

*A Case Study :*

**WIND MILL ASSISTED MULTI PANEL SOLAR STILL : DESIGN AND TECHNOECONOMIC EVALUATION**

VASISHTA D. BHATT  
.....

Correspondence to :

**VASISHTA D. BHATT**

Dept. of Chemical Sciences,  
N. V. Patel College of Pure and  
Applied Sciences,  
VALLABH VIDYANAGAR  
(GUJARAT) INDIA

Accepted : July, 2007  
.....

**ABSTRACT**

A comparative study of parameters of some of the popular solar desalination units is presented here. A new multi-panel solar still assisted by wind mill is proposed. All the important techno-economic features of the proposed still are compared using an empirical scale. A working model of the still has been prepared. The superiority and suitability of the proposed still is the outcome of the analysis.

**Key words :** Multipanel solar still, Design, Technoeconomic evaluation, Solar desalination units.

India is a country having one of the largest coastlines in the world along with a suitable latitudinal position on the globe. It has ample possibility of generating sources of non-conventional energy like sunshine all the year round and favourable southwesterly and north easterly winds. However, due to insufficient awareness about sophisticated technology, entrepreneurial capability, scarcity of funds and bureaucratic support, India is still in its infancy with regards to generation and utilization of renewable energy resources. According to the *Rig Veda*, the Sun is the supreme source of energy and all the different types of energy, directly or indirectly, originate from the Sun.

In recent years the attention of scientists and technocrats is focused towards maximum utilization of the non-conventional sources of energy. The development of wind mills, turbines<sup>7</sup> and solar stills<sup>1,2,3</sup> are important landmarks in this direction. Several solar stills have been designed and developed till now to obtain good quality water from saline water.

However, in order to obtain sufficient quantity of potable water, the scaling up<sup>4,5</sup> of these stills is very important. The constraints in this scaling up are related to requirement of space, cost of manufacturing, fragility of the still and pumping of water<sup>7</sup> from the reservoir which is generally in the ground. Thus, there is a need of a still which has better techno-economical parameters. Upon combining wind and solar energy, the said task can easily

be achieved.

**Description of the currently used stills :**

The stills under the review are solar stills in which a cone is capped on a metallic dish containing saline water. Due to solar radiation, the water in the dish gets heated, evaporates and sticks to the inner side of cone from where it slowly trickles and is collected as pure water.

**Two such stills are popular :**

1. In which the cone is made up of plastic or mylar<sup>2</sup>.
2. In which the cone is made up of pyrex glass<sup>1</sup>.

The use of plastic sheets in the stills is not advisable for making the cone as it loses transparency and gets frequently worn out<sup>6</sup>. Whereas the use of glass ends up with increased cost and possibility of breakage.

The third still subjected to the present investigation is Ebara evaporation distillation<sup>3</sup> with triple effect evaporators. This device is successfully used in Gaza-Palestine. Since the Ebara model is relatively hi-tech and looking at the nature of the present investigation the technical details are avoided.

**Description of the proposed windmill assisted multi-panel solar still:**

The proposed still is attempted to include all the good points and also eliminates the drawbacks of the stills discussed previously. Proposed model is designed with a view to provide good quality water to the people of rural and coastal areas of the country.