a related Sustainable Settlement Initiative launched in 2012 to provide farming land and technical

**Veracel in numbers**

Veracel, our 50/50 joint operation with the Brazilian company Fibria, runs a pulp mill and eucalyptus plantations in southern Bahia, Brazil. Veracel owns 215 000 hectares of land, of which approximately half is dedicated to rainforest preservation, and leases 12 000 hectares of land.

	2016	2015
<b>Employment</b>		
Veracel's own employees	755	700
Contractors' employees	2 552	2 244
<b>Remuneration, Veracel employees (EUR million)</b>	15	14
Tax payments (EUR million) <sup>1</sup>	28	22
<b>Local sourcing (EUR million)<sup>2</sup></b>	137	143
<b>Agroforestry activities</b>		
Partner farmers in the Forest Producer Programme	96	93
Partner farmers with certified tree plantations	71	79
Honey producers on the company's land	136	128

<sup>1</sup> Including federal, state and municipal taxes and pension and social security payments.

<sup>2</sup> Sourcing from suppliers in the state of Bahia.

and educational support to help hundreds of local families improve their incomes. This initiative is facilitated by the Government of the State of Bahia through the Secretariat of Rural Development (SDR), and conducted in cooperation with landless people's social movements and INCRA.

Through this initiative the social movements have pledged to leave areas occupied since July 2011, while Veracel has agreed not to seek to repossess areas occupied before that date. The initiative relates to a total area of 16 500 hectares of Veracel's lands designated for the settlements, of which INCRA has inspected and evaluated some 13 500 hectares to be purchased from the company. Compensation for the land transfers will be paid to Veracel by INCRA in line with Brazilian legislation.

In terms of the number of people assisted and its geographical scope, this will be one of the most significant land reform projects realised in Brazil over the last 25 years.



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02

01 In 2016 Veracel continued its long-term efforts to enhance the livelihoods of local communities.

02 The Roça do Povo scheme has assisted 79 farmers who cultivate 80 hectares.

Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance



### How can tree plantations help support local livelihoods?

Uruguay has relied on small-scale farming for centuries, and the country's extensive plains are home to more cows than people. However, local farmers are now benefitting from the Alianzas forestry and land use initiative, realised in partnership with Montes del Plata pulp mill, which involves integrating eucalyptus plantations into their farms.

➔ Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

**170 farmers kept cattle on Montes del Plata's lands while 31 beekeepers produced honey in some 4 900 beehives.**

At the end of 2016, additional areas of Veracel's land totaling 3 499 hectares (5 461 hectares at the end of 2015) were occupied by landless groups not involved in the Sustainable Settlement Initiative. During the year, Veracel continued to seek repossession of these areas through legal processes, and the company resumed forest management on 1 962 hectares. Stora Enso also reports on this additional occupied area in the group's [Interim Reports](#).

#### Montes del Plata, Uruguay

Montes del Plata, a 50/50 joint operation shared by Stora Enso and the Chilean company Arauco, runs a 1.3 million tonne pulp mill at Punta Pereira in Colonia, in southwestern Uruguay, together with associated eucalyptus plantations mainly located in central and northwestern parts of the country.

In 2016 Montes del Plata continued to engage in strategic, long-term collaboration with local communities, focusing on three main objectives: contributing to local development by enhancing positive impacts; mitigating any possible negative impacts on communities; and developing effective relationships with local stakeholders.

#### Enhancing livelihoods

Montes del Plata seeks to create positive impacts in local communities by fostering employment opportunities, maximising local hiring, and promoting further education and an entrepreneurial spirit among local youngsters.

During 2016, Montes del Plata continued to create strategic alliances with local rural producers. The Alianzas Programme is an initiative that provides additional income for local farmers by enabling them to use their land to produce timber as well as agricultural crops. By the end of the year 350 farmers with lands totalling 54 939 hectares, of which 43 857 are planted with eucalyptus, had joined the programme.

Alianzas also promotes the diverse use of Montes del Plata's lands, for purposes such as cattle grazing and honey production. By the end of the year, 170 farmers were keeping approximately 60 000 cattle on Montes del Plata's lands while 31 farmers produced honey in some 4 900 beehives. The diverse use of lands improves local livelihoods, reduces forest fire risks, and helps to build stronger relationships with the community.

Montes del Plata runs the Bioparque M'Bopicuá in Fray Bentos, which includes a visitor centre and 150 hectares of land used to breed endangered species and other animals for eventual return to their wild natural habitats. The centre promotes environmental education, enabling visitors to experience native wildlife at first hand, and learn how ecosystems function.

Montes del Plata also finances local projects targeting increased cohesion, social participation and local development in nearby communities. During 2016, Montes del Plata supported 22 projects (19 in 2015) focusing on heritage conservation, sports, social integration, health, and education. Montes del Plata also made various donations to local community work, including emergency relief following local flooding.

#### Mitigating negative impacts of logistics

Since 2014 Montes del Plata has been developing a long-term strategy for the sustainable transportation of wood,

#### Montes del Plata in numbers

Montes del Plata, our 50/50 joint operation with the Chilean company Arauco, runs a state-of-the-art 1.3 million tonne pulp mill at Punta Pereira in southwestern Uruguay, together with associated eucalyptus plantations. Montes del Plata owns 190 000 hectares of land and leases 55 000 hectares of land.

	2016	2015
<b>Employment</b>		
Montes del Plata's own employees	687	668
Contractors' employees	3 542	3 137
<b>Number of local suppliers<sup>1</sup></b>	162	188
<b>Agroforestry activities</b>		
Partner farmers in the Forest Producer Programme	350	308
Honey producers on the company's land	31	31
Cattle farmers on the company's land	170	180
Hectares of company land used for cattle grazing	131 916	135 386

<sup>1</sup> Local suppliers in the Department of Colonia, where Montes del Plata pulp mill is situated.



Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance



01

- 01 Montes del Plata's strategy for the sustainable transportation of wood covers road safety and shipping.
- 02 Montes del Plata has created strategic alliances with local farmers.



02

**Bulleh Shah Packaging, Pakistan**

Stora Enso supports six local schools in cooperation with the Pakistani non-governmental organisation Idara-e-Taleem-o-Aagahi. Since 2015 these schools have been providing education for children previously identified as child workers in Bulleh Shah Packaging's (BSP) supply chain. The schools have the capacity to educate up to 640 children. The pupils also receive free school uniforms and medical checks. BSP is additionally providing vocational training for the children's parents, to improve their life skills and ability to find work.

BSP runs a maternity and child healthcare clinic near its mill in Kasur. Other community investment actions taken in 2016 included the commissioning of a mobile medical health care clinic, created together with the Yunus Center of the Asian Institute of Technology and Shalamar Hospital, in order to provide basic services to local communities linked to the supply of agricultural by-products used by BSP. The pilot phase of the medical mobile clinic in BSP's operational

including annual action plans involving truck drivers, transport companies, and local communities. Montes del Plata carefully trains all drivers before they start to work for the company, with high quality support from the Roadway Safety and Education Institute (ISEV). Quarterly workshops on safety and social responsibility are organised for approximately 700 truck drivers, and regular meetings are held with the owners of the transport companies serving Montes del Plata to follow up on safety indicators and emphasise the need for permanent improvement.

Methodology for identifying vulnerable locations has been developed to help address the most serious impacts of the traffic generated by Montes del Plata. Based on these findings, the company, its contractors and their truck drivers have together run workshops in selected communities to build awareness of traffic safety issues. During 2016 Montes del Plata helped to arrange such awareness-building sessions at eight local schools.

**Active dialogue with neighbouring villages**

Montes del Plata's continuous cooperation with local stakeholders aims to ensure that communities near the mill and its forestry operations become better acquainted with Montes del Plata, and build a positive relationship with the company. This will encourage them to approach the company with any possible concerns or complaints.

Stakeholder engagement work realised in 2016 included several educational visits to the mill site, Montes del Plata's tree nursery, the main port, and Bioparque M'Bopicuá. Altogether 1 720 people visited our operations, including employees' family members as well as many other local residents.

Montes del Plata's anonymous Ethics Channel grievance mechanism, available on the company's website, enables the company's own employees, the employees of contractors and suppliers, and members of local communities to bring up topics related to Montes del Plata's Code of Ethics and Conduct.

**Bulleh Shah Packaging in numbers**

Stora Enso has a 35% shareholding in Bulleh Shah Packaging (Private) Limited, which we own together with the Pakistani company Packages Limited. Bulleh Shah Packaging is Pakistan's largest fibre-based packaging producer, and the country's only liquid packaging board producer. The company's operations are located in Lahore, Karachi, and Kasur, in Punjab Province.

	31 Dec 2016	31 Dec 2015
<b>Employment</b>		
Bulleh Shah Packaging's own employees	1 070	1 121
Contractors' employees <sup>1</sup>	1 552	2 005
<b>School support initiative</b>		
Number of schools	6	6
Total capacity of the schools to educate children	640	640

<sup>1</sup> Contractors' employees working onsite at production facilities in Kasur and Karachi, and at collection sites for agricultural by-products.

Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance



In Laos, our village development fund has supported electricity and water supply projects, road upgrades, and purchases of livestock to enhance food security.

area is expected to start during the first quarter of 2017 and continue until the end of the year.

For information on our human rights related work in Pakistan, see page 12.

**Laos**

Our plantations in Laos have been established to enable local farmers to grow rice and cash crops between the trees. The integration of agriculture and tree growing continued to further engage communities in our operations during 2016.

In Laos we have also established a village development fund to share benefits among local villagers, and to further support local development and livelihoods. Most of the funding allocated during 2016 was directed to infrastructure projects such as electricity and water supply connections, road upgrading, and purchases of livestock to enhance food

security. These projects have been designed together with the villagers according to their needs and requirements. All the projects are also approved by the local authorities.

For more information about our human rights work in Lao communities, see page 15.

**Chennai, India**

In June 2015 Stora Enso announced the permanent closure of the group’s corrugated packaging converting unit in Chennai, India, due to its long-term unprofitability and declining customer demand. The non-profit organisation BSR provided advice on a responsible closure plan.

Chennai is one of the fastest growing metropolitan cities in India. Its growth has triggered large-scale migration, and many children live in the city’s slums or on its streets. To make a positive contribution on our departure, Stora Enso




**How can tree plantations be combined with food production in Laos?**

For Stora Enso, operating in Laos has required a completely new approach to tree-growing. Together with local farmers the company has developed a land use model that benefits the farmers as well as our business. Stora Enso has particularly worked to make the land safe by removing unexploded bomblets. Between 1964 and 1973 more ordnance was dropped on Laos than was dropped during the whole of World War II.

[Read the blog post at forestsolutions.panda.org](https://forestsolutions.panda.org)

provided support during 2015–2016 for Save the Children’s local work. This aims to improve children’s quality of life, enhance the life skills of adolescents, make communities and caregivers more sensitive to children’s needs, and improve water sanitation and hygiene.

**The project included the following actions:**

- Improving the personal hygiene of 3 000 children
- Providing access to safe drinking water in five child protection centres and four schools
- Raising awareness of proper sanitation, including the construction of a public toilet and provision of waste bins
- Encouraging people to use biodegradable waste for making compost
- Building the capacity of adolescents to advocate for their rights.



Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance

# Business ethics

For Stora Enso, business ethics means much more than merely complying with regulations. We strive to promote ethical behaviour, and we openly discuss any ethical dilemmas that arise in relation to our work. We believe this approach will help us succeed in business, foster accountability, and enhance our good reputation.

## Opportunities and challenges

### Ensuring compliance in a complex global environment

For a global industrial company, compliance with laws and regulations is always of the utmost importance. However, as a value-driven organisation we believe that adopting a wider ethical approach is also a priority.

Stora Enso operates in locations including high-risk emerging markets which offer good business opportunities, but may also entail exposure to serious risks relating to corruption or fraud, for instance. Joint venture agreements may also expose a company to risks related to competition law. Various governments and authorities have shaped effective legislation to combat corruption, such as the UK Bribery Act and the US Foreign Corrupt Practices Act. These laws place high demands on companies' controlling mechanisms, but they also help to build accountability and trust among employees, partners, and other stakeholders.

In the era of digitalisation, privacy issues are becoming increasingly important. Stora Enso takes measures designed



Our employees receive Code of Conduct training either through an e-learning tool or during face-to-face training sessions.

**Top level commitment plays a key role in making Stora Enso a more value-driven organisation.**

to ensure the privacy of our customers, suppliers, employees, and other stakeholders. New legislation such as the EU Data Protection Regulation additionally sets requirements concerning the processing of personal data, with heavy fines imposed for infringements. In this context we also increasingly need to acknowledge and address the emerging threat of cybercrime.

## Our policies

### Streamlined policies on ethics and compliance

The Stora Enso Code of Conduct is a single set of values defined for all our employees, to provide guidance on our approach to ethical business practices, environmental values, and human and labour rights. These same values are applied

Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance



All managers in key positions are required to make a personal commitment to our Code of Conduct and our Business Practice Policy.

wherever we operate. Other policies relevant to ethics and compliance include our:

- Business Practice Policy
- Data Privacy Policy
- Supplier Code of Conduct.

**How we work**

**Combatting misconduct on all fronts**

Stora Enso’s Ethics and Compliance function is a sub-function operating under our Legal team, headed by our General Counsel, who reports directly to the CEO. Our Ethics and Compliance Board, a governance body appointed by the CEO, monitors Stora Enso’s legal compliance and ethical business

conduct by following up on our Ethics and Compliance Action List. The Board met four times during 2016.

Stora Enso’s Ethics and Compliance Strategy forms the basis for annual action plans. The strategy has five focus areas:

- Top level commitment
- Improved communication and training
- Intensified efforts in countries with heightened concerns
- Developing our grievance channels
- Ethics and compliance as a competitive edge.

Stora Enso is represented in Transparency International’s Steering Committee for Business Principles for Countering

Bribery, where we actively participate in the network’s efforts to combat corruption globally.

**Top level commitment**

In our efforts to make Stora Enso a more value-driven organisation, we highlight the significance of top level commitment. All managers in key positions are required to make a personal commitment to our Code of Conduct and our Business Practice Policy, and to provide related training and information for employees within their respective organisations.

**Communications and training**

Our communication strategy for ethics and compliance aims to ensure that Stora Enso’s employees and business partners all understand what ethical behaviour is, and how they should respond to any ethical dilemmas that arise.

Our employees receive Code of Conduct training, either through an e-learning tool, or through face-to-face training provided for those who do not have direct access to computers. We aim to ensure that our new employees receive such training within their first month with us. In addition, an in-depth e-learning course on anti-trust and anti-corruption is mandatory for all members of our Group Leadership Team, for divisional and mill management teams, and for employees dealing with competitor contacts, purchasing, marketing, and sales. This course has been run since 2013. During 2016 all employees within these categories underwent mandatory refresher training.

**Intensified efforts in risk areas**

Operating in high-risk emerging markets and entering into joint ventures can entail serious risk exposures. Our risk assessment procedures on compliance cover all our units. The most significant compliance risks in our global operations relate to corruption and anti-trust.

The management and employees of our totally or jointly owned operations in Brazil, Russia, and China, and our equity-accounted minority investment in Pakistan receive extensive face-to-face training on our Business Practice Policy. Employees in Pakistan and in our joint operations in Brazil and Uruguay additionally receive training on these operations’ respective Codes of Conduct and Business Practice Principles. Training sessions cover topics such as human rights, environmental impacts, safety, and ethical practices. Anti-trust guidelines designed for our joint



Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance



01

ventures are implemented with the help of related training in Uruguay, Brazil, Pakistan, and China.

During 2016 our Ethics and Compliance team completed a set of road shows organised in risk areas in China, Poland, and Russia. These road shows were held to meet with local employees and managers face to face, to gain a better understanding of local ethical dilemmas, and to train local personnel on key topics.

**Formal grievance mechanisms**

Our employees are encouraged to report any suspected cases of misconduct or unethical behaviour to their own supervisor, or to our Human Resources or Legal functions. Employees may also report their concerns in confidentiality to the Head of Internal Audit. Our Supplier Code of Conduct also obliges our suppliers to report any non-compliance with the Code to Stora Enso’s Head of Internal Audit.

Stora Enso uses an additional external service through which our employees globally, and in certain locations also

external stakeholders, can anonymously report potential non-compliance cases by phone, mail, or online. This service, which covers all of our units, is available 24/7.

All potential non-compliance cases are duly investigated. The consequent findings are recorded and reviewed by the heads of our Internal Audit and Ethics and Compliance functions, and reported both to our Ethics and Compliance Board, and to our Board of Directors’ Financial and Audit Committee. Proven cases of non-compliance can lead to disciplinary or legal actions.

Our joint operations Veracel and Montes del Plata, and our equity-accounted minority investment Bulleh Shah Packaging each have their own local grievance channels.

**Progress**

**Enhanced training and monitoring**

We have developed an index that enables us to monitor and evaluate our employees’ perceptions of our work on topics covered by our Code of Conduct. The index is



02

- 01 Our data privacy policy ensures that the rights of our employees, business partners and other stakeholders are duly protected.
- 02 The “Do What’s Right“ mobile app makes it easy for employees to find and share information about compliance.

based on employees’ responses to related questions in our annual employee survey. In 2016 this index improved to 81 (80<sup>1</sup> in 2015). Our goal is to maintain this positive trend.

By the end of 2016, 19 374 Stora Enso employees had received training on our Code of Conduct. Furthermore, 2 509 employees in managerial positions completed an in-depth e-learning refreshment course on anti-trust and anti-corruption during 2016.

A Compliance Forum for Group Functions was established in 2016, following on from the creation of Division Compliance Forums in 2015. These forums bring together the heads of key functions and divisions to assess risks and monitor compliance.

Our Ethics and Compliance Self-Assessment Tool (T.E.S.T.), introduced in 2015, was run twice in 2016, and extended to cover group functions. This tool has been designed to give our divisions and functions a better overview of the progress their units are making on implementing our policies and compliance measures, while also identifying possible gaps and risks related to compliance. The results were addressed through the Compliance Forums, with action plans subsequently developed, implemented, and monitored as necessary.

**Making ethics and compliance more visible**

Our internal communications concept “Ethical Spotlight of the month” has continued to be used throughout the company. Each month, a specific topic related to ethics and compliance is presented for discussion, with the help of related material and communications kits.

In order to restructure, clarify, and simplify our various internal policies and guidelines on ethics and compliance, eight related policies were merged into a single Business Practice Policy (BPP) in 2016.

