

The race for mobile broadband is on! Find out about mobile spectrum pricing trends and new auctions with this new and exciting report.



International Review of Mobile Spectrum Prices and Licensing

After two blockbuster spectrum auctions in 2008 the world economy sank into a financial crisis. However, as previous recessions have proven, the mobile industry does not slow down like other sectors... Spectrum is a key input to the growth in mobile competition and is the enabler of development of mobile broadband services worldwide. The increasing economic importance of mobile is reflected in continued focus on licensing activities in many countries.

Lemay-Yates Associates Inc. (LYA) has conducted extensive research for this report to bring together information on licensing activities and spectrum prices worldwide. Some interesting trends have emerged. There have been impacts of the economic downturn and some countries have delayed licensing processes (not always due to the financial crisis). Many awards – e.g. in the 2.6 GHz and “digital dividend” spectrum – had been anticipated for 2008-2009 but will now take place in 2010. That said, however, there is little evidence of declining prices in the spectrum awards that have taken place and there is no overall slow down in licensing processes for new spectrum.

The 2.6 GHz and digital dividend spectrum represent the “rising tide” of new mobile spectrum that operators increasingly value for new fourth generation mobile broadband services – allowing for creation of portfolios of spectrum licenses, below and above 1 GHz. New licensing and license renewal processes often recognize the need for competing carriers to have equitable access to networks and to different types of spectrum, in some cases by re-farming 900 MHz spectrum. Licensing is a critically important activity for governments, given that mobile and related investments in innovative devices and applications may well be key stimulators of economic growth.

LYA’s report includes 15 years of spectrum pricing information from 82 licensing processes held in 45 countries since 1995. It also provides insight into spectrum licensing processes underway in 54 countries... of which almost half resulted in the award of new licenses, in the 3G bands and 2.6 GHz and others. In some cases these provided for additional capacity for existing providers; some are focused on spectrum for new competitors. The license for a fourth mobile operator in France was issued late in 2009, a 3G auction will be held in India and in Mexico in 2010. Ten years after having set the high water mark for spectrum prices, there is a landmark auction teed up in Germany for 2010, with the UK no doubt to follow. In 2009 the FCC conducted a major review of spectrum to support mobile broadband development as part of the US recovery plan.

LYA’s 92-page report covers the “long view” of spectrum pricing, looking at different types of spectrum for mobile – below and above 1 GHz – and provides insight to the dynamics of recent auctions, the timeline and assessment of prices by spectrum type, by region of the world and relative to mobile penetration and GDP per capita, as well as pricing and licensing trends going forward. It is a must-read for spectrum regulators, governments, mobile carriers, investors, and equipment vendors – anyone with an interest in industry development worldwide.

LEMAY-YATES ASSOCIATES INC.

1200 de Maisonneuve Blvd. West, Suite 7F, Montreal, QC H3A 0A1 Canada – Tel/Fax : (1) 514-288-6555

