Preface

Dear Reader,

The book at hand was authored by a large team of highly dedicated people and represents a consolidated summary of results of nearly 4 years of their work. Its aim is to investigate the highly complex policy and regulatory aspects that govern the ecosystem of wireless services and innovation. It seeks to identify policy changes that can be instantiated to become effective enablers for the development and proliferation of advanced wireless communications systems, particularly those based on Cognitive Radio (CR) technologies. A distinguishing feature of this book is its consideration of the prospects of CR from two diverging standpoints: technological development and economic market reality. This book therefore provides a broad survey of various techno-economic and policy aspects of CR development, and offers the reader an understanding of the intricate complexities involved in such aspects, as well as providing a toolbox of possible solutions to enable the evolutionary leap towards successful implementation of CR technology.

This book might thus be seen as a quite unique survey giving a holistic techno-economic treatise on the subject of CR policy and regulation. This is particularly significant given the importance of the current radio spectrum governing framework and its adaptations needed to pave the way for CR and Dynamic Spectrum Access (DSA) applications to develop and flourish in real-world deployment environments. It should also be understood that the motivation and basis for any regulatory advancements would in turn rely on the ability to prove the soundness and economic benefits of proposed CR development scenarios.

It is sincerely hoped that this book will become a source of subject reference material and new ideas of value to academic researchers in the field of wireless communications, especially those working on CR and DSA and their interaction with regulatory and policy issues. Moreover, this book should be equally useful for the industry and regulatory professionals concerned with radio spectrum management and the general development of wireless communications. This is particularly the case noting the breadth of considered regulatory and strategic issues covered in the book. Together, these provide a solid basis upon which academic or professional work can flourish.

The intention is that this book will also become a helpful reading reference for advanced postgraduate studies on burgeoning subjects of wireless technologies.

This book will provide learned knowledge and inspiration to study novel wireless technologies such as CR and their promotion at the intersection among policy, communications technology and economic interests. Possible study topics and directions that directly relate to the subjects covered in this book include:

- Cognitive Radio and Software-defined Radio (SDR);
- Dynamic Spectrum Access and "White Space" Technologies;
- Radio Spectrum Management;
- Advanced Wireless Communications;
- Telecommunications Policy and Strategy;
- Telecommunications Business.

The overall structure of this book is organised so as to carefully lead the reader through the key constituent elements in consideration of CR policy and regulation. First, the introduction together with Chap. 1 gives an insight into the role and modern structures of wireless policy and radio spectrum management. This includes discussion of the state-of-the-art approaches to standardisation and regulation of emerging CR and DSA technologies and applications.

Chapter 2 presents an overview and analysis of CR deployment scenarios, thus setting the foundation and common terminology for further analysis.

Chapters 3 and 4 cover, respectively, technical and business considerations around the process of bringing CR to reality. This analysis is capped by the impact assessment of policy developments discussed in Chap. 5.

Chapter 6 presents the reader with a set of example case studies that describe several practical scenarios for applying and developing CR technologies in different contexts: TV White Spaces, ISM Bands and in challenging applications to medical environments.

Finally, Chap. 7 wraps up the preceding analysis by offering some forward-looking insights as well as several examples of quite concrete and specific proposals that may be conducive for the realisation of CR and DSA technologies.

On this occasion we would like to thank our colleagues, chapter editors and each and every author who has contributed their time and work towards the drafting of this book.

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http://www.springer.com/978-3-319-04021-9

Cognitive Radio Policy and Regulation
Techno-Economic Studies to Facilitate Dynamic Spectrum Access
Medeisis, A.; Holland, O. (Eds.)
2014, XIV, 387 p. 168 illus., 63 illus. in color. With online files/update., Hardcover
ISBN: 978-3-319-04021-9