

# **FRAMEWORK FOR THIRD GENERATION (3G) CELLULAR NETWORK DEPLOYMENT AND SERVICES OFFERING IN SINGAPORE**

## **RESPONSE FROM TELECOMMUNICATIONS INDUSTRY ASSOCIATION**

### **SPECTRUM MANAGEMENT IN A GLOBAL SOCIETY**

#### TIA Policy for the International Management of Spectrum

As the association that represents manufacturers and suppliers of wireless products and systems, the Telecommunications Industry Association (TIA) has a direct interest in spectrum management policies that govern the availability and use of radio spectrum, both in the United States and abroad. It is TIA's opinion that forward-looking management of radio spectrum is essential to the goal of making telecommunications services accessible to everyone, and to ensuring that the public derives maximum benefit from its use. In this paper, TIA presents its perspective on certain fundamental principles that contribute to the effective and responsible management of radio spectrum in a global society.

#### **The Need for Responsible Spectrum Management**

Radio spectrum is a unique, ubiquitous natural resource. Unlike many other natural resources, it can be repeatedly reused. However, in practice, it is a finite resource that can only accommodate a limited number of simultaneous users at one time. This limitation requires careful planning and management in order to maximize its value for public and private services.

This is particularly true because the demand for communications spectrum worldwide is rapidly increasing. Both the competition in newly liberalized markets around the world that is giving rise to new competitive service providers and the availability of new private low power radio devices that can be used on an unlicensed basis are increasing the demand for access to the same limited spectrum. While this increased demand is placing pressure on regulators to make difficult choices among competing would-be users, it is also stimulating technological advances in spectrum sharing techniques and creating economies of scale.

The goal of global, mobile, seamless, "anytime, anywhere" communications is evident in recent work on universal, next-generation terrestrial mobile communications systems and the deployment of global satellite systems. These global projects have exposed the need for global harmonized spectrum to maximize economies of scale, which in turn calls for an unprecedented level of international coordination on the use of spectrum worldwide. At the same time, regional municipalities are concerned about reserving radio spectrum for specific local needs to meet public safety goals, while national governments want to retain ownership of certain parts of the spectrum to meet national security and critical infrastructure objectives.

Thus, administrations seeking to implement policies to meet present and future demands for radio spectrum face a complex task. Rapid changes in technology, liberalization of markets, globalization, and the public welfare are all dynamic forces that present a significant challenge to regulators. However, it is a challenge that can be met through strategic planning and recognition of the following fundamental principles that lead to optimal spectrum usage:

- Market-driven allocation and assignment
- Competitive service promotion
- Administrative certainty
- Non-discriminatory procedures
- Regulatory flexibility and technological neutrality
- International outreach and coordination

### **Reliance on Market Forces – The Role of Regulators**

Around the world, government regulators have exercised varying degrees of oversight and control in the management of the radio spectrum. In some countries this has led to a wireless infrastructure that is highly regulated, sometimes more than its wireline counterpart. It is TIA's position—and indeed current market developments demonstrate—that increased reliance on market forces, rather than government oversight, results in the most economically efficient use of spectrum, in the development of the most innovative technologies, and in the universal deployment of wireless services.

#### **Competitive Service Promotion**

In general, the public will pay for the services it values the most. Unfortunately, it is difficult for any government regulator to predict with great reliability what specific services the public will demand in the future. It is also a challenge for a regulator to keep pace with the rapid technological change, or to foresee what services will be available within particular frequency bands even a few years from now. Modifying outdated regulatory decisions becomes a costly and protracted process that ultimately discourages investment and inhibits innovation, as there is little incentive for being first to market or coming up with novel uses of spectrum.

In a competitive market, companies will develop and produce those technologies and services that are most desired by consumers. And they will offer these services at competitive prices. If spectrum can be used for those services that are most in demand, then companies will have a greater profit motive for entering the wireless market. In this way, market forces will encourage an efficient, innovative, and flexible use of the spectrum and will serve as the best arbiter among competing technologies and the services that they provide. Administrations, therefore, should both permit and promote the growth of competitive market forces in the management of spectrum.

