International Journal of Research in Advent Technology, Vol.7, No.5, May 2019
E-ISSN: 2321-9637
Available online at www.ijrat.org

A Novel approach and Comprehensive Analysis for Hydro panel that makes drinking water from sunlight and air

Burri Ankaiah [1], Dr.Rajashekar P.Mandi [2], Ananda M.H [3], Sujo Oommen[4], Adithya Balaji[5]
Assistant Professor,School of EEE,REVA University[1,3,4,5]
Director, School of EEE,REVA University[2]
Email: burriankaiah@reva.edu.in[1]

Abstract- In present world out of 10 people 3 will be lack of safe, readily available water in domestic by the reports of World Health Organization. So 2.1 billion people unbelievable clearly this equates to an, lack of clean water is a very serious problem in our world. While World Water Day encapsulates all aspects of Earth's most precious resource, including a focus on minimizing flooding, lessening the impact of droughts, recycling water, and reducing contamination, the availability of water is, for many, an on-going concern. Providing off-grid fresh water is not a simple task, but solar-powered fresh water production is now a possibility for anywhere with sunshine for those less fortunate or perhaps situated in rural or remote areas, water needs are vastly more complex and vastly more expensive, scarcity, quality, and water-borne diseases are significant problems. Solar panels provide energy to capture moisture from the air to and supply clean drinking water. No power is generated only water. you own the air you breath, it's time you own the water you drink. In so many places around world, the conditions for climate are good and suitable for drinkable water generation. However, there are different types of problem of water scarcity. Another system for generating very fresh water which can be recovery from nature basically atmosphere.

Keywords- hybrid panel; compact battery; porous material; water storage compartment; comprehensive analysis.

1. INTRODUCTION

Hybrid panel totally off-grid, powered by solar and non self -contained equipment which creates pure drinking water from air and also the sunlight. With a fan air is collected into the unit with a help of the fan, after that a special materials which is hygroscopic absorb the content of water[1]. The vapor from water is collected then natural airflow flows through a closed condenser, after that flows into a unit of reservoir it is mineralized with magnesium and also calcium. It avoids a taste that is "flat" in the last product. Then water flows and pumped through a new polishing type cartridge before being delivers to the designated normal tap or a unit of the refrigerator with an cumulative water dispenser or maker which produces ice. Each of the compact hydro panel unit of the reservoir is nearly capacity of 30 liters, so 60 liters in the total for a fixed standard installation design (2 hydro panels)[2]. solar panels to the unit of system which incorporates to a battery so that the natural water can be collected at the night and production of water which it can continually during the cloudy periods seasons. Instead of groundwater filtering, the compact hydro panels it collects vapour of water from the air, even in the low humidity [3]. Areas. The compact hydro panel system is the free infrastructure, which means there is no use of pipes or wires, except for the operation of a single tube structure running from the unit panel to the connected tap. The result which is the pure type of water that can produced with the on-site so that it is called free of toxic chemicals and also to reduce many risk of the contamination[4]. It's also for zero waste – which has no usage of the more water bottles which is made of plastics on the landfill or in the ground.

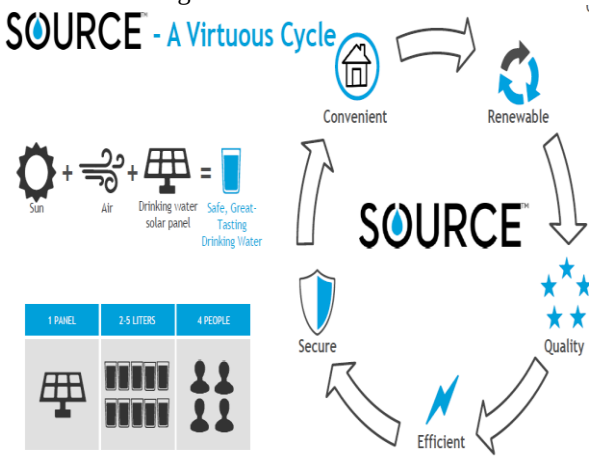

Fig. 1 Virtuous cycle

Which can be operate in conditions at unfavorable isn't clear. Now a days the self-respecting for the high-tech device is not complete without the aspect of internet. Each and every Source for the installation is connected.center for the network operations in Water, which also monitors the working conditions and also for remotely optimizes the unit of system [5]. If any issues that will crop up are either that can be remotely resolved. Compact hydro panel works in the conditions for low humidity, but it works for

