

INDUSTRY EXPERIENCE FROM THE COOKSTOVE SECTOR

ROBERT MÜLLER

WEBINAR: CAN BIOENERGY PROJECTS
BENEFIT FINANCIALLY FROM SAVING CO₂?

27.05.2025



**WORLD
BIOENERGY
ASSOCIATION**



COOKSTOVE TECHNOLOGIES WITH BIOMASS FUELS

Conventional carbon project with improved cookstoves

Only stove technology improved, without fuel switch



Bioenergy cookstove projects

Fuel switch to pellets, briquettes, ethanol, biogas or other biomass fuel

Existing projects (most under Gold Standard)

Micro-gasifiers with pellets: Supamoto (Zambia, Malawi), Ecosafi (Kenya, Uganda), Biomasters (Rwanda)

Micro-gasifiers with briquettes (multi-fuel:) ACE (Uganda, Cambodia, Lesotho)

Ethanol stoves: Koko, Climate Care

Coming projects under the Paris Agreement

For example, Supamoto in Zambia and Malawi under Art. 6.2. High-quality projects are generally preferred under Art. 6

CARBON FUNDING POTENTIAL

High for cookstoves: Example

2 credits per stove and year – 10-15 EUR/credit

- 50-150 EUR within 5-10 years
- Carbon can fund ~100% of the hardware! (Biomass power plant: Maybe 2-10%)

Carbon Funding is often a key asset for investors and banks.

Pricing

5-35 EUR/ton

Cookstove credits are traditionally premium credits, due to important co-benefits (smoke reduction, reduction of domestic labour...)

BUT...

Cookstove carbon offsets overstate climate benefit by 1,000%, study finds

Cookstove projects are one of the fastest-growing carbon offset schemes but research finds carbon benefits are vastly overstated

- Massive criticism in 2023 for over-crediting
- Opportunity for high-quality projects to make a difference:
- Ecosafi: 35 US\$ per credit!

But high quality means less credits per stove!

19 Sep. 2024 | 2 min read

Kenyan clean cookstove project fetches premium carbon credit prices

Carbon credits Kenya Cookstoves Carbon pricing

Editor

Share this article: [f](#) [in](#) [t](#)

Ecosafi, a company specialising in biomass-fuelled cookstoves, has made headlines with a significant carbon credit deal from its clean cooking project in Kenya. The credits have been sold for as much as \$35 per tonne of CO₂, significantly higher than the typical rates for

Popular Topics

Carbon offsetting Sustaina

KEY METHODOLOGICAL ASPECTS FOR COOKSTOVE PROJECTS

Baseline

Amount of CO₂ emissions that would have been caused by cooking with baseline stoves and fuels. Main factor: Increased stove efficiency.

Example Supamoto

1 kg of pellets replaces 1.6kg of charcoal used on a traditional stove

Charcoal has much higher energy content (29.5 vs. 17MJ/kg), but Supamoto stove is 2.75 times more fuel efficient (55% vs 20%).

Over-crediting happens if cookstove projects...

- overstate baseline consumption (e.g., by using non-representative tests)
 - neglect stove stacking in the baseline (like partial usage of LPG, for example), particularly in urban contexts
 - neglect usage of improved stoves in the baseline
- > **GS metered methodology** requires full consideration of baseline technologies

KEY METHODOLOGICAL ASPECTS FOR COOKSTOVE PROJECTS

Baseline - fNRB

Fraction of Non Renewable Biomass, or:

How unsustainable is wood/charcoal harvesting in the baseline?

Until last year, 95% of cookstove projects used values >80% (using a simple tool)

This year, new default values per country are being introduced, based on the Mofuss tool (scientific basis)

Values will be much lower (20-50%) and directly lead to less credits.

Details still under discussion. Urban fNRB values may be allowed to be slightly higher, for example.

KEY METHODOLOGICAL ASPECTS FOR COOKSTOVE PROJECTS

Monitoring

Conventional cookstove projects: Sampled usage surveys. Easily overestimate usage of improved cookstove and underestimate continued usage of baseline stoves.

GS metered methodology: Fuel supply is monitored at 100%. Pellet consumption gives an accurate picture of stove usage, normally at individual stove level.

Also remote usage can be monitored (fan speed, heat sensors).

- ➔ Usage found to be lower under GS metered, due to higher accuracy (no over-crediting)
- ➔ But transparency and accuracy are strong arguments for higher prices.

KEY METHODOLOGICAL ASPECTS FOR COOKSTOVE PROJECTS

When are biomass fuels supplied deemed residual (carbon neutral)?

Guidelines under CDM:

- Show that raw biomass (e.g. sawdust) is left to decay (at least a surplus of 25%).
- If used as fuel -> treated as conventional wood
- Dead biomass in forests -> not residual.
- In practice, not assessed very strictly.

Own production of biomass in sustainable plantations

- Possible, but quite complex (competing land usage, fertilizers etc.).

Project emissions (production, transport):

- Have to be considered (like electricity for pellet production, transport)

QUALITY LABELS

Rating agencies

- Check projects individually (BeZero, Calxy Global, ...)
- Cookstove projects can be punished for overcrediting
- But only A-rated project under BeZero: Ecosafi Kenya, pellet stove.

CCP criteria:

- Core Carbon Principles, of ICVCM (Integrity Council for the Voluntary Carbon Market)
- Generalized label according to overall criteria. Cookstove projects start to get eligible (among others, when using the GS metered methodology)

Ecosafi Receives "A" Rating From BeZero Carbon

by Petya Trendafilova · May 15, 2024 · 4 minute read



SUMMARY

- Carbon credits can be main revenue source for cookstove projects.
- Risk of overcrediting, often in combination with low-quality cookstoves.
- Carbon markets start demanding quality – but this means less credits per stove.
- Cookstoves with biomass fuels are generally technically advanced, allowing for individual stove monitoring.
- They often target urban markets - risk of competing with LPG and electricity.
- New framework evolving under the Paris Agreement Article 6.2 (bilateral) and 6.4 (multilateral), partially replacing the voluntary carbon market.

A series of white, overlapping geometric lines and polygons on a black background, located on the left side of the slide.

THANKS!

QUESTIONS?

Robert Müller

Independent Carbon Consultant

robert@bridge-builders.de