ABSTRACT

The capital city of the archipelago is the new Indonesian government center located in the province of East Kalimantan, to be precise, in two cities, namely the city of Kutai Kartanegara and the city of North Penajam Paser.. In the future, the capital city of the archipelago will use 3 concepts, of course the capital city of the archipelago will move in industry 4.0 so that it requires a fairly high connectivity network where all industrial players will be connected to each other using technology. Therefore, a fifth generation wireless network technology is needed, namely 5G NR.

5G is the 5th generation and New Radio is 5G technology, this technology has upload and download speeds 20x faster than the previous generation. This design will use a frequency of 26 GHz, based on IMT 2020, a measurable value that shows the effectiveness of a network to serve users. It has three use cases including URLLC, mMTC, EMBB. In terms of coverage, the propagation model uses Urban Micro propagation. In order to find out the feasibility of planning a 5G New Radio network in the capital city of the archipelago, for economic analysis use the CAPEX, OPEX and Revenue scales, then for economic analysis use NPV, PP, IRR, ROI, ARR, PI

This research on Coverage planning produces 200 sites and on Capacity planning produces 27 sites, and the results of capacity planning optimization are 80 sites. So from the Coverage results, the SS-RSRP value is -56.04 dB, SS-SINR 29.99 dB, and Throughput 270,363.43 kbps. For Capacity planning, the SS-RSRP value is -69.15 dB, SS-SINR 32.05 dB and Throughput 273,275.51 kbps. The results of capacity optimization SS-SS-RSRP -62.92 dB, SINR 31.35 dB, throughput 272,608.09 kbps. Based on the analysis of the initial capital cost structure, Capex is IDR 142,043,077,200, and Revenue increases each year so that the NPV obtained is positive and can be said to be feasible for this investment because the payback period of this design returns capital within 4 years

Keyword: 5G New Radio,Techno Economi, IKN