

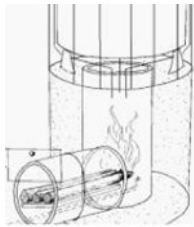
# Solutions for efficient and sustainable cooking



While ICS technologies can decrease CO and PM emissions, reducing health risks related to inefficient biomass cooking means looking at the entire cooking environment : fuel type & moisture content, cooking cycles & habits, kitchen space and ventilation.

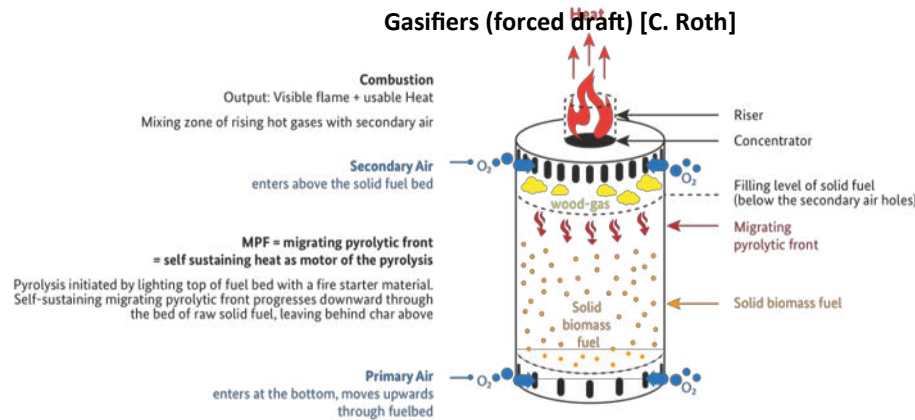
Improved Cookstoves (ICS) are designed to help users consume less fuel through optimum heat generation and minimized heat losses. Various design principles exist for biomass fueled ICS:

## Rocket (natural draft)



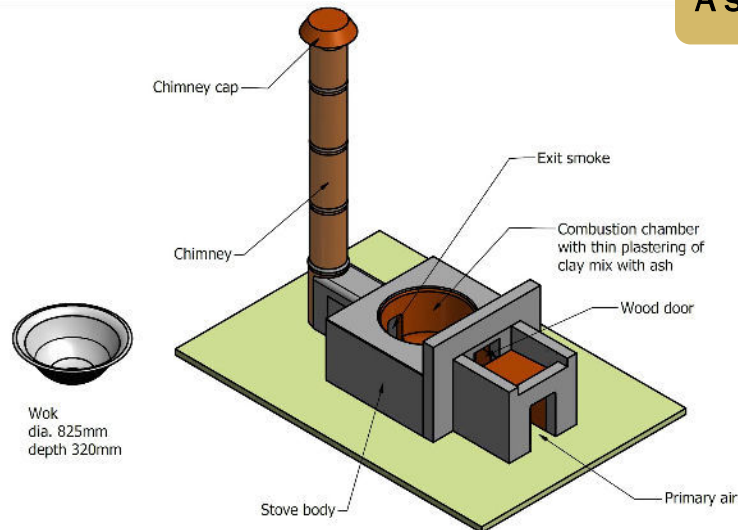
GERES developed in 2014 the Improved Multi-Energy Productive Stove (IMEPS) which enables up to 30% of fuelwood savings, and which can be operated with alternative fuels such as agricultural and other biomass residues (e.g. rice husk, palm leaves). Pilot users reported significant side benefits as the process is rejecting less smoke, allowing a better quality of sugar production.

## Gasifiers (forced draft) [C. Roth]



**Did you know ?**  
Unregulated charcoal market generates around US\$ 100 million of revenues per year in Cambodia.

## A sustainable charcoal value chain for multiple benefits



Production of sustainable charcoal implies legal and sustainable sourcing of wood and efficient technologies to process it into charcoal. The sourcing of wood requires replanting large areas of forest to create a sustainable cycle of planting-growing-collection of wood. In doing so, the balance of CO<sub>2</sub> remains neutral as the CO<sub>2</sub> released when burning the wood is compensated by the CO<sub>2</sub> captured by the new trees planted. Restored forests also generate ecological services essential to climate change adaptation such as improved water cycle and barriers against soil erosion, flooding, and loss of biodiversity affecting farmers. 80,000 charcoal producers - often farmers - could gain legal access to wood while forest community members could get a new source of income through the collection and sale of sustainable wood.



# Bringing together the conditions for a successful transition

Households and restaurants choices for cooking fuels are based on multiple factors, where costs, convenience, health and tradition play along.

From a client perspective, sustainable charcoal should present the same quality characteristics as illegal charcoal.

SGFE's successful experience demonstrates that users prefer slower and more efficient burning of char-briquettes.

Fiscal incentives are key leverage for sustainable biomass companies.



5. Social Client approach

5 imported **Advanced Biomass Stoves (ABS)** distributed in Cambodia : Prime, ACE, Mimimoto, 3G and Kanioka.

2 individual entrepreneurs and 1 trained staff in HESED can build **IMEPS** : raw material cost is estimated at \$67 and installation from \$50 to \$100.

GERES is piloting a project with an international expert from CIRAD to identify simple options for **kiln improvements** applicable by producers at low costs.



1. Technology Availability in Cambodia

Availability, accessibility and affordability are main barriers preventing ICS uptake and up-scale.

GERES is working with **forest communities** to support the sustainable management of forest resources providing a legal and sustainable source of wood for charcoal producers

=> Need a regulatory framework bolstering the production of sustainable and legal charcoal and penalizing the production of illegal charcoal.



2. Human Resources Actors involved



4. Organization From conception to distribution and maintenance

CQuestCapital facilitates ABS dissemination through the **Stove Auction** (market mechanism designed by SNV and funded by GIZ EnDev Results Based Financing program).

Supply barriers for 3-stones and Mong stoves' switch to more efficient cooking: [local NLS and NKS ICS] : accessibility and profitability

Wood resource is the main bottleneck. Little CF (Community Forests) have management plan with silviculture activities such as thinning and coppicing with standards that could supply both fuelwood in the short-term and timber in the longer term => need to both expediate the approval of CFMPs in Cambodia and extend production forest available for woodfuels in order to reap all the benefits of a structured sustainable charcoal value chain.



3. Information How to spread the word?

Government led initiatives aiming at widely disseminating the improved kiln infrastructures and practices.

National Standards development on ICS, with quality controls and certification mechanisms could attract both private sector and consumers' confidence. Government endorsement of selected products is a simple first step.