significantly effect on the production of water . compact hybrid solar panel which has a standard array of (2 panels) averages and also the 4-10 liters of production of water in a day each, it depending on the conditions for humidity and also for sunlight.compact hybrid solar panel which is a very large device with each of the panel that weighing nearly 124 kilograms and also for the measuring 1.2m x 2.4m.

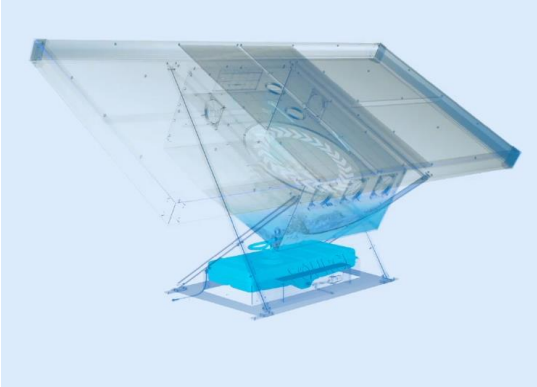

Fig. 2 Hybrid Solar Panel

2. HYBRID SOLAR PANEL

A compact Hydro panel which works maximum in the non-grid to create the pure water for drinking with the just natural air and also from sunlight. Compact Hydro panel through in advanced capture of water technology that mainly consists

1. Double solar panels
2. A battery in compact
3. Material of porous Proprietary for generation of heat
4. Material of Proprietary that collects the content of moisture from the natural air
5. A storage compartment for the water purpose

From the air humidity is collected into the unit of device and then it converted into pure drinking water. Now, obviously, in the air which has more content of humidity– the content of more water will be produce in the compact hybrid solar panel. However, for dry areas which are incredibly relative humidity which is less than 5% .compact hybrid solar panel still produces water [1]. Even for the typical domestic Source array which it can produces an average amount of 4-10 liters of water for each day it always depending on the natural sunshine and humidity conditions.

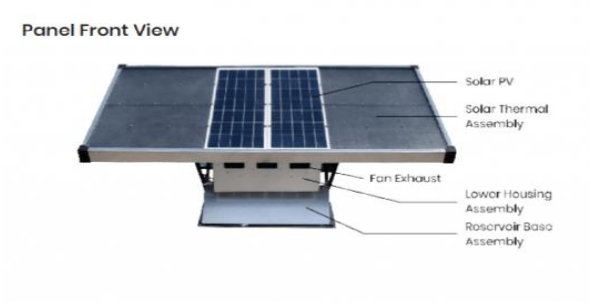

Fig. 3 Hybrid Solar Panel Front View

Fig. 4 Hybrid Solar Panel Rear View

Compact hybrid solar panel which it can stores up to 30 liters of pure water, with the ingenious on-board of the pump that can produces 80 psi line pressure in the system . which it can allows the water storage to be delivered to an device called the dispenser in-sink and/or a refrigerator and in the integrated maker for the ice[2] . Hybrid solar panels which is in Compact that also can be operated totally independently; ideal solution for the water problems in a concerned infrastructure. And also the stikes of disasters which happens in natural, compact hybrid solar panel can be the unit of lifesaver – providing the pure and safe natural drinking water. For non isolated schools and also for the medical facilities that can also use compact hybrid solar panel for constant maintenances and also the supply which is more essential for supply of pure and clean drinking water[3]. One more application for compact hybrid solar panel for wildlife which is more potential benefits. For instance, compact hybrid solar panels arrays which can be installed in the drought-stricken places to provide with pure fresh water to alive and keep them hydrated[4].The technology is the certainly an impressive, the amount of current puts it less range for the most of the people. If prices come slowly comes down, the compact hybrid solar panel is one of the best useae pure drinking water to communities .may be two-panel compact hybrid solar panel set up which help to be remove 60,000 plastic water bottles from circulation[5] So, reducing the pollution form plastic usage and also saves the life

