

Sustainability

Part of Stora Enso's Annual Report 2018



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We are creating
a renewable future
in the bioeconomy.



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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 CO₂e emissions.

The GRI index is available at
➤ storaenso.com/gri2018

Our year 2018



Minimising waste

The utilisation rate for our process residuals and waste was 98%.



Combatting global warming

Our CO₂e emissions were 18% lower than the 2010 base-year level.



Enhancing safety performance

Compared to 2017, a 18% reduction was achieved on our TRI rate.

@storaenso October 11



Stora Enso has been top-ranked for gender balance and gender #equality by @equileap, ranking at 12 out of 200 top companies globally.

@storaenso December 18



Stora Enso recognises the urgency to #StepUpNow and supports ambitious #EU2050 targets to combat global warming. #COP24 <http://stepupnow.eu/> @StepUpNowEU



A single set of values

Our code of conduct was renewed and rebranded as the Stora Enso Code.



Sustainable forestry

96% of the lands we own or manage were covered by forest certification schemes.



Responsible sourcing

We began using sustainability criteria in the tender phase of each sourcing process.



@storaenso December 4



Here's our secret revealed: Stora Enso and startup Sulapac have joined forces to develop renewable and biodegradable straws. Read more: <http://fal.cn/Sepa>



@storaensoworld January 15



Improving energy efficiency can mean either process changes or developing the systems for better monitor and control. These are some essential tools for that work. #storaensoworld #storaenso#papermaking #energyefficiency



New products to replace fossil-based plastic

Our innovative products, such as the DuraSense™ and Lineo™ by Stora Enso are a step towards replacing fossil-based products.



External recognition

We received several recognitions including top-ranking in greenhouse gas management and performance by the Transition Pathway Initiative (TPI).



Leadership performance

The Leadership Index, measuring our employees' perceptions of their managers, improved to 83/100, surpassing our target.



Community investments

25% of our voluntary contribution to communities around our operations support education.

@storaenso May 22



Beetles 🐞 have an important role in the ecosystem as decomposers. Leaving behind enough decaying wood during harvesting is vital for forest biodiversity – and a top priority to Stora Enso. #BiologicalDiversityDay #Biodiversity <https://goo.gl/8zfwsz>



Human rights

In 2018, we defined our eight highest priority human rights.



@storaensoworld August 22



Management commitment is essential in all safety work, and last week Marie Morin was appointed mill manager. The picture when she one early winter morning stood at the gate discussing safety issues with contractors makes me happy, because cooperation and commitment from her is important to my daily work and to our aim towards a safer mill. As the first female mill manager in Skoghall I hope she will continue to motivate and inspire just by being herself and sharing her drive and engagement with all of us #storaensosverige #storaensoworld #skoghall #management #chef #skoghallsbruk #safety #contractorsafety #hammarö #storaenso

Governance

Our sustainability agenda covers social, environmental, and economic responsibility.

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Strategy, governance, and stakeholders

Global megatrends drive the world's demand for renewable materials. We have an important role to play in the transition to a fossil-free, more sustainable world.



Stora Enso's strategy for transformation is about sustainable profitable growth based on customer insight and innovation, supported by structured processes and motivated employees. Inherent in our strategy, we work to support customers to meet consumers' demand for sustainable products based on renewable materials. Our Sustainability Agenda encompasses the social, environmental, and economic responsibility of our operations throughout the value chain. The agenda is based on the Triple Bottom Line framework widely used in corporate responsibility work. It addresses the ten sustainability topics identified as material to Stora Enso and our key stakeholders: Employees and wider workforce; Community; Business ethics; Materials, water, and energy; Carbon dioxide; Forests, plantations, and land use; Customers; Suppliers; and Investors. Respect for human rights is considered to be so integral to our long-term success that it is an overarching theme of our Sustainability Agenda.

In line with our Sustainability Agenda, we have set ambitious targets and defined key performance indicators (KPIs) for our sustainability work. Progress is regularly monitored at Group level and quarterly via division-level business reviews. Consolidated results on our sustainability performance are reported annually in the Sustainability report. Selected sustainability indicators are also reported quarterly in our Interim Reports.

Stora Enso acknowledges the importance of the United Nations Sustainable Development Goals as part of a commonly agreed global ambition to end poverty, protect our planet, and ensure prosperity for all. Read more about our approach to the SDGs on page 10–11.

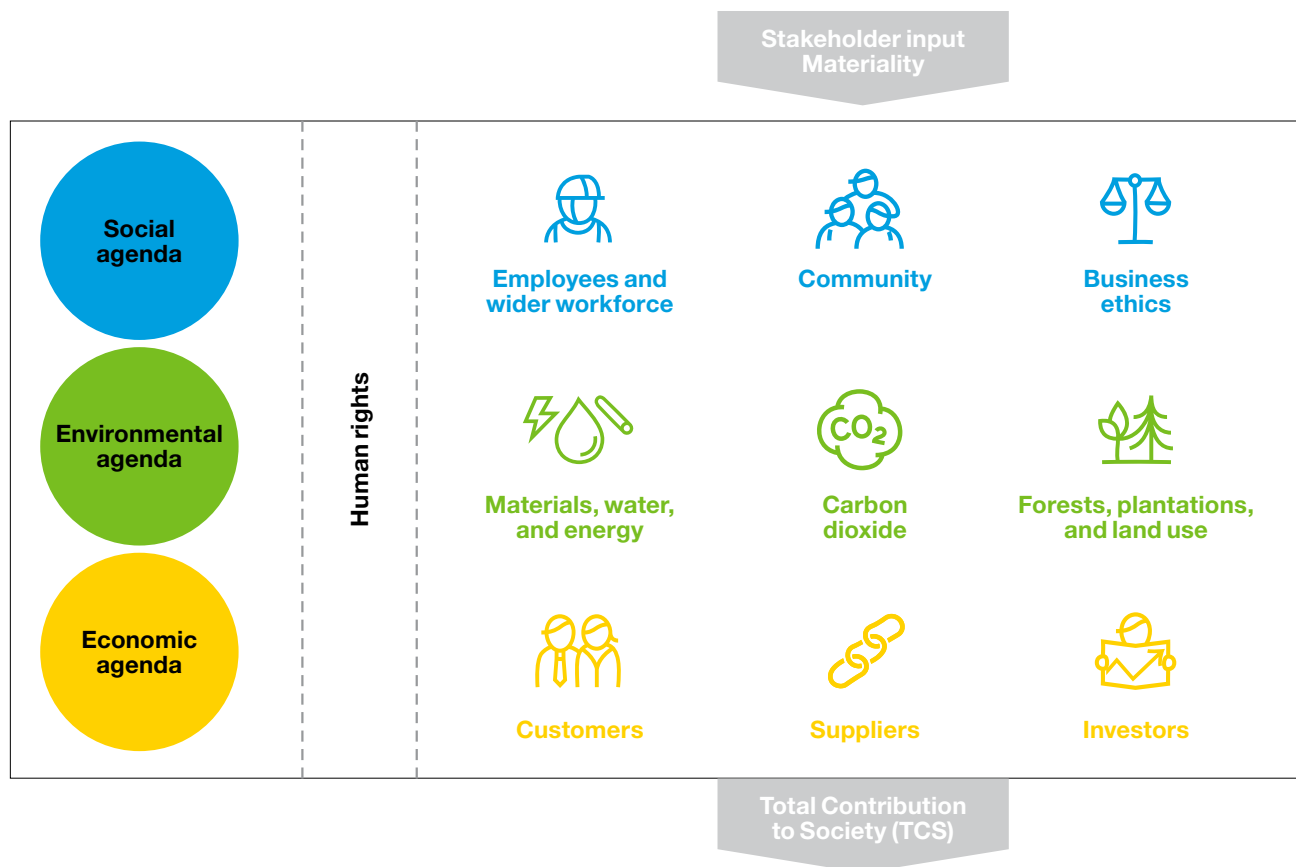
Structured sustainability processes

Our Sustainability Policy describes our overall approach to sustainability. At the same time, our code of conduct – the Stora Enso Code – and other policies and guidelines on specific sustainability topics further elaborate our approach, while also guiding our employees in their everyday work. These documents are available at storaenso.com/sustainability. Following a comprehensive review of the company's existing sustainability policies and guidelines in 2016, Stora Enso introduced a revised Sustainability Policy as well as revised policies and guidelines steering our environmental work in 2017. In 2018, we published our Human Rights Policy, which replaced our previous Human Rights Statement.

Sustainability governance

Sustainability is promoted by the Board of Directors, the CEO, and the Group Leadership Team (GLT). The CEO has the ultimate responsibility for the successful implementation of our sustainability strategy.

The Board of Directors' Sustainability and Ethics Committee oversees the implementation of our sustainability strategy and the ethics and compliance strategy. The committee met four times in 2018 and has reviewed the disclosures in this report. The main focus areas of the committee in 2018 are described in our **Governance 2018**.



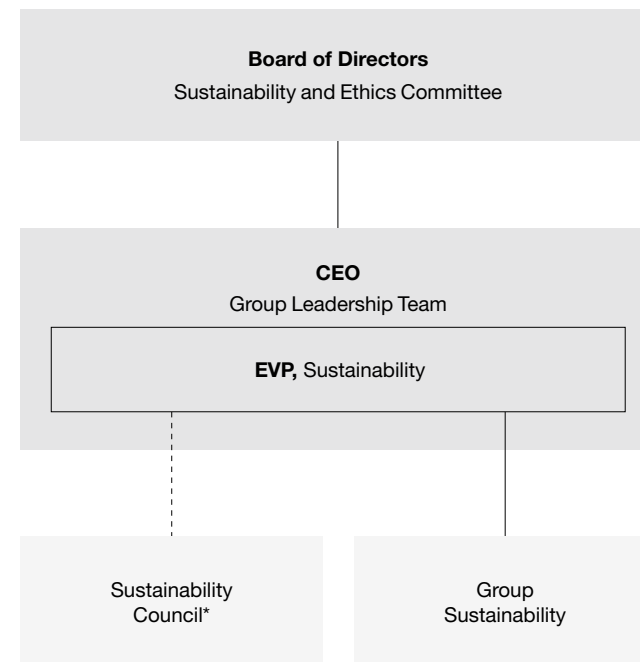
Our Sustainability Agenda is based on the classic Triple Bottom Line model. It addresses the ten sustainability topics identified as material to Stora Enso.

At Stora Enso, sustainability work is led by the Executive Vice President, Sustainability, who reports directly to the CEO and is part of the Group Leadership Team (GLT). Everyday sustainability topics are managed by our Group Sustainability team together with our Human Resources, Legal, Wood Supply, and Sourcing and Logistics functions, and our divisions (Consumer Board, Packaging Solutions, Biomaterials, Wood Products, and Paper). Each of our business divisions has its own Head of Sustainability, who reports directly to the Executive Vice President of the division. Other key functions, such as Wood Supply and Sourcing and Logistics, 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, which includes members from our five divisions, our Sourcing and Logistics function, and subject matter experts from our Group Sustainability team. Chaired by the Executive Vice President, Sustainability, its work involves sharing good practices and identifying longer-term opportunities and challenges that may require a Group-wide response. The Sustainability Council met ten times during 2018. The GLT is periodically informed of sustainability developments, as is the Board of Directors when appropriate, through its Sustainability and Ethics Committee.

Sustainability is one of the performance metrics in the GLT members' remuneration through Short Term Incentive programmes. Different members of the GLT can be assigned appropriate

Sustainability governance at Stora Enso



* Stora Enso's operational sustainability work is steered by our Sustainability Council, which includes members from our divisions, Sourcing and Logistics function, and subject matter experts from our Group Sustainability team.

-- EVP Sustainability chairs the Sustainability Council. Members of the Council report directly to their respective EVP.

sustainability indicators. For more information on remuneration see our Remuneration Statement.

Sustainability governance of joint operations

Our joint operations in Brazil (Veracel) and Uruguay (Montes del Plata) have their own sustainability teams, and sustainability topics are regularly discussed by their boards, which include representatives from their parent companies. Sustainability is also regularly covered by Stora Enso's joint operation steering committees for Veracel and Montes del Plata. In addition, Stora Enso is represented on the boards of the forestry companies Tornator and Bergvik Skog in Finland and Sweden respectively.

Stakeholder engagement

Open dialogue with our key stakeholders is crucial if we are to successfully identify stakeholder concerns, global trends and market expectations. Our stakeholder engagement work is based on both structured and ad hoc interaction, as well as regular surveys on topics such as customer and employee satisfaction and investor expectations. We also obtain important information through formal grievance channels. Engaging with stakeholders on social media is important for us in understanding our stakeholders' opinions and concerns locally around our units, as well as on divisional and Group level. We actively monitor social media discussions and respond, where appropriate, to stakeholder queries through social media channels.

Materiality review

We periodically assess how well our agenda is aligned with the expectations and perceptions of our key stakeholders. The Group's latest focused materiality review was carried out in 2017. The review involved an external expert organisation consulting 124 group-level stakeholders around the world through online and telephone surveys to assess if our Sustainability Agenda and external communications were focused on the right topics. The consulted stakeholders included campaigners (e.g. NGOs), customers and corporate peers, experts, investors, partners and suppliers, and the media.

In the consultation, stakeholders were asked to rank the aspects of Stora Enso's Sustainability Agenda they consider to be most important, and to indicate if anything significant was missing. In the consolidated results, the most important sustainability topics for the Group's stakeholders were:

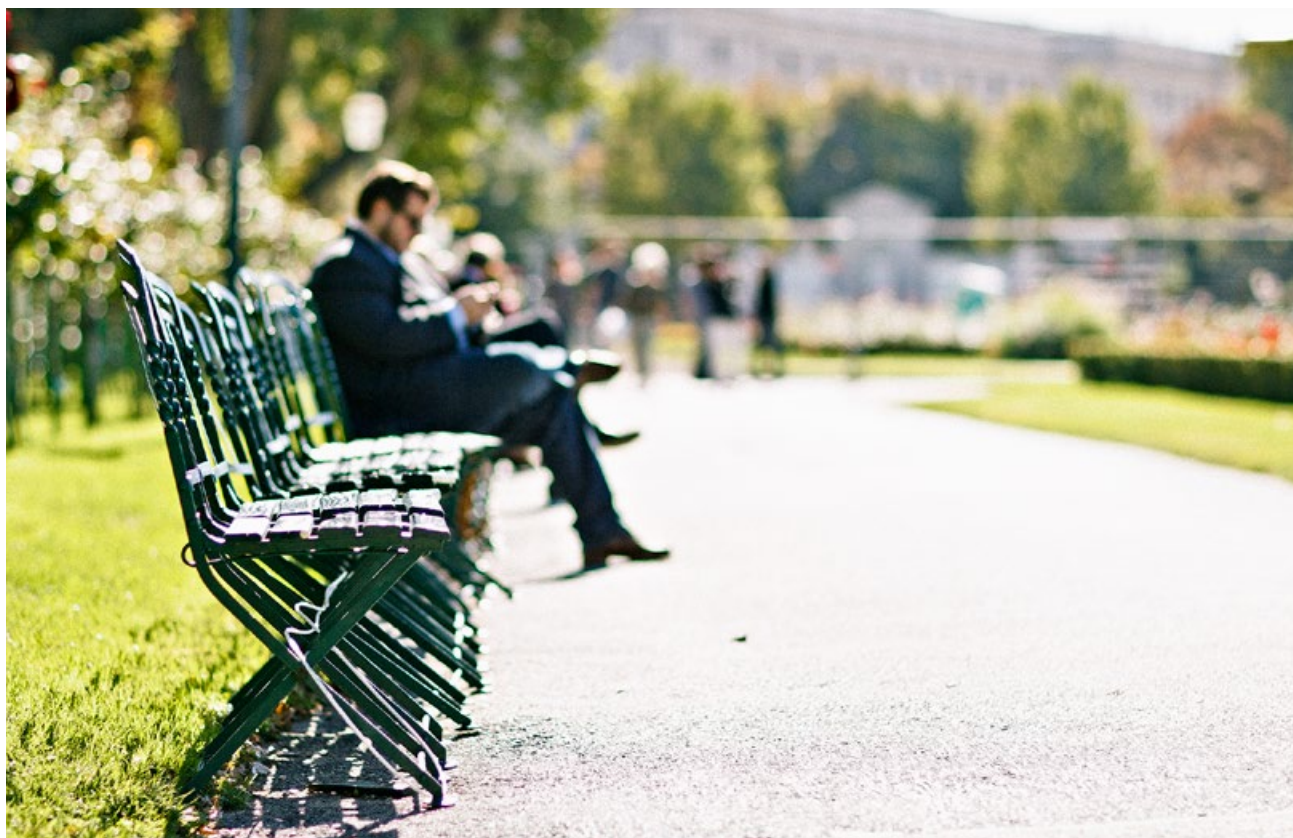
- sustainable forestry
- human rights
- global warming
- business ethics
- sustainable materials and products, and
- responsible sourcing.

Other elements in our existing Sustainability Agenda were also considered important. The results were largely in line with Stora Enso's previous focused materiality review carried out in 2014, despite not being fully comparable due to different terminology.

The consolidated results from our materiality review were examined by the Group Leadership Team and the Sustainability and Ethics committee of the Board of Directors in 2017.

In addition to ranking the importance of different sustainability topics, the consultation identified opportunities to further clarify the links between topics within our Sustainability Agenda. The most important ones were:

- human rights, business ethics, and responsible sourcing
- sustainable forest management and our commitment to combat global warming
- renewable materials and products, in terms of innovation, waste reduction and product safety
- community investment in a wider social responsibility context



In 2018, the results have been used in our sustainability work, including in the incorporation of the UN Sustainable Development Goals into our Sustainability Agenda and reporting.

Through focused in-depth consultations of external stakeholders, our materiality review complements our Enterprise Risk Management (ERM) process and includes a broader scope of sustainability topics than those identified as the Group's key risks. Whereas our statutory Non-Financial Reporting in the Report of Board of Directors includes those sustainability topics that are identified as the Group's key risks, our longer Sustainability Report also covers topics considered important by stakeholders in our broader materiality review process.

In 2018, our Consumer Board division carried out its own materiality assessment using a similar methodology to that of the Group. The results were well aligned with the group-level assessment done in 2017, but also identified some division-specific priorities.



"Stora Enso uses a four-tier structure in its reporting to present the most material opportunities and challenges. This is recognised as good practice. Stora Enso also clearly articulates the potential impacts of external trends and regulations, describing the approaches taken to manage and address this."

Rodney Irwin
Managing Director of Redefining Value
World Business Council for Sustainable Development

Purpose-driven disclosure

Through our participation on WBCSD's Redefining Value Board we support and help develop processes and tools that lead to purpose-driven disclosure (PDD). The objective of PDD is for companies to disclose relevant, useful ESG information for investors to encourage the flow of capital to more sustainable companies and outcomes. Redefining Value PDD achievements so far include guidance on materiality and the release for consultation of a "ESG Disclosure Judgement Handbook".

Collaboration with non-governmental organisations

Stora Enso actively cooperates with prioritised international and non-governmental organisations (NGOs) and industry associations. We are involved in developing industry practices related to combatting global warming and food loss and waste, circular and bioeconomy, sustainable forestry, human rights, and business ethics, as well

as the development of sustainability reporting and assurance.

Examples of our collaboration during 2018 can be found below and in the relevant sections of this report.

In 2018, Stora Enso's CFO signed a Statement of Support by Accounting for Sustainability (A4S) to promote better disclosure of climate risks and opportunities. A4S aims to inspire action by finance leaders to drive a fundamental shift towards resilient business models and a sustainable economy. The Financial Stability Board's (FSB) Task Force on Climate-related Financial Disclosures (TCFD) recommends a framework for disclosing climate related risks and opportunities that goes beyond current practices. The TCFD recommendations respond to a growing demand for improved financial disclosures from companies in relation to climate risks. In addition to investors and regulators, leading companies are also communicating their support for the recommendations through Statements of Support by Accounting for Sustainability (A4S)

About this report

Sustainability 2018 is structured to reflect our Sustainability Agenda, with the agenda's ten elements addressed through a common four-tier 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 **Financials 2018**.

Our policies

These sections set out the 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 performance during 2018.

External assurance

The report has been assured by an independent third-party provider with a level of Limited Assurance. Given our commitment to combat global warming and related emission data reliability, a level of Reasonable Assurance has been provided for our direct and indirect fossil CO₂e emissions (Scope 1 and 2). For more information on assurance, see page 72.



Creating value for society

Stora Enso engages with communities all over the world through its operations, sales and supply chains. Stora Enso has a range of positive financial, social, and environmental impacts on society, such as direct and indirect employment, taxes and dividends, and products providing renewable alternatives to non-renewable materials. For more information about how we create value and contribute to society, see **Strategy 2018**. For details of Stora Enso's annual tax footprint in the countries we operate, see **Financials 2018**.

Stora Enso continues to explore ways to define and report on the monetary value associated with the company's non-financial sustainability impacts and actions.

Read more about how we create value in **Strategy 2018**.









Particularly significant stakeholder groups for Stora Enso include:

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

In 2018, Stora Enso actively collaborated with a range of international organisations:

- A4S Accounting for Sustainability, pages 8, 44, and 65
- BSR, pages 13 and 20
- International Finance Corporation (IFC), page 15
- International Labour Organisation (ILO), page 14
- Science Based Targets initiative, page 42
- The Prince of Wales's Corporate Leaders Group (CLG), page 45
- Transparency International, page 28
- UN Global Compact, page 68
- We Mean Business Coalition, page 45
- World Business Council for Sustainable Development (WBCSD), pages 10, 34, 50, and 59
- WWF, pages 50 and 52

Our sustainability targets and key performance indicators (KPIs)

Key performance indicator (KPI)			2018	2017	Targets	Progress
	Human rights	To be reviewed during 2019	Eight highest priority human rights defined	88% of the human rights actions completed and 100% resolved ¹	To be reviewed during 2019	In progress
	Employees and wider workforce	Total Recordable Incident (TRI) rate ²	6.1	7.4	6.7 by the end of 2018	Achieved
					New target will be communicated in the Interim Report for Q1/2019	In progress
		Leadership Index ³	83	81	80 by the end of 2018	Achieved
					New target: 85 by end of 2022	
	Community	Total voluntary community investment, EUR million ⁴	2.7	n/a	To be reviewed during 2019	In progress
	Business ethics	Code of Conduct Index ³	85	83	Positive trend	Achieved
	Materials, water, and energy	Number of significant environmental incidents ⁵	8	10	Zero significant incidents ⁵	Not achieved
		Materials: Process residuals utilisation rate (%) ⁶	98%	98%	To be reviewed during 2019	In progress
		Water: Total Water Withdrawal per saleable tonne of board, pulp, and paper (m ³ /tonne)	56	56	Decreasing trend	In progress
		Water: Process water discharge per saleable tonne of board, pulp, and paper (m ³ /tonne)	26	26	Decreasing trend	In progress
		Energy: Reduction in electricity and heat consumption per saleable tonne of board, pulp, and paper (kWh/tonne)	-4.2%	-4.2%	-15% by the end of 2020 from a 2010 base-year	In progress
	Carbon dioxide	Reduction in CO ₂ equivalents per saleable tonne of board, pulp, and paper (kg/tonne)	-18%	-21%	-31% by the end of 2030 from a 2010 base-year (Science-based target)	In progress
	Forests, plantations, and land use	% of the owned and managed lands in wood production and harvesting covered by forest certification schemes ⁷	96%	97%	Maintain the high coverage level of 96% ⁷	Achieved
	Suppliers	% of supplier spend covered by our Supplier Code of Conduct	95%	95%	Maintain the high coverage level of 95%	Achieved

¹ 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. At the end of 2017, a process for completion was in place for three Group-level actions, but the completion was carried forward into 2018.

² Number of incidents among our own employees per one million hours worked. As of January 2018, Stora Enso's joint operations Veracel and Montes del Plata are included in the Group's consolidated safety performance. The 2017 figure has been recalculated accordingly for comparability.

³ Measured in the annual employee survey.

⁴ Voluntary community investments covering cash, employee working hours for voluntary community work, and in-kind. Includes 50% of joint operations Veracel in Brazil and Montes del Plata in Uruguay.

⁵ Environmental incidents involving a non-compliance with environmental legislation, a permit or a significant stakeholder concern related to environmental performance. For more details, see page 41.

⁶ Utilisation rate for process residuals excluding, for example, tall oil, turpentine, and wood chips.

⁷ During 2018 the KPI and target were reviewed to include only lands in wood production and harvesting. Includes joint operations in Latin America.

Adopting the Sustainable Development Goals

The seventeen United Nations Sustainable Development Goals (SDGs) address social and economic development issues on a global scale, each with their own set of related targets. All sectors of society, including businesses, are encouraged to work and collaborate on these goals. For business to deliver its contribution, they must be integrated into company agendas and strategies.

Integrating the SDGs into our strategy

In 2016, we investigated how our business operations relate to the SDGs, based on previous materiality reviews, risk assessments, and stakeholder consultations. In 2017, an external expert organisation engaged with our divisions and functions to prioritise the SDGs according to their relevance to our operations, and assess our impacts and related business opportunities. The outcomes were reviewed by Stora Enso's CEO and Group Leadership Team (GLT).

In 2018, the GLT confirmed the SDGs most strategic to Stora Enso's business. We also decided to work on new 2030 sustainability targets that are aligned with our contribution to our prioritised SDGs. We aim to finalise these targets during 2019.

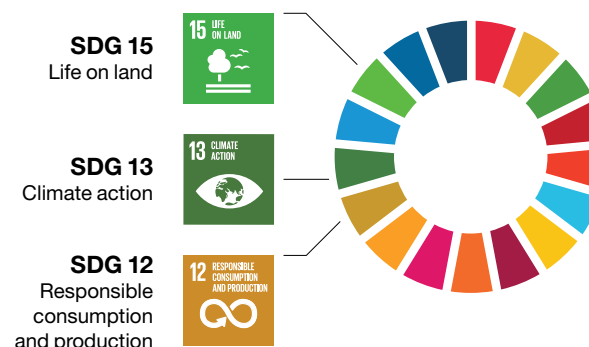
During the year, we also participated in the development of the SDG Sector Roadmap as part of our co-chairing of the Forest Solutions Group (FSG) at the World Business Council for Sustainable Development (WBCSD). The roadmap describes the forestry sector's current level of alignment with the SDGs, and identifies the key impact opportunities and actions that the sector should take. The Forest Sector Roadmap will be launched at the United Nations high-level political forum in New York in July 2019. The roadmap follows WBCSD's set of SDG Sector Roadmap Guidelines, published in April 2018.

Our way of working is in line with the SDG Compass, which was developed by the Global Reporting Initiative (GRI), the UN Global Compact (UNGC), and WBCSD as a guide for companies.

In this chapter, we outline our key impacts in relation to our most strategic SDGs – SDG 12, 13 and 15. We further explain our reporting to the SDG sub-targets in a separate online appendix.

Our priority SDGs

Stora Enso supports all seventeen SDGs, but the following three goals were identified as the most strategic to our business:



SDG 12 – Responsible consumption and production

Our contribution and business opportunities related to SDG 12 can be summarised by the concepts of circular economy and bioeconomy. Our operations are based on renewable raw materials and sustainable forest management, which contribute to responsible consumption and resource use.

Our mills promote material efficiency and enable circular resource use such as by using Paper for Recycling (PfR) as a raw material. Our operations also generate emissions and discharges that account for our biggest negative impacts related to SDG 12. We are committed to improving our environmental performance through Best Available Technologies (BAT), our management systems and our environmental targets.

Our wood and fibre-based products help to replace fossil-based materials in society, and we promote the bioeconomy with new and innovative products. Packaging plays a key role in combatting food waste, which is one of the sub-targets for SDG 12. Stora Enso is one of the largest producers of renewable packaging for food in the world. With safe and intelligent packaging we can extend product shelf-life and design right-sized packaging for small households to help cut food waste.

Read more in the Materials, water, and energy, and Customers chapters



SDG 13 – Climate action

The use of renewable materials enables us to contribute towards a low-carbon economy. Trees in sustainably managed forests absorb carbon dioxide (CO₂) from the atmosphere and together with wood-based products act as carbon storage. Our products help our customers and society at large to reduce CO₂ emissions by providing low-carbon alternatives to solutions based on fossil fuels and other non-renewable materials. As the first in our industry, we set ambitious science-based targets for reducing our greenhouse gas emissions in 2017. We also contribute to raising awareness of global warming, which is a central topic in our communications with stakeholders.

In addition, global warming poses physical risks to our operations and has been identified as one of the Group's key risks.

Read more in the Carbon dioxide, Forests, plantations, and land use, and Customers chapters



SDG 15 – Life on land

Sustainable forest management safeguards forest health and productivity, helps combat global warming, and protects biodiversity whilst securing the long-term availability of our renewable resources. In our sustainable forest management, we are committed to responsible sourcing and land use – to safeguard the health and ecological functions of ecosystems and help conserve biodiversity, soil, and water resources. In order to achieve this, we maintain open dialogues with our stakeholders.

All 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 (FSC)¹ Chain of Custody/Controlled Wood scheme, the Chain of Custody/Due Diligence System of the Programme for the Endorsement of Forest Certification (PEFC), and the ISO 14001 environmental management standard.

As wood is our most important raw material, our Group's key risks cover forests and land use.

Read more in the Forests, plantations, and land use chapter

How to transform our world – together

“As the renewable materials company, Stora Enso relies on a healthy planet, which is why we support the Sustainable Development Goals,” says **Noel Morrin**, EVP Sustainability at Stora Enso, in our animation. “But a healthy planet is everyone's business. Look around you: what more could we do – together?”



Watch the video ▶ storaenso.com/sdgs

¹ Stora Enso Communications' FSC® trademark license number is FSC-N001919.



Human rights

Our commitment to respect human rights covers all our operations, including our employees, contractors, suppliers, and neighbouring communities.

Stora Enso's highest priority human rights were defined in 2018

Opportunities and challenges

Addressing challenges globally

When it comes to human rights, Stora Enso's operations cover challenging markets such as Russia, China, Laos, and Brazil. Many of the human rights challenges we face are deeply rooted in local society and can only be effectively addressed through a long-term commitment and close cooperation with global and local stakeholders. We must also remain vigilant for the risk of modern slavery in all our markets.

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 inadequate. Compliance with these principles requires companies to conduct human rights due diligence procedures to identify, assess, and remedy the human rights risks and impacts of their operations, products, and services.

Our policies

Guided by international human rights standards

In addition to our commitment to the UN Guiding Principles on Business and Human Rights, Stora Enso respects and follows the requirements of the UK Modern Slavery Act and we continue to monitor the development of similar legislation in other countries. Human rights are integrated into our Sustainability Agenda, which is aligned with the ten principles of the UN Global Compact, including human rights.