<sup>1</sup> Restated (+1)

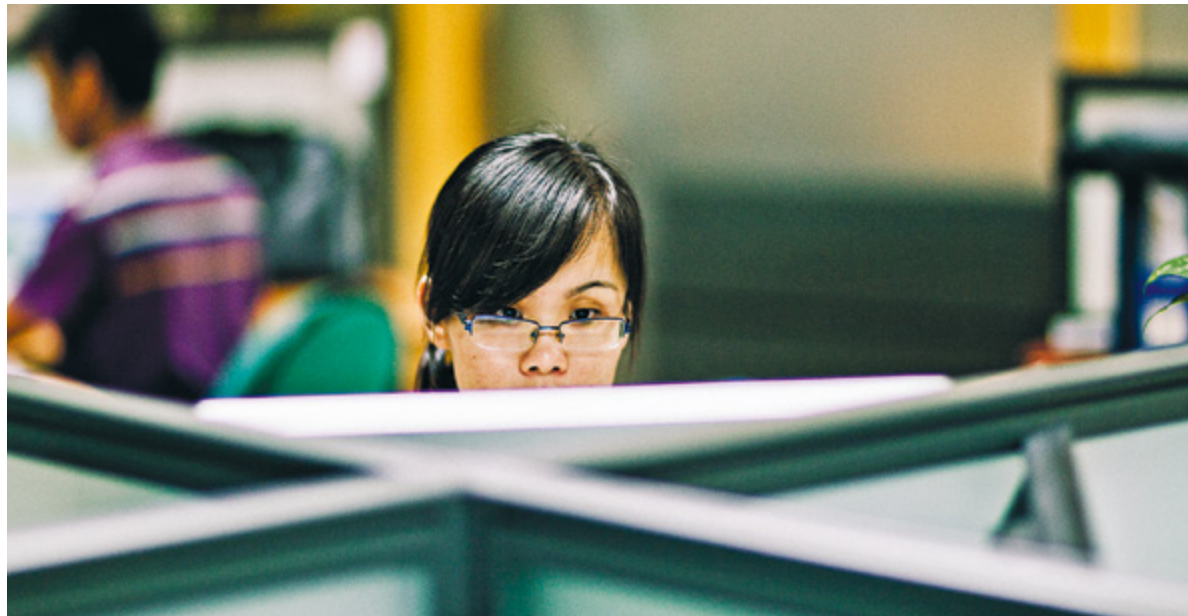
**By the end of 2016, 19 374 employees had received training on our Code of Conduct.**

Governance
<b>Social agenda</b>
Environmental agenda
Economic agenda
Data and assurance

During the year 170 employees from 24 countries and different backgrounds volunteered to take part in our Ethics Ambassadors Programme. Ethics Ambassadors are employees selected to informally assist our Ethics and Compliance function by promoting and implementing ethical values in their own locations.

**Data privacy in focus**

To protect personal data throughout our operations and ensure that we comply with all applicable laws, the new Stora Enso Data Privacy Policy was launched in April 2016. The policy aims to protect the company against risks related to breaches of data privacy, to let our employees know how Stora Enso collects and uses their personal data, and to ensure that the privacy rights of our employees, business partners and other stakeholders are protected. The Data Privacy Policy and related practical guidance have been rolled out through an e-learning tool.



In the era of digitalisation, privacy issues are becoming increasingly important. The new Stora Enso Data Privacy Policy was launched in 2016.

**More ways to speak up**

In 2016 we opened up a new internal grievance channel for the United States. Such reporting is now possible in 38 countries. Our external grievance channel is meanwhile available to stakeholders in China, India, Russia, Laos, and Brazil. The mobile app “Do What’s Right” continues to make it easy for employees to find and share information related to compliance, or to report possible violations, using their mobile devices.

In 2016 a total of 58 reports received through Stora Enso’s various grievance channels were identified as potential non-compliance cases (67 in 2015). Proven misconduct leading to disciplinary and/or legal actions was identified in 18 of the completed investigations (10), while five further complaints were found to be valid without involving misconduct. None of the proven misconduct cases were related to child labour, forced labour, or discrimination.



**Can I pay for a customer’s dinner?**

Stora Enso is committed to ensuring compliance and fostering a culture of ethical behaviour. But how can we ensure that these commitments are realised whenever our 25 000 employees around the globe make decisions in their everyday work? This is where the work of Stora Enso’s new Ethics Ambassadors starts.

[Read the full article at storaenso.com/sustainability](http://storaenso.com/sustainability)

**Breakdown of potential non-compliance cases**

	2016	2015
Fraud	5	8
Corruption	20	26
Anti-trust	2	2
Conflict of interest	7	6
General human resources	13	17
Health and safety	0	0
Miscellaneous	11	8
<b>Total</b>	<b>58</b>	<b>67</b>



Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance



# Environmental agenda

- Materials, water, and energy 34
- Carbon dioxide 44
- Forests, plantations, and land use 50

Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

# Materials, water, and energy

Stora Enso works hard to improve resource efficiency. This benefits our business as well as the environment and society. Stora Enso and the forest industry are pioneering a transition to a bioeconomy.

## Opportunities and challenges

### Making more with less

Global warming, population growth, and urbanisation are global megatrends that are bringing about significant long-term changes around the world. At Stora Enso we strive to respond proactively to these trends by developing products and technologies based on renewable, recyclable, and biodegradable materials.

### Materials

Replacing the use of fossil-based resources with renewable raw materials is the foundation for a sustainable bioeconomy. Our products also contribute to a low-carbon circular economy, in which materials are reused and recycled, while waste is minimised, to maximise environmental and financial added value.

The European Commission (EC) has adopted a Circular Economy Package containing proposals for legislation designed to reduce waste, as well as an action plan aiming to optimise product life cycles through recycling and reuse. The benefits of sustainably sourced renewable materials are recognised by the EC, providing great business opportunities for Stora Enso.

### Water

Water plays a central role in Stora Enso's production, heating, cooling and cleaning processes, and in the generation of the renewable hydroelectricity that we purchase. Our forests and plantations also need rainwater. Though most of our production units are located in regions where water is relatively



We use high-performing wastewater treatment systems to ensure all discharged water is ecologically safe for the local environment.

abundant, global water scarcity may still impact our operations in the long term through our supply chains, and as controls on pollution, recycling, and water pricing are toughened. At the same time, such developments give us opportunities to reduce costs by using water more efficiently.

### Energy

The EU's 2020 Climate and Energy Package and 2030 Climate and Energy Framework, currently under revision, map out the way forward for industrial energy. The forthcoming revisions may include changes in the Emissions Trading System (for

**Water plays a central role in our production, heating, cooling, and cleaning processes.**



Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

more information see page 44) and tougher requirements on industrial energy efficiency. An increase in the global demand for biomass can additionally be expected.

Most of our mills use substantial amounts of biomass in their internal energy production. This renewable energy is generated from by-products and residuals from our own production processes, harvesting residues, recovered wood, and wastes.

The EU's Renewable Energy Directive sets member states a binding collective target to realise 20% of their final energy consumption from renewable sources by 2020. With its high proportion of biomass-based energy, the forest industry can help the EU reach its renewable energy targets.

**Our policies**

**Steering our use of natural resources**

Stora Enso's policies relevant to our usage of materials, water, and energy include:

- Code of Conduct – guidance on issues related to resource usage
- Supplier Code of Conduct, Practical Instructions for Stora Enso's Suppliers, and Purchasers' Instructions – guidance on responsible sourcing and issues related to water and materials in our supply chain
- Policy on Wood and Fibre Sourcing, and Land Management – measures to ensure our work on forestry, land use, sourcing and water is well integrated into our sustainable forest management and the land use practices we follow in plantations and forests
- Statement on Water and Water Use – setting out the company's position and activities
- Energy Guidelines – to steer our long-term energy procurement and energy generation choices, and promote a wider corporate culture of responsible energy management.

**How we work**

**Striving for continuous improvement**

Stora Enso continuously works to improve resource efficiency by driving material, waste, water, and energy efficiency, and by developing new business opportunities from residuals and by-products.



The environmental work realised at our mills, including water and energy management and resource efficiency, is supported by third-party-certified environmental management systems. All our board, pulp, and paper mills are certified to the ISO 14001 environmental management system standard. All our sawmills and corrugated packaging facilities are certified or are in the process of being certified under ISO 14001. By the end of 2016, 33 of our production units were certified to the ISO 50001 energy efficiency management system standard (36 in 2015), corresponding to 92% of our total energy consumption in 2016 (90%). In addition, seven units are expected to be certified to the ISO 50001 standard in early 2017. For unit-specific information on certificates, see page 69.

The emissions generated by each of our mills are regulated by the relevant authorities, with limits set through environmental permit processes taking into account local conditions and legislation. Our mills monitor their compliance with these permits, as do the relevant environmental



- 01 All our production units are certified or in the process of being certified to the ISO 14001 environmental management system standard.
- 02 Stora Enso is one of the largest consumers of paper for recycling in Europe.

authorities. For details of all significant incidents and violations of environmental permits occurring in 2016, see page 42.

Environmental improvements at our production units are driven by local circumstances. The EU's Best Available Techniques (BAT) Reference Documents – which include BAT conclusions with limits for effluents and emissions to air, as well as BAT conclusions for large combustion plants – will apply to our board, pulp, and paper mills in Europe. The related investment needs are proactively planned as part of group investment processes. These investments fit into the company's normal CAPEX framework and policy.

**Paper for recycling used at seven mills**

Wood is the primary raw material in Stora Enso's production processes. Primary fibre is used for materials used for products with special safety requirements such as food packaging, toys, and pharmaceuticals. For more information about our wood procurement see page 50.

Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance



### How can a mill benefit local farmers while protecting the sea?

Agriculture is among the main polluters of the Baltic Sea, especially due to the use of phosphorus-rich fertilisers. Stora Enso's Imatra Mills are among the pioneers recycling residual materials to create soil improvement products that can reduce the need for artificial fertilisers. These residuals contain only limited amounts of easily soluble nutrients that may leach into water, while they are rich in a wide range of organic, slowly soluble nutrients.

▶ Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

Europe's PfR collection rate has been high for many years (72% in 2015). This is a noteworthy achievement, particularly since The Confederation of European Paper Industries (CEPI) estimates that 22% of all paper is of grades that cannot be recycled, such as tissue paper. This nevertheless means that 6% more could still be recovered for recycling. Stora Enso and the paper industry are actively collaborating to find ways to access this unrecycled paper.

### Beneficial use of residuals and waste

Stora Enso's production processes generate various residuals and wastes, including ash, black liquor, sawdust, bark, and wastewater treatment sludge. Many of these materials are used in our internal bioenergy generation and pulp production, or supplied to partners for use in agriculture, brick manufacturing, or road construction, for instance. We are constantly looking for innovative ways to beneficially use materials that would otherwise end up as waste.

We ensure that hazardous waste is safely processed at suitable facilities or incinerators, and we report on hazardous waste disposal in accordance with the relevant regulations.

Our mills' third-party-certified ISO 14001 systems form part of the on-site management procedures for handling chemicals and waste. Knowhow and best practices related to optimising material flows are shared within the company by expert networks focusing on environment and efficiency, PfR, chemical safety, and product safety.

### Water efficiency and wastewater management

While Stora Enso handles relatively large amounts of water, of this water only around 4% is consumed in our production processes and almost 96% is returned to the local environment. Process water is purified by our treatment plants and then discharged, whereas cooling and other non-process water can be safely released without treatment.

Stora Enso uses high-performing wastewater treatment systems to ensure that discharged water is ecologically safe and meets all regulatory requirements. Our systems recycle water within our mills whenever possible, to reduce the need for water intake. Reducing our water demand also helps us to improve the energy and material efficiency of our production, and makes the purification of the remaining wastewater more efficient.

### Stora Enso's water withdrawal and consumption



Almost **96%** of the water we withdraw is recycled back to the local environment after being carefully purified.

Some **4%** of the water we withdraw is consumed in our production.

Stora Enso is also a significant user of paper for recycling (PfR). We use PfR wherever this makes good sense environmentally and economically. Seven of Stora Enso's mills currently use PfR. Recycled newspapers and magazines are used to produce certain paper grades at Langerbrugge Mill in Belgium (where they account for 100% of sourced fibre), Sachsen Mill (100%) and Maxau Mill (approximately 75%) in Germany, Dawang Mill in China (95%), and Hylte Mill in Sweden (50%). Recovered board is used to make certain containerboard grades at Ostrołęka Mill in Poland (85%) and at Varkaus Mill in Finland.

Through contracts with local authorities and waste management companies, and by managing our own collection facilities, we secure a sufficient supply of used paper and board for reuse. In some regions we use PfR from industrial and commercial sources such as printers and retailers, in addition to material originating from households. In Poland we run a network of 21 depots where board is collected and baled for transportation to our Ostrołęka Mill.



Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance



### How can renewable energy be generated from wastewater?

Untreated wastewater from any board or paper mill has high concentrations of organic compounds, measured as chemical oxygen demand (COD). If left untreated, such effluent can worsen environmental problems such as toxic algal blooms in natural waters. Heinola Fluting Mill in Finland has introduced a bioreactor that converts the COD in its wastewater into bio-based methane that can be used to generate renewable energy.

Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

We have applied the Global Water Tool devised by the World Business Council for Sustainable Development to assess related risks at our production units, and we actively follow the latest water footprint methodology developed by researchers and standardisation bodies.

### Energy supply based on long-term contracts

The most energy intensive phases in Stora Enso's value chain are our board, pulp, and paper production processes. It is therefore essential that our mills have access to a reliable energy supply at a reasonable cost. Stora Enso's energy supply is managed under long-term contracts, direct market access through energy exchanges, efficient combined heat and power production, and shareholdings in power generation companies such as Pohjolan Voima Oy and Teollisuuden Voima Oy in Finland. For more information on these partnerships, see our [Financial Report](#) (Note 31).

Stora Enso is committed to continuous improvements in energy efficiency and energy self-sufficiency. Opportunities to use biomass fuels or other low-carbon options are assessed in connection with energy investments.

### Carefully structured energy management

Stora Enso's Energy Services team is responsible for procuring energy and ensuring that our energy efficiency strategy is duly implemented. This work involves hedging of energy prices,

managing the sales of emission rights, consulting the mills in relation to energy procurement, trading in green certificates, following our carbon dioxide allowance balance, and monitoring energy legislation.

The biofuels used within Stora Enso are mainly purchased by our Wood Supply organisation, whereas each mill is individually responsible for the procurement of other fuels. Mills are also responsible for optimising their energy efficiency using internal tools and certified environmental and energy management systems, with support from our energy efficiency teams.

Nine of Stora Enso's board and paper mills in Europe, and all of our Nordic sawmills, monitor energy efficiency online in real time. All of Stora Enso's board, pulp, and paper mills are part of an energy efficiency best practice network.

### Progress

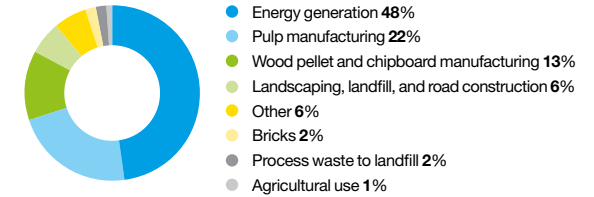
#### New targets and KPIs

During 2016, a review of Stora Enso's sustainability strategy involved reassessing how we manage materials, water, and energy.

#### Materials

After reviewing our approach to material efficiency during 2016, we have outlined a set of key performance indicators

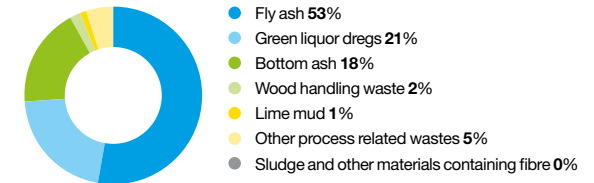
### Utilisation of process waste and residual materials<sup>1</sup>



<sup>1</sup> Covers all Stora Enso production units, as dry tonnes.

### Process waste to landfill<sup>1</sup>

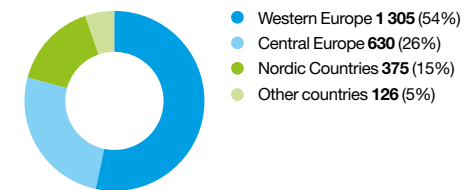
71 938 tonnes



<sup>1</sup> Covers all Stora Enso production units. In addition to process waste to landfill Stora Enso's production units created a total of 3 274 tonnes of non-process waste while 74 054 tonnes of process waste was sent to on-site storage facilities.

### Paper for recycling: procurement by origin

Thousand tonnes<sup>1</sup>



<sup>1</sup> As delivered to our mills.

Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

focusing on internal operational efficiency and external factors such as beneficial use and revenues derived from by-products and residuals. Related work will continue in 2017 with the goal of measuring our progress and contributions towards a low-carbon and resource efficient circular bioeconomy.

In 2016, the group's revenues derived from residuals and by-products, including tall oil, amounted to EUR 70 million (EUR 83 million in 2015). The utilisation rate for residuals and by-products across the group was 98% (98%), covering internal and external use.

During 2016 Stora Enso's production units generated a total of 3 489 tonnes of hazardous waste, slightly down from 3 574 tonnes in 2015. These materials include oils, solvents, paints, laboratory chemicals, and batteries. In addition, 23 247 tonnes of sludge classified as hazardous waste was generated at the disused Falun Copper Mine in Sweden (9 517 tonnes).

Stora Enso used 1.9 million tonnes of paper for recycling (PfR) in 2016 (2.1 million tonnes), making us one of the largest PfR consumers in Europe. The PfR utilisation rate in our paper and board production was 20% (23%).

**Intensified focus on chemical safety**

An internal working group was set up in 2016 to coordinate and support activities designed to enhance chemical safety. This involves working with occupational health and safety,

**Water withdrawal and consumption<sup>1 2</sup>**

	2012	2013	2014	2015	2016	Trend 12-16
<b>Total water withdrawal (million m<sup>3</sup>)</b>						
Process water	290	287	287	306	297	2%
Cooling water	319	333	323	283	301	-6%
<b>Total</b>	<b>609</b>	<b>620</b>	<b>610</b>	<b>590</b>	<b>598</b>	<b>-2%</b>
<b>Process water withdrawal efficiency</b>						
m <sup>3</sup> /tonne	26.8	27.1	28.6	30.0	28.3	6%
<b>Total water consumption</b>						
million m <sup>3</sup>	23.9	25.7	24.8	22.8	23.0	-4%
m <sup>3</sup> /tonne	2.2	2.4	2.5	2.2	2.2	0%
<b>Process water discharges</b>						
million m <sup>3</sup>	277	272	266	272	280	1%
m <sup>3</sup> /tonne	25.5	25.7	26.5	26.7	26.7	5%

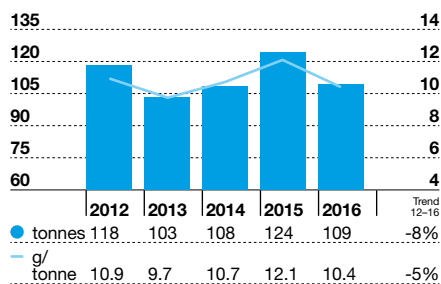
<sup>1</sup> Figures from pulp, paper and board production units. Normalised figures are reported per unit of sales production.  
<sup>2</sup> Historical figures recalculated due to changes in baseline following divestments or accuracy improvements.

environmental safety, and product safety aspects related to our purchasing, use, and manufacturing of chemicals. The working group will also focus on areas such as chemical safety in innovation, R&D, operations, and supply chain interaction, when bringing new products to the market.

