

## **Abstract**

**Up until now, geophysical surveys on oil and gas exploration still rely on cables to transmit seismic data from geophones to data collection centers. The existing system is very reliable in terms of speed of data transmission, but has weaknesses in the aspects of procurement and maintenance. There is the latest research to cover the weaknesses that exist with the use of wireless networks in its implementation, but it is still necessary to apply an energy efficiency architecture in order to obtain maximum results in reducing the weaknesses that exist in the existing system. The energy efficiency architecture studied is the Adaptive Clustering Wireless Geophone (ACWG) which focuses on each transmission run in order to select the master geophone from the WG node that has the greatest power in each group. From the research conducted, it is proven that the energy efficiency architecture of Adaptive Clustering Wireless Geophones can save power by 8.03% and extend the lifetime of WG nodes by 50% compared to wireless geophone architectures that do not apply energy efficiency of adaptive clustering.**

**Keywords: geophone, wireless network, energy efficiency, Adaptive clustering wireless geophone, master geophone, power, lifetime**