

# **A low cost hydrokinetic wells turbine system for oceanic surface waves energy harvesting**

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## **Abstract-**

**This paper provides a feasibility study on a low cost system called Hydrokinetic Wells turbine for surface wave energy conversion without using plenum chambers. The elimination of the plenum chamber and its complicated valve systems can reduce the expenses of wave energy conversion up to 23%.The feasibility process were done for high and low frequency conditions. For the low frequency waves, we offer the 300 rpm angular velocity as an optimum selection for further studies. For the high frequency condition a reliable analytical approach based on validated methods was developed. The analytical results indicate that a wells turbine with 60 cm diameter could produce up to 1600 Watts power in high frequency waves. The efficiency and power coefficient values in high frequency condition are less in compared with low frequency situation, nevertheless the vast usage of the small scale and elimination of the plenum chambers can reduce the total cost of the conversion. The abundant availability of high frequency surface waves is a motivation for developing Hydrokinetic Wells turbine farms to harvest a great source of clean energy with lower cost levels.**

**Index Terms- Wells turbine; Surface waves; Oscillatory motion; Ocean energy**

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