**Water**

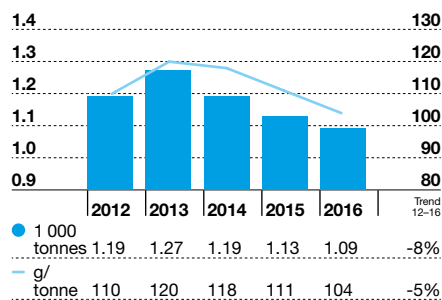
Stora Enso has intensified its work on efficiency at the mill level, with a focus on comprehensive local approaches to water management. Our target to reduce chemical oxygen demand (COD) levels in discharged water per saleable tonne of pulp, paper, and board by 7% from the 2007 benchmark level was

**Phosphorus<sup>1 2</sup>**



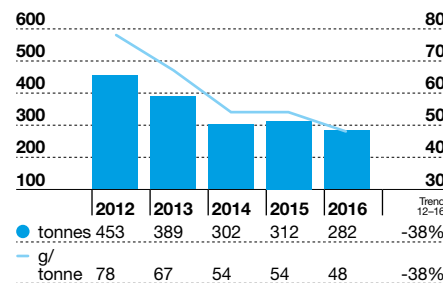
<sup>1</sup> Figures from pulp, paper and board production units. Normalised figures are reported per unit of sales production.  
<sup>2</sup> Historical figures recalculated due to changes in baseline following divestments or accuracy improvements.

**Nitrogen<sup>1 2</sup>**



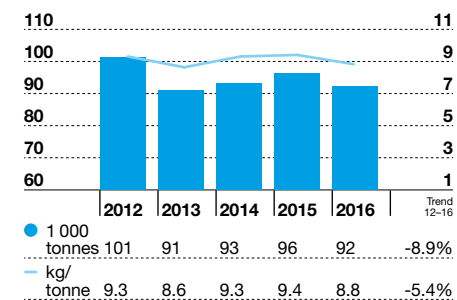
<sup>1</sup> Figures from pulp, paper and board production units. Normalised figures are reported per unit of sales production.  
<sup>2</sup> Historical figures recalculated due to changes in baseline following divestments or accuracy improvements.

**Adsorbable organic halogen compounds (AOX)<sup>1 2</sup>**



<sup>1</sup> Figures from bleached chemical pulp production units only. Normalised figures are reported per unit of bleached chemical pulp production.  
<sup>2</sup> Historical figures recalculated due to changes in baseline following divestments or accuracy improvements.

**Chemical oxygen demand (COD)<sup>1 2</sup>**



<sup>1</sup> Figures from pulp, paper and board production units. Normalised figures are reported per unit of sales production.  
<sup>2</sup> Historical figures recalculated due to changes in baseline following divestments or accuracy improvements.



Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

achieved and completed in 2016, following a reduction of 9% during the year (3% in 2015).

Stora Enso's target to reduce normalised process water discharges by 6% from the 2005 benchmark level was not achieved in 2016. In 2016 the reduction was 3% (2% in 2015). We will continue to follow this key performance indicator (KPI) as part of our new approach to water and energy efficiency. We will also introduce total water use at our board, pulp, and paper mills as a new KPI in 2017.

A pilot project on water and energy stewardship was carried out at Skutskär Mill in 2016 to assess a new approach to water efficiency for wider use across Stora Enso. The project resulted in a number of actions including the development of a Water Management Tool Box containing a model for the calculation of water costs and energy savings, which will be further developed and applied in 2017.

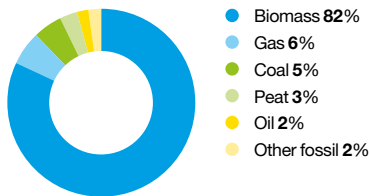
**Local water initiatives**

Stora Enso actively supports and participates in international and local initiatives related to water in our operations and in the surrounding communities. In 2016, Stora Enso's Ostrołęka Mill in Poland worked with a group of residents to clean up the local River Omulew.



We are striving to further increase the share of biomass in our energy production.

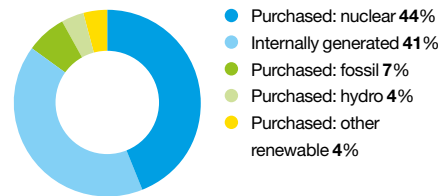
**Fuels<sup>1</sup>**



Our total annual fuel consumption was 152 098 terajoules (TJ) in 2016 (145 754 TJ in 2015).<sup>2</sup> 1 TJ = 10<sup>12</sup> joules

<sup>1</sup> Figures cover pulp, paper and board production units. Normalised figures are reported per unit of sales production.  
<sup>2</sup> Historical figures recalculated due to changes in baseline following divestments or accuracy improvements.

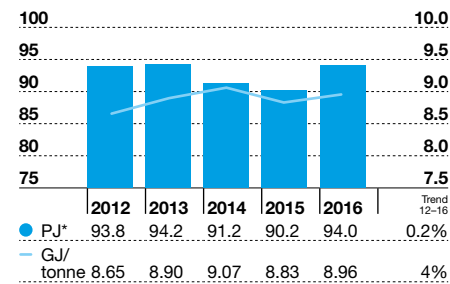
**Electricity<sup>1</sup>**



During 2016 we generated and purchased 12.6 terawatt hours (TWh) of electricity and consumed 12.2 TWh (12.4 and 12.0 during 2015).<sup>2</sup> 0.4 TWh was sold (0.4).  
TWh (terawatt hour) = 10<sup>9</sup> kilowatt hours

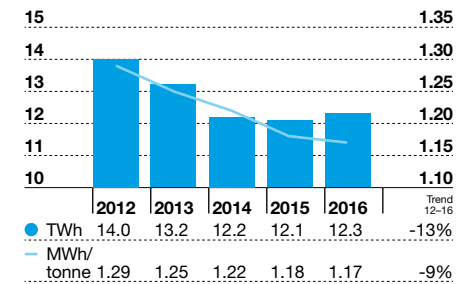
<sup>1</sup> Figures cover pulp, paper and board production units. Normalised figures are reported per unit of sales production.  
<sup>2</sup> Historical figures recalculated due to changes in baseline following divestments or accuracy improvements.

**Heat consumption<sup>1 2 3</sup>**



<sup>1</sup> Figures cover pulp, paper and board production units. Normalised figures are reported per unit of sales production.  
<sup>2</sup> Excluding heat used for electricity generation. Power plants' own heat consumption and non-process heat consumption included in 2016 reporting.  
<sup>3</sup> Historical figures recalculated due to changes in baseline following divestments or accuracy improvements.  
\* 1 PJ = 10<sup>15</sup> joules.

**Electricity consumption<sup>1 2</sup>**



<sup>1</sup> Figures cover pulp, paper and board production units. Normalised figures are reported per unit of sales production.  
<sup>2</sup> Historical figures recalculated due to changes in baseline following divestments or accuracy improvements.

Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance



### How is Stora Enso helping Uruguay to lead the way on renewable energy?

Uruguay is showing the way for the rest of the world, with the majority of the country’s energy production based on renewable sources. The Montes del Plata pulp mill, which is 50%-owned by Stora Enso, contributes by producing five percent of Uruguay’s electricity from biomass.

➤ Read the full article on [storaenso.com/sustainability](http://storaenso.com/sustainability)



In 2016, our specific electricity and heat consumption per tonne of pulp, paper, and board production was 4.5% lower than the 2010 benchmark level.

### Energy

During 2016 we introduced a new KPI on Stora Enso’s carbon intensity, focusing on fossil CO<sub>2</sub> emissions in relation to total energy consumption. For more information see page 45.

Our group-wide target is to reduce specific electricity and heat consumption per tonne of pulp, paper, and board production by 15% by 2020, compared with the baseline year of 2010. In 2016 this indicator was 4.5% lower than the 2010 benchmark level (4.7% in 2015).

In 2016 our total energy self-sufficiency figure was 63% (64%). The share of biomass in internal energy production was 82% (82%).

In 2016 our electricity self-sufficiency level was 43% (42%). Some 89% (81%) of our purchased electricity was generated from low-carbon sources including nuclear and renewable energy. Existing contracts and our internal electricity generation capacity are estimated to cover around 81% of our needs for the next five years (80% in 2015).

Energy accounted for 10% of Stora Enso’s variable costs in 2016 (10% in 2015).

### Continuous improvement in energy efficiency

During 2016 Stora Enso continued to enhance energy efficiency throughout the group’s operations.

The Wood Products division implemented ISO 50001 energy management systems at seven mills: Varkaus LVL unit in Finland, Planá Sawmill in Czech Republic, Brand Sawmill

in Austria, Impilahti Sawmill and Nebolchi Sawmill in Russia, and Ala Sawmill and Gruvön Sawmill in Sweden. Our online energy efficiency tool was adopted at our Finnish and Swedish sawmills.

We prolonged our voluntary commitment to the Energy Intensive Industries Agreement managed by the Confederation of Finnish Industries, whereby we aim to reduce energy use at our Finnish production units by 4% over the period 2017–2020, and by 3.5% (cumulative, in MWh) for 2021–2025.

### Energy fuel optimisation

We actively look for different means to optimise fuel use and increase the share of biomass in our energy production. During 2016 our Ostrołęka Mill in Poland, for instance, increased the use of biomass. Read more about the climate effects of these changes on page 46.

### Stora Enso’s energy efficiency fund

One cornerstone of our work is a central energy efficiency investment fund. In 2016 this fund of EUR 15 million (EUR 11 million in 2015) was earmarked for use in our mills’ energy efficiency work. It supported 52 (32) projects during the year, including: efficiency improvement projects for drying sections at Heinola Fluting, Oulu, Imatra, and Ingerois mills; a low-energy concept for pulp production at Langerbrugge Mill; and energy saving projects in vacuum systems at Ostrołęka and Veitsiluoto mills.

When in full effect, the projects financed in 2016 should generate reductions in energy consumption of at least 275 GWh per year (54 GWh electricity and 221 GWh heat). These figures are equivalent to 0.4% of our annual electricity consumption and 0.7% of our annual heat consumption.

### Emissions to air

Our atmospheric emissions mainly result from the combustion of fuels used to generate energy. These emissions include carbon dioxide (CO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and fine particles.

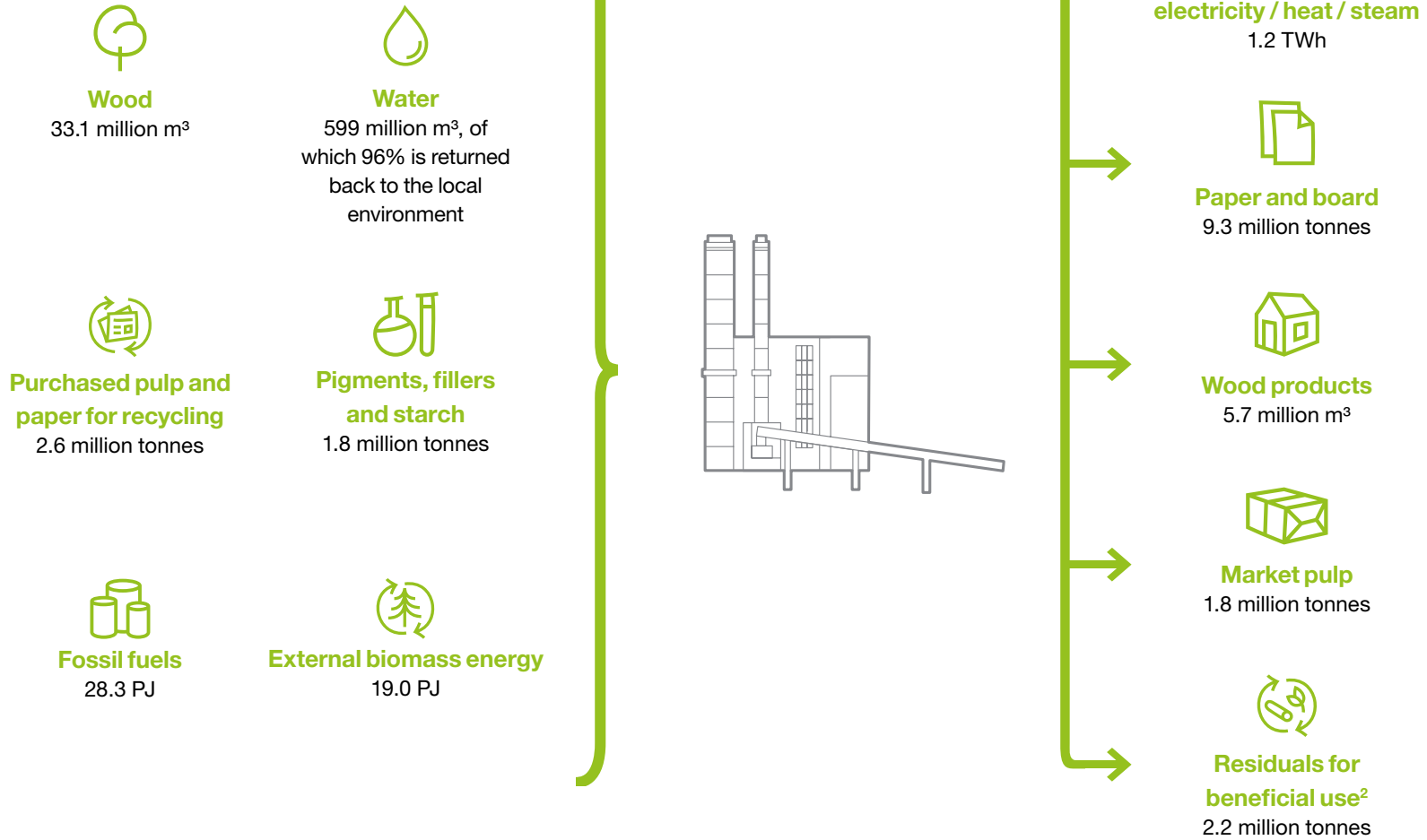
We are working to reduce our emissions to air by using more renewable energy and by improving our energy efficiency. SO<sub>2</sub> and NO<sub>x</sub> emissions, which affect air quality and cause acid rain and soil acidification, are also controlled through advanced technologies such as scrubbers and boiler process control systems.

In 2016 our SO<sub>2</sub> emissions amounted to 3.6 thousand tonnes (3.7 thousand tonnes in 2015), NO<sub>x</sub> emissions totalled 10.8 thousand tonnes (11.0 thousand tonnes), and emissions of fine particles amounted to 1.9 thousand tonnes (1.7 thousand tonnes).



Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

### Material use in 2016<sup>1</sup>



<sup>1</sup> Covers all Stora Enso production units.

<sup>2</sup> By-products, residuals and wastes utilised by external stakeholders.

The illustration shows the key materials used in our processes, together with our production figures for 2016. For a comprehensive illustration on how we create value for society see our [Progress Book](#).

## Environmental incidents in 2016

The list below gives details of environmental incidents that occurred at our production units during 2016. Joint venture operations are excluded from the list. During 2016 Stora Enso continued to develop new group-wide reporting and management processes for environmental incidents at production units. These procedures will be fully implemented in early 2017. Due to improvements in reporting, this list of unit-level environmental incidents in 2016 is not fully comparable with corresponding reports from previous years.

Unit	Incident	Corrective actions
Anjala Mill, Finland	Annual average permit limits for emissions of dioxins and furans applying to one of the mill's boilers were slightly exceeded.	The related sulphur feeding process has been modified, and new measurements are being compiled.
Enocell Mill, Finland	The mill's permit level for phosphorus emissions to water was exceeded slightly in July and August due to a nutrient imbalance.	Taking into account the mill's long-term efforts to minimise phosphorus discharges, the authorities have granted the mill a new permit limit for phosphorus. Investigations have been conducted to help improve the control of phosphorus discharges.
Fors Mill, Sweden	In February the mill exceeded its monthly limit for total phosphorus emissions. In July the mill exceeded its monthly limits for emissions of total phosphorus and suspended solids due to a leakage of sodium hydroxide. In December the mill exceeded its monthly limit for suspended solids in discharges due to a disturbance in the wastewater treatment plant.	The monitoring of the mill's flotation step has been improved, and enhanced chemical treatment and a new nutrient additive have been introduced at the wastewater treatment plant. The authorities have ordered the mill to continue monitoring pH levels and to find ways to prevent similar incidents in future.
	Leakages in a vault and inside a heat pipe's vessel resulted in the leakage of sodium hydroxide into the mill's wastewater treatment plant and into the ground in June and July.	All water from affected areas has been pumped back to the wastewater treatment plant. No contaminated water entered the River Forsån. The pH levels in affected ground areas are being monitored. No further requirements were imposed by the authorities.
Heinola Fluting Mill, Finland	The mill's monthly limit for phosphorus emissions was exceeded in January due to releases of higher phosphorus loads into the effluent treatment plant. Up to 100 litres of oil leaked from the mill's power plant into a nearby bay during April. The leakage was caused by a broken oil pipe between the mill's heavy oil tank and the power plant. A permanent oil boom located in the bay failed to function properly during the leakage.	Actions have been taken to identify the source of the excess phosphorus and to improve controls over phosphorus loads. A written notification was received from the environmental authorities. Additional oil spill prevention actions were taken immediately. The local fire brigade installed a new oil boom in the lake, and collected the spilt oil. Oil collection trucks were employed to ensure that no more oil was leaked. After these immediate corrective measures, new oil booms were installed in the bay, the faulty pipe was taken out of use, oil was cleared from channels, and a new oil pipe was built above ground.
	The mill's monthly chemical oxygen demand (COD) limit was exceeded in October due to difficulties encountered during the start-up after the annual maintenance shutdown.	A new measurement point has been added to improve control of the nutrient dosage of the effluent treatment plant. A further one-year optimisation period, during which conditions in the wastewater treatment plant and the anaerobic process will be improved, started in the beginning of November. Written notification from the authorities was received approving the continuation of the optimisation process.
Hyte Mill, Sweden	The mill's daily average limit for carbon monoxide emissions was exceeded in January and February, due to problems with the fuel feed of a boiler after its start-up.	A new rotary valve has been installed in the fuel feeding system, and procedures for boiler start-ups have been updated. An investigation report was submitted to the authorities, and no further requirements were imposed.

