ABSTRACT

4G LTE-Advanced is the result of the development of 3G technology. Along with the development of technology, the number of users in an area will increase because people's activities today cannot be separated from technology and the internet. “Network congestion" is a problem currently being faced in Indonesia, where network traffic is experiencing congestion due to too many users using the network.

This research implements the 2100 MHz frequency band as an additional frequency for the 4G LTE-Advanced network in dense urban and urban areas. The planning area in this research is Central Jakarta and North Jakarta. This research uses three different analyses; there are technical analysis, economic analysis, and regulation analysis; it also uses two different technical methods, carrier aggregation method and without carrier aggregation method. This is done to determine whether adding a 2100 MHz frequency is feasible and implemented on the 4G LTE-Advanced network in the planning area.

The final result of this research is the addition of a frequency of 2100 MHz as an additional frequency for 4G LTE-Advanced technology in the planning area is feasible to be implemented. From the analysis results, it is found that the Central Jakarta area requires fewer sites than North Jakarta to cover all areas with excellent network quality. Planning using the carrier aggregation method requires fewer sites than without using the carrier aggregation method. Based on the business aspect, both regions have positive NPV and IRR values with returns on capital in the range of 2-3 years. Based on the applicable provisions and with the permission of the relevant Minister, the operator can implement this frequency implementation plan.

Keywords: LTE-Advanced, Frequency, Key Performance Indicator, Economic, Regulation