span of lives, for the at present world the compact hybrid solar panel is the good device to saves earth from the plastic usages.

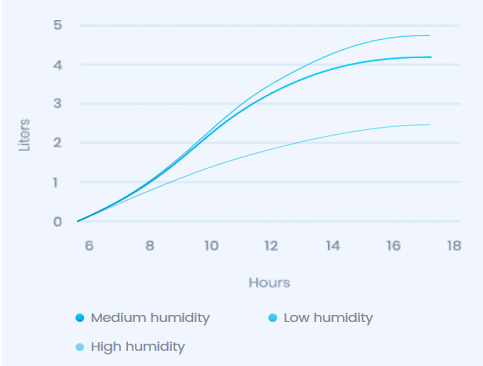

Fig. 5 Different Humidity Conditions

3. REDUCING DISPOSABLE PLASTIC BOTTLES

Compact hybrid solar panel that produce the enough content of pure water to displace 0ver 20,000 plastic bottles over a period of 15-years. Compact hybrid solar panels could be incorporated into the buildings around the every country for water supply source. In case of agriculture, the compact hybrid solar panels technology which can provide a good quality of water supply to the farmers as well as the livestock, when there is a drought. Compact hybrid solar panel which can provide the water in the locations which is most remote without any electricity also it access to potable water [1].compact hybrid solar panels which it produces the water sources of reliable drought resistant for the remote communities while it can be the simultaneously low reducing the quantity of usage of plastic bottles in landfill that end up. Compact hybrid solar panel technology provides non conventional sources and also the infrastructure- best solutions for the free water in the earth for the driest inhabited continent. Compact hybrid solar panelswhichit combines the PV (solar photovoltaic),in the material science and also the other technologies[2]. It is a independent product and that can work anywhere on the ground and also in the top of the building. which can be easily installed because the absence of electrical power input.

4. WATER QUALITY

Compact hybrid solar panel water it contains of the mineralized with calcium and also the magnesium content, which it can achieves a best optimal taste. With this perfect combination of electrolytes for hydration, compact hybrid solar panel which brings the peak -quality water for the health [3]. Guidelines for number of contaminants tested and regulatory limits for contaminants detected in the compact hybrid solar panel water above for hybrid solar panels with International standards & guidelines for contaminants [4].

5. COMPREHENSIVE ANALAYSIS

5.1. *Solar Powered Harvester,* MIT

MIT, a novel approach technique for collecting pure water for drinking with the natural the air. The flow of sequence images at the right side shows how to get the water droplets which it collectively increases inside the temperature when it is exposed to the natural sun. Critical water shortages now a day's already affect so many areas around the world, with the increasing population and the climate get heat up that is the most worse situation. But with novel technology developed by scientists at MIT and also the University of California at Berkeley could be a new technique for getting the fresh natural water with clean everywhere on earth anywhere, collecting water which is directly even in the locations is driest, from the moisture in the air[5].