Governance

Social agenda

Environmental agenda

Economic agenda

Data and assurance



	Unit	Incident	Corrective actions
Governance	Imatra Mills, Finland	300m <sup>3</sup> of white liquor leaked from the air bleed valve of a pipeline during September and October, due to a mechanical failure. This leakage caused slight soil contamination in the vicinity of the leakage area.	A mitigation and follow-up plan required by the authorities has been duly implemented. New preventive actions including frequent pipeline inspections have been initiated. The air bleed and emptying valves with actuators and limit switches will be renewed during the next major maintenance shutdown in 2017. Instructions for pipeline inspection routines have been updated and added to the mills' management system.
Social agenda			
<b>Environmental agenda</b>	Ostrołęka Mill, Poland	From January to the end of April the mill used surface water in line with the conditions of an outdated permit, due to delays in the prolonged assessment of a permit application filed with the authorities.	The mill has requested an interpretation from the environmental authorities, and requirements are still pending.
Economic agenda		The mill's permit limits for emissions of dust, nitrogen dioxide and total organic carbon were exceeded in the power plant's flue gases between May and September due to damaged bag filters and a measurement system failure.	The measurement system has been repaired, and the damaged filters have been replaced. A possible fiscal fee is still pending from the environmental authorities.
Data and assurance		In June the mill operated a biological effluent treatment plant under an outdated permit, due to delays in the prolonged assessment of a permit application filed with the authorities.	The mill has requested an interpretation from the environmental authorities, and requirements are still pending.
		In June the mill experienced odour problems caused by the accumulation and fermentation of sewage in the retention water tank after a maintenance break.	Key stakeholders including local media were informed about the cause of the problem. No requirements were imposed by the authorities.
	Oulu Mill, Finland	The mill experienced odour problems during the first quarter of 2016, due to the defective functioning of the pulp mill's odorous gas collection and treatment system following a maintenance stop and the rebuilding of a chip silo at the end of 2015.	As requested by the authorities, the mill has developed an action plan and already taken several measures to rectify gas collection and treatment conditions. These measures have included adjustments to the process and the automation system, updates of operating procedures, and further personnel training.
	Sunila Mill, Finland	The mill's permit level for phosphorus emissions to water was exceeded in June, July and August, due to a nutrient imbalance.	Actions were taken to increase nitrogen content and to start removing phosphorus by inducing a precipitation reaction in the wastewater treatment plant. The authorities were duly informed, and the mill's actions have been accepted.
		The mill's permit level for total reduced sulphur (TRS) emissions was exceeded during January, February, June and August at the mill's lime kilns, due to operational inconsistency in the burning of lignin and in the combustion of large volumes of weak odorous gases in the gas boiler.	The use of lignin as fuel in the mill's lime kiln was stabilised in February, effectively reducing TRS emissions. The distribution of weak gases between the gas boiler and the recovery boiler has been optimised, with more gases now burnt in the recovery boiler to ensure compliance with the mill's TRS limits. The authorities were duly informed, and the mill's actions have been accepted.

Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

# Carbon dioxide

We believe that the key to combatting global warming involves the use of renewable materials, resource and energy efficient production processes, and sustainable forest management practices. We are working to reduce fossil carbon dioxide emissions within our operations, by improving energy efficiency, and by increasing the share of biomass and other non-fossil fuels in our internal energy generation, which is already as high as 82%.

## Opportunities and challenges

### Creating value with renewable materials

The use of renewable materials enables us to contribute to the development of a low-carbon economy. Trees in sustainably managed forests absorb carbon dioxide (CO<sub>2</sub>) from the atmosphere and together with wood-based products act as carbon sinks. Our products help our customers and society at large to reduce CO<sub>2</sub> emissions by providing low-carbon alternatives to solutions based on fossil fuels and other non-renewable materials.

The first truly global climate agreement was approved at the Paris Climate Conference (COP21) in December 2015, entering into force in November 2016. Stora Enso welcomes this agreement as an important milestone in sustainable global development.

The EU's Emissions Trading System (ETS) is the biggest mandatory international system for trading greenhouse gas emission allowances, and a major element of the EU's efforts to combat global warming. The ETS grants "carbon leakage" status to industries where it is considered that costs related to climate policies might cause businesses to transfer production to countries with less demanding requirements to reduce greenhouse gas emissions. The forest industry currently has carbon leakage status for the period 2015–2019. Plans for the period beyond 2020 are under consideration within the EU, with possible implications for the forest industry.



Our use of renewable materials enables us to contribute to a low-carbon economy. We are currently developing renewable alternatives for fossil-based materials and aluminium, which may be used in bicycles or automobiles, for instance. Read more about our innovation activities in our [Progress Book](#).

## Our policies

### Shaping a carbon strategy

During 2016 Stora Enso finalised a carbon strategy and continued to work on related policies. It is our firm intention to drive down our fossil fuel use even more over the next ten years, so that we get as close to zero as possible using technically and commercially feasible means. Relevant policies steering our efforts to combat global warming include our Statement on Global Warming, and our Supplier Code of Conduct and Practical Guide for Suppliers, which give guidance on how CO<sub>2</sub> emissions can be reduced in our supply chain.

## How we work

### Improving our energy efficiency

Greenhouse gases emitted by our operations include carbon dioxide, methane and nitrous oxide – with carbon dioxide being the most significant. The most effective ways to reduce our direct fossil CO<sub>2</sub> emissions are to further improve our energy efficiency, and to keep increasing our usage of biomass fuels. Significant investments in previous years, particularly in multi-fuel boilers, successfully generated large reductions in our fossil CO<sub>2</sub> intensity.



Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

**Focusing on carbon intensity through a new KPI**

For over a decade we have been actively reducing the energy intensity of our operations – and in many places also our dependency on fossil fuels. A new key performance indicator (KPI) focusing on the carbon intensity of the energy used by all Stora Enso’s production units was launched in 2016. Starting from 2017 we will measure our progress based on fossil CO<sub>2</sub> emissions (kg) in relation to energy consumption (MWh). For related data see page 48.

**Systematic work supported by management systems**

Stora Enso evaluates risks and opportunities related to global warming through the annual Enterprise Risk Management (ERM) process, which forms an integral part of the group’s management approach (for more details see our [Progress Book](#)). We also routinely calculate the financial impacts of potential cost increases in relation to emission allowances, including the financial impacts on our business of possible consequent increases in energy prices.

Our production units systematically work to meet their environmental regulatory requirements and to improve their energy efficiency. Their work is supported by international third-party-certified systems such as the environmental management standard ISO 14001 and the energy management standard ISO 50001. For unit-specific information on certification see page 69.

**Detailed carbon reporting**

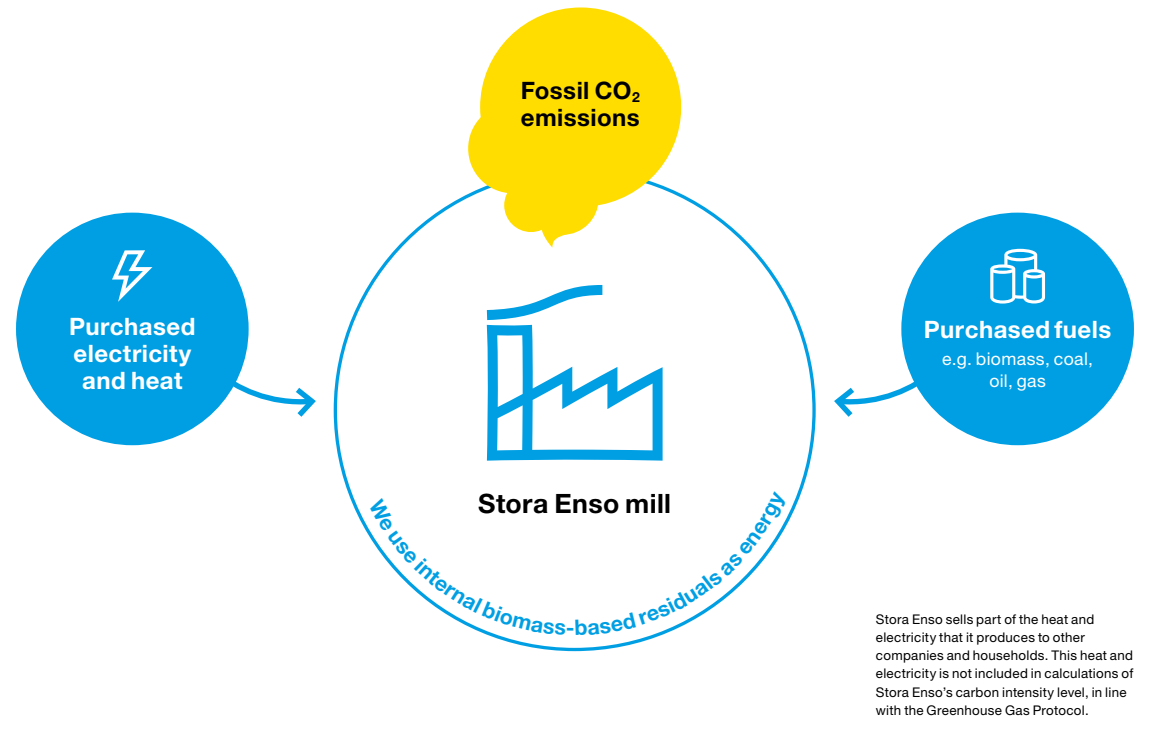
We publicly report on our greenhouse gas emissions in three categories

- Fossil CO<sub>2</sub> emissions from operations we directly own or control, including on-site energy generation facilities and our own processes, power boilers, lime kilns and on-site vehicles (scope 1).
- Fossil CO<sub>2</sub> emissions related to the electricity and heat we purchase externally for use in our operations (scope 2).
- Estimated fossil CO<sub>2</sub> emissions from other indirect sources along our value chain (scope 3).

Our board, pulp, and paper mills report quarterly on carbon emissions for scopes 1 and 2, while sawmills and converting facilities report their carbon emissions annually. A group-level estimate for scope 3 emissions is updated biannually. Our carbon

**The carbon intensity of Stora Enso’s operations**

Our related KPI measures our **fossil CO<sub>2</sub> emissions** in relation to our total **energy consumption** (kg of CO<sub>2</sub> per MWh). In 2016, our carbon intensity level decreased to 62 kg/MWh.



footprint accounting is based on guidelines provided by the Greenhouse Gas Protocol of the World Resource Institute and the World Business Council for Sustainable Development (WBCSD). In 2016 we continued to have our direct and indirect fossil CO<sub>2</sub> emissions (scopes 1 and 2) externally assured to Reasonable Level, as one of the few companies in the world to do so. For more details see page 68.

In 2016 a new internal reporting tool was adopted for the group’s sustainability data.

**Partnering for climate action**

Ahead of COP21 Stora Enso joined the [We Mean Business coalition](#), and signed a pledge to combat global warming by committing to a science-based emission reduction target.

Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

This made Stora Enso the first company in Finland to make such a commitment. The coalition brings together non-profit organisations, businesses, and investors who all recognise that transitioning to a low-carbon economy is the only way to secure sustainable economic growth.

As part of our work with the non-profit organisation BSR, Stora Enso, BSR and the Finnish Climate Leadership Council co-hosted a major collaborative networking event “We Mean Business – Accelerating Climate Action” in Helsinki in October 2016. The event focused on topics including science-based emission reduction targets and the goal of shifting to 100% renewable energy.

During 2016 Stora Enso also worked with the Prince of Wales’s Corporate Leaders Group (CLG) on a Low Carbon Business Compendium for EU officials, which demonstrates the ambitions and achievements that leading European businesses have defined and realised in moving towards a low-carbon economy.

In 2016, Stora Enso continued to support the WBCSD’s Low Carbon Technology Partnership Initiative (LCTPI), and in particular the implementation of the LCTPI – Forests Action Plan, by scaling up sustainable forest management and replacing energy-intensive products with fibre-based alternatives.

**Progress**

**Reducing our carbon dioxide intensity**

Since 2007, our target has been to reduce our fossil CO<sub>2</sub> emissions per saleable tonne of board, pulp, and paper by 35% from 2006 levels by the end of 2025. This target is periodically adjusted to take into account the changing shape of the company. This CO<sub>2</sub> intensity target covers both emissions generated directly by our own facilities (scope 1), and indirect emissions produced during the generation of the electricity and heat we purchase (scope 2).

In 2016 our CO<sub>2</sub> emissions per saleable tonne of board, pulp, and paper were 39% lower than the 2006 benchmark level (38% lower in 2015). We have thus reached our target, but the group’s CO<sub>2</sub> intensity will in the future be adversely affected by the use of coal for energy production at our Beihai Mill in China. For more information see page 62.

During 2016 the group’s fossil CO<sub>2</sub> emissions per saleable tonne were reduced by applying more accurate CO<sub>2</sub> factors for energy suppliers, and due to the closure of Suzhou paper mill



**What does the Paris Agreement mean for companies?**

In November 2016 the historic Paris Climate Agreement entered into force, aiming to strengthen the global response to the threat of global warming so as to limit average global temperature rises to below 2 degrees Celsius compared to pre-industrial levels. “We have entered into an era of a new business-as-usual,” says **Edward Cameron**, managing director of the global non-profit organisation BSR.

Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

in China and the divestment of Kabel paper mill in Germany. The updated, more accurate market-based CO<sub>2</sub> factor and grid energy-mix information obtained from the authorities for electricity purchased in Finland also reduced the emissions figure for 2015, by approximately 0.25 million tonnes.

The total direct and indirect fossil CO<sub>2</sub> emissions from Stora Enso’s board, pulp and paper mills amounted to 3.08 million tonnes in 2016 (3.03 million tonnes). Direct fossil CO<sub>2</sub> emissions decreased both in absolute terms and per unit of sales production. Direct fossil CO<sub>2</sub> emissions per unit of sales production were 12% lower than in 2006. In absolute terms, our direct and indirect fossil CO<sub>2</sub> emissions were 51% lower than in 2006.

The fossil CO<sub>2</sub> emissions resulting from the generation of the electricity we purchased during 2016 were 69% lower than in 2006 per unit of sales production. The CO<sub>2</sub> factors we use for purchased energy (scope 2) largely follow market-based methodology, meaning that almost all of our units apply CO<sub>2</sub> factors provided by their energy suppliers, instead of average factors for the countries of operation.

Thirteen of Stora Enso’s mills are currently linked to local district heating systems. In most cases the heat supplied from our production units directly reduces the use of oil and other fossil fuels in these localities. In 2016 a total of 3.7 PJ of heat was sold to these district heating systems (3.7 PJ). Using this amount of

renewable energy instead of light fuel oil for heating resulted in estimated emission reductions amounting to 0.28 million tonnes of CO<sub>2</sub> (0.28 million tonnes).

We continuously strive to increase the share of biomass in our internal energy generation. At Ostrołęka Mill in Poland, for example, the increased use of biomass in the mill’s boiler has enabled a 7% reduction in the mill’s direct and indirect CO<sub>2</sub> emissions compared to 2015, corresponding to approximately 40 kilotonnes.

**Recognition by the CDP**

In 2016, CDP (formerly known as the Carbon Disclosure Project) included Stora Enso on its Climate A List and Supplier Climate A List, in recognition of the company’s long-term actions and

**In 2016, 80% of the total CO<sub>2</sub> emissions from our own operations were carbon neutral.**



Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

strategy to reduce emissions. Stora Enso was also the only Nordic company to be included in CDP's Supplier Engagement Leaderboard for driving change in its supply chain.

Our full response to CDP's annual climate questionnaire is available on [CDP's website](#).

**Finding ways to use non-fossil fuels in Beihai**

At our new Beihai Mill in China, coal is currently the only feasible energy source for an industrial project of this scale, as there are no sustainable supply chains for non-fossil fuels in southern China at present. We have begun to investigate long-term options to gradually move away from coal to biomass and other non-fossil fuels. The mill's boiler is technically able to use a variety of fuel mixes, and in late 2016 already started to use modest amounts of wastewater sludge, forest residuals and other side streams from our production processes. For more information about our coal sourcing see page 62.

**Carbon neutral emissions**

Carbon neutral CO<sub>2</sub> emissions are fossil-free emissions generated during the combustion of biomass-based fuels coming from sustainably managed forests<sup>1</sup>. Stora Enso's operations utilise renewable biomass-based fuels to a large extent, so the share of carbon neutral CO<sub>2</sub> emissions in our total emissions is high. In 2016 80% (79%) of the total CO<sub>2</sub> emissions from our own operations were carbon neutral.

**Our carbon footprint**

Direct emissions from our operations account for 23% (21% in 2015) of our carbon footprint, while emissions related to the electricity and heat we purchase for use in our operations account for 9% (15%) of our total carbon emissions. The majority of the emissions in our carbon footprint – 68% (64%) – are according to our estimates generated elsewhere along the value chain: in the sourcing and manufacturing of our raw materials and services (41% of the total scope 3 emissions); in the further processing of our products by customers (34%); and in the transportation of raw materials to our mills and our final products to our customers (25%).

During 2016 we strengthened our internal steering processes to identify potential for further reducing our emissions in scopes 1, 2 and 3. We also continued

<sup>1</sup> Recommendations on Biomass Carbon Neutrality, WBCSD 2015.



Sustainably managed forests play a crucial role in combatting global warming.

implementing methodologies for calculating the quantities of carbon sequestered in forests and plantations owned and managed by Stora Enso and our associate companies. It is our intention to also work with external experts to identify a credible methodology to calculate the positive substitution effect our wood fibre-based products have when compared to alternatives produced from fossil CO<sub>2</sub>.

**Emissions along the value chain**

During 2016 we enhanced our work to estimate our scope 3 emissions with the help of improved methodology. The CO<sub>2</sub> emissions generated during the transportation of our raw materials and products, which are the most significant

environmental impacts associated with our logistical operations, are mainly produced by external logistics service providers. Transportation accounts for 24% of our CO<sub>2</sub> emissions.

In order to reduce our scope 3 emissions we have reduced the environmental footprint of our wood transportation in Sweden, for instance. During 2016 one of our major wood transportation suppliers switched to minimum 50% renewable diesel fuel, reducing the fossil CO<sub>2</sub> emissions generated by their wood trucks by approximately 40%.

Transportation by sea accounts for approximately 89% of all our product transportation by weight and distance, while road and rail transportation constitute 9% and 2% respectively.

Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

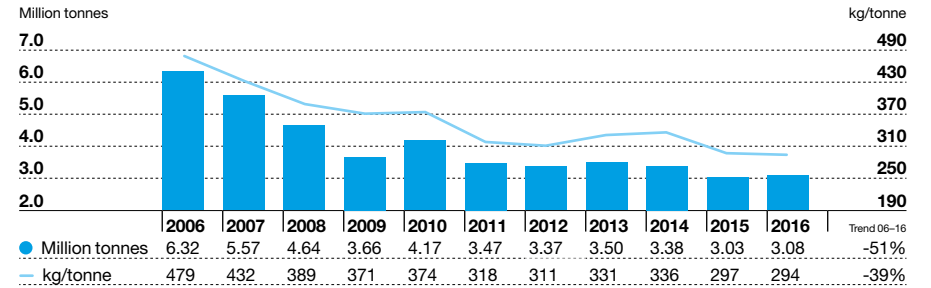


### How can companies combat global warming through partnerships?

In 2016 Stora Enso and Volvo Cars jointly opened a four-kilometre pipeline carrying hot water between the two companies' manufacturing sites in Ghent, Belgium. This unique partnership helps to combat global warming by enabling Volvo Cars to use substantially lower amounts of fossil fuels for heating.