Relevant Stora Enso policies on human rights include:

- **Stora Enso Code** – our Code of Conduct that expresses our respect for human and labour rights.
- **Supplier Code of Conduct** – imposes strict contractual requirements on our suppliers regarding human rights.
- **Human Rights Policy** – expresses our respect for international 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 (relevant to the forest products sector).

How we work

Systematic assessment of human rights impacts

Human rights risks and impacts are required to be taken into account throughout our operations, including investment decisions related to 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 investment compliance with the Stora Enso Code and our Business Practice Policy are also assessed, together with environmental due diligence. On-going human rights due diligence continues with Environmental and Social Impact Assessments (ESIAs), and the periodic monitoring of compliance with Stora Enso's Group-wide Minimum Human Resources requirements for labour conditions, and our Supplier Code of Conduct. Additional elements will be defined in our updated human rights due diligence and monitoring programme, currently under development, which will be based on our highest priority human rights, defined in 2018. We also continued to provide human rights training and expert capacity building during the year, and have initiated security risk assessments at units identified as high priority.

Environmental and social impact assessments (ESIA)

We conduct ESIAs for all new projects that could directly or indirectly cause significant adverse effects in local communities. Such projects include board, pulp, paper, or sawmills built on greenfield sites, industrial scale plantation projects, and any large-scale expansions of existing facilities.

An important element of any ESIA involves assessing the operational context from a social impact perspective, including human rights, 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. ESIA results give us valuable information on how local communities may be affected by changes in their socio-economic situation and any impacts on cultural heritage, while also setting out implications for community health, safety, and security.

During 2018, we conducted an ESIA in Oulu, Finland, to evaluate the potential conversion of our paper mill into a packaging board mill. The ESIA included an assessment to understand the socio-economic impacts of the project, including its indirect employment impacts.

Grievance and remediation mechanisms

In accordance with the UN Guiding Principles on Business and Human Rights and our own Human Rights Policy, Stora Enso is committed to remedy situations where our activities have caused or contributed to adverse human rights impacts. Where 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 the relevant stakeholders to ensure that those impacts are remedied.



A long-term partnership to improve our human rights work

For four years, the global nonprofit organisation BSR has worked with Stora Enso to support the company's human rights journey. Stora Enso is one of the first companies globally to systematically track its human rights impacts and publish the findings.

During the partnership, both BSR and Stora Enso have learned valuable lessons.

"Case studies on Stora Enso's work have been shared within the BSR Human Rights Working Group as topics for discussion and learning, which has directly impacted the group's member companies and, more widely, the global human rights field," BSR writes in their blog.

Read the full article at [BSR.org](https://www.bsr.org)

A third-party-administered grievance channel is available to all our employees. The channel enables employees to report instances where their rights may have been infringed, or where they have observed violations of the Stora Enso Code, including those related to human rights.

We have also established local grievance channels for communities and other external stakeholders associated with our plantations and mill in Guangxi, China. We encourage anyone with concerns to call our 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, and our joint operations Veracel in Brazil and Montes del Plata in Uruguay. For more information on our formal grievance mechanism, which is also open to external stakeholders in countries where legislation allows, see page 29.

In 2018, access to grievance and remediation mechanisms was identified as one of Stora Enso's highest priority human rights issues. In recognition of this, the results of our mapping of existing community grievance mechanisms will be incorporated into all our future due diligence efforts.

Reporting on our performance

Stora Enso reports on its human rights work annually. We also follow the legal requirements of the UK Modern Slavery Act. Our second

annual Slavery and Human Trafficking Statement was published in 2018 on [storaenso.com/sustainability](https://www.storaenso.com/sustainability).

Progress

Highest priority human rights confirmed

In 2018, we completed the defining of our human rights priorities with support from BSR, an international expert organisation. To reflect this, we updated and published our Human Rights Statement as a Human Rights Policy and confirmed eight Group-wide highest priority human rights:

- Health and safety
- Fair employment conditions
- Forced labour
- Freedom of association
- Non-discrimination and non-harassment
- Land and natural resource rights acquisition and management
- Grievance mechanisms
- Children's rights (relevant to the forestry sector).

While we respect and consider all human rights important, our identified highest priority human rights will be the primary focus of our future work. This includes our updated due diligence and monitoring programme, which will be finalised and implemented in 2019. We also aim to develop a new consolidated key performance indicator (KPI) for our human rights work during 2019 to monitor compliance with our eight highest priority human rights.

Country-specific actions in 2018 included:

Veracel, Brazil

Veracel, our 50/50 joint operation with the Brazilian company Suzano¹, manages a pulp mill, eucalyptus plantations, and related logistics in southern Bahia State. Veracel's active community engagement focuses on land use, and local social and economic development.

During 2018, Veracel strengthened its commitment to human rights through activities such as:

- Continuing to implement the Sustainable Settlements Initiative (SSI) for disputes related to land and landless movements, and indigenous people's rights. Read more on page 25.
- Together with the municipality of Belmonte, co-managing a project aimed at ensuring an effective protection system for the care of local child and adolescent victims of violence (for more information, see page 25).
- Fully implementing Veracel's supplier code of conduct. Associated training, audits, and follow-up procedures will continue during 2019. Additional human rights training is provided annually to those employees of Veracel's security service provider who work as guards.



Veracel supports local communities through the Sustainable Settlements Initiative (SSI). Building schools is one example of SSI's work.

Some stakeholders have criticised Veracel for issues related to land use and landless people's social movements. In 2018, Veracel continued its dialogue with the landless movements and the Bahia State government to address issues of land distribution in Bahia. Veracel's also continued its ongoing implementation of the Sustainable Settlements Initiative in response to this issue, and signed a new agreement with the landless peoples' social movements in 2018. For more information about landless people's social movements in Bahia and Veracel's community engagement, see pages 24–26.

Veracel maintains good relations with local indigenous villages, and supports programmes designed to strengthen the cultural identity of 28 Pataxó and three Tupinambá communities. Local indigenous communities are calling for the expansion of the Barra Velha Indian Reserve. The extension would include 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 2018, this case was still being processed by the regional federal court. Veracel remains committed to fully comply with the court's eventual decision.

Guangxi, China

Stora Enso's operations in Guangxi province consist of eucalyptus tree plantations in several locations and a consumer board mill in the



Veracel supports programmes that strengthen the cultural identity of 28 indigenous Pataxó communities.

Tieshangang industrial zone, about 40 km from Beihai city. Stora Enso owns 83% of the operations, the International Finance Corporation owns 5%, and the remainder is owned by two state-owned organisations: Guangxi Forestry Group Co Ltd and the Beihai Forestry Investment and Development Company.

During 2018, our human rights work in Guangxi focused on internal and external capacity building and strengthening due diligence:

- Human rights training for key employees, including those working with sourcing, legal issues, human resources, and sustainability.
- Ongoing development efforts with key forestry contractors. This included reviewing safety guidelines together with contractors, as well as providing training in defensive driving to the managers of 30 wood transportation companies and over 200 Stora Enso employees.
- Continuous review of our Responsible Sourcing Programme, launched in China in 2018, which aims to improve supplier cooperation and transparency. For more information about responsible sourcing, see pages 60–63.

During the year, we continued the pilot human rights work related to our local due diligence programme, which covers both our forestry and manufacturing operations in Guangxi, in accordance with the requirements of the UN Guiding Principles. This work will continue in 2019.

When required, consultation with community stakeholders, including Free, Prior and Informed Consent (FPIC), continues to be a key element in our human rights due diligence and forestry operations in Guangxi. Our forestry employees work in dialogue with the communities neighbouring our plantations to maintain good community relations, and to understand and address the potential social impacts of our operations. Our work to further improve our local community consultation processes continued in 2018.

Pakistan

As part of our responsible exit from Pakistan following the 2017 divestment of the 35% minority holding in the equity accounted investment Bulleh Shah Packaging (Private) Ltd. (BSP), Stora Enso completed a three-year Public Private Partnership with the International Labour Organisation (ILO) at the end of 2018.

In 2018, Stora Enso continued to support six schools in cooperation with the Pakistani non-governmental organisation Idara-e-Taleem-o-Aagahi (ITA). These schools were set up in 2015 to provide education for the 640 children identified as child workers in BSP's supply chain that was subsequently shut down in 2014. The contract for the school programme, together with Stora Enso's funding for ITA, will remain in place until 2023 when the youngest children will complete compulsory primary school education as required by the state of Pakistan.

¹ The merger between Fibria and Suzano was announced in March 2018 and finalised on 14 January 2019.



In Guangxi, China, we reviewed the safety guidelines of our key forestry contractors.

A grievance channel is available to all our employees.

Laos

Stora Enso has continued to develop trial plantations in the Saravane and Savannakhet provinces of southern Laos on lands totalling 3 805 hectares (3 731 in 2017), of which 3 113 (2 988) are planted with eucalyptus. Stora Enso Laos has 123 employees (125).

During 2018, our human rights work in Laos focused on community engagement in land acquisition processes, community communication, and management systems:

- The Environmental and Social Management and Monitoring Plan launched in 2017 was fully implemented during 2018.
- In 2018, Stora Enso became the first forest products company in Laos to have their plantation and nursery operations certified under OHSAS 18001 for occupational safety.
- The community grievance mechanism created in cooperation with the International Finance Corporation (IFC) was fully implemented and actively communicated to local communities to ensure they know which channels to use in case of concerns.
- Measures were taken 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. Stora Enso also continued to enhance gender involvement in the land acquisition process and community consultation meetings.
- An additional tool for FPIC procedures was developed to ensure communities understand the information shared with them.

Stora Enso's tree plantations in Laos are located near villages that are culturally and ethnically diverse. This makes it essential for us to engage in dialogues in a culturally appropriate way, based on informed consultation and participation, and obtain community consent for our projects. In 2018, we continued to train Stora Enso employees on stakeholder engagement and community consultation, particularly considering the interests of women and vulnerable groups.

A set of community consultation tools jointly launched by Stora Enso and Village Focus International in 2017 were fully implemented during 2018, as part of our efforts to improve our engagement with local communities. The tools help empower the communities to gain a deeper understanding of our agroforestry model, its benefits and impacts on their villages, and to enable the entire community to participate in decision-making related to Stora Enso's activities.

Social agenda

We care about all our people, engage with local communities, and strive to conduct ethical business.

- › Employees and wider workforce 17
- › Community 22
- › Business ethics 27





Employees and wider workforce

We aspire to be an attractive employer and to provide safe and rewarding workplaces for our employees.

TRI rate

6.1

TRI = Total recordable incident

Leadership
Index

83/100

Opportunities and challenges

Change through people

Stora Enso is transforming into the renewable materials company. Engaged and motivated employees in a capable organisation will enable us to deliver our business strategy.

The development of capabilities in customer insight, innovation and operational efficiency, as well as the ability to utilise new technologies will be critical for our future success. We need to ensure we have competent and engaged employees and manage employee turnover and the demographic structure of our workforce in various markets. This will require careful workforce planning and responsible leadership. To be successful and to promote a safe working culture, we need to ensure we develop our leadership, organisation, competencies and processes.

Our policies

Motivated employees and a capable organisation

Stora Enso's People Agenda guides our efforts to create engagement and motivation among our employees, and to build a capable organisation that can help us realise our business strategy. Key areas in our People Agenda include: leadership development, performance management, people ethics, health and wellbeing, talent management, competence development, workforce planning and employer branding.

Stora Enso's Health and Safety Policy defines the objectives for our safety management as well as our governance model on how we manage health and safety topics in practice and how we integrate them into annual planning and reporting.

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

- **Stora Enso Code** – our Code of Conduct
- **Supplier Code of Conduct**
- **Minimum Human Resources Requirements – Labour Conditions**
- **Global Framework Agreement**
- **Diversity Policy**



Leadership is the strongest driver for performance, wellbeing, and company culture.



Building a safety culture

What makes a safe workplace? Safety gear, warning signs, safer machines? They all help but it's people who create a strong safety culture.

"Ultimately, it's about trust," says **Sari Sarin**, Head of Safety and Occupational Health at Stora Enso. "When employees trust each other and their managers, they feel safe saying that they've made a mistake, that this accident happened because of something I did. Then the community works together to find the root cause, learn from it, and make changes – this is the best way to ensure people are committed."

Read the full article at storaenso.com/sustainability

How we work

Everybody home safe, every day

Stora Enso's goal is to be an accident-free workplace. Encouraging a company-wide safety culture means that everyone is responsible for making every workday healthy and safe – from our top management and throughout the company.

Safety management at Stora Enso is based on international standards such as OHSAS 18001 and ISO 45001, but our processes go beyond these requirements. Responsibility for implementing each tool and programme in our units lies with line management, supported by local staff and OHS professionals.

Since 2018, safety and industrial hygiene are managed by the Group Sustainability function. Occupational health including wellbeing is managed by our Group Human Resources function. Stora Enso's Safety Steering Group directs strategic long-term planning at Group level and oversees the work of the Safety Management Team, which develops and aligns Group-wide safety programmes. Our country-level OHS networks in Finland, Sweden, Germany, and China also share good practice and organise training to enhance our safety procedures and competencies. Local OHS committees and working groups at our units provide forums for raising safety-related topics and suggestions.

Our units report monthly on safety performance data, including incidents, absenteeism statistics, and safety observations. Stora Enso also monitors the number of safety incidents among on-site, logistics, and forestry contractors.

We encourage everyone to provide ideas on how to further improve safety.

Safety training for contractors

Stora Enso's approach to safety extends to contractors, suppliers, and on-site visitors. We encourage everyone to give feedback and provide ideas on how to further improve safety. Additionally, we promote safety among our contractors and suppliers through a dedicated e-learning – Safety Trail. We also emphasise the importance of safety by asking suppliers for information on their safety performance in our tendering process. For more information about our supplier approach, see pages 60–63. We also cooperate closely on safety work with our joint operations in Brazil and Uruguay.

Leadership – a key enabler

Leadership is a key enabler of our strategy as it is the strongest driver for performance, wellbeing and company culture. Our culture is based on our values "Lead" and "Do what's right", which we expect our leaders to embrace and demonstrate through their actions and behaviour. We measure our progress on leadership by using an overall Leadership Index that measures employee perceptions of their managers.

Performance management

Performance management is an important part of promoting engaged and motivated employees. We set targets for both our business and employees, provide context and continuous feedback as well as follow up on targets and expectations during annual employee performance appraisals.

Diversity

We believe diversity strengthens our competitiveness and we aim to reflect the societies in which we operate. Diverse working teams enable us to explore different perspectives and challenge our way of thinking, contributing to better decision-making. To benefit from diverse working teams, we need inclusive work environments that respect and appreciate individual differences. Dimensions such as skills and experiences, gender, age, cultural background and personality are important to Stora Enso when we strive for diversity.

Fair working conditions

We care for all our employees and are committed to fully respecting human rights throughout our operations.

All Stora Enso units are expected to work systematically to ensure that employees are treated with respect and fairness. Units should also comply with a set of minimum requirements for labour conditions in order to create an environment where employees are

both motivated and able to perform their work. These requirements address areas such as working hours, basic worker rights, working conditions, and non-discrimination. Based on a self-assessment conducted in 2017, the vast majority of our production units are in compliance with these requirements, and units with improvement needs have action plans in place to become fully compliant with the requirements. The next self-assessment will be conducted in 2019.

In 2018, we signed a Global Framework Agreement with three global unions – IndustriALL Global Union, UNI Global Union and the Building and Wood Worker's International – as another step towards creating working environments where all our employees are treated with respect and in a fair manner.

Progress

Enhancing safety performance

From January 2017, Stora Enso has applied Occupational Health and Safety Administration (OHSA) definitions in the reporting of total recordable incident (TRI) and lost-time accident (LTA) rates to be better aligned with international standards and to enable future benchmarking with peers and companies in other sectors.

In the beginning of 2018, Stora Enso changed the main KPI for measuring safety performance from the Lost Time Accident (LTA) rate to the Total Recordable Incident (TRI) rate. The TRI rate gives a more

@storaenso July 19

Thanks to the Accident-Free Mill programme at our Anjalankoski Mills, the number of accidents at the mill has plummeted to close to zero. The secret? Working together & caring for yourself and others. Have a safe summer! #safety #OHS

comprehensive picture of safety performance as it also includes less-severe accidents.

In 2018, our TRI rate decreased to 6.1¹ (7.4 in 2017). Compared to 2017, a 18% reduction was achieved on the TRI rate. There were no fatal accidents involving Stora Enso employees or onsite contractor employees at our units.

With regard to occupational health, Stora Enso measures illness-related absenteeism with a focus on encouraging units to invest in proactive health management. In 2018, illness-related absenteeism amounted to 3.0% (3.1%) of total theoretical working hours.

The average number of safety observations reported per employee was 10.5 (9.0).

Other focus areas in our safety management work during 2018 included:

- Updating the group-wide safety instructions to ensure consistent criteria for our key safety topics.
- Developing and piloting a new safety audit process to verify the implementation of the updated safety instructions.
- Systematically sharing the learnings from accidents within the company to reduce the risk of similar accidents happening in other units or functions.
- Ensuring sufficient resources for safety management and developing the competence of our safety professionals.

Contractor accidents

Stora Enso's reporting of accidents involving contractors has been developed in recent years. From early 2017, contractor accidents were reported in separate categories for on-site accidents and logistics incidents, to allow better comparability with statistics from other companies. In 2018, proactive measures have been taken when seeing statistically more accidents with some contractors than others.

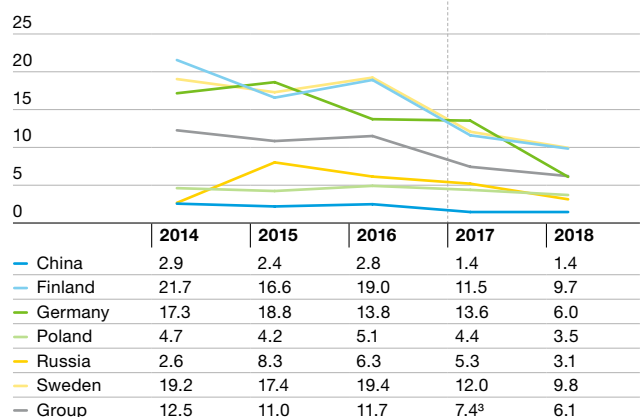
Leadership and performance management

Stora Enso's key performance indicator (KPI) for leadership, the Leadership Index, measures employee perceptions of their managers. The index is calculated based on our annual employee survey. Our target was to achieve an index of 80/100 by 2018. The Leadership Index in 2018 improved to 83 (81). The response rate to our employee survey remained high at 89% (91%). Our new ambitious target is to achieve an index of 85/100 by 2022.

¹ Recalculated due to additional data after the Q4/2018 Interim Report.

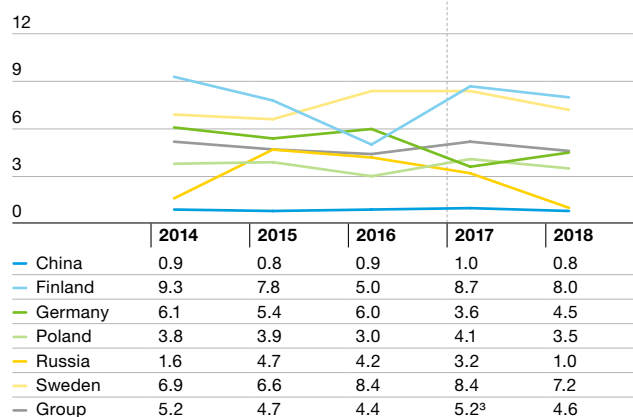
Total recordable incident rates (TRI)^{1,2}

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



Lost-time accident rates (LTA)^{1,2}

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

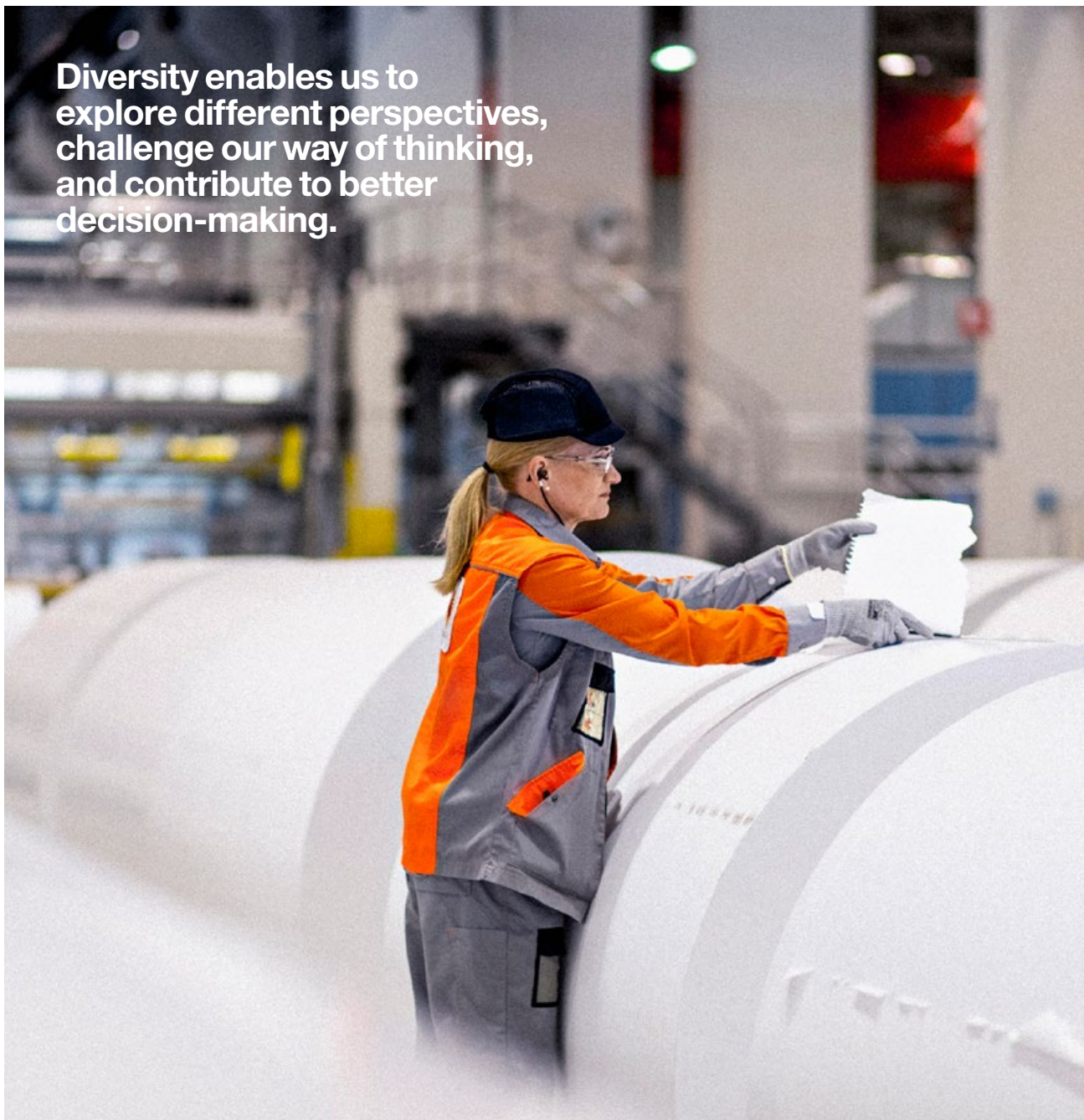


¹ For Stora Enso employees, including joint operations.

² As of January 2017 Stora Enso applies new Occupational Safety and Health Administration (OSHA) definitions in the reporting of TRI and LTA rates to better align with international standards. Due to this change, the 2017 and 2018 figures are not comparable with earlier years figures.

³ As of January 2018 Stora Enso's joint operations Veracel and Montes del Plata are included in the Group's consolidated safety performance. 2017 figure has been recalculated accordingly for comparability.

Diversity enables us to explore different perspectives, challenge our way of thinking, and contribute to better decision-making.



We continuously invest in the development of our leaders through programmes such as “Lead Through People” which targets all managers in the company. Since 2015, approximately 2 600 managers have participated in our Lead Through People programme. As our leaders need to lead the transformation we have launched new modules for Lead Through People that focus on developing skills in change management.

We promote performance management by setting clear expectations with team and individual goals and development objectives, providing regular coaching and feedback, and ensuring employees understand the wider context of how they contribute to the success of the company. All Stora Enso employees should be involved in at least one formal performance review meeting with their manager each year. In 2018, 91% of our employee survey respondents stated that they had taken part in a performance review during the past twelve months (91%).

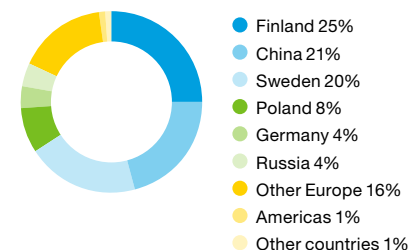
Employee diversity

When asked about diversity in the annual employee survey, 83% (81%) of our employees reported that their management was able to create diverse teams. Our objective was for 80% to respond positively. When it comes to gender diversity, our aim was to achieve a gender balance of 70% male and 30% female among senior managers by the end of 2018. At the end of 2018, the ratio was 80% (79%) male and 20% (21%) female. The Group Leadership Team had five female and seven male members in 2018. In the 2018 report by Equileap that assessed gender equality among 3 200 public companies, Stora Enso was ranked as number 12 globally and as number 1 in Finland.

Providing living wages

Every other year, the global non-profit organisation BSR supports us in defining and calculating living wages in relevant locations. In 2017, we reviewed the current situations in Brazil, China, Russia, Laos, and Uruguay. The results of this study indicate that overall, Stora Enso pays minimum/entry level wages above the living wages defined by BSR. The next assessment will be conducted in 2019.

Employee distribution by country¹



¹ Excluding employees of our 50%-owned joint operations Veracel in Brazil and Montes del Plata in Uruguay.

Compensation and equal opportunity¹

	Ratio of highest individual compensation to median compensation ²		Female employee compensation compared to male employees ^{1,3}	
	2018	2017	2018	2017
China	89	81	101%	100%
Finland	15	14	97%	97%
Germany	5	5	93%	97%
Poland	24	19	87%	n/a
Russia	30	31	93%	n/a
Sweden	43	37	99%	100%

¹ Figures for the six largest countries in terms of the total number of employees.

² The ratio shows how many times larger the highest individual annual total compensation, including incentives, is compared to median compensation. For 2018 reporting, the calculation methodology was developed to include incentives consistently. The 2017 figures are recalculated accordingly for comparability.

³ Calculated using weighted averages based on gender comparisons within each country's employee categories as applicable.

Figures for China and Germany based on samples due to data availability.

Share of female employees at Stora Enso

	2018	2017
Total number of employees at year-end ¹	25 880	25 210
Share of women among all employees (%)	26%	26%
Share of women among senior managers (%)	20%	21%
Women in the Group Leadership Team	5 out of 12	5 out of 12
Women on the Board of Directors	3 out of 9	3 out of 9

¹ Excluding employees of our 50%-owned joint operations Montes del Plata and Veracel. Reporting changed for the 2018 report from full-time equivalents to headcount. 2017 figure restated accordingly.

Employee distribution and turnover¹

	China ⁴		Finland		Germany		Poland		Russia		Sweden		Group total
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	
Number of employees	2 590 (48%)	2 780 (52%)	1 320 (20%)	5 150 (80%)	220 (21%)	830 (79%)	450 (20%)	1 770 (80%)	270 (24%)	860 (76%)	1 070 (21%)	4 100 (79%)	25 880
Up to 30	990	1 240	120	560	30	140	90	340	30	130	140	510	21%
31–50	1 580	1 470	750	2 560	100	310	240	970	200	610	550	1 590	51%
51 and over	20	70	450	2 030	90	380	120	460	40	120	380	2 000	28%
Number of hires²	1 070 (44%)	1 360 (56%)	80 (20%)	330 (80%)	30 (50%)	30 (50%)	30 (27%)	80 (73%)	30 (33%)	60 (67%)	100 (30%)	230 (70%)	4 040
Up to 30	620	930	20	70	20	20	10	40	10	30	30	80	53%
31–50	450	420	50	200	10	10	20	30	20	30	60	120	42%
51 and over	0	10	10	60	0	0	0	10	0	0	10	30	5%
Number of leavings³	1 230 (49%)	1 300 (51%)	60 (20%)	240 (80%)	20 (29%)	50 (71%)	20 (13%)	130 (87%)	10 (14%)	60 (86%)	100 (28%)	260 (72%)	3 890
Up to 30	720	840	0	10	0	10	0	30	10	10	10	30	47%
31–50	510	450	20	70	10	10	10	50	0	40	60	90	39%
51 and over	0	10	40	160	10	30	10	50	0	10	30	140	14%
Employee turnover	48%	47%	5%	5%	9%	6%	5%	7%	5%	7%	9%	6%	15%⁴

¹ Figures for the six largest countries in terms of the total number of employees. Rounded to the nearest 10.

² Hires: numbers of permanent employees joining the company. Excluding hires due to acquisitions.

³ Leavings: numbers of permanent employees leaving voluntarily or due to restructuring, retirement or death. Excluding leavings due to divestments.

⁴ The employee turnover in China mainly comes from Stora Enso China Packaging units where packaging manufacturing operations are relatively labor intensive and the number of employees vary according to seasonality. The high employee turnover of China Packaging units also has a significant impact on the Group employee turnover. The Group employee turnover excluding China Packaging units is 7%.

Our lowest wages compared to local minimum wages¹

Ratio of our lowest wage to the local minimum wage

	2018	2017
Brazil ²	1.0	1.1
China ³	1.2	1.3
Estonia	1.1	1.0
Laos	1.2	1.3
Latvia	1.1	1.2
Lithuania	1.4	1.0
Poland	1.0	1.0
Russia	1.5	1.0
Uruguay ⁴	1.0	1.1

¹ 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.

² Including employees of our 50%-owned joint operation Veracel.

³ 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.

⁴ Including employees of our 50%-owned joint operation Montes del Plata.



Community

We respect the cultures and values of local people and societies in the various regions we operate. We always strive to contribute to social and economic development.



Total voluntary community investment
EUR 2.7 million

Opportunities and challenges

The importance of local communities

Global companies can make a positive contribution in local communities through active corporate citizenship. Such voluntary investments can benefit communities and the company over the long term.

Stora Enso's operations are heavily dependent on local communities for a motivated and competitive workforce, as well as the sourcing of our most important raw material – wood. Therefore, the communities we depend on must be resilient and able to thrive economically, socially, and environmentally over the long term.

Stora Enso's operations generate emissions and our tree plantations influence land use that may adversely impact local communities. Our socio-environmental impacts must be managed responsibly, in order to minimise negative impacts, maximise our positive influence, and maintain cooperative community relations that ensure our long-term license to operate.

