

APPENDIX 2



**Lemay-Yates
Associates
Inc.**

A Discussion of the Evolution of
VoIP Regulation Worldwide

Report presented to:

Canadian Cable Telecommunications Association

November 2005



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❖ Executive Summary

➤ *Background to this Mandate*

This independent Report has been developed by LEMAY-YATES ASSOCIATES INC. (LYA) on behalf of the Canadian Cable Telecommunications Association (CCTA). The objective of the Report is to discuss the evolution of Voice over Internet Protocol (VoIP) regulations around the world and to compare the approach taken by the Canadian regulator, namely the Canadian Radio-television and Telecommunications Commission (CRTC), with what is being done elsewhere.

To achieve a meaningful comparison, this paper provides a summary of not only the salient aspects of VoIP regulation but also the competitive context and industry structure in which these regulatory choices are made and applied.

The degree of facilities-based competition, the availability and penetration of broadband cable and telephone (DSL) facilities to support VoIP, the market share of competitors in local access lines and voice services, and key aspects of the structure of the local phone market, such as metered local calls and Carrier Selection or Pre- Selection for local calls¹, all impact the extent to which VoIP can become a substitute to traditional phone service over the short term and hence the response of the regulator.

¹ Carrier Selection or Carrier Pre-Selection or CPS enables consumers to choose alternate service providers for metered local or long distance calls. This is how competition in long distance services developed in Canada. In countries such as in Europe where local calls are metered, the same concept was applied to local calls in addition to long distance. CPS means that a service provider does not need to have access to a local loop facility to offer local voice services. Therefore, in many countries, CPS has enabled a rapid market share capture of local calls revenues by competitors while the incumbent local telephone company retained its near monopoly on access line revenues.



The discussion of VoIP regulation in this Report is essentially focused on the residential or consumer market.



➤ ***Key Findings***

The top ten (10) findings from this Report are summarized herein.

1. In most countries, the development of the VoIP regulatory framework has just begun. As VoIP has, to date, had a relatively small or negligible impact on local telephone markets, most regulators have initially focused on issues related to consumer protection, access to emergency services, access to telephone numbers and lawful intercept. Questions related to the impact of VoIP on the competitive environment and the need for economic regulations of VoIP services provided by incumbent local exchange carriers have yet to be fully addressed, except in the cases of Canada, Singapore and Hong Kong, and to some extent in France and Sweden.
2. The notion that there is a unanimous approach to VoIP regulations around the world and that this approach is diametrically opposed to what the CRTC has set in place in Canada does not stand up to closer scrutiny. On the contrary, the approach used by the CRTC to review VoIP is very similar to what has been happening in other countries. The CRTC approach can be generally described as first to determine the related market segments associated with VoIP services, and then to apply the regulatory framework associated with those specific market segments to the appropriate VoIP services.
3. In most countries, the VoIP regulatory framework is undergoing evolution and modification. The European Union has adopted a multi-phased approach to develop its position on VoIP regulation. The European Regulators Group (ERG) has indicated in its work plan for 2005 that issues related to the regulation of dominant operators in emerging markets (which would include VoIP) are to be addressed at a later stage. In



its Common Statement regarding VoIP regulatory approaches, the ERG indicated that “Legal analysis of the European regulatory framework in relation to VoIP by ERG is more appropriate when the market has further developed.”

4. Due to the timing of its review and of the completeness of its analysis, the CRTC could be seen as being at the forefront of regulators in assessing the impact of VoIP. The CRTC was ahead of other regulators in identifying that VoIP is a substitute for traditional circuit switched telephone services and in moving ahead to ensure adequate consumer protection, as far back as in the preliminary opinion outlined in Telecom PN 2004-2 in April 2004. Since then, other jurisdictions have joined the growing chorus that adequate consumer protection must be provided when consumers subscribe to VoIP services. These include the US, Hong Kong and the European Union. Hong Kong refers to the CRTC² in explaining its decision to impose free access to emergency services for Class 1 and Class 2 VoIP service providers “if they assign their customers with numbers from the Hong Kong Numbering Plan”³.

5. If there is one principle on which all regulators seem to agree, it is that telecommunications services should be regulated on a technology-neutral basis. Of all the countries highlighted in this Report, not one has chosen to regulate VoIP services differently than other voice services because it is based on a different technology platform than traditional circuit-switched Plain Old Telephone Service (POTS)⁴. Service attributes and usage by consumers are the key elements on which regulators, as well as competition tribunals, have based their assessment of VoIP services. The

² Regulation of Internet Protocol (IP) Telephony, Statement of the Telecommunications Authority, 20 June 2005, par. 62

³ Idem, par. 63

⁴ Among EU countries, the corresponding terminology used is PATS for Public Access Telephone Service.



regulatory framework for PSTN interconnected VoIP services is therefore closely coupled with the framework for POTS in the countries surveyed as part of this Report.

6. Focusing on the aspects of the economic regulation of retail VoIP services, the differences in the end results, i.e. whether or not incumbent local telephone company provided VoIP services are subject to economic regulation, are expected to vary significantly due to the significant differences in the domestic markets. That is to say, if the local telephone market has already been deemed fully competitive and forborne from *ex-ante* price regulation, then it follows that VoIP services that are substitutes to POTS are also forborne from *ex-ante* economic regulation. Hong Kong is a good example of a jurisdiction where this is the case. The second key characteristic is the penetration of high-speed Internet among households. If, contrary to Canada, the penetration of high-speed Internet in a given country is so low as to marginalize the impact of VoIP in the market place, then the regulator may choose not to spend time and resources on VoIP until such time as it can realistically be viewed as having a chance for mass-market deployment.
7. The market structure for local phone service in many countries is in fact comprised of two different market segments. These two segments are 1) the access line, i.e. the telephone copper pair providing service to each house, and 2) the revenues for local calls, which are metered. This is not the case in Canada where access lines and local call revenues are bundled and form a single market. Many European countries have been fairly successful in growing the market share of competitors for local calls while the incumbent telephone company has retained a near monopoly on the local access lines. In Sweden, competitors have captured 50% of local calls revenues. In France, France Telecom has lost 30% market share in local calls revenues. Therefore, it is apparent that the market for local calls is much more competitive in many European



countries than it is in Canada. This characteristic creates a significant difference in market structure for local phone service between Canada and countries where local calls are metered. VoIP services offered by various service providers riding on the high-speed Internet facilities of telephone companies are direct competitors to the traditional circuit switched local calling services. The material market share loss for local calls already experienced by incumbent telephone companies in many countries goes a long way in explaining why the economic regulation of VoIP services provided by incumbent telephone companies is not at the top of the agenda for many regulatory agencies.

8. As an interesting observation, countries with no government ownership in the local telephone company and *ex ante* regulation of incumbents for POTS service have tended to also be the countries where facilities-based competitors have been successful in developing market share for local access services. Examples are the United Kingdom and Hong Kong. These countries also have in common relatively small territories, compared to Canada, and high population densities. These two factors have been two important in sustaining the deployment of alternate facilities-based networks over the last few decades.

9. There appears to be a risk of foreclosure of competition in countries where the incumbent telephone company's VoIP service is being offered without economic regulation in the emerging stages of the market and where high-speed Internet access is highly concentrated in the hands of the dominant incumbent telephone company. There is no guarantee that VoIP services will be successful, especially in terms of competition and maximizing its benefits to consumers. As is demonstrated by Bell Canada's recent launch of Digital Voice Services, ILECs are in a position to offer IP telephony services to their client base even when they do not subscribe to a high-



speed Internet service and without added customer premises equipment. In addition, some countries are considering restrictions on telephone numbers for nomadic VoIP applications, which may have a negative impact on the attractiveness of these services and hence on the market success of VoIP new entrants at the benefit of the incumbent telephone companies.

