



Comparative analysis of spectrum fees

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Analysis prepared for the Canadian Wireless Telecommunications Association

Ovum Consulting, 119 Farringdon Road, London EC1R 3DA

Telephone +44 (0) 20 7551 9000 Facsimile +44 (0) 20 7551 9090/1
www.ovumconsulting.com

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1 Introduction

This paper provides a brief, quantitative analysis of the costs of spectrum used by mobile network operators.

Industry Canada is in the process of renewing cellular and PCS spectrum licences. This process will include a consultation on a proposed spectrum licence fee. This paper summarizes information on administrative spectrum fees applied by developed nations for spectrum licences that are comparable to Canadian cellular/PCS licences.

The formulas and rationales for pricing spectrum, which are determined by governments or national regulatory authorities, vary considerably between countries. Some countries, such as the United States, charge annual fees in order to recover the costs of managing the radio spectrum. Other countries, such as Australia, New Zealand, and the United Kingdom, charge spectrum fees designed explicitly to reflect opportunity costs associated with the licence, or to recover economic rents associated with the use of a public resource.

Different countries use different formulas for determining and applying spectrum fees: in some, the annual spectrum usage fees are based on the number of subscribers that an operator has; in others there is a fee levied per MHz of spectrum allocated; and in some countries there is a charge determined based on a percentage of an operator's revenues.

Spectrum usage fees can be normalised to allow comparison, in which case the fees may be expressed in a number of ways, two of which are presented in this paper:

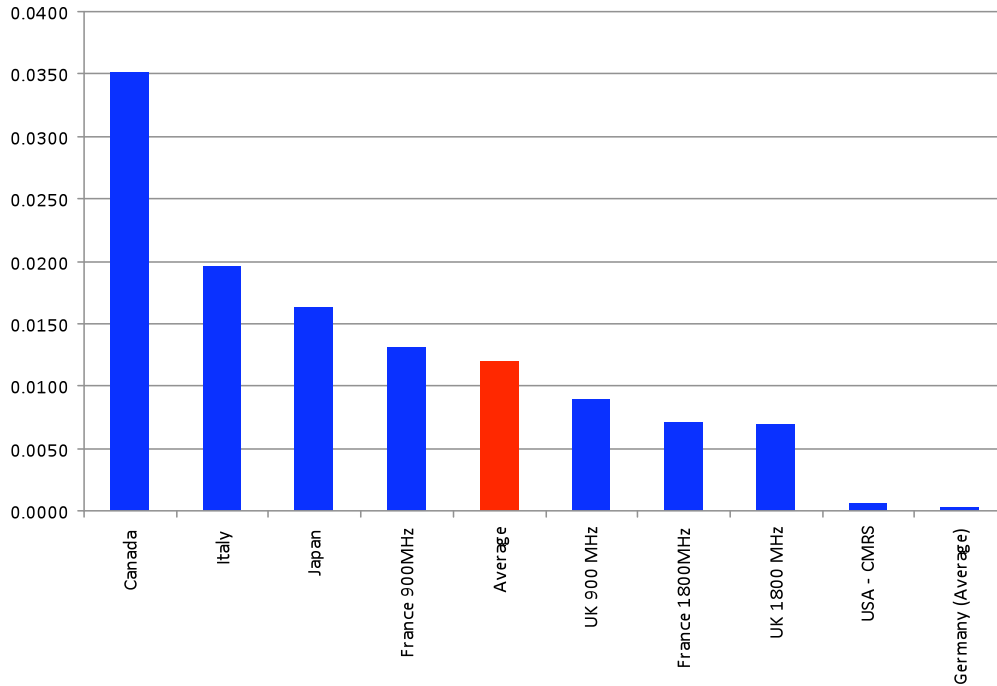
- in terms of price per MHz of spectrum per head of population (\$/MHz/pop)
- in terms of price per subscriber (\$/sub).

This paper shows that Canada's fees are high relative to international comparators. Canada's fees are highest of the fees of the G7 countries for which data is presented. Furthermore, Canada's fees are more than twice as high than the average of the fees identified.

The data sources used for the comparison are detailed in Section 3 of the paper.