Our policies

A comprehensive approach to community work

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

- **Sponsorship and Donations Policy**
- **Community Investment Guidelines**
- **The Stora Enso Code** – our Code of Conduct
- **Business Practice Policy**
- **Guidelines for Social Responsibility**
- **Human Rights Policy**
- **Tax Policy**

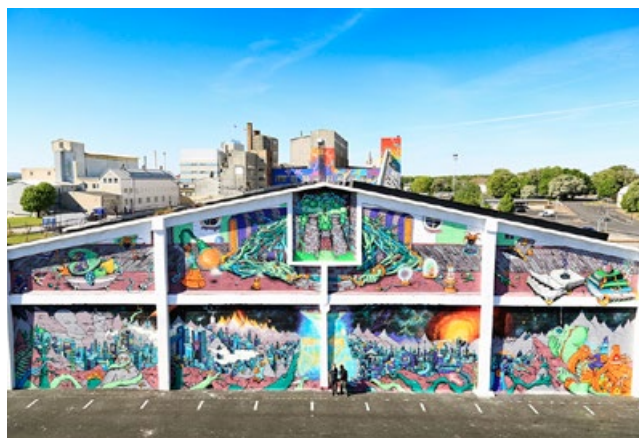
Our joint operations in Brazil and Uruguay have each developed formal procedures for their respective community work to reflect Stora Enso's requirements.

How we work

Managing social responsibility

In many locations, Stora Enso is a major employer, taxpayer, and partner for local entrepreneurs that benefits the local economy. In addition to implementing mandatory and regulated contributions to communities, we apply precautionary management actions to mitigate and remedy potential adverse environmental and social impacts 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 13.
- Due diligence assessments, which are realised as part of Stora Enso's acquisition and investment processes prior to any critical 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 develop constructive relationships with stakeholders such as governments, business partners, local communities, and NGOs. Any subsequent investment decision must consider our ability to mitigate and manage identified adverse impacts.
- Third-party certified management systems at our production units, applying international standards such as ISO 14001, OHSAS 18001 and ISO 50001.
- Third-party forest management certification for our own forestry operations and suppliers, such as the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC).
- When necessary, restructuring processes and closure of operations realised in cooperation with the authorities to support the communities through related changes, and to create opportunities for new business initiatives.



Voluntary community investment

Community investment is an essential part of building a sustainable future for our business as part of our engagement with communities. Building on the local community work Stora Enso has carried out over many years, we implemented a new Group-wide framework in 2017. We want to be an active corporate citizen and to make every place we operate in better as a result of our presence by contributing to the resilience of the local communities.

Community investments are contributions that involve engaging with local communities beyond our core business and legal responsibility. Stora Enso defines community investment as the voluntary donation of cash, working hours, and in-kind for non-profit purposes or non-profit community organisations in accordance with the LBG framework, which is a globally recognised framework for measuring these activities. For Stora Enso, community investments are managed locally, where the community is the main beneficiary – but where we recognise that the company can also benefit over the long term.

In 2018, Stora Enso mapped and analysed its community investment to define the Group's community investment focus areas. We aim to increase the proportion of volunteered working hours and in-kind contributions compared with cash.

Progress

Measuring our contribution

As a global company with a strong local presence, particularly in wood procurement, we are committed to numerous community activities.

In 2018, the total number of Stora Enso's voluntary community investment projects was 453, including those facilitated by our joint operations Veracel in Brazil and Montes del Plata in Uruguay. The largest community investment areas in 2018 were economic development, education, and healthy lifestyles. Based on our



“Today's world requires companies to demonstrate a social license to operate and to understand the difference their contributions make to business and society. LBG is the global standard to measure and manage corporate community investment, it also acts as a membership platform to share learnings. Stora Enso has shown commitment to measure and share its community investment activities in a transparent and consistent way.”

Clodagh Connolly
Associate Director
Corporate Citizenship, LBG lead

reporting, the total contribution of these activities consisted of cash (76% of total contribution), volunteered working time (13%), and in-kind contributions (11%). In 2018, the total voluntary contribution to communities as defined by LBG was EUR 2.7 million, including 50% of the community investments by our 50%-owned joint operations in Brazil and Uruguay.

Communities are part of our value chain

During 2018, we engaged with the local communities close to our operations in various ways, including investments in agroforestry programmes, and capacity building projects.

Europe

Stora Enso's voluntary community investments in Europe focus on enhancing the attractiveness of communities situated close to our sites, with the aim of benefitting our existing and potential future employees. To support our potential labour pool, we participate in programmes that promote education and youth training, and provide internships and public research opportunities. We also strive to promote local workforce diversity by participating in programmes that facilitate the employment of disadvantaged people and refugees.

To support the everyday vitality of communities, we also financially support local associations, including sports clubs and cultural activities.

Our Hylte Mill in Sweden has supported language training initiatives for refugees since 2015. Over a three-week period, the mill provides refugees with opportunities to practice their new language skills in real working situations, and to get acquainted with a Swedish workplace by following the day-to-day activities at the mill. This gives them good insights into Swedish working life.

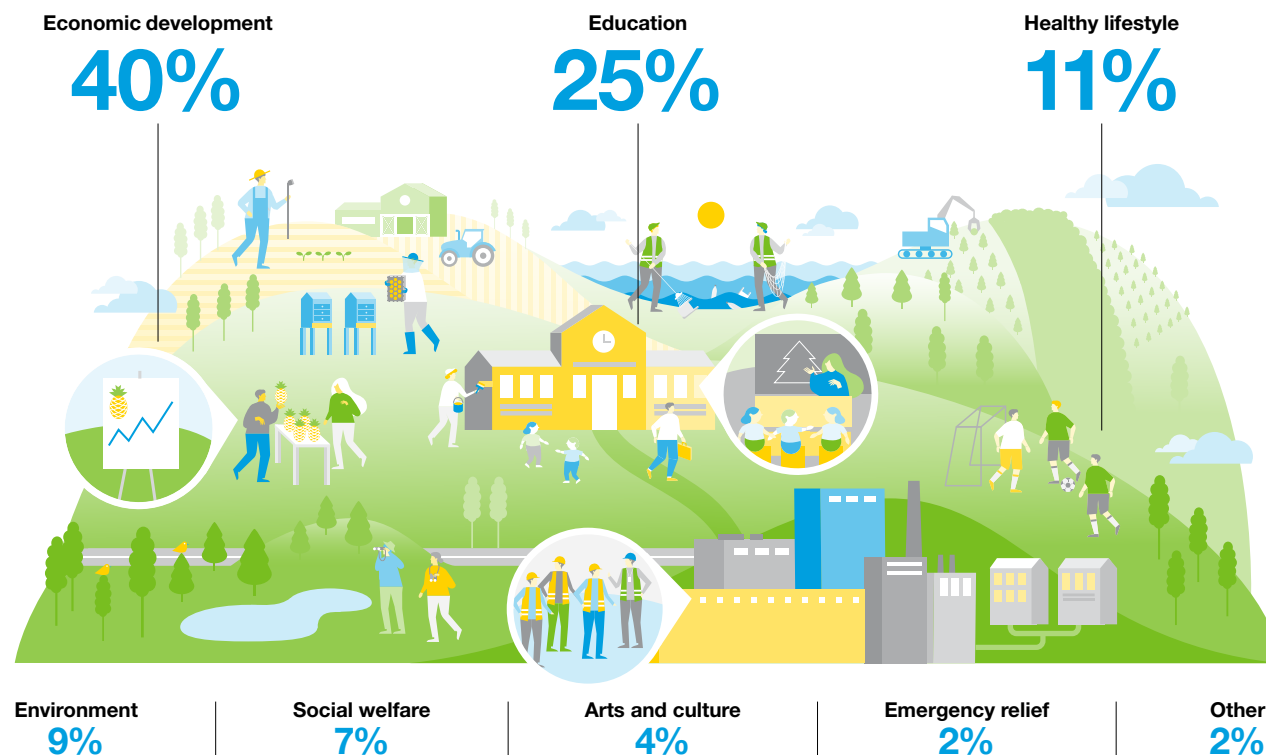
Donated heat supports local artists and athletes

Our Nymölla paper mill in Sweden donates “used” heat as part of their community investment work. Once hot water sold to the local municipality has circulated through the district heating system, it comes back to the mill. One recipient of this donated heat is a nearby sports complex with an outdoor football field and a sports arena – a new way to sponsor local sports teams.

The mill also donates heat to Ifö Center, an old ceramics factory turned into a centre for the arts. “Ifö Center provides work spaces for high-class artists, and it's great that we can support them in this way,” says **Michael Lindemann**, Mill Manager at Nymölla Mill.

Read the full article at > storaenso.com/sustainability

Voluntary community investment by investment area¹



Stora Enso's Skutskär Mill in Sweden collaborates with a technical college to support youth employability and to ensure the availability of skilled labour in the future. The forest industry in Sweden is undergoing a generational shift, and most companies in the sector are faced with a shortage of younger workers. We received five trainees to Skutskär Mill through this collaboration, and we offer summer work placements to students from the school programme. Stora Enso's employees mentor the students, host school visits, and participate in steering group meetings with peer companies and the school.

In 2018, we continued to voluntarily support the Finnish Forest Foundation by matching voluntary donations from forest owners, which are linked with the purchase of wood. Stora Enso has supported the foundation since 1995. We also report to community investment funds that provide social benefit, such as education and youth. Activities include taking students to forests, inspiring young people to pursue a career in forestry and, funding research projects that focus on the social aspects of the forestry sector.

Guangxi, China

Stora Enso leases 82 217 hectares of land in Guangxi province China, of which 29 265 hectares (29 581 hectares in 2017), corresponding to 36% (36%) of the total area, is social land leased from village collectives, individual households, and local forest farms. Engagement with local communities is a key element of our everyday operations. Stora Enso's field staff and social engagement officers speak regularly with local people impacted by our plantations and mill, and along our transportation routes, to inform them about our operations and to enable them to express their concerns and contribute ideas. Our aim is to understand social risks in advance, so we can properly mitigate and remedy them.

During 2018, we continued the socio-economic profiling of local villages in order to better understand and address ethnic structures, opportunities for development, and other characteristics that can help us maximise the positive impacts of our operations, and mitigate any negative impacts. During the year, where applicable, we continued to

Voluntary community investment by contribution type¹



¹ Total community investment includes cash, voluntary working hours and in-kind as defined in the LBG framework. Including 50% of joint operations Veracel in Brazil and Montes del Plata in Uruguay.

advance Free, Prior, and Informed Consent (FPIC) processes in land leasing. For more information, see page 14.

Our forestry operations in Guangxi run community projects to address challenges in rural villages near our plantations. During 2018, Stora Enso supported 20 community projects focusing on topics such as sanitation improvement and the availability of clean drinking water. One of the clean drinking water projects was located in Liuwenpo village where the water source was upgraded with Stora Enso's support in 2018.

Veracel, Brazil

Veracel, our 50/50 joint operation owned together with Suzano¹ owns 213 500 hectares of land in Bahia, Brazil, of which about half has been reserved for rainforest restoration and conservation. Veracel also leases 11 000 hectares of land. Supporting income generation and employment for local communities are the top priorities of Veracel's sustainability agenda. Since 2012, Veracel has been involved in the Pact for the Development of the Discovery Coast. Under this agreement, the government has committed to reimburse Veracel the ICMS tax credits paid by the company, in return for investments in local development programmes. The pact's projects contribute to the sustainable development of family farming by forming associations for small producers and indigenous communities. During 2018, the pact supported two projects related to cassava production.

Supporting multiple land uses

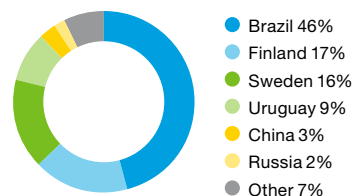
Veracel also supports local livelihoods by making some of its land available to family farmers, and by providing training and technical support. The Agrovida farming programme, for instance, aims to produce food for the local community and to trade surplus production in regional markets. The Roça do Povo project supports local families cultivating cassava and other crops. By the end of 2018, the Agrovida initiative involved 47 (153 in 2017) farmers cultivating 64 (208) hectares, while the Roça do Povo scheme assisted 79 (82) farmers cultivating 80 (80) hectares.

Veracel also allows local beekeepers to keep their hives on the company's land and provides training in beekeeping. In 2018, a total of 176 (155 in 2017) honey producers, mostly working through local cooperatives, benefitted from this support.

¹ The merger between Fibria and Suzano was announced in March 2018 and finalised on 14 January 2019.

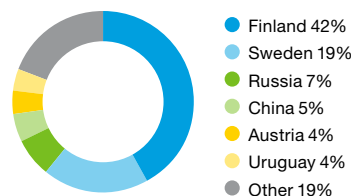
Voluntary community investment by country¹

EUR 2.7 million



Voluntary community investment projects by country²

By number of projects (In total 453 projects)



¹Total community investment includes cash, voluntary working hours and in-kind as defined in the LBG framework. Including 50% of joint operations Veracel in Brazil and Montes del Plata in Uruguay. ² Including joint operations Veracel in Brazil and Montes del Plata in Uruguay.

In 2018, Veracel also continued to support the local fishing communities of Belmonte, Santa Cruz Cabrália, and Santo Antônio. The cooperation includes support for studying the dynamics and development opportunities for local fishing, and providing infrastructure for its commercialisation.

Investing in local social welfare and causes

To strengthen the labour market in neighbouring communities, Veracel is cooperating with several NGOs to prepare young people for the labour market. In 2018, this cooperation covered training on coastal and marine environments together with the NGO Instituto Mae Terra. During the year, the company also cooperated with the National Business Apprenticeship Service (SENAC) to help 60 students graduate with an assistant degree in administration, and with a sewing and cutting course for 20 women to help them improve their income.

During 2013–2015 and 2017–2018, Stora Enso and Veracel successfully cooperated with the NGO Childhood Brasil to combat child abuse and exploitation in the municipalities of Porto Seguro, Santa Cruz de Cabralia, and Eunápolis in South Bahia. The cooperation included formulating, implementing, and strengthening public policies related to child exploitation, and providing training for professionals. Municipality of Belmonte participated in the cooperation in 2018.

For information on Veracel's engagement with indigenous communities, see page 14.

Continuous dialogue with the landless people's movement

Land invasions of private property are a long-running challenge in Brazil that have affected various actors who use areas of land, such as mining companies and farming businesses. In 2018, some stakeholders criticised Veracel for its land use and evictions of landless people's from illegally occupied lands. Landless movements have also illegally invaded Veracel's lands. To help find sustainable local solutions, Veracel strives to maintain continuous dialogue with these movements and supports land allocations through the

Sustainable Settlements Initiative. Dialogue with landless people is important for Veracel, particularly as certain groups have occupied some of the company's land since 2008. During 2018, 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)

In 2018, work continued on a related Sustainable Settlements Initiative launched in 2012 to provide farmland and technical 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 is conducted in cooperation with the 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 this date. The initiative relates to a total area of approximately 16 500 hectares of Veracel's lands designated for the settlements to be purchased from the company by INCRA. In addition to advancing this process during 2018, Veracel also provided socio-economic support for the landless people's social movements, including support for agricultural activities and literacy enhancement.

During the last quarter in 2018, Veracel signed a new agreement with the social landless movements to complement the earlier agreed Sustainable Settlements Initiative. In the new agreement Veracel sells 3 300 hectares of previously occupied lands to the movements and related associations, and the movements will leave from Veracel's lands corresponding to 800 hectares. In addition, Veracel donates 225 hectares. After this new agreement, 468 hectares



Better livelihoods from fishing in Brazil

Fittingly shaped like an ice cube, the small white ice factory in Santo Antônio provides ice to three nearby communities, mainly local fishermen and restaurants.

The ice factory saves time and money for the local fishing communities. "I come here twice a week to buy ice," says a man from a locally-owned restaurant. "Before this ice factory, we had to source ice from far away so the factory saves time and transport costs."

Veracel, our 50/50 joint operation, voluntarily supports local fishing communities in various ways for example by providing the infrastructure to support the commercialisation of fishing.

Read the full article at > storaenso.com/sustainability

of productive land owned by Veracel remained occupied by social landless movements not involved in the Sustainable Settlement Initiative or in the new agreement. Stora Enso also reports on this additional occupied area in the Group's Interim Reports. Veracel will continue to seek repossession of remaining occupied areas through legal processes. Previously Veracel has voluntarily reserved 16 500 hectares to support the Sustainable Settlements Initiative. At the end of 2018, the total land area owned by Veracel was 213 500 hectares, of which 76 000 hectares are planted with eucalyptus for pulp production.

Montes del Plata, Uruguay

Montes del Plata, our 50/50 joint operation owned together with the Chilean company Arauco, runs a pulp mill in Punta Pereira, in southwestern Uruguay, together with associated eucalyptus plantations mainly located in central and northwestern parts of the country. Montes del Plata owns 190 000 hectares and leases 61 500 hectares (Alianzas programme) of land.

Montes del Plata seeks to benefit local communities near the mill by fostering local employment opportunities, maximising local hiring, and participating in mentoring programmes. It also promotes local education to improve future opportunities for local people and the qualified labour pool for the company. Montes del Plata promotes entrepreneurship among young people through events such as “start-up weekend” It also finances local development by supporting initiatives carried out by local community groups. The aim is to boost local social cohesion and strengthen community organisations.

In addition to community investments, Montes del Plata continued to work on the Alianzas programme which integrates social and business interests into business models. The programme provides additional income for local farmers by enabling them to integrate eucalyptus plantations into their farms on suitable lands. At the end of the year, 426 (374 in 2017) farmers participated in the programme with 61 500 hectares (56 500 hectares), of which 48 500 (45 000) are planted with eucalyptus.

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, 189 (183) farmers kept cattle on Montes del Plata's land. 33 (39) farmers produced honey from approximately 8 100 (6 500) beehives situated on Montes del Plata's land to supplement their incomes. At the end of the year, 47% (31%) of these hives were certified organic and Montes del Plata is working with local governmental initiatives to promote tourism and the consumption of organic honey. The diverse use of land enhances local livelihoods, reduces forest fire risks, and helps to build stronger relationships with the community.

Strong and resilient communities contribute to successful business.



Through the Alianzas programme, local farmers can keep cattle on Montes del Plata's lands.

In 2018, Montes del Plata worked together with local government and Algorta town to promote commercial forest mushroom picking. For local women, mushroom foraging can be an opportunity to improve their livelihoods.

Montes del Plata works to get the local community better acquainted with its operations. Stakeholder engagement work in 2018 included several educational visits to the mill, Montes del Plata's tree nursery, the main port, and the company-owned Bioparque M'Bopicuá environmental centre. The environmental centre, which received over 2 000 visitors during the year, promotes education as well as enables visitors to experience native wildlife at first hand and to learn how ecosystems function.

Mitigating negative impacts from logistics

The company has a long-term strategy for the transportation of wood, including annual action plans involving truck drivers, transport companies, and local communities. Montes del Plata's wood supply is operated by approximately 680 truck drivers from 20 different transportation companies. Montes del Plata carefully trains all drivers before they start working for the company. Quarterly workshops on safety and social responsibility are organised for truck drivers

and regular meetings are held with the owners of the transportation companies to follow up on safety indicators.

Montes del Plata, together with its logistics contractors and their truck drivers, works to raise awareness of traffic safety issues in the locations most severely affected by the company's traffic. In 2018, this work included cooperation with 15 schools on local road safety development projects.

Laos

Stora Enso's plantations in Laos have been established in a way that enables local farmers to grow rice and cash crops between the trees. Before establishing plantations, Stora Enso makes the land safe by removing unexploded bombs dropped over Laos during the Vietnam War.

In Laos, we have established a village development fund to share benefits among local villagers, and to further support local development and livelihoods. Most of the 2018 funding was directed to projects such as electricity provision, purchases of livestock to enhance food security, and the repair of a school building. These projects have been designed together with the villagers according to their needs. All the projects are endorsed by the local authorities. For more information about our human rights work in Laos, see page 15.



Business ethics

For Stora Enso, complying with regulations is only the beginning. A culture of honesty, transparency, and ethical behaviour is key to our long-term success.



Code of Conduct Index

85/100

Opportunities and challenges

Broad ethical approach beyond compliance

Stora Enso operates in locations including high-risk markets that offer good business opportunities, but may also entail exposure to serious risks relating to topics such as corruption and fraud. Joint venture agreements may also involve risks related to competition law. The US Foreign Corrupt Practices Act, the UK Bribery Act, and the French Loi Sapin II are all examples of effective legislation that governments and authorities have introduced to combat corruption. These laws place high demands on companies' controlling mechanisms, but they also help to build accountability and trust among stakeholders. Complying with international trade sanctions may also require companies to take new measures.

Digitalisation brings great opportunities for organisations, but it also presents challenges regarding cybersecurity and the treatment of stakeholders' personal data. New legislation such as the EU General Data Protection Regulation (GDPR) sets requirements concerning the processing of personal data, with heavy fines imposed for infringements. While compliance with laws and regulations is always the highest priority for us, we believe that adopting a wider ethical approach is also crucially important.

Our policies

Comprehensive approach to ethics and compliance

Our code of conduct, renewed and rebranded as the **Stora Enso Code** in 2018, is a single set of values for all our employees that explains our approach to ethical business practices, human and labour rights, as well as environmental values. These values are applied 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 within our Legal team, headed by our General Counsel, who reports directly to the CEO. Our Ethics and Compliance Management Committee, 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 Committee met four times during 2018.

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 (TI) Steering Committee for Business Principles for Countering Bribery, where we actively participate in the network's efforts to combat corruption globally and nationally. We are also a member of TI's Corporate Supporters' Forum.

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 participate in training and make a personal commitment to the Stora Enso Code and our Business Practice Policy, and to provide related information for employees within their respective organisations.

Training our employees

We strive 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. Communications and training are a crucial part of this work.

Our employees receive Stora Enso Code training, either through an e-learning tool, or through face-to-face training provided for those who do not have direct computer access. We aim to ensure that our new employees receive such training within their first month of employment. In addition, an in-depth e-learning course on anti-trust and anti-corruption is mandatory for all members of our

Our code of conduct was renewed and rebranded as the Stora Enso Code in 2018.



We have a zero tolerance for corruption, and we strive to ensure that our partners are aware of and share our commitment.

Group Leadership Team, for divisional and mill management teams, and for employees dealing with competitor contacts, purchasing, marketing, and sales. The training has been run since 2013 and was updated in 2018 to be more interactive and to better reflect the challenges of today's work environment. All relevant employees will receive the updated training during 2019.

The Stora Enso Data Privacy 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. All white-collar Stora Enso employees are required to complete our e-learning training on data privacy. By the end of 2018, 7 432 white-collar employees had been trained.

Comprehensive risk assessments on compliance

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

The management and employees of our fully and jointly owned operations in Brazil, Uruguay, and China receive training on our Business Practice Policy. Employees in our joint operations in Brazil and Uruguay additionally receive training on their respective Codes of Conduct and Business Practice Principles, covering topics such as human rights, environmental impacts, safety, and ethical practices. Anti-trust guidelines designed for our joint operations are implemented with the help of related training in Uruguay, Brazil, and China.

During 2018, our Ethics and Compliance team continued to provide training in Brazil, China, and the Baltic countries. This training involved meetings 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 suspected cases of misconduct or unethical behaviour.

Stora Enso uses an additional external service through which our employees globally, and also external stakeholders in certain locations, can anonymously report potential non-compliance cases by phone, mail, or online. This service is available 24/7. Our operations in China and Laos have established internal grievance channels in local languages for those stakeholders whose knowledge of the main language is inadequate.

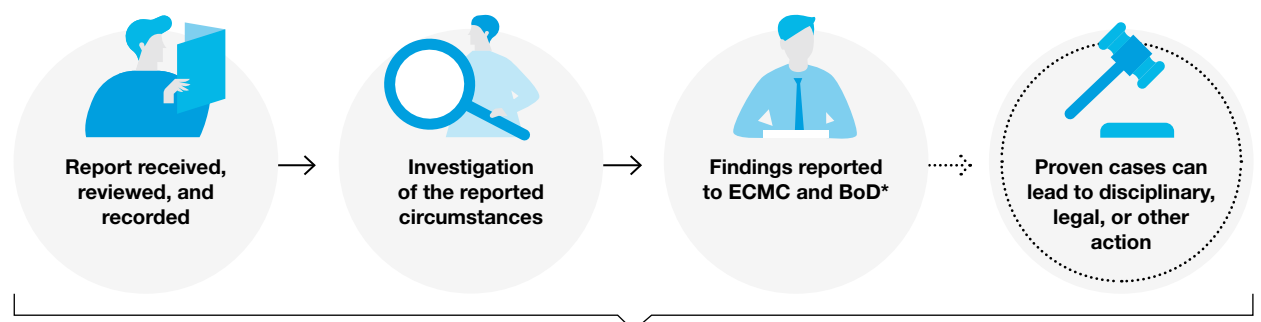
All potential non-compliance cases are duly investigated. Any findings are recorded and reviewed by the heads of our Internal Audit and Ethics and Compliance functions, and reported both to our Ethics and Compliance Management Committee, and to our Board of Directors' Financial and Audit Committee. Proven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

Our joint operations Veracel in Brazil and Montes del Plata in Uruguay each have their own local grievance mechanisms.

In 2018, a total of 68 reports received through Stora Enso's various grievance channels were identified as potential non-compliance cases (61 in 2017). Based on the investigations finalised by end of the year 2018, proven misconduct leading to disciplinary actions, legal actions and/or process improvements was identified in 20 (14) of the completed investigations, while 18 (22) further complaints were found to be valid without involving misconduct.

Based on our assessments, two of the proven misconduct cases can be considered relating to corruption and/or fraud. Both cases resulted in employee dismissal or disciplinary process, and in one the business relationship with an external party was terminated.

How we investigate suspected non-compliance cases



Heads of Internal Audit and Ethics and Compliance functions are responsible for the overall process.

* ECMC = Ethics and Compliance Management Committee

BoD = Board of Directors' Sustainability and Ethics Committee and Board of Directors' Financial and Audit Committee

Competitive advantage from business ethics

Being value-driven gives Stora Enso a competitive advantage at a time when stakeholder interest for business ethics is growing, as it builds trust both within Stora Enso and with external stakeholders such as customers and potential employees. We are committed to conducting our business ethically and strive to ensure that our business partners are aware of and share our commitment.

Progress

Comprehensive monitoring

We use an index to monitor and evaluate employee perceptions of our work on topics covered by our code of conduct. The index is based on employee responses to related questions in our annual employee survey. In 2018, this index improved to 85 (83 in 2017). Our goal is to maintain this positive trend. By the end of 2018, 20 930 Stora Enso employees had received training on our code of conduct.

Following the establishment of the Division Compliance Forums and the Group Function Compliance Forum in recent years, a Wood Supply Compliance Forum was established during 2018. These forums, eight in total by the end of 2018, 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 once in 2018. This tool has been designed

to give our divisions and functions a better overview of the progress their units are making in implementing our policies and compliance measures, while also identifying possible gaps and risks related to compliance. The results are addressed through the Compliance Forums, with action plans subsequently developed, implemented, and monitored as necessary. As of 2018, results are cross-checked between more people within each unit to gain a deeper understanding of their reliability.

Focus on data privacy and tax evasion

The EU General Data Protection Regulation (GDPR) came into force in May 2018, entailing new responsibilities for data controllers such as Stora Enso. With preparations for the requirements on-going since 2015, Stora Enso is well-equipped to comply with the regulation. We have, for example, documented our personal data processing, implemented required actions to IT systems and other registers, trained employees, and established processes to manage new obligations such as the identifying and reporting of personal data breach incidents and fulfilling the requests of data subjects.

The UK Criminal Finances Act makes companies liable for failing to prevent the facilitation of tax evasion and allows authorities to use new investigatory tools. To reflect the Act's requirements, we updated our tax policy in 2018 to highlight our commitment to national and international tax laws and regulations. We have also taken measures to improve tax risk assessments, train relevant personnel, and raise awareness internally.

Breakdown of potential non-compliance cases

	2018	2017
Anti-trust	1	8
Conflict of interest	7	6
Corruption	9	14
Fraud	2	4
General human resources	33	16
Health and safety	3	2
Miscellaneous	13	11
Total	68	61

Stora Enso is represented in Transparency International's Steering Committee for Business Principles for Countering Bribery.

Encouraging employee discussions on ethics

We continued to use our internal communications concept “Ethical Spotlight of the month” to help managers discuss ethics topics with their teams. The concept includes topic-related communications materials to facilitate discussions. In 2018, topics included sexual harassment, protecting company assets, promoting the culture of listening, and ethics issues related to digitalisation.

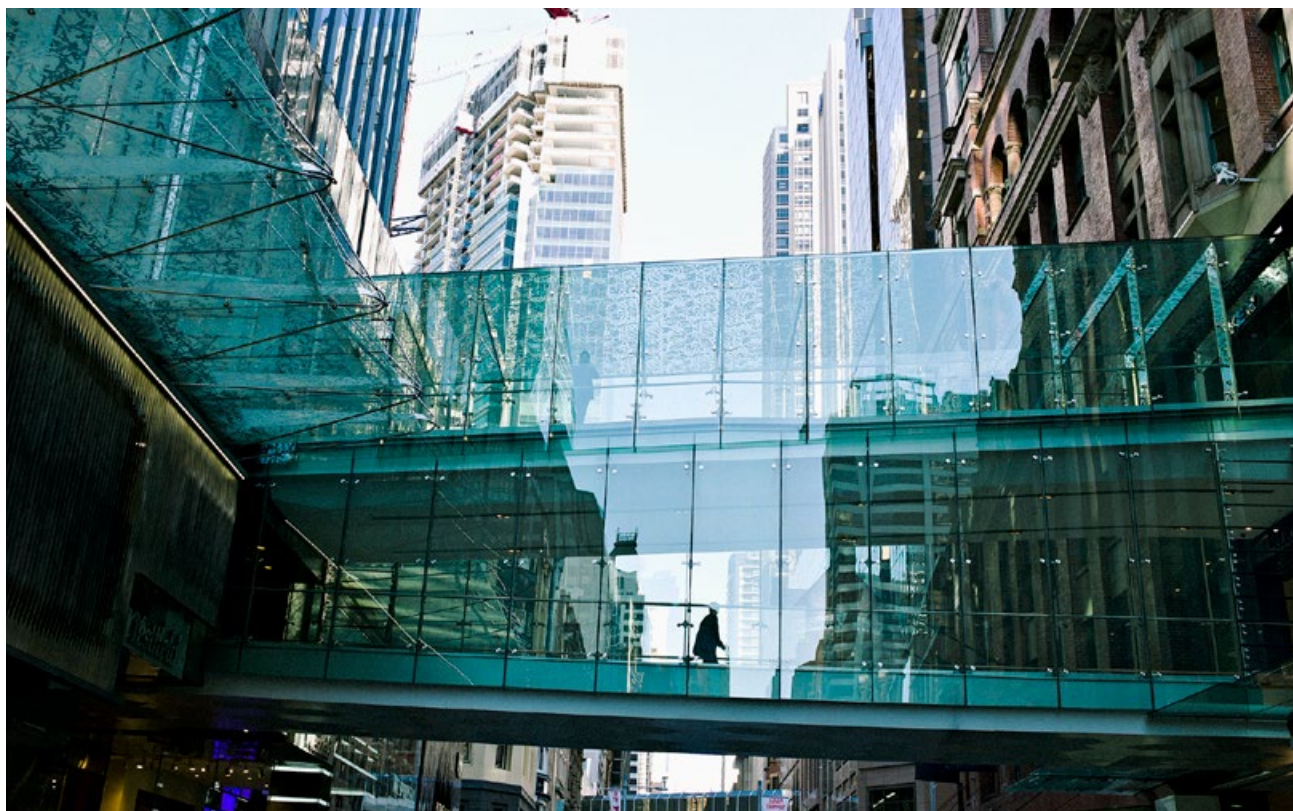
Compliance rules can be complicated and ensuring that all our employees know Stora Enso's purpose, values, goals, and policies can be challenging. In 2018, our Ethics Ambassadors, consisting of Stora Enso employees, continued their work in voluntarily supporting our Ethics and Compliance function by running training sessions, clarifying our rules, and answering questions in their respective units.