10. Canada is well advanced in its own consideration of forbearance for local services. VoIP is implicitly included in the assessment of market dominance in the local residential and business voice market segments and would eventually be subject to the set of criteria that are expected to be developed as part of the current CRTC Public Notice on local forbearance (PN 2005-2). Accordingly, VoIP services provided by incumbents within their old monopoly territories will presumably be forborne when local voice services in general are forborne. This approach is entirely consistent with what is being pursued in other countries.

Canada is in a favourable position since it already benefits from the presence of two facilities-based service providers addressing the residential market across the country⁵. Furthermore, the Canadian regulatory framework ensures access to the networks of both telephone and cable companies to the other service providers, such as ISPs and other telephone companies, for the provision of VoIP services. The stage has been set for sustainable competition to develop in local phone services and benefit Canadian consumers.

⁵ The context is fairly different for many business customers which have yet to be served by multiple facilities-based providers.



1 Introduction and Methodology

This independent Report has been developed by LYA on behalf of the Canadian Cable Telecommunications Association (CCTA). The objective of the Report is to discuss the evolution of Voice over Internet Protocol (VoIP) regulations around the world and to compare the approach taken by the Canadian regulator, namely the Canadian Radio-television and Telecommunications Commission (CRTC), with what is being done elsewhere.

To achieve a meaningful comparison, this paper provides a summary of not only the salient aspects of VoIP regulation but also the context and industry structure in which these regulatory choices are made and applied as well as the results achieved to date in terms of consumer choices.

Timing and status of the industry are having a significant impact on regulators' choices worldwide in deciding on how VoIP should be regulated and thus VoIP regulatory frameworks can not be compared in a contextual vacuum for this discussion to be of any relevance.

The focus of this Report is on the consumer or residential market segment and on VoIP services interconnected with the Public Switched Telephone Network (PSTN).

While VoIP services offered riding on another carrier's facilities are now common in most countries; it is not the case for facilities-based VoIP service, including the local access, provided by carriers other than the incumbent local telephone companies.



In this aspect and in the case of the residential market, the role of cable companies in providing choices to consumers is crucial. Therefore, broadband penetration and the split of broadband access along DSL or cable modem technologies is an important element impacting the ensuing market structure for VoIP. As well, the market share capture of competitors for both Plain Old Telephone Service (POTS) is another element to take into consideration when discussing the regulatory choices of any jurisdiction. A country where the market for local voice services or POTS is deemed fully competitive should be expected to be the subject of different rules and regulations applied to the incumbent telephone companies than one where it is not.



2 Countries Included in this Report

This Report draws together information and assessment regarding the VoIP regulatory framework for eighteen (18) countries around the world, as identified in Table 1.

Nineteen (19) countries were included in the review of international VoIP regulations submitted by Bell Canada et al. as part of the documents supporting its appeal of Telecom Decision 2005-28⁶.

It should be noted that 11 out of the 19 countries included in the Bell Canada submission are part of the European Union (EU). This implies that each of these 11 countries adheres to the same overall framework for telecommunications regulations with adaptation from the individual National Regulatory Agencies (NRAs). Thus, the regulatory approaches regarding VoIP regulation as well as for other telecommunications services should be expected to be somewhat similar.

Differences are that this Report excludes the Philippines, Japan and Malaysia, which were included in the Bell submission, and that Norway and Switzerland, two European countries not part of the EU, have been added.

The Philippines were excluded from the assessment because its economic and telecom environments are so different from that of Canada as to invalidate any conclusions that could be reached. For example, the ruling on VoIP from the National Telecommunications Association was perceived as maybe the “end to the almost two-

⁶ Attachment 3 to Bell Canada and al.'s Petition to the GIC, Report by Gilbert + Tobin, “Comparative International Approaches to VoIP Regulation”, July 25, 2005.



year debate between big telecommunications firms and ISPs⁷. The controversy surrounded the rights of Internet Service Providers (or ISPs) to offer VoIP services while telephone companies argued that the provision of VoIP services was their exclusive domain. Lower rates for international calls were at the center of the discussions. These issues are not being debated in Canada where ISPs such as AOL Canada have been offering VoIP services for some time. International calling rates in Canada have been low for a number of years and ISPs, cable and telephone companies as well as any other new entrant have the right to offer VoIP services. We also note that Japan has concluded that VoIP services are subject to regulatory requirements applicable for voice telephony services, a similar conclusion as reached in other countries⁸.

In this context, it appeared interesting to add comments regarding other European countries, which are evolving within a similar economic paradigm and discuss how they are dealing with VoIP regulations. Thus, Norway and Switzerland have been included in this Report. The other countries are the same as those surveyed in the Bell Canada submission⁹.

The LYA Report provides a discussion of the background and context underlying the decisions and choices with respect to VoIP regulations and casts a different light on these developments.

⁷ IT Matters, October 1, 2005, “Regulator girds for court battle on VoIP ruling”.

⁸ A detailed discussion of Japan and Malaysia was excluded due to time constraints

⁹ The US was not included in the G+T Report and hence has not been included in the LYA Report.



Table 1 – List of Countries Included in this Report

	Country	EU Member
1	Belgium	Y
2	Denmark	Y
3	Finland	Y
4	France	Y
5	Germany	Y
6	Ireland	Y
7	Italy	Y
8	Netherlands	Y
9	Spain	Y
10	Sweden	Y
11	UK	Y
12	Australia	N
13	Hong Kong	N
14	New Zealand	N
15	Norway	N
16	Singapore	N
17	South Korea	N
18	Switzerland	N



3 Recap of the VoIP Regulatory Framework in Canada

3.1 The key elements of CRTC Telecom Decision 2005-28

Before discussing how other countries are regulating VoIP, it is useful to recap the key elements of the VoIP regulatory framework as set out by Canadian Radio-television and Telecommunications Commission (CRTC) in Telecom Decision 2005-28. Those elements are summarized in Table 2.

The CRTC's overall conclusion is that VoIP services are substitutes to the Plain Old Telephone Service (POTS) and thus should be regulated as such under the current framework for voice services, local as well as long distance. The guiding principle of technology neutrality was a determinant factor in reaching this conclusion. As noted in the next section of this Report discussing VoIP regulations in other countries, technology neutrality is certainly one key principle that all regulators worldwide appear to agree with, whether they are reviewing VoIP or any other service.

While some elements of the Canadian VoIP regulatory framework have generated substantial controversy, mainly the economic regulation of local VoIP services in the incumbent local exchange carrier (ILEC) territories, others have been given very little attention. Among these we note the fact that long distance VoIP by ILECs is totally unregulated and that ILECs can offer unregulated local VoIP services outside of their ex-monopoly serving territories.

The table does not include the elements of the VoIP regulatory framework related to emergency service obligations which were stipulated in CRTC Telecom Decision 2005-21 and are not in dispute under the current Appeal.



As a general note, PC to PC VoIP has been forborne from regulation, as is the case in other countries. This corresponds to the basic Skype service offering, a well-known service provider of Internet telephony, and not to the Skype Out product, which provides interconnection with the public switched network.

The assessment of the VoIP regulatory framework conducted by CRTC does stand out in its completeness. Many other countries, notably EU members are conducting this assessment in a phased approach, first addressing only issues related to consumer protection and information.

Canada also stands out by the fact that access to cable company networks for VoIP service providers has been explicitly included in the CRTC assessment. No other country reviewed as part of this research includes requirements on cable companies to open their network to other providers to enable them to use their high-speed Internet bandwidth to offer VoIP services.



