

## Project Fact Sheet Improving Kiln Efficiency in Brick Making Industries in Bangladesh -PDF B Phase

### THEMATIC AREA

- ✚ Energy conservation and energy efficiency
- ✚ Innovative technology applications
- ✚ National and global environmental benefits
- ✚ Technical capacity development
- ✚ Policy and legislation
- ✚ Financing mechanisms and private sector involvement
- ✚ Livelihood and health

### PROJECT DATA

Name: Improving Kiln Efficiency in Brick Making Industry – PDF B Phase

Implementing organization: UNDP/UNOPS  
Location: Dhaka, Bangladesh  
GEF contribution: US \$ 348,000  
UNDP Contribution: US \$ 27,840  
Stakeholder Contribution: US \$ 797,700  
Start Date: 2005

### ENERGY OVERVIEW

Energy resource: Coal  
Technology: Hybrid Hoffman Kiln  
Application: Brick-making  
Sector: Small-scale industrial  
Cost of each system: US \$550,000  
Efficiency: Reduces coal use in brick-making by 50%

### BACKGROUND

Bricks form the backbone of the aggregate requirement in Bangladesh. Traditionally, brick making is a small-scale businesses mostly located in peri-urban areas. In Bangladesh, there are over 4,000 brick-making enterprises producing over 12 billion bricks annually. Annual growth rate of the construction sector in Bangladesh has ranged from 8.1% to 8.9% in the last decade and this is expected to continue into the foreseeable future.

Brick production, however, is one of the most environmentally damaging activities in the industrial sector. It is one of the largest sources of greenhouse gas emissions in Bangladesh estimated to be in the order of 3.0 million tonnes of CO<sub>2</sub> annually. Outmoded, inefficient and poorly constructed kilns and the use of substandard fuels such as high sulphur coal, tires and wood energy in the kilns have all contributed to these high levels of kiln emissions. The kilns utilize a technology that is centuries old. Unless interventions that will induce change are implemented, greenhouse gas (GHG) emissions will continue to grow unabated accompanied with deteriorating air quality. Besides the air pollution, brick making industries contributes to 2 other serious environmental concerns: land degradation and deforestation.

Environmentally-friendly brick making technologies are available in other countries, most notably in China that combine fuel injection brick making techniques with energy efficient kilns to produce high quality, lower cost bricks. The bricks themselves can also be molded to produce “hollow” bricks that lower resource use and serve as good insulating material because of “air traps” in the perforations. The energy efficiency of the kilns and the fuel injection techniques will result in significantly reduced local and global emissions.

With the availability of such technologies, a GEF/UNDP project was initiated to develop a project to remove barriers to the dissemination of energy efficient technologies in brick making on an industry-wide basis. The “Hybrid Hoffmann Kiln” was chosen as a “lead” technology since it is the most efficient available; a number of other technologies are available that may serve intermediate objectives.

The scope of the PDF-B phase included promotion of energy efficient kiln technology to transform the brick production market. The transformation is manifested in the shift to energy efficient kilns in the brick manufacturing industry in Bangladesh. The main drivers of the market transformation to energy efficient kilns are the:

- Demand from brick manufacturers for the mitigating technology since it will lead to significant reduction in production costs and improvement in product quality;
- Pressure from civil society and government to reduce smokestack emissions; and,
- Benefits for consumers from lower production costs and better quality bricks.

## PROJECT OVERVIEW

The project is a technology transfer project that facilitates barrier removal towards adoption of energy efficient kilns. Key barriers that have contributed to the current state of the industry and its inability to bring about changes, particularly in the way energy is utilized in brick making operations includes:

- Lack of supporting regulations, fiscal incentives and standards to encourage more energy-efficient practices and technologies.
- Little or no governmental activity to assist the brick industry to undertake comprehensive programs to transform the industry and make it less polluting and more profitable.
- Lack of knowledge and access to energy efficient technologies that can lower production costs. Comprehensive technology dissemination programs that demonstrate the potential economic benefits of energy-efficient technologies have yet to be carried out;
- Lack of access to liquidity to finance modernization of brick making operations. Financial institutions consider small scale family type operations as high-risk due to the seasonal, itinerant nature of their operations and lack of collateral;
- Lack of capacity in terms of technical and business skills at the enterprise level to manage the necessary changes that could result in more efficient production and less pollution;
- Limited experience of commercial lending institutions with SMEs and in particular, brick SMEs. They lack interaction with and understanding of the brick industry;

The PDF-B phase is the first phase of the project, which has resulted in the development of a 5-year full-scale technical assistance project for improving kiln efficiency in brick making industries and technical support to the first demonstration Hybrid Hoffman Kiln (HHK) in Bangladesh involving private sector and financing institutions. Structurally, the HHK is built like the Hoffman but combines a number of refinements to reduce heat escape and waste heat recovery for drying green bricks into a tunnel enabling year round production. The fuel, granulated coal, is fed into the firing zone in the kiln through stoke holes on the roof. . Usually about 5,000 to 6,000 units are fired at one time, in line stacks of around 1,000. The firing time for each line stack is about half an hour.

The full-scale project is expected to create an enabling environment to up-scaling the adoption of energy efficient Hybrid Hoffman Kilns through private financing. The project will provide the technical assistance in terms of capacity building, technology transfer, monitoring and evaluation. The scope of this project does not include financing any energy efficient kilns from GEF project fund.