During 2018, new functionalities were added to our “Do What's Right” mobile application. The app gives all our employees access to all relevant compliance policies whenever and wherever needed and allows employees to report suspected violations. The new features also make it easier for the company to inform employees about regulatory or policy changes directly through their mobile devices.

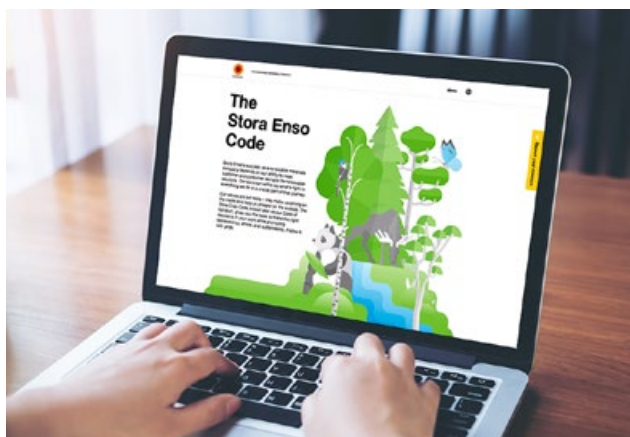
Enhanced compliance control processes

Making sure that laws, regulations, and company rules are complied with is an essential part of our business. To ensure this compliance control, we developed and implemented a more comprehensive due diligence system for on-boarding critical business partners in 2018.

In 2018, we also incorporated a function into our travel cost reimbursement tool that controls the gifts and hospitality offered to public officials, customers, and suppliers. The change improves the visibility and enforcement of our requirements for appropriate gifts, hospitality, and entertainment.



Making sure that laws, regulations, and company rules are complied with is an essential part of our business.



Doing what's right

Could I hire my brother? Who should I tell about the unsafe behaviour I saw? Making the right, ethical decision in our daily work is not always easy. The Stora Enso Code, our updated Code of Conduct, helps employees work out ethics questions.

“We have also introduced Ethics Ambassadors,” says **Yang Zhang**, Legal Counsel in Stora Enso's Ethics and Compliance team. “They are more trained in ethics than their peers and are better equipped to notice when something is off and can raise their voice. That's all we need.”

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Environmental agenda

We use natural resources with care, combat global warming, and respect the environment.

- › Materials, water, and energy 32
- › Carbon dioxide 42
- › Forests, plantations, and land use 49





Materials, water, and energy

We contribute to the transition from a fossil-based world into a circular bioeconomy with our biobased, renewable, recyclable, and low-carbon solutions. In our operations, we always look for ways to make more from less.



Share of biomass
in our internal
energy production

81%

Process
residuals
utilisation rate

98%

Opportunities and challenges

Reduced waste, maximum value

Global megatrends such as global warming, population growth, eco-awareness, and urbanisation are affecting consumer and corporate decision-making around the world. At Stora Enso, we proactively respond to these trends by developing products and solutions based on materials that are both renewable and recyclable.

Materials

As a renewable materials company, Stora Enso operates at the heart of the bioeconomy and contributes to a circular economy. In a circular economy, waste is minimised as materials are reused and recycled to maximise environmental and financial value. The European Commission (EC) has adopted several legislative proposals on waste reduction within its Circular Economy Package, as well as strategies on plastics and bioeconomy to protect the environment from plastic pollution whilst fostering growth, bio-based innovation, and recycling and reuse initiatives. The EC has for example announced the establishment of a EUR 100 million Circular Bioeconomy Thematic Investment Platform to bring bio-based innovations closer to the market and lower the risk for private investments in sustainable solutions. The objectives of these ambitions provide business opportunities for Stora Enso.

Water

Water plays a central role in Stora Enso's production, heating, cooling, and cleaning processes, and in generating renewable electricity from the hydropower we purchase. We clean process water in our high-performance water treatment plants before discharging it back into the nature. Sustainably managed forests and plantations have a key role in maintaining natural water cycles and increasing resilience to the impacts of global warming. We consider water in the planning and management of our forest and plantation operations. Our forests and plantations also need rainwater for growth, and active water management in plantations contribute to positive effects on total water balance, water storage, purity and quality.

While water is relatively abundant in most of our production locations, water scarcity may still impact operations locally and through our wider supply chains, as controls on pollution, recycling, and water pricing are tightened. Some mills have been impacted by water stress in terms of availability and increased water temperatures, and we consider water stewardship to be an area of increasing importance. At the same time, such challenges give us opportunities to reduce costs by using water more efficiently.

Energy

The EU's 2020 Climate and Energy Package, 2030 Climate and Energy Framework, and 2050 Low Carbon Economy Roadmap outline the way forward for industrial energy. The rules for the next trading period of the Emissions Trading System (for more information, see page 43) have also been decided.

The Energy Efficiency Directive II sets new energy efficiency targets for 2030 requiring energy savings of 0.8% per year on energy consumed. Additionally, the Renewable Energy Directive II sets member states a binding collective target on EU level to derive 32% of their final energy consumption from renewable sources by 2030. With its high proportion of biomass-based energy, the forest industry can help the EU achieve its targets.

A high proportion of biomass is used in the internal energy production of most of our mills. This renewable energy is generated from by-products and residuals from our own production processes, harvested residues, recovered wood, and waste streams.

Our policies

Guidance throughout the supply chain

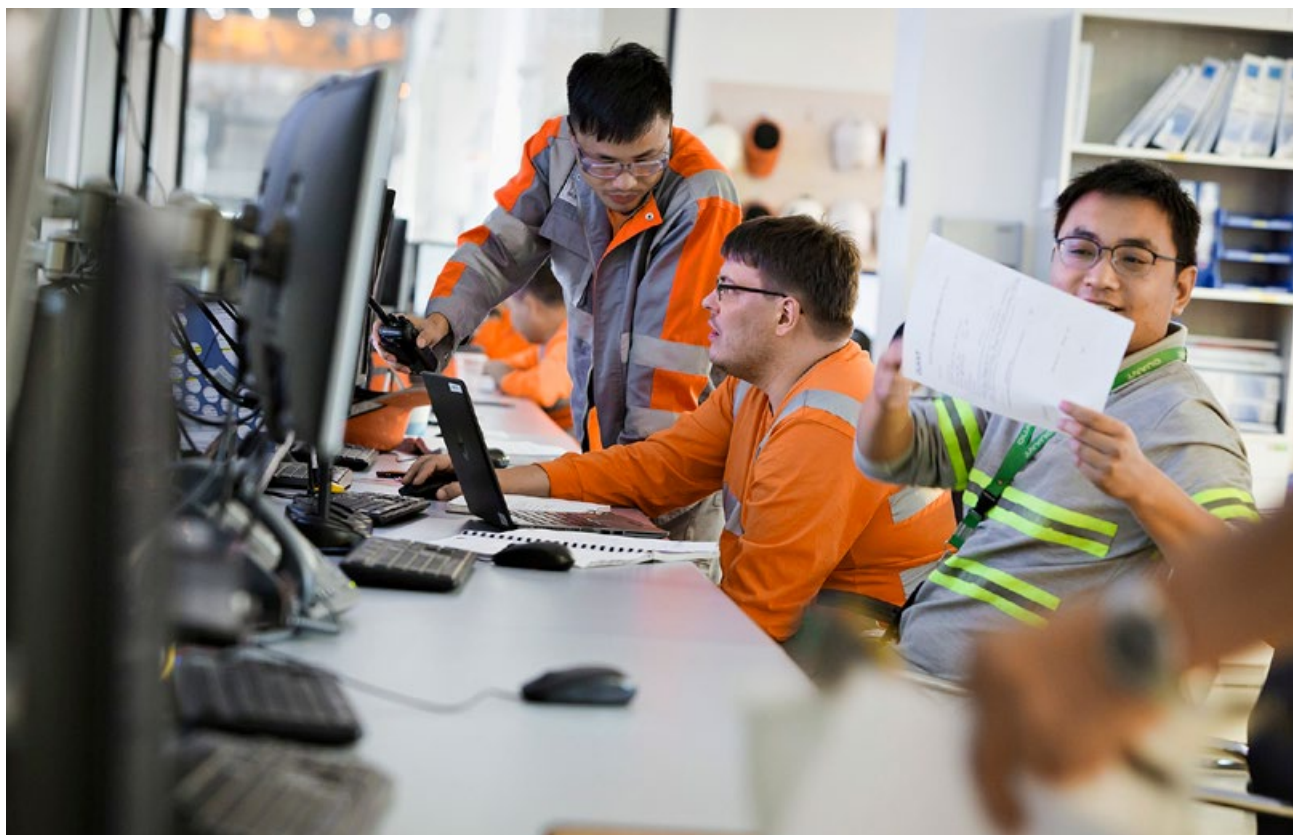
Stora Enso's policies relevant to our use of materials, water, and energy include our:

- **The Stora Enso Code** – our Code of Conduct that guides us on issues related to resource use.
- **Supplier Code of Conduct** – includes practical instructions for Stora Enso's suppliers, Purchasers' Instructions, Sourcing Policy, and Sourcing Guidelines: a guiding framework for the responsible sourcing of materials and energy.
- **Policy on Wood and Fibre Sourcing, and Land Management** – our commitment to the responsible integration of forestry, land use, sourcing, and water stewardship into our sustainable forest management and land use practices.
- **Policy on Energy and Carbon** – a policy stating our ambitions in combatting global warming.
- **Environmental Guidelines** – a comprehensive overview of our policy objectives and how we work to achieve them.

How we work

External initiatives guide our work

We apply precautionary management actions to mitigate and remedy potential adverse environmental impacts. The environmental work at our mills, including water and energy management and resource



Compliance with legislation and permits is monitored by the environmental authorities and by our mills.

efficiency, is supported by third-party certified environmental management systems. All our board, pulp, and paper mills and sawmills are certified to the ISO 14001 environmental management system standard, along with all but one corrugated packaging unit. The interests of local communities and forestry operations are respected in our approach to systematic Environmental and Social Impact Assessments (ESIAs) in due diligence executed in conjunction with mergers, acquisitions, and divestments (see page 13).

By the end of 2018, 95% of our total energy consumption was certified to the ISO 50001 energy efficiency management system standard. 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 that consider local environmental conditions, stakeholders, and legislation. Compliance with legislation and permits is monitored by the environmental authorities and by the mill

By 2018, 95% of our total energy consumption was certified to the ISO 50001 energy management system.

in question. Non-compliances and incidents are reported by mills to Group management on a quarterly basis, and significant incidents are reported immediately. For details of all significant incidents and violations of environmental permits in 2018, see page 41.

Environmental improvements and investments at our production units are driven by regional and local conditions. The EU's Best Available Techniques (BAT) Reference Documents have limits for



Our wood-based biocomposites offer a bio-based alternative to fossil-based plastics and can reduce a product's CO₂ footprint by up to 80%.

In 2018, Stora Enso became a signatory to the New Plastics Economy Global Commitment, led by the Ellen MacArthur Foundation.

@storaenso June 5



Did you know that there is a sustainable alternative to fossil-based plastics? The journey towards a plastic free world has started. #BeatPlasticPollution #WorldEnvironmentDay #Biocomposites #whata treecando <https://youtu.be/KICxh2sx8Kk>

effluents and emissions to air, and the BAT conclusions for pulp and paper, as well as medium and large combustion plants apply to board, pulp, paper, and sawmills in Europe. The related investments are proactively planned as part of Group investment processes. These investments fit into Stora Enso's normal capital expenditure framework and policy.

Contributing to the circular bioeconomy

Stora Enso works proactively to support the transition towards a global circular bioeconomy. We minimise waste and resource use and aim to maintain the value of products and materials for as long as possible through product design, innovation and recycling. When a material or product has reached its end-of-life, we promote recycling and energy recovery to create further value.

In 2018, Stora Enso became a signatory to the New Plastics Economy Global Commitment led by the Ellen MacArthur Foundation, in collaboration with UN Environment.

As a founding board member of WBCSD's circular economy initiative, Factor10, we worked to develop forward-looking policy recommendations and pilot metrics for our material flows in the circular economy. Stora Enso also launched a platform to increase recycling throughout Europe together with other members of the Alliance for Beverage Cartons and the Environment (ACE).

Value from waste and residuals

In addition to our traditional products as well as lignin, tall oil, turpentine and energy pellets, Stora Enso's production processes generate various residuals and wastes, including ash, sawdust, bark, and wastewater treatment sludge. Many of these materials are used in our internal bioenergy generation and pulp production, or supplied to partners to be used in applications such as agriculture, or land and road construction. We are constantly innovating to improve resource efficiency and make profitable use of material streams that would otherwise end up as waste.

We ensure that hazardous waste is safely processed at suitable facilities, and we report on hazardous waste disposal in accordance with relevant regulations. Our third-party certified ISO 14001 systems comprise of on-site management procedures for handling chemicals and waste at our mills. Expertise and best practices related to optimising material streams are shared within Stora Enso by networks focusing on the environment, materials, Paper for Recycling, chemical safety, and product safety.

Stora Enso's long-term circular economy vision is to maximise the value of material streams, and work towards zero process waste. We will achieve this by emphasising circular material flows in our value chain and by maximising the net value of waste and residuals while reducing waste to landfill to as close to zero, whenever legally, technically and commercially possible.

During 2018, we continued to monitor our financial value creation from process waste and residuals and commercialise new product applications.

Paper for Recycling

Wood and fibre are the main raw materials in Stora Enso's production processes. Materials made with virgin fibre are used for products with special safety requirements such as food packaging and pharmaceuticals. For more information about our wood procurement, see page 51.

Virgin fibre is needed in the paper recycling process. After several recycling rounds, paper fibres become too short to be reused but can be burned for bioenergy, which drives the need for new virgin fibre. Stora Enso also uses paper for recycling (PfR) wherever it makes environmental and economic sense. 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 (55%). Recovered board is used to make specific containerboard grades at Ostrolęka Mill in Poland (90% of fibre sourced for containerboard production) and at Varkaus Mill in Finland.

Through cooperation with local authorities and waste management companies, and our own collection facilities, we secure sufficient PfR from industrial, commercial and domestic sources. In Poland, we own and manage a network of 21 depots where PfR is collected and baled for transportation to our Ostrolęka Mill.

According to the Confederation of European Paper Industries (CEPI), Europe's overall PfR collection rate has been high for many years. In 2017, the rate was 72.3%, which is equivalent to 57 million tonnes of PfR (+1.2% compared to 2016). This is a noteworthy achievement as not all paper can currently be recycled, such as tissue paper. While overall collection rates within the EU are relatively high, certain central and southern European countries still have potential to improve. Focusing on EU countries with collection rates below 60%, Stora Enso and the paper industry are actively supporting best practices while these countries establish sustainable collection systems.

Responsible water use

Production at Stora Enso's mills requires large amounts of water. However, only around 4% is consumed in our production processes while almost 96% is recycled and 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.


Our strategic approach to water stewardship builds upon six pillars:


- assessment of conditions in mills and water basins where we operate,
- setting ambitious levels and goals,
- investments,
- mill water use mapping to identify saving potential,
- performance measurement, and
- communication and engagement with stakeholders.

Stora Enso withdraws 98.8% of its total water from surface water, 1.1% from municipal sources and 0.1% from groundwater. We have applied the Global Water Tool devised by WBCSD to assess the

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.

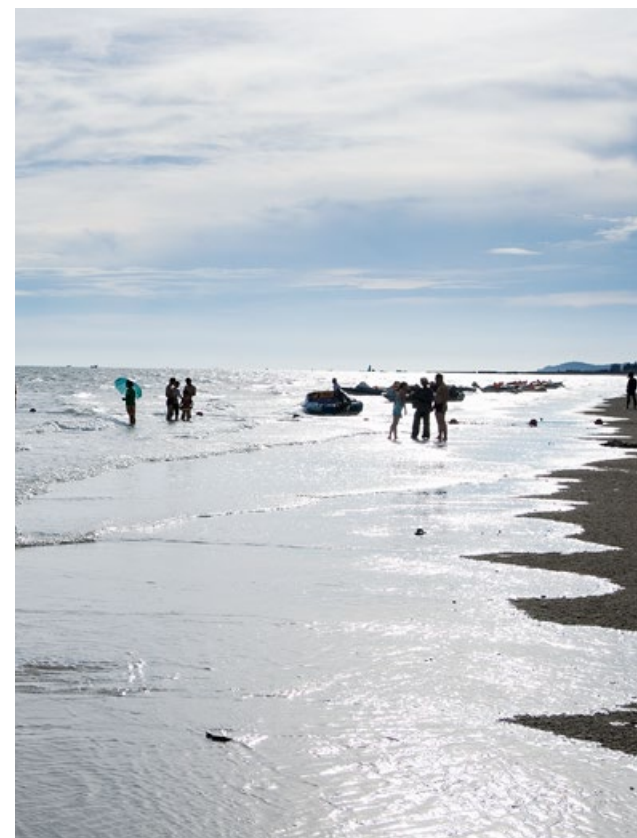
 Some **4%** of the water we withdraw is consumed in our production.

related risks at our production units. The assessment identified five mills operating in water basins where water stress occurs. It also calculated the total proportion of our water withdrawn from water-stressed basins to be 2%.

As a public commitment to water resource management and the development of sustainable water strategies, Stora Enso signed the United Nations Global Compact's CEO Water Mandate in 2009. We actively follow the latest water footprint methodology developed by researchers and standardisation bodies. In 2018, we also signed the Finnish Water Stewardship Commitment.

In 2018, we transparently disclosed our water-related strategies and performance to CDP Water (score of B-).

Our strategic water goals are to reduce impacts on water use, to minimise impacts on quality, and to recycle water within mills when possible to reduce the need for water intake. Our Group targets are to



Safeguarding marine environments at Beihai Mill

Stora Enso's Beihai board mill in Guangxi province is located beside the South China Sea. Having industrial production so close to the sea shore requires special considerations for the marine environment, especially since large amounts of water are circulated in the mill's production and cooling processes.

"The vast majority of the water we use is released back into the environment – to the sea – after being carefully purified," says Mill Manager **Weiyang Zhu**. "The water we release to the sea is significantly cleaner than the sea water, and we even have tilapia fish living in the discharge pond."

Read the full article at storaenso.com/sustainability

decrease both total water withdrawal and process water discharges. Quantified water targets are always set based on the local context as part of our mill environmental management systems to drive continuous improvement.

Approximately 2% of our water use is recycled internally by reusing cooling and non-contact water as process water. Optimising our water use also reduces the need for water pumping and heating, which creates energy savings and makes the purification of the remaining wastewater more efficient.

We continue to explore the potential to use refined wastewater residue in new products. For example, our Skoghall Mill in Sweden is working together with the University of Karlstad to use wastewater residues to create bio-based products such as bioplastics and hydrogen gas from biosludge. Several Stora Enso mills in Sweden are involved in a research programme led by the independent research foundation Mistra in cooperation with the mining industry to refine other challenging residuals such as green liquor dregs and lime mud.

Long-term energy supply contracts

Board, pulp, and paper production processes are the most energy-intensive phases in Stora Enso's value chain, which makes it essential for our mills to 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 **Financials 2018** (Note 14).

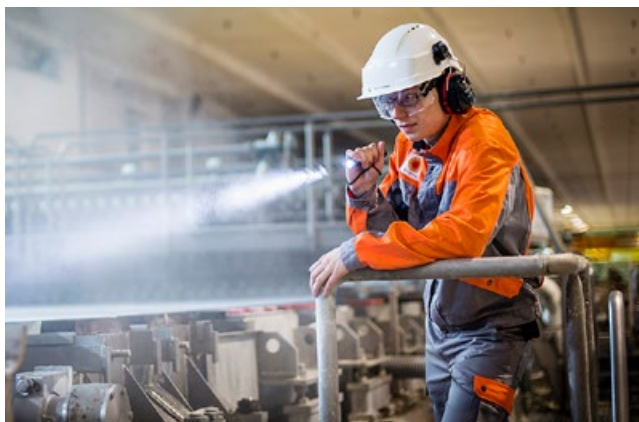
Stora Enso is committed to continuous improvement in energy efficiency and energy self-sufficiency. We always assess the opportunities to use fuels from biomass residual streams or other low-carbon options in connection with energy investments.

Structured approach to energy management

Stora Enso's Energy Services team is responsible for procuring energy and managing the implementation of our energy strategy. This work involves the hedging of energy prices, managing the trading of emission rights, consulting our mills on a wide range of energy topics, trading in green certificates, and monitoring our carbon dioxide allowance balance. We also monitor and contribute to developments in energy legislation.

The biomass residue streams used for energy within Stora Enso's operations is mainly purchased by our Wood Supply organisation, whereas each mill is individually responsible for the procurement of most 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.

We continue to explore the potential of using refined wastewater residue in new products.



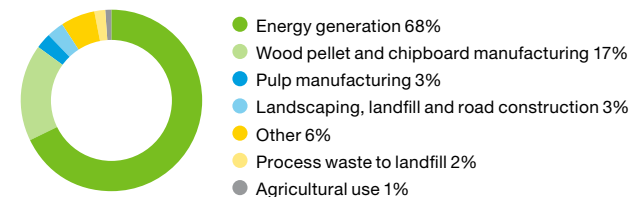
Always be better: finding new ways to save energy

Energy efficiency doesn't happen on its own. People make it happen by always looking for ways to make our processes, tools, and ways of working better. At Anjala Mill, a new innovation will save 50 000 MWh in energy and 5 000 tonnes in CO₂ emissions every year.

"We need to use a lot of electricity to ensure a steady production of paper and board, so direct reductions in electricity use are challenging," says **Risto Mänttari**, Engineering Manager at the mill. "But we've found many ways to be more energy efficient."

Read the full article at storaenso.com/sustainability

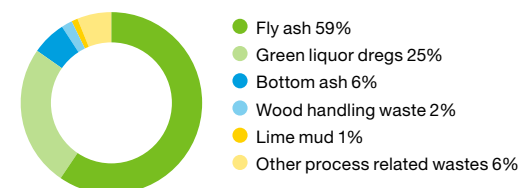
Utilisation of process waste and residual materials¹



¹ Covers all Stora Enso production units, as dry tonnes. Excluding joint operations.

Process waste to landfill¹

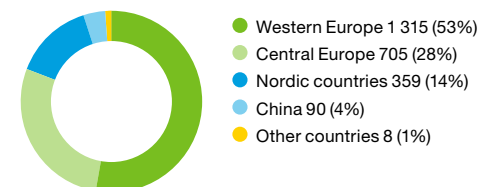
68 615 tonnes



¹ Covers all Stora Enso production units. Excluding joint operations. In addition to process waste to landfill, Stora Enso's production units created a total of 1 990 tonnes of non-process waste, and 70 971 tonnes of process waste was sent to on-site storage facilities.

Paper for Recycling: procurement by origin

Thousand tonnes¹



¹ Total amounts of Paper for Recycling (recovered paper and board) procured within these regions for delivery to our mills.

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

Progress

Materials

Value from waste

Stora Enso's utilisation rate for process residuals and waste across the Group includes internal and external uses amounted to 98% in 2018 (98% in 2017). During the year, Stora Enso's revenue from residuals amounted to EUR 34 million (EUR 26 million in 2017). We continued the commercialisation and product development applications for fly ash from several paper mills. One example of circularity from our Paper division is the beneficial use of fly ash at Oulu Mill in Finland. Annually 15 000 tons of fly ash from the solid fuel boiler is granulated onsite at Rakeistus Oy's granulation plant. The granules are used as natural fertiliser in the forests in the vicinity of the town of Oulu. The financial yearly savings compared to landfill are approximately EUR 0.8 million.

Hazardous waste

During 2018, Stora Enso's production units generated a total of 5 229 tonnes of hazardous waste, up from 3 858 tonnes in 2017. This waste includes oils, solvents, paints, laboratory chemicals, and batteries. In addition, 8 309 tonnes of sludge classified as hazardous waste was generated at the disused Falun copper mine in Sweden (16 276 tonnes).

Paper for Recycling

Stora Enso used 2.5 million tonnes of paper for recycling (PfR) in 2018 (2.5 million tonnes), making us one of the largest PfR consumers in Europe. The PfR utilisation rate in our paper and board production was 26% (26%).

Chemical safety management

During 2018, Stora Enso started to roll out Group-wide Chemicals Management Instructions, which outline the minimum requirements for all our units globally, including occupational health and safety and environmental safety. During the year, we identified the properties of chemicals that need restricted use or should be replaced. To further improve chemical safety, we have implemented new routines to help us share learnings between all divisions. Compliance with the instructions will be verified in 2019 as part of our Safety Toolbox and management system audits.

Water

Promoting water efficiency

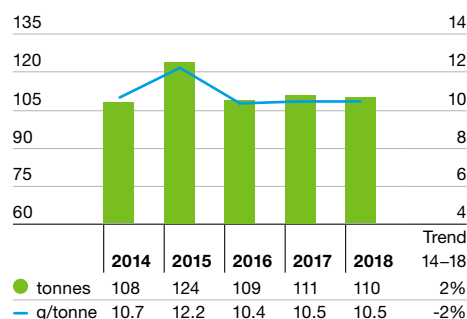
We continued to identify mill-specific water-related challenges and opportunities in 2018. The work focused on assessing water efficiency activities at Imatra, Sunila, and Enocell Mills in Finland.

A good example of achieved combined heat and water savings in 2018 was a project at our Anjala Mill in Finland, where investments were made to improve hood ventilation, heat balance, and water balance. The objective was to save natural gas, replace fresh steam with recovered heat energy, and reduce fresh water consumption. The achieved energy savings amounted to 35 GWh/year and, and water savings 1.4 million m³/year. Efficiency work will continue at other mills in 2019 as part of our approach to define business cases in water and energy stewardship.



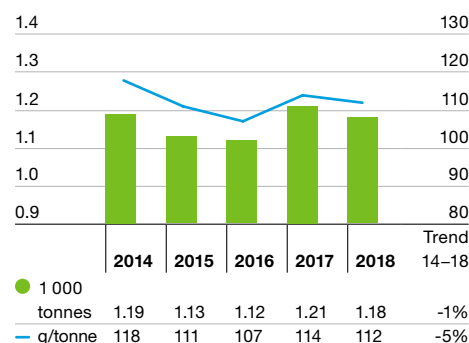
Lignin-based products, such as Lineo™ by Stora Enso, can be used as non-toxic, renewable alternatives to fossil-based materials.

Phosphorus¹



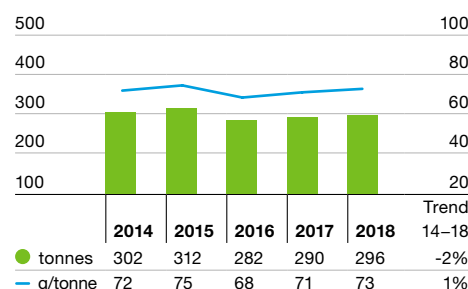
¹ Figures cover board, pulp, and paper production units. Excluding joint operations. Normalised figures are reported per unit of sales production.

Nitrogen¹



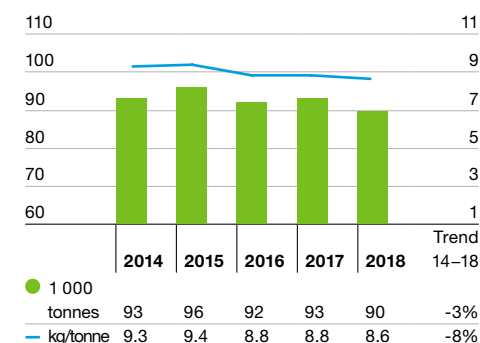
¹ Figures cover board, pulp, and paper production units. Excluding joint operations. Normalised figures are reported per unit of sales production.

Absorbable organic halogen compounds (AOX)¹



¹ Figures from bleached chemical pulp production units only. Excluding joint operations. Normalised figures are reported per unit of bleached chemical pulp production.

Chemical oxygen demand (COD)¹



¹ Figures cover board, pulp, and paper production units. Excluding joint operations. Normalised figures are reported per unit of sales production.

Several mills experienced water stress situations related to water availability and cooling capacities due to the unusually long, warm, and dry summer season in northern Europe. The most severe situation occurred at Nymölla Mill in Sweden. The mill was forced to close production on one pulp line and one paper machine in October due to extremely low water levels in the Lake Ivö, which supplies water for mill operations.

Our EUR 25 million investment at Maxau Mill in Germany to install a new steam turbine with a closed-loop cooling system and additional biomass storage is expected to be completed in 2020. The cooling system will relieve pressure on the Rhine River through a lower thermal output and by withdrawing considerably less water.

Stora Enso and energy company Gasum signed a contract in 2018 to build a biogas plant at Stora Enso's Nymölla Mill in Sweden. The plant, built and operated by Gasum, will turn the mill's wastewater effluent into renewable energy.

The objective of our KPIs on total water withdrawal and process water discharges is to drive a downward trend from our 2016 baselines of 57 m³ and 27 m³ per saleable tonne, respectively. In 2018, our total water withdrawal was 56 m³ per saleable tonne (56 in 2017) and our process water discharges amounted to 26 m³ per saleable tonne (26 in 2017).

Effluents to water

The wastewater treatment facilities treating process water from our production processes release effluents to water. These effluents include phosphorus (P), nitrogen (N), chemical oxygen demand substances (COD), and absorbable organic halogen compounds (AOX). The wastewater treatment facilities ensure that discharged water is ecologically safe. The discharge of process water that has not been properly treated can contribute to local environmental impacts. Excessive concentrations of phosphorus compounds in water, together with nitrogen compounds and organic substances, can lead to increased biological activity in natural watercourses through eutrophication. AOX is a collective term for the amount of chlorine or other halogens bound to organic matter such as wastewater. In 2018, Stora Enso's Group-wide nitrogen effluents to water amounted to 1 180 tonnes (1 210 tonnes), phosphorus effluents to 110 tonnes (112 tonnes), and AOX to 300 tonnes (297 tonnes).

