

Energising Development (EnDev) Ethiopia

Improved Cook Stoves (ICS)



Period	2006 - 2009 Endev phase I 261,626 disseminated ICS 2010 - 06/2014 EnDev phase II 545,881 disseminated ICS
Areas	Amhara, Oromia, SNNPR, Tigray; some activity in: Addis Ababa, Dire Dawa and Harari
Partners	Ministry of Water, Irrigation and Energy, Ethiopian Energy Authority, Ministry of Agriculture, Ministry of Health, Ministry of Environment and Forest, non-governmental organisations and others
Stoves in use	486,207 stoves in use A total of 807,507 disseminated ICS since 2006
Beneficiaries	1.2 million people currently have sustainable access to improved cook stoves A total of 2.1 million people have benefitted since 2006 More than 650 producers have been trained to manufacture and sell improved cook stoves

Challenges: unsustainable use of biomass

Biomass is the main cooking fuel in Ethiopia. It is used by 99% of the rural and 80% of urban households and women and girls especially are burdened with its collection. Unsustainable use of biomass results in deforestation and consequently land degradation. In addition to this, the incomplete combustion of biomass inside the home generates indoor air pollution which causes adverse health effects.

Approach: developing sustainable markets

EnDev Ethiopia, operating under the name GIZ Energy Coordination Office (GIZ ECO), focuses on market development and capacity building of local and public stakeholders via the following mechanisms:

- Promotion of the private sector to facilitate local production of ICS
- Trainings for producers to improve their technical, business and marketing skills
- Advertisement of ICS through public demonstration
- Cost reduction within marketing chains and creation of access to consumer credit
- Technology development to improve stove designs
- Ongoing testing of stoves in order to ensure high quality products

Objective

Low-income households, social facilities and small and medium enterprises gain sustainable access to improved energy technologies and services, since ICS reduce deforestation and indoor air pollution, and offer more time for education and improved living conditions especially for women.



Implemented by **giz** German Development Cooperation

Advantages of the technology

Using ICS instead of the traditional three-stone open fire reduces the firewood consumption. By facilitating efficient combustion, harmful emissions, like carbon monoxide and particular matter are reduced. Furthermore, ICS can burn a variety of biomass fuels such as crop residues and dung. In order to sustain their production and purchase, the stoves are produced with locally available material.

Technology: efficient cook stoves

EnDev Ethiopia mainly promotes three types of improved cook stove technologies for households and institutions. The stoves are used to burn mostly woody biomass and have a minimum fuel-saving potential of 40% compared to the three-stone open fire, as well as a thermal efficiency of at least 20%. In order to burn more efficiently an ICS possesses an insulated combustion chamber with an air inlet that regulates the oxygen supply and an improved heat transfer between fire and pot/pan.

The Mirt Stove is used for both baking injera (Ethiopian traditional bread) and for cooking at the same time. It is made of a sand-cement mixture and can save up to 50% fuel compared to the three-stone open fire with a thermal efficiency of around 22%.

The Tikikil Stove is a portable household cook stove made of galvanised sheet metal with a ceramic liner. It saves up to 50% of fuel compared to the three-stone open fire; its thermal efficiency is around 28%.

The Institutional Rocket Stove (IRS) is a portable stove used for larger-scale cooking in institutions. The stove can potentially save up to 70% of fuel compared to the three-stone open fire with a thermal efficiency of 40-50%.



Impacts: improved living conditions

Nearly 500,000 ICS are currently in use, while a total of more than 800,000 have been disseminated since 2006. These have been sold by around 650 manufacturers trained by EnDev Ethiopia. At this point in time, 1.2 million people of low-income households in Ethiopia have sustainable access to improved cooking technologies that use less biomass fuel. Especially women benefit from the advantages of the technology.

Direct impacts upon livelihood include:

- The adverse health effects of indoor air pollution are reduced, especially for children and women who are intensively exposed
- The drudgery of fuel wood collection is diminished saving time and effort
- Small-scale stove producers, nearly 50% women, benefit from self-sustaining income-generating opportunities

In addition, pressure upon local biomass stocks is lowered: an average household saves around 575 kg of wood per year using the *Mirt* stove and 300 kg of wood using *Tikikil* stove, while the *Institutional Rocket Stove (IRS)* saves 493 kg of wood. Over 250,000 tonnes fuel wood per year can thus be saved, conserving natural resources and lowering CO₂ emissions.