Table 2 – Key elements of Telecom Decision 2005-28

	Key Element	Comment/Update	Paragraphs
1	VoIP is a substitute to POTS and are not part of retail Information Services already forborne.	As the foundation for their proposals, ILECs argued that VoIP is a different technology and service and not a substitute to POTS.	69-70, 113
2	Facilities-based or access independent VoIP treated as part of same market when interconnected with PSTN.	Most regulators worldwide agree that VoIP is a substitute to POTS.	63
2	VoIP Long Distance is forborne from regulation.	Canadian ILECs have yet to take advantage of this provision.	484
3	VoIP supplied by ILECs outside of their ex-monopoly territories is unregulated.	Major Canadian ILECs have yet to take advantage of this provision ¹⁰ in the residential market except for SaskTel's subsidiary Navigata which offers WebCall to consumers in certain cities.	484
4	Regulatory framework for ILEC in-territory local VoIP regulated as a local voice service meaning:		
	A. tariff filing and approval requirements, subject to promotions and winback provisions, B. eligible for contribution, equal access, directory listings, telephone numbers as well as number portability, etc..	Bell Canada filed tariffs for its Digital Voice services; Telus has yet to file tariffs for residential VoIP services.	325,326 380, 213,214, 225, 242,260
5	Removal of VoIP restriction on cable company's Third Party Internet Access (TPIA)	In general, other countries, except for the US, have not addressed unbundling of the local loops of cable companies.	429

¹⁰ As of October 25, 2005

Telus has been offering its IPOne service to business customers in Ontario and Quebec for some time.



3.2 *Significant increased pricing flexibility for ILECs*

Other recent CRTC decisions will exert a material and positive impact on the flexibility of ILECs to address the VoIP market. The first one is the change in process for tariff approval announced in Telecom Circular CRTC 2005-6. Tariffs can be given interim approval within 10 days, a significant improvement over the 55-day average delay incurred previously.

The second major change is the interim approval by CRTC on October 20, 2005 of different proposed price ranges filed *ex parte* for Bell's Digital Voice service in the provinces of Quebec and Ontario¹¹. This enables Bell to target pricing at specific competitors such as Vidéotron and Rogers on a provincial basis. The fact that tariffs can be filed on an *ex parte* basis also means that prices are not announced to competitors weeks in advance of their implementation.

¹¹ Telecom Decision CRTC 2005-62, Approval on an Interim Basis of different rates for Bell Digital Voice in Ontario (\$40/month) and Quebec (\$35/month).



4 Comparative Assessment of VoIP Regulation Around the World

Many regulators worldwide have to date conducted at least a partial review of the regulatory framework for VoIP focusing on aspects related to end user protection and access to emergency services.

What emerges from the assessment of VoIP regulatory consultations conducted is that final determinations regarding VoIP regulatory framework are still to be completed in many countries. The first step taken by regulators has usually been to focus on issues surrounding end user information and protection as well as access to emergency services, while issues related to economic regulation of VoIP are kept for a later assessment.

Some regulators also reach different conclusions than the CRTC regarding the use of geographic or traditional telephone numbers for nomadic use by VoIP customers, something which is taken for granted in Canada. Nomadicity is a feature promoted by the new VoIP entrants in Canada such as Primus and Vonage. If restrictions or different telephone numbering schemes are applied, it could be perceived as having a negative impact on the attractiveness of their services.

The following provides a description of the different steps that are part of the EU processes for assessing the VoIP regulatory framework as many of the countries involved in this review are EU members.

This is followed by a discussion of the VoIP regulatory status in a number of countries and jurisdictions with comparative tables highlighting key characteristics for each country. These include government ownership, market share loss of incumbents for local voice services, high-speed Internet penetration and the market share of cable companies



as well as when a preliminary determination on the VoIP regulatory framework was completed.

A description of the VoIP regulatory environment in specific countries, namely Italy, France, Hong Kong, Singapore, Norway, Australia and Switzerland also provides additional insight. The criteria used to focus on these countries included to be part of the EU, or not, to exhibit significant differences in geography (Hong Kong vs Australia) and to represent a mix of European and Asian countries with economies in a similar state of development as Canada.



4.1 Background on the EU New Regulatory Framework

A New Regulatory Framework (NRF) for electronic communications services came into force in July 2003 in the European Union. Key objectives of the new framework are to promote competition, harmonize regulations between the different member states and thus to reinforce the single market as well as to safeguard consumer interest.

The concept of technology neutrality is embedded in the NRF and is perceived to be “essential to provide the necessary flexibility to deal with emerging technologies and their convergence”¹².

The new framework aims at ensuring consistency across the European market to ensure a stable and predictable investment environment throughout the Union. Each National Regulatory Agency (NRA) is responsible for applying the guidelines of the NRF taking into consideration the domestic market structure and specific characteristics of its competitive environment.

An important characteristic of the European market is the out-of-country expansion of incumbent operators, even those that to this day are still partially owned or controlled by the state. As an example, France Telecom (FT), which is still more than 40% owned by the French government, has significant operations outside of France, for example in the UK, Belgium, the Netherlands, Romania, and Poland as well as Spain via its recent acquisition of mobile operator Amena. FT’s international expansion is focused on mobile, Internet and, in some cases, fixed lines such as in Poland, Belgium and Spain¹³.

¹² EU, FactSheet 13 “Electronic Communications: Principles of the New Regulatory Framework”, October 2004.

¹³ France Telecom H1 2005, Preliminary results, July 28 2005.



Another important difference between the European and Canadian environments is the higher penetration of mobile telephony in Europe. Hence many countries have experienced significant decrease in the total fixed voice access lines while the number of mobile only households is usually much higher than in Canada. For example, only 83% of households in Norway now subscribe to a residential fixed line, down from more than 95% a few years ago. European NRAs nevertheless still view mobile and the fixed local access voice services as separate markets. Regulation of mobile services, however, is a much more significant endeavor in Europe than it is in Canada and captures a significant portion of the NRAs' agenda.

A third key element relates to the structure of the local voice markets. In Europe, local calls have traditionally been metered and the access line is a separate billing item from local calls. This has led to the introduction of Carrier Pre-Select (CPS) for local calls in most countries. This has a significant impact on the competitive structure of local markets as an incumbent carrier can maintain total dominance on local access lines while losing significant market share in local call revenues.

As a general rule, the EU framework is characterized by the notion that a national regulator has to first assess the competitiveness of specific pre-defined market segments, such as the residential local voice access market, before assessing which measures, including *ex ante* regulation for retail services, are required to ensure a level playing field for all market participants. The EU framework has defined market segments 1 and 2 as the fixed line access segments for residential and business customers. Separate market segments (3 to 6) have been defined for local or national and international long distance calls, again for residential and business applications¹⁴. Therefore, an incumbent operator

¹⁴ Often when NRAs performed this exercise, VoIP was in its very early stage of market introduction and thus has often yet to be included in the analysis.



could be found dominant in access lines and non-dominant in local and national call services, depending on the success achieved to date of CPS and resold local lines. This is the case in Sweden where TeliaSonera has more than 90% market share in local access lines but only 50% market share in local calls. In light of this, the Swedish regulator granted forbearance to TeliaSonera for calling services earlier this year.

Therefore, CPS is very useful to increase the level of retail competition in local services when there is no alternative facilities-based provider such as cable television networks to act as a network platform for competitive voice services.

This structure does not exist in Canada where local call revenues are combined with the local access and provided from a single supplier.

Table 3 highlights the prevalence of *ex ante* regulation of fixed retail voice switched services among the countries included in this Report. As is shown, many European countries still apply retail tariff approval to local residential POTS service provided by the incumbent operator. *Ex ante* retail tariff approval is also usually found in countries where facilities-based competition has yet to make significant headway, as is the case in Canada. For example, in France, France Telecom still retains close to 100% of market share in local access voice lines. Telecom Italia still enjoys similar market share in fixed voice access services. On the other hand, in Belgium, where only a price cap is applied, the penetration of cable-based POTS access has been growing since the year 2000 and the domestic market share of competitive service providers for local and national calls was 30% in the first quarter of 2004¹⁵. A similar situation prevails in Denmark and the United Kingdom where new entrants had captured in the range of 16% of access lines at the end

¹⁵ L'IBPT et les communications électroniques, Rapport Annuel, 2004, p.20



of 2003¹⁶. In Switzerland, 30% of households were reported as using an alternate service provider for their local and national calls in 2004 while SwissCom retains a near monopoly control (>98%) on access lines.

