

Efficient, Low Energy, Low Cost Water Purification Systems

Technology Overview



Low Energy, Low Cost, Any Contaminated Water Source to Any Level of Potable Water

The Problem

- Large quantities of contaminated water sources requiring immediate treatment
- Potential environmental hazards of contaminated water affecting multitude of eco-systems
- Poor water quality affecting the health of all living things
- The purification of most contaminated water sources is currently cost prohibitive
- The environmental and economic cost of inaction is far greater than action.

The Resource

- Unlimited amount of sunlight that can be cost effectively harnessed
- Abundantly available sources of contaminated water requiring purification
- Utilizing existing and new technologies to provide an innovative engineered water purification solution
- The approximate estimated initial **Capital Costs** (Capital Costs are all site dependant) for megalitres (ML) per day are:
 - » One Billion ML/day = US\$1,200,000,000,000
 - » Half Billion ML/day = US\$650,000,000,000
 - » 100 Million ML/day = US\$160,000,000,000
 - » 10 Million ML/day = US\$20,000,000,000
 - » 100 ML/day = US\$14,000,000

The Solution

- Providing innovative utilization of solar energy to purify any contaminated source of water to produce any standard of potable water.
- Provide additional water to river systems, farming communities and other eco-system during drought or low rain fall periods.

Potential water sources:





Economic Opportunity

There are many water purification technologies for converting contaminated water to potable water within present-day markets.

Key production methods include but are not limited to:

Thermal Distillation

Whereby large quantities of heat convert contaminated water to steam which is then condensed to produce a particular standard of potable water.

Vacuum Distillation

Whereby the boiling point of the contaminated water is reduced by putting it under partial vacuum, creating steam at lower temperatures and then condensing the steam to produce a particular standard of potable water.

Reverse Osmosis

Whereby water is forced through a fine membrane to filter out all contaminants.

All these technologies suffer from major problems:

- In the case of the distillation processes, they suffer from huge energy inefficiencies requiring large amounts of energy to convert the contaminated water to potable water. In addition to this there is a high degree of unreliability within the system and the system requires frequent cleaning due the build-up of unwanted contaminants.
- In the case of the reverse osmosis processes, it too also consumes large amounts of energy to force contaminated water through a membrane in order to convert the contaminated water to potable water. This technique also requires frequent and complex cleaning regimes due to microbiological and material build up on the membrane which if left unchecked will cause rapid deterioration of the membrane and premature failure.

HIPA has engineered a unique water purification system that does not suffer from the problems that plague current water purification technologies.

The water purification system engineered by HIPA is highly efficient, cost effective, infinitely scalable and can produce any standard of potable water from any contaminated water source.

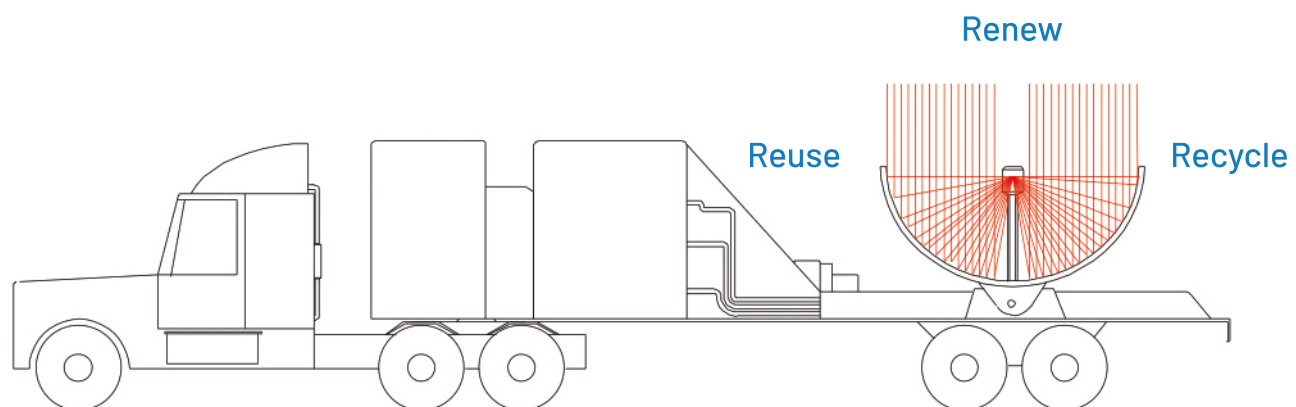
Whilst HIPA's water purification system can be scaled from a small production plant (1000 mega litres of potable water per day) to a very large production plant (1 billion mega litres of potable water per day), the uniquely engineered technology is also available as a mobile unit.

