

TELKOM UNIVERSITY

*Abstract*

SCHOOL OF ELECTRICAL

The Graduate School

Master of Engineering

**Radio Resources Allocation Based-on Energy Saving for LTE-Advanced System**

by Vinsensius Sigit Widhi Prabowo

To fulfill the demand of high speed data rate, 3GPP introduced Carrier Aggregation (CA) to support wider transmission bandwidth and spectrum efficiency. CA becomes the new standard on LTE-Advanced system. With CA, user can be scheduled on multiple carriers. Since the frequency of each carrier are different, there are some differences in coverage and fading characteristic as well. This condition makes the performance of allocation algorithm decreased, especially in energy and spectral efficiency.

This work proposed some method to improve the performance of resources allocation algorithm in CA system. The methods are user-chunk grouping (UCG) and waterfilling (WF) power allocation. UCG process will classify each user and resource in several group, according to fading characteristic of each carrier. Meanwhile, the WF power allocation will distribute power for each resource, so the energy is not wasted on bad channel.

The allocation algorithm performance in CA system can be repaired by adding the UCG and IWF method. In varied users (75-250 users), the spectral efficiency of proposed algorithm increased by 1.5057 bps/Hz in average and energy efficiency increased by 188.21 kbps/Watt in average compared with original MG algorithm. But, in the other hand by adding UCG and WF method, the fairness of the system decreased about 0.295.