Countries where the incumbent telephone companies have lost more market share in fixed voice access lines often correspond to those with well developed cable television operators who either had launched telephony over circuit switched many years ago, such as in the UK, or who did so recently leveraging their bi-directional Hybrid Fibre Coaxial (HFC) infrastructure initially upgraded to offer high-speed Internet (HSI) access services.

¹⁶ OECD Communications Outlook 2005, Table 2.2



Table 3 – Status of ex ante regulation for local residential voice services in European countries

Country	Ex ante regulation of local residential POTS
Belgium	Price cap
Denmark	Price cap
Finland	No
France	Retail tariff approval
Germany	Retail tariff notification
Ireland	Price cap and retail tariff notification
Italy	Price cap and retail tariff approval
Netherlands	Price cap
Spain	Price cap and retail tariff approval
Sweden	<ul style="list-style-type: none"> ➤ Forbearance for local call services granted in 2005 (50% competitor market share) ➤ Requirement for wholesale access on a “retail minus” price basis since TelisSonera is dominant provider in fixed line access market.
UK	Price cap and retail tariffs approval
Norway	Prices subject to a cost orientation regime
Switzerland	Ceiling prices for access lines and local/national calls

Although the intent of the EU NRF is to be as pro-competitive and as less intrusive as possible, success is not guaranteed. As stated by Ms. Vivian Reding, Member of the European Commission responsible for Information Society and Media, “One of the main goals of the framework is to re-focus regulation, and to withdraw regulation as competition becomes effective. In practice over the last two years, there have been –



unfortunately- very few markets where the incumbent's market share has dropped below the threshold of "significant market power"¹⁷. In the EU NRF, in market segments where there is dominance of the incumbent, *ex ante* regulatory measures are often still required to ensure that an equitable competitive marketplace can develop.

4.2 A snapshot of the development of a regulatory framework for VoIP in the EU

The EU initiated a regulatory consultation process specific to VoIP in June 2004¹⁸ and the first statement of the European Regulators Group (ERG) on VoIP was issued in February 2005.

This first document was concerned with the issues surrounding the applications of the Directives of the NRF to VoIP (e.g. privacy, authorisation, etc.). Concerns regarding the "regulatory safeguards that may be needed to ensure fair competition in the provision of VoIP based services" as well as "the impact of VoIP based services on the markets identified in the Commission recommendations on relevant markets, and on the market analyses undertaken by NRA's" are to be addressed at a later stage foreseen as late 2005 in the case of the impact of VoIP on market analyses¹⁹. In other words, the EU and NRAs have yet to assess the potential competitive market impact of VoIP and have to date focused their efforts on consumer-related issues and other elements such as access to geographic telephone numbers and number portability.

¹⁷ "The review of the regulatory framework for e-Communications, Vivian Reding, Speech of Sept. 15 2005 at the 1st Meeting of the Centre for European Policy Studies Taskforce on Electronic Communications".

¹⁸ The treatment of Voice over Internet Protocol (VoIP) under the EU Regulatory Framework, An Information and Consultation Document, June 2004.

¹⁹ *Idem*, Section 1, Purpose of this document.



The ERG has indicated in its work plan for 2005 that issues related to the Regulation of dominant operators in emerging markets (which would include VoIP) are to be addressed at a later stage. In the ERG Common Statement regarding VoIP regulatory approaches, the ERG indicated that “Legal analysis of the European regulatory framework in relation to VoIP by ERG is more appropriate when the market has further developed”. The ERG Common Statement on VoIP therefore focused on numbering plans, number portability, and access to emergency services. There is no discussion of the need or not to have economic regulation of VoIP services. It is left to “the NRAs to further clarify the rights and obligations for VoIP providers”, a step yet to be taken by most countries.



4.3 Discussion of the status of VoIP Regulatory Framework in Selected Countries

The following three tables provide a summary of key characteristics and indicators relevant to a discussion of VoIP regulatory framework for a particular country²⁰. These include:

1. The level of state ownership in the incumbent telephone company.
2. The presence of any foreign investment restrictions on other telecom carriers operating in the country.
3. The status of *ex ante* retail tariff regulation for ILEC POTS.
4. The timing of the initial consultation or determination on elements of a regulatory framework for VoIP. Except for Canada, Singapore and Hong Kong, and to some extent, Sweden and France, the determinations or consultations of the other regulatory agencies that have been completed to date, for the most part in 2005, essentially focus on consumer protection issues, numbering and access to emergency services.
5. The market share of new entrants in voice access lines, a key factor impacting the assessment of significant market power by an incumbent telephone company and thus of its potential market power in that market segment.
6. The market share of new entrants in local calls (where available), is a second key factor impacting the assessment of incumbent market power in local phone services. Local call revenues correspond to the market segment where Carrier pre-selection (CPS) for local calls and non facilities-based VoIP services offered by competitive service providers operate.

²⁰ A variety of sources of information have been used to compile Tables 4 - 6 including the OECD Communications Outlook 2005 Report as well as numerous reports and studies by NRAs, the EU as well as reporting from some of the individual companies.



7. The penetration achieved for high-speed Internet access, expressed in terms of percentage of population, and the market share of cable companies for this service. For example, in the Netherlands, the penetration of HSI is at 19% of the population and cable companies have a 39% market share in this segment. The remainder is usually DSL based HSI, provided either directly to the end users by the ILECs or via resale to third parties. Some countries also had, at year-end 2004, limited HSI penetration from fixed wireless²¹.
8. An indication as to the launch of a VoIP service from local cable companies, relevant to the availability of a facilities-based alternative for VoIP service to the residential market.

Countries that are part of the EU are highlighted as shaded areas in the following three tables.

Table 4 summarizes the ownership and regulatory environment for local phone services among the countries researched.

Table 5 highlights the competitive environment with respect to local markets including both local phone access lines and local call revenues as well as the penetration of high-speed Internet (HSI) and the market share of cable companies for HSI service within each country.

Table 6 highlights the availability of VoIP services provided by cable operators for each country.

²¹ Note: not highlighted in the Table.



Table 4 – ILEC Ownership and Regulatory Environment for Local Services

Country	ILEC State Ownership	Foreign Ownership Restrictions on Other Carriers	Ex Ante Retail Tariff Regulation for ILEC POTS	Timing of Initial Determination or Consultation on VoIP Regulatory Framework
Canada	None except for SaskTel	Yes (46.7%)	Price Cap and Tariff Approval	May-05
Belgium	Yes (50% +1)	None	Price Cap	May 2005 Recommendations of the "Comité consultatif pour les Télécommunications".
Denmark	Yes	None	Price Cap	April-04
Finland	Yes (19%)	None	Tariff Notification	None
France	Yes (>40%)	None	Tariff Approval	July-05
Germany	Yes (approx. 38%)	None	Tariff Notification	First determination issued Sept. 2005. PSTN VoIP part of traditional markets. Too early to have final framework.
Ireland	None	None	Price Cap and Tariff Notification	Numbering and consumer issues addressed in July 2005. Non binding guidelines.
Italy	No	None	Price Cap and Tariff Notification	July-05
Netherlands	Yes (<20%)	None	Price Cap	Not yet.
Spain	None	EU Residents only	Price Cap and Tariff Approval	February-05
Sweden	Yes (>40%)	None	Forbearance on local calls since 2005. Wholesale access lines subject to regulation on a "retail price minus" basis.	IP Telephony included in market analysis for telephony
UK	No	None	Price Cap and Tariff Approval	September-04
Australia	Yes (partial sale in process)	None	Price Cap	Consultation in 2004. No decision yet. Proposal for substitutable services to be regulated similar to POTS.
Hong Kong	None	None	Forbearance since Jan. 2005	June-05
New Zealand	Yes (Kiwi Share)	None	No	
Norway	Yes (>50%)	None	Retail prices subject to a cost orientation regime	April 2005 for initial view on consumer issues. SMP market analyses being conducted in 2005.
Singapore	Yes (62%)	Yes. 74% total direct and indirect.	Tariff Approval	June-05
South Korea	None	49%		
Switzerland	Yes (>60%)	None	Ceiling prices for access lines and local call services.	Non-binding document issued in January 2005 on "VoIP Functional Standards"

