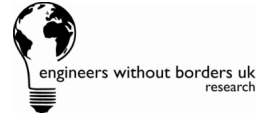


**engINDia & EWB-UK Research**

## **Project Proposal: Natural Water Heating on Roofs**

### **Full description of Problem:**

In Pabal, a rural village in Maharashtra, India, approximately 90% of the community uses hot water for showers and/or laundry each day. To heat the water the population uses natural gas or kerosene heaters. This causes an unnecessary cost for the community on fuel and on natural resources. As Pabal is in a particularly dry area of Maharashtra, there is sunshine for the majority of the year. This natural, free resource for heating water seems to be wasted. Water could be easily heated on roof space using solar radiation and then stored in an insulated tank for future use, thereby stopping the use of electrical or natural gas heating.

### **How the local community will use the proposed solution:**

The water can be heated on local rooftops using an efficient method (piping, running water off sheet metal, etc.). The water can then be stored in an insulated tank at ground level, and then used at a time in the future (e.g., the next day) when people have their morning showers, or to wash crockery, floors, etc. This would mean that living standards and cleanliness of the community would improve, therefore improving health standards. This project can be linked to the rainwater harvesting project.

### **Estimate of the economic benefit anticipated and plans for training of the local community:**

An implemented project would mean that the community would spend less on fuel for water heating. This could add up to a large saving over the course of a year. Therefore a cheap design of a rooftop method of heating water could save the community a lot of money as the payback time for the investment could be short.

Vigyan Ashram has welding capabilities and other facilities that would be required to implement a solution, at least in the form of a prototype.

This solution would be more environmentally friendly. However, less kerosene would be sold so some jobs may be lost, but some jobs would also be created by the construction of a solution. Also, the solution would save the community a lot of time as hot water would be easily and quickly available.

**Full description of the local situation:**

Some wealthy residents of Pabal heat water on their roofs already using a system of pipes and holding tanks which use the day's heat to warm the water, then store it overnight and use it for morning showers. However, the cost of installation is high and so this technology is not available to everyone in Pabal.



*Typical rooftops in Pabal*

**Useful background reading or resources:**

See engINdia Website: <http://www.engindia.net/resources.htm>

**Organisation Contact Details:**

Name of Organisation      engINdia

Web site                      www.engindia.net

Background information      engINdia exists to promote appropriate and sustainable engineering solutions in developing areas. Currently the

program focuses on Pabal, Maharashtra, a rural village in India located 80 miles east of Mumbai. Pabal is home to Vigyan Ashram (see details below), an educational institution that focuses on rural technologies. The existence of Vigyan Ashram and Pabal's proximity to Mumbai made it the perfect starting point for engINdia.

engINdia is a partnership between 6 students from the University of Cambridge, Massachusetts Institute of Technology (MIT) and the Indian Institute of Technology Bombay (IITB). An expedition was conducted during the summer of 2005 to the area of Pabal, Maharashtra. There, the engINdia team worked with Vigyan Ashram and the local community to gain an understanding and appreciation of the development issues faced by rural India which could be tackled through engineering.

Name of Organisation      Vigyan Ashram

Web site                      <http://vigyanashram.com/>

Background information      Vigyan Ashram is an educational institution situated just outside Pabal, Maharashtra, about five hours east of Mumbai. The focus of the institution is on rural education and enabling the rural population of Pabal and the surrounding areas to learn about technology and start their own businesses. The facility includes classrooms, labs, workshops, and living quarters for students. There is also a Fab Lab installed at the site (for more information, see <http://fab.cba.mit.edu/>). VA is striving to become an internet service provider for the area and to that end many of the organization's activities are becoming focused on internet-related projects, such as internet kiosks for rural farmers. A few people at VA speak English, but some knowledge of Marathi or an interpreter will be needed in order to carry out work in the area.