Production costs per megalitre (ML) (1,000 litres) for the current commercial systems:

Thermal and Vacuum Systems
US\$35 to US\$40

Reverse Osmosis System
US\$20 to \$25

HIPA Purification Systems
US\$2



The mobile water purification unit has been specifically designed to fit compactly within a standard 12 metre shipping container for use in remote location.

HIPA's production plants and mobile units recycle 100% of any waste generated. It produces its own electricity and is completely self-sustainable thus can operate entirely off grid. It is currently the most efficient and ecologically and economically sound technology of purifying contaminated water to any standard of potable water required.

Advantages

When compared to the existing technologies currently being utilized by the water purification industry there are a number of clear and distinct advantages is choosing HIPA's uniquely engineered water purification system.

They include but are not limited to:

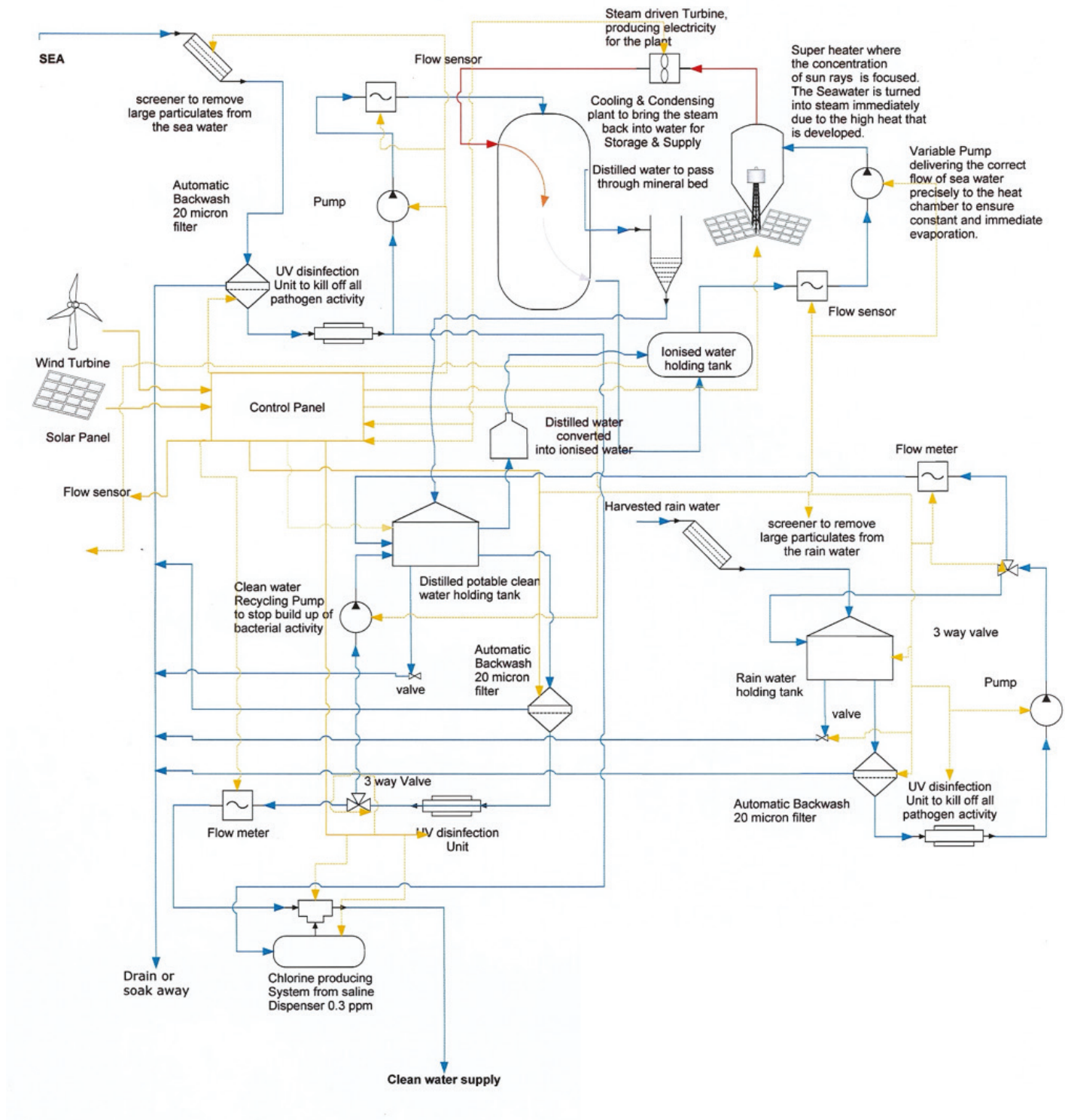
- The water purification production system/plants are infinitely scalable. They can range from a small mobile unit producing a rate of 50 mega litres per day to a super-sized production plant that has been specifically designed to produce over 1 Billion mega litres per day. The larger the production plant the cheaper the potable water is to produce. It has been estimated that the larger scale production plants can produce potable water for approximately \$20 - \$30 per mega litre.
- It is estimated that the return on investment on a 1 Billion mega litres per day production plant will be realized within a 6-year period after the said plant is fully operational.
- The water purification system employs simple accelerated water production methods using natural water convection techniques.
- The water purification system is self-cleaning and required little or no maintenance.
- The water purification system is designed to decontaminate any source of water, soil and other toxic chemicals and/or materials such as oils and heavy metals. All harmful chemicals are efficiently and cost effectively returned back to their natural elemental state.