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Table 5 – Overview of Competitive Environment in Local Markets

Country	Market Share of New Entrants in Access Lines (Dec. 2003 or as indicated)	Market Share of New Entrants in Local Calls (where available) (Dec. 2003 or as indicated)	High Speed Internet Penetration % Pop. Pen. /Cablecos Market Share (Dec. 2004 or later)
Canada	3.25% in residential 11.6 % for business 6.18% of total access lines as of Dec. 2004	Not Applicable	17.8/51%
Belgium	Cable voice access lines between 5% and <10%	19% share of local calls	15.6/38.5%
Denmark	16% in access lines	Not Available	18.8/29%
Finland	5% of access lines (2001)	5% share of local calls	15/15%
France	1% market share for residential fixed access lines	30% share of local calls	10.6/7%
Germany	1.1% of access lines	10% of local phone calls	8.4/3%
Ireland	Not Available	16% of all Retail Narrowband Revenues (Q2 2005)	4.3/6%
Italy	<1% in access lines	30% share of local calls	8.1/0%
Netherlands	3% in access lines	24% share of local calls	19.0/39%
Spain	10.7% in access lines	20% share of local calls	8.4/24%
Sweden	1% in residential access lines (2005) 9% in business access lines (2005)	50% share of local / national calls (2005)	14.5/18%
UK	14.7% in local access lines	43% share of local calls	10.5/32%
Australia	11% in access lines		7.7/26%
Hong Kong	30% in access lines		22.40%
New Zealand	3.7% in access lines (2001)		4.8/6%
Norway	Cablecos have 1% of voice access lines.	19% competitor market share on local phone subscriptions.	14.9 / 13.4 %
Singapore	N/A	N/A	11.5/48%
South Korea	13.9% in access lines		24.9/34%
Switzerland	<1% on access lines (2004)	30% of Swiss households used alternate carrier for local / national calls in 2004	17.3/38%

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Table 6 – Availability of Cableco VoIP Services

Country	High Speed Internet Penetration % Pop. Pen. /Cablecos Market Share (Dec. 2004 or later)	Cableco VoIP	
		Yes/No	Cableco & Launch
Canada	17.8/51%	Yes	Mar-05
Belgium	15.6/38.5%	Yes	Coditel in 2004
Denmark	18.8/29%	Yes	2005
Finland	15/15%	Yes	Mar-05
France	10.6/7%	Yes	UPC in IIIQ 2005
Germany	8.4/3%	Yes	ish in Jan 2005
Ireland	4.3/6%	Cablephone service but not VoIP	
Italy	8.1/0%	No	
Netherlands	19.0/39%	Yes.	Started 2004. UPC NL, 248K subs in June 05
Spain	8.4/24%	Yes	ONO, for a number of years.
Sweden	14.5/18%	Yes	"Com hem" and "Bredbands - Bolaget"
UK	10.5/32%	No	NTL and Telewest offer Circuit sw. telephony.
Australia	7.7/26%	Yes	Neighbourhood Cable in 2004
Hong Kong	22.40%	Not yet	
New Zealand	4.8/6%		
Norway	14.9 / 13.4 %	Yes	UPC affiliate
Singapore	11.5/48%	Yes	Jul-05
South Korea	24.9/34%	Yes	
Switzerland	17.3/38%	Yes	Cablecomm in 2004.

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The following key observations have been drawn from these tables.

- The majority of countries have issued a preliminary determination or initiated a public consultation process on the regulatory framework for VoIP. However, in most cases i.e. excluding Canada, Hong Kong, and Singapore, this determination or consultation does not address economic regulations of VoIP as many regulatory agencies have found it difficult to assess the impact of VoIP in the market at this stage. France and Sweden have included VoIP in their recently concluded assessment of local fixed voice markets.
- For all the countries included in this review, VoIP services are assessed on a technology-neutral basis and therefore PSTN interconnected VoIP is assessed within the context of fixed telephone services. This includes the local access markets and very importantly the local/national telephone call markets in countries with metered local calls.
- There is significant state ownership in incumbent telephone companies in many countries. It could be argued that it is in the best interest of governments to ensure that incumbent telephone companies operate in the most favorable of regulatory environments when they are still fully or partially state owned and when one is considering sale of these assets. As noted in recent press reports pertaining to the sale of Telstra “current regulations had allowed Telstra to deliver its biggest ever profit²²” and Telstra has been challenged to explain its low share price. No economic regulation of VoIP services before the market fully develops could be also perceived as one way to sustain the revenue profile of these same incumbent telephone companies.

²² "Minister turns up pressure on Telstra", The Sydney Morning Herald, Stephanie Peatling, September 5, 2005.



As part of our review of the documents and determinations published on VoIP, it can also be noted that most regulators in Europe and Asia who have made preliminary determinations regarding VoIP are also implementing restrictive use of access to geographic or conventional telephone numbers for nomadic VoIP services. Italy, Norway, Hong Kong, Singapore have all made such determinations. This is usually perceived as potentially having a negative impact on the attractiveness of service offerings from many service providers, in particular providers like Vonage and Primus Canada. The CRTC has not chosen to proceed along this path and this is one element where Canada is a friendlier jurisdiction for the development of VoIP and innovative services than most other countries.

When looking at the competitive environment for local phone and high-speed Internet markets, many European countries are still characterized by the dominance of the incumbent telephone company and its affiliates, even though their markets have been open to new entrants for a number of years.

The important role of cable companies in creating a network platform for facilities-based competition for local voice access in the residential market cannot be underestimated. The penetration of cable television networks in the larger EU countries other than the UK, meaning France, Germany, Spain and Italy, has not reached a level even close to what has been achieved in Canada. This has had a significant impact on the penetration of HSI achieved to date and on the market structure and technology platform of HSI and hence for VoIP in these countries. Those countries that are succeeding in developing alternative facilities-based provider for local voice access services are those with strong cable company networks, such as the UK, Denmark, the Netherlands, Singapore, South Korea, Hong Kong, and of course Canada. It is also not a surprise that these same countries are



those, except for Finland, Switzerland and Sweden, with the highest penetration achieved for high-speed Internet access.

For example, in France, DSL infrastructure provided by France Telecom accounts for more than 90% of all high-speed Internet access, a competitive environment very different than what is found in Canada where cable companies represent 51% of the high-speed Internet access. A similar situation as France is found in Germany, Ireland, Italy, Norway, Finland, Denmark, Spain, Sweden, Australia and New Zealand, or 11 out of the 18 countries researched, if we include all countries where cable-based HSI had captured less than 30% of the market as of year-end 2004.

This also means that the market share loss in residential access lines experienced in these countries is also very limited due to facilities-based alternative providers and that this situation is unlikely to change significantly over the next few years.

In these cases, the alternatives to offer VoIP are focused on service providers such as Internet Service Providers (ISPs) and others who do not own their facilities. This often implies a stronger focus of the regulatory agenda on access to facilities provided by the incumbent telephone companies and on ensuring low interconnect or wholesale prices to the incumbent's facilities to enable competition to develop.

The fact that local calls are metered and billed separately from the local access lines and the implementation of CPS both impact the assessment of the competitive environment for VoIP services. VoIP services offered using the incumbent telco's facilities are similar in nature to the local calling services offered on a CPS basis, which have already captured significant market share in many large European countries.