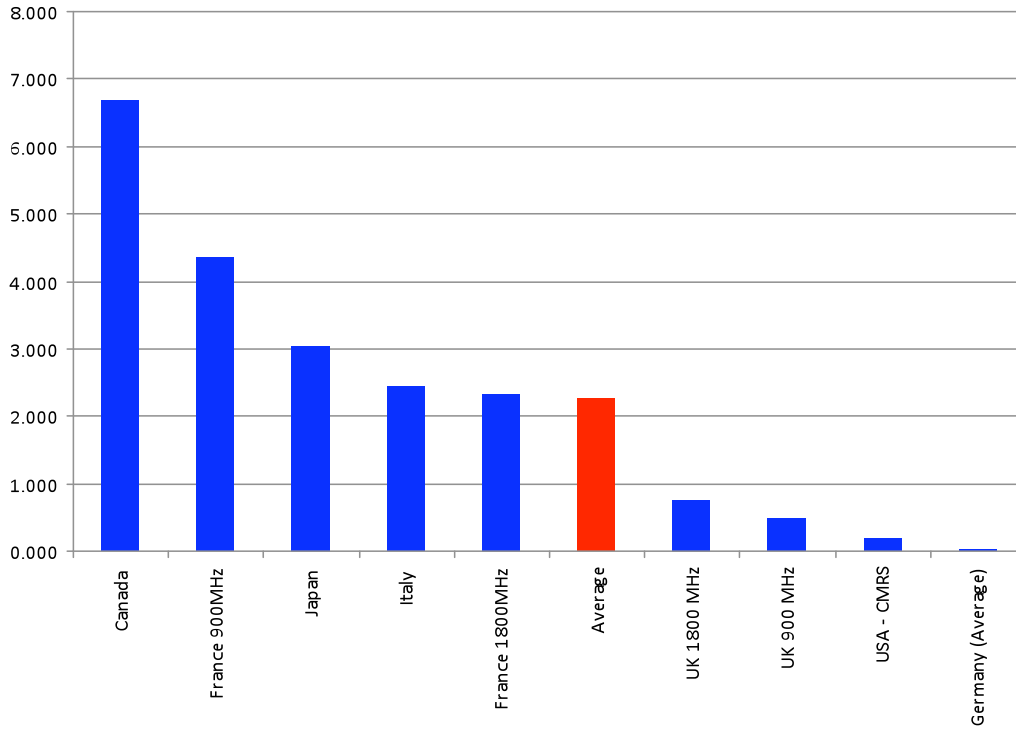
2 Spectrum fees

G7 Countries \$/MHz/pop



Fees Revised	Country	G7 Countries \$/MHz/pop
2003	Canada	0.0351
1999	Italy	0.0195
2005	Japan	0.0163
2009	France 900MHz	0.0132
	Average	0.0120
2005	UK 900 MHz	0.0089
2009	France 1800MHz	0.0070
2005	UK 1800 MHz	0.0069
2009	USA - CMRS	0.0006
1992	Germany (Average)	0.0002

G7 Countries \$/Sub



Fees Revised	Country	G7 Countries \$/Sub
2003	Canada	6.687
2009	France 900MHz	4.351
2005	Japan	3.054
1999	Italy	2.444
2009	France 1800MHz	2.326
	Average	2.260
2005	UK 1800 MHz	0.768
2005	UK 900 MHz	0.487
2009	USA - CMRS	0.194
1992	Germany (Average)	0.029

Country	Date Revised	\$/MHz/pop	\$/Sub		
Australia 900MHz	<i>n/a</i>	0.0528	n/a		G20
Belgium (Average)	2010	0.0315	0.0270		G20
Canada	2003	0.0351	6.6873	G7	G20
Denmark 900MHz	2010	0.0044	0.2301		
Denmark 1800MHz	2010	0.0022	0.2656		
Finland 900 MHz	2004	0.0084	0.0555		G20
France 900MHz	2009	0.0132	4.3513		
France 1800MHz	2009	0.0070	2.3264	G7	G20
France Pre 2009	<i>no longer in force</i>	0.0229	7.5666		
Germany (Average)	<i>n/a</i>	0.0002	0.0288	G7	G20
Ireland (Average)	2000	0.0210	0.0000		
Italy	<i>n/a</i>	0.0195	2.4438	G7	G20
Japan	2005	0.0163	3.0541	G7	G20
Korea - KT Corp	2005	0.0272	3.5305		
Korea - LGT	2005	0.0310	3.4819		G20
Korea - SKT	2005	0.0636	5.7418		
New Zealand	2007	0.0158	0.7595		
Spain (Average)	<i>n/a</i>	0.0245	0.0206		
Sweden	2010	0.0017	0.2828		
UK 900 MHz	2005	0.0089	0.4869	G7	G20
UK 1800 MHz	2006	0.0069	0.7682		
USA - CMRS	2009	0.0006	0.1943	G7	G20

3 Data sources

Common sources

- **Population:** Ovum Knowledge Centre Country Statistics – derived from US Census Bureau's International Database and National Statistics Databases
- **Currency exchange rates:** OECD 2009 exchange rates:
http://stats.oecd.org/Index.aspx?datasetcode=SNA_TABLE4
- **Mobile service subscribers:** Informa Telecoms and Media World Cellular Information Service (WCIS) database.
- **Mobile service revenues:** Informa Telecoms and Media World Cellular Information Service (WCIS) database.