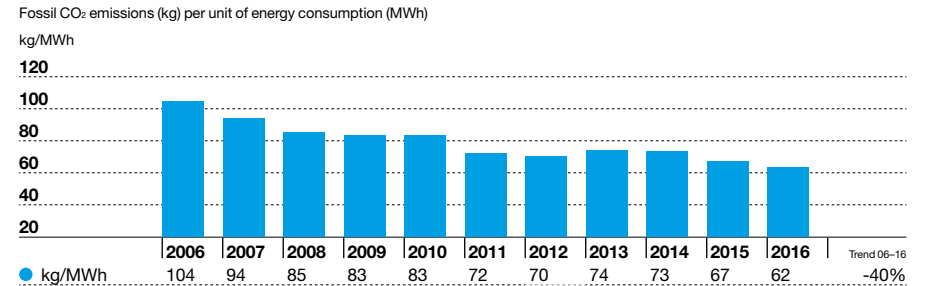
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### Our fossil CO<sub>2</sub> emissions<sup>1</sup>



<sup>1</sup> Covering direct and indirect fossil CO<sub>2</sub> emissions (scopes 1 and 2) from pulp, paper, and board production units. Normalised figures are reported per unit of sales production. Historical figures recalculated due to changes in baseline following divestments or accuracy improvements.

### Fossil CO<sub>2</sub> emissions in relation to our energy consumption<sup>1</sup>



<sup>1</sup> Covering direct and indirect fossil CO<sub>2</sub> emissions (scopes 1 and 2) and energy consumption from all production units.

### Total carbon footprint 2012–2016<sup>1,2</sup>

Emission source		Fossil CO <sub>2</sub> equivalent (million tonnes)				
		2016	2015	2014	2013	2012
Stationary and mobile combustion sources (direct) <sup>3</sup>	Scope 1	2.39	2.24	2.39	2.47	2.37
Purchased electricity and heat (indirect)	Scope 2	1.00	1.23	1.45	1.50	1.48
Other sources (indirect)	Scope 3	7.07	6.92	6.83	7.22	7.42
		10.47	10.39	10.67	11.19	11.27

<sup>1</sup> Covers all Stora Enso production units.

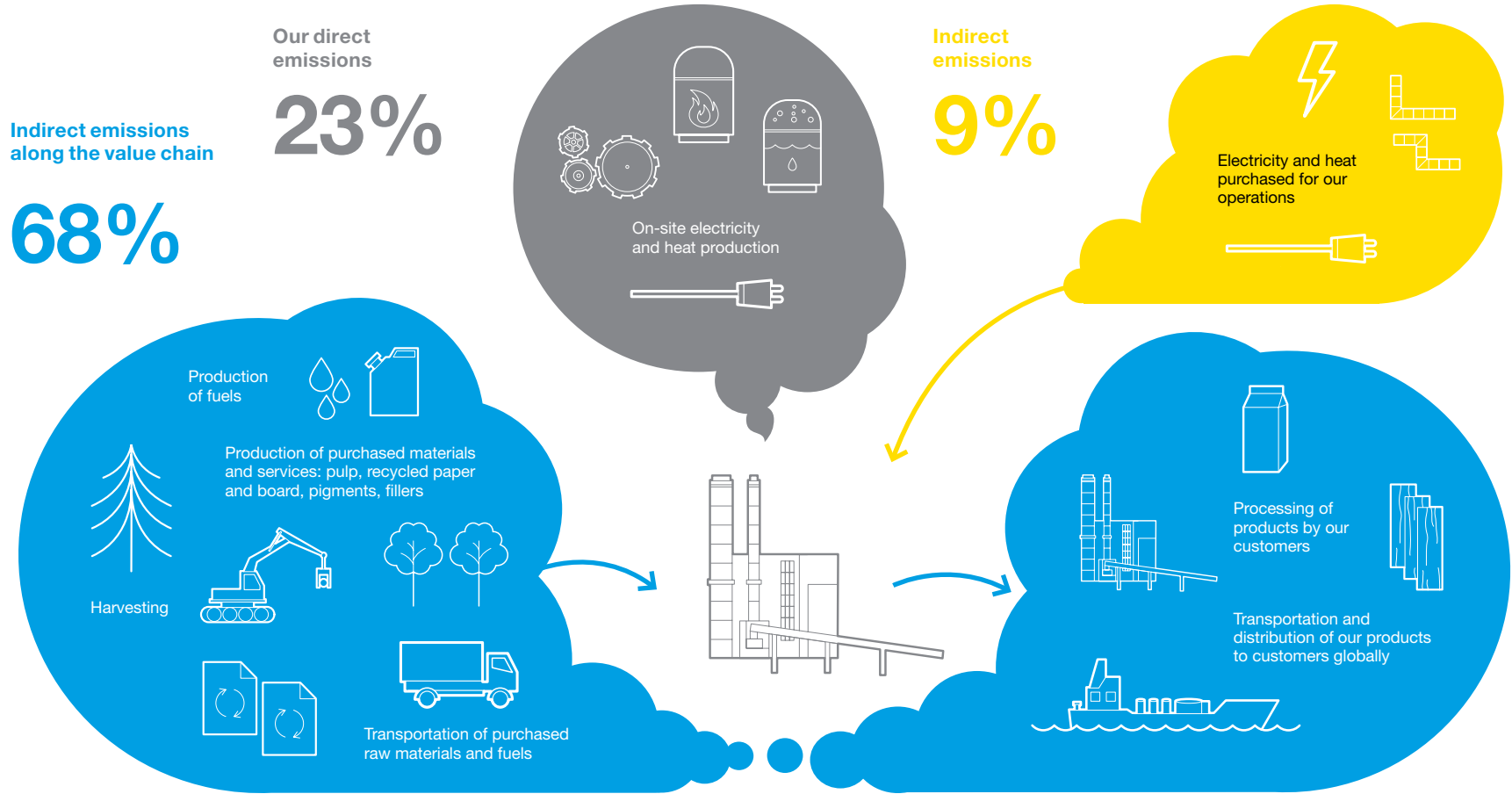
<sup>2</sup> Historical figures recalculated due to changes in baseline following divestments or accuracy improvements.

<sup>3</sup> CO<sub>2</sub> equivalent includes also other greenhouse gases in addition to CO<sub>2</sub>. 95% of our greenhouse gases under scope 1 are CO<sub>2</sub>, the rest are methane and nitrous oxide (N<sub>2</sub>O).



Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

## Stora Enso's carbon footprint<sup>1</sup>



● Scope 1: Direct emissions from our operations. ● Scope 2: Emissions related to purchased energy consumed in our operations. ● Scope 3: Emissions from other sources along our value chain.

<sup>1</sup> Covers all Stora Enso production units, a total of 10.47 million tonnes of fossil CO<sub>2</sub> equivalent (10.39 million tonnes in 2015).

Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

# Forests, plantations, and land use

Sustainable forest management is in our immediate and long-term interest, as it keeps forests healthy and productive, and thus helps secure the long-term availability of the renewable resources we use.

## Opportunities and challenges

### Forestry in a changing world

Forests and plantations are an increasingly important part of a wider global development agenda, especially in relation to combatting global warming. As a renewable natural resource, wood represents a favourable alternative to materials based on fossil fuels. Trees absorb carbon dioxide (CO<sub>2</sub>) from the atmosphere, and together with wood-based products act as carbon sinks. If forests and plantations are managed sustainably, new generations of trees replace those that are logged, sequestering more CO<sub>2</sub> from the atmosphere.

Global warming entails physical challenges and opportunities in relation to forests and plantations, due to changing patterns of temperature, wind, and rainfall, which can all be expected to impact our operational environment. Well-managed forests can make entire ecosystems more resilient to negative impacts, and benefit from positive ones.

Global challenges such as population growth, increasing demand for agricultural land, and the widening gap between supply and demand for wood, all require us to use natural



In 2016, 90% of Stora Enso's wood came from managed semi-natural forests in Europe, where most forests are privately owned.

**We know the origin of all the wood we use. 100% comes from sustainable sources.**

resources even more efficiently, and to produce larger amounts of raw materials from less land. Because the need to conserve our remaining natural ecosystems is also increasing, we must find new ways to integrate competing land uses. Simultaneously, the trend for more forest-owners to be based in cities away from their landholdings brings new challenges in relation to wood procurement as their connection to day-to-day operations is weakened.

In December 2016, environmental NGOs announced a global campaign calling for increased protection of northern

forests. Stora Enso believes that safeguarding the biodiversity of forests is a cornerstone of a successful bioeconomy. This requires sustainable forest management, sufficient forest protection, and open stakeholder dialogues.

## Our policies

### Committed to sustainable forestry

Stora Enso's policy on Wood and Fibre Sourcing, and Land Management covers the entire cycle of forest and plantation



Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance



### How can we promote sustainable forestry along our supply chains?

Sustainable forestry in the Northern Hemisphere has become a hot topic, with environmental NGOs widely calling for forests to be better protected. Stora Enso believes that safeguarding the biodiversity of forests is a cornerstone of a successful bioeconomy. This requires sustainable forest management, sufficient forest protection, and open stakeholder dialogues.

➤ Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

- Forest and plantation planning
- Silvicultural operations (everyday forest and plantation management)
- Wood harvesting
- Regeneration of forests and plantations
- Monitoring of each part of the process, for example through audits and self-assessments.

In 2016 the total amount of wood (including roundwood, wood chips, and sawdust) delivered to our mills was 37.6 million m<sup>3</sup> (solid under bark) (36.2 million m<sup>3</sup> in 2015).

#### Planning with a long-term view

As trees take many years or decades to mature, long-term forestry planning is essential. Such planning involves ecological landscape plans and biodiversity assessments made to identify, conserve, and restore vital ecosystems and ecological features. In 2016, 90% (89% of Stora Enso's wood came from managed semi-natural forests in Europe where most forests are privately owned. Forest planning involves finding ways to optimise wood production and conservation. We work together with forest-owners to identify sensitive forest areas in need of protection.

In 2016, 10% of Stora Enso's wood came from tree plantations (11%). When establishing new plantations, we use internationally approved principles such as the Food and Agriculture Organisation's (FAO) Voluntary Guidelines

management. Key goals include ensuring that we can trace the origin of all the wood we use. We also aim to maintain open dialogues with our stakeholders. Other Stora Enso policies that promote sustainable forestry include our Code of Conduct and our Supplier Code of Conduct.

#### How we work

##### Ensuring the sustainability of fibre

Stora Enso's approach to responsible forest and tree plantation management and our related actions duly take into account the economic, social, and environmental aspects of sustainability. Compliance with national legislation is only the starting point for our work, and we actively support and implement voluntary forest conservation and restoration measures both in lands owned, leased, and managed by Stora Enso, and in other areas where we purchase wood.

We are also active members of numerous local and global forestry associations, networks, and programmes. Stora Enso has been a member of the Forest Solutions Group (FSG) of the World Business Council for Sustainable Development since the late 1990s.

In 2016, we continued to support and participate in The Forests Dialogue (TFD), a platform for multi-stakeholder discussion and collaboration on the most pressing local and global issues facing forests and people.

We also continued participating in the WWF's New Generation Plantations (NGP) platform, which focuses on the institutional and technological aspects of responsible plantation management. In 2016, we hosted a NGP study tour on our trial plantations in Laos. For more information about our operations in Laos, see page 27.

Stora Enso is cooperating with WWF Finland to promote forest conservation and the sustainable use of forests. This works includes promoting alternative harvesting practices among private forest-owners.

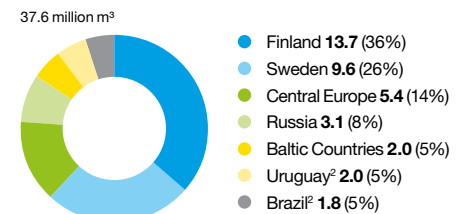
##### Comprehensive wood procurement

To cover all three aspects of sustainability in our forest and plantation operations, we apply the same comprehensive wood procurement process in all the regions where we operate. Our wood procurement is organised regionally, with our supply units in Finland, Sweden, the Baltic Countries, Russia, and Central Europe each responsible for sourcing wood for the Stora Enso mills in these regions. Each of our tree plantations operates under the mill to which it supplies wood.

Our Biomaterials division manages certain plantation projects that are not associated with a single mill, like our trial plantation in Laos, while our Chief Technology Officer is responsible for our forestry operations in Guangxi, China.

Our wood procurement process covers the entire management cycle in forests and plantations, including:

#### Wood procurement by region<sup>1</sup>



<sup>1</sup> Total amounts of wood (roundwood, chips and sawdust) procured within these regions for delivery to our mills (million m<sup>3</sup>, solid under bark). In addition 20 000 m<sup>3</sup> was delivered to our Beihai Mill in China which commenced operations in 2016.  
<sup>2</sup> Figures for Brazil and Uruguay include 50% of the wood procurement of our joint operations Veracel and Montes del Plata.

Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

on Planted Forests, and we also certify our commercial plantations to ensure all three aspects of sustainability are duly taken into consideration. Stora Enso never establishes plantations in natural forests, protected areas, or water-sensitive locations. We only use land with low biodiversity value, such as former pasturelands. Stora Enso's employees and forestry contractors are given on-the-job training on ecological management, and we regularly monitor the impacts of our operations on biodiversity, soil, and water resources.

We recognise that our plantations are an integral part of local land use, and we invariably evaluate and define sustainable land use practices for each location. After determining the scope of expected impacts and possible remedies, we decide on whether or not to go ahead with a planned project. Stora Enso subsequently remains in constant dialogue with stakeholders, and strives to make sure that land contracts are legitimate and fair.

**Sustainable silviculture and harvesting**

Stora Enso closely monitors the management of the forests and plantations where we purchase wood. Wood harvesting is planned to suit the special characteristics of each harvesting site, making use of appropriate felling methods and technology. Wood harvesting volumes are always aligned with the long-term carrying capacity of the forests and plantations. All the roundwood, chips, sawdust, and externally purchased pulp supplied to our mills come from sustainable sources. We use a range of tools to ensure this, and to guarantee the sustainability of each part of the forest management cycle. These tools include forest certification and third-party traceability systems such as the Forest Stewardship Council's®<sup>1</sup> (FSC) Chain of Custody/Controlled Wood scheme, the Chain of Custody/Due Diligence System of the Programme

**We design our tree plantations to be an integral part of local land use.**



for the Endorsement of Forest Certification (PEFC), and the ISO 14001 environmental management standard.

We actively work with our stakeholders to promote sustainable forest management and the wider use of certification systems. As certification programmes cover all three aspects of sustainability, they are an important indicator of responsible forestry. For this reason we follow our progress with a key performance indicator measuring the proportion of the lands owned and managed by Stora Enso that are covered by forest certification schemes.

In Sweden we provided further training for our forestry experts during 2016 to help them better recognise local

<sup>1</sup> Stora Enso Communications' FSC ® trademark license number is FSC-N001919.



**01** We continuously strive to improve the productivity and quality of the eucalyptus trees grown in our tree plantations.

**02** We always ensure that forests and plantations are duly regenerated wherever wood is harvested.

environmental and cultural characteristics in forestry operations, in line with our updated guidelines. One key goal here is to ensure that optimal felling methods are used in environmentally sensitive areas. More than 600 employees from our Swedish wood procurement and harvesting operations received such training during 2016. To further strengthen our wood procurement organisation in Sweden we also recruited five environmental experts to new positions.

**Regenerating forests and plantations**

We always ensure that the forests and plantations where we harvest wood are duly regenerated. Often this is done with active planting or sowing, though in many areas active regeneration is complemented by natural seed dispersal



Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance

## Veracel conserves and restores extensive areas of native rainforest.

from nearby forests, by leaving seed trees in the harvesting area, or by coppicing. Whatever the methods used, we always make sure the trees that we harvest will be replaced by new growth.

In Brazil, our joint operation Veracel goes beyond regeneration by conserving and restoring areas of natural rainforest. Approximately half of Veracel’s 215 000 hectares of land are dedicated to rainforest preservation. Areas where natural regeneration is not possible are carefully planted. Veracel aims to restore 400 hectares of rainforest habitat every year through local partnerships. A total of 6 098 hectares of forest have been restored between 1994 and the end of 2016. This work is part of a regional restoration programme which helps to connect remaining areas of valuable natural habitat with forest corridors, enabling animals to move from one area to another.

The Veracel Station visitor centre, established in an area of preserved rainforest habitat, conducts research, conserves native and endangered ecosystems, and provides environmental education for visitors.

### Detailed monitoring

We closely monitor the sustainability of our operations throughout the forest management cycle, focusing on their impacts on biodiversity, soil, and water resources. We regularly audit our suppliers and work together with respected local institutions to make sure everything is done according to the standards set by certification schemes and our own policies.

In Sweden, for instance, our monitoring of the environmental quality of felling sites is based on information received during assessments and feedback sessions conducted with harvesting teams. More than 100 felling sites are monitored in Sweden each year. In Finland, local

institutions annually monitor the environmental quality of some 150 Stora Enso harvesting sites.

In China, we have continued our long-term cooperation with Flora & Fauna International (FFI) on biodiversity monitoring in tree plantations.

### Tree breeding

Stora Enso is working continuously towards the long-term goal of improving the productivity and quality of the eucalyptus trees grown in our plantations, so as to sustainably enhance wood production per unit of land. Tree breeding primarily targets increased biomass production (i.e. volume and density) and cellulose yield. Other targets may include resistance to frost, drought, pests, or diseases, or improved rooting, depending on local conditions and the species in question. We test and apply modern scientific tools for tree improvement and the management of genetic diversity. This may involve selecting “elite trees”, or conducting marker assisted breeding and genetic engineering.

Our genetic engineering activities are in the research and development phase. As with traditional clone improvements, it will take many years to develop genetically engineered clones. We are currently planning to establish related field trials in areas totalling less than 50 hectares at two locations in Brazil in 2017. These trials will fully comply with the relevant national regulations. Stora Enso will not carry out any trials considered by the authorities to be

unsafe or otherwise not permissible. Currently we have no plans to plant genetically engineered trees in any of our commercial plantations.