The focus on CPS and the resulting market share loss of incumbent telephone companies in call revenues means that the assessment of market dominance and thus the need for *ex ante* regulation of local voice services and hence eventually of VoIP services is very different compared to Canada where the provider of the local access lines receives 100% of the local call revenue. Thus, in European countries, 95% market share in voice access lines does not equate to 95% in local voice revenues. For example, France Telecom has lost 30% market share in local calls. TeliaSonera's market share in local/national calls is now at 50%. Thus the overall local phone market in these countries is significantly more competitive than what could be concluded just by taking market share loss in access lines into account. This characteristic is certainly a key factor in deciding if and how VoIP services provided by incumbent telephone companies should be economically regulated since in many countries the market share loss of the incumbent telephone company in local calls is already significant.

Other items of interest highlighted:

- The importance of geographic area and population density in achieving success in alternate local networks and thus in local voice competition. All the countries reviewed with strong cable company networks and alternatives for local voice access services have a much smaller territory and much higher population density than Canada. Among these we note Hong Kong, Singapore, Belgium, Denmark, South Korea and the UK. Financing and building alternative facilities-based networks in some of these countries could be compared to building out the Greater Toronto Area (GTA) only in Canada, a much smaller endeavor than building out facilities across the entire country. In this respect, the success achieved in Canada in sustaining and growing alternate cable television networks clearly stands out and bodes well for consumers going forward.



- In almost every country reviewed, the cable companies, even those with less than pervasive market reach, have chosen to launch VoIP. This is the case in Belgium, Denmark, Finland, Norway, France, Germany, the Netherlands, Spain, Australia, Singapore and Switzerland for example. This fact speaks to the importance for these operators to offer VoIP as part of a triple play to the residential consumers and of hopefully their expanding market share in local markets over the next few years.



4.3.1 Italy

In Italy, Telecom Italia (TI) is the dominant service provider with reportedly close to 100% market share in wireline access services, 50% market share in mobile and greater than 75% in high speed Internet services. The penetration of HSI in Italy is half of what has been achieved in Canada and cable modem based HSI is not available. Hence, the market is fully dependent on DSL rolled out by TI as well as on competitors offering services using unbundled loops and ADSL regulated wholesale offers obtained from TI. There is also limited deployment of fiber to the home and emerging broadband wireless deployment.

Traditional retail voice services are currently subject to *ex ante* regulations including tariff approvals. TI has been fully privatized.

In July 2005, AGCOM, the Italian regulator, initiated a public consultation (Delibera n. 26/05/CIR) on its proposal for regulatory intervention in VoIP. The Proposed regulations include restrictions on the use of geographic telephone numbers to fixed POTS-like VoIP applications and the creation of a new set of telephone numbers (5xy) for nomadic VoIP. Number portability, access to emergency services, calling ID and phone tapping are all part of the conditions attached to VoIP service providers with some leeway provided to operators for a flexible implementation of access to emergency services at least in the initial phases of deployment of VoIP services.

For the moment, VoIP services provided by TI are not subject to economic regulation. However, the decision to regulate TI VoIP or not is considered to be pending once the assessment that VoIP by TI is a substitute for PSTN voice services is completed. Italy has also yet to decide if VoIP regulations will be different for service providers who provide



both the broadband Internet access and those that provide a service independent of Internet access. As can be seen, one cannot draw final conclusions at this point in time as to what the final regulatory framework for VoIP will be in Italy. However, the regulator has clearly indicated it views that PSTN interconnected VoIP is a substitute to conventional local phone service, similar to the approach taken by the CRTC.

4.3.2 France

France, like Italy, is characterized by a strong dominance of France Telecom in local access lines, in fact 98.91% of residential access lines as per the latest analysis of the fixed telephony market published by the French regulator²³. The deployment of cable television networks in France is much less significant than in Canada and this fact mitigates prospects for a second fixed facilities-based alternative for voice access lines to consumers.

The penetration of HSI in France is slightly above the OECD average at 10.6 % of population at year-end 2004. Again related to the limited deployment of cable television networks, more than 90% of HSI access is provided over DSL, thus over facilities of FT. However, France has been successful in stimulating competition over FT's broadband facilities. FT's market share of retail residential HSI access was reported at 46.9% at the end of the second quarter 2005²⁴ meaning that slightly more than half of the HSI access is

²³ Projet de décision portant sur l'analyse des marchés de la téléphonie fixe, Autorité de régulation des Communications électroniques et des Postes, July 26 2005, p.55

²⁴ FT H1 2005 preliminary results. July 28, 2005, p. 26



being provided by other service providers either using FT's unbundled loops or wholesale offers²⁵.

Another key characteristic of the French market as with most other European countries is Carrier Pre-Selection (CPS) for local services, in addition to domestic and international long distance. This means that consumers can choose a different service provider than the incumbent FT for local calls, which are usually metered, while they retain the physical local access line from FT. So, even though FT has close to 100% of the local access lines, for which it gets all the revenues, it reportedly has lost close to 30% of market share in local call revenues since CPS for local calls was introduced²⁶.

Thus, the market structure for local telephone service in France is quite different than the one found in Canada where local calls are not metered and all revenues for local phone service remain with the provider of the local access line.

Nevertheless, FT is still subject to *ex ante* retail tariff regulation for fixed residential voice services. As part of its recent proposed decision on retail rates, the French regulator, L'Autorité de Régulation des Communications Électroniques et des Postes (ARCEP) highlights the need to be notified of changes to retail tariffs three weeks before their planned implementation date accompanied with information necessary for their assessment. The ARCEP can oppose the proposed tariffs with proper economic justification and has the obligation to prevent below cost or what is referred to as eviction tariffs. However, this element has not been applied to Voice over Broadband or VoB services as PSTN interconnected VoIP is referred to in France.

²⁵ ARCEP, Tableau de Bord du dégroupage et du haut débit, Chiffres au 1 janvier 2005.

²⁶ HT H1 2005 preliminary results. July 28, 2005, P. 25



There is disagreement between the French NRA, the ARCEP, and the Conseil de la Concurrence (France's equivalent to the Competition Bureau) on how they perceive VoB services. The Conseil de la Concurrence issued an opinion in February 2005 stating that "The Development of VoB must be taken into account in any analysis of the fixed telephony markets"²⁷. The "Conseil" invited the ARCEP to re-examine the issue of VoB since it considered that, contrary to the prior opinion of the Agency that VoB was a complement to ADSL service, VoB is a credible substitute to fixed telephony.

As part of its July 26, 2005 revision to its analysis of fixed markets, the ARCEP stated that indeed VoIP is part of the local fixed market but specifically excluded VoB from many of the *ex ante* restrictions imposed on FT with the proviso that regulation is "not necessary at the moment". The revised ARCEP proposal was approved by the EU on September 15. The EU stated that it approved the ARCEP's decision not to impose any *ex ante* requirements on VoB in France using the rationale that "VoB can in principle be provided by any broadband access provider". However, the EU also calls on the ARCEP to "monitor this part of the retail market closely and if necessary intervene to remedy them". As noted earlier in this Report, the EU has also indicated that "regulatory safeguards that may be needed to ensure fair competition in the provision of VoIP based services" as well as "the impact of VoIP based services on the markets identified in the Commission Recommendations on relevant markets, and on the market analyses undertaken by NRA's" are to be addressed at a later stage.

