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To: 中华人民共和国国务院法制办公室 State Council Legislative Affairs Office, People's Republic of China

COPY: 中华人民共和国工业和信息化部 Ministry of Industry and Information Technology, People's Republic of China

From: Dynamic Spectrum Alliance

Date: June 6, 2014

Re: Comments regarding the "Radio Regulations of the People's Republic of China (draft revision)"

About the Dynamic Spectrum Alliance

The Dynamic Spectrum Alliance is a global, cross-industry alliance focused on increasing dynamic access to unused radio frequencies. The membership spans multinational companies, small-and-medium-sized enterprises, academic, research, and other organizations from around the world, all working to create innovative solutions that will increase the utilization of available spectrum to the benefit of consumers and businesses alike.[1]

Introduction

Today, spectrum, more than ever, is identified by policy makers as a key asset to support growth of the digital economy and, more broadly, the economy overall. The remarkable growth in the use of smartphones and other wireless devices in recent years has exponentially increased demands on radio spectrum.[2] Policy-makers in many countries are now actively looking to both ***maximise spectrum resources*** made available for wireless communication services and to ***increase the efficiencies*** made in their use.

Furthermore, virtually all sectors of the economy, from education and health care through to small and medium sized enterprise (SME) productivity and consumer activity, benefit from the

[1] A full list of members is available at www.dynamicspectrumalliance.org/members.html.

[2] The Cisco Visual Networking Index predicts that mobile IP traffic globally will increase eleven-fold over the next five years, and traffic from wireless devices will constitute the majority of all IP traffic by 2016. *See* Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update: Forecast and Methodology, 2013–2018, http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.html; Cisco Visual Networking Index: Forecast and Methodology, 2012–2017 at 1-2 (May 29, 2013), *available at* http://www.cisco.com/c/en/us/solutions/collateral/service-provider/ip-ngn-ip-next-generation-network/white_paper_c11-481360.pdf.

increased availability of widely available, affordable and efficient wireless broadband services. Increasingly such use is being accessed via **unlicensed spectrum** through a variety of existing applications, such as Wi-Fi networks, short range devices, and so forth. License-exempt, or unlicensed, spectrum is itself a market allocation mechanism, with no entry price attached but instead conditions of shared use set by administrations. Applications such as Wi-Fi have shown the success of this approach, success – and benefits – that would not have been achieved if traditional approaches to the allocation of such spectrum had been followed.

It is within this context that the Chinese State Radio Regulatory Commission (SRRC) is to be congratulated for releasing the Draft Amendments to the Radio Regulations of the PRC to public input; the first comprehensive update to the wireless regulatory framework since its initial promulgation in 1993. This update is indeed timely, and the Dynamic Spectrum Alliance (DSA) welcomes both the approach and draft for the sensible, structured and consistent approach that has been adopted.

As the Draft states, the intent of the new regulations is to enhance radio management, ensure the normal development of the radio business, efficiently use radio frequency and satellite resources, and protect economic and social development and national defence, clearly a much broader mandate than the original set of regulations and one that sensibly recognizes the central position and widely felt impact of spectrum usage in any modern economy.

Overall, the draft provides greater clarity across a range of the critical clauses under the radio spectrum regulation. There are at least five major areas in which this draft either adds new articles or comprehensively revises existing legislation: i) the roles of the relevant stakeholders including the provincial radio regulators, ii) the process criteria through which the State Radio Regulator will use to allocate radio frequency and satellite orbit resources, iii) clauses on the use of satellite resources, iv) process for obtaining approval certificates for radio-transmitting equipment (for both locally produced and imported), and v) penalty clauses.

While we find this to be a consistent and overarching address of the issues, we suggest that for setting a framework for future growth, there are some key areas that are either missing or under-recognized and would benefit from incorporation. To this end, we have provided some general key comments and then a few specific suggestions in relation to particular articles.

General Comments

New approaches to spectrum management largely fall under two broad categories of initiatives: those targeted at ***making more spectrum resources available*** for wireless communication services, primarily mobile broadband; and those aimed at ***maximising spectrum efficiency***.

