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Assessment of the Current and Future Energy Generation Mix in Uasin Gishu County, Kenya

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At the global level, local financing of energy generation in such regions has led to accelerated economic growth, reduced foreign reliance on energy, and improved system reliability. The Kenya Constitution of 2010 also set up a system of devolution that vested the responsibility of overseeing most sectors with the counties, including energy. Devolution to the Uasin Gishu County presents an opportunistic benefit in exploiting indigenous energy resources with a possibility of potentially exporting surplus power to neighboring counties and even abroad to contribute own-source revenues.This study evaluates the existing energy mix and future generations possible in Uasin Gishu County. To start with, the installed capacity is currently made up of solar (140 MW), hydro (2 MW), thermal (100 kW), and wind (less than 5 kW). Other investments in development by the private sector include the Kaptagat solar plant for ammonia production (195 MW) and the proposed Copper Hetero Junction Thin Films (Cu-HJT, 20 MW) at the African Economic Zone(AEZ). Understanding that the County is just 30 km away from Kerio Valley oil field, there is a reasonable basis to suggest that indeed it is a candidate for future oil exploration. The County has a significant scope in bio diesel (from big grain crops such as wheat, maize, and sugarcane) and biogas, with over 3,000 dairy farmers eligible for small-scale digester installation. A research on Hydrogen energy is being conducted by Moi University and will provide future opportunities in the sector. This paper attempts to approximate the collective potential energy production from such resources, quantify cost saving by reduced grid dependency, and conduct a cost-benefit analysis to assess whether an expansion in localized generation is economically viable.
Key Words:Energy Mix, Solar, Wind, Hydro, hydrogen, Biodiesel, Biogas, Cu-HJT

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