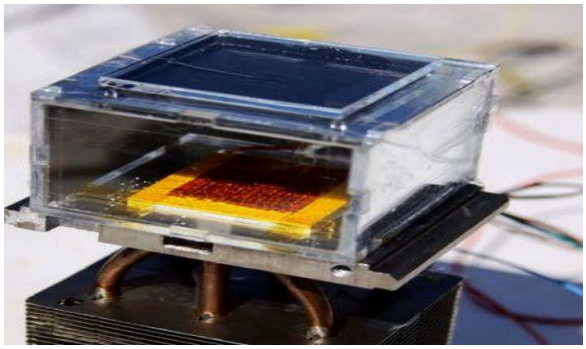

Fig. 6 Solar Powered Harvester, MIT

Extracting water with moist air, technologies exist such as "fog harvesting", deployed many number of coastal locations. But it is very much expensive methods for moisture removal from air which is drier. Novel technique approach that is the first which have more potential in distributed over a large area, any location which is virtually, notwithstanding the levels of humidity, the researchers says the passive system which is completely have developed for material which is foam based which collects moisture pores of it. solar heat and totally powered [1].

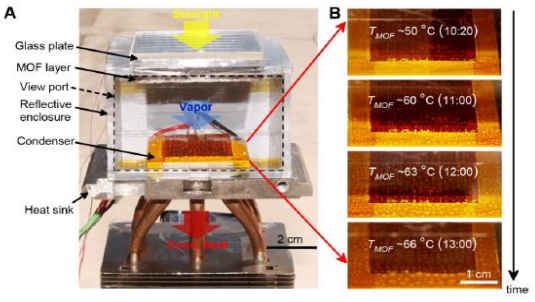

Fig. 7 Concept device built at MIT for demonstration

5.2. Metal-Organic Framework (MOF)

Harvesting water device for the Air-naturally cooled for the atmospheric in the based of adsorbent with the framework metal−organic (MOF)-801working for the increasing arid climate and dew points for zero conditions for thermal efficiency which is water conversion to the solar input approximately14%. this system which it can delivered for the 0.25 L of water which is for single cycle in daily for MOF[2]. The water quantity which it can be in the harvested in one duration of cycle Using the device MOF-801 which is to be used for evaluated in the adsorption of Isotherm in Fig. 6. To obtain the total desorption (at ~10% RH), help of a ambient type of duration in time day (condenser) the temperature should be 30 °C (saturation vapour pressure, Psat = 4.2 kPa), the minimum adsorbent be heated to of 77 °C (Psat = 42 kPa).The temperature target for difference corresponds that approximately 45 K between the condenser and the adsorbed[3]

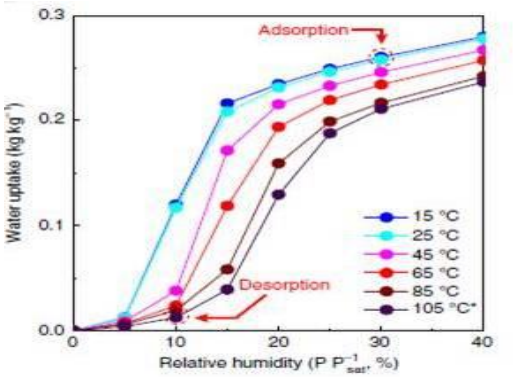

Fig. 8 Adsorption Of Water in the isotherms of MOF-801 in kg kg-1

The working of humidity which is relative (P Psat−1, saturation pressure over the vapour pressure) at temperatures of 85 °C, 65°C , 45°C, 25°C and 15°C calculated by using analyzer absorption . At 105 °C the isotherm was can be predicted by using the based characteristic curve [4].The circles with dotted in the red which shows the conditions representative achieved for the during absorption in the time for nights and water production of time in day.