E-mail: LYA@LYA.com www.LYA.com



International Review of Mobile Spectrum Prices and Licensing

Table of Contents

1.	INTRODUCTION AND KEY FINDINGS.....	1
1.1	FOCUS OF THE REPORT	2
1.2	SPECTRUM BANDS	3
1.3	KEY OBSERVATIONS.....	5
1.3.1	<i>Different types of spectrum have different values.....</i>	5
1.3.2	<i>Spectrum equity</i>	6
1.3.3	<i>Entry and competition</i>	7
1.3.4	<i>License renewals.....</i>	8
1.3.5	<i>Conclusion.....</i>	9
2.	MOBILE SPECTRUM PRICES IN 82 LICENSING PROCESSES IN 45 COUNTRIES.....	11
2.1	THE LONG VIEW... FROM US PCS IN 1995 TO THE 3G EURO-BUBBLE TO THE ECONOMIC CRISIS	11
2.2	END OF AN ERA OR START OF A NEW TREND?	15
2.2.1	<i>2G and 3G Mobile spectrum price trend.....</i>	15
2.2.2	<i>Rising tide – 2.6 GHz, 3.5 GHz and 700 MHz.....</i>	17
2.3	EVOLUTION OF SPECTRUM PRICING BY REGION	19
2.3.1	<i>Americas</i>	19
2.3.2	<i>Europe</i>	21
2.3.3	<i>Asia-Pacific</i>	22
2.3.4	<i>Middle East.....</i>	23
2.4	SPECTRUM PRICING TRENDS	24
2.4.1	<i>Spectrum pricing and mobile penetration</i>	25
2.4.2	<i>Spectrum pricing and GDP per capita</i>	27
3.	THE 2008 NORTH AMERICAN BLOCKBUSTER AUCTIONS.....	29
3.1	US 700 MHZ.....	29
3.2	CANADIAN 2 GHZ AUCTION	36
4.	SPECTRUM ACTIVITIES AND AWARDS IN 54 COUNTRIES DURING 2009.....	40
4.1	TIMELINE IN 2009 YEAR-TO-DATE.....	40
4.2	SPECTRUM LICENSING, CONSULTATIONS AND RELATED ACTIVITIES DURING 2009	45
4.2.1	<i>Americas.....</i>	45
4.2.1.1	<i>Argentina</i>	45
4.2.1.2	<i>Brazil.....</i>	45
4.2.1.3	<i>Canada</i>	46
4.2.1.4	<i>Chile.....</i>	47
4.2.1.5	<i>Colombia.....</i>	48
4.2.1.6	<i>Costa Rica.....</i>	48
4.2.1.7	<i>Jamaica.....</i>	49
4.2.1.8	<i>Mexico.....</i>	49
4.2.1.9	<i>Panama.....</i>	50



International Review of Mobile Spectrum Prices and Licensing

Table of Contents, continued

4.2.1.10	Peru	50
4.2.1.11	United States	51
4.2.1.12	Venezuela	52
4.2.1.13	Trinidad and Tobago	53
4.2.2	<i>Europe</i>	53
4.2.2.1	Austria	53
4.2.2.2	Belgium	54
4.2.2.3	Denmark	55
4.2.2.4	Finland	56
4.2.2.5	France	57
4.2.2.6	Germany	59
4.2.2.7	Greece	60
4.2.2.8	Hungary	61
4.2.2.9	Ireland	62
4.2.2.10	Italy	63
4.2.2.11	Netherlands	64
4.2.2.12	Norway	64
4.2.2.13	Poland	65
4.2.2.14	Portugal	66
4.2.2.15	Spain	67
4.2.2.16	Sweden	68
4.2.2.17	Switzerland	69
4.2.2.18	United Kingdom	70
4.2.3	<i>Asia-Pacific</i>	71
4.2.3.1	Australia	71
4.2.3.2	China	72
4.2.3.3	Hong Kong	73
4.2.3.4	India	73
4.2.3.5	Indonesia	75
4.2.3.6	Japan	75
4.2.3.7	Nauru and other Pacific Island states	76
4.2.3.8	New Zealand	77
4.2.3.9	Thailand	78
4.2.3.10	Vietnam	79
4.2.4	<i>Middle East and Africa</i>	79
4.2.4.1	Bahrain	79
4.2.4.2	Gabon	80
4.2.4.3	Iran	80
4.2.4.4	Iraq	81
4.2.4.5	Jordan	81
4.2.4.6	Lebanon	81
4.2.4.7	Libya	82
4.2.4.8	Nigeria	82
4.2.4.9	South Africa	83
4.2.4.10	Syria	84
4.2.4.11	Tunisia	84
4.2.4.12	Turkey	84
4.2.4.13	United Arab Emirates	85



International Review of Mobile Spectrum Prices and Licensing

Table of Contents, continued

5. APPENDIX – LIST OF 82 LICENSE AWARDS AND NOTE ON SOURCES86

List of Figures

Figure 1 – Mobile spectrum price trends from 1995 to 2009 - \$US per MHz-pop12

Figure 2 – 2G and 3G Mobile spectrum price trend – US\$ per MHz-pop – 2005 to 200915

