

1ST PRIZE

ENERGY FOR LIFE - BEST PRACTICE AWARD 2011

System / Location

National Biogas Programme (NBP) / Cambodia



The NBP Cambodia has been established through a joint development between the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the Netherlands Development Organisation (SNV) since 2006. The overall objective of the first phase of the NBP (2006-2012) is the establishment of a permanent domestic biogas sector, operating on a commercial and market-oriented basis.

The total technical potential in Cambodia is approximately 400,000 households and up to present the programme has been implemented in 2 provinces and installed over 12,000 biogas plants.

To become a permanent sector, it is necessary to have solid contributions from the farmers. Normally, farmers cover around 70-80% of the total costs of the plant – an amount that will be paid back in 1.8 years (after deducting the subsidy amount, US\$ 150 granted from the programme).

Planning/Installation

National Biogas Programme
www.nbp.org.kh

Donation/Support

SNV, www.snvworld.org
MAFF, www.maff.gov.kh
GIZ, www.giz.de

Operator

National Biogas Programme

PROJECT DATA SHEET

Year the installation started operating	2006
Type of system	Biogas
Type of energy produced	Gas
Geographical position	Covering about two-third of Cambodia
Location	Over 100 districts of 12 provinces, Cambodia
Size of installation	Domestic biogas plants with 4,6,8,10 and 15 m ³
Thermal Power of installation	Not applicable
Use of energy produced	Cooking and lighting; the by-product (bio) is used as organic fertiliser
Quantity of energy produced per day	1,6 m ³ gas per day which equals 10 kWh thermal energy
Type of financing	Subsidy from programme: US\$ 300/plant: ODA and carbon financing Farmer investment cost: Own money with access to special loan through participating MFIs
Source of financing	DGIS/SNV, GIZ, MAFF/VER income, Farmers
System investment cost	Plant cost: US\$ 500 Programme cost including subsidy: US\$ 300
System cost per watt	Over a 15 year life span the cost per kWh is US\$ 0,14 per kWh per system
Income generated from installation	Total Energy saving 14,4\$/month/HH, Total Fertilizer saving 4,33\$/month/HH
Maintenance cost per year	US\$ 8/HH/Year
Fossil fuel savings per year	Kerosene saving is 29 l/HH/year or 350 m ³ in total
CO2 reduction per year	4,7 tons of CO2 per plant per year
Number of beneficiaries	66,000 direct beneficiaries
Presence of renewable energy country programme	Yes



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Biodigester / Cambodia

National Biodigester Programme/Cambodia

LEGAL FRAMEWORK

NBP of Cambodia links with many national and international policies:

1. National Strategy Development Plan

- Enhancement of the agriculture sector: Effective utilisation of green manure residues; land fertility management and utilisation of organic fertiliser; improved livestock production such as cattle and pigs with prevention of widespread animal diseases
- Rural Development: Improvement of rural sanitation and rural economy; biodigesters make the household environment clean: cattle dung management and cleaner stables; establishment of conducive career opportunities for the people.
- Environmental protection, conservation and climate change: Monitoring of water quality: management of cattle dung can reduce fresh water pollution: Climate change: biodigesters save GHG emissions: 5 tons/year/plant, which highly contribute to the mitigation of climate change and global warming.

2. Millennium Development Goal

Target 1 of MDG 1: To halve extreme poverty because a biodigester can reduce the expenses associated with the purchase of fuelwood and other electricity sources; Target 4 of MDG 3: To eliminate gender disparity in education; Target 8 of MDG 6: To halt / reverse the incidence of malaria and other major diseases; MDG 7: To ensure environmental sustainability.

FEASIBILITY, SUSTAINABILITY AND REPLICABILITY

The Cambodian farmers' biodigester system is a feasible, sustainable and environmentally friendly renewable energy source which has a great positive impact on their rural livelihood. 1. The plant structure has a life expectancy of more than 20 years and feeding material is easily gathered from the animal stables. 2. Farmers are comfortable using the biogas for daily cooking and lighting. 4. Farmers can substitute inputs such as fertilisers and fossil fuel by using bio slurry and biogas. A biogas system can relieve farmers from work on dung disposal or dung application on their fields. As a result, improved farmyard manure raise the yield of plant production and soil quality.

Additionally, biodigester technology has multiple benefits in cross sectors:

International scale: Global warming and climate change are among international and national concerns. Through biodigester technology, the quantity of GHG emissions derived from manure, fuelwood, and fossil fuels has been reduced by substituting the fuel with biofuel produced by the biodigester.

National scale: A substantial number of working biogas systems will help reduce deforestation, increase agricultural production, raise employment, and substitute imports of fossil fuels and fertilisers. If macroeconomic benefits are obvious and quantifiable, a government may even consider subsidising biogas systems to bridge a microeconomic profitability gap.

Local scale: Biogas technology opens-up market niches for masons, plumbers, civil engineers and agronomists; they are often the most effective promoters of biogas technology. Families have more time for income-generated activities while the children will have access to education because their workload such as wood gathering and other household chores is minimized.

SOCIAL IMPACTS

Lighting to promote education and household work; biogas for cooking meals while reducing smoke associated diseases; women save 1-2 hour per day and their workload is reduced resulting in higher social participation, increase in school enrolment rate for girls because of their freedom from collecting fuelwood; 14.39\$/month savings on fossil fuel expenditures; reduction in the quantity of chemical fertilizer used with savings of 4.3\$/month; local people, both men and women, turn to business oriented activities such as promoter, staff or director of biodigester company and technicians; reduction in greenhouse gases especially methane; reduction of pollution from pig dung that was being dumped in surface water; elimination of smell from dung storage ponds at pig farms; improved household sanitation by attaching latrines to the biodigester; prevention of land fertility degradation due to the excessive use of chemical fertilizers.

FINANCING AND FINANCIAL IMPACT

The NBP obtained carbon credits by saving large amounts of methane emissions and fuelwood replacement, while the subsidy could be paid from the carbon credits. As such, the subsidy was increased from 100\$ to 150\$ starting May 2008. In addition to the subsidy, NBP alleviated the financial burden of the farmers who have insufficient money to buy a biodigester by providing a biodigester construction credit through two local microfinance institutions offering an interest rate of 1.2% per month. The return on investment is expected within 1.6 years, which is a good sign for financial benefit. According to the user survey conducted in 2010, the subsidy and loan conditions are satisfied by farmers and all of them have been able to repay the loan.

ADDED VALUE

From the biodigester, NBP has approached to Carbon credit facilities. The revenue from selling carbon credits will be a sustainable financial support for NBP. This means that the carbon fund will be used as a subsidy for farmers, reducing the financial burden on farmers, especially on the poor farmers, and will be used for project implementation activities. The use of biogas is satisfactory for women since it is quicker and easier to use than fuelwood. Moreover, the flame from biogas is smokeless and does not require constant attention such as blowing air on the coals; women can put on the burner and conduct other activities while the food is cooking. In summer, the heat produced during cooking is reduced. In general women feel that they cough less and have fewer problems with their eyes. On a long term basis, a private sector biogas construction company will be established as a reliable service provider to local farmers as to support the commercial, market oriented biodigester sector in Cambodia.