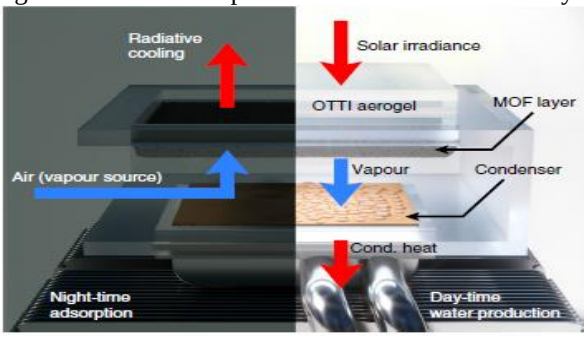

Fig. 9 Schematic Water Harvesting Device Illustrative

The operation and Principle of MOF-801 the device - based harvesting water and adsorption of the isotherms. For the Undergoing adsorption (left half ,night-time only) and in water production in the solar-assisted (right half ,day-time) for the processes. During the process adsorption, for the circulation of air is across the layer of MOF and adsorbed water with air. Cooling lowers for the radiative Passive the layer of MOF below the temperature for ambient by thermal radiation which is dissipating to the cold sky clear to maintain the in RH total increase [5]. When the production of water.MOF on the top of layer which as the OTTI aero gel stacked solar absorber heat loss to suppress to convective. The release of vapour then condensed to a condenser and the rejection is with heat for the ambient by a heat sink with a heat pipe[1]. The purpose of MOFs for harvesting water. The MOFs which is more flexibility that to be modified and made at the level of molecular which is coupled to their porosity ultra-high make them which is suitable for challenges for overcoming conditions.

5.3. Graphene in Water Harvesting

In Graphene material which has caught much attention in science of materials , physics science and other in many more areas over sixty years. Two-dimensional properties is present in Graphene crystalline allotrope of carbon. It is a sheet of single-atom-layer thickness which consist of sp2-hydridized carbon atoms arranged in a hexagonal honeycomb structure. This very special lattice structure grants graphene to have many merits: 1) high pore volume; 2)large surface area; 3) high presence of surface functional groups in those materials. Even though graphene is a two-dimensional material, because of flexibility when it allows it to become a units of basic building for all other materials in dimensional graphitic. For example, 1) By wrapping graphene up of which produces the 0D buckyballs 2) By rolling graphene which produces the 1D nanotubes 3) By stacking graphene which produces the 3D graphite.

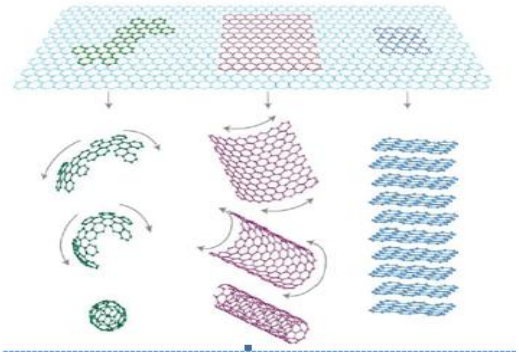

Fig. 10 The transformation of how 2D Grapheme can turn into all other grphic forms

6. CONCLUSION

Comprehensive Analysis for Hydropanel that makes drinking water from sunlight and air with off-grid technology, no power is generated only pure water .Hybrid solar panel which it can brings best water with highest-quality and also for health right from taps in domestic .The purification of is water produced on-site that is chemicals free and has no contamination which reduced risk. It's also zero waste – which means the reduction of plastic and also water bottles no more in the landfill or in ground

Acknowledgments

This I offer my sincere thanks to God and my family for giving me an opportunity to dedicate my time and energy. The first author is thankful to Dr.RAJASHEKAR P.MANDI Director School of Electrical and Electronics Engineering, for his constant support and guidance. Special thanks to REVA University, for encouraging.

(A.1)

REFERENCES

[1] https://www.zeromasswater.com
[2] https://www.sciencemag.org/news/2017/04/new-solar-powered-device-can-pull-water-straight-desert-air
[3] https://www.nature.com/articles/s41467-018-03162-7
[4] https://www.zeromasswater.com
[5] Hyunho Kim1 , Sameer R. Rao1 , Eugene A. Kapustin2,3, Lin Zhao1 , Sungwoo Yang1 , Omar M. Yaghi 2,3,4 & Evelyn N. Wang1, "Adsorption-based atmospheric water harvesting device for arid climates"