



Improved Cookstove Projects

How fuel-efficient cooking technology generates verified carbon credits and transforms lives in sub-Saharan Africa

PROJECT TYPE GUIDE | Gold Standard GS4GG / CDM | SDG 3, 5, 7, 13, 15

| | |
|-----------------------------|---|
| Standard | Gold Standard GS4GG / CDM |
| SDG alignment | SDG 3, 5, 7, 13, 15 |
| Typical credit yield | 1.5 – 3.5 tCO ₂ e per household per year |
| Project life | 7 – 10 years (renewable) |
| Indicative price | GBP 8 – 14 per tCO ₂ e (Gold Standard, 2024) |

What is an Improved Cookstove Project?

In much of sub-Saharan Africa, households cook over open fires or simple three-stone fires using firewood or charcoal. These fires are highly inefficient — burning large quantities of fuel to produce relatively little usable heat, while generating significant indoor air pollution and smoke.

Improved cookstove projects distribute fuel-efficient stoves to households, typically reducing wood consumption by 30 – 60% compared to baseline cooking methods. This reduction in non-renewable biomass consumption directly translates into measurable greenhouse gas emission reductions, which can be verified and sold as carbon credits.

- Stoves typically burn 30 – 60% less wood than open fires
- Reduced indoor air pollution improves respiratory health
- Women and girls save hours each week previously spent collecting firewood
- Reduced pressure on local forests supports biodiversity
- Projects are verifiable under Gold Standard and CDM methodologies

How Carbon Credits Are Generated

The Baseline Scenario

The baseline represents what emissions would occur without the project — households continuing to cook on open fires using non-renewable biomass. The fraction of biomass that is non-renewable (the NRB fraction) is a critical input, typically assessed through field surveys and government forestry data. In areas of high deforestation pressure, NRB fractions of 60 – 90% are common.

Emission Reduction Calculation

| Parameter | Typical Value | Notes |
|--------------------------------|-------------------------------|--|
| Baseline wood consumption | 5 – 8 kg/household/day | Measured via kitchen performance tests |
| Stove efficiency improvement | 30 – 60% | Varies by stove model |
| Non-renewable biomass fraction | 60 – 90% | Country/region specific |
| Wood emission factor | 1.83 tCO ₂ e/tonne | IPCC default |
| Monitoring frequency | Annual | Required by Gold Standard |

Verification Process

Projects must be validated and verified by an accredited third-party auditor. Annual monitoring visits confirm stove usage rates, collect usage data, and verify that stoves remain in active use. Gold Standard requires demonstration of contribution to at least three Sustainable Development Goals in addition to the climate benefit.

Project Economics

Cookstove projects are among the most cost-effective carbon interventions available, combining meaningful emission reductions with significant co-benefits across health, gender equality and livelihoods.

| Scale | Annual Credits | Annual Revenue (at GBP 12/t) | Setup Cost |
|-------------------|----------------------------|------------------------------|----------------|
| 1,000 households | ~2,400 tCO ₂ e | ~GBP 28,800 | GBP 50 – 100k |
| 5,000 households | ~12,000 tCO ₂ e | ~GBP 144,000 | GBP 150 – 300k |
| 20,000 households | ~48,000 tCO ₂ e | ~GBP 576,000 | GBP 400 – 700k |

Note: Assumes 2.4 tCO₂e per household per year, GBP 12/tCO₂e credit price. Actual values vary by geography, stove model and NRB fraction.

SDG Co-Benefits

- SDG 3 (Good Health): Reduction in indoor air pollution reduces respiratory disease, particularly in women and children who spend the most time cooking
- SDG 5 (Gender Equality): Women save an average of 2 – 4 hours per week on firewood collection, enabling income-generating activities and education
- SDG 7 (Clean Energy): Access to cleaner, more efficient cooking technology
- SDG 13 (Climate Action): Direct greenhouse gas emission reductions verified under internationally recognised standards

- SDG 15 (Life on Land): Reduced deforestation pressure supports forest conservation and biodiversity

Key Risks and Mitigations

| Risk | Likelihood | Mitigation |
|----------------------------------|------------|---|
| Low stove adoption / usage rates | Medium | Community engagement, culturally appropriate design, follow-up visits |
| NRB fraction reassessment | Low–Medium | Conservative baseline estimates, regular monitoring |
| Credit price volatility | Medium | Forward sales agreements, diversified buyer base |
| Stove durability failures | Low | Quality assurance, warranty programmes, replacement policy |
| Regulatory / standard changes | Low | Maintain Gold Standard certification, stay current with methodology updates |

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