

# **New Energy Source and Alternative Fuel in Saudi Arabia**

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## **Energy and Water and Environmental & Sustainability**

### **Abstract**

At present, Saudi Arabia is driven by its 2030 Vision that incorporates large steps towards generating electricity from renewable resources, primarily by deploying photovoltaic cells technologies. Although the solar-based technologies are mature and proven, this study aims to bring an untapped renewable energy source to the Saudi market that can hold as much effects as solar based technologies. It will also produce emissions free electric power and eliminate major environmental issues in the coastal cities such as Al-Jubail and Jeddah. In fact, the proposed renewable energy system is not recent and already deployed in Norway, Canada and other countries and is able to provide 1,700 TWh annually, which is, in theory, 70% of the total world consumption in 2008. It matters with exploiting salinity gradient power that is naturally released when the lower salinity water of rivers and lakes flows into the higher salinity water of seas and oceans, owing to the chemical principle of osmosis [2].

However, Saudi Arabia might not be the country to invest in the “Blue Energy”, given the fact that it is the largest country in the world with no flowing fresh water streams such as rivers. Thus, how could this renewable energy source be feasible in it. The answer is that the blue energy is not only viable when rivers run into seawater; nevertheless, it is released when two solutions with different salinities meet through a semi-permeable membrane. Principally, Saudi Arabia is the largest country in the world with desalination and wastewater treatment plants, thereby their byproduct brackish water (Brine) can be thought as high saline solution and seawater will relatively be a low saline solution.

My presentation will focus on the Blue Energy and how well it can serve the the current desalination plants in Saudi Arabia and beyond. I have also submitted a patent regarding this idea and will touch upon its outcomes.

### **Keywords (12 font)**

Desalination, Brine, Seawater, Renewable Resource and Membranes.

## **Biography**

**Hadi Alyami** received his BEng degree in Electrical and Electronics Engineering from the University of Brighton, England followed by his MSc degree in Energy Systems from the University of Alberta, Canada in 2013 and 2017 respectively. In 2018, Alyami has joined TVTC wherein he established the TVTC Research and Consulting Studies Centre in Tabuk, and besides his management role thereof, he teaches courses in Electrical Engineering and Renewable Energies Technology at Associate and Undergraduate levels. He has published several papers in peer-reviewed journals including IEEE and given several talks at national/international conferences and forums including the 22<sup>nd</sup> Gulf Engineering Forum and Kuwait SmartGrid Conference. His research interests include VSC-HVDC, Osmotic Power Systems and Energy Storage Technologies.