

# SUSTAINABLE STEAM FOR CAMBODIAN GARMENT FACTORIES

RICE HUSK BRIQUETTE TO FIGHT  
DEFORESTATION AND CLIMATE CHANGE



SUSTAINABLE THERMAL ENERGY AND ALTERNATIVE BIOMASS

geres

# THE ISSUE OF FIREWOOD

IN THE CAMBODIAN GARMENT SECTOR

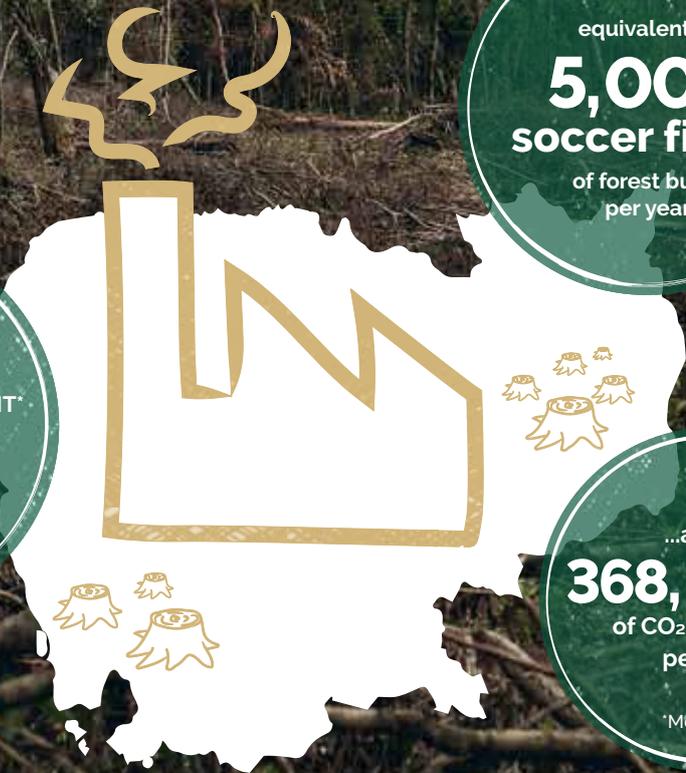
More than **300,000 MT\*** of wood are burnt every year by garment factories

\*Metric tons

equivalent to **5,000 soccer fields** of forest burnt per year

...and to **368,000 MT\*** of CO<sub>2</sub> emissions per year

\*Metric tons



Currently, **more than 780,000 MT (Metric tons) of wood are burnt every year by the industrial sector in Cambodia to produce heat and steam**, including at least **300,000 MT by garment factories only**, mostly for ironing, washing and dyeing. It is estimated that 70% of it is sourced either from forest conversion for agriculture or from illegal harvesting and therefore contributes to deforestation and climate change. This represents 368,000 MT of CO<sub>2</sub> emissions per year and the equivalent of 3,500 hectares of forest every year.

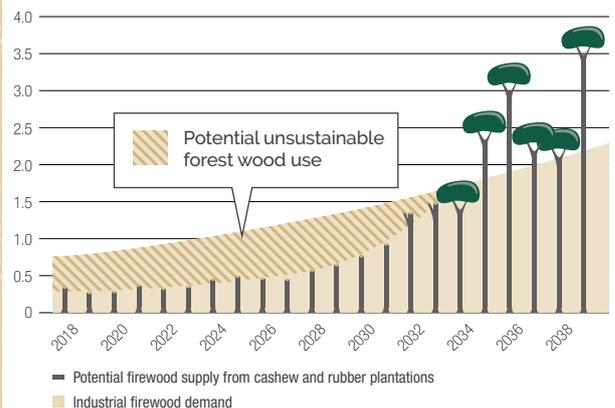
With the increasing demand for firewood, **the pressure on natural forest resources is rising**. This leads to an increase in the price of wood and a greater risk of having more wood illegally sourced from protected areas.

Today **only 30% of the industrial demand can be satisfied** by firewood from cashew nut and rubber plantations.