In the initial consultation, many competitors to FT had expressed outrage with respect to the ARCEP's perspective on fixed telephony markets and on its proposal to not impose *ex*

²⁷ February 17, 2005 Press release from the Conseil de la Concurrence " In an opinion issued to the ART, the Conseil de la Concurrence draws the Authority's attention to the development of Voice over Broadband (Vob) offers and he potential distortion of competition caused by unbalanced application of regulation.



ante regulation on FT's VoB services while it is still assessed as a dominant carrier in telephony markets. Among these, we note opposition from Free SAS and AFORS Telecom, the French association of telecom service and network operators. Specifically on the question related to regulation of VoB, AFORS noted that the ARCEP position on VoB is in violation of the principle of technology neutrality and that its analysis results in high risks for competition at the expense of consumers.

There is also close involvement of the French government, which still owns a large position in FT, in telecom regulation matters. For example, French telephone companies Orange (owned by FT) and SFR recently agreed to price cutting measures related to contract termination and number portability for mobile, fixed lines and other services after meetings with the Minister and regulators²⁸.

In summary, the developments with respect to VoIP regulatory framework indicate a tendency from the regulator to provide free reigns to France Telecom for the moment, in spite of the views expressed by the Conseil de la concurrence. Considering that France Telecom controls close to 100% of the residential access lines and a large majority of the access lines for high speed Internet, this environment may not be very conducive to future investment in local facilities by alternate carriers and cable companies active in France in the short term. Hence, the grip of France Telecom on local facilities may be strengthened overall.

²⁸ DowJones Newsire, Sept. 27, 2005, French Telcos agree to price cutting measures.



4.3.3 Singapore

Singapore has a population of close to 4.5 Million spread over 693 Sq. Kms and thus a population density of over 6000 persons per sq. km. In Singapore, as in Hong Kong, facilities-based competition has been a success in part due to the favorable geographic environment.

SingTel is the incumbent telephone carrier in Singapore. Although publicly listed on the Singapore Stock Exchange, SingTel is controlled by a government holding company and operates in a total of 20 countries.

Foreign ownership of telecom carriers in Singapore is capped at a 74% direct and indirect ownership.

Singapore boasts 47.6% of households with high-speed Internet (or 11.6% of the total population). Owing to the strong presence of alternate facilities providers, the split of HSI between DSL or telco-based access and cable modem based access is 55% for DSL and 45% for cable modems (as of June 2005²⁹).

The Infocomm Development Authority (IDA) of Singapore issued a policy framework document for IP Telephony in June 2005. Key elements of this framework are that both “Facilities-based Operators and Services-based Operators can be licensed under the new IP Telephony framework”³⁰. For the incumbent telephone operator SingTel, this also implies prior notification and approval of tariffs as it is a dominant carrier. However,

²⁹ IDA Statistics on Telecom Services for 2005.

³⁰ IDA Press release, June 14 2005, “IDA Launches New Policy Framework for Internet Protocol (IP) Telephony”.



many other elements of the framework could be perceived as favoring the incumbent telephone company, SingTel, over the competitors. These include use of a specific range of telephone numbers for non facilities-based VoIP service providers (as opposed to facilities-based VoIP operators) and the fact that number portability has not been mandated for IP telephony³¹.

³¹ IDA Explanatory Memorandum Issued by IDA of Singapore on the Policy Framework for IP Telephony and Electronic Numbering in Singapore, June 14 2005, Par. 22.



4.3.4 Norway

Norway is a country of close to 4.6 millions residents. Norway is not part of the EU. However, Norway does closely align its telecommunications regulatory framework with the EU framework and as such has embarked on an assessment of market dominance exercises in key market segments, as per the guidelines of the EU NRF.

Competition in telephony services was introduced in Norway in 1998. The penetration of fixed line telephony in Norwegian households has been decreasing since that time and was reported at only 83%³² at year-end 2004. This means that close to one out of five household does not use a local fixed telephone line. Telenor's market share for subscriptions to local service was reported at 81% at the end of 2004. It should be noted that the market share loss is not due to alternate facilities providers but to carrier pre-selection and resold lines i.e. other local service providers using Telenor's underlying facilities to provide their own traffic services.

There are close to 900 thousands cable television subscriptions in Norway, a penetration of approximately 20% of the population. Nevertheless, DSL is the main technology for HSI in Norway accounting for more than 80% of the high-speed access links. This can be explained by the fact that the Norwegian cable television industry is extremely fragmented with approximately 900 cable television networks in operation at the end of 2004. Thus, many small operators may not have had to date the financial and technology resources to upgrade their networks to deploy HSI and then telephony. Cable telephony subscriptions in Norway have been increasing since the year 2000 but only accounted for a very small percentage at the end of 2004, i.e. slightly more than 20 thousand lines on a total of more than 2 million access lines or in the range of 1% market share achieved over

³² The Norwegian Telecommunications Market 2004, NPT.



5 years. Of note, there were close to 48 thousand IP telephony subscribers in Norway at the end of 2004, already twice as much as cable telephony.

In Norway, there is a presumption of dominance by Telenor, the incumbent telephone company, in the telecommunications segments where it operates. The prices for retail as well as wholesale telephony services have been subject to a cost orientation regime.

At the moment, Telenor does offer a VoIP service, which does not require tariff approval. The Telenor VoIP service was only offered to Telenor's ADSL online subscribers during its initial phase³³. Telenor must provide its customers with 1-month notice for any changes to its prices.

The Norwegian Post and Telecommunications Authority (NPT) issued a document on the regulation of VoIP in Norway on April 15, 2005. The issues regarding significant market power and VoIP were specifically not addressed in this paper and await the outcome of the European discussion on the subject. At this point in time, NPT is considering including Telenor's VoIP services in the market segments defined by the EU NRF, including market segments 1-6, which include the local voice access and calling markets for residential and business applications.

However, the NPT has already concluded that VoIP services that are "any-to-any communications enabled" and thus provide the ability to call and receive calls from POTS are within the scope of the Electronic Communications Act and that if available to the public, these services "are deemed as a publicly available telephony service³⁴". As in other European countries, a separate set of telephone numbers is being allocated for

³³ Telenor to launch broadband telephony, Press release, March 30, 2005.

³⁴ NPT, Outline of the regulation of VoIP in Norway, Executive Summary, April 21, 2005.



nomadic VoIP applications. The complete set of rights and obligations of Public Access Telephone Services (PATS) under Norway's Electronic Communications Services (ECS) Act apply to VoIP service providers. Examples of such rights and obligations include quality of service, number portability, universal service obligations, etc. These obligations may also include price controls for operators assessed to have significant market power, an assessment, which has yet to be completed. A recent draft decision by the regulator to propose new "tight controls on Telenor fixed line fees³⁵", namely price cap regulation on fixed telephony interconnection, is seen as an indication that NPT does take measures to impose stricter price controls when need be.

Thus in Norway as in Italy, one cannot draw final conclusions at the moment regarding the outcome of economic regulations for VoIP services provided by the incumbent Telenor.

However, it is noted that the NPT is following an approach similar to that of CRTC and that, as with the CRTC, the provision of publicly available PSTN interconnected VoIP service is clearly seen as within the same market as conventional telephone service.

³⁵ "Telenor, others facing new price controls from telecom regulator", September 15, 2005, AFX News on Yahoo!



4.3.5 Switzerland

A number of organizations are involved in the development of telecommunications policy and regulations in Switzerland. There is the Federal Communications Commission (ComCom), the Federal Office of Communications (OFCOM) as well as the Federal Competition Commission and the Department of Environment, Transportation, Energy and Communications (DETEC). ComCom, a seven-member independent governmental commission, is the key entity with policy making and judicial powers. OFCOM is an agency of DETEC and is responsible for many administrative tasks including market supervision.

In 2004, 47% of the revenues associated with the Swiss telecom market were generated by mobile services, with 87% penetration achieved, while fixed telephony, both local and long distance, accounted for 25%. The remainder was split between data services at 17% and cable television services at 11%³⁶. Fixed teledensity has been on a continuing slow decline in Switzerland and now stands at 53.4% of population, down from 60% in 1998. As in other European countries, local calls are metered and users can benefit from carrier pre-selection to choose their service provider for local or long distance calls. Swisscom had retained just over 65% market share of all domestic wireline calls, local and long distance, at the end of 2004, while it retains a near monopoly situation or 99.4% of market share on the local access lines. More than 30% of users opted to use an alternate service provider for their metered local calls in 2004³⁷.

