Unravelling sustainable wood sourcing for garment, textile and footwear industry

Image © Yann François

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DEUTSCHE ZUSAMMENARBEIT

Implemented by
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FABRIC Cambodia

switchasia

Funded by the European Union

SWITCH GARMENT
PROMOTION OF SUSTAINABLE ENERGY PRACTICES IN THE GARMENT SECTOR IN CAMBODIA

AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

VETHIC

geres ACTING FOR CLIMATE SOLIDARITY

Firewood use in the garment sector

700,000 m^3 of wood are consumed every year by garment factories

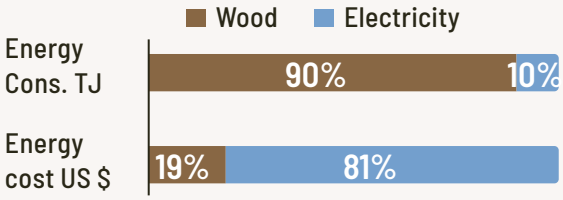
Including **400,000 m^3 of forest wood**

equivalent to

- **5,500 soccer fields** of forest consumed per year
- **485,000 tCO_2** tonnes of CO_2 direct emissions per year
- the emissions of **63,000 round world** tours by plane

Assessment of the firewood demand

Wood expenditure in factories using wood boilers accounts for only 19% of energy costs, yet it contributes to nearly 90% of the overall energy consumption. This is partially due to inefficiencies in converting primary wood fuel into usable steam within the current production system, which is expected to continue driving demand for wood.

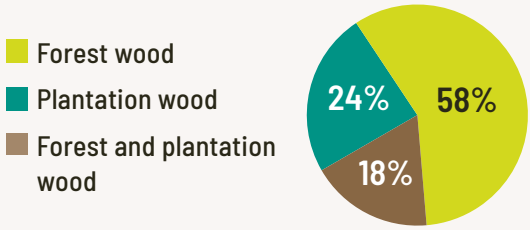


Share of electricity and wood in an average garment factory using wood for steam generation

Source of wood

About half of the garment factories use wood for steam production, mostly for washing, ironing and dying.

Among those, 76% rely on forest wood, with 58% using forest wood exclusively and 18% using both plantation and forest wood.



Percentage of factories using wood, electricity, or others

Sweater and denim factories, which have high steam requirements, **primarily rely on wood**, while **sportswear factories differ by relying mainly on electric boilers** and minimal wood boilers.

Sustainable firewood availability for garment factories

While plantation wood is generally considered to be more traceable, legal, and sustainable, it does have a slightly lower energy density compared to forest wood (often sourced illegally or through deforestation). Consequently, it may require a bit more handling and storage space. This challenge can be addressed by improving boiler operations, such as enhancing drying processes or implementing more efficient combustion techniques.

A switch to more efficient boilers and more modern technologies such as chain grate boilers would make plantation wood more competitive than unsustainable wood in the current boilers.

For more information on boilers and energy sources for steam production

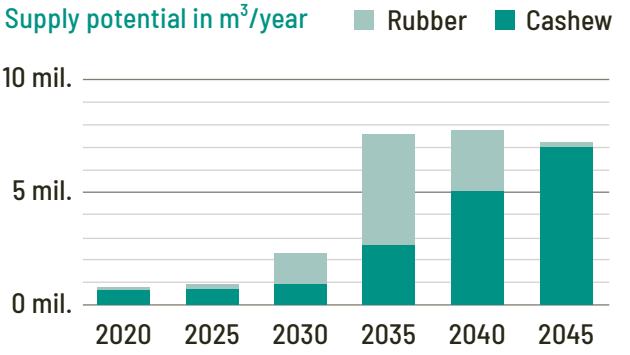
	Traceability	Sustainability	Legality	Suitability with Boiler Technology: Fixed Grate	Chain Grate	Fluidized Bed
Forest Wood	●	●	◐	●	●	●
Plantation Wood	◑	●	●	●	●	●

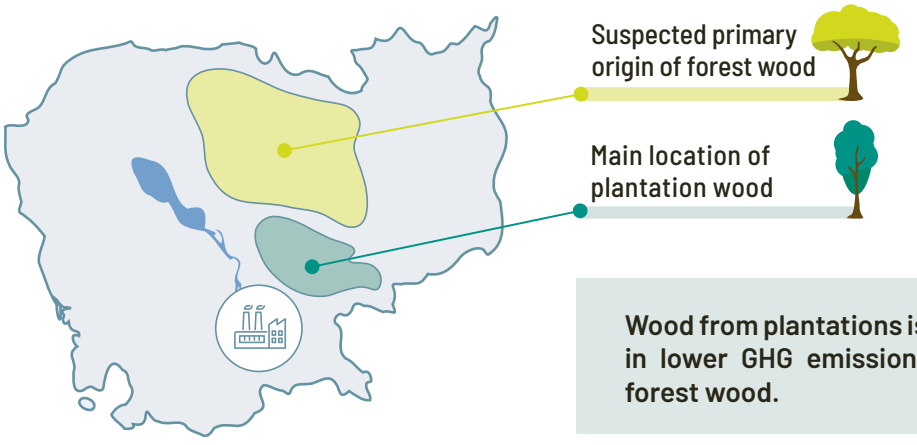
Negative ← → Positive

Growing potential for firewood supply

Plantation wood such as rubberwood and cashew supplies, for example, are expected to increase significantly by 2030 and could largely contribute to the sector demand in order to reduce the reliance on forest wood.

