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Dynamic Spectrum Access: Implications of the diffusion of spectrum sharing technology

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ABSTRACT

Like most common natural resources, spectrum is finite and prone to overuse and “crowding”. Most of today’s radio systems are not aware of the spectrum environment and operate in a pre-given, static frequency band. Technologies such as cognitive radio (CR) that enable dynamic spectrum access (DSA) have been proposed to improve efficiency and flexibility in the utilization of spectrum. Such technologies offer the promise of economic benefits for consumers, manufacturers and the telecommunications industry; while minimizing the burden of spectrum management for regulators. However, while it is acknowledged that more efficient use of spectrum is required and the necessary technology approaches maturity, there remains a considerable degree of uncertainty concerning the market potential of DSA. In order to overcome this uncertainty in this paper we provide an introductory overview of DSA related technologies, the promising business scenarios, industry impacts, visions and opinions for the way forward and the associated challenges.