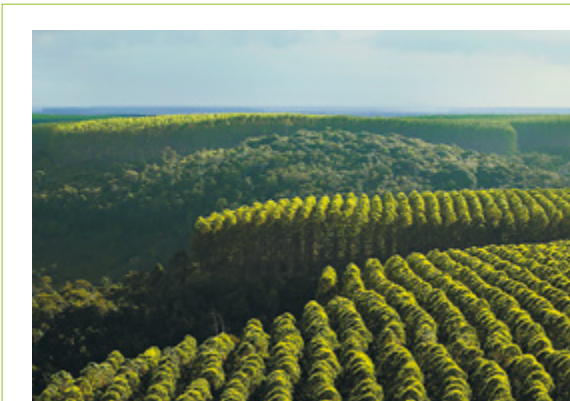
### Progress

#### Steady advances on certification

Stora Enso owns or leases lands with a total area of 972 821 hectares globally. We follow our progress on responsible forestry with a key performance indicator (KPI) that measures the percentage of these lands covered by certification systems. Our target is to reach 96% coverage by the end of 2017. In 2016 coverage amounted to 90% (90% in 2015). The share of certified wood in our total wood supply was 83% (80%).

In 2016 our 50%-owned joint operation Montes del Plata in Uruguay was granted PEFC certification for lands it owns and leases, in addition to existing FSC certification.

Wood Supply Russia continued to work with WWF Russia during 2016 to expand Stora Enso’s FSC certification groups and to make certification more accessible and cost efficient for small and medium-sized companies. In June, four new logging companies joined FSC certification groups managed by Stora Enso in Russia. This added 126 000 hectares to the total area covered by the group certifications, and increased the total extent of certified areas to 940 000 hectares



### How can sustainable tree plantations benefit biodiversity?

Stora Enso widely uses raw materials obtained from tree plantations. Do plantations endanger biodiversity, or can biodiversity actually be enhanced by sustainable tree plantations? We talk to **Peter Kanowski**, Professor of Tropical Silviculture at the Australian National University in Canberra and **Antti Marjokorpi**, Head of Forest, Plantations, and Land use at Stora Enso.

Listen to the podcast at [storaenso.com/renewablefuture](http://storaenso.com/renewablefuture)



Governance
Social agenda
<b>Environmental agenda</b>
Economic agenda
Data and assurance



### How does Stora Enso enhance sustainable forestry in Karelia?

Forestry is a vital industry to the economy of the densely forested Republic of Karelia in northwest Russia. Stora Enso procures wood in Karelia while also working with local partners – including non-governmental organisations and research institutes, as well as the authorities – to promote sustainable forestry and preserve the forests' ecologically valuable features.

➤ Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

land leased from village collectives, individual households, and local forest farms. In many cases these social lands had already been sub-leased, sometimes repeatedly, resulting in chains of sub-leases. Often the original owners did not benefit from increased land rental prices because of these chains.

Stora Enso has been reviewing and correcting land lease contracts in Guangxi since 2009, when irregularities in the contract chains were first discovered. By the end of 2016, 66% of the contracts were found to be free from contractual defects (63% by the end of 2015). In irreconcilable cases we terminate leases in a responsible manner, considering all potential impacts. In 2016, we terminated identified irreconcilable contracts covering a total area of 1 719 hectares. The leased area without contractual defects covered 16 480 hectares (16 471). When contracts have no defects this means that the ownership of land is clear or resolved, and contracting procedures have proven to be legal, authentic and valid.

The target for the end of 2016 was to terminate all remaining irreconcilable or economically unviable contracts. At the year-end irreconcilable or economically unviable contracts corresponding to 382 hectares remained in effect. These remaining contracts will be terminated by mid-2017.

As announced on 19 January 2017, Stora Enso is reconsidering its plans to build a chemical pulp mill in Beihai. As a consequence of the change in scope, Stora Enso would decrease the area of its leased forest lands in the Guangxi region. The scope and schedule for this reduction will be decided later. As a part of this process, all contracts will be evaluated, and Stora Enso aims to have only land leased that is free of contractual defects.

(814 000 hectares in 2015). Stora Enso's Russian subsidiary companies have been FSC-certified since 2006, and are included in the total certified area above.

Stora Enso also continued to actively promote economically viable and ecologically responsible forestry across Russia during 2016 through cooperation with Boreal Forest Platform (BFP), a new stakeholder forum organised by WWF.

Since 2011 Veracel has been promoting group certification among its tree farmers in Brazil. In 2014, Aspex, an association representing certified tree farms, took over the management of the certification process, using certificates granted by both FSC and Cerflor (PEFC). By the end of 2016, dual forest certificates had been obtained by 71 farmers (79 at the end of 2015) for areas totalling 37 876 hectares (35 724), of which 16 147 hectares (15 351) are planted with eucalyptus.

In 2016 Stora Enso's pellet production and supply chains at Näpi and Imavere in Estonia, and Nebolchi in Russia obtained Sustainable Biomass Partnership (SBP™) certifications. For more information see page 59. As part of our efforts to improve the energy efficiency of our forestry operations, our wood supply operations in Finland were certified to the ISO 50001 energy management standard in 2016.

### A proactive approach to land use

Stora Enso recognises that the areas where we operate are of value to different stakeholders. We have therefore adopted an integrated approach to land use around our plantations, applying locally developed agroforestry models, for example. We have duly developed innovative land use models in Laos, Uruguay, and Brazil to benefit local farmers and communities as well the company. For details of these integrated land use practices, see pages 24–28.

Until 2016, Stora Enso kept track of progress on land use efficiency through a group-level key performance indicator measuring the increase in the average volume of fibre produced per hectare in certified tree plantations owned and managed by Stora Enso. We instead plan to monitor the sustainable intensification of production separately at each plantation, taking into account different local operating conditions, as this enables us to assess progress more accurately than a global average.

### Managing land contracts in Guangxi, China

Stora Enso leases a total of 83 560 hectares of land in four regions of Guangxi, of which 30 500 hectares (32 322 hectares in 2015), corresponding to 37% (37%) of the total area, is social

**In 2016, 90% of the lands we own or lease were covered by forest certification systems.**



**Forests, plantations, and lands owned by Stora Enso<sup>1</sup> as of 31 December 2016**

Unit	Area	Certification coverage	Details of local landscapes and protected areas
Montes del Plata plantations and lands, Uruguay (joint operation with Arauco)	190 279 ha, of which 102 312 ha planted	PEFC and FSC for 190 279 ha	Mainly pasturelands and agricultural fields. Remnants of native ecosystems, such as grasslands and riparian forests, are protected within the company's lands.
Veracel plantations and lands, Bahia, Brazil (joint operation with Fibria)	214 963 ha, of which 73 082 ha planted for pulp production	CERFLOR (PEFC) for 179 411 ha; FSC for 179 411 ha	Dominated by pasturelands cleared from Atlantic rainforest between the 1950s and 1980s. 113 072 ha of Veracel's lands are protected, including a 6 063 ha Private Natural Heritage Reserve. These protected areas mostly consist of native forest remnants at different stages of regeneration (see page 53).
Plantations and lands, Rio Grande do Sul, Brazil	43 412 ha, of which 20 810 ha planted		Mainly pasturelands and agricultural fields. 14 000 ha of the total area is protected, including native grasslands, riparian forests and other habitats.
Wood Supply, Estonia	137 ha, of which 124 ha planted		No protected areas within this area.

<sup>1</sup> Including operations where Stora Enso's shareholding is at least 50% and size of the area exceeds 100 hectares. In addition to the forest and plantation areas listed above, Stora Enso owns 49% of Bergvik Skog, which owns 2.3 million hectares of land in Sweden and 0.1 million hectares in Latvia; and 41% of Tornator, which owns 0.6 million hectares of forestland in Finland, 53 000 hectares in Estonia, and 12 000 hectares in Romania.

**Forests and plantations leased, and managed by Stora Enso<sup>1</sup> as of 31 December 2016**

Unit	Area	Certification coverage	Details of local landscapes and protected areas
Wood Supply, Russia	369 422 ha	FSC group certificate	In Russia protected areas are generally excluded from lease agreements. Areas amounting to 2 266 ha are protected as natural monuments including genetic pine reserves and watercourses.
Plantations and lands, Guangxi, China	83 560 ha, of which approximately 69 940 ha planted with eucalyptus and 13 620 ha with other species	Chinese Forest Certification Council certificate (PEFC) for 83 560 ha; FSC for 83 560 ha	Mosaic landscape including agricultural crop fields, forest plantations and settlements. No native ecosystems are found in the leased lands. Areas totalling around 1 300 ha are protected (including 184 ha of public benefit forest), consisting of steep slopes, buffer zones and other important areas for watershed protection.
Montes del Plata	54 939 ha, of which 43 857 ha planted	PEFC and FSC for 44 193 ha	Mainly pasturelands and agricultural fields. Protected and sensitive areas are not included in lease agreements.
Veracel	12 209 ha, of which 5 999 ha planted	FSC for 10 965 ha; PEFC for 10 965 ha	5 384 ha of leased lands are protected. They mostly consist of native forest remnants at different stages of regeneration.
Trial plantations, Laos	3 900 ha, of which 2 995 ha planted		The plantations are located within a mosaic of intensive shifting cultivation lands and traditionally protected remnants of native forests. One plantation area is located close to a National Biodiversity Conservation Area. The majority of the total area is covered by agroforestry production schemes.

<sup>1</sup> Including operations where Stora Enso's shareholding is at least 50% and size of the area exceeds 100 hectares.

Governance
Social agenda
Environmental agenda
<b>Economic agenda</b>
Data and assurance



# Economic agenda

- Customers 57
- Suppliers 60
- Investors 64

Governance
Social agenda
Environmental agenda
<b>Economic agenda</b>
Data and assurance

# Customers

Increasing global consumer demand for sustainability is encouraging companies and brand owners to provide smart and safe solutions to meet everyday needs.

## Opportunities and challenges

### Replacing fossil-based materials with renewable alternatives

In many countries the middle class is growing even faster than the rapid average increase in global population. This means more and more people are demanding lifestyles that can seriously burden the environment. Simultaneously, consumers' awareness of the scarcity of natural resources and their sense of social responsibility are increasing, putting pressure on brand owners to focus more on environmental and social responsibility throughout supply chains. Combined with new legislation, this is also driving our customers to use renewable and recyclable raw materials to create more sustainable products.

In the long run, the world is looking to replace fossil-based materials with renewable alternatives. Stora Enso's various fibre-based products, including future bio-based chemicals, are well-positioned to respond to these demands.

## Our policies

### A single set of globally applicable values

The Stora Enso Code of Conduct constitutes a single set of values, expectations, and ambitions related to our global approach to ethical business practices, environmental values, and human and labour rights. These values are applied wherever we operate, and in all dealings with customers.

## How we work

### Serving multiple sectors

At Stora Enso we are developing our expertise in renewable materials to meet our customers' needs through products with high sustainability performance. Our business is organised into five divisions, each with their own focus



We produce various products covered by specific safety regulations, such as food contact materials.

areas and products, catering to many kinds of customers. Our product portfolio includes various boards for printing and packaging, several pulp grades, wood-based products for construction, energy pellets, paper products made from virgin fibre and recycled paper, and lignin, which can be used to replace fossil-based phenols, for instance. These safely recyclable products are based on renewable materials. Stora Enso promotes and participates in successful recycling schemes, particularly for paper. We also sell a variety of useful by-products from our production processes (for more information, see page 34).

We work actively together with our customers to improve the material efficiency and environmental impact of our products and the related production processes. We also regularly measure customer satisfaction.

### Prioritising product safety

Stora Enso's products covered by specific safety regulations include food contact materials, material for toys, packaging for pharmaceuticals, and construction materials. Our in-house product safety and quality control systems cover our processes from product development and raw material sourcing all the way



Governance
Social agenda
Environmental agenda
<b>Economic agenda</b>
Data and assurance



### Is eating packaged food safe?

Shopping for food and drink is not always easy – particularly when weighing up options regarding healthy eating and taste. But at least choosing a safely packaged product should never be a problem. Experts from Stora Enso and our customer Tetra Pak explain why product safety is a top priority for both companies.

▶ Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

For unit-specific details of our sustainability certificates see [storaenso.com/certificates](http://storaenso.com/certificates).

### Life cycle assessments and ecolabels

Stora Enso's experts collect product-specific life cycle inventory data (LCI) for use in life cycle assessments (LCAs), which are in practice mostly conducted by our customers or brand owners. The environmental performance of our paper and consumer board products is reported in line with the voluntary Paper Profile initiative.

More than 90% of our Paper division's own brands are covered by one or more recognised ecolabels, including the EU Ecolabel, the Nordic Ecolabel, and the Blue Angel (Blauer Engel). Many of our graphical board brands are also available with the EU Ecolabel. Ecolabel criteria cover the whole life cycle of a product, from the extraction of raw materials through production, product use, and disposal. Ecolabels are voluntary tools that aim to help buyers identify products and services that have a reduced environmental impact compared with other similar products.

Our Wood Products division offers its customers sustainable building materials and solutions that enable buildings to obtain environmental and energy efficiency certification. Many Stora Enso products are also sold as FSC or PEFC certified, showing that they have been produced using wood from responsibly managed sources, and that the entire journey of the raw material from the forest to the store shelf has been verified by a third party. For more information about our responsible forestry and forest certification work see page 50.

### Progress

#### Continuous engagement with our customers

Systematically collected customer feedback plays an essential role in developing our products, services, and processes. We also cooperate with our customers by exchanging expertise on various sustainability topics. When it comes to new products, such as lignin, we collaborate closely with customers to create applications meeting their needs with regard to the entire value chain. During 2016 we shared our expertise on human rights topics in the supply chain with some of our large customers through training sessions arranged at their request.

In 2016 Stora Enso conducted forest and mill excursions with 50 paper customers. Participants visited our Central European



Our Wood Products division offers its customers sustainable building materials and solutions that enable buildings to obtain environmental and energy efficiency certification.

to the delivery of the finished products. We also oblige our suppliers to comply with our product safety requirements.

Our units producing sensitive packaging materials follow Good Manufacturing Practice, a set of widely recognised guidelines also incorporated into EU regulations. All our Consumer Board mills and most of our Packaging Solutions mills are additionally certified according to recognised hygiene management standards. Food safety compliance for essential raw materials is also checked with our suppliers prior to any purchasing decision. We additionally provide our customers with information on products' hygiene and safety aspects through compliance declarations.

We follow legislation designed to protect public health and the environment, including the EU's REACH, Biocidal Products, and Classification, Labelling, and Packaging regulations, as well as other food contact legislation and demands relating to food safety. When producing food contact materials we only use chemicals that have been specifically approved for that purpose, after duly checking their safety and legal compliance. Many of our wood products are CE-marked to guarantee that they comply with the related EU directives.

Our divisions have Product Safety Networks in place, and all our mills work to ensure that their products meet the relevant product safety requirements. Our units' ISO 22000, FSSC 22000, and FDA product safety certificates ensure that they apply a systematic approach to food safety issues.

Governance
Social agenda
Environmental agenda
<b>Economic agenda</b>
Data and assurance



### How can you tell if paper has been sustainably produced?

Paper brands are different – not just in terms of their quality, but also in their environmental performance. Ecolabels are voluntary tools with strict criteria that showcase the reduced environmental impact of a product along its full life cycle, as compared to other products in the same category. More than 90% of Stora Enso’s own paper brands have been awarded one or more ecolabels, such as the EU Ecolabel, the Nordic Ecolabel, and the Blue Angel.

➤ Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

**26 Stora Enso mills were registered with Sedex by the end of 2016.**

paper mills and discussed the whole supply chain, covering issues from sustainable forestry, wood logistics and pulp and paper production to certificates, ecolabels, on-product labelling, and how certified paper is delivered to customers.

Our Biomaterials division is also collaborating with the fashion industry to create a more sustainable and traceable value chain for clothing products (for more information, see our [Progress Book](#)).

#### New initiatives in product stewardship

In 2016 our pellet production and supply chains at Näpi and Imavere sawmills in Estonia and Nebolchi Sawmill in Russia obtained Sustainable Biomass Partnership (SBP™) certifications. SBP certification is used to verify the legal and sustainable sourcing of wood and to track greenhouse gas emissions along the supply chain. Stora Enso’s Wood Products Division also joined the stakeholder committee of the SBP certification system.

Imatra Mills in Finland meanwhile joined the Guarantees of Origin system, which is designed to provide third-party evidence of reductions in products’ carbon footprints, achieved by favouring renewable energy sources in their production.

During 2016 Stora Enso issued environmental product declarations (EPD) for one liquid packaging board, one cupstock product, and Cross Laminated Timber (CLT). EPDs are third-party-verified documents that offer transparent and comparable information about the environmental footprint of a product throughout its life cycle.

#### Sharing information as a supplier

By the end of 2016, 26 of Stora Enso’s mills were registered with the Supplier Ethical Data Exchange (Sedex). Sedex gives us a platform to share information with customers on our compliance with the Ethical Trading Initiative’s base code and other key sustainability topics through the supply chain. By the end of 2016, all our Consumer Board mills were also third-party-audited according to the Sedex Members’ Ethical Trading Audit (SMETA) guidelines, which set standards on labour, health and safety, business ethics, and the environment, while also facilitating reporting and auditing.

Sedex benefits customers and Stora Enso as a supplier in many ways. Customers can use the same approach with several suppliers instead of developing their own systems and running individual queries. It also means that suppliers only

have to provide sustainability-related data once, while all the content follows the Sedex format and level of detail, and is regularly updated.

In 2016, Stora Enso received the highest recognition level (Gold) in the ethical supplier rating system Ecovadis.



Our in-house product safety and quality control systems cover our processes from raw material sourcing all the way to the delivery of the finished products.



Governance
Social agenda
Environmental agenda
<b>Economic agenda</b>
Data and assurance

# Suppliers

In addition to wood and fibre, Stora Enso sources other raw materials, products, and services from approximately 25 000 suppliers and contractors globally. We strive to ensure that our suppliers meet our high standards of sustainability.

## Opportunities and challenges

### Sustainability along the supply chain

We source a wide range of raw materials, products, and services for our business globally. In 2016, purchases of materials, goods, and services represented 48% of our total variable costs and fibre procurement accounted for 52%. The concept of responsible sourcing is relatively new in some markets, and local suppliers may not be familiar with sustainability requirements and audits. However, we believe that demonstrating sustainability ultimately benefits our suppliers, while helping to promote more sustainable sourcing around the world.

Although Stora Enso works in various regulatory environments, we consistently respond to our stakeholders' demands concerning transparency and sustainability performance of our suppliers. Imposing sustainability requirements on our direct suppliers encourages them to build up their capacity to meet such stricter demands, and creates a larger pool of more sustainable suppliers.

## Our policies

### High standards for sourcing

We strive to identify and address the impacts of our operations in our supply chain. The Stora Enso Supplier Code of Conduct (SCoC) plays an integral role in our sourcing. The code is a legally binding document that imposes minimum supplier sustainability requirements on human and labour rights, occupational health and safety, environmental commitments, and responsible business practices. It applies to all our sourcing categories globally.



Our Supplier Code of Conduct imposes minimum requirements on human and labour rights, occupational health and safety, environmental commitments and responsible business practices.