At the same time, a management framework that relies on market forces does not preclude government administrations from playing a significant role within that framework. There are, in fact, specific, essential tasks that the regulator should undertake. These include determining how best to apportion spectrum among mutually exclusive services and among licensed and unlicensed services; maintaining services for the public welfare; ensuring a level playing field among competitors; protecting networks from interference; and protecting the public's health from any potentially harmful effects of radio transmission. However, other decisions regarding spectrum, such as types of specific services offered, technologies used, consumer pricing, and network performance, are best left to the marketplace as business drivers.

### **Spectrum Allocation – Flexibility and Neutrality**

Traditionally, governments have allocated available frequency bands for specific uses before granting licenses to use the frequencies. Regulators should establish the initial geographic scope and bandwidth of licenses, taking into account the various characteristics of different frequencies, electromagnetic compatibility, public safety, and, in general, the different spectrum needs of broad categories of service. This flexible approach allows for technological developments that might make the most effective and efficient use of the bandwidth provided for certain services, as well as permits the introduction of new services.

A flexible approach also means that governments forbear from mandating what particular technology or which equipment an authorized network operator shall deploy. Technical flexibility gives spectrum users the ability and incentive to develop and install innovative, spectrum-efficient, low-cost technologies that respond to the needs of consumers. This gives service providers the ability to compete on the basis of what they believe to be the best technology at the best value for the consumer.

At the same time, too much flexibility can be problematic. Allocating spectrum without an understanding of marketplace and technical demands can lead to fractured markets, increased equipment costs, delayed research and product development, and increased time-to-market, as well as increased potential for interference among users. In some cases it could undermine public interest goals. Moreover, many new terrestrial and satellite services are global in coverage and therefore require harmonized spectrum worldwide.

This potential conflict must be addressed by the market players and not by the regulators. Specifically, in order to combine the positive effects of harmonization for the consumer with the creative power and benefits of innovation, market players should work within standardization organizations and try to agree on one or several harmonized standards for a specific market, not region. Market forces will lead the market players to adopt the optimal set of standards voluntarily. On the other hand, the mandating of a particular technical standard may discourage or even prevent future innovation that would benefit the public.

Ultimately, spectrum allocation decisions must reflect a government and private sector consensus as to what services are technologically possible, commercially viable, spectrally efficient and likely to benefit the public.

### **Spectrum Assignment – Economically Efficient Spectrum Use**

A regulator faces several considerations when assigning spectrum. Two of the most important are assigning licenses quickly and with minimal administrative costs. In addition, the regulator must ensure that the entity that obtains the license will make the best use of this public resource.

Although spectrum auctions may be an effective license assignment tool for certain services, this tool should be applied with the proper rationale. That is, there should first be a determination as to whether a need exists for the spectrum and whether the assignment of this spectrum generates mutually exclusive applications.

Spectrum auctions should not be a substitute for sound spectrum assignment decisions or used solely as a means of revenue generation. The cost of auctions and associated relocations place a tremendous financial burden on operators, which trickles down to end users. Allowing the highest bidder to determine the use of the spectrum causes inconsistency and uncertainty, which in turn raises equipment cost to the users, negates economies of scale, retards manufacturer investment, increases the potential for interference and threatens the investment of existing operators. Such results are not compatible with sound spectrum management. Moreover, implementation of spectrum auctions can inadvertently discourage allocations for very beneficial spectrum users, which do not generate auction revenues, for example, public safety systems.

In the case of global satellite services, and other services that need to be provided on a transnational basis, auctions could seriously inhibit market and technology developments. Satellite service area footprints are not confined to national borders and, accordingly, satellite service operators are compelled to obtain licenses from multiple governments to operate a system. Therefore, any government that uses auctions to assign spectrum for a global satellite service can distort the value and price of its national licenses and/or kick off a round of sequential auctions by other governments. This creates an uncertain environment that may deter entry and impede the provision of the satellite service and the development of new offerings.