In 2018, Stora Enso announced the EUR 22 million investment in wastewater treatment improvements at Skoghall Mill in Sweden. The investment will reduce the effluents of COD and total suspended solids, including remaining low effluents of nitrogen and phosphorus being discharged into Lake Vänern. The investment, consisting of rebuilding the biological water treatment process including extended pre-sedimentation, will be completed in 2020.

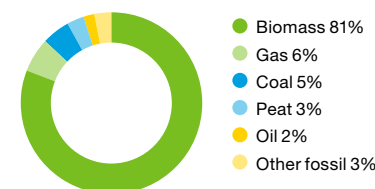
Energy

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 2018, this indicator was 4.2% lower than the 2010 baseline (4.2% in 2017). Specific energy consumption has been reduced by structural factors such as production line closure or conversion to new products in



In 2018, we assessed water efficiency activities at three Finnish mills.

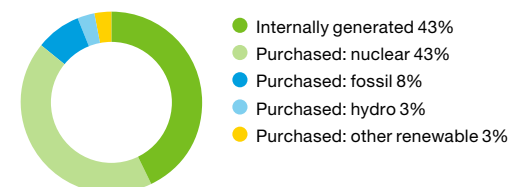
Fuels¹



Our total annual fuel consumption was 153 862 terajoules (TJ) in 2018 (150 864 TJ in 2017). 1 TJ = 10¹² joules

¹ Figures cover board, pulp, and paper production units. Excluding joint operations.

Electricity¹



During 2018 we generated and purchased 12.6 terawatt hours (TWh) of electricity and consumed 12.3 TWh (12.8 and 12.4 during 2017). 0.3 TWh was sold (0.4). TWh (terawatt hour) = 10⁹ kilowatt hours.

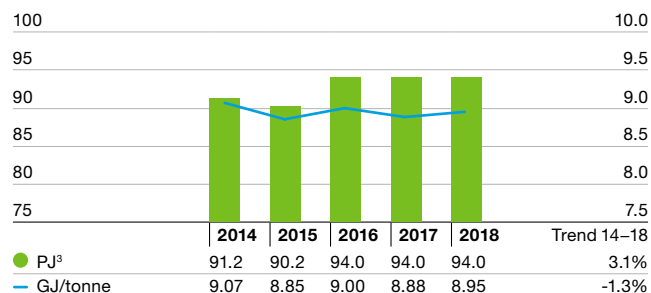
¹ Figures cover board, pulp, and paper production units. Excluding joint operations. Electricity from Pohjolan Voima Oy (PVO) included in purchased electricity.

Water withdrawal and consumption¹

Million m³	2014	2015	2016	2017	2018	Trend 14–18
Process water	287	306	297	291	291	1%
Cooling water (net)	323	283	301	304	297	-8%
Total water withdrawal	610	589	598	595	587	-4%
m³/tonne	61	58	57	56	56	-8%
Water consumption	25	23	23	25	23	-7%
m³/tonne	2.5	2.2	2.2	2.3	2.2	-12%
Process water discharges	266	272	280	272	273	3%
m³/tonne	27	27	27	26	26	-2%

¹ Figures from board, pulp, and paper production units. Normalised figures are reported per unit of sales production.

Heat consumption^{1,2}



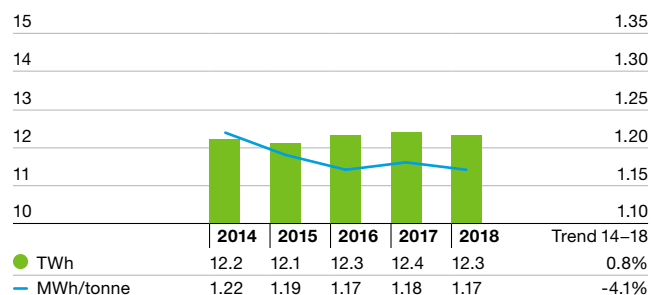
¹ Figures cover board, pulp, and paper production units. Excluding joint operations.

Normalised figures are reported per unit of sales production.

² Excluding heat used for electricity generation.

³ 1 PJ = 10¹⁵ joules.

Electricity consumption¹



¹ Figures cover board, pulp, and paper production units. Excluding joint operations.

Normalised figures are reported per unit of sales production.

In 2018, EUR 10 million were earmarked for energy efficiency investment projects at our mills.

our mills, as well as product portfolio choices and operational issues on production lines. Stora Enso's science-based target is to reduce greenhouse gas emissions from our operations by 31% per tonne of board, pulp, and paper produced by 2030 from the 2010 baseline. For more information, see page 46.

In 2018, our total energy self-sufficiency rate¹ was 63% (63%). The share of biomass in our internal energy production was 81% (82%). During the year, our electricity self-sufficiency level¹ was 44% (43%).

Approximately 86% (86%) of our purchased electricity¹ was generated from low-fossil carbon sources, including nuclear and renewable energy. Existing contracts and our internal electricity generation capacity are estimated to cover around 77% of our needs for the next five years (80% in 2017). Energy accounted for 10% of Stora Enso's variable costs in 2018 (10% in 2017).

Energy efficiency high on the agenda

Stora Enso continued to enhance energy efficiency throughout the Group's operations in 2018. Six sawmills received ISO 50001 energy management certification during the year: Imavere, Näpi, Launkalne, Amsterdam, Murow, and Hylte. All Stora Enso's sawmills are now certified to ISO 50001. Our Beihai Mill also received ISO 50001 energy management certification in 2018.

We are committed to the voluntary Energy Intensive Industries Agreement managed by Finnish Forest Industries (FFI), which aims at a national 4% energy use reduction among its signatories between 2017 and 2020, and a 3.5% reduction (cumulative, in MWh) during 2021–2025.

We also participate in national groups that share industry best practices on energy efficiency in Finland, and promote energy efficiency at our most energy intensive mills.

We actively seek ways to optimise fuel use and increase the proportion of biomass in our energy production. The plan to install a new steam turbine with a closed-loop cooling system and additional biomass storage at our Maxau Mill in Germany is a significant step towards this goal. The investment contributes to Stora Enso's carbon neutral roadmap and science-based targets through a higher proportion of biomass and greater efficiency, which is expected to result in savings of over 50 000 tonnes of CO₂ emissions every year.

In 2018, we also invested in a new turbine at Hylte Mill in Sweden. The turbine will improve the mill's energy efficiency and electricity self-sufficiency.

Stora Enso's energy efficiency fund

Stora Enso's central energy efficiency investment fund is another important part of our work. In 2018, this fund amounted to EUR 10 million (EUR 10 million in 2017) and was earmarked for energy efficiency investment projects at our mills. The fund had financed 55 (28) projects by year-end, including LED lighting projects at 14 units, the Ostrołęka power plant controlling project, and a new energy-efficient method of producing mechanical pulp at our Anjala Mill. When fully implemented, the projects financed in 2018 are estimated to generate annual energy savings of at least 259 GWh (73 GWh electricity and 186 GWh heat). These figures are equivalent to 0.6% of our annual



We always assess the opportunities to use fuels from biomass residual streams.

electricity consumption and 0.6% of our annual heat consumption. The projects are estimated to eliminate over 16 000 tonnes of annual direct fossil CO₂ emissions.

Emissions to air

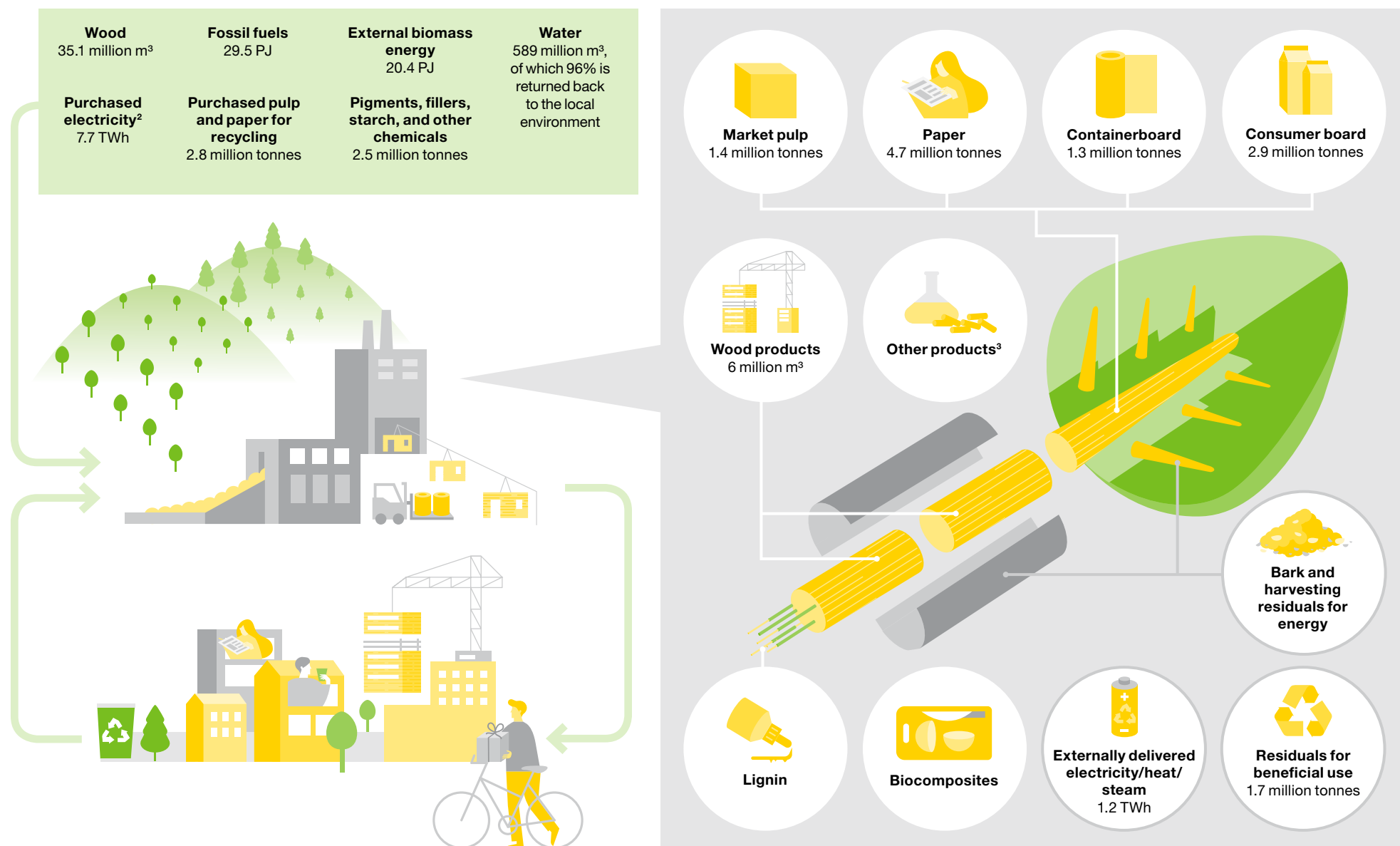
Our atmospheric emissions primarily result from the combustion of fuels used to generate energy. These emissions include carbon dioxide (CO₂), sulphur dioxide (SO₂), nitrogen oxides (NO_x), and fine particles. When not properly managed, CO₂ contributes to global warming while SO₂ and NO_x emissions affect air quality and cause acid rain and soil acidification. We work to reduce our air emissions by using more renewable energy, improving energy efficiency, and using advanced technologies such as scrubbers and boiler process control systems.

In 2018, Stora Enso completed the EUR 14 million investment at Imatra Mills to replace and modernise its odorous gas treatment system including a new boiler. The new boiler went into operation in 2017 and is estimated to reduce the boiler's NO_x and SO₂ emissions by 10%. Air quality in the surrounding residential areas has improved and measurements have shown that the number of hours with traces of malodorous gases in the air has been reduced.

In 2018, Stora Enso's Group-wide SO₂ emissions amounted to 2 900 tonnes (3 030 tonnes in 2017), NO_x emissions totalled 10 840 tonnes (10 920 tonnes), and emissions of fine particles amounted to 1 740 tonnes (2 190 tonnes).

¹ Electricity from Pohjolan Voima Oy (PVO), where Stora Enso is a minority shareholder, is considered purchased electricity in the energy consumption figures.

Efficient use of materials in circular bioeconomy¹



¹ Covers all Stora Enso production units. Excluding joint operations. The illustration shows the key materials used in our processes, together with our production figures as reported in our environmental reporting system. For a comprehensive illustration on how we create value see our Strategy 2018. ² Electricity from PVO included in purchased electricity. ³ Other products include mainly pellets, wood chips, tall oil and turpentine.

Environmental incidents in 2018

During 2018, Stora Enso continued to develop the procedures for effective Group-wide reporting and management of environmental incidents at our production units. The list below gives details of environmental incidents involving a non-compliance with environmental legislation or permit, or a significant stakeholder concern related to environmental performance.

Unit	Incident	Corrective actions
Anjala/Ingerois mill integrate	The mill's daily COD limits during March and annual Chemical Oxygen Demand (COD) and phosphorus effluent limits were exceeded. This was due to a mechanical malfunction in the bio-sludge thickener and increased bio-sludge content in the wastewater treatment plant. The authorities were regularly informed and there was no environmental impact in the receiving waters.	The mechanical malfunction was repaired, and the wastewater treatment process was optimized. The recovery of the bio-sludge and activated sludge process took a few months to complete. Process performance was improved by using an online database control system utilising predictive analytics and simulation.
Heinola Fluting Mill	The mill's monthly limits for effluent containing COD, biological oxygen demand (BOD) and phosphorus were exceeded in May during the start-up of the mill and wastewater treatment plant after a longer than normal investment shutdown. There was no environmental impact in the receiving water. The mill's annual limit for diffuse sulphur dioxide (SO ₂) was exceeded. This was due to malfunctioning recovery plant absorption tower equipment.	Actions were taken to decrease the load into the treatment plant to speed up and support its recovery. Corrective actions were taken related to new alarm limits set in the factory system. Investigation of the case was initiated.
Enocell Mill	The mill's monthly limit for effluent containing phosphorus was exceeded in July and August due to a combination of phosphorus in the incoming effluent during the summer and improper operation of the sludge treatment. The environmental impact was not significant.	Corrective actions were taken related to sludge dewatering and chemicals were added to precipitate phosphorus.
Skutskär Mill	Pitch oil from the pulp production process was accidentally discharged to clean water effluent in the port basin during October. During start-up after a maintenance stop the preheater for pitch oil to the lime kilns broke due to high pressure in the preheater. The environmental permit was not breached as effluent was kept within the permit limit for suspended solids. Part of the oil leaked from the port basin to the Baltic sea where small amounts landed in shores and island in Gävle archipelago. Pitch oil is not toxic or dangerous to the environment, but it is sticky in texture and can cause problems for sea life.	Troubleshooting and cleaning measures were started immediately upon detection. The removal of pitch oil from the port basin and the sea, beaches and islands in the bay of Gävle outside the mill was finalised during November. Preventive actions have been taken and procedures were reviewed to make sure the incident will not happen again.
Sunila Mill	The dust emission permit limit was exceeded at one recovery boiler in April and November.	Rebuild of existing equipment will be made in spring 2019. Option for additional rebuild or installation of new equipment may be planned for the 2020 maintenance stop.



Carbon dioxide

We combat global warming with renewable materials, resource and energy efficient production processes, and sustainable forest management.



Our CO₂e emissions were

18% lower

than the 2010 base-year level

Opportunities and challenges

Contributing to a low-carbon economy

Global warming is one of the greatest challenges of our time. Stora Enso and the forest industry have an opportunity not only to contribute, but to pioneer the transition to a fossil-free, sustainable world. As a leading renewable materials company with access to carbon neutral biomass, we are in a unique position to combat global warming. The use of renewable materials enables us to contribute towards a low-carbon economy. Trees in sustainably managed forests absorb carbon dioxide (CO₂) from the atmosphere and together with wood-based products act as carbon storage. Our products help our customers and society at large to reduce CO₂ 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 2015 and entered into force in November 2016. Ahead of COP21, Stora Enso signed a pledge to combat global warming with science-based reduction targets for greenhouse gas (GHG) emissions. In December 2017, we became the first forest products company to have their climate targets approved by the Science Based Targets initiative. Our ambitious targets, which address significant emissions throughout our value chain, were announced in early January 2018 and are well below the 2°C limit set by the Paris Agreement.

The Science Based Targets initiative is a collaboration between CDP, World Resources Institute (WRI), the World Wide Fund for Nature (WWF), and the United Nations Global Compact (UNGC). It is also one of the commitments of the We Mean Business Coalition to drive ambitious corporate climate actions.

Growing trees in sustainably managed forests absorb CO₂ from the atmosphere.

The Intergovernmental Panel on Climate Change (IPCC) released a special report in 2018. The report states that the Paris Agreement is not enough to keep global average temperatures well below 2°C and close to 1.5°C. Due to the IPCC report, target setting criteria for SBTs will most likely change. When launched in 2019 by the SBT Initiative, we will review our approved science-based targets to assess what more we can do.

The EU's Emissions Trading System (ETS) is the largest 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 outside the EU with less demanding requirements. The EU forest industry currently has carbon leakage status for the period 2015–2019. It will continue to enjoy this status for the recently agreed 2021–2030 period.

The number of free emission allowances will be reduced gradually in the next trading period. This has already led to increased emissions allowance costs during 2018.

In late 2018, the European Commission presented its strategy for a carbon neutral EU by 2050. The strategy relies on the circular economy, natural carbon sinks, and lifestyle changes and suggests emission cuts from all main sectors including power generation, industry, transport, buildings, construction, and agriculture. As an overall ambition level, it states that by 2050, the EU should achieve net zero greenhouse gas emissions, with an unchanged milestone of a 40% reduction by 2030 compared to 1990 levels. The role of a competitive EU industry is considered a key enabler in the strategy, and it specifically refers to reaping the full benefits of the bioeconomy. The strategy will be discussed during 2019 and should be adopted in early 2020.



Our science-based targets have been informed by the Intergovernmental Panel on the Climate Change (IPCC) to keep global average temperatures well below 2°C.

Our policies

Comprehensive carbon strategy

Agreed in 2016, our carbon strategy states that it is our firm intention to drive down our fossil fuel use, so that we get as close to zero as possible within a decade using technically and commercially feasible means. Relevant policies guiding and steering our efforts to combat global warming include our:

- **Policy for Energy and Carbon**
- **Environmental Guidelines** – a more comprehensive overview of our policy objectives and how we work to achieve them.
- **Supplier Code of Conduct and Practical Guide for Suppliers** – guides us on how CO₂ emissions can be reduced in our supply chain.

How we work

Scenario-driven work

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. We measure our progress to reduce greenhouse gas (GHG) emissions as a key performance indicator (KPI). Stora Enso's science-based target is to reduce greenhouse gas (GHG) emissions from our operations by 31% per tonne of pulp, paper and board produced by 2030 compared with the 2010 base-year. We report on our progress in our Sustainability report and quarterly Interim Reports.

Our science-based targets have been informed by the Intergovernmental Panel on Climate Change (IPCC) well below 2 °C scenario and the Sectoral Decarbonisation Approach, which is a method for setting corporate emission reduction targets in line with climate science. A key tool in the scenario assessment and the establishment of reduction targets was the Stora Enso Carbon Neutrality Roadmap, which guides our long and short-term fossil CO₂ reduction actions. Read more about our actions in the Progress section of this chapter.

Improving our energy efficiency

Greenhouse gases emitted by our operations include carbon dioxide, methane and nitrous oxide – with carbon dioxide being by far the most significant. The most effective ways to reduce our direct fossil CO₂ emissions are to further improve our energy efficiency, and to continue to increase our use of biomass fuels. Significant investments in recent years, particularly in multi-fuel boilers, have achieved large reductions in our fossil CO₂ intensity.

Evaluating risks and opportunities

A proactive approach to decreasing our dependency on fossil fuels and reducing our direct and indirect fossil CO₂ emissions creates new business opportunities and helps us to manage costs and risks. Stora Enso evaluates the risks and opportunities related to global warming through its annual Enterprise Risk Management (ERM) process, which forms an integral part of the Group's management approach (for more details see our **Financials 2018**). We routinely

calculate the financial impacts of potential cost increases in relation to emission allowances, including the impacts of possible 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.

The Financial Stability Board's (FSB) Task Force on Climate-related Financial Disclosures (TCFD) recommends a framework for disclosing climate related risks and opportunities that goes beyond current practices. The TCFD recommendations respond to a growing demand for improved financial disclosures from companies in relation to climate risks. In addition to investors and regulators, leading companies are also communicating their support for the recommendations through

Statements of Support by Accounting for Sustainability (A4S). In 2018, Stora Enso's CFO signed an A4S Statement of Support to promote better disclosure of climate risks and opportunities.

Detailed carbon reporting

We publicly report on our greenhouse gas emissions in three categories:

- Carbon dioxide equivalent (CO₂e) 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).
- CO₂e emissions related to the electricity and heat we purchase externally for use in our operations (Scope 2).
- Estimated CO₂e emissions from other indirect sources along our value chain (Scope 3).

All our units report quarterly on carbon emissions for Scopes 1 and 2. A Group-level estimate for Scope 3 emissions is updated biannually. Our carbon footprint accounting is based on guidelines provided by the Greenhouse Gas Protocol of the World Resource Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). In 2018, we continued to have the reporting of our direct and indirect CO₂e emissions (Scopes 1 and 2) externally assured to a Reasonable Level – as one of the few companies in the world to do so. For more details, see page 72.

External recognition and partnerships to combat global warming

In November 2018, Stora Enso was top-ranked in greenhouse gas management for the second time in a row. The Transition Pathway Initiative (TPI) is an asset owner-led initiative supported by Grantham



A wooden home grows back

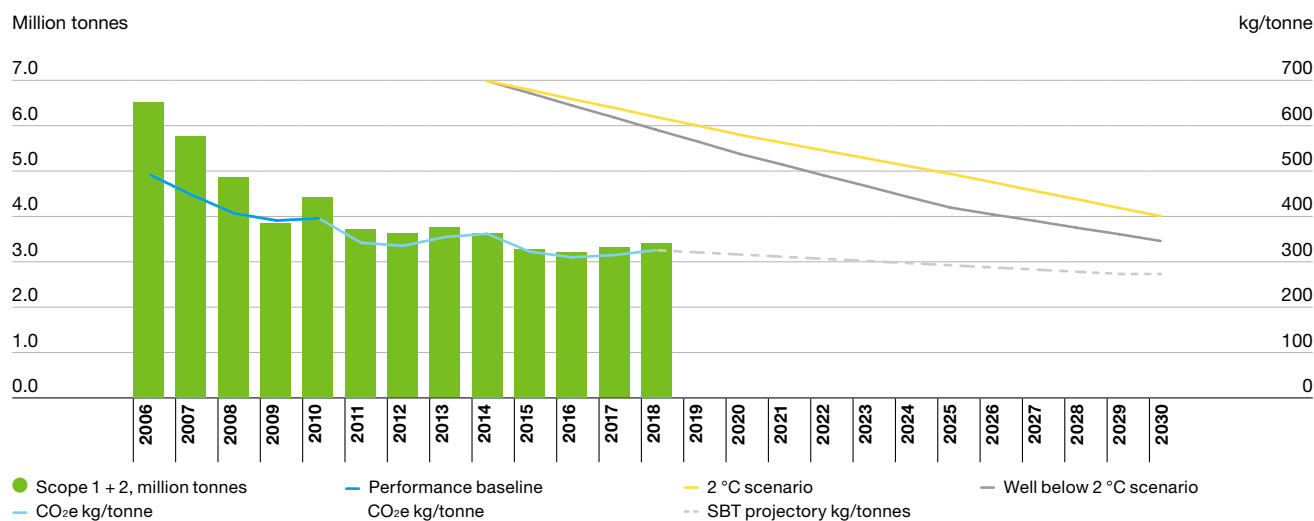
When you think of a wooden house, what do you see? Many of us will imagine a small wooden cabin, or possibly a quaint old house in the countryside, undisturbed by the modern world. But a wooden home has many faces.

“Concrete, steel, and bricks represent between 8–15% of global greenhouse gas emissions so when we can replace or complement non-renewable construction materials with renewable wood, we are combatting global warming,” says **Mathieu Robert**, Head of Building Solutions business at Stora Enso. “Wooden homes store carbon for decades, or even centuries. Wood is recyclable like many other materials, but recyclability is no longer enough – wood is the only major construction material that is also renewable.”

Read the full article at storaenso.com/sustainability

Stora Enso's GHG performance¹ and scenarios for forest industry²

Greenhouse gas emissions (GHG) in relation to production



Scope 1 + 2	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ⁴	2017 ^{4,5}	2018 ⁴	Target 2030
Million tonnes	6.52	5.78	4.86	3.85	4.42	3.72	3.62	3.75	3.63	3.27	3.21	3.31	3.41	
kg/tonne	494	448	407	391	396	341	334	354	361	321	308	313	324	273

¹ Covering direct and indirect emissions as fossil CO₂ equivalents (scope 1 and 2) from board, pulp, paper, and corrugated production units. Excluding joint operations. Normalised figures are reported per unit of sales production.

² GHG reduction pathways for 2°C scenario and well below 2°C scenarios based on information from the Transition Pathway Initiative (TPI)* including scenarios data from the Energy Technology Perspectives report by the International Energy Agency.

³ CO₂e emissions data from our operations (scope 1+2) have been verified at reasonable assurance level since 2015 and calculated according to the GHG protocol and GHG Scope 2 guidance.

⁴ Adversely affected by the coal-based energy consumption at our Beihai Mill in China.

⁵ Historical figures recalculated due to accuracy improvements.

* Asset owner-led initiative supported by Grantham Research Institute and London School of Economics.

SBT= Science-based target

Research Institute and London School of Economics. It evaluates and tracks the quality of a company's management of greenhouse gas emissions and of risks and opportunities related to the low-carbon transition. It also evaluates how a company's future carbon performance would compare to the international targets and national pledges made as part of the Paris Agreement. In its assessment of how 18 of the largest paper producers globally are preparing for the transition to a low-carbon economy, TPI top-ranked Stora Enso in both management quality and carbon performance. Stora Enso was the only company that both ranked on the highest possible level in management quality and had an emissions reduction target set until 2030, aligned with keeping the global temperature rise below 2°C.

Stora Enso was top-rated in combatting global warming by the international non-profit organisation CDP. Stora Enso was included on CDP's new 2018 Climate A List, which identifies the global companies that are taking leadership in climate action.

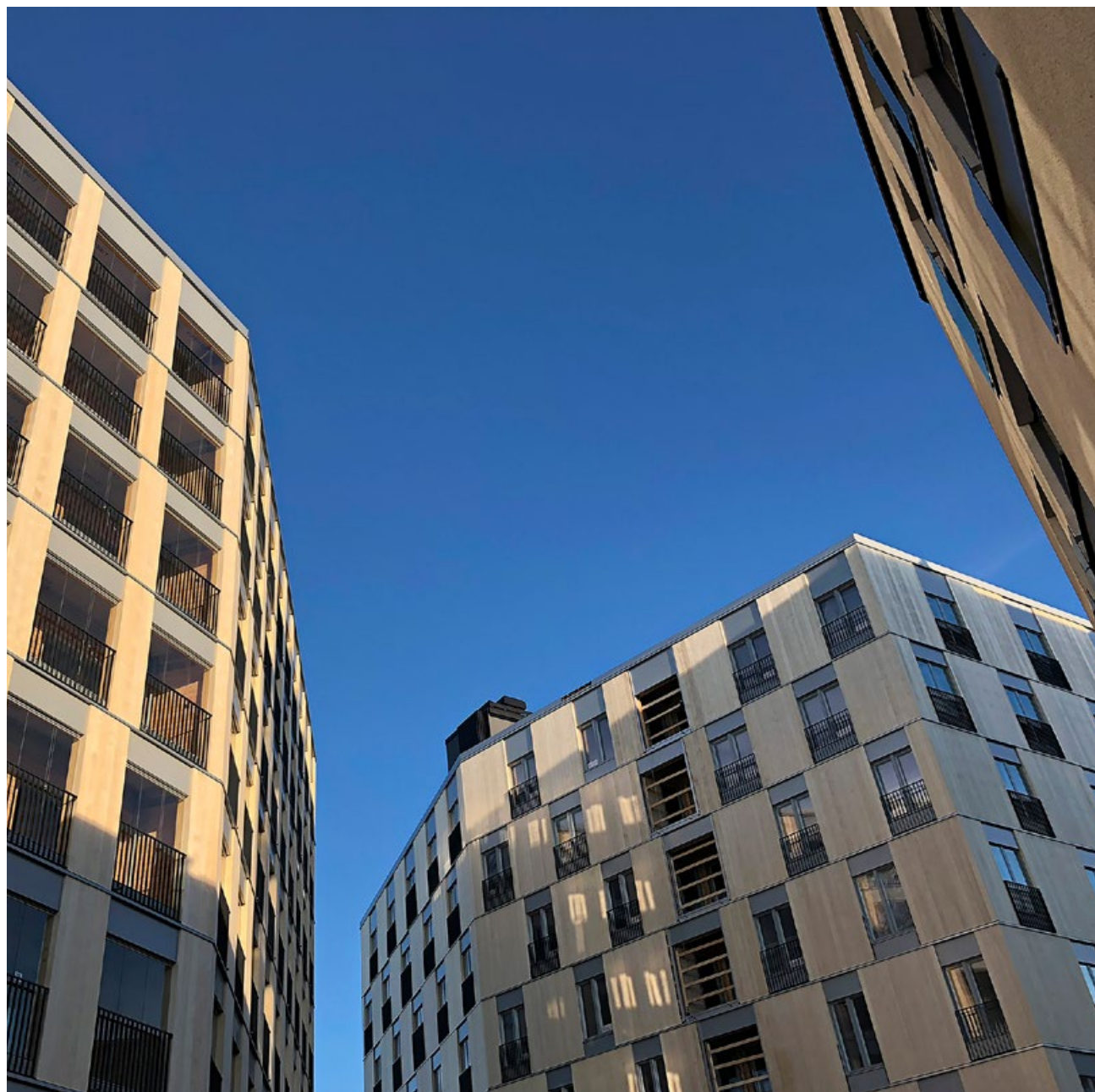
Stora Enso endorses the Corporate Leaders Group (CLG) policy statement on net-zero strategies. The CLG brings together European business leaders to accelerate progress towards a low-carbon, sustainable economy.