1. Increasing spectrum resources

Enabling access to both licensed and unlicensed spectrum is key to meeting increasing spectrum demands. Exclusive access to licensed spectrum provides the certainty operators need to make large investments in their wide-area networks, while broad eligibility for access to unlicensed spectrum fosters rapid and widespread contributions to innovation and investment in emerging wireless connectivity technologies. For instance, because unlicensed devices are "free from the burden of normal delays associated with the licensing process," manufacturers can design equipment to "fill a unique need [that can] be introduced into the market quickly."[3] Thousands of new unlicensed devices are certified each year. Wi-Fi devices are the best known, but Bluetooth,[4] Zigbee,[5] and RFID[6] devices have all also experienced rapid growth in the last several years. Given the exponential rise in wireless usage, that will only continue and increase as machine-to-machine (M2M) and smart city communications emerge, enhanced mechanisms of both licensed and unlicensed spectrum allocation may become the norm in the near future, and forward-proofing any current regulatory framework to include such possibilities is therefore a necessity.

Unlicensed use also complements licensed use. For example, "the availability of Wi-Fi networks in many locations . . . enable[s] users to take much of their data off of a licensed network," benefiting users by enabling faster service and reducing congestion for licensed operators.[7] For smartphones and tablets in particular, Cisco has found that "daily data consumption over Wi-Fi is four times that of cellular."[8] This ability to offload data from cellular networks to Wi-Fi is saving mobile network operators billions of dollars in annual network deployment costs.[9] The

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[3] Kenneth R. Carter, Ahmed Lahjouji, & Neal McNeil, United States Federal Communications Commission, *Unlicensed and Unshackled: A Joint OSP-OET White Paper on Unlicensed Devices and Their Regulatory Issues*, OSP Working Paper Series at 5 (May 2003).

[4] Bluetooth is a standard facilitating hands-free operation of music players, mobile phones, and other devices.

[5] Zigbee powers technologies that benefit from ad hoc and mesh networking solutions, such as home automation.

[6] Radio Frequency Identification (RFID) technologies are used in a variety of industries to track inventory or other objects.

[7] Federal Communication Commission, *The National Broadband Plan* 95 (2010), *available at* www.broadband.gov.

[8] *Id.* at 20.

[9] Mark Cooper, Efficiency Gains and Consumer Benefits of Unlicensed Access to the Public Airwaves, at iii, 15-18 (Jan. 2012) (finding that offloading lowers operator costs by approximately $26 billion per year); European Commission, *Study on the Importance of Wi-Fi & the Socioeconomic Benefits of Using Small Cell Infrastructures*, Aug. 1, 2013, *available at* http://ec.europa.eu/digital-agenda/en/news/study-importance-wi-fi-socioeconomic-benefits-using-small-cell-infrastructures, at 5 (finding that offloading reduced the network costs of European network operators by 35 billion euros in 2012, with savings expect to rise to as much as 200 billion euros in 2016).

Wi-Fi experience also makes clear that greater availability of unlicensed spectrum increases both demand for and the utility of licensed spectrum. Wi-Fi availability has enabled consumers to use their phones and tablets more intensively to access online content and services. Use and development of these online services in turn drives demand for licensed and unlicensed network access, creating a virtuous cycle of investment in content, services, and applications.

2. Maximising spectrum efficiency.

Broadly, three types of efficiency can be considered:

- Dynamic – enables use of innovative services
- Allocative – assigns spectrum to the stakeholders that value it most
- Productive – reduces production costs of radio-communication services

In practice, the decision making process needs to take into account all three types and, in some cases, reach trade-offs between them.

Spectrum sharing or dynamic allocation aims at maximising spectrum efficiency by allowing a third-party to use underutilised spectrum resources that are either allocated but not assigned – as in the case of unassigned UHF frequencies – or are assigned to government or other stakeholders that do not fully exploit their spectrum capacity. The emergence of technologies such as cognitive radio and geo-location databases that make the most of a limited resource have enabled the implementation of new spectrum licensing frameworks.

