

Emerging Technology and Spectrum Policy Reform

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Abstract

Emerging technology, coupled with effective policy reform, could lead to tremendous gains in spectral efficiency. This would alleviate the spectrum scarcity that many nations have experienced. To be effective, reform in spectrum policy must fit the realistic capabilities of emerging technology, as well as applicable economic theory. This paper discusses three general approaches to reform. The first approach is increased reliance on market-based mechanisms, possibly leading to a spectrum property system. The second approach is the expanded use of commons, or blocks of spectrum that are available to all devices for sharing. It is argued that both approaches have significant merit that regulators should exploit. However, each of these approaches is ineffective when taken to its extreme, where one must make unfounded assumptions about technology. The third approach discussed in this paper is sharing between a primary spectrum user that is licensed, and one or more secondary users, where secondary users may not cause harmful interference to the primary spectrum user. Many people underestimate the potential importance of this third approach in today's debates over spectrum policy reform. Emerging technology such as cognitive radio, location technology, and secure micropayment schemes will make a variety of primary-secondary sharing schemes ranging from real-time secondary markets to unlicensed opportunistic access more practical. Each of these schemes could be highly beneficial for a different set of applications and circumstances.

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