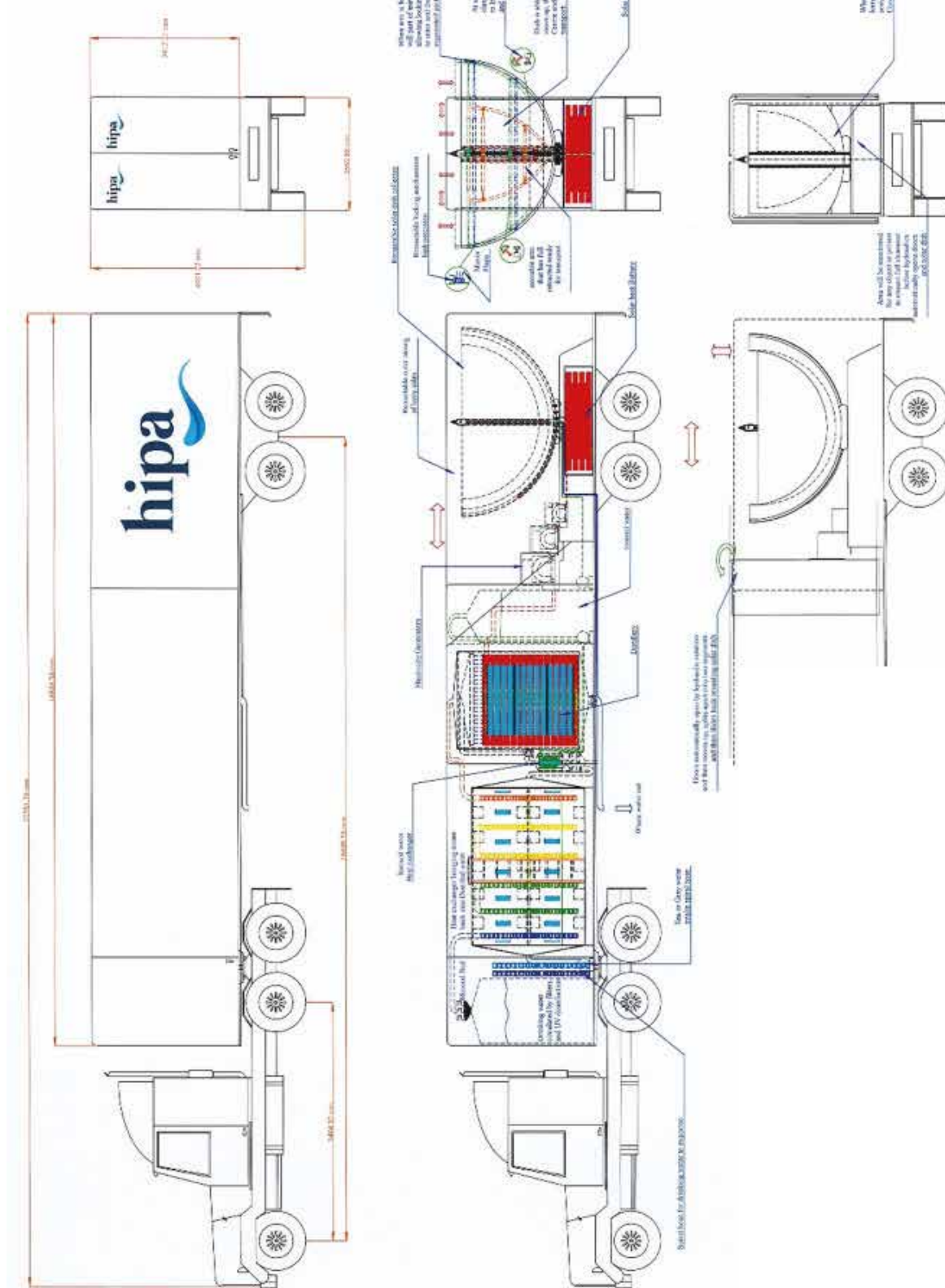
- Able to decontaminate radioactive water.
- Cyclone proof production plants are also offered to meet all stated national and international regulations and specifications.
- Every production plant is fully automated and monitored.
- The production of potable water is strictly in compliance with applicable EPA and other regulatory agency requirements.
- Excess electrical and thermal energy produced during the production of potable water can feed other plants or be sold to the grid or local corporations or be used by domestic consumers.
- Noise from production plants or mobile units are well below specified statutory limits.
- Plant performance warranties and full technical support is provided.