Figure 3 – 2.6 and 3.5 GHz range spectrum price trend – US\$ per MHz-pop17

Figure 4 – 700 MHz range spectrum price trend in the US – US\$ per MHz-pop18

Figure 5 – Evolution of spectrum pricing in US and Canada – US\$ per MHz-pop19

Figure 6 – Evolution of spectrum pricing in Latin America – US\$ per MHz-pop20

Figure 7 – Evolution of spectrum pricing in Europe since 1999 – US\$ per MHz-pop21

Figure 8 – Evolution of spectrum pricing in Asia-Pacific – US\$ per MHz-pop22

Figure 9 – Evolution of spectrum pricing in Middle East – US\$ per MHz-pop23

Figure 10 – Mobile penetration vs. GDP per capita24

Figure 11 – Spectrum pricing and mobile penetration25

Figure 12 – Spectrum pricing and GDP per capita27

Figure 13 – US 700 MHz bid value distribution35

Figure 14 – Canadian 2 GHz bid value distribution38

List of Tables

Table 1 – US 700 MHz values by license block31

Table 2 – US 700 MHz values by major winning bidder32

Table 3 – US 700 MHz population coverage by bidder by license block33

Table 4 – US 700 MHz auction most expensive markets by license block34

Table 5 – Canadian 2 GHz values by license block and most expensive licenses38

Table 6 – Canadian market – overall post auction spectrum MHz holdings39

Table 7 – Spectrum awards and activities January-March 200941

Table 8 – Spectrum awards and activities April-June 200942

Table 9 – Spectrum awards and activities July 2009 to year end43

Table 10 – Summary number of countries reviewed, licensing, consultations44

Table 11 – License awards 1995 to 200187

Table 12 – License awards 2001 to 200288

Table 13 – License awards 2002 to 200789

Table 14 – License awards 2007 to present90



About the Authors

Since 1993 Lemay-Yates Associates Inc., "LYA", has been providing consulting services to the telecom industry focused on business plan development, market research, spectrum licensing, as well as expert testimony and evidence in policy and regulatory matters. LYA is a key advisor to the telecom industry including at the Board and ownership level of many of its clients, helping to drive major investment decisions and strategy. LYA work in the wireless area has included business case and license valuation, due diligence of mobile and fixed wireless operators and technologies, policy development, auction strategy and support, and market research. LYA does independent research and has published a number of reports on telecom markets with topics covering Local Competition, CLECs, Foreign Investment, Mobile 911, Consumer Telecom, Mobile Broadband Services and others. **Please visit our web site at www.LYA.com.**

YES! I would like to order the LYA Report: INTERNATIONAL REVIEW OF MOBILE SPECTRUM PRICES AND LICENSING...

Date of order: _____

	Single user PDF		Enterprise License PDF (unlimited users) *	
	Check	US\$ or Cdn \$	Check	US\$ or Cdn \$
INTERNATIONAL REVIEW OF MOBILE SPECTRUM PRICES AND LICENSING		\$ 2,500.00		\$ 6,250.00
Sales tax: GST 5% applicable to Canadian clients, plus TVQ 7.5% for Quebec clients				
Total				

* License for posting to intranet site for internal client use only

Note: LYA accepts Visa, Mastercard and American Express (American Express orders are charged in Cdn \$)

Name: _____

Title: _____

Company: _____

Address: _____

City: _____ Prov/State: _____

Postal/ZIP Code: _____ Country: _____

Telephone: () _____ Fax: () _____

E-mail: _____

Payment Information:

Cheque payable to LEMAY-YATES ASSOCIATES INC.

VISA/Mastercard/Amex: _____ Exp. _____

Signature _____ Name on card: _____

Publication date – September 25, 2009

LYA is a registered trademark of Lemay-Yates Associates Inc.

To order – please complete and send the above form to lya@lya.com or by fax to 514-288-6555; Or call us at 514-288-6555

LEMAY-YATES ASSOCIATES INC.

1200 de Maisonneuve Blvd. West, Suite 7F, Montreal, QC H3A 0A1 Canada – Tel/Fax: (1) 514-288-6555

E-mail: LYA@LYA.com www.LYA.com