

# Device to device power saving

2 June 2020, by David Bradley



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When devices communicate they are usually configured to save power by first choosing an appropriate channel, connecting to each other, and then carrying out power control according to the quality of service (QoS) requirements of each device. However, after they have connected the power requirements of each device have usually dropped or at the very least change and so they are essentially not optimized for efficiency. Research published in the *International Journal of Ad Hoc and Ubiquitous Computing* shows how channel and power reallocations can be performed over several iterations until transmission power drops below a threshold to reduce overall power consumption.

Chih-Shun Hsu of the Department of Information Management at Shih Hsin University, in Taipei, Taiwan, discusses the trade-off among [transmission power](#), throughput, and computation costs based on extensive simulations. He suggests that his simulation results justify the energy efficiency of the proposed refining schemes. The scheme may well allow 5G systems to run more effectively as part of the infrastructure of the 5G network will be to utilize unlicensed bandwidth between devices rather than carrying all packets of information as would be normal across the

licensed [cellular network](#).

Three power refining protocols are proposed in the paper: refining scheme with [power control](#) (RPC), the refining scheme with channel reallocation (RCR), and the refining scheme hybrid channel reallocation and power control (RCRPC). "All the three refining schemes can greatly reduce the total transmission power and enhance the transmission power efficiency of the scheme with no refining phase," Hsu explains. He adds that of the three refining schemes, the RPC scheme can achieve the highest total throughput with the lowest computation time, the RCR scheme can achieve the lowest total transmission power with the highest computation time, and the RCRPC scheme can achieve a balanced result such that the total throughput of the RCRPC scheme is slightly lower than that of the RPC scheme and the total transmission power is slightly higher than that of the RCR scheme."

**More information:** Chih Shun Hsu. Refining channel and power allocation for green device-to-device communications, *International Journal of Ad Hoc and Ubiquitous Computing* (2020). [DOI: 10.1504/IJAHUC.2020.107502](#)

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