# Fact sheet „$CO_2$ offsetting projects"

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## 1. India: Solar Lamps for Rural Areas

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| **Total Savings:** | 30,000 tons of $CO_2$/year (appr. 0.1 t of $CO_2$ per lamp per year) |
| **Local Environment:** | Replacement of fossil fuels, less smoke emissions, prevention of fires. |
| **Further Advantages:** | Energy independence, lowered household expenses. |
| **Local Employment:** | 20 in market and product development, more in sales. |

In rural areas of India, there are about 580 million people who have no stable supply of electricity. The Indian government's efforts to expand the national electricity grid into rural areas are only making minor and slow improvements. The increasing demand for electricity is much higher than the production capacity.

As a result, over 80% of the rural residents in Uttar Pradesh and Bihar (two of the poorest states in India) were using kerosene lamps for lighting. This is a huge burden for families because they have to spend one-third of their monthly income on kerosene, which only ensures minimum lighting. This lack of proper light affects the ability of children to do their homework for school. Likewise, the time span during which one can accomplish chores around his or her house is limited. These kerosene-powered lamps often cause burns, create soot that can lead to eye problems and cause fires. In addition, the system through which kerosene is supplied is inadequate, despite state subsidies. The state distribution system only meets half of the demand; the rest has to be bought on the black market at high prices.

With atmosfair funding D.light Energy, can sell solar-powered LED lamps at a price that the poor rural population can afford. By the end of next year, several hundred thousand lamps will be sold in the states of Uttar Pradesh and Bihar. Production and delivery of the lamps has already begun. The distribution network between wholesalers and intermediate vendors has been set up and is being expanded. In the regions where the project is being carried out, many lamps have been purchased, and quite quickly.



*Indian woman with solar lamp*



*Homework with kerosene lamp*



*Homework with solar lamp*

## 2. Rwanda: Efficient fuel wood stoves

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| **Total savings:** | expected savings of 40,000 tons $CO_2$/year |
| **Technology transfer:** | Efficient fuel wood stoves substitute charcoal usage and thus achieve 80% energy savings. |
| **Local environment:** | Less deforestation in the region. |
| **Further advantages:** | Local population saves money for charcoal. |

The utilisation of efficient fuel wood stoves instead of charcoal stoves has two important effects to secure a sustainable fuel wood supply:

1. Due to the direct utilisation of wood the energy intensive charcoal production is avoided. Just by this, large amounts of wood will be saved as in Rwanda 9kg of wood are needed to produce just 1kg of charcoal.

2. Due to very high efficiency of the new stoves, the amount of fuel wood does not increase despite a higher calorific value of charcoal compared to wood. Therefore, regarding transportation of fuel, the total transport volume will not rise.

The design and construction of the efficient fuel wood stove makes the handling as easy as before. Compared to a traditional charcoal stove or 3-stone-fire the new stove saves 80% of the wood for the same performance. Therefore enormous savings for Rwandan households will be achieved as charcoal is getting more and more expensive due to the high demand and increasing costs for transport and production.

To make sure that there is a real demand for the stoves, they are sold and not given away for free. As no charcoal has to be purchased any longer, the savings are large which guarantees that the investments pay off quickly. Furthermore the stoves are subsidized by atmosfair so that low income household can also afford them. Moreover stoves can be paid in instalments.

To ensure the high efficiency and long lifetime (>10 years) of the stoves, industrialised production is required as well as high-quality materials (stainless steel). Therefore the components are produced in Germany and assembly is done in Rwanda.



*Old charcoal stoves with high fuel demand..*



*...and the much more efficient new stove*

## 3. Biogas from cow dung

**Total savings:** 15.000 tons $CO_2$ per year
**Technology transfer:** Biogas units for the energy supply of households
**Local environment:** Replaces fuel wood, gas and kerosene, Avoidance of deforestation, Production of fertile slurry as a by-product
**Further advantages:** Creation of jobs for construction and maintenance of the biogas units

Like in many other African countries, biomass is the most important energy resource for the population in Kenya (68% of the total energy consumption by households). In rural areas the consumption of fuel wood is as high as 80%.

The project is carried out in the Nairobi River Basin, which is located in the west of Kenya's capital, Nairobi. Thousands of dairy farmers, who each have two to three cows on their property, live in this area. These farmers consume an average of more than ten kilogrammes of fuel wood per day; it is mainly used for cooking purposes. The high demand for fuel wood is a huge threat to the surrounding forests. If the overexploitation of these resources continues, fuel wood will become more and more scarce and local biodiversity is negatively affected. In addition to fuel wood, people in the project area also use kerosene and gas for cooking.

In order to reduce the consumption of fuel wood, gas and kerosene the atmosfair project will supply small biogas units (2-3 m³) to the dairy farmers in the area, which produce regenerative biogas. The biogas units run on cow dung and other agricultural wastes. During the process of biogas generation, slurry is produced as a by-product. Due to its high nutrient content, farmers can use this by-product as an agricultural fertilizer. For efficient operations of the biogas unit, every household will need to have at least two cows on their property.



*One of the first biogas units just before completion. At the moment more than a dozen specialised masons are doing the construction work of the installations.*