**Until 2035, there will not be enough firewood from plantations to satisfy the industrial demand. If nothing changes, more unsustainable forest wood will be used to fill the gap.**

**Industrial firewood demand in Cambodia**

in million metric tons / Year



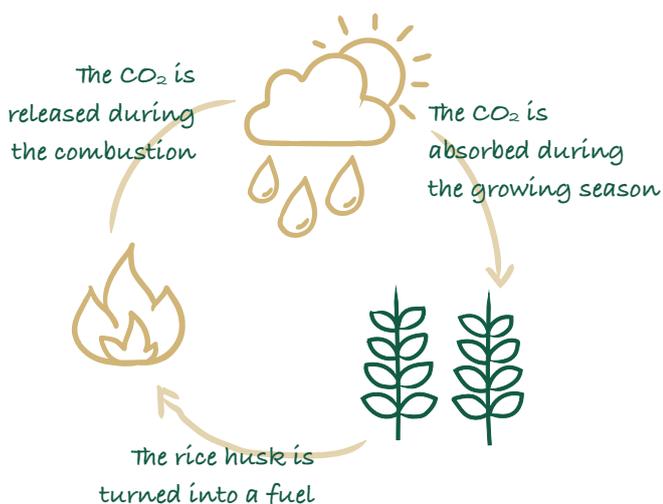
# WHY GARMENT SUPPLIERS

SHOULD ACT ON CLIMATE CHANGE?

## A global challenge for all sectors of the economy

Climate change can dramatically impact the economy and the wellbeing of people in Cambodia and around the world. It is mainly caused by greenhouse gases (GHG) emissions that provoke global warming which in turn increases the severity of floods, droughts, windstorms, and seawater intrusion. The productivity of most of the economic sectors would be seriously impacted by such changes.

Natural forest stores CO<sub>2</sub> from the atmosphere. Burning wood from non-sustainably managed forests releases this CO<sub>2</sub> into the atmosphere thus contributing to climate change.



However, using agricultural residues such as rice husk can be considered carbon neutral since the CO<sub>2</sub> released during the combustion is reabsorbed every year by the crops during the next growing season.

“Our objective is to achieve a climate neutral supply chain by 2030.

One of our main milestones is to reduce 30% of GHG emissions per product by 2025”



Aurelie Pruvost, H&M Group,  
ENVIRONMENT SUSTAINABILITY PROGRAM RESPONSIBLE  
CAMBODIA & VIETNAM

## International brands require a greener supply chain

International apparel companies are also pushing towards GHG emissions reduction. Among them, H&M Group is developing renewable energy targets to drive its transition towards a carbon-neutral supply chain by promoting energy efficiency and renewable energies.

## The Royal Government of Cambodia is pushing towards the reduction of GHG emissions

In the frame of the Paris agreement and growing concerns about climate change and deforestation, the Royal Government of Cambodia enacted its Climate Change Strategic Plan 2014-2023 containing measures to enable businesses, NGOs, government administrations and communities to respond to climate change through adaptation and mitigation activities.



The objective of the Cambodian government is to reduce by 7% the GHG emissions in the country (compared to 2010).

# Why using Rice Husk Briquettes?

Rice Husk Briquette (RHB) is one of the cheapest fuels for steam production and has the lowest CO<sub>2</sub> emissions.

## Two types of briquettes

There are two types of Rice Husk Briquettes: the piston press briquettes and the screw press briquettes. Usually the screw press briquettes are denser, larger and burn very slowly, they are also more expensive as their production is energy intensive. The piston press briquettes are usually cheaper, however they are less dense and tend to crumble if they are not solid enough. Both have usually the same calorific value and moisture content.