Stora Enso is a member of the We Mean Business coalition. The coalition brings together non-profit organisations, businesses, and investors who recognise that transitioning to a low-carbon economy is the only way to secure sustainable economic growth.



“The world should be seeking to half greenhouse gas emissions in little more than a decade and reach net zero around 2050. Stora Enso has demonstrated that it is committed to acting on this challenge – setting science-based targets and showing real commitments to action. They are also looking at what such a comprehensive change to our economy means for them and their business in the long-term.”

Eliot Whittington
Director
The Prince of Wales's Corporate Leaders Group
University of Cambridge Institute for Sustainability Leadership



Wooden buildings store carbon for decades, or even centuries.



The CO₂ emissions generated during the transportation of our raw materials and products are mainly produced by external logistics service providers.

Progress

Our science-based targets

In 2018, our CO₂e emissions per saleable tonne of board, pulp, and paper were 18% lower than the 2010 benchmark level (21% lower in 2017). The full-year performance declined three percentage points from 2017, mainly due to the increased use of peat at two Finnish mills and a higher fossil content in the generation of the purchased electricity in Finland and Poland. In absolute terms, our direct and indirect CO₂e emissions were 23% lower than in 2010. Direct CO₂e emissions per unit of sales production were 7% lower than in 2010. The CO₂e emissions resulting from the generation of purchased electricity and heat during 2018 were 37% lower than in 2010 per unit of sales production.

The total direct and indirect CO₂e emissions from Stora Enso's board, pulp, and paper mills amounted to 3.41 million tonnes in 2018 (3.31 million tonnes in 2017).

Fourteen of Stora Enso's mills use production process residuals to generate renewable energy and distribute it to local district heating systems (approximately 80%) and industrial partners (approximately 20%). In most cases the heat supplied from our production units directly reduces the local use of oil and other fossil fuels. In 2018, a total of 3.3 PJ of heat was sold to these district heating systems serving twelve communities (3.3 PJ in 2017). Using this amount of renewable energy instead of light fuel oil for heating for example resulted in estimated emission reductions amounting to 0.24 million tonnes of fossil CO₂ (0.25 million tonnes).

In 2018, 80% of the total CO₂ emissions from our own operations were carbon neutral.

Investing in a low-carbon future

We strive to increase the proportion of biomass in our internal energy generation. In line with our policy to give preference to energy from low-fossil carbon sources, Stora Enso announced plans to invest EUR 25 million to boost green energy generation at Maxau Mill. For more information, see page 39.

In 2018, Stora Enso and energy company Gasum signed a contract to build a biogas plant at our Nymölla Mill in Sweden. The plant, built and operated by Gasum, will turn sludge from the mill's wastewater treatment plant into renewable energy. The expected Liquefied Biogas production of the plant is 75-90 GWh per year, which is equivalent to 20 000 tonnes of avoided fossil CO₂ emissions per year when replacing conventional diesel in transportation.

Another important part of our work is our central energy efficiency investment fund. When fully implemented, the projects financed in 2018 are estimated to eliminate over 16 000 tonnes of annual fossil direct CO₂ emissions. For more information, see page 39.

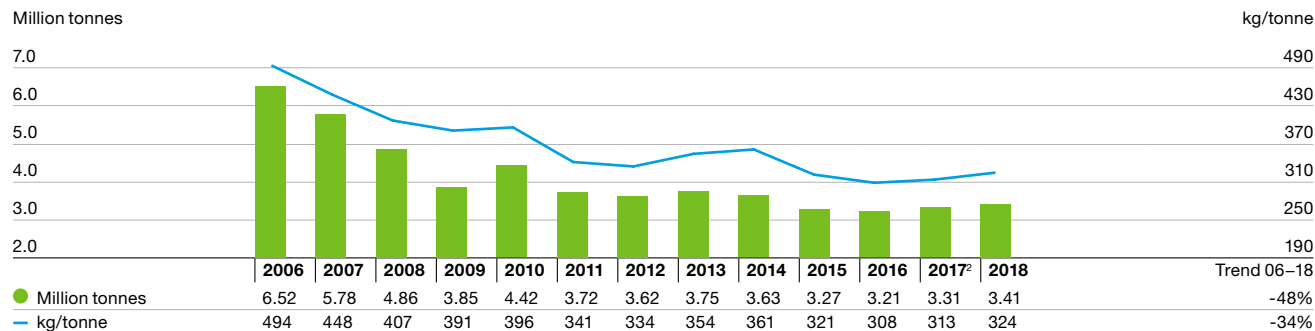
Investigating non-fossil fuel alternatives for Beihai Mill

At our Beihai Mill in Guangxi province, China, coal is currently the only feasible energy source for an industrial project of its scale in the region, as there are inadequate sustainable supply chains for non-fossil fuels at present. We continue to investigate long-term options to gradually move away from coal to biomass and other non-fossil fuels. The power boiler at Beihai Mill is technically able to use a variety of fuel mixes, and in 2018 modest amounts of wastewater sludge, forest residuals and other side streams from our production processes were used. The medium-term objective is to annually replace 10 000 tonnes of coal with these steps. For more information about our coal sourcing, see page 63.

Carbon neutral emissions

Carbon neutral CO₂ emissions are fossil-free emissions generated during the combustion of biomass-based fuels sourced from sustainably managed forests¹. These emissions are carbon neutral as the forests are regenerated and the new generation of trees absorb CO₂ while growing. When forests are sustainably managed, this cycle can continue indefinitely. Stora Enso's operations utilise renewable biomass-based fuels to a large extent, which means that the proportion of carbon neutral CO₂ emissions in our total emissions is high. In 2018, 80% (80%) of the total CO₂ emissions from our own operations were carbon neutral.

Greenhouse gas emissions in relation to production¹



¹ Covering direct and indirect emissions as fossil CO₂ equivalents (scope 1 and 2) from board, pulp, paper and corrugated production units. Excluding joint operations. Normalised figures are reported per unit of sales production.

² Historical figures recalculated due to accuracy improvements.

Our carbon footprint

Direct emissions from our operations account for 22% (20% in 2017) of our carbon footprint, while emissions related to the electricity and heat we purchase for use in our operations account for 9% (10%) of our total carbon emissions. According to our estimates, 69% (70%) of the emissions in our carbon footprint are generated elsewhere along our value chain. The majority of our emissions are generated in the sourcing and manufacturing of our raw materials and services (30% of the total Scope 3 emissions); in the further processing of our products by customers (42%); and in the transportation of raw materials to our mills and our final products to our customers (20%). To identify potential for further reducing our emissions in Scopes 1, 2, and 3, we strengthened our internal steering processes in accordance with the actions agreed in our science-based targets. We continued to implement methodologies for calculating the quantities of carbon sequestered in forests and plantations owned and managed by Stora Enso and our associate companies. We also continued our work with external experts to identify a credible methodology to calculate the positive substitution effect our renewable products have when compared to fossil CO₂ intensive alternatives.

Value chain emissions

The CO₂ 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 20% of all our Scope 3 CO₂ emissions. One example of good practice is our “Right Method” system to pre-plan logging roads, which reduces damage to the soil and fuel consumption by about 10%, according to studies made by our wood supply organisation in Sweden. Sea transport accounts for approximately 89% of all our product transportation by weight and distance, while road and rail transportation account for 9% and 2% respectively.

Our commitment to science-based targets includes engagement targets for Scope 3. To reduce emissions in the value chain, Stora Enso commits to having 70% of its non-fibre raw material suppliers and downstream transportation suppliers in terms of spend set their own greenhouse gas (GHG) reduction targets by 2025, towards the aim of adopting science-based GHG reduction targets by 2030.

In 2018, we began using sustainability criteria in the tendering phase of our sourcing process and collecting data on supplier performance. Suppliers now need to respond to a set of questions about their financial stability, CO₂ emissions, and accident rates. These criteria are part of every tender, regardless of previous contracts with the same supplier. For more information, see page 61.

In addition, we will educate 100% of our customer-facing staff on the advantages of setting science-based targets by 2020. In 2018, we created e-learning material to progress this target.

¹ Recommendations on Biomass Carbon Neutrality, WBCSD 2015.



Stora Enso's carbon footprint 2014–2018^{1 2}

	Fossil CO ₂ equivalent (million tonnes) ³					Trend 14–18
	2014	2015	2016	2017	2018	
Scope 1: Direct emissions from our operations.	2.40	2.24	2.40	2.34	2.49	4%
Scope 2: Emissions from purchased energy consumed in our operations. ³	1.41	1.19	0.97	1.10	1.06	-25%
Scope 3: Emissions from other sources along our value chain. ⁴	6.88	7.26	7.65	7.97	7.89	15%
Total	10.69	10.69	11.02	11.41	11.44	7%

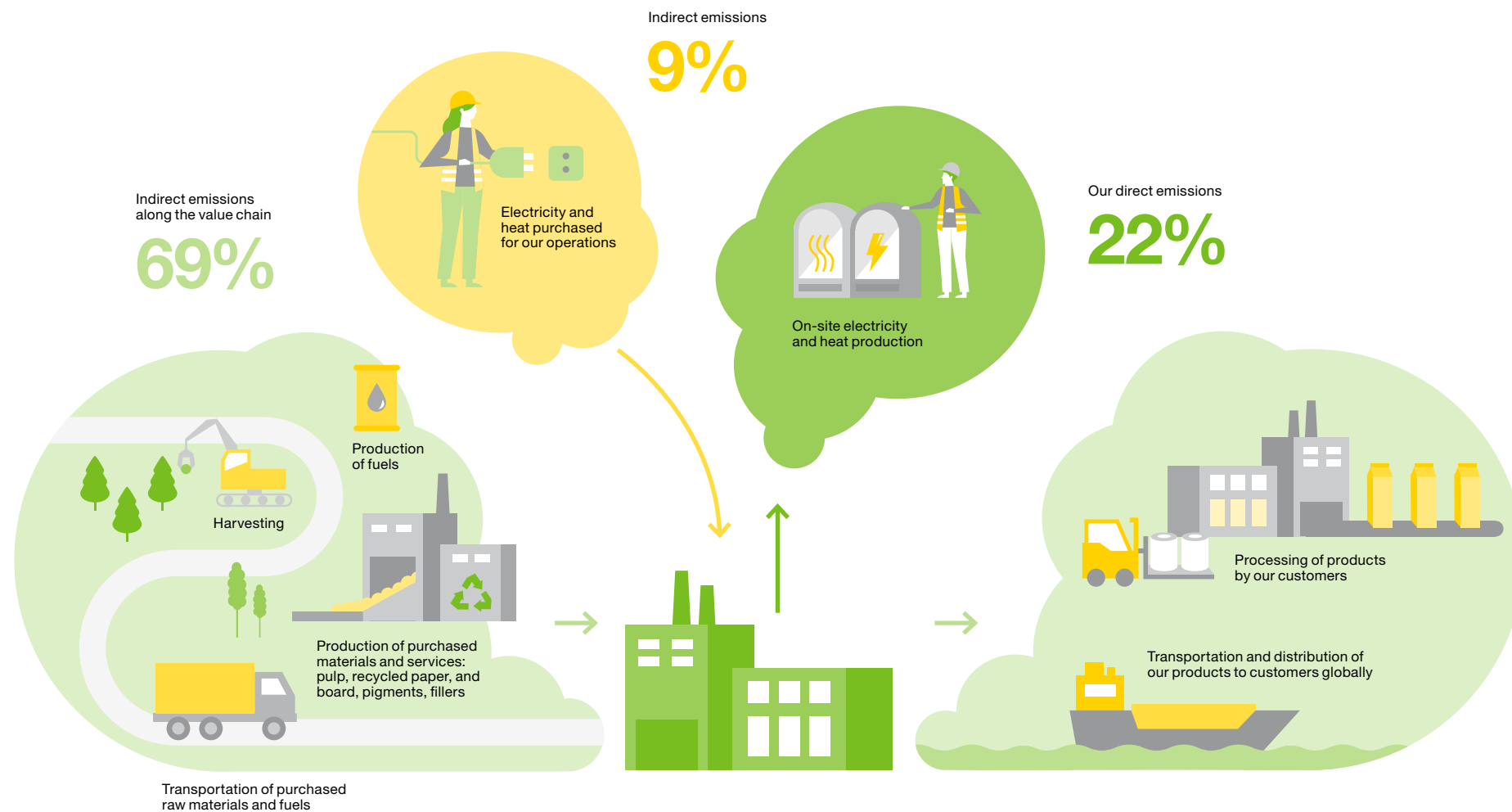
¹ Covers all Stora Enso production units. Excluding joint operations.

² Historical figures recalculated due to accuracy improvements.

³ The CO₂ factors we use for purchased energy (scope 2) largely follow the market-based methodology, which means that almost all our units apply CO₂ factors provided by their energy suppliers. When applying currently available location-based factors our scope 2 emissions for 2018 are 1.30 million tonnes of CO₂ equivalents.

⁴ Historical scope 3 emissions recalculated bi-annually against the most recent methodology in order to ensure comparability.

Stora Enso's carbon footprint¹



● Scope 1: Direct emissions from our operations.

● Scope 2: Emissions from purchased energy consumed in our operations.

● Scope 3: Emissions from other sources along our value chain.

¹ Covers all Stora Enso production units, a total of 11.44 million tonnes of fossil CO₂ equivalent (11.41 million tonnes in 2017). Excluding joint operations.



Forests, plantations, and land use

Sustainable forest and plantation management is essential for securing the long-term availability of wood – our most important renewable raw material. Forests have an important role to play in the transition to a fossil-free world.

Forest certification coverage for owned and managed lands was

96%

Opportunities and challenges

Combating global warming with forestry

Forests and plantations are an increasingly important part of the wider global sustainable development agenda, particularly in relation to combatting global warming. As a renewable natural resource, wood represents a favourable alternative to fossil-based materials. Growing trees absorb carbon dioxide (CO₂) from the atmosphere, and together with wood-based products act as carbon storage. Sustainable forest management ensures that new generations of trees replace those that are logged. The growing trees absorb more carbon from the atmosphere than is released, increasing the role of forests as carbon storage.

The role of Land Use, Land Use Change and Forestry (LULUCF) in combatting global warming has been broadly recognised. For Stora Enso, it is essential that any regional or national policy fully utilises the potential of sustainable renewable materials and supports the transition towards a bio-based circular economy.

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 and plantations can make entire ecosystems more resilient to negative impacts, and even benefit from the positive effects.

Global challenges such as population growth, increasing demand for agricultural land, and the widening gap between the supply and demand for wood, all require us to use natural resources even more efficiently, and to produce more raw materials from less land. At the same time, major global trends such as eco-awareness and the growing middle class drive the world's demand for renewable materials. 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 forest owners have less connection to day-to-day operations.

Our policies

Committed to sustainable wood and fibre sourcing

Stora Enso's policy on Wood and Fibre Sourcing, and Land Management covers the entire cycle of forest and tree plantation management. The policy requires sustainable forest management through responsible sourcing and land use – to safeguard the health and ecological functions of ecosystems and to help conserve biodiversity, soil and water resources. To achieve this, we maintain an open dialogue with our stakeholders.

Other relevant policies that promote sustainable forestry include our:

- **Environmental Guidelines** – a more comprehensive overview of our policy objectives and how we work to achieve them.
- **The Stora Enso Code** – our Code of Conduct.
- **Supplier Code of Conduct** – our demands on suppliers.

How we work

Ensuring the sustainability of fibre

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

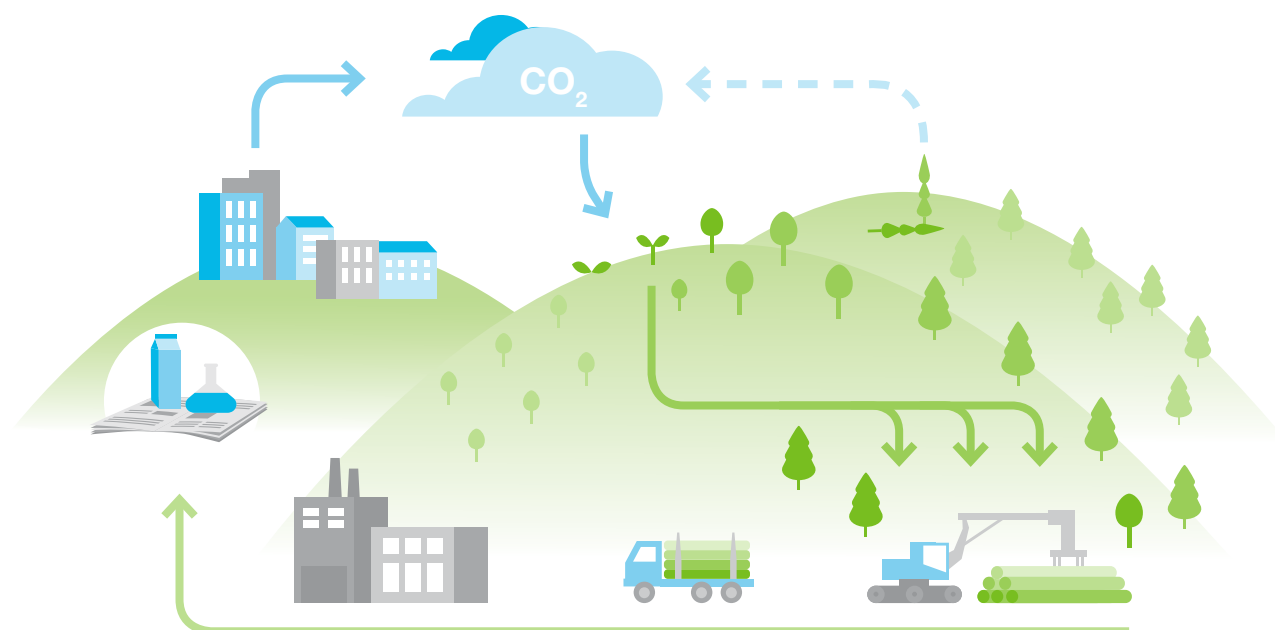
Stora Enso continued its cooperation with World Wildlife Fund for Nature (WWF) in several countries in 2018. Initiatives included



“The New Generation Plantations (NGP) platform is a place to learn about better plantation management through real world experiences, and influence others to follow good examples. The NGP brings together leading plantation companies and some government agencies that manage and regulate plantations. Stora Enso is one of the NGP founding members and has provided good practice examples in the study tours in Brazil, Uruguay and Laos.”

Luis Neves Silva
Lead, New Generation Plantations
WWF

Carbon circulates endlessly between the atmosphere, growing trees and wood-based products



Forests have a central role in the carbon cycle. Young forests absorb carbon when they grow and old forests release it as they decay. Carbon is stored in forest products until they decay or are burned at the end of their life when the carbon dioxide is released back into the atmosphere. Growing forests reabsorb carbon from the air.

the New Generation Plantations (NGP) platform, which focuses on the institutional and technological aspects of responsible plantation management. Stora Enso is also cooperating with WWF Finland to promote the conservation and sustainable use of forests. This work includes promoting alternative harvesting practices among private forest owners.

We are active members in 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 (WBCSD) since the late 1990s. During 2018, we actively participated in finalising its strategic review and initial implementation of the new programme to make FSG a global engagement platform on sustainable forestry and forest products. In 2018, Stora Enso's EVP Sustainability was appointed the new FSG Co-Chair for a period of two years. We also continued to support and participate in The Forests Dialogue (TFD), which is

a platform for multi-stakeholder discussion and collaboration on the most pressing local and global issues facing forests and people.

During the year, we also transparently disclosed our strategies and performance related to tackling deforestation to CDP Forests (score of A-).

In 2018, Stora Enso and the Forest Stewardship Council (FSC) signed an international partnership agreement establishing a long-term strategic collaboration to develop and promote sustainable forestry. Stora Enso promotes all main forest certification systems and is committed to the responsible sourcing of wood and fibre from only sustainably managed forests and tree plantations.

Sustainability in our forestry operations

To cover all aspects of sustainability in our forest and plantation operations, we apply the same comprehensive wood procurement process in all our operating regions. Our Wood Supply organisation consists of regional units that source wood for Stora Enso mills.

Key elements in this work include knowledge sharing, personnel rotation, contractor support, centralised coordination of innovation projects and the use of digitalisation. Our wood procurement process covers the entire management cycle in forests and plantations, including:

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

In 2018, the total amount of wood (including roundwood, wood chips, and sawdust) delivered to our mills was 38.7 million m³ (solid under bark) (37.5 million m³ in 2017).

Long-term forestry planning

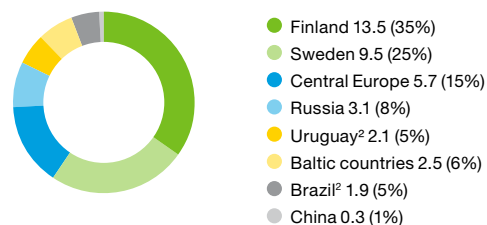
As trees take many years or decades to mature, long-term forestry planning is essential. This involves ecological landscape plans and biodiversity assessments to identify, conserve, and restore vital ecosystems and ecological features. In 2018, 89% (88%) of Stora Enso's wood came from managed semi-natural forests in Europe, most of which 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. Our experts are trained to identify such areas and we regularly consult the authorities on these matters.

Responsible forestry

In 2018, 11% of Stora Enso's wood came from tree plantations (12%). When establishing new plantations, we use internationally approved principles such as the Food and Agriculture Organisation's (FAO) Voluntary Guidelines on Planted Forests, and we also certify

Wood procurement by region¹

38.7 million m³



¹ Total amounts of wood (roundwood, chips and sawdust) procured within these regions for delivery to our mills (million m³, solid under bark).

² Figures for Brazil and Uruguay include 50% of the wood procurement of our joint operations Veracel and Montes del Plata.



our commercial plantations to ensure all aspects of sustainability are 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 pastureland. Stora Enso's employees and forestry contractors are given on-the-job training in ecological management, and we regularly monitor the impacts of our operations on biodiversity, soil, and water resources.

As we recognise that our plantations are an integral part of local land use, we evaluate and define sustainable land use practices specifically for each location. After determining the scope of expected impacts and possible remedies, we decide whether or not to proceed with a proposed project. Stora Enso subsequently remains in constant dialogue with stakeholders and strives to ensure that land contracts are legitimate and fair.

Protecting biodiversity in forestry operations

Stora Enso closely monitors the management of the forests and plantations from which it sources wood. Wood harvesting is planned to suit the particular characteristics of each harvesting site, making use of appropriate harvesting methods and technologies. Harvesting volumes are aligned with the long-term carrying capacity of particular forests and plantations.

All 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 (FSC) Chain of Custody/Controlled Wood scheme, the Chain of Custody/Due Diligence System of the Programme for the Endorsement of Forest Certification (PEFC),

A harvesting method better for the soil

The wet and mild winter of 2017–2018 in Scandinavia was challenging for the forest industry, making a method developed by Stora Enso, named "Rätt Metod" (Right method) in Swedish, very useful – both in Finland and Sweden.

"Basically, our method is about making thorough pre-studies of the ground to find the most durable spots within a harvesting area where the wood can be transported without damaging the soil and water streams. In the future, global warming will increase the need for harvesting on soft ground," says **Vegard Haanaes**, Development Manager at Wood Supply Sweden.

Read the full article at storaenso.com/sustainability

In 2018, 89% of our wood came from managed semi-natural forests in Europe.

and the ISO 14001 environmental management standard. In addition, our Supplier Code of Conduct complements these tools by imposing strict contractual requirements on our suppliers. We work actively with our stakeholders to promote sustainable forest management and the wider use of certification systems. As certification programmes cover all three aspects of sustainability (environmental, social, and economic), they are an important indicator of responsible forestry. For this reason, we follow our progress with a key performance indicator measuring the proportion of land in wood production and harvesting owned and managed by Stora Enso that is covered by forest certification schemes.

We regularly audit our suppliers and work together with respected local institutions to ensure everything is done according to the standards set by certification schemes and our own policies.

Preparing and adapting forestry to changing weather patterns

Global warming is increasing the occurrence of extreme weather events in the areas in which we operate. We use long-term planning to ensure our forestry operations are preparing and adapting to the changing climatic conditions. 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 **Financials 2018**).

In the summer of 2018, a long drought caused a number of forest fires in Sweden. We adapted our operations to the prevailing weather conditions, observed the greatest caution, and supported the rescue services. Our personnel have significant expertise in fire safety issues that we offered to fire-fighting activities, such as the management of major controlled burns in collaboration with government agencies.

In 2018, Stora Enso and the Swedish Meteorological and Hydrological Institute (SMHI) began an eighteen-month cooperation project. SMHI's data is combined with forest data in a digital service that can be used to plan harvesting activities. The service is based on the forest industry's need to reduce soil damage and to pursue more efficient and sustainable forestry. The digital service can provide valuable soil condition forecasts.

Forest regeneration

We always ensure that the forests and plantations where we harvest wood are duly regenerated. This is often done through active planting or sowing, although in many areas active regeneration is complemented by natural seed dispersal from nearby forests, by leaving seed trees standing in the harvesting area, or by coppicing. Whatever the methods used, we always ensure the forest will regenerate.



The Veracel Station rainforest research and conservation centre celebrated twenty years of operation in 2018.

In Brazil, our joint operation Veracel goes beyond regeneration by conserving and restoring areas of natural Atlantic Rainforest. All Veracel's tree plantations were established on degraded pasture lands, and no rainforest has been converted into plantations. When Veracel's plantations were established in 1991, less than 7% of the original Atlantic rainforest was left in the region following extensive logging and clearing for cattle ranching between the 1960s and 1980s. Since the plantations were established, Veracel has worked systematically to protect and restore local biodiversity.

Approximately half of Veracel's 213 500 hectares of land are dedicated to rainforest preservation and restoration. Veracel aims to restore approximately 400 hectares of rainforest habitat every year. A total of 7 217 hectares of forest has been restored between 1994 and the end of 2018. This work is part of a regional restoration programme that helps connect the remaining areas of valuable natural habitat to each other with forest corridors that enable wildlife to move more freely from one area to another. Veracel's significant contribution to the conservation of natural Atlantic rainforest and its rich biodiversity has been recognised by both the Brazilian authorities and international stakeholders.

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

Tree breeding

Stora Enso is continuously working 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 improved rooting or resistance to frost, drought, pests, or diseases, 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. During 2018, we continued the process to establish field trials in areas totalling less than 30 hectares in Brazil. 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 permitted. Currently we have no plans to plant genetically engineered trees in any of our commercial plantations.

Progress

Wood from sustainable sources

Globally, Stora Enso owns or leases lands covering a total area of 933 000 hectares. We follow our progress on responsible forestry with a key performance indicator measuring the proportion of land in wood production and harvesting owned and managed by Stora Enso



Forests have important recreational value as a location for activities such as hiking, mushroom foraging, and hunting.

that is covered by forest certification schemes. Our target is to maintain the high level of 96%. In 2018, coverage amounted to 96% (97% in 2017¹). The KPI was reviewed in 2018, and as of January 2018, the scope excludes forest management units whose primary purpose is not wood production and harvesting, such as test and pilot sites.

The proportion of third-party certified wood in our total wood supply was 76% in 2018. As of 2018, the share of certified wood excludes externally delivered certified wood. This decreased the certified share compared to previous years.

In Russia, we continued to work with WWF Russia during 2018. During the year, Stora Enso and WWF Russia organised training for all forestry certification group members in Karelia. The total area covered by group certifications in Russia was 1 312 500 hectares (1 336 000 hectares in 2017). Our Russian subsidiaries have been FSC-certified since 2006, and the lands leased by Stora Enso in Russia are included in the total certified area. For details about lands leased and managed by Stora Enso in Russia, see the table on page 54. We also continued to actively promote economically viable and ecologically responsible

¹ Recalculated according to the reviewed definition.

forestry throughout Russia during 2018 through cooperation with the Boreal Forest Platform (BFP), a stakeholder forum organised by WWF Russia.

In Finland, Stora Enso offers FSC forest certification services for private forest owners. In 2018, the number of members of Stora Enso Wood Supply Finland's FSC group grew from around 20 to 135 private forest owners, which is equivalent to an increase in forest area from around 4 000 hectares to more than 30 000 hectares.

Since 2011, Veracel has promoted 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 2018, dual forest certificates had been obtained by 73 farmers (74 at the end of 2017) for areas totalling 38 054 hectares (37 831), including 15 992 hectares (15 895) planted with eucalyptus.

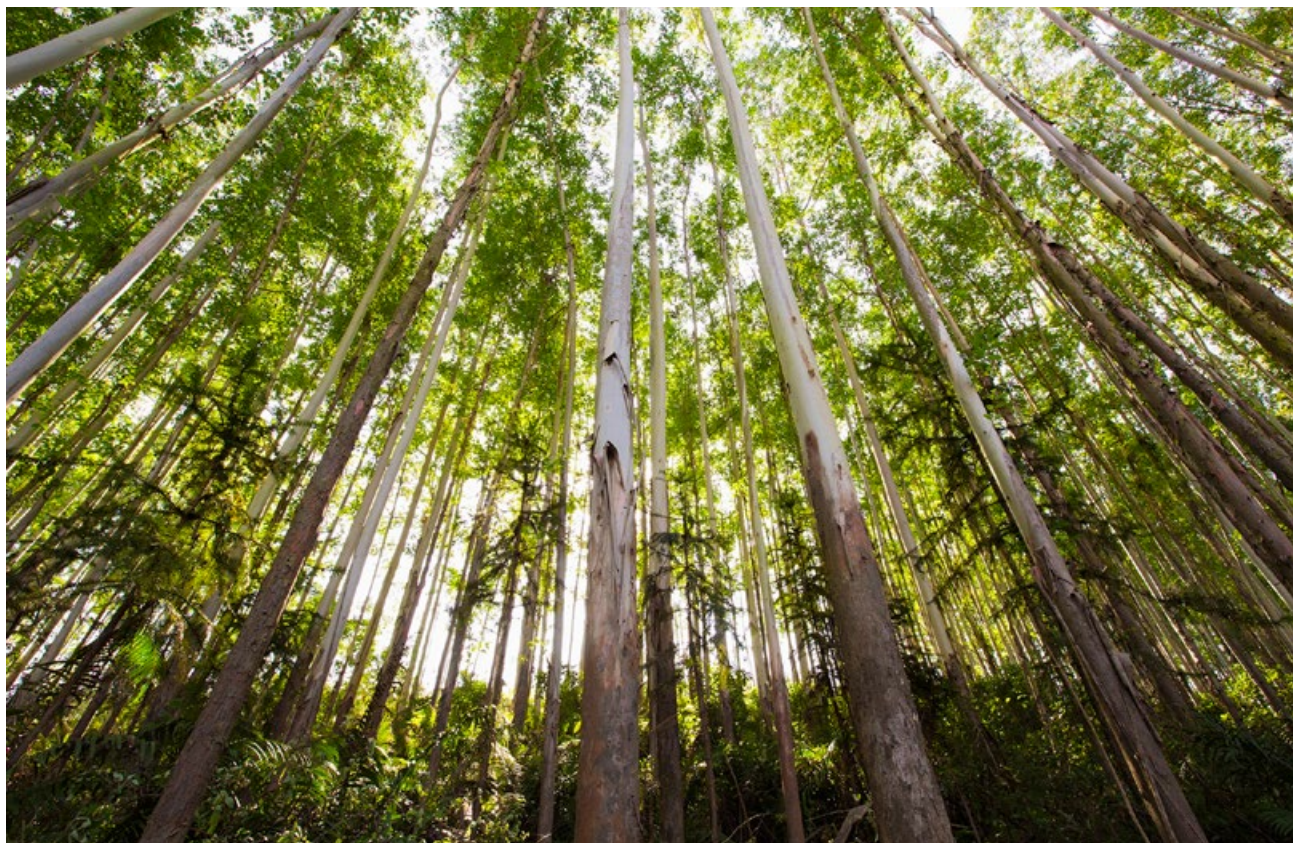
We work actively with our stakeholders to promote sustainable forest and plantation management.

