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Spectrum Refarming Challenges for LTE in the Americas

Many countries in the Americas are interested in the refarming, reallocating and harmonizing 700MHz and 2.6GHz spectrum for mobile services. However regulatory bodies are facing many challenges in freeing up this spectrum and making the transition from broadcasting (analog) to mobile (digital) use. TV stations are gradually abandoning the spectrum, but not at a fast enough rate to supply the rapidly increasing demand for mobile services. Regulators are therefore having to work out incentive schemes that will persuade broadcasters to give up the spectrum they have. In the US, the Federal Communications Commission (FCC) seeks to take back 120MHz of spectrum from broadcasters in the next 5 years and reallocate it to wireless broadband. One of the major goals of the FCC's National Broadband Plan is to free up to 300MHz within 5 years and 500MHz of spectrum within 10 years. It makes sense to take back the spectrum that is unused by broadcasters and allocate it to mobile carriers that can make better use of it. The problem today is that so much spectrum is allocated to analog TV that it will be a challenge to get it enough of it back.

The FCC is looking into other sources of spectrum for mobile broadband, as well. In March 2008, the FCC allocated the 700MHz spectrum for LTE. Major winners included AT&T and Verizon Wireless. However, demand for spectrum continues to grow, and one chunk of spectrum didn't sell, the so called: "D block" (10MHz). When the D block, went up for auction, nobody even met the reserve price, so today the D block remains available. In addition, the D block was plan for a nationwide public safety network, however an allocation of this block to the private sector is now under consideration. The FCC has yet to allocate this spectrum. An auction had been promised for the first half of 2011, but it has yet to occur.

In Mexico, the Telecommunications Federal Commission (COFETEL) has already announced its intention to auction the 700MHz for digital dividend in 2012. Mexico could become the first country in Latin America to make this spectrum available for mobile services. The government has yet to decide whether to make available 60MHz or 90MHz in this frequency band. In previous consultations, Mexican mobile operators (Telcel, Telefonica, Iusacell and Nextel) have shown interest in the 1.7/2.1GHz and 700MHz frequency bands for mobile services, but not really for the 2.6GHz band. In our opinion, Mexican mobile operators should follow in the steps of mobile operators in the United States (AT&T, Verizon, T-Mobile), which are launching 4G services in the 1.7/2.1GHz and 700MHz frequency bands.

The propagation characteristics of 2.6GHz make it an attractive band for mobile broadband in most countries around the globe, but Mexico restricts services to fixed/nomadic, and mobility is not allowed. As a result, the major owners of these bands, MVS Mexico and Ultravision, cannot fully benefit from deploying true 4G networks, either mobile WiMAX such as Clearwire's (USA), or LTE. At present, the government has not decided whether or when there

might be a spectrum refarming of the 2.6GHz to allow mobile broadband services. This band will be reallocated in Mexico eventually under a new regulation that allows mobile broadband services under a technology-neutral scheme in which mobile WIMAX or LTE can be deployed. Sadly, the lack of resolution from the government is stopping international investments from Intel, Clearwire and Alestra, which are interested in a major mobile WiMAX project in Mexico in partnership with MVS Mexico. Read related story [here](#).

Countries in Latin America are following developments in Mexico closely as they consider their own course of action. Uruguay and Colombia, for example, have taken one step ahead on this, both countries having decreed that 700MHz will be used for mobile broadband services, with auctions expected in 2012 and 2013 respectively. Erasmo Rojas, Director for Latin America and the Caribbean at 4GAmericas, said at the 4GAmericas Analyst Forum 2011, *“One major issue is that in Latin America the 700MHz spectrum used in TV analog channels is having very low usage in rural areas where it is most needed for internet access, and sometimes regulators want to have all the spectrum cleared throughout the entire country before they auction it. However, we think that the real imminent need is to release 700MHz in rural areas, so we mention to the regulators: Why don’t you release initially spectrum in rural areas where no interference is present, while you wait for the switchover from analog to digital in urban areas? Although not many regulators agree, some of them are considering it as an alternative.”*

In Brazil, 2.5GHz has for years been used by MMDS service providers but will be released in 2013 for mobile broadband. At that time, 140MHz will be allocated for mobile services, while 50MHz will remain in the hands of broadcasters. In general, MMDS operators in Latin America have a lot of spectrum and not many customers, while mobile operators have a lot of customers and not much spectrum, and regulators are starting to realize how to work out arrangements to get the best use of spectrum for society.

The table below provides a summary of current spectrum usage in Latin America and the Caribbean:

450 MHz	Multiple uses: Rural, fixed, mobile telephony, public and private safety, point-to-point and point-to-multipoint distribution services
700 MHz	<ul style="list-style-type: none"> Broadcasting services – TV Planned for TV broadcasting, fixed and mobile services
850/900/1800/1900/2100 MHz	Mobile services
1700/2100 MHz	In service in Mexico (August 2011) and auctioned in Chile in 2009
2500/2690 MHz	<ul style="list-style-type: none"> TV and MMDS services Assigned to mobile services since 2010
3400/3600 MHz	<ul style="list-style-type: none"> Fixed services Point-to-point and point-to-multipoint distribution services

Source: 4GAmericas Analyst Forum 2011, Latin America and Caribbean Overview.



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Another major issue is the channelization of both 2.6GHz and 700MHz. In the US, the 2.6GHz spectrum is currently dominated by one entity (Sprint Nextel and its owned affiliate Clearwire), which controls as much as 120-150MHz of this spectrum in some markets. Therefore, the extent to which the majority of this band is used to deliver broadband wireless services is subject to the financial strengths and business success of only one operator. The 2.6GHz spectrum in the US is arranged on a contiguous rather than interleaved basis, organized around eight 16.5 MHz channel blocks paired with 6 MHz channels. Both FDD and TDD channelization plans are permitted within the band.

In Canada and Brazil, the 2.6GHz band is aligned with ITU option 1. Brazil currently allocates the 2.6 GHz spectrum for primary use by MMDS (Multimedia Distribution Services). The Brazilian regulator ANATEL is now considering how to accomplish the transition of the 2.6 GHz band towards the goal of allocating more bandwidth for mobile broadband. Still, controversy exists surrounding how the 190 MHz available in the 2.6 GHz band plan should be divided between paired and unpaired spectrum suited to FDD and TDD modes of operation respectively across several countries.

In most countries, demand for wireless broadband access is intensifying, but the lack of sufficient spectrum or reallocation has delayed the commercial network deployment plans of many players. Some of the major spectrum issues are related to the strong emphasis of regulators on encouraging competition and new entrants, rather than looking at the needs of the society in general. For example, in Brazil, MMDS operators have long been restricted in deploying mobile WiMAX networks in order to avoid competition with 3G players who had heavily invested in their 3G licenses. The regulator has finally now acknowledged the need for spectrum for mobile broadband and is moving ahead to supply it.

Today the focus of regulators should be not only to have a healthy balance of competition, but also on making sure that current players can address all the needs of the market. Regulators in developing markets in Latin America should look at what the regulators in developed countries are doing to foster a more healthy telecommunications environment. I would mention 3 major steps that all regulators should follow: 1) Start refarming analog to digital spectrum as soon as possible to address today's rapidly increasing demand for mobile broadband, 2) Take back unused spectrum from carriers that are not fully utilizing it and reallocate it wisely, and 3) Do not allocate too much spectrum or an entire band in the hands of only one player. The current situation in the United States, where much of the 2.6GHz band is controlled by a single company, is one that other countries should take pains to avoid.