



# PROMOTING CLEAN AND EFFICIENT COOKSTOVES IN SOMALIA

## TECHNOLOGY DESCRIPTION

### TECHNICAL DESCRIPTION

Clean and efficient cookstoves are advanced cooking technologies designed to reduce biomass consumption (firewood and charcoal) while improving combustion efficiency. Traditional cooking methods, with largely open fires or rudimentary stoves, commonly practiced in Somalia, lead to high levels of indoor air pollution and contribute significantly to deforestation. With over 80% of Somalis using biomass for cooking, the clean and efficient cookstoves are designed to address these challenges by requiring less wood fuel, reducing harmful emissions, and enhancing overall cooking efficiency. The widespread adoption of clean cookstoves in Somalia could reduce indoor air pollution by up to 70%, improving overall public health outcomes. Furthermore, the deployment of these cookstoves aligns with Somalia's climate goals, as it reduces reliance on biomass, mitigating deforestation and contributing to lower greenhouse gas emissions.

### CURRENT TECHNOLOGY READINESS LEVEL OR COMMERCIAL READINESS INDEX

The Technology Readiness Level (TRL) of clean and efficient cookstoves in Somalia is currently at TRL 8, indicating that the technology has been demonstrated in real-world environments and is ready for widespread deployment. There are ongoing initiatives by local and international NGOs promoting adoption particularly in Somaliland. However, the Commercial Readiness Index (CRI) for these cookstoves remains at an intermediate level, around CRI 3 to 4, meaning that while the technology is technically proven, there are significant barriers to large-scale commercial adoption. Challenges such as limited financing options, lack of widespread market infrastructure, lack of policy, technical capacities, and insufficient consumer awareness have hindered the broader uptake of clean cookstoves.

### CLIMATE RATIONALE OF THE TECHNOLOGY

Somalia relies heavily on biomass for energy, with over 80% of the population using firewood and charcoal for cooking. This reliance leads to large-scale deforestation, contributing to Somalia's greenhouse gas (GHG) emissions, primarily through carbon dioxide (CO<sub>2</sub>) from biomass combustion. By introducing clean cookstoves, the country aims to reduce deforestation rates and GHG emissions, improving resilience to climate change. The technology is aligned with Somalia's Nationally Determined Contributions (NDC), which targets a reduction of 2.15 million tonnes of CO<sub>2</sub> equivalent (MtCO<sub>2</sub>eq) per year by 2030 from improved cooking methods alone. Additionally, reducing deforestation enhances climate resilience by conserving ecosystems and reducing soil erosion, making clean cookstoves a critical technology for both climate mitigation and adaptation in Somalia.



## AMBITION OF THE TECHNOLOGY

### SCALE FOR IMPLEMENTATION AND TIME-LINE

The goal is to deploy 5 million clean cookstoves by 2030, targeting both households and institutions such as schools and health centers. This would represent 30% penetration across Somalia, significantly reducing fuelwood consumption and improving air quality for millions of households, particularly in rural areas where reliance on biomass is highest. The ambition is to lower GHG-emissions, improve health outcomes for women and children, and create local economic opportunities in manufacturing and distribution.

### AMBITION FOR TECHNOLOGY READINESS LEVEL OR COMMERCIAL READINESS INDEX

By 2030, the technology is expected to reach TRL 9 and CRI of 5 or 6 – Demonstration in an operational environment, with large-scale deployment in rural areas and institutional use across Somalia. The strategy includes establishing local manufacturing capabilities, improving distribution channels, and ensuring affordability through financial instruments.<sup>1</sup>

### EXPECTED IMPACTS OF THE TECHNOLOGY

- **Environmental Impact:** Reduced deforestation and forest degradation as less biomass is needed for cooking. Widespread use of clean cookstoves could lead to a 30% reduction, translating to approximately 1.8 million tons of firewood saved annually. This reduction aligns with Somalia's NDC target of lowering annual greenhouse gas emissions by an estimated 2.5 MtCO<sub>2</sub>eq by 2030.
- **Health Impact:** Improved indoor air quality through reduced smoke emissions, particularly benefiting women and children (by up to 90%) who are most exposed to cooking fumes. This can result in fewer cases of respiratory diseases and other health complications associated with air pollution by at least 30%. According to WHO estimates, reducing exposure to indoor air pollution could save around 2,500 lives annually in Somalia by 2030.<sup>2</sup>
- **Economic Impact:** Significant fuel cost savings for households using clean cookstoves, by up to 50%, as they will require less firewood or charcoal, amounting to an annual saving of approximately \$150 per household. With 3 million households expected to adopt clean cookstoves, this translates into a collective annual saving of \$450 million. Additionally, local production and maintenance of cookstoves could create approximately 50,000 new jobs by 2030, particularly for women and youth, boosting rural economic activity.<sup>3</sup>
- **Social Impact:** Women and children spend an average of 3-5 hours per day collecting firewood. By reducing the need for biomass, this time could be cut by up to 60%, freeing up to 1,200 hours annually per household. Time saved from fuel collection by women and children can be redirected to education, economic activities, and community engagement. Gender empowerment is a key social benefit, as the adoption of clean cookstoves reduces the burden on women and girls who are traditionally responsible for cooking and fuel collection. This is key for a country ranked 4th last on the UNDP Gender Inequality Index<sup>4</sup> with a score of 0.776 (where the maximum score of 1 denotes complete inequality).