### **Regulatory Flexibility**

Because spectrum is a limited resource, regulators should consider re-farming spectrum that is currently under-utilized, recognizing the inherent cost associated with relocating existing users to other frequency bands, if necessary. A substantial amount of spectrum has been allocated in many countries to government use, often for technologies and services that can be provided more cost-effectively using newer, more spectrally efficient systems. Thus TIA encourages regulators to continue to transition unused or under-utilized spectrum allocations from government to commercial use.

Regarding spectrum that has been allocated and is currently in commercial use, re-farming should be minimized because it increases wireless service providers' business risks and, consequentially, increases their cost of capital while deterring investment in the wireless services industry. To mitigate the need for ongoing re-farming and substitution, there should be maximum flexibility in spectrum allocations and licensing to allow licensed operators to transition both the technologies they use and the services they provide in response to market demand. Additionally, licenses should allow for partitioning, disaggregation, and resale of licenses to other users and applications. Flexibility, long-term licensing regimes, and a more certain regulatory environment will provide operators with easier access to capital markets when necessary, and support the ongoing deployment of advanced radio services around the world.

### **Non-Discriminatory Procedures**

Open, transparent, objective and non-discriminatory procedures are a requirement of the World Trade Organization (WTO) telecommunications agreements and related national commitments. Open and transparent procedures offer service providers and manufacturers a clearer understanding of the relevant rules and regulations. Such procedures should allow for comments from all interested parties to the regulatory process. Objective procedures are equitable, reasonable and should be no more burdensome than necessary to assure quality of service. By adhering to non-discriminatory procedures, regulators will not only improve economic efficiency and pave the way for receipt of new technology, but also will be in a better position to ask their trading partners to follow comparable procedures.

### **International Outreach and Coordination**

On a regional and international basis, regulators should coordinate issues related to spectrum usage with the goal of stimulating innovation, producing economies of scale for equipment manufacturers, reducing time to market for products, and meeting user needs, such as regional and global roaming. To the extent possible, domestic policies should support global systems and seamless international networks, both in terrestrial and satellite systems, without precluding other uses and technologies. Where the value of some frequency band is likely to be for a particular worldwide service, administrations should optimize the use of the relevant band for that service without foreclosing other uses of that spectrum, preventing the market from reconfiguring the spectrum, or limiting the ability of service providers to use the standards and technologies they want to satisfy their customers needs.

The International Telecommunication Union (ITU) plays a critical role in spectrum coordination and globalization, as well as standards development. Unquestionably, the introduction of new global services into shared spectrum requires careful and measured technical study, as well as an understanding by administrations of the necessary regulatory regimes. Administrations are encouraged to actively participate in the ITU Study Groups and World Radio Conferences (WRCs) and to reach out to other administrations toward developing a common view. Consultations should be extended to other international and regional forums to build consensus on relevant issues affecting the telecom industry

## **Conclusion**

Just as worldwide telephony standards have enabled telecommunications systems to cross borders and become globally accessible, harmonized spectrum coordination around the world can enable more effective, economical and competitive wireless communications. This gives consumers a global communications mobility as well as global access. Given the unprecedented growth in mobile and personal communications and the convergence of telecommunications and information technologies, regulators are faced with the difficult challenge of ensuring good spectrum planning and management.

Sound spectrum policies form the basis upon which companies make decisions regarding investments in capital, technology and manufacturing, and, in turn, help drive the demand for products and services. Such policies should be based on: 1) reliance on market forces, rather than government mandate; 2) streamlined spectrum assignment mechanisms that promote the efficient use of the spectrum and the introduction of new technologies to the marketplace; and 3) active participation in the ITU and other international and regional forums with the view toward building a global consensus on important telecom issues.