Several other Stora Enso policies and documents also support responsible sourcing, including:

- Sourcing Guideline, which defines how sourcing should be executed, managed, and controlled
- Sourcing Strategy, which sets out a consistent framework for "Sourcing Best Partners"
- Practical Instructions for Stora Enso Suppliers, including guidance on the topics included in the SCoC
- Instructions for Purchasers, providing practical guidance on responsible sourcing process for our purchasers to help them address challenges related to sustainability
- Policy on Wood and Fibre Sourcing, and Land Management, which includes standards that apply to our suppliers.



Governance
Social agenda
Environmental agenda
<b>Economic agenda</b>
Data and assurance

**How we work**

**Constructive engagement with suppliers**

For Stora Enso, responsible sourcing means drawing on our deep commitment to sustainability, addressing the concerns of key stakeholders, complying with regulatory frameworks, adhering to best practices, and managing supply risks. These principles are put into practice every day by our employees responsible for sourcing. Our approach to responsible sourcing has become more deeply embedded in purchasing and supplier management since our more centrally-led sourcing organisation was established in 2014.

Materials and products sourced by Stora Enso include wood and fibre-based materials such as pulp and paper for recycling (PFR), as well as chemicals, fillers, energy, fuels, spare parts, and maintenance, logistics, and IT services.

**Our responsible sourcing process**

Any supplier who wishes to do business with Stora Enso must first pre-qualify, before being awarded with a contract. As with our SCoC, this pre-qualification process applies to all sourcing globally. Instead of using our own supplier numbering, we use D-U-N-S@ numbering, which is a globally recognised system for identifying companies.

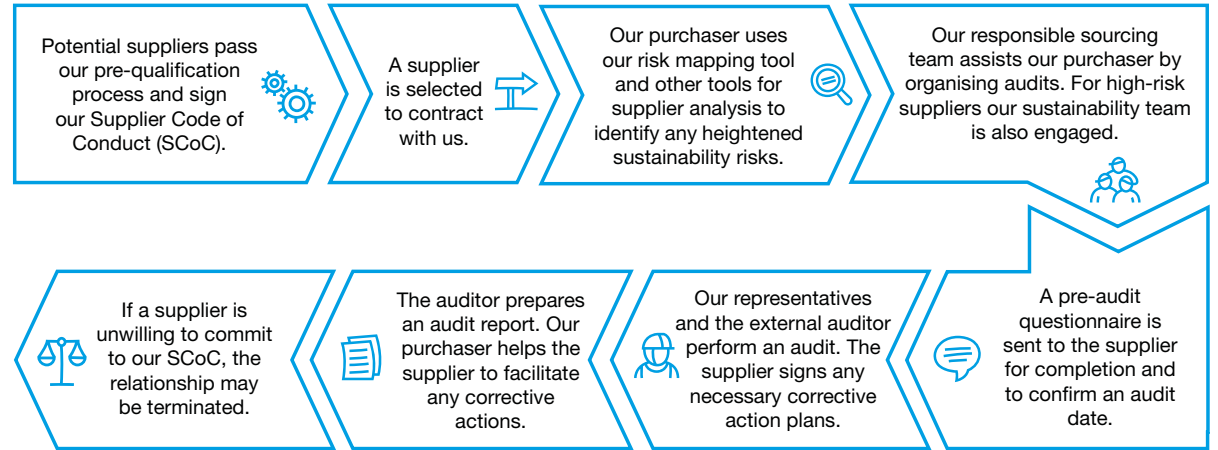
To pre-qualify, suppliers must respond to a questionnaire, and submit confirmation of their compliance with our SCoC. Our suppliers are also asked to provide information about their own suppliers, such as sub-suppliers operating in high-risk countries.

**Competence building and auditing**

In addition to enforcing our SCoC, we actively engage with our suppliers to help them improve their sustainability performance. This may involve on-site visits, detailed supplier assessments, or in-depth training sessions, depending on the supplier's location and product category.

Our supplier sustainability risk mapping tool was developed in collaboration with the non-profit organisation BSR in 2014. It includes criteria for geographic location, the nature of the supply chain, product category, and our purchasing power. Suppliers may be selected for a third-party sustainability audit, conducted together with the purchaser, based on a pre-evaluation of the supplier's social and environmental risk profile. This tool helps our purchasers review sustainability risks related to suppliers.

**Managing supplier sustainability risks at Stora Enso**



Any non-conformances with our SCoC identified during audits are followed up with supplier meetings where the findings are discussed and corrective action plans devised. Suppliers must sign up to these plans, and our purchasers will then monitor progress on their implementation. If a supplier does not take the necessary corrective actions, new discussions are held to examine the reasons, at higher management level if necessary. In cases where suppliers are not willing to improve their performance, relationships are terminated.

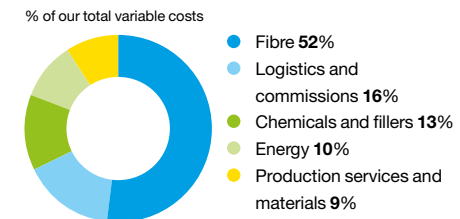
**Pulp procurement**

Most of the pulp used by Stora Enso's mills is produced internally, but for quality and logistical reasons we also purchase some pulp from external suppliers for our paper and board production. In 2016, 3% of our pulp was purchased externally. Pulp from our joint operation Veracel in Brazil is considered to be internally produced in these figures.

As with our wood purchases, we ensure that all the pulp we purchase is sustainably sourced, by applying third-party-verified traceability systems and forest certification systems. These include the Forest Stewardship Council's

(FSC) Chain of Custody/ Controlled Wood scheme, the Chain of Custody/ Due Diligence System of the Programme for the Endorsement of Forestry Certification (PEFC), and the ISO 14001 environmental management standard. The ISO 14000 and ISO 9001 standards were updated during 2016, and we have subsequently integrated the necessary changes and improvements. All the pulp we purchase or produce also complies with the EU Timber Regulation, which ensures that no illegally harvested wood or wood products enter the EU.

**Breakdown of raw material and service costs**



Governance
Social agenda
Environmental agenda
<b>Economic agenda</b>
Data and assurance

For more information about our approach to sustainable wood procurement see page 50.

**Paper for recycling**

Stora Enso sources paper for recycling (PfR) from various local authorities and waste management companies. For more details of our PfR use see page 35.

**Contractors**

In some of our operations we hire contractors for long-term work such as forest and plantation management. We also hire contractors for shorter periods of time, for example in large-scale investment and mill maintenance projects. Our SCoC also applies to such contractors. While contractors are primarily responsible for their own employees, we make every effort to ensure that everyone working on our premises is treated fairly and receives adequate safety training.



01

**Progress**

**Increasing our Supplier Code of Conduct coverage**

Stora Enso's related key performance indicator (KPI) measures the proportion of our total supplier spend covered by our SCoC, including all categories and regions. By the end of 2016, 92% of Stora Enso's total spending on materials, goods, and services was duly covered (90% at the end of 2015), exceeding our target of 90% by the end of 2016. In 2016, this indicator was broadened to also cover our Wood Supply units. The target for 2017 will be communicated in the Interim Report for Q1/2017.

**Focusing on training**

During 2016 Stora Enso provided extensive training for our purchasers on a variety of topics, including supplier pre-

qualification, and business principles. Most of these training sessions used a train-the-trainer concept, where the trained purchaser is then responsible for training their team.

Our Supplier Management Tool was introduced in China and Russia in 2016. This tool facilitates the pre-qualifying process for potential suppliers.

**Supplier audits**

Stora Enso continued to conduct third-party supplier audits in 2016 with a focus on high-risk suppliers in China. During the first half of the year our purchasers worked to ensure that suppliers audited during the previous year duly completed their corrective action plans and remained committed to the requirements imposed on them. During the second half of the year, in addition to re-auditing previously audited suppliers, third-party audits were extended to new sites and suppliers. In 2016 a total of 36 suppliers were third-party audited in China (39 in 2015).

Supplier audits conducted in China revealed non-conformances primarily related to occupational safety, wages, working hours, and basic workers' rights, as defined by our SCoC.

During 2016 third-party audits were also conducted on 11 suppliers in countries other than China. These audits revealed non-conformances particularly related to wages, working hours, and preparedness for emergency situations in the workplace. During the year we were compelled to terminate three supplier relationships due to these suppliers' unwillingness to commit to our SCoC (five in 2015).

Other work in 2016 included the launch of updated versions of our Instructions for Suppliers and Purchasers. We additionally intensified our focus on contractors' safety. For more information about Stora Enso's approach to occupational health and safety, see page 17. Our Sourcing Strategy was also slightly updated. More extensive revisions will be made during 2017 and applied from 2018.

**Coal sourcing for Beihai Mill**

In southern China coal is currently the only feasible energy source for an industrial facility as large as Stora Enso's Beihai Mill. However, we are investigating opportunities to use more renewable energy as a part of our long-term planning (for more information see page 47).

In 2016 our focus was on identifying the most sustainable sourcing solution possible. This involved evaluating seven



- 02
- 01 In addition to enforcing our Supplier Code of Conduct, we actively engage with our suppliers to help them improve their sustainability performance.
- 02 Transportation by sea accounted for 89% of all our product transportation by weight and distance in 2016. Read more on page 47.

Governance
Social agenda
Environmental agenda
<b>Economic agenda</b>
Data and assurance



**What does sustainability mean at Stora Enso's Beihai Mill?**

Stora Enso's new consumer board mill at Beihai in Guangxi, China, started production in May 2016. The mill produces liquid packaging board and other high-grade consumer board products to meet growing consumer demand for safe and high quality renewable packaging in the Asia-Pacific region. Sustainability has been an integral part of the mill and forestry operations right from the start.

Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

**We believe that demonstrating sustainability ultimately benefits our suppliers, while helping to promote more sustainable sourcing around the world.**

local coal suppliers against our supplier selection procedures to identify the supplier that best fulfilled our sustainability requirements and our SCoC. BSR reviewed our supplier selection procedures, and concluded that the process was rigorous. We also introduced a responsible sourcing process eight months prior to awarding the contract with the preferred supplier.

Two Stora Enso sustainability audits and three third-party audits of the preferred supplier were conducted in 2016. Areas requiring improvement were identified for further examination with the supplier, and progress will be monitored through future meetings and audits. Audits of mineral suppliers are rare in China, as mining companies typically do not allow customers to visit their mines. Stora Enso was able to audit the whole coal supply chain, excluding shipping, and a social impact assessment was also conducted in villages neighbouring the mine as well as along the logistics chain.

The supplier is committed to develop its processes, but contracts are currently awarded for only a few months at a time to ensure continuous improvement and compliance.

**Sourcing sugar industry by-products in Louisiana, USA**

Stora Enso has completed the construction of a demonstration and market development plant in Raceland, Louisiana,

to validate extraction and separation technologies developed by Viridia – a start-up company purchased by Stora Enso in 2014. The plant will convert cellulosic biomass such as wood or crop residues into highly refined xylose sugars. The project entered its commissioning and start-up phase during 2016.

The demonstration plant is located in the vicinity of an existing sugar mill and sugar cane growing operations, enabling it to use bagasse by-product from the mill as feedstock. The sugar cane growing operations were audited in December 2014 to verify that the feedstock supplier's operations comply with Stora Enso's Supplier Code of Conduct. The sugar industry in Louisiana uses migrant workers in harvesting and production, and this was one of the major issues examined in the audit. During 2016 Stora Enso evaluated labour rights in the bagasse supply chain and among employees at the demonstration plant site. The evaluation identified concerns regarding working hours in the supplier's sugar mill and harvesting operations. Stora Enso is currently assessing the labour rights context in Louisiana in more detail to ensure compliance with our Supplier Code of Conduct.

When sugar cane is harvested the leaves are left in the fields. Stora Enso will continue to examine opportunities to use this residual material in our production processes.



Transportation accounted for 24% of our CO<sub>2</sub> emissions in 2016. For information on how we work with suppliers to combat global warming, see page 47.



Governance
Social agenda
Environmental agenda
<b>Economic agenda</b>
Data and assurance

# Investors

We strive to continuously improve our sustainability performance and reporting to keep investors informed of our progress, ambitions, and future direction.

## Opportunities and challenges

### Sustainability crucial for long-term success

The global pool of socially responsible investors (SRIs) is growing, and the incorporation of environmental, social, and governance (ESG) analysis into mainstream investment decision-making is accelerating. Both of these trends encourage companies to be more sustainable in their operations. At the same time, shareholders expect financial profits from their investments. At Stora Enso we believe that only truly sustainable operations can ensure long-term financial success.

Stora Enso’s Investor Relations work is guided by several laws and regulations, including the EU’s Market Abuse Regulation (MAR), the Finnish Securities Markets Act, Nasdaq rules in Helsinki and Stockholm, and the standards of the Finnish Financial Supervisory Authority.

## Our policies

### Consistent investor dialogues

Company policies and guidelines related to our Stora Enso’s Investor Relations include:

- Disclosure Policy, a set of rules covering all our communications with investors and other stakeholders, and encompassing insider guidelines, closed periods,

**Timely and transparent communications with shareholders are a top priority for Stora Enso.**



We believe that only sustainable operations can ensure long-term financial success.

- communications governance, and communications procedures
- Code of Conduct, which applies to all our operations around the world, including investor relations.

## How we work

### Transparent communications

Various aspects of sustainability are important to Stora Enso’s investors, including human rights and global warming. Stora Enso’s main shareholders are long-term investors, and sustainable business practices are high on their agenda.

They constantly follow our sustainability performance and reporting. For more information on how we create value with a sustainable business model, see our [Progress Book](#). For details of Stora Enso’s ownership distribution see our [Financial Report](#).

Timely and transparent communications with shareholders are a top priority for Stora Enso. We actively maintain open dialogue with our investors on ESG matters through face-to-face meetings, conference calls, seminars, and webcasts. We also regularly share updated information on our sustainability performance with our shareholders in our Interim and Annual reports, stakeholder letters, web updates, and investor newsletters. We also regularly participate in sustainability

Governance
Social agenda
Environmental agenda
<b>Economic agenda</b>
Data and assurance



In 2016 our Investor Relations function organised 13 investor meetings focusing on ESG-related topics. Approximately 60 investor representatives participated in these meetings.

events of interest to investors. For more information about our investor relations, see [storaenso.com/investors](http://storaenso.com/investors).

**Progress**

**Focusing on key sustainability indices**

In 2016 our Investor Relations function organised 13 investor meetings focusing on ESG-related topics. In total, approximately 60 investor representatives participated in these meetings. The

meetings also included a webinar for ESG investors and analysts focusing on our sustainability strategy and activities.

During the year we revised our strategy for providing ESG information to shareholders, aiming to make sustainability information more widely available on our website to benefit and serve all our different stakeholder groups. This also involved further prioritising Stora Enso’s participation in questionnaires and assessments for the ESG index and ratings schemes that are most material for our investors.



**How can the credibility of sustainability reporting be improved?**

Though the external assurance of corporate sustainability reporting is not mandatory, **Lasse Ingström**, Risk Advisory Partner at Deloitte explains that companies are increasingly choosing to give greater credibility to their reporting by obtaining external assurance. In 2015 Stora Enso became one of the few companies in the world to obtain Reasonable Assurance for its direct and indirect fossil CO<sub>2</sub> emissions data.

Read the full article at [storaenso.com/sustainability](http://storaenso.com/sustainability)

**We share updated information on our sustainability performance in our Interim Reports.**

Governance
Social agenda
Environmental agenda
<b>Economic agenda</b>
Data and assurance

# ESG indices and other external recognition in 2016

Stora Enso was included in and recognised by at least the following indices and reviews in 2016:



### FTSE4Good Index

Stora Enso is included in the FTSE4Good Index Series. These indices measure on a half-yearly basis the performance of companies that meet globally recognised corporate responsibility standards.



### ECPI Ethical Indices

Stora Enso is included in the ECPI EMU Ethical Equity index, which covers environmental, social, and governance criteria.



### Ethibel Investment Register

Stora Enso is listed in Forum ETHIBEL's Ethibel EXCELLENCE Investment Register and Ethibel Sustainability Index (ESI) Excellence Europe. Such recognition indicates that a company performs better than average in its sector in terms of corporate social responsibility.



### Global Compact 100

Stora Enso is included in the United Nations Global Compact 100, a global stock index that combines corporate sustainability and financial performance.



### Recognitions by CDP

CDP included Stora Enso on its 2016 Climate A List as well as on its Supplier Climate A List, in recognition of the company's long-term actions and strategy in response to global warming. Stora Enso was also the only Nordic company to be included in CDP's Supplier Engagement Leaderboard.



### Euronext Vigeo – Europe 120

Stora Enso is listed in the Euronext Vigeo – Europe 120 index as one of the 120 most advanced European companies in terms of environmental, social, and governance performance.



### ReportWatch

Stora Enso's Annual Report 2015, including the Sustainability Report, was ranked by ReportWatch as the best annual report in Finland for the second consecutive year, and the seventh best report globally. The rankings included 1 600 companies from 65 countries.



### OMX GES Sustainability Finland index

Stora Enso is included in the NASDAQ OMX and GES Investment Service's OMX GES Sustainability Finland index. GES Investment Services compare leading companies listed on NASDAQ OMX Helsinki with regard to their responsibility work on environmental, social, and governance issues.



### Oekom Research

Stora Enso is classified as "Prime" by Oekom Research's environmental, social, and governance rating methodology.



### STOXX ESG indices

Stora Enso is included in several STOXX ESG indices. These indices rate leading global companies according to environmental, social, and governance criteria.



### Global Child Forum

In a benchmark report published by the Global Child Forum and the Boston Consulting Group Stora Enso was recognised as an industry leader in the Nordic region for advancing children's rights.



Governance
Social agenda
Environmental agenda
Economic agenda
<b>Data and assurance</b>



# Data and assurance

- ▶ Reporting scope 68
- ▶ Data by production unit 69
- ▶ Assurance report 72

Governance
Social agenda
Environmental agenda
Economic agenda
<b>Data and assurance</b>

# Reporting scope

At Stora Enso we regularly review the priorities in our Sustainability Agenda, and ensure that our reporting duly addresses them. When defining the materiality of issues impacting our sustainable business model, we consider the expectations of significant stakeholders inside and outside the company. For more information on our approach to materiality, see page 7.

## Data boundaries

Unless otherwise stated, the group’s consolidated performance data as expressed in this report covers the parent company, Stora Enso Oyj, and all companies in which we hold over 50% of voting rights directly or indirectly. The group’s consolidated sustainability performance data does not cover joint operations or equity-accounted investments where Stora Enso’s ownership is between 20% and 50%, or companies in which our ownership share is less than 20%.

The report does, however, describe issues directly relating to companies in which Stora Enso’s ownership is 50% or below, when these issues have been identified as material considering the sustainability impacts of the group, and related interest among our stakeholders. For this reason this report covers material sustainability topics relating to Stora Enso’s joint operations in South America, Veracel and Montes del Plata, as well as our 35%-owned equity-accounted investment Bulleh Shah Packaging in Pakistan.