Water Purification System (WPS) Process Flow Chart



Mobile 75 tonnes of water a day production system.



WPS Major Plant

Volume: 25 Million tonnes per day

Dish Diameter: 100 metres

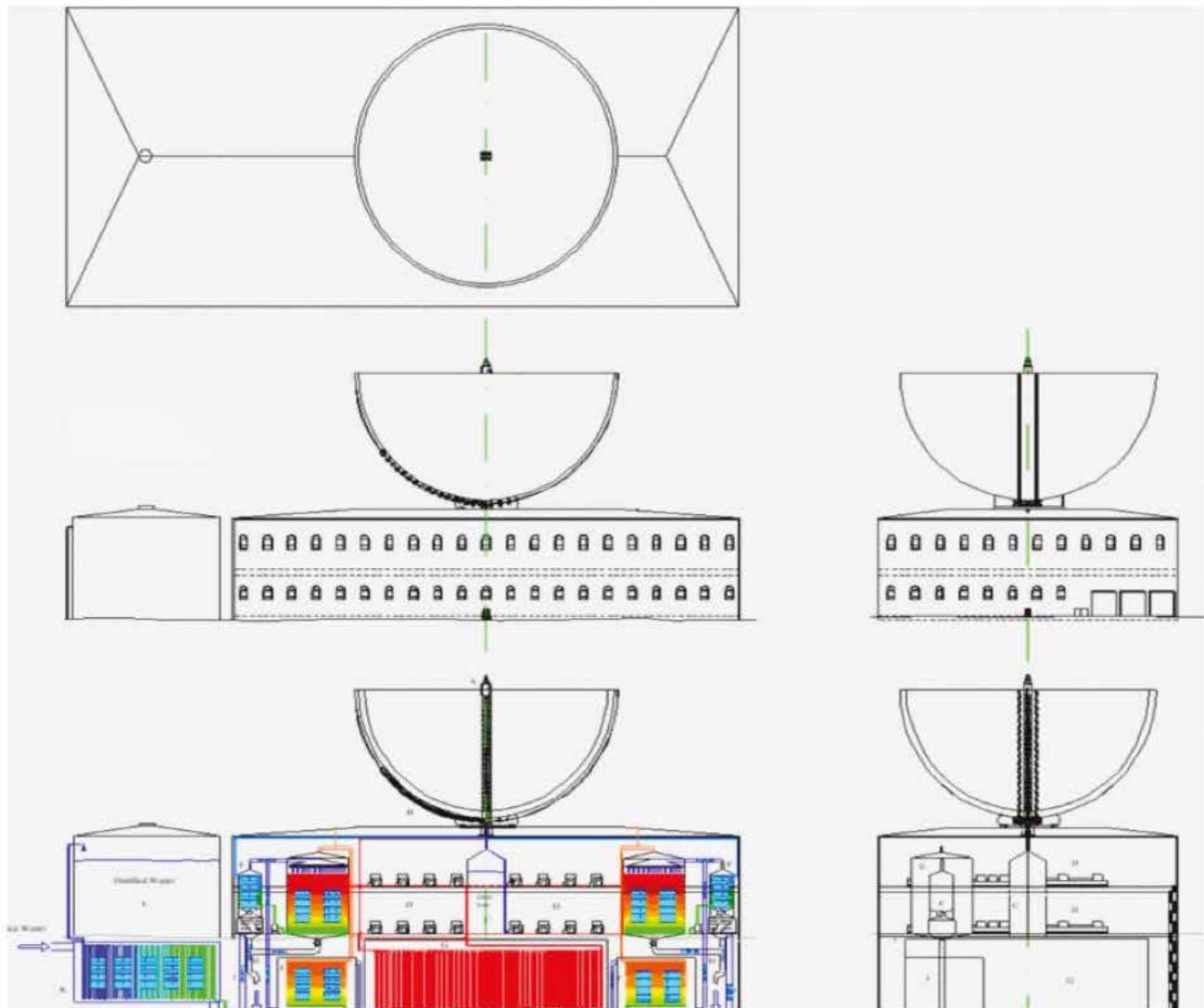


Image Credits

Cover: <https://www.ecoideaz.com/expert-corner/concentrated-solar-power-in-india-still-in-infancy>

Page 2:

- Unspalsh
- <https://www.northerndailyleader.com.au/story/5535295/green-algae-outbreak-takes-over-peel-river/>
- Unspalsh

Page 3:

Unknown



**Efficient, Low Energy, Low Cost
Water Purification Systems**

Technology Overview

