

ABSTRACT

AMI is an integrated intelligent metering system, communication network, and data management system that enables two-way communication between utilities and customers which is expected to increase efficiency in monitoring and detection of leaks, so that losses can be overcome. IoT is a concept where certain objects have the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

To support the development of AMI, there is a standardization of technology connectivity, namely LPWAN. LPWAN-based technology is divided into 3GPP technology that works on licensed spectrum and non-3GPP technology that works on un-licensed spectrum.

In this study, a techno-economic study was conducted on LPWAN-based IoT network planning by comparing three technologies, namely LoRaWAN, Sigfox, and NB-IoT for AMI in the Surabaya area within a period of 10 years. The results of research that have been carried out based on simulations obtained the average best signal level -88.92 dBm for LoRaWAN, -87.30 dBm for Sigfox, and -69.37 dBm for NB-IoT. And the results are based on the average SNR value of -9.17 dB for LoRaWAN, 5.6 dB for Sigfox, and 9.67 dB for NB-IoT. The results of the study based on economic analysis were obtained for LoRaWAN, the NPV value of \$ 30,072,494.12, IRR of 59.79%, Payback Period of 5 years 2 months, and PI 1.92. The results of the economic analysis for Sigfox obtained an NPV value of \$29,808,492.43, an IRR of 67.03%, a Payback Period of 4 years and 10 months, and a PI value of 2.08. As for the NB-IoT, the results of the economic analysis showed an NPV value of \$30,305,763.71, an IRR of 55.72%, a Payback Period of 5 years and 5 months and a PI of 1.83. Based on the results of the research that has been done, the technology recommendation for AMI services is Sigfox because Sigfox technology has the fastest return on investment compared to LoRaWAN and NB-IoT.

Keywords- Feasibility Study, IoT, AMI, Connectivity, LPWAN, TEA.