

ABSTRACT

This study evaluates the feasibility of utilizing the 2100 MHz frequency for Narrowband Internet of Things (NB-IoT) networks in the Purwokerto area using In-Band and Guardband schemes. The analysis was conducted through simulations based on the existing number of sites, with estimates of usage based on capacity and network coverage. Network design and simulations were carried out using radio planning software, focusing on the analysis of key technical parameters: Reference Signal Received Power (RSRP), Signal to Interference plus Noise Ratio (SINR), and Throughput. This study aims to provide a technical foundation for the implementation of Smart Metering AMI services based on NB-IoT in Purwokerto. The simulation results show that the 2100 MHz frequency can be used for the NB-IoT network in Purwokerto. The Guardband scheme yields a better RSRP value compared to the In-Band scheme, with RSRP of -94.39 dBm, SINR of 6.61 dB, and throughput of 14,947 bps. Meanwhile, the In-Band scheme results in RSRP of -99.39 dBm, SINR of 6.61 dB, and throughput of 14,623 bps. Based on these simulation results, the Guardband scheme is recommended for implementation as it provides better performance in terms of RSRP and throughput, which are crucial for supporting the Smart Metering AMI service quality in the Purwokerto area.

Keyword : Narrowband Internet of Things (NB-IoT), 2100 MHz, In-Band, Guardband, Reference Signal Received Power (RSRP), Signal to Interference plus Noise Ratio (SINR), Smart Metering.