Other significant biomass could supply the industry, such as mango or acacia trees. Rice husk is also an agricultural residue with high added value. Unfortunately, very few millers invest in rice processing equipment, such as briquettes or pellets due to a low demand. Besides the garment industry, brick and cement factories also use biomass as fuel.





While forest conversion to agriculture likely remains the primary wood source for the garment sector, key supply areas indicate tree cover loss in protected areas.

Wood from plantations is located closer to factories, resulting in lower GHG emissions from transportation compared to forest wood.

What can be done to achieve sustainability?

SUSTAINABLE BIOMASS ENERGY PRODUCTION AND CONSUMPTION FRAMEWORK

Decision-makers, brands, and suppliers can use the following framework as guidance principles for establishing minimum sustainability standard for the utilization of biomass energy in factory operations.

These principles are not comprehensive and do not prescribe specific methodologies but rather outline key considerations.

SOURCING

- Allow only forest/agricultural/wood processing residues
- Prohibit natural ecosystem conversion
- Limit removals to preserve sufficient soil organic matter
- Use certified biomass when possible

To ensure the long-term viability of resources for current and future generations

PROCESSING

- Prioritize wood and agricultural products processing residues
- Use renewable energy for biomass processing and densification
- Report processing emissions in GHG inventories

To maximize resource utilization efficiency, minimize waste and reduce GHG

TRANSPORT

- Source biomass close to factories
- Report biomass transportation emissions

To ensure transparency and accountability for the environmental impact along the supply chain

END - USE

- Prioritize biomass for large-scale and high-temperature processes
- Invest in energy efficiency
- Monitor regularly for corrections

To enhance the potential of renewable resources

TRACEABILTY AND LEGALITY

- Establish traceability to track firewood to its source
- Comply with harvesting, transportation, workers' and community rights laws
- Monitor to prevent feedstock from violating rights in certain areas

To ensure ethical and responsible sourcing practices

Roadmap for the garment sector to achieve sustainable steam production using biomass fuel

In the pursuit of sustainability within Cambodia's garment industry, this roadmap presents a strategy that addresses both the supply and demand aspects of energy production. Together, these comprehensive measures work in tandem to reduce environmental impact, optimize energy consumption, and fortify the industry's competitiveness.

Demand-Side

Improving the efficiency of existing steam systems

By looking at insulation, regular cleaning, minimizing stack gas losses, exploring the potential for heat recovery and ensuring regular cleaning and maintenance.

Replacing boiler technologies (cf. Boiler and Steam System Tech Brief)

By switching to more energy efficient boilers and boiler technologies allowing the use of alternative biomass such as chain-grate or fluidized bed boilers. Consider electricity for factories with small heat needs.

Supply-Side

Developing and enforcing minimum wood sustainability requirements

Since most factories supply multiple brands, it is essential to develop minimum sustainability requirements that are agreed upon among the largest possible group of brands.

Promoting long-term partnerships with biomass suppliers

By developing partnerships with large scale plantations and farmers' cooperative and secure wood supply. Pre-drying wood on-site would increase efficiency and decrease consumption.

Enabling factors

To facilitate progress toward sustainable biomass utilization, three critical enabling factors have been identified

Distinguish renewable vs. non-renewable biomass for better accountability in GHG accounting.

Incentivize sustainable biomass with fiscal benefits (e.g., VAT exemption).

Minimum Energy Performance Standard (MEPS) prevents inefficient boilers and promotes alternative biomass.

About Switch Garment:
Switch Garment, a project funded by the European Union Switch Asia Grants Program and jointly implemented by Global Green Growth Institute (GGGI) Cambodia, Textile, Apparel, Footwear & Travel Goods Association in Cambodia (TAFTAC) and Geres aims at 'Promotion of sustainable energy practices in the garment sector in Cambodia' ("Switch Garment"). The objective of this project is to increase the competitiveness, and decrease the environmental impact of the Cambodian garment industry through sustainable production.

About Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH:
GIZ is a global service provider in the field of international cooperation for sustainable development and international education work. With over 50 years of experience, GIZ works across diverse areas, including economic development and employment, energy and the environment, and peace and security.

The GIZ project FABRIC Cambodia operates on behalf of the German Federal Ministry of Economic Cooperation and Development (BMZ). FABRIC Cambodia works with partners to support the textile and garment industry in Cambodia and the region in its transformation towards fair production for people and the environment. To achieve sustainable solutions and enhance the industry's competitiveness, the project cooperates with various public, private and civil society actors on social and environmental issues.

About VETHIC :
The VETHIC project (2022-2024), funded by Agence française de développement (AFD), aims to improve the environmental performance of the Cambodian textile sector by leveraging energy transition. The project is jointly implemented by Geres, TAFTAC, Cambodia Women for Peace and Development (CWPD), and Live and Learn Cambodia (LLC).

Disclaimer:
This publication was produced with the financial support of the German Federal Ministry for Economic Cooperation and Development (BMZ) through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, the European Union (EU SWITCH-Asia Program) and Agence française de développement (AFD). Its contents are the sole responsibility of the authors and do not necessarily reflect the views of the GIZ, EU and AFD.

December 2023

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