Australia

Licence fees: Apparatus Licence Fee Schedule 5th April 2010:

http://www.acma.gov.au/webwr/assets/main/lib311409/licence_fee_schedule_april_2010.pdf

Total licensed spectrum: N/A

Belgium

Licence fees: 15 MARS 2010. — Loi portant modification de l'article 30 de la loi du 13 juin 2005 relative aux communications Electroniques

<http://bipt.be/GetDocument.aspx?forObjectID=3245&lang=fr>

Total licensed spectrum: N/A

Canada

Licence fees: Gazette Notice No. DGRB-005-03

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08105.html>

Total licensed spectrum: CWTA

Denmark

Licence fees: Ovum research with ITST:

- GSM 900: 112,811 DKK per MHz per year
- GSM 1800: 56,405 DKK per MHz per year

<http://en.itst.dk/spectrum-equipment/frequency-legislation/Calculation%20of%20frequency%20charges.pdf>

Total licensed spectrum: Ovum research

Finland

Licence fees: <http://www.ficora.fi/en/index/luvat/taajuusmaksut/laskentakaavatjakertoimet.html>.
Ficora collects approximately €255,000 per GSM licence.

Total licensed spectrum: GSM spectrum / operator - Ovum research with Ficora

France

Licence fees: ARCEP: <http://www.arcep.fr/fileadmin/reprise/textes/decrets/2009/d2009-948-290709.pdf>

Note: The requirement for a levy of 1% of revenues does not apply to spectrum used for GSM services

Total licensed spectrum: Ovum research

Germany

Licence fees and total licensed spectrum: EC Report: Study on administrative and frequency fees related to the licensing of networks involving the use of frequencies:

http://ec.europa.eu/information_society/policy/ecom/doc/library/ext_studies/frequencies.pdf

Japan

Licence fees:

Japanese Radio Law – Article 103-2, page 98:

http://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/Resources/laws/2003RL.pdf

Total licensed spectrum: Ovum research

Korea

Licence fees and total licensed spectrum: Ovum Korea research:

- SKT: 155.1 billion KRW for spectrum rental fee (2005)
 - One-off contribution: 80 Billion KRW
 - Annual contribution to R&D fund: 0.75% of total sales of service (since 1994)
- KT: 59 billion KRW for spectrum rental fee (2005)
 - One-off contribution: 220 Billion KRW
 - Annual contribution to R&D fund : 0.5% of total sales of service
- LGT: 33.6 billion KRW for spectrum rental fee (2005)
 - One-off contribution: 110 Billion KRW
 - Annual contribution to R&D fund: 0.5% of total sales of service

New Zealand

Licence fees and total licensed spectrum:

800/900 MHz Management Rights, Offer Document, Telecom New Zealand Limited, November 2007. <http://www.rsm.govt.nz/cms/pdf-library/policy-and-planning/radio-spectrum/rights-at-expiry/telecom-s-renewal-offer-250-kb-pdf/view>

800/900 MHz Management Rights, Offer Document, Vodafone New Zealand Limited, November 2007. <http://www.rsm.govt.nz/cms/pdf-library/policy-and-planning/radio-spectrum/rights-at-expiry/vodafone-s-renewal-offer-221-kb-pdf/view>

UK

Licence fees: The Wireless Telegraphy (Licence Charges) Regulations 2005:

<http://www.opsi.gov.uk/si/si2005/20051378.htm>

Total licensed spectrum: Ovum research

USA

Licence fees: 2010 revenues:

http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-51A1.pdf

Total licensed spectrum: FCC Spectrum Dashboard. Spectrum allocated for telephony use in 2 service categories:

- Cellular Radiotelephone Service: 2 x 25 MHz in each of 2 bands
- Broadband PCS Service: 130 MHz in 1850 – 1915 MHz band; 130 MHz in 1930 – 1995 MHz band

Spain, Ireland, Italy, Sweden

Licence fees: dot.econ report to ComReg: Liberalisation of spectrum in the 900MHz and 1800MHz bands:

<http://www.dotecon.com/publications/ComReg0999c.pdf>

Total licensed spectrum: N/A