<sup>1</sup> Federal Government of Somalia(2021) Somalia updated NDC 2021

<sup>2</sup> [https://cdn.who.int/media/docs/default-source/country-profiles/environmental-health/environmental-health-som-2022.pdf?sfvrsn=d042f6bf\\_5&download=true](https://cdn.who.int/media/docs/default-source/country-profiles/environmental-health/environmental-health-som-2022.pdf?sfvrsn=d042f6bf_5&download=true)

<sup>3</sup> Federal Government of Somalia(2022) Somalia, Energy Sector Policy, 2018

<sup>4</sup> <https://www.undp.org/somalia/our-focus/genderequality>



## POLICY ACTIONS FOR TECHNOLOGY IMPLEMENTATION

### EXISTING POLICIES IN RELATION TO THE TECHNOLOGY

- **National Development Plan (NDP) 2020-2024:** The NDP emphasizes clean energy solutions and outlines a strategy for addressing the energy needs of vulnerable groups, including women and displaced persons. Clean cookstoves are highlighted as part of the plan's broader clean energy strategy to reduce deforestation and meet growing energy demands.
- **Somalia National Energy Policy (2018):** This policy aims to provide all Somalians with access to efficient, affordable, and sustainable energy, promoting environmental stewardship. It encourages investment in renewable energy and energy-efficient technologies like clean cookstoves to mitigate climate change and improve household energy use.
- **National Climate Change Policy, 2020:** The policy offers strategic direction on issues of climate change in Somalia including mitigation country's baseline emissions and emphasis on the low emissions development path. It recommends policy interventions to be implemented across all sectors including in relation to energy and the importance of improved cooking methods
- **Updated Nationally Determined Contributions (NDC) (2021):** Somalia's NDC includes clean cookstoves as a priority technology for emission reduction. The NDC sets a target of achieving 30% adoption of clean and energy-efficient cookstoves by 2030, with the goal of reducing CO<sub>2</sub> emissions by 2.15 MtCO<sub>2</sub>eq annually.

### PROPOSED POLICIES TO ENHANCE TECHNOLOGY IMPLEMENTATION

1. **Financial Incentives and Support:**
  - Introduce subsidies and grants to make clean cookstoves more affordable for both manufacturers and consumers. This includes targeted financial support for local manufacturers to scale production and for low-income households to purchase cookstoves.
  - Microfinance partnerships: Work with local microfinance institutions to provide low-interest loans or Sharia-compliant financial products, enabling households to purchase cookstoves through Pay-As-You-Go (PAYG) models or installment plans. These financing methods can significantly reduce the upfront costs of clean cookstoves for consumers.
2. **Strengthen Policy and Regulatory Frameworks:**
  - Develop a national policy on clean and efficient cookstoves, establishing quality and performance standards to ensure that cookstoves are safe, durable, and efficient. The policy should mandate minimum efficiency levels and regulate the market to prevent substandard products.
  - Create a coordinating body within the Ministry of Environment and Climate Change to oversee the implementation of clean cookstove initiatives, ensuring alignment with national climate and energy policies. This body would also be responsible for monitoring and evaluation.
3. **Capacity Building and Local Production:**
  - Establish training centers to build the technical capacity of local manufacturers and technicians, focusing on stove production, distribution, and maintenance. These centers should provide opportunities for women and youth to develop skills in the clean energy sector.
  - Support research and innovation in clean cookstove design to ensure that stoves meet the unique cooking preferences and energy needs of Somali households.
4. **Public Awareness and Education:**
  - Launch a national awareness campaign to educate the public on the benefits of clean cookstoves, including health improvements, fuel savings, and environmental impact. The



campaign should be delivered through multiple platforms, including radio, television, social media, and community workshops.

- Engage community leaders and women's groups as advocates for clean cookstove adoption, particularly in rural areas where traditional cooking methods are deeply entrenched.

## COSTS RELATED TO THE IMPLEMENTATION OF POLICIES

The estimated budget for the implementation of clean and efficient cookstoves in Somalia is approximately USD 45 million over the period 2025-2030. This budget will cover:

- Subsidies and grants for manufacturers and consumers (USD 32 million)
- Capacity building for local artisans and institutions (USD 5 million)
- Public awareness and education campaigns (USD 3 million)
- Policy development and enforcement (USD 5 million)

The total investment is expected to be supported through a combination of domestic resources (including private sector), international climate finance, and partnerships with development agencies such as the Green Climate Fund (GCF) and multilateral development banks.

## USEFUL INFORMATION

### CONTACT DETAILS

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### LINKS TO TNA REPORTS

<https://tech-action.unepccc.org/country/somalia/>