

## Maharashtra: Biogas tanks provide clean energy for 12,500 homes



Certification:  
**Gold Standard**  
Climate Action & Community Development

### Key Facts



## Background

India is the world's number 1 consumer of fuelwood for energy. The state of Maharashtra is home to over one million people, many of whom rely on firewood as their main source of energy. The average household uses 5 kg of firewood every day. This mainly comes from local forests which are increasingly put under more pressure due to this demand alongside increasing livestock population and illegal exploitation. Consequently, Maharashtra is a deficit region for firewood and families must travel 2-5 km every day for their firewood.

Other effects of deforestation include the increasing problem of desertification and land degradation. This is making agriculture more difficult for rural dwellers, who account for 45% of the total population of Maharashtra. Dry lands lead to poor crop yields and degrading land also increases flood risk in nearby areas.



## The Project

The project involves installing around 12,500 small-scale biogas plants in rural households. The capacity of the biodigester varies based on how much livestock the household has. The project will focus on households living below the poverty line in rural Maharashtra. The biodigesters will be fuelled by animal dung which not only reduces the need for fuelwood, but also deals with agricultural waste. The residue from the biodigester can then be used as a fertilizer on crops. This residue will also be more effective than fresh manure as it has already been fermented. The project will reduce roughly 48,500 tonnes of carbon dioxide every year.

**Location:**  
Maharashtra, India

**Project type:**  
Renewable Energy – Biogas

**Total emission reductions:**  
» 48,500t CO<sub>2</sub>e p.a. «

**Project standard:**  
Gold Standard

**Project start date:**  
January 2009

## Sustainable Development

By supporting this project you'll contribute to the following Sustainable Development Goals:



**SUSTAINABLE DEVELOPMENT GOALS**

While focusing on reducing greenhouse gas emissions, all our projects also generate multiple co-benefits. These are supportive of the United Nations Sustainable Development Goals.



**No poverty**

The project focuses specifically on households who live below the poverty line. In Maharashtra, this accounts for 24% of the rural population. Biogas is a free resource and so will help alleviate poverty for the local people.



**Zero hunger**

The residue from the biogas can be used as fertilizer on crops. The sludge is already fermented meaning it is a lot more effective than using fresh manure. This will improve the crop produce for households.



**Good health and well-being**

Using biogas for cooking reduces the burning of firewood inside households. This is important as traditional wood fires pollute homes with toxic gases, leading to respiratory illnesses. According to the WHO, these are the 2<sup>nd</sup> biggest killers of adults in India and responsible for 13% child deaths under 5.



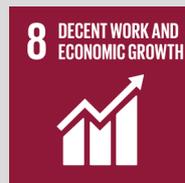
**Gender equality**

The task of collecting firewood often lands on women and children. Due to the wood deficit, they have to walk up to 5 km every day for fuelwood. With on-site biogas, more time becomes available to women, allowing them opportunities to work or do other activities.



**Affordable and clean energy**

By using waste generated by their own household, owners of the biogas will be using virtually free energy which is much cleaner than the wood alternative.



**Life on land**

The project employed 20 locals for management and maintenance. Furthermore, a study conducted by Imperial College London found that, in a similar First Climate project in India, each ton of CO<sub>2</sub> yields 303\$ of extra benefits, 90% of which come from improved health.



**Responsible Consumption and Production**

The project is expected to save a total of 3,500,000kg of wood every month. Each biogas will be able to save 200-600kg per month based on its capacity. Furthermore, the biogas deals with agricultural waste making the project a responsible solution to energy demand.



**Life on Land**

Using agricultural waste improves the local soil and water quality by preventing parasites infiltrating into soil and the water table. Furthermore, it avoids methane gas, otherwise emitted when manure is left to decay. The reduction of deforestation improves local air quality and protects the nearby biodiversity.



## Technology brief – how it works

Biogas is created through a process of anaerobic digestion, whereby microorganisms break down biodegradable materials under oxygen-free conditions. To generate biogas, biomass such as animal waste is mixed with water and then fed into the plant where it is digested over a period of about 8 weeks. The gas is extracted via a valve located in the roof of the digestion tank.

The main feature of a Deenbandhu biogas plant, the model used for the project, is the fixed underground digester chamber, constructed with a layer of bricks and an additional layer of cement mortar forming the roof above. Connected to the underground chamber is an inlet tank, through which manure is fed into the plant. The manure then ferments, separating the slurry from the methane gas which rises and collects at the top of the digester tank. This is then released through the gas outlet pipe. The slurry passes into the outlet tank where it is ejected from the plant and can be used as fertilizer on the field. When properly maintained, the digester can operate for more than 20 years.



## Project Standard

**Gold Standard**  
Climate Security & Sustainable Development

The Gold Standard is an award winning certification standard for results based project finance and is recognised internationally as the benchmark for quality and rigour in certifying environmental and socio-economic project outputs. Established in 2003 by the World Wide Fund For Nature (WWF), the Gold Standard today is trusted and endorsed by NGOs, governments and multinationals including United Nations agencies worldwide.

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