PISTON PRESS BRIQUETTES\*



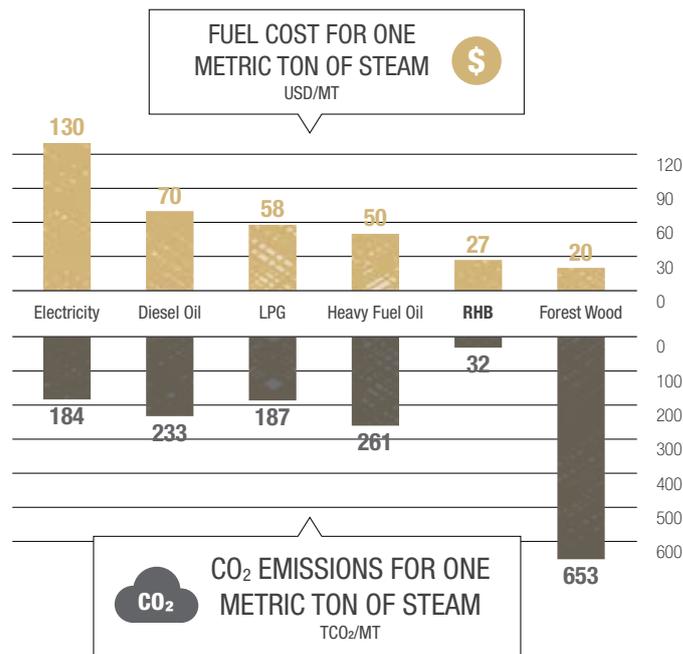
SCREW PRESS BRIQUETTES\*

## It can easily replace wood

Rice Husk Briquettes can be used in most of the biomass boilers (a small adaptation of the grate in the combustion chamber may be needed to prevent the ashes from blocking the airflow). Ask your boiler manufacturer if changes are required.

## Mixing fuels is possible

If necessary it is possible to use wood and rice husk briquettes alternatively or to mix both fuels in the combustion chamber.



## More efficient than wood

Rice Husk Briquettes are usually more effective than wood thanks to their lower moisture content. Rice Husk Briquettes will always have a stable moisture content lower than 10%, whereas firewood is often between 20% and 40%. Humidity decreases considerably the calorific value of the fuels.

## A solution widely used in Asia

Rice Husk Briquettes are already used in many countries and in different industries that need steam in their production process particularly in places where wood fuels are less available than in Cambodia.

## Available all year round

1.5 million tons of rice husk are produced every year in Cambodia, from January to December, which is much more than what the industry would need.

## Easy to store and transport

Rice Husk Briquettes are produced by compressing the rice husk into a cylindrical briquette to improve its combustion performance and reduce the storage and transportation costs.

# ENERGY EFFICIENCY

*Best practices to save  
money and energy*



## Monitor your energy consumption

Measuring energy consumption is the first step before making the right decision (investment in a new boiler, switch to new fuels).



## Use efficient boilers

About 40% of the boilers used in Cambodia have an energy efficiency under 40%. A switch to a boiler with 80% efficiency usually results in important savings with short payback period (less than 2 years).



## Keep it Dry

**High moisture content critically reduces biomass fuel efficiency:** firewood with 40% of moisture content is 30% less efficient than wood with a moisture content of 20%. This must be taken into account when buying biomass fuel. The fuel must be stored in a sheltered place to avoid the rain.



## Upgrade your steam system and maintain it

Many factories in Cambodia have flaws in the design and installation of their steam system. It is critical to make sure that the steam system is well designed and does not have broken steam traps or separators. The steam pipes must be well insulated and the whole steam system must be regularly well maintained. Investing in proper steam condensate recovery is also necessary.

# Sustainable Thermal Energy and Alternative Biomass

## STEAM PROJECT

Since June 2016, GERES, with the support of H&M Group and the Cambodia Climate Change Alliance, has been researching solutions to reduce the use of unsustainable firewood in the manufacturing industries.

Ongoing cooperation and mutual feedbacks with garment factories and rice millers allowed GERES to propose appropriate solutions to reduce the impact of the industry on climate change and deforestation. GERES did several tests in laboratories and in factories to confirm the technical feasibility and the performance of a switch from forest wood to rice husk briquettes to produce steam in Cambodia.

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### CAMBODIA CLIMATE CHANGE ALLIANCE

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Empowering lives,  
Resilient nations.



SWEDEN

