

# **WOOD FUEL DEMAND IN SCHOOLS IN RELATION TO THEIR COOKING PATTERNS**

## **BACKGROUND**

Most of secondary schools in Kenya offer boarding facilities to students. This creates need for school management to provide not only shelter but also all the meals that students require during their studying period.

This in turn requires more cooking to be done in order to provide these meals (Breakfast, lunch, 4pm tea break and supper). It is this need to cook for all these meals that brings about enormous demand for wood as the source of fuel to cook the meals.

Every year, there are on average 1,000,000 pupils who sit for K.C.P.E. At least half of this number is absorbed by the boarding secondary schools country wide. And the other 3 more classrooms already in those schools. This translates to at least 2 million students in boarding schools every year.

All the schools have a cooking pattern developed by their respective management. Each cooking pattern reflects the meals cooked in every school.

## **OUR FEASIBILITY STUDY FINDINGS**

After visiting a considerable number of schools during our feasibility study, our findings was that the wood fuel demand in every school depended wholly on the cooking pattern of every individual school. The meals cooked depended on the population of every individual school and their preferred type of meals.

But one fact stood out in all the schools is the demand for hot water to make various types of meals and beverages. Our findings showed that most schools cook meals that require pre heating of hot water in huge volumes before those meals are cooked (e.g. Ugali, rice, porridge, tea).

We also found out that most schools boil water for their students to bathe with in the morning and also prepare their own tea late at night after preps.

Using the above findings and through questioning the cooks, we did calculations on the amount of wood that directly went into heating water in order to provide for all the hot water demands in a school. And we found out that in all the schools that we visited, the amount of wood required to heat water constituted 40~50% of the total amount of wood used in schools for cooking.

### **A GREEN ENERGY SOLUTION TO HOT WATER DEMAND IN BOARDING SCHOOLS**

From the above finding, we can practically say that if an alternative, reliable and sustainable source of energy to heat water is provided, wood demand in boarding schools can be cut down by 40~50%.

Our country is located along the equator where sunshine is available throughout the year with minor variation during the 2 months of cold season. With a solar power radiation of 1000 watts per square metre, the country stands at a great advantage to tap solar energy. Heat from the sun can easily and practically be tapped and used to heat water in schools using an already developed and existing technology known as solar water heaters.

These heaters are designed to tap the sun's heat energy and use it to heat water directly. The modern solar water heater technology has efficiencies of up to 95%.

Using solar water heater in schools to heat all the hot water requirements can then save millions of trees from being felled down for firewood hence mitigate the global warming/climate change.

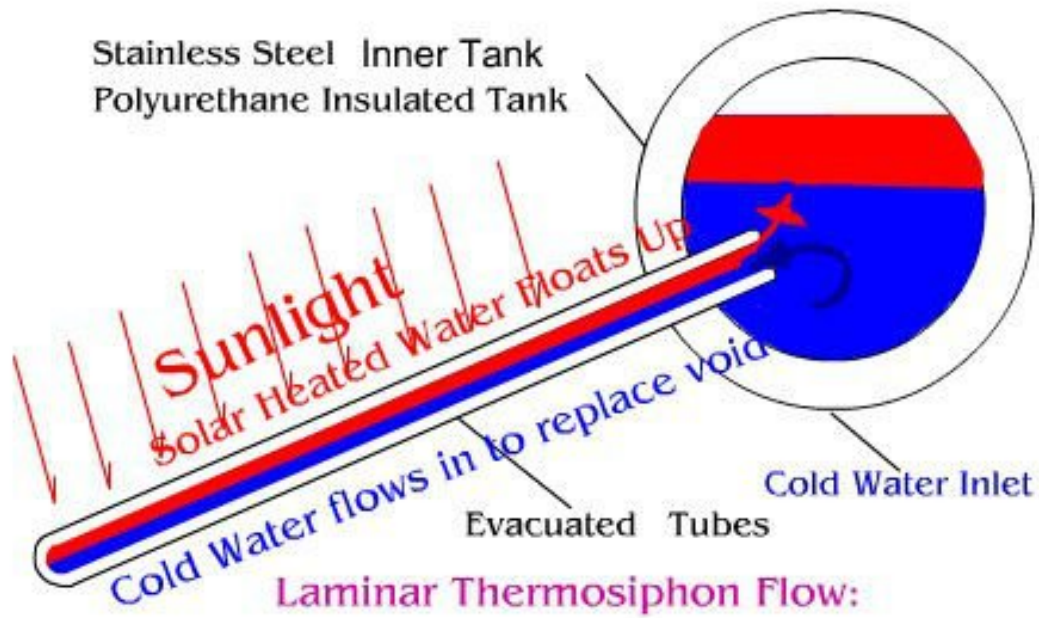
In addition to saving trees, schools will also realize monetary savings through reduced demand for wood fuel.

If for example we take a school with a population of 1,000 students spending about Kshs. 2 million/year on firewood expenditure; and this school utilizes 40% of that firewood in direct heating of water, then replacing woodfuel with solar water heaters will eventually save that school Kshs 800,000 every year.

From our tabulations, such a school can spend about Kshs 2.5 million to install a solar water heating system that will supply all their hot water demands.

Indicating that the payback period for such a project in a school is only 3 years.

**NB: The above explained benefits are sure proof how viable solar water heating projects are for schools and worth investing in.**



## How the Solar Heater Works

# Split Solar Hot Water System

