

## ABSTRACT

*The implementation of the Internet of Things (IoT) plays a strategic role in addressing urban challenges, particularly in managing water, electricity, and gas consumption data, which have traditionally been collected manually. Narrowband IoT (NB-IoT) technology offers an effective solution to support real-time data processing through the Advanced Metering Infrastructure (AMI) system. This study aims to analyze the technical and economic feasibility of planning an NB-IoT network using a standalone scheme in the urban area of Malang City. The methodology includes network parameter planning based on the Okumura-Hatta propagation model, as well as network coverage and capacity estimation using Atoll software. Device demand data were obtained from the Malang City Central Statistics Agency (BPS). Simulation results indicate that network performance parameters such as RSRP, SINR, and BLER fall within feasible thresholds, with an optimal signal coverage area of 71.55 km<sup>2</sup> in the range of -90 to -85 dBm. A techno-economic analysis was conducted over a 10-year period, based on the distribution of CAPEX and OPEX, along with internal benefits in the form of 4% annual operational cost savings and external revenue from customer services. The results show that the project is both technically and economically feasible, with a positive investment value indicated by an NPV of IDR 76.02 billion, an IRR of 17.362%, and a payback period of 4.48 years.*

**Keywords :** AMI, BPS, IRR, NB-IoT, NPV