Spectrum sharing can make additional spectrum for wireless services available relatively quickly. The process of reallocating frequencies, clearing incumbents, and auctioning exclusive licenses can be lengthy and complicated. Spectrum sharing minimizes delays by leaving existing allocations or assignments in place. Further, spectrum sharing can be utilized in times of transition between clearing and auctioning—for example, databases can enable temporary access to available spectrum before reallocated frequencies are assigned and new licensed services become operational.[10]

Spectrum sharing is also proven. Networks relying on shared spectrum have been deployed successfully in, for example, the United States[11] and South Africa.[12] Other proof-of-concept

[10] *See* Michael Calabrese, *Use it or Share it: Unlocking the Vast Wasteland of Fallow Spectrum* (2011), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1992421; *see also* Incentive Auction NPRM at ¶ 405.

[11] Amar Toor, *North Carolina launches FCC-approved TV White Space network in Wilmington*, Engadget, Jan. 30, 2012, http://www.engadget.com/2012/01/30/north-carolina-launches-fcc-approved-tv-white-space-network-in-w/

[12] Google's Cape Town trial delivered broadband over vacant broadcast spectrum with a minimum data rate of 2.5 Mbps and peak data rates of 10 Mbps to 10 secondary schools at distances between 3-6 kilometers of a base station, without causing harmful interference to incumbent services.

projects and commercial deployments are occurring in locations as diverse as the United Kingdom, Singapore, Japan, Korea, the Philippines, Kenya, Tanzania, and Malawi. Importantly, these trials have achieved excellent performance without causing harmful interference to incumbent licensees.

Regulators such as UK Ofcom, Industry Canada, and Singapore IDA, as well as the European Commission's Radio Spectrum Policy Group, have recognized the economic and social value that can be derived from increased dynamic access to finite spectrum resources. Through trials and pilots, many other regulators around the world are looking at whether and how to enable opportunistic access to unused frequencies.

At the World Telecommunications Development Conference, the Member States of the International Telecommunications Union – Development Sector adopted a modified resolution (Resolution 9) which resolves to consider new spectrum-sharing approaches and "compile case studies and collect best practices regarding national uses of shared spectrum access, including DSA, and study the economic and social benefits arising from the effective sharing of spectrum resources."

Spectrum inventories offer opportunities for identifying spectrum supply, assessing its demand and consulting with stakeholders on the different proposals. This, together with technical studies, can assist in identifying candidate bands for sharing; it also enhances the mechanisms for assessing the feasibility of deployment scenarios for new entrants by highlighting underutilisation of spectrum and enabling shared. Spectrum inventories can therefore be used by policy makers in publishing rules for spectrum use.

Policy makers also need to be able to tackle existing challenges of effective authorisation procedures limiting third party access to underutilised spectrum, such as around improved mitigation techniques for harmful interference and limited disruption of existing services.

Spectrum harmonisation, regionally and globally, is a desirable long-term goal as it has the potential to enhance economies of scale, as well as providing new and innovative market entrants with clarity for making new investments. Dynamic spectrum sharing need not wait for global harmonization, but global regional harmonization does enhance economies of scale, reducing the cost of devices for consumers. This is true for both network deployment and device manufacturing. The general objective needs to be set against other spectrum management goals such as band harmonisation at the regional level, the promotion of spectrum trading and flexibility for all players to adopt innovative technological solutions and the protection of critical

government services. It also needs to take into account other constraints such as international frequency co-ordination, interference mitigation and the current uses made of spectrum.

For a country such as China, the economies of scale made possible by spectrum harmonisation are a particularly consideration as new and sizeable players increasingly make their way into global markets both as vendors and service providers. In addition to the manufacturing of wireless devices, spectrum harmonisation facilitates roaming services and the mitigation of harmful cross-border interference. This plays a pivotal role in enabling the use of additional spectrum resources for communication services and in promoting spectrum efficiency in current or future spectrum bands used for those services.

Some suggested specific revisions to the current Draft to support the above issues are as follows:

Chapter 1: General Provisions

Article 6

While we support the coordinated management of the market, we suggest that Article 6 may confuse those using unlicensed spectrum or providing services not requiring a license, and suggest clarifying the language to include class-based or general approval when provided by the framework.