Our consolidated environmental and energy data covers our production units as of the end of the reporting period. Figures for related historical performance have been recalculated following the removal of divested units from the baseline. Scope limitations related to specific environmental indicators are explained in footnotes. Stora Enso’s sawmills and converting facilities are excluded from the group’s current environmental targets due to their lower materiality.

Human resources (HR) data is derived from separately collected HR statistics, except for numbers of employees, which are derived from financial accounting. Unlike in our [Progress Book](#) and [Financial Report](#), consolidated HR data

in this Sustainability Report excludes employees of our 50%-owned joint operations Montes del Plata and Veracel. All the HR data presented here covers our permanent and temporary employees as of 31 December 2016, except for the unit-specific numbers of employees on pages 69–71 which are yearly averages. Certain administrative functions and sales offices are not included in the group’s consolidated occupational health and safety (OHS) data.

## Significant changes in scope during 2016

Stora Enso completed the divestment of the Arapoti paper mill in Brazil on 1 April. The divestment of a mill producing coated mechanical paper at Kabel in Germany was completed on 1 September. The closure of Suzhou paper mill in China and the divestment of the Hartola modular building unit in Finland were completed in June.

Our consolidated data on environment and energy, HR, human rights and responsible sourcing covers our continuous operations as of the end of 2016, excluding units divested or closed during the year. Data on these divested and closed units is, however, included where necessary in the consolidated data on occupational health and safety (OHS), forest and land use, and training and compliance case figures related to business ethics.

Our new consumer board mill in Beihai commenced operations in May, and is included in the group’s consolidated sustainability data.

## Following the GRI framework

This report corresponds to the ‘Comprehensive’ level in the G4 reporting framework of the Global Reporting Initiative (GRI). This means that our reporting covers all the Standard Disclosures of the G4 framework, as well as all the sustainability aspects we have identified as material in our operations. Our GRI index (available at [storaenso.com/gri](http://storaenso.com/gri)) lists our Standard Disclosures with reference to G4 categories, aspects and indicators, and refers to the pages or locations where these issues are addressed in our annual reporting publications and/or other information channels. References to pages or locations are complemented with additional reporting in the index as necessary.

Impacts that make sustainability topics relevant for us may occur outside Stora Enso, or they may be material only for certain of our operations or locations. When our

reporting on a sustainability aspect or indicator only concerns specific units, geographical regions or other data collection boundaries, based on the identified materiality, this is specified in the comment field in the G4 index table, or in connection with the respective disclosure.

Stora Enso’s generic management approach to sustainability covers all of the aspects of the G4 framework identified as material. We also report on our management approach with regard to specific aspects in the relevant sections of this report, with respective page references included in the G4 index table.

## External assurance

This report has been assured by an independent third-party assurance provider in accordance with the voluntary external assurance practices followed in sustainability reporting. The assurance report for this report appears on page 72.

Deloitte & Touche Oy has provided a limited level of assurance covering the contents of this report, as well as pages 5–13 and 57–59 of the group’s Progress Book. For the second year running a level of reasonable assurance has been provided for Stora Enso’s reporting on direct and indirect fossil CO<sub>2</sub> emissions (scopes 1 and 2).

## The UN Global Compact

Stora Enso supports the ten principles of the United Nations’ Global Compact, an initiative set up to encourage businesses worldwide to embed responsibility in their operations. We respect and promote these principles throughout our operations, and report on our progress in this report. We annually upload our Communication on Progress to the [UN Global Compact website](#) as a public record of our commitment.



COMMUNICATION ON PROGRESS

This is our **Communication on Progress** in implementing the principles of the **United Nations Global Compact** and supporting broader UN goals.

We welcome feedback on its contents.

# Data by production unit

This table presents unit-specific information on environmental performance, production, certificates, and numbers of employees. Joint ventures and units that were divested or closed during 2016 are excluded.

Unit	Number of employees <sup>a</sup>	Production capacity <sup>b</sup> 1 000 t	Products	Recovered fibre <sup>c</sup>	Certificates								Fossil CO <sub>2</sub> emissions											
					ISO 9001	ISO 14001	ISO 22000	FSSC 22000	ISO 50001	OHSAS 18001	FDA	FSC <sup>®</sup> CoC	PEFC <sup>™</sup> CoC	Process waste to landfill <sup>d</sup>	Hazardous waste <sup>d</sup>	SO <sub>2</sub> <sup>e</sup>	NO <sub>x</sub> as NO <sub>2</sub> <sup>e</sup>	Direct CO <sub>2</sub> <sup>f</sup>	Indirect CO <sub>2</sub> <sup>f</sup>	CO <sub>2</sub> , on-site transportation <sup>f</sup>	Biogenic CO <sub>2</sub> , biomass fuels <sup>f</sup>	COD	AOX	Phosphorous
<b>Belgium</b>																								
Langerbrugge	348	555	④	x	x	x		x	x	x	x	6 614	87	5	254	109 503	32 832	1 452	562 511	983	1	6	26	6 655
<b>China</b>																								
Beihai <sup>g</sup>	393	<sup>h</sup>	①		x	x	x		x	x	x	0	11	11	32	222 157	25 057	325	2 681	88		1	8	2 188
Dawang	220	170	④	x	x	x		x	x	x	0	1				125 134	5	0	44				2	952
Gabou, Dongguan	1 323	50*	③		x	x		x	x	x	0	6	0	0	161	2 702	12	0	6	0	0	0	0	0
Jiashan, Zhejiang	372	10*	③		x	x		x	x	x	0	3	0	0		1 428	7	0	0	0	0	0	0	0
Qian'an, Hebei	1 420	55*	③		x	x		x	x	x	0	4	0	0		4 406	57	0	0	0	0	0	0	1
<b>Estonia</b>																								
Tallinn	29	15*	③		x	x				x	0	0				623	35	0						1
<b>Finland</b>																								
Anjala/Ingerois	528	435/280	④ ①		x	x	x <sup>i</sup>	x	x	x	x	0	85	14	265	125 132	90 068	1 519	143 530	2 037		3	84	9 347
Enocell	177	470	②		x	x		x	x	x	x	9 117	30	90	996	61 777	3 777	147	1 430 003	7 540	51	3	56	22 422
Heinola Fluting	170	300	①		x	x	x	x	x	x	x	1 097	186	407	395	143 853	6 540	203	193 913	1 352		2	14	4 760
Heinola <sup>l</sup>	138	100*	③		x	x	x	x	x	x	15	29				851	111	0						16
Imatra	1 082	1 130	① ②		x	x	x	x	x	x	x	889	310	158	2 085	192 625	49 019	1 645	2 136 040	18 697	76	13	195	64 432
Kristinankaupunki	42	20*	③		x	x	x	x	x	x	0	1				145	50	24	0					0
Lahti	160	40*	③		x	x	x	x	x	x	97	53					3 110	74	0					10
Oulu	613	1 080	② ④		x	x		x	x	x	29	162	368	1 336	225 602	30 083	3 095	1 223 506	9 254	51	8	75	19 377	
Sunila	167	370	②		x	x		x	x	x	3 469	132	53	728	26 790	780	585	904 184	6 553	36	8	32	17 092	
Varkaus	253	390	①	x	x	x	x	x	x	x	1 116	173	386	621	110 217	13 675	594	674 410	3 628		4	53	14 948	
Veitsiluoto	526	785	④		x	x		x	x	x	857	9	486	1 042	216 391	29 375	324	1 108 092	9 450	22	9	176	10 983	
<b>Germany</b>																								
Maxau	430	530	④	x	x	x		x	x	x	0	132	8	244	118 445	117 373	3	274 167	1 480	0	3	13	5 192	
Sachsen	262	310	② ④	x	x	x		x	x	x	38	1	5	144	162 020	2 990	765	39 270	567	1	0	12	3 334	
<b>Latvia</b>																								
Riga	142	100*	③		x	x				x	0	40		2	4	4 310	163	0						7
<b>Lithuania</b>																								
Kaunas	47	20*	③		x	x				x	0	2				1 386	67	0						4
<b>Poland</b>																								
Łódź	222	120*	③		x	x	x		x	x	0	0	0	3	3 567	6 400	0	0						11
Mosina	97	25*	③		x	x	x		x	x	0	53				392	1 702	36	0					3
Ostrołęka	1 228	670	① ③ ④	x <sup>k</sup>	x	x	x <sup>i</sup>		x	x	0	128	220	231	363 662	160 127	1 459	366 296	989		4			7 210
Tychy	142	110*	③		x	x	x		x	x	0	4				2 860	4 203	166						12





	Capacities						Certificates							Fossil CO <sub>2</sub> emissions							
	Number of employees <sup>a</sup>	Sawn products 1 000 m <sup>3</sup>	Further processed 1 000 m <sup>3</sup>	CLT 1 000 m <sup>3</sup>	Wood pellets 1 000 t	LVL 1 000 m <sup>3</sup>	ISO 9001	ISO 14001	OHSAS 18001	ISO 50001	PEFC™ CoC	FSC® CoC	SBP™	Process waste to landfill t	Hazardous waste <sup>b</sup> t	SO <sub>2</sub> t	NO <sub>x</sub> as NO <sub>2</sub> t	Direct CO <sub>2</sub> <sup>c</sup> t	Indirect CO <sub>2</sub> <sup>c</sup> t	CO <sub>2</sub> on-site transportation <sup>c</sup> t	Biogenic CO <sub>2</sub> , biomass fuels <sup>d</sup> t
<i>Unit</i>		1 000 m <sup>3</sup>	1 000 m <sup>3</sup>	1 000 m <sup>3</sup>	1 000 t	1 000 m <sup>3</sup>															
<b>Wood products units</b>																					
<b>Austria</b>																					
Bad St. Leonhard	228	350	275	60			x	x	x	x	x	x	0	60		4		10 730	3		
Brand	191	440	255					x	x		x		0	36				3 135	3		
Ybbs	331	550	390	70			x	x	x	x	x	x	0	63				5 855	3		
<b>Czech Republic</b>																					
Planá	227	360	220					x	x		x		408	65	1	19		0	1 979	31 382	
Ždírec	273	560	320		65		x	x	x	x	x	x	3 158	22	1	88		0	2 275	90 728	
<b>Estonia</b>																					
Imavere	317	335	155		100		x	x	x		x	x	2 202	56			312	50 544	1 982	59 318	
Näpi	89	35	150		15		x	x	x			x	0	5	1	6	10	11 201	346	6 476	
<b>Finland</b>																					
Honkalahti	103	310	70				x	x	x	x	x	x	0	9		30	205	2 749	776	50 976	
Kitee	83	260	110		25		x	x	x	x	x	x	9	15		28		2 039	526	37 909	
Uimaharju	52	240	20				x	x	x	x	x	x	0	23	0	1	800	19 259	835	601	
Varkaus <sup>d</sup>	33	130				40	x	x	x	x	x	x	17	18				4 761	143		
Veitsiluoto <sup>e</sup>	51	200					x	x	x	x	x	x	0	0	14	20		5 548			
<b>Germany</b>																					
Pfarrkirchen	92		110				x	x	x	x	x	x	19	2	2	14		2 933	298	6 257	
<b>Latvia</b>																					
Launkalne	131	190	10				x	x	x		x	x	734	4		32	353	1 861	5	24 590	
<b>Lithuania</b>																					
Alytus	208	200	90				x	x	x	x	x	x	0	22	1	11	0	13 491	1 378	41 188	
<b>The Netherlands</b>																					
Amsterdam	40		55				x	x	x		x	x	0	1			14	939	3		
<b>Poland</b>																					
Murow	200	200	35								x	x	117	8	3	18		241	3	9 212	
<b>Russia</b>																					
Impilahti	98	120	10		15		x	x	x			x	1 465	0	0	5		16 923	32	11 978	
Nebolchi	160	180	30		35				x			x	940	0	0	49		30 794		23 990	
<b>Sweden</b>																					
Ala	148	370	45					x	x		x	x		39	2	36		31	1 793	49 341	
Gruvön	83	370	150		100			x			x	x		13			1 150	1 782	1 311		
<b>Wood products units total</b>		<b>5 400</b>	<b>2 500</b>	<b>130</b>	<b>355</b>	<b>40</b>							<b>9 069</b>	<b>460</b>	<b>24</b>	<b>360</b>	<b>2 844</b>	<b>184 817</b>	<b>13 692</b>	<b>443 945</b>	

<sup>a</sup> Yearly average.

<sup>b</sup> Reporting is based on country-specific definitions applied in national regulations.

<sup>c</sup> All CO<sub>2</sub> figures are calculated using the WRI/WBCSD Greenhouse Gas Protocol.

<sup>d</sup> Varkaus LVL (laminated veneer lumber) line start-up in June 2016.

<sup>e</sup> Sawing capacity reported with the Paper division.

Governance

Social  
agendaEnvironmental  
agendaEconomic  
agendaData and  
assurance

# Independent assurance report

## To the Management of Stora Enso Oyj

We have been engaged by Stora Enso Oyj (hereafter Stora Enso) to provide limited assurance on Stora Enso's Sustainability information and reasonable assurance on Stora Enso's direct and indirect (scopes 1+2) fossil CO<sub>2</sub> emissions as a whole within the Sustainability Information for the reporting period of January 1, 2016 to December 31, 2016. The information subject to the assurance engagement is the Sustainability Report 2016 and the Sustainability information disclosed in the Progress Book 2016 on pages 5–13 and 57–59 (hereafter: Sustainability Information).

### Management's responsibility

Management is responsible for the preparation of the Sustainability Information in accordance with the Reporting criteria as set out in Stora Enso's reporting principles on page 68 of the Sustainability Report and the Sustainability Reporting Guidelines (G4 Comprehensive) of the Global Reporting Initiative. This includes: designing, implementing and maintaining internal control relevant to the preparation and fair presentation of the Sustainability Information that are free from material misstatement, whether due to fraud or error, selecting and applying appropriate criteria and making estimates that are reasonable in the circumstances.

### Assurance provider's responsibility

Our responsibility is to express an assurance conclusion on the Sustainability Information based on our engagement. We conducted our assurance engagement in accordance with International Standard on Assurance Engagements (ISAE) 3000 (Revised) to provide limited assurance on performance data and statements within the Sustainability Information, and in accordance with ISAE 3410 to provide reasonable assurance on direct and indirect (scopes 1+2) fossil CO<sub>2</sub> emissions as a whole.

This requires that we comply with ethical requirements and plan and perform the assurance engagement to

obtain limited assurance whether any matters come to our attention that cause us to believe that the Sustainability Information has not been prepared, in all material respects, in accordance with the Reporting criteria. In addition, we have a responsibility to form an independent conclusion, based on our reasonable assurance procedures, on whether the fossil direct and indirect CO<sub>2</sub> emissions as a whole are reported, in all material respects, in accordance with the reporting criteria.

We did not perform any assurance procedures on the prospective information, such as targets, expectations and ambitions, disclosed in the Sustainability Information. Consequently, we draw no conclusion on the prospective information. Our assurance report is made in accordance with the terms of our engagement with Stora Enso. We do not accept or assume responsibility to anyone other than Stora Enso for our work, for this assurance report, or for the conclusions we have reached.

A limited assurance engagement with respect to Sustainability related data involves performing procedures to obtain evidence about the Sustainability Information. The procedures performed depend on the practitioner's judgment, but their nature is different from, and their extent is less than, a reasonable assurance engagement. It does not include detailed testing of source data or the operating effectiveness of processes and internal controls and consequently they do not enable us to obtain the assurance necessary to become aware of all significant matters that might be identified in a reasonable assurance engagement. Our procedures on the limited assurance included:

- Conducting interviews with senior management responsible for Sustainability at Stora Enso to gain an understanding of Stora Enso's targets for Sustainability as part of the business strategy and operations;
- Reviewing internal and external documentation to verify to what extent these documents and data support the information included in the Sustainability Information and evaluating whether the information presented in the Sustainability Information is in line with our overall knowledge of Sustainability at Stora Enso;
- Conducting interviews with employees responsible for the collection and reporting of the Sustainability Information and reviewing of the processes and systems for data gathering, including the aggregation of the data for the Sustainability Information;

- Performing analytical review procedures and testing data on a sample basis to assess the reasonability of the presented Sustainability information;
- Performing site visits to Beihai in China and Ostrołęka in Poland to review compliance to reporting policies, to assess the reliability of the Sustainability data reporting process as well as to test the data collected for Sustainability reporting purposes on a sample basis;
- Assessing that the Sustainability Information has been prepared in accordance with the Sustainability Reporting Guidelines (G4 Comprehensive) of the Global Reporting Initiative.

The reasonable assurance engagement involved performing procedures to obtain evidence about the direct and indirect fossil CO<sub>2</sub> emissions as a whole. In addition to the limited assurance work, our key assurance procedures have included an evaluation of the operating effectiveness of internal controls and the systems and processes for collecting and processing the direct and indirect fossil CO<sub>2</sub> emissions data. Furthermore we have performed testing on a sample basis at selected sites, chosen based on an evaluation of significance, as well as general and specific risks, to evaluate whether direct and indirect fossil CO<sub>2</sub> emissions as a whole presented in the Sustainability Information are reported according to the Reporting Criteria.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

### Our independence, quality control and competences

We complied with Deloitte's independence policies which address and, in certain cases, exceed the requirements of the International Federation of Accountants Code of Ethics for Professional Accountants in their role as independent assurance providers and in particular preclude us from taking financial, commercial, governance and ownership positions which might affect, or be perceived to affect, our independence and impartiality and from any involvement in the preparation of the report. We have maintained our independence and objectivity throughout the year and there were no events or prohibited services provided which could impair our independence and objectivity.

Deloitte & Touche Oy applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements. This engagement was conducted by a multidisciplinary team including assurance and sustainability expertise with professional qualifications. Our team is experienced in providing sustainability reporting assurance.

### Limited assurance conclusion

On the basis of the procedures we have performed, nothing has come to our attention that causes us to believe that the information subject to the assurance engagement is not prepared, in all material respects, in accordance with the Sustainability Reporting Guidelines (G4 Comprehensive) of the Global Reporting Initiative or that the Sustainability Information is not reliable, in all material respects, with regard to the Reporting criteria.


### Reasonable assurance conclusion

On the basis of the procedures we have performed, in our opinion, Stora Enso's reporting on direct and indirect fossil CO<sub>2</sub> emissions as a whole is prepared in accordance with the Reporting criteria and is reliable, in all material respects, with regard to the Reporting criteria.

Our assurance report should be read in conjunction with the inherent limitations of accuracy and completeness for Sustainability information. This independent assurance report should not be used on its own as a basis for interpreting Stora Enso's performance in relation to its policies of sustainability.

Helsinki 13 February 2017  
Deloitte & Touche Oy

  
Jukka Vattulainen  
Authorized Public Accountant

  
Lasse Ingström  
Authorized Public Accountant



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