Stakeholder concerns and dialogues

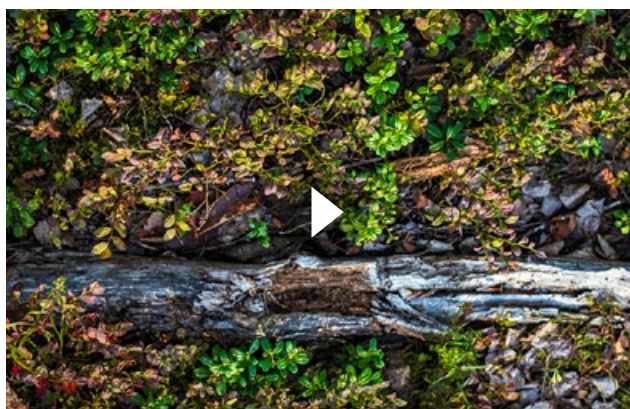
Stora Enso recognises that the areas where we operate are of value to different stakeholders. We have therefore adopted an integrated approach to land use around our plantations. This includes applied innovative land use models in Laos, Uruguay, and Brazil to benefit local farmers and communities as well the company. For details of these integrated land use practices, see pages 24–26.

In 2018, sustainable forestry particularly in the northern hemisphere was of stakeholder interest, with environmental NGOs widely calling for forests to be better protected.

In our stakeholder communications during the year, we stressed our commitment to forest certification, wood traceability, and open stakeholder dialogues, and that we always ensure that all the wood we use comes from sustainably managed sources. We believe that the most sustainable way to protect high conservation value is through national and regional multi-stakeholder processes. During the year, Stora Enso engaged in continuous dialogues with NGOs and other stakeholders. We also encouraged our business partners and NGOs to participate in such engagements.



We always ensure that the forests and plantations where we harvest wood are duly regenerated.



How can we harvest trees and still protect biodiversity?

"The big challenge for modern forestry is to maintain biodiversity for future generations," says **Göran Ericsson**, Professor in Wildlife Ecology at the Swedish University of Agricultural Sciences, in our video. "If we lose biodiversity, we might have very few options remaining if we are challenged with a crisis with global warming."

Watch the video > storaenso.com/biodiversity

Forests, plantations and lands owned by Stora Enso¹ as of 31 December 2018

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 103 847 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 Suzano)	213 594 ha, of which 75 865 ha planted for pulp production	CERFLOR (PEFC) for 186 158 ha; FSC for 186 158 ha	Dominated by pasturelands cleared from Atlantic rainforest between the 1960s and 1980s. 112 746 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.
Wood Supply, Estonia	137 ha, of which 124 ha planted		No protected areas within this area.

¹ 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 41% of Tornator, which owns 0.6 million hectares of forestland in Finland, 60 000 hectares in Estonia, and 12 000 hectares in Romania.

Forests and plantations leased and managed by Stora Enso¹ as of 31 December 2018

Unit	Area	Certification coverage	Details of local landscapes and protected areas
Wood Supply, Russia	369 464 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	83 270 ha, of which 77 326 ha planted	Chinese Forest Certification Council certificate (PEFC) for 83 270 ha; FSC for 83 270 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	61 406 ha, of which 48 666 ha planted	PEFC and FSC for 54 409 ha	Mainly pasturelands and agricultural fields. Protected and sensitive areas are not included in lease agreements.
Veracel	11 050 ha, of which 4 212 ha planted	PEFC and FSC for 11 050 ha	5 404 ha of leased lands are protected. They mostly consist of native forest remnants at different stages of regeneration.
Trial plantations, Laos	3 805 ha, of which 3 113 ha planted	FSC for 3 113 ha	The plantations are located within a mosaic of intensive shifting cultivation lands and traditionally protected remnants of native forests with variable degree of human influence. One plantation area is located close to a National Biodiversity Conservation Area. The majority of the total area is covered by agroforestry production schemes.

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

Economic agenda

We help customers be sustainable, choose like-minded partners, and reward investors sustainably.

- › Customers 56
- › Suppliers 60
- › Investors 64





Customers

As the renewable materials company, Stora Enso develops and produces solutions based on wood for a range of industries and applications worldwide.



25

**of our production units
were registered in Sedex**

Opportunities and challenges

Demand for sustainable solutions

In many countries around the world, the global middle class is on average growing at a pace greater than the world population, which is leading to an increased demand for lifestyles that can seriously burden the planet's resources. At the same time, consumer awareness of limited natural resources, the environmental impacts of products, and social responsibility is growing, which places pressure on brand owners to pay more attention to product and supply chain responsibility. Combined with policies, regulations and economic incentives, these megatrends are also driving our customers to use renewable raw materials and to increase the recycling of products and materials.

In the long term, we believe societies will increasingly choose to replace fossil-based materials with renewable alternatives. Stora Enso's various wood and fibre-based products, including bio-based chemicals and biocomposites, are well-positioned to respond to this new market demand.

The European Commission (EC) has adopted legislative proposals on waste reduction within its Circular Economy Package, as well as strategies on plastics and the bioeconomy. These are designed to protect the environment from plastic pollution, underline the role of bio-based innovation, and enhance recycling and reuse initiatives, whilst promoting economic growth. The objective of the first-ever European Strategy for Plastics in a Circular Economy, adopted in January 2018, is to transform the way plastic products are designed, used, produced, and recycled in the EU. In May 2018, the EC proposed new EU-wide rules to target the 10 most common single-use plastic products that litter Europe's beaches and seas, as well as lost and abandoned fishing gear. Together these items account for 70% of all marine litter.

The objectives of these ambitions provide business opportunities for Stora Enso, such as the development of more sustainable bio-based alternatives that can replace fossil-based plastics.



With tailored renewable packaging we can extend product shelf-life and help reduce food waste.

We actively work with our customers to decrease the environmental impact of our products.

@storaenso October 16



30% of all food produced globally goes to waste. Something needs to be done. Learn more about how good packaging can help, in the Renewable Future podcast. #WorldFoodDay bit.ly/2lXQ9qs

Our policies

A single set of values

The Stora Enso Code – the Stora Enso Code of Conduct, which constitutes a single set of values for all our employees and explains our approach to ethical business practices, human and labour rights, as well as environmental values. These values are applied wherever we operate.

How we work

Focus on customers and innovation

At Stora Enso, we are strengthening our expertise in renewable materials and products with high sustainability performance to meet the needs of our current and future customers. Our business is organised into five divisions, each with their own focus areas and products that cater to a broad range of customers. Our product portfolio includes various boards for packaging and printing, several

pulp grades, wood and fibre-based products for construction, biocomposites, energy pellets, paper products made from virgin and recycled fibre, and lignin, which can be used to replace fossil-based phenols. Stora Enso is also researching new uses for lignin, including formaldehyde-free binders, carbon fibre and energy storage applications. Our products are made from wood and wood fibre, which are renewable and recyclable raw materials. Stora Enso promotes and participates in successful recycling schemes, particularly for paper and board. We also sell and reuse a variety of valuable by-products and residuals from our production processes. For more information, see page 34.

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

We foresee many possibilities for bio-based chemicals, bio-barriers, lignin, and biocomposites to meet industry and consumer demands for more sustainable solutions that can replace fossil-based materials.

Prioritising product safety

Stora Enso's products covered by specific safety regulations and demands include food contact materials, materials for toys, packaging for pharmaceuticals, and construction materials. Our in-house product safety and quality control systems cover product development, raw material sourcing, and the manufacturing and delivery of products. We demand that our suppliers comply with our product safety requirements.

Our units producing sensitive packaging materials follow Good Manufacturing Practices, a set of widely recognised guidelines 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 verified with our suppliers prior to any purchasing decision. We provide our customers with information on product hygiene and safety aspects through compliance declarations.

We follow legislation designed to protect our employees' health, public health, and the environment. These include the EU's REACH, Biocidal Products, the Classification, Labelling, and Packaging Regulation, as well as relevant food contact legislation and demands concerning food safety. When producing food contact materials, we only use chemicals that have been specifically approved for this purpose, after verifying their safety and legal compliance. Many of our wood products are CE-marked to guarantee that they comply with the relevant EU legislation. Our divisions have Product Safety Networks in place, and all our mills work to ensure that their products meet the relevant product safety requirements. The ISO 22000, FSSC 22000, and FDA product safety certificates issued to many of our units further ensure that we apply a systematic approach to food safety issues. In addition, ISO 9001 certified quality management systems help our units to identify and meet customer requirements, and systematically improve product quality.

Certified sustainability in product stewardship

In 2018, Stora Enso's Wood Products division continued to be a member of the stakeholder committee of the Sustainable Biomass Program (SBP) certification system. The SBP certification system enables verification of the legal and sustainable sources of wood as well as energy and carbon data throughout the biomass supply chain. Our sawmills producing pellets as by-products also work with ENplus™ certification, which includes criteria for product quality, wood origin, and greenhouse gas emissions.

For unit-specific details of our sustainability certificates, see page 69.

Life cycle assessments and ecolabels

Stora Enso's experts collect product-specific life cycle inventory (LCI) data, which is typically used in life cycle assessments (LCAs) conducted by our own experts, our customers, or brand owners. The environmental performance of our paper and board products is reported in line with the voluntary Paper Profile initiative. Paper Profiles have been calculated for all our paper and containerboard products, and all main paperboard products.

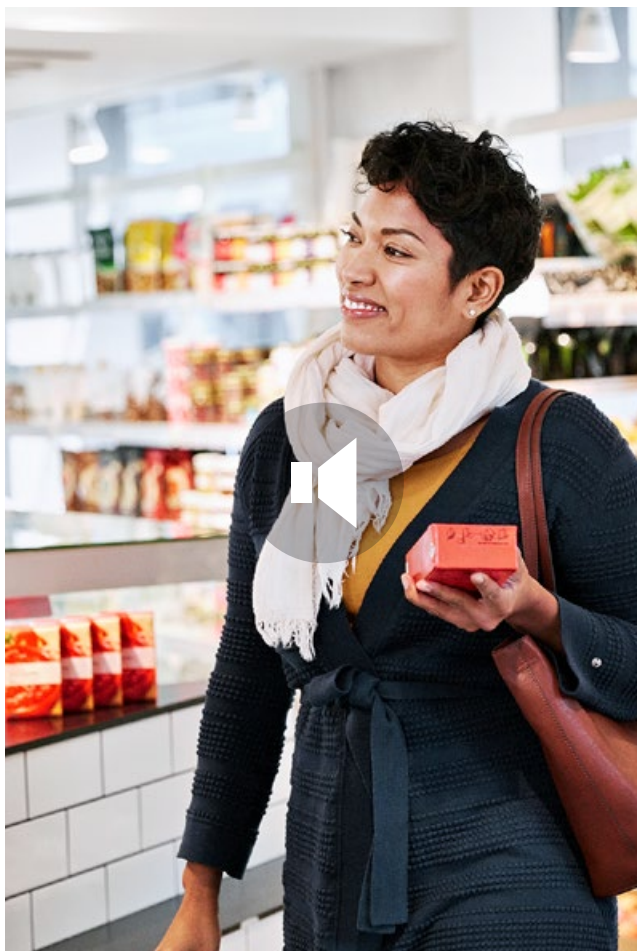
More than 90% of our Paper division's own brands are covered by one or more recognised ecolabels, including the EU Ecolabel, the Nordic Ecolabel, and the German Blue Angel (Blauer Engel). Many of our graphical board brands are also available as EU Ecolabel certified. Ecolabel criteria cover the entire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

During 2018, our Packaging Solutions division focused on a deeper understanding of LCA impacts through selected product specific deep dives, for example the EcoFishBox™. This more detailed information has been valuable in interaction with customers to truly understand the benefits of renewable packing solutions.

Many Stora Enso products are sold as FSC or PEFC-certified, which validates that they have been produced using wood from responsibly managed sources, and that the entire journey of the



In 2018, Stora Enso joined H&M and IKEA in the TreeToTextile initiative which aims to develop new textile fibres in a sustainable way at attractive cost levels.



How to consume in an environmentally friendly way

Consumers want to make the right environmental choices when they go shopping but how exactly do you go about it? How should we be thinking about the packages our purchases arrive in?

“One helpful guideline is to avoid unnecessary packaging and buy products and packaging you can reuse or recycle. Another aspect to keep in mind is to prefer renewable materials”, says **Tiina Pursula**, Director of Sustainability, Consumer Board division, Stora Enso.

Listen to the podcast at ► storaenso.com/en/inspiration-centre

raw material – from forest to store shelf – has been verified by a third party. For more information about our responsible forestry and forest certification work, see pages 49–54.

Third-party verified Environmental Product Declarations (EPDs) offer transparent information about the footprint of a product throughout its life cycle. Most Stora Enso's wood products, such as Classic Sawn Timber and Cross Laminated Timber (CLT) have an EPD in place. EPDs are used by our customers to help optimise environmental performance using whole building LCA and to achieve green building certification. In 2018, Stora Enso developed the capability to help our customers perform whole building LCAs.

Progress

Continuous customer engagement

Customer needs are a key element in developing our products, services, and processes. We identify these needs by collecting systematic feedback from our customers and by exchanging expertise with them on various sustainability topics. When it comes to new products, such as lignin and biocomposites, we collaborate closely with customers to create applications that meet their needs throughout the value chain. For example, our Biomaterials division is collaborating with the textile industry to create a more sustainable and traceable value chain for clothing products.

Biocomposite granule production began at our Hylte Mill in Sweden in 2018. Consisting of wood fibres and synthetic polymers, these granules significantly reduce the amount of fossil-based raw materials in plastic products. The DuraSense™ product family is suitable for a wide range of applications from consumer goods to industrial applications including furniture, pallets, hand tools, automotive parts, beauty and lifestyle products, toys and items such as kitchen utensils and bottle caps. Significant environmental benefits can be achieved through taking customer insights onboard early in the product innovation process. In 2018, the Husqvarna Group named Stora Enso its most innovative supplier. Together, the companies created a cone shaped box for chainsaws that has enabled Husqvarna to save on transportation costs and significantly reduce CO₂ emissions in its logistics chain.

We provide training and support for customers on sustainability topics. In 2018, Stora Enso conducted four Paper & Print Academy training sessions with over 60 participants from customer companies. The sessions enable participants to follow the entire supply chain – from forest management and harvesting to the final paper product. They encourage discussions about certificates, ecolabels, on-product labelling, and efficient ways to print and convert certified paper.

Enhancing paper cup recycling processes in Europe

Our Consumer Board division continues to support the Alliance for Beverage Cartons and the Environment (ACE). In 2018, ACE launched a dedicated platform across Europe to drive the industry's engagement in beverage carton recycling, including the non-paper components of packages. The new platform will be based in

More than 90% of our paper brands are covered by ecolabels.

Frankfurt and support ACE's role as the industry's voice towards EU policy makers. It will also closely collaborate with national carton industry associations, member company initiatives and other stakeholders.

Our Consumer Board division also works with the Paper Cup Alliance, where Stora Enso is actively involved with many of our customers and brand owners to facilitate recycling of these products in the UK.

Partnering with the food industry to combat food waste

To help reduce food loss and waste globally, Stora Enso joined Food Reform for Sustainability and Health (FReSH), an initiative by the World Business Council for Sustainable Development (WBCSD) and EAT, which is the science-based global platform for food system transformation. With business solutions that are aligned with science-based targets, FReSH aims to create healthy, enjoyable food for all, produced responsibly within planetary boundaries, by 2030. Renewable packaging plays a significant role in this value chain. With safe and intelligent packaging, we can for example guarantee food safety, extend the shelf-life of products, or design right-sized packaging to help cut food waste in smaller households.

Sharing information as a responsible supplier

By the end of 2018, 25 (26 in 2017) of Stora Enso's production units were registered in 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 throughout the supply chain. Sedex makes it easy for suppliers to share sustainability information with multiple customers in an agreed format and level of detail, reducing the need for individual systems and queries. We update the sustainability information regularly in the Sedex platform. When our units are audited through Sedex Member Ethical Data Audits (SMETA), they make the summary audit reports visible to customers in the platform.

Stora Enso is also a member of the ethical supplier rating system Ecovadis. In January 2019, we obtained a score of 82/100 and were included in the top 1% of industry supplier performers, achieving the highest recognition level, Gold.



Suppliers

In addition to wood and fibre, Stora Enso sources other raw materials, products, and services from over 20 000 suppliers globally. We have strict sustainability requirements for all of them.

95%

**of supplier spend was covered
by our Supplier Code of Conduct**

Opportunities and challenges

Driving change in our supply chains

As a global business with an extensive worldwide supplier base, Stora Enso can use its purchasing power to drive its suppliers to make their operations more sustainable. This helps create a larger pool of more sustainable suppliers globally. On the other hand, developing a comprehensive understanding of a supplier's sustainability performance remains a challenge, even with very strict sourcing processes in place.

Although Stora Enso works in a variety of regulatory environments, we consistently respond to the demands of our stakeholders concerning transparency and the sustainability performance of our suppliers. Similarly, we are looking for ways to address the growing stakeholder demand for less plastic when sourcing materials. Digitalisation brings new opportunities to increase supply chain transparency. Imposing sustainability requirements on our direct suppliers encourages them to develop their capacity to meet such new demands and improve their overall performance.

**In 2018, we began using
sustainability criteria in every
tender, for both new and
existing suppliers.**

Our policies

Strong guidance for responsible sourcing

The Stora Enso Supplier Code of Conduct (SCoC) is the cornerstone of our approach to responsible sourcing. The code is a legally binding document that imposes 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.

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

- **Sourcing Policy** – our statement on the sourcing framework and objectives at Stora Enso.
- **Sourcing Guideline** – defines how sourcing should be executed, managed, and controlled.
- **Practical Instructions for Stora Enso Suppliers** – detailed guidance and examples on the topics included in the SCoC.
- **Comprehensive internal guidance** for our Sourcing and Logistics personnel to help them address challenges related to sustainability.
- **Policy on Wood and Fibre Sourcing, and Land Management** – includes standards that apply to our wood and fibre suppliers.
- **Environmental Guidelines** – guidance on how to reduce our environmental impact through sourcing.
- **Human Rights Policy, Energy and Carbon Policy, Occupational Health and Safety Policy** – include commitments that apply to our suppliers.

How we work

Supporting supplier sustainability

Materials and products sourced by Stora Enso include wood and fibre-based materials such as pulp and Paper for Recycling (Pfr), chemicals, fillers, energy, fuels, and spare parts, as well as maintenance, logistics, and IT services. In 2018, purchases of materials, goods, and services represented 50% of our total variable cost (49% in 2017) while fibre procurement accounted for 50% (51%).

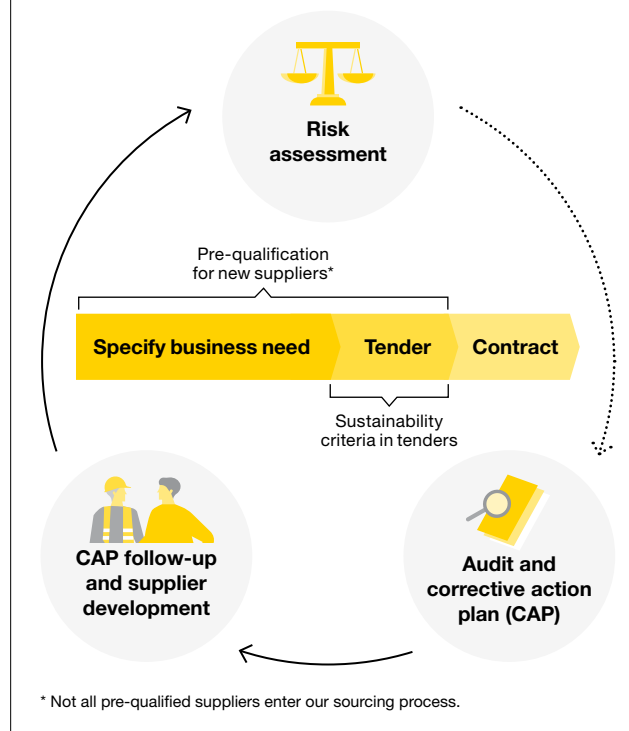
For Stora Enso, responsible sourcing means drawing on our deep commitment to sustainability and proactively driving change in our supply chains. We address the concerns of key stakeholders, comply with regulatory frameworks, adhere to best practices, and manage supply risks. These principles are put into practice every day by our employees working with sourcing.

Sourcing is a centrally led function at Stora Enso, serving the entire Group and enabling clear and transparent decision-making. Sourcing initiatives are reviewed and resolved by dedicated committees that meet when the sourcing need is specified, during the tendering process, and when a contract is drafted.

All suppliers wishing to do business with Stora Enso must first pre-qualify, during tendering, or at the latest before a contract is drafted. 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 complete

Our process for responsible sourcing

Risk assessments and audits can be conducted prior to pre-qualification and at any stage of the supplier contract.



a questionnaire, submit confirmation of their compliance with our SCoC, and complete our safety management online training. Our suppliers are also asked to provide information about their own suppliers, including sub-suppliers operating in high-risk countries.

In 2018, we began using sustainability criteria in the tendering phase of our sourcing process and collecting data on supplier performance. Suppliers now need to respond to a set of questions about their financial stability, accident rates, and carbon dioxide (CO₂) emissions, which contributes to our ambitious science-based targets. These criteria are part of every tender, regardless of previous contracts with the same supplier.

Risk mapping and auditing

In addition to enforcing our SCoC, we help our suppliers improve their sustainability performance. Our topic-based “deep dives”



We purchase materials such as pulp, chemicals, and fillers to make the best out of our raw material, wood.

or thorough reviews help us better understand the operations, opportunities, and challenges of a supply chain related to a specific topic or category. They also serve the information needs of our customers. In addition, we conduct on-site visits and focused audits to monitor and improve supplier sustainability performance. Focused audits are conducted based on risk assessments or concerns raised by our stakeholders.

Stora Enso's supplier sustainability risk mapping tool, created in collaboration with an international non-profit organisation, supports our purchasers in making risk assessments. This tool was updated in 2018 to provide a more detailed risk assessment of sub-categories such as the different energy forms under the sourcing category for energy. Based on a pre-evaluation of a supplier's social and environmental risk profile, they may be selected for a third-party sustainability audit, conducted together with our purchaser.

Supplier non-conformances

Any suspected SCoC non-conformances brought to our attention through our many grievance channels are investigated and followed up. Similarly, any non-conformances 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 follow up on their implementation. If a supplier does not take the necessary corrective actions, new discussions are held to examine the reasons, and at a higher management level if necessary. In cases when a supplier is not willing to improve their performance, the relationship is terminated.

Contractors

Some of our suppliers are contractors hired for long-term work, such as forest and plantation management, and others on a shorter-term basis, for example in large-scale investment or mill maintenance projects. Our SCoC and sourcing process applies to all contractors. While contractors are primarily responsible for their own employees, we strive to ensure that everyone working on our premises is treated fairly and receives adequate safety training.

Pulp procurement

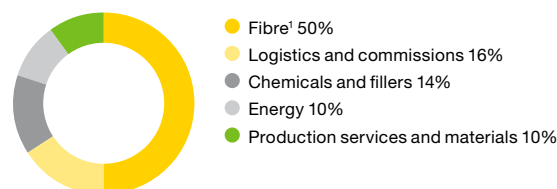
Most of the pulp used in Stora Enso's operations is produced internally at our mills. For quality and logistical reasons, a small proportion of the pulp for our paper and board production is purchased from external suppliers. As with wood procurement, we ensure that all the pulp we purchase is sustainably sourced by applying third-party-verified traceability systems and forest certification systems, and by complying with the relevant regulations. For more information about our approach to sustainable wood procurement, see page 50.

Paper for Recycling

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

Breakdown of raw material and service costs

% of our total variable costs



¹ Wood, Paper for Recycling and purchased pulp



Buying with care

Ensuring that all our over 20 000 suppliers are committed to sustainability is a challenge like no other, but by supporting them in this process we can help bring about powerful change. Every day this ambitious task is driven by our employees in charge of purchasing.

"It's vital that you know the product or service you're buying," says **Markus Koskinen**, Procurement Manager in charge of domestic land transports from our mills in northern Finland. "Not only is it important to understand things like pricing and product quality, but a purchaser must also know what can be expected of the supplier – regarding human rights, for example."

Read the full article at storaenso.com/sustainability

Progress

New sustainability criteria in tenders

Stora Enso's key performance indicator (KPI) for responsible sourcing measures the proportion of our total supplier spend covered by our SCoC, including all categories and regions. By the end of 2018, 95% of Stora Enso's total spend on materials, goods, and services was covered (95% at the end of 2017), which meets our target to maintain the level of 95%. Joint operations, intellectual property rights (IPR), leasing fees, financial trading, government fees such as customs, and wood purchases from private individual forest owners are not included in our total supplier spend.

In 2018, we began using sustainability criteria in the tender phase of each sourcing process and by year-end, they were included in the majority of tenders. These criteria will help us make more balanced sourcing decisions and create incentives for our suppliers to invest in sustainability reporting. Supplier responses to our inquiries show that many do not collect this data or are not familiar with it. On the other hand, many have also indicated they will begin measuring the requested data.

We updated our risk assessment tool in 2018 to provide a more detailed risk assessment of sub-categories, conducted by internal experts, and to have more of a focus on human rights. After

screening our active suppliers using the updated tool, we identified 239 high-risk suppliers. By the end of 2018, about 7% of high-risk suppliers were audited.

In 2018, we also began efforts to automate the collection of supplier sustainability performance data, starting with their carbon footprints. The goal is to use search robotics and artificial intelligence to access CO₂ data in publicly available supplier reporting. In our initial screening, slightly over 200 out of our approximately 1 300 top suppliers by spend had publicly reported their CO₂ data.

Safety Trail is a safety capacity building e-learning tool for existing suppliers and a mandatory element in the pre-qualification process for potential suppliers. At least one management-level employee of the supplier must complete the training and commit to sharing it within their organisation. Our target for 2018 was to cover 75% of our total supplier spend, and this target was achieved with a coverage of 80% by year end.

In 2018, we improved our systematic analysis of supplier data to identify suppliers with a statistically higher accident rate than average, made possible by our Group-wide reporting platform that provides more data than was previously available. We discussed the results with the relevant suppliers and will follow up on their safety performance. For more information about Stora Enso's approach to occupational safety, see page 18.



Focused supplier audits are conducted based on risk assessments or concerns raised by our stakeholders.

Continued focus on risk-based supplier audits

In 2018, Stora Enso's third-party supplier audits continued to focus on suppliers with heightened sustainability risk, as identified by our risk assessment tool. Other focus areas were the chemical value chain, energy sourcing, and people-intensive sourcing categories such as service providers and land logistics.

During 2018, we conducted a total of 52 third-party supplier audits (26 in 2017). These audits revealed non-conformances particularly related to working hours, basic worker rights, and emergency preparedness. Several non-conformances were also related to missing documentation and policies. No supplier relationships needed to be terminated in 2018 (none in 2017). 23 supplier visits were conducted using the purchaser checklist template introduced in 2017.

Sourcing developments in China and the USA

Coal sourcing for Beihai Mill in China

In southern China, coal is currently the only feasible energy source for an industrial facility as large as Stora Enso's Beihai Mill. However, as part of our long-term planning, we are investigating opportunities to use more renewable energy – for more information, see page 46. In 2018, we continued to look for more sustainable alternatives to coal.

Following a thorough mineral supply chain audit in China, a rare opportunity in the country, we continued to follow up on corrective actions in 2018. Unfortunately, not enough improvement was made by our current supplier and we continued to look for alternative coal suppliers with the aim to identify a supplier that best fulfils our



“Integrating human rights into supply chain management is a daunting task. Stora Enso is taking a strategic and pragmatic approach, but I encourage them to continuously look for ways to improve their work.”

Peter Nestor
Director, Human Rights
BSR

criteria. Many coal suppliers in the Chinese market are not familiar with detailed sustainability requirements such as our Supplier Code of Conduct, which makes the search for the ideal supplier challenging. However, after several attempts, we made progress in 2018 in pre-qualifying alternative coal mines with potentially better sustainability performance than our current supplier.

Sourcing sugar industry by-products in the USA

Stora Enso's demonstration plant in Raceland, Louisiana, USA, validates extraction and separation technologies by converting cellulosic biomass into highly refined xylose sugars. The first batches of xylose were produced in 2018. For feedstock, the demonstration plant purchases bagasse, a residual from the sugar-making process, from a nearby sugar mill.

Due to the seasonal nature of the work and the shortage of available local workers, the sugar industry in Louisiana is dependent on seasonal foreign migrant workers for harvesting, transporting, and sugar-making during a compressed 100-day period of production. Since there is no federal legislation in the United States, nor state legislation in Louisiana to directly limit maximum working hours, Stora Enso has been monitoring labour rights in its bagasse supply chain for several years to ensure that working hour schedules do not have adverse impacts on worker health and safety. In 2018, we continued to monitor and support our bagasse supplier in adopting our SCoC requirements, while continuously pushing for improvements.



Investors

We aim to keep investors informed about our progress and future direction with consistent and transparent communications and reporting.

ESG was discussed in

7% of investor meetings

Opportunities and challenges

Sustainability changing the investment industry

Investors are increasingly recognising the importance of corporate sustainability in their investment decision-making by exploring ways to integrate environmental, social, and governance (ESG) performance into their investment strategies. In addition to the growing interest in sustainability aspects, investors perceive sustainability as a valuable growth driver for companies and sustainability reporting as an important tool in identifying investment opportunities that can generate long-term shareholder value. Hence, companies are encouraged to aim for more sustainable operations. Simultaneously, investors expect financial rewards from their investments.

At Stora Enso, we believe that long-term financial success results from truly sustainable operations. 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

Guiding our Investor Relations

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

- **Disclosure Policy** – a set of rules covering all our communications with investors and other stakeholders. Encompasses insider guidelines, closed periods, communications governance, and communications procedures.
- **The Stora Enso Code** – the Stora Enso Code of Conduct, applied to all our operations around the world, including Investor Relations.