Chapter 2: Radio Regulatory Bodies and Their Duties

Articles 10 and 11

Clearly separating authority and responsibility for the various radio regulatory bodies is very sensible. Introducing a 'coordination mechanism' for alignment between such authorities is also sensible and clearly required to avoid overlapping mandates. However we believe further clarity is needed with the proposed coordination mechanism.

We suggest that transparently identifying how such a mechanism will work will be beneficial for overall market development and market coordination. And further suggest that this is equally true for coordination between the central government and the provincial administrations as between the various authorizing bodies.

Chapter 3: Management of Radio Frequency and Satellite Orbit Resources

Article 15

We suggest that Article 15 needs to more generically recognize unlicensed use of spectrum, and remove the specific exemptions, e.g., amateur radio stations and walkie-talkies. To this end, we suggest the use of language such as:

"*To use a radio frequency, a license shall be obtained for such use where required, with an exception of amateur radio stations. Radio frequency which is available for use but for which no license is required shall be recognized as unlicensed radio frequency.*"

Article 18

We welcome the approach to use tenders and auctions for future allocation and licensing of radio frequencies. However, greater clarity on the stakeholder engagement processes will be required to ensure transparency and fair processes.

Article 18 should also clarify that future non-auctioned allocation will not include allocated unlicensed spectrum.

Chapter 4: Management of Radio Stations

Article 26

Exceptions to Article 26 should more broadly include unlicensed devices. It may be worth also extending out what some of these exceptions are likely to include such as Wi-Fi devices and TV White Spaces devices.

Articles 31 and 32

The language in Article 31 requires more clarity with respect to the requirements for building-out radio stations; for example, "ensure harmony with its surrounding buildings and facilities as proposed in the urban and rural development plan." We would suggest greater clarification of the language to help ensure compliance.

We would also suggest that project sponsors (i.e. companies) be given the ability to submit their own interference studies and analysis, rather than requiring that the provincial regulator must "lead relevant organizations" to do it. This increased flexibility could reduce costs and decrease approval timeframes for applicants.

Chapter 5: Management of Radio Transmitting Equipment

Articles 42 and 46

We note that Articles 41, 42, and 46 create some confusion with regard to importation of prototype devices for development purposes. The text in Article 42 could be clarified to ensure that there are no radio type approval requirements for devices used for engineering and development purposes.

"*Except the equipment specified in Article 46 herein, an application for type approval shall be filed with the State radio regulator when manufacturing or importing new-type radio transmitting equipment. Type approval will not be required for the importation of new types of*

radio equipment for the purposes of developing, engineering, export, disaster response and rescue or forward-looking radio technology research and experiments."

Article 43

Article 43 includes reference to "testing institution[s] accredited by the State". We suggest clarification that accredited testing institutions includes private testing facilities, including foreign-owned. Encouraging the growth of a private testing lab ecosystem will help to lower costs and streamline the Radio Type Approval process.

In addition, we would recommend language that allows for supplier declaration of conformity in certain situations – for example when equipment has a proven history of compliance with relevant regulatory requirements

Conclusion

This public consultation approach undertaken by the SRRC is to be commended. One overarching concern we have and have presented here is that the approach appears to be focused on generically 'static' allocation at a time when the world is rapidly moving towards 'dynamic' allocation. We believe the SRRC should embrace new spectrum sharing technologies and approaches by the explicit recognition of unlicensed spectrum allocation and usage, definition of forward-looking database requirements and the management of dynamic allocation of spectrum.

As the SRRC undertakes the redrafting of its spectrum regulatory framework it should consider those policies' long-term economic impact. Spectrum policies will remain with us for years to come, while technology and innovation are constantly changing. Over the course of the last several decades, there are abundant examples of the tremendous economic growth created through innovation and entrepreneurship when new unlicensed spectrum is made available. The best policies are those that invite and enhance such innovation, economic growth, and competition across wireless applications, devices, and services.

We look forward to working together on policies that power tomorrow's wireless economy.

Respectfully submitted,

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