Stora Enso has the long-term aim to secure funding partners that have sustainability as a fundamental part of their agenda.

How we work

Sustainability as a key metric

Many investors today are committed to integrating ESG factors into their investments. Aspects of sustainability, such as global warming and sustainable forest management, are important to Stora Enso's investors. Our main shareholders are long-term investors that place high value on sustainable business practices and continuously monitor and evaluate our performance. For more information on how we create value with a sustainable business model, see our **Strategy 2018**. For details of Stora Enso's ownership distribution see our **Financials 2018**.

Timely and transparent communication with investors is 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 investors in our Interim and Annual Reports, stakeholder letters, web updates, and investor newsletters. We regularly participate in sustainability events of interest to investors. For more information about our investor relations, see storaenso.com/investors.

Stora Enso's Sustainable Finance strategy is an integrated part of our overall strategy. Stora Enso should have access to sufficient and competitively priced funding at any time to be able to pursue its strategy and achieve its targets. In order to accomplish this, our emphasis is on debt capital markets funding. In the long-term, Stora Enso's aim is to secure funding partners that have sustainability as a fundamental part of their agenda. We aim at contributing to a scenario where the sustainability of business is a key metric for credit risk assessment. We aim to influence and develop the financial markets to ensure that sustainability becomes an integral part of decisions and credit evaluation.



Investors are increasingly recognising the importance of corporate sustainability in their decision-making.



Not just talk: the role of business in combatting global warming

"Things do not get done unless they are measured," says our CFO **Seppo Parvi**. "It's important to make sure that climate efforts are not talk only, but that they become a part of the company's daily work. Setting targets and reporting on them are proof of our progress. Making targets public also creates pressure to reach those targets, to stay on track – or to publicly explain why they were not reached."

Read the full article at storaenso.com/sustainability

@storaenso October 24



Reasonable assurance for data & externally verified targets can contribute to better financing decisions. Stora Enso's ability to deliver on its #ScienceBasedTargets has been tied to the pricing of a revolving credit facility. @MorrisNoel #CMSingapore18 @wbcsd

Progress

ESG topics embedded in investor relations activities

In 2018, ESG topics were discussed in 7% of all Stora Enso investor activities. More than 60 external participants, representing 9% of all participants, joined these discussions in one-to-one meetings, conference calls, a group meeting, and a webinar. The focus was on Stora Enso's sustainability strategy and activities.

During the year, we also continued our strategy to enhance the availability of ESG information to investors, and to prioritise Stora Enso's participation in questionnaires and assessments for the ESG index and ratings schemes that are most material for our investors.

In September 2018, Stora Enso's CFO signed an A4S Statement of Support to promote improved disclosure of climate risks and opportunities. The Financial Stability Board's (FSB) Task Force on Climate-related Financial Disclosures (TCFD) recommends a framework for disclosing climate related risks and opportunities that goes beyond current practices.

Green funding at Stora Enso

In 2018, Stora Enso launched a Green Bond Framework as part of its Sustainable Finance approach. The ambition is to offer a type of loan that supports sustainability-focused fixed-income investors, and to report the direct environmental impacts of some investments and business activities. Stora Enso strives to build confidence and a track record with fixed-income investors by being informative and transparent. In December 2017, Stora Enso signed a Revolving Credit Facility (RCF) loan where part of the pricing is based on Stora Enso's ability to reduce greenhouse gas emissions per tonne of pulp, paper, and board produced, in accordance with the Science Based Targets initiative.

The Green Bond Framework is aligned with the 2017 version of the Green Bond Principles (GBP) published by the International Capital Markets Association (ICMA). To confirm such alignment, Stora Enso commissioned Sustainability as an external reviewer to provide a third-party opinion on the framework.

ESG indices and other external recognition in 2018



Euronext Vigeo

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



FTSE4Good Index

Stora Enso is included in the FTSE4Good Index Series. These indices measure 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.



ISS-oekom Research

Stora Enso is classified as “Prime” by ISS-oekom Research’s environmental, social, and governance rating methodology. In 2018, Stora Enso also received the best possible Environmental & Social quality score by the Institutional Shareholder Services (ISS).



MSCI

Stora Enso is included in several of MSCI’s ESG indices.



Ecovadis

Stora Enso was included in the top 1% (industry suppliers) of the Ecovadis ethical supplier rating system, and achieved the highest recognition level (Gold).



OMX GES Sustainability Finland index

Stora Enso is included in the NASDAQ OMX and GES Investment Service’s OMX GES Sustainability Finland index.



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.



Ethibel

In 2018, Forum Ethibel included Stora Enso in the Ethibel PIONEER Investment Register which indicates that the company can be qualified as a sector leader in terms of Corporate Social Responsibility (CSR). Stora Enso is also listed in the Ethibel Sustainability Index Excellence Europe.



Transition Pathway Initiative (TPI)

In 2018, Stora Enso was top-ranked in greenhouse gas management and performance by the TPI. An asset owner-led and asset manager-supported global initiative, the TPI assesses companies’ preparedness for transition to a low carbon economy, supporting efforts to address climate change.



CDP

CDP has included Stora Enso on its new 2018 Climate A List, which identifies the global companies that are taking leadership in climate action.



Sustainability Reporting Awards Finland

Stora Enso’s Sustainability Report 2017 was ranked best by the media in a competition organised by seven not-for-profit organisations representing various sectors of society. The report was short-listed among the 10 best reports in the overall competition.



ReportWatch

Stora Enso’s Sustainability Report 2017, part of our Annual Report, was included in ReportWatch’s Best Practices in Annual Sustainability Reporting.



WBCSD

Stora Enso’s Sustainability Report 2017 was included in the top ten sustainability reports globally according to the 2018 Reporting matters publication by the World Business Council for Sustainable Development (WBCSD).



Sustainable Brand Index

Stora Enso was ranked “Industry Leader 2018” in the Sustainable Brand Index™ B2B, which is the largest brand study on sustainability in the Nordics.



Equileap

Stora Enso was ranked number 12 globally and the best performing Finnish company in gender balance and gender equality by Equileap, an organisation set up to accelerate progress toward gender equality at work.

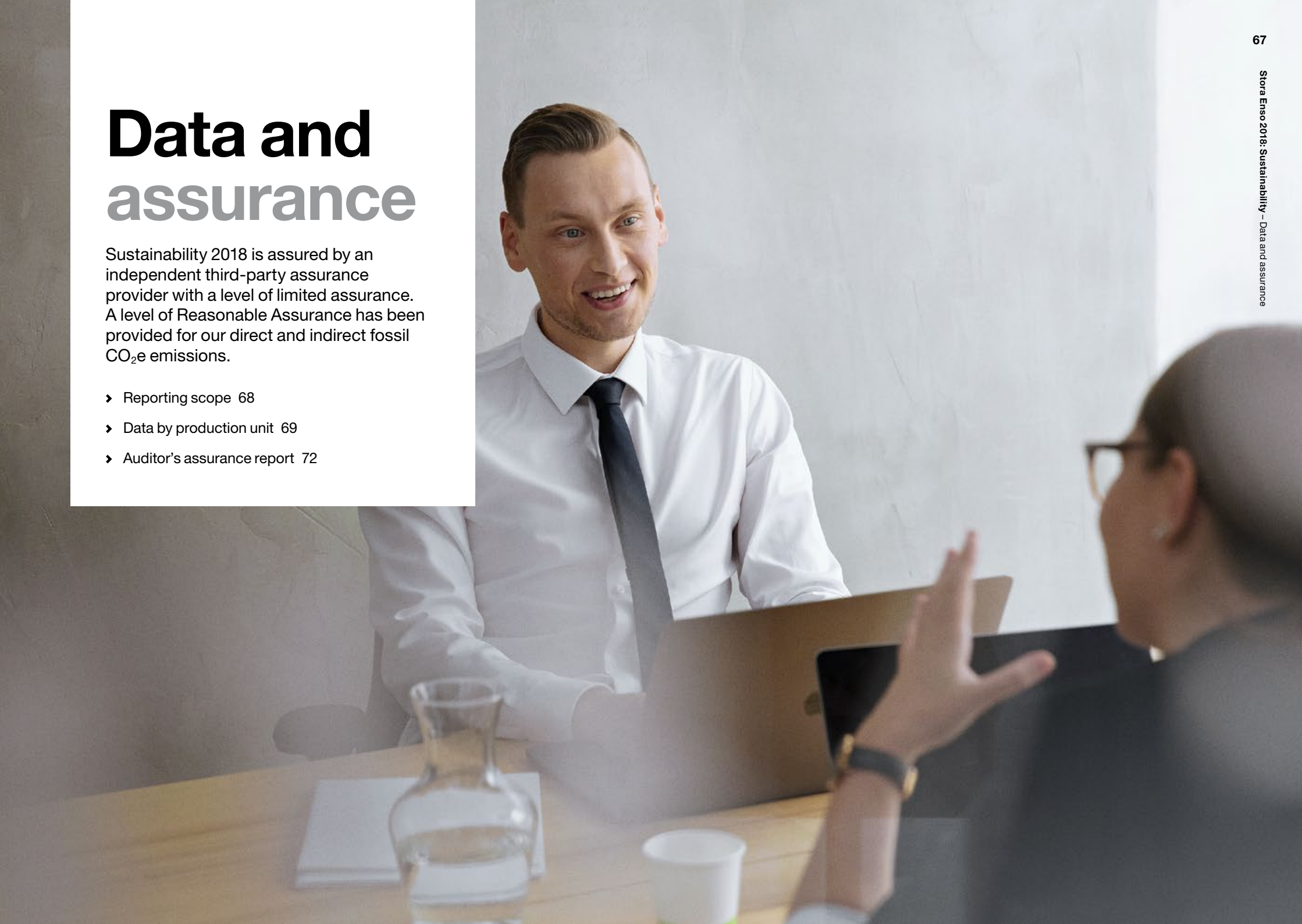
Most sustainable company 2018

In November 2018 Stora Enso was ranked as the most sustainable listed company in Sweden by Dagens Industri, Aktuell Hållbarhet, and Lund University School of Economics and Management.

Data and assurance

Sustainability 2018 is 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 CO₂e emissions.

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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 our major internal and external stakeholders. For more information on our approach to materiality, see page 7.

Data boundaries

Unless otherwise stated, the Group's consolidated performance data 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 consolidated figures and reporting on human rights, occupational safety, community, and forests, plantations, and land use also include the 50% owned joint operations Veracel in Brazil and Montes del Plata in Uruguay, due to their materiality to the Group's sustainability impacts and stakeholder interest. Otherwise the consolidated figures do not include equity-accounted investments where Stora Enso's ownership is between 20% and 50%, or companies in which our ownership share is less than 20%.

Consolidated environmental and energy data covers our production units. Stora Enso's sawmills and converting facilities are excluded from water, energy, and certain CO₂ indicators that are normalised per tonne of sales production unless otherwise specified in the respective footnotes. This is due to the lower materiality of sawmills and converting facilities in the Group's related performance and different metric for sales production (cubic metre and square metre, respectively), compared with board, pulp and paper mills (tonnes).

Human Resources (HR) data is derived from separately collected statistics. Unlike in our financial reporting, consolidated HR data in this Sustainability report excludes employees of our 50% owned joint operations Montes del Plata and Veracel. The HR data presented covers our permanent and temporary employees as of 31 December 2018 and are expressed as a headcount (rounded to the nearest 10). Certain administrative functions and sales offices are not included in the Group's consolidated occupational health and safety (OHS) data due to data availability and lower occupational safety risk compared to production units.

Significant changes in scope during 2018

During 2018, there were no significant organisational changes affecting our sustainability reporting. The divestment of the wood

supply company in Rio Grande do Sul, Brazil was completed during the second quarter. For more information on the Group's acquisitions and disposals, see note 4 in **Financials 2018**.

Our principle in our environmental and energy reporting is that new production units are included in the reporting after production has started. In 2018, our Packaging Solutions division inaugurated a new corrugated packaging unit in Wujin, China, and our Wood Products division started the production of biocomposites in Hylte, Sweden. Both new units are included in the reporting.

In our environmental and energy reporting, divestments and closures are managed according to the international Greenhouse Gas Protocol. This means that figures for historical performance are recalculated following the removal of divested units from the baseline when necessary. However, closed units are maintained in the environment and energy target and trend calculation baselines as per the internationally accepted rules.

In accordance with the GRI Standards

Our reporting is prepared in accordance with the GRI Standards: Core option. This means that our reporting covers all the General Disclosures, as well as the Topic-specific Standards we deem material. Our GRI Content Index lists our disclosures with reference to the GRI Standards, and refers to the locations (supported by URL links) where these issues are addressed in our reporting. The location references are complemented in the index with additional information, such as explanations on reasons for omissions as necessary.

Impacts that make sustainability topics relevant to us may occur outside Stora Enso, or they may only be material for some of our operations or locations. When our reporting on a sustainability disclosure only concerns specific units, geographical regions or other data collection boundaries, based on the identified materiality, this is specified in connection with the respective disclosure.

External assurance

This report has been verified by an independent third-party assurance provider in accordance with the voluntary external assurance practices followed in sustainability reporting. The assurance report appears on page 72. PwC has provided a limited level of assurance covering the entire contents of this report, based on an assessment of materiality and risk. For the fourth year running, a level of reasonable assurance has been provided for Stora Enso's reporting on direct and indirect fossil CO₂e 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 in 2000 to encourage businesses worldwide to embed responsibility into 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.



Data by production unit

This table presents unit-specific information on environmental performance, production, certificates and numbers of employees. Joint operations are excluded.

Unit	Number of employees ^{a)}	Production capacity ^{b)}	Products	Recovered fibre ^{c)}	Certificates								Fossil CO ₂ emissions										Process water discharges				
					ISO 9001	ISO 14001	ISO 22000	FSSC 22000	FDA	ISO 50001	OHSAS 18001	FSC® CoC	PEFC™ CoC	Process waste to landfill	Hazardous waste ^{d)}	SO ₂ ^{e)}	NO _x as NO ₂	Direct CO ₂ ^{f)}	Indirect CO ₂ ^{f)}	CO ₂ , on-site transportation ^{g)}	Carbon neutral CO ₂ , biomass fuels ^{h)}	COD		AOX	Phosphorus	Nitrogen	
		1 000 t												t	t	t	t	t	t	t	t	t	t	t	1 000 m ³		
Belgium																											
Langerbrugge	338	555	④	x	x	x			x	x	x	x	11 239	58	2	303	123 512	22 626	1 433	482 312	1 112	0.7	3.5	11.5	6 865		
China																											
Beihai	418	470	①			x	x		x		x	x	255	14	214	224	467 372	77 898	1 049	37 863	183		0.8	13.4	4 293		
Dawang	222	140	④	x		x	x				x	x		1				118 252	2		45			1.4	968		
Dongguan	1 196	30*	③			x	x				x	x		5				5 517	6		14		0.0	0.6			
Jiashan	399	20*	③			x	x					x	x	3				1 558	9			0.0	0.0	0.0	6		
Qian'an	1 901	25*	③			x	x					x	x	6				8 667	68						1		
Wujin ^{g)}	225	5*	③											1				135									
Estonia																											
Tallinn	35	18*	③			x	x	x					x	10			81	790	24						1		
Finland^{h)}																											
Anjala/Ingerois	569	435/280	④ ①			x	x		x ⁱ⁾		x	x	x	x	89	5	277	94 508	114 680	1 497	158 788	4 377		6.9	176.3	10 120	
Enocell	263	490	②			x	x				x	x	x	x	6 945	57	87	912	55 137	-1 471	158	1 449 845	8 340	54.6	3.9	55.7	21 460
Heinola Fluting	175	300	①			x	x	x			x	x	x	x	1 024	170	608	319	132 950	9 596	160	181 916	1 260		2.4	35.3	1 294
Imatra	1 318	1 200	① ②			x	x	x	x	x	x	x	x	484	325	106	2 158	193 938	66 271	1 566	2 178 384	19 596	94.0	15.0	200.0	62 111	
Kristiinankaupunki	51	20*	③			x	x	x			x	x	x				192	80	7							1	
Lahti	283	130*	③			x	x	x				x	x		343				5 488	198		6		0.0	0.3	27	
Oulu	762	1 080	④ ②			x	x				x	x	x	x	13	290	383	1 029	262 707	30 185	2 901	1 117 530	7 580	39.3	9.8	75.0	17 741
Sunila	232	375	② ⑤			x	x				x	x	x	x	4 870	154	103	669	27 304	5 300	439	807 955	4 825	30.0	5.5	14.9	12 921
Varkaus	307	390	①	x		x	x	x			x	x	x	x	2 570	168	95	566	63 011	16 872	323	748 327	1 685		3.2	58.0	14 932
Veitsiluoto	536	790	④			x	x				x	x	x	x	460	29	316	997	201 255	43 436	296	1 069 672	8 559	24.3	6.0	134.0	10 211
Germany																											
Maxau	426	530	④	x		x	x				x	x	x	x	5	425	1	290	99 854	141 090	3	324 029	1 717	0.4	3.5	12.6	5 584
Sachsen	251	310	④ ②	x		x	x				x	x	x	x		2	3	148	169 671	2 159	836	34 736	709	0.4	0.4	13.3	3 657
Latvia																											
Riga	159	105*	③			x	x	x			x		x		72		2	2	594	190							15
Lithuania																											
Kaunas	54	20*	③			x	x	x					x		3				274	61							3

	Number of employees ^{a)}	Production capacity ^{b)}	Products	Recovered fibre ^{c)}	Certificates								Fossil CO ₂ emissions										Process water discharges			
					ISO 9001	ISO 14001	ISO 22000	FSSC 22000	FDA	ISO 50001	OHSAS 18001	FSC® CoC	PEFC™ CoC	Process waste to landfill	Hazardous waste ^{d)}	SO ₂ ^{e)}	NO _x as NO ₂	Direct CO ₂ ^{f)}	Indirect CO ₂ ^{f)}	CO ₂ , on-site transportation ^{g)}	Carbon neutral CO ₂ , biomass fuels ^{h)}	COD		AOX	Phosphorus	Nitrogen
Unit		1 000 t									t	t	t	t	t	t	t	t	t	t	t	t	t	1 000 m ³		
Poland																										
Łódź	267	135*	③		x	x	x			x	x	x	1		3	3 062	9 466									
Mosina	104	20*	③		x	x	x			x	x	x	63		441	1 818	31							1		
Ostrolęka Corrugated ^{l)}	256	145*	③	x	x	x	x			x	x	x	27	111	342	309 067	201 044	1 782	426 471	918		5.6	18.3	8 750 ^{j)}		
Ostrolęka Containerboard ^{l)}	999	723	① ④		x	x				x	x	x	2				12 448	111								
Tychy	161	135*	③		x	x	x			x	x	x	5			2 761	5 296	163						13		
Russia																										
Arzamas	168	100*	③		x	x	x				x		16	9	1	5	3 602	14 179	81		9		0.0	0.4	29	
Balabanovo	342	165*	③		x	x	x				x		84	5	1	2	4 675	21 359	108		12		0.1	0.4	28	
Lukhovitsy	135	100*	③		x	x	x				x		61	3		2	2 546	13 975	113		3		0.0	0.1	20	
Sweden																										
Falu Rödfärg ^{k)}			⑥		x	x							8 309	1		480										
Fors	573	455	①		x	x		x	x	x	x		160	5	104		87	616	265 252	1 671	0.5	1.7	27.9	4 204		
Hylte	420 ^{h)}	480	④	x	x	x				x	x	x	x	27 980	51		122	4 451	156	1 027	252 258	907	1.4	2.0	19.7	5 514
Jönköping	180	100*	③		x	x						x	33			200	498	42						10		
Kvarnsveden	473	550	④		x	x				x	x	x	x	155	15	105	27 227	274	12	216 133	1 924	0.5	2.1	46.5	7 901	
Nymölla	575	485	④ ②		x	x				x	x	x	x	158	509	486	-496	54	1 664	754 394	11 581	0.5	8.4	73.5	29 100	
Skene	145	100*	③		x	x						x	1				20	39						15		
Skoghäll	734	875	① ②		x	x	x	x		x	x	x	x	6 355	1 513	133	498	50 121	137	1 695	936 458	8 599	14.6	9.9	94.5	25 564
Skoghäll (Forshaga)	106	120	①		x	x	x	x	x	x	x	x	x	4			2 223	4	309							
Skutskär	394	540	②		x	x				x	x	x	x	10	179	742	136	27	1 586	1 613 010	4 798	38.5	19.5	96.7	19 460	
Vikingsstad	66	75*	③		x	x						x	1				1 014	46	1						23	
Total board, pulp, paper, converted products		11 573 ^{m)}											62 371	12 725	2 876	10 305	2 303 004	950 887	20 607	13 055 331	90 430	299.7	110.3	1 180.3	272 840	
Total, wood products		n)																								
Wood products units ⁿ⁾					o)	o)	o)	o)	o)	o)	o)	o)	6 243	803	25	536	3 861	106 428	16 530	505 511						
Grand Total																										
All units													68 615	13 528	2 901	10 841	2 306 864	1 057 315	37 137	13 560 843	90 430	299.7	110.3	1 180.3	272 840	

a) At year-end.

b) Production capacities of integrated board, pulp, and paper mills only include paper and board production capacities.

c) Mills using recovered fibre as raw material (fully or partly).

d) Reported on the basis of country-specific definitions applied in national regulations.

e) Total sulphur is reported as sulphur dioxide (SO₂) equivalent, but includes all sulphurous compounds.f) All CO₂ figures are calculated using the WRI/WBCSD Greenhouse Gas Protocol and Scope 2 Guidance.

g) Wujin Mill began operation in June 2018.

h) Also includes those employees of our maintenance company Efora Oy that are located on site.

i) Only covers board production at Ingeröis.

j) Water discharges reported together from both Ostrolęka units.

k) Does not have its own personnel but hires personnel from Stora Enso AB.

l) Number of biocomposite production line employees is included. See separate table for Wood Products units for biocomposite production data.

m) Excluding total corrugated board capacity 1 428 million m².n) Production capacities for sawn timber 5 197 000 m³ and for wood pellets 369 000 t.

o) See separate table for Wood Products units.

Products:

① board and packaging paper

② market pulp

③ converted products (e.g. cores, corrugated board)

④ paper

⑤ lignin

⑥ red paint pigment

The figure 0 (zero) in the table signifies that such discharges, emissions, or waste did not occur or they were below the Group's reporting threshold. Where cells are left blank, this signifies that the parameter is considered as not relevant for that unit.

Up-to-date certificate information can be found at storaenso.com/certificates* million m²

	Capacities							Certificates							Fossil CO ₂ emissions							
	Number of employees ^{a)}	Sawn products 1 000 m ³	Further processed 1 000 m ³	CLT 1 000 m ³	Wood pellets 1 000 t	LVL 1 000 m ³	Biocomposite 1 000 t	ISO 9001	ISO 14001	ISO 50001	OHSAS 18001	FSC® CoC	PEFC™ CoC	SBP	Process waste to landfill t	Hazardous waste ^{b)} t	SO ₂ ^{c)} t	NO _x as NO ₂ t	Direct CO ₂ ^{d)} t	Indirect CO ₂ ^{d)} t	CO ₂ , on-site transportation ^{d)} t	Carbon neutral CO ₂ biomass fuels ^{d)} t
Unit																						
Wood products units																						
Austria																						
Bad St. Leonhard	248	350	105	80				x	x	x	x	x	x			47		4			1	
Brand	207	440	260					x	x	x	x	x	x			32					1	
Ybbs	394	610	440	90				x	x	x	x	x	x			56					1	
Czech Republic																						
Planá	243	370	220					x	x	x	x	x	x		513	28	1.3	54			1 964	28 006
Ždírec	277	550	220		75			x	x	x	x	x	x		3 702	35	0.7	159			2 192	126 337
Estonia																						
Imavere	326	340	160		100			x	x	x	x	x	x	x	46	77	5.4	54		49 363	1 834	59 111
Näpi	92	47	160		14			x	x	x	x	x	x		21	11	0.6	6	27	12 644	340	7 339
Finland																						
Honkalahti	116	310	70					x	x	x	x	x	x			2		27	67	3 541	678	38 893
Kitee	98	260	110		25			x	x	x	x	x	x		10	15	0.3	17		2 536	478	37 707
Uimaharju	68	240	20					x	x	x	x	x	x			38				2 862	745	1 479
Varkaus	120	150	10			70		x	x	x	x	x	x		33	67				6 154	677	
Veitsiluoto ^{g)}	55	200						x	x	x	x	x	x				9.0	20		5 560	615	
Germany																						
Pfarrkirchen	102		145					x	x	x	x	x	x			20	2.0	14			260	6 245
Latvia																						
Launkalne	133	190	20					x	x	x	x	x	x		534	4		31	538	1 736	2	25 060
Lithuania																						
Alytus	236	200	90					x	x	x	x	x	x			28	1.9	15		2 626	1 165	28 089
The Netherlands																						
Amsterdam	42		80					x	x	x	x	x	x		16	1			13	1 005	1	
Poland																						
Murow	278	260	210					x	x	x	x	x	x			275	2.7	15			1	15 570
Russia																						
Impilahti	112	140	10		20			x	x	x	x	x	x					9		4 458	1 185	19 467
Nebolchi	176	180	45		40			x	x	x	x	x	x	x	1 369		0.5	47		8 295	1 146	27 695
Sweden																						
Ala	161	370	50		95			x	x	x	x	x	x			60	0.7	63		10	1 852	84 513
Gruvön	178	370	150		100			x	x	x	x	x	x			9			3 216	5 573	1 391	
Hylte	10						15	x	x	x	x	x	x							67		
Wood products units total		5 577	2 575	170	469	70	15								6 243	803	25.0	536	3 861	106 428	16 530	505 511

a) At year-end.

b) Reporting is based on country-specific definitions applied in national regulations.

c) Total sulphur is reported as sulphur dioxide (SO₂) equivalent, but includes all sulphurous compounds.d) All CO₂ figures are calculated using the WRI/WBCSD Greenhouse Gas Protocol and Scope 2 Guidance.

e) Sawing capacity reported with the Paper division.

Certificate documents can be found at storaenso.com/certificates

Auditor's assurance report

To the Annual General Meeting of Stora Enso Oyj

We have been engaged by the Board of Directors and the Group Leadership Team of Stora Enso Oyj (hereafter Stora Enso) to provide limited assurance on Stora Enso's Sustainability Report 2018 as a whole, and reasonable assurance on Stora Enso's direct and indirect (scopes 1+2) fossil CO₂ emissions as disclosed in the Sustainability Report.

Responsibilities of the Board and Management

The Board of Directors and Group Leadership Team of Stora Enso Oyj are responsible for preparing the Sustainability Report in accordance with the Reporting Criteria as set out in the Company's reporting instructions, including the GRI Sustainability Reporting Standards of the Global Reporting Initiative and the Greenhouse Gas Protocol for CO₂ emissions. This responsibility includes the internal control relevant to the preparation of a Sustainability Report that is free from material misstatements, whether due to fraud or error.

Responsibilities of the Auditor

Our responsibility is to express a conclusion on the Sustainability Report based on the procedures we have performed and the evidence we have obtained. Our assignment is limited to the historical information that is presented and thus does not include future-oriented information. We do not accept, or assume responsibility to anyone else, except to Stora Enso for our work, for this report, or for the conclusions that we have reached.

We conducted the assurance engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000, "Assurance Engagements Other than Audits or Reviews of Historical Financial Information", to provide limited assurance on the Sustainability Report as a whole, and in accordance with ISAE 3410, "Assurance Engagements on Greenhouse Gas Statements", to provide reasonable assurance on direct and indirect (scopes 1+2) fossil CO₂ emissions as disclosed in the Sustainability Report. These standards require that we plan and perform the engagement to obtain the appropriate level of assurance that the information examined is free from material misstatement.

A reasonable assurance engagement includes examining, on a test basis, evidence supporting the selected information in the Sustainability Report. We have evaluated the effectiveness of internal controls and the processes for collecting and consolidating CO₂ emissions data, and performed testing on a sample basis to evaluate whether the CO₂ emissions are reported according to the Reporting Criteria.

A limited assurance engagement consists of making inquiries, primarily of persons responsible for the preparation of the Sustainability Report, reviewing documentation, and applying analytical and other limited assurance procedures based on the auditor's judgement. In addition, we have performed site visits to Beihai (China), Imavere (Estonia), and Varkaus (Finland) to review compliance with reporting policies, assess the reliability of local reporting process, and test data collected for sustainability reporting purposes on a sample basis.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusions below. The conclusion based on our limited assurance procedures does not comprise the same level of assurance as the conclusion of our reasonable assurance procedures. Since this assurance engagement is combined, our conclusions regarding the reasonable assurance and the limited assurance procedures are presented separately below.

Our independence and quality control

We have complied with the independence and other ethical requirements of the "Code of Ethics for Professional Accountants" issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

PricewaterhouseCoopers 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.

Conclusions

Based on the limited assurance procedures we have performed, nothing has come to our attention that causes us to believe that the Sustainability Report is not prepared, in all material respects, in accordance with the Reporting Criteria.

In our opinion, Stora Enso's direct and indirect (scopes 1+2) fossil CO₂ emissions which have been subject to our reasonable assurance procedures have, in all material respects, been prepared in accordance with the Reporting Criteria.

Helsinki, 13 February 2019

PricewaterhouseCoopers

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It should be noted that Stora Enso and its business are exposed to various risks and uncertainties and certain statements herein which are not historical facts, including, without limitation those regarding expectations for market growth and developments; expectations for growth and profitability; and statements preceded by "believes", "expects", "anticipates", "foresees", or similar expressions, are forward-looking statements. Since these statements are based on current plans, estimates and projections, they involve risks and uncertainties, which may cause actual results to materially differ from those expressed in such forward-looking statements. Such factors include, but are not limited to: (1) operating factors such as continued success of manufacturing activities and the achievement of efficiencies therein, continued success of product development, acceptance of new products or services by the Group's targeted customers, success of the existing and future collaboration arrangements, changes in business strategy or development plans or targets, changes in the degree of protection created by the Group's patents and other intellectual property rights, the availability of capital on acceptable terms; (2) industry conditions, such as strength of product demand, intensity of competition, prevailing and future global market prices for the Group's products and the pricing pressures thereto, price fluctuations in raw materials, financial condition of the customers and the competitors of the Group, the potential introduction of competing products and technologies by competitors; and (3) general economic conditions, such as rates of economic growth in the Group's principal geographic markets or fluctuations in exchange and interest rates. All statements are based on management's best assumptions and beliefs in light of the information currently available to it and Stora Enso assumes no obligation to publicly update or revise any forward-looking statement except to the extent legally required.