³⁶ OFCOM, "Le marché suisse des télécommunications en comparaison internationale", July 2005.

³⁷ Idem, p.4



Swisscom is the holder of the universal services license for fixed telephony and under this regime has to provide a telephone service at prices identical or lower than the ceiling prices as set in the Telecommunications Service Ordinance.

Switzerland is characterised by a relatively strong penetration of high-speed Internet at 17.3% of the population, just slightly below Canada. However, Swisscom's ADSL infrastructure retains the lion's share (>60%) either on a resale basis or by providing the service directly to end users on a retail basis.

VoIP falls under the Swiss Telecommunications Act and the Telecommunications Service Ordinance. In January 2005, the OFCOM-Industry Working Group on VoIP published a non-binding document entitled "VoIP Functional Standards". This document addresses issues related to interoperability and interconnection of VoIP services as well as numbering issues, such as the use of geographic telephone numbers, and user related aspects such as number portability. The same requirements would apply to "VoIP providers who offer their services via broadband connections of other providers and those using other means"³⁸, therefore no distinction is made between service providers providing VoIP over their own facilities or using someone else's

The incumbent Swisscom recommended that Carrier Pre-selection, which was a key enabler of competition in Switzerland, be eliminated as a requirement for VoIP service providers.

³⁸ OFCOM-Industry Working Group on VoIP non-binding document entitled "VoIP Functional Standards", Jan. 19, 2005, p. 5



In Switzerland, a revision project to the Law of Telecommunications initiated in 2002 still has to be enacted. The major stumbling blocks have been the unbundling of the incumbents local networks, to which the regulator is strongly committed, and the originally proposed use of *ex ante* regulatory measures for the incumbent in situations of Significant Market Power i.e. dominance. This last proposal has been abandoned after significant opposition from the incumbent; even if it means that in doing so Switzerland departs from the telecommunications regulatory framework of most other European countries that are members of the EU.

The need for unbundling of Swisscom's fixed local access network is perceived as a critical enabler of competition in Switzerland considering the high market share of Swisscom in local access lines, the high cost of duplication of facilities and as noted in 2003, the fact that the Cablecom network only serves approximately 40% of households in Switzerland³⁹. In other words, Switzerland is far from being able to achieve facilities-based competition, a context similar to most other European countries.

As noted in a comparative study of the effectiveness of telecommunications regulators prepared for OFCOM a few years ago, the authors raise the question of ownership of the incumbent telephone company in discussing the impact of regulators on the evolution of the market share of incumbents. "Indeed one could put forward total privatization of the incumbent as an explanatory factor of the incumbent's lower market shares. In countries where the incumbent is totally privatized, its market shares are indeed lower... In France

³⁹ Message relatif à la modification de la loi sur les télécommunications (LTC), Conseil fédéral suisse, 12 novembre 2003, p. 8, note 21.



and Germany on the other hand, state-ownership would be an explanatory factor for higher market shares of the incumbent⁴⁰.

OFCOM reported 105,860 VoIP users in Switzerland at the end of 2004⁴¹. Cablecomm, the largest cable company, launched VoIP in 2003. Swisscom offers an unregulated VoIP service to its ADSL high-speed Internet customers .

⁴⁰ “Finger, Matthias, Voets Annelies, “Comparative study on the effectiveness of Telecommunications regulators; summary”, École polytechnique fédérale de Lausanne, July 2003.

⁴¹ OFCOM, Statistiques des telecommunications, August 2005, P. 9



4.3.6 Hong Kong

Hong Kong has a population of close to 7 million people over a territory of 1100 sq. kms, yielding a population density over 6000 persons per sq. km., similar to Singapore.

The Hong Kong telecommunications market has been very dynamic both in fixed and mobile telecommunications for many years. Mobile penetration exceeds 120% of the population⁴². Competition in local telecom service was launched in 1995. In 2004, the market share of new entrants in phone service was estimated at 30%. Following a consultation, the Telecommunications Authority (TA) of Hong Kong decided that the time had come to evolve from an *ex ante* regulation of the tariffs of the incumbent PCCW-HKTC to an *ex post* tariff regulation regime. This new regime became effective at the start of 2005.

As in Canada and the EU countries, the Telecommunications Authority (TA) conducted an assessment of VoIP based on the principle of technology neutrality. A consultation was initiated in October 2004.

In its statement on VoIP released on June 20, 2005, OFTA has defined 2 classes of VoIP services⁴³. OFTA would allow existing licensees to operate VoIP services under their existing operator licenses, whether they are facilities or services based. The first class of VoIP service (Class 1) would correspond to services with the same attributes as conventional telephone services and be required to meet relevant license conditions

⁴² OFTA Telecommunications Statistics

⁴³ Regulation of Internet Protocol (IP) Telephony, Statement of the Telecommunications Authority, June 20, 2005, Hong Kong.



applicable to fixed network operators operating conventional telephone services as per the terms of Fixed Telecommunications Network Services or Fixed Carrier (FTNS/FC) licenses. This includes requirements such as number portability and printed directory listing and the same quality of service as conventional telephone service.

Class 2 services, for which a new type of license will be created, are those that do not provide all the attributes of conventional telephone service. These would be subjected to minimal licensing obligations limited to consumer protection. Elements of the rights and obligations of Class 2 VoIP service providers are currently the subject of further consultation. This includes among other things, access to a new range of 8-digit telephone numbers or the use of 10-digit telephone numbers or some other alternative. There is interest in allocating a new range of 8-digit telephone numbers for nomadic VoIP services to properly identify these services and provide differentiation. A new consultation has been initiated entitled “Consultation Paper on the Creation of a New License for Services-Based Operators for the Provision of IP Telephony Services⁴⁴”.

Class 2 VoIP service providers have to advise customers of any limitations of the service they offer. Operators for both types of VoIP services must provide free access to emergency services, if they assign telephone numbers from the Hong Kong Telephone numbering plan. OFTA noted in its Statement that “administrations such as the US and Canada have recently made a ruling that all VoIP services that can receive calls from, and place calls to, telephones connected to the PSTN are required to provide their customers with access to emergency services⁴⁵”.

⁴⁴ Issued on August 22, 2005

⁴⁵ Regulation of Internet Protocol (IP) Telephony, Statement of the Telecommunications Authority, June 20, 2005, Hong Kong, Par. 62



With respect to tariffs, the proposed license conditions⁴⁶ for VoIP services include a reference to publish and charge no more than the amounts published. VoIP tariffs offered by non-dominant carrier Hong Kong Cable Television Limited are presently available on the OFTA's web site for reference purposes. PCCW-HKT, the incumbent operator, must also notify the TA of discounts one day prior to their implementation. These discounts may be made public by the TA, if it believes it is justified by the public interest. Cost accounting information is still to be provided by the carrier to the TA in the *ex post* regime.

⁴⁶ "Consultation Paper on the Creation of a New License for Services-Based Operators for the Provision of IP Telephony Services", Issued by the Telecommunications Authority, Hong Kong, Special Conditions, Par. 4



4.3.7 Australia

Following government direction in September 2004⁴⁷, the Australian Communications Authority (ACA), now renamed the Australian Communications and Media Authority (ACMA), the Australian Competition and Consumer Commission (ACCC) and the Department of Communications, Information Technology and the Arts (DCITA) each released discussion papers on policy and regulatory frameworks for new voice services, namely VoIP.

One of the interesting aspects of the framework in Australia is that ACMA is in charge of the VoIP consultation while it is the ACCC that is in charge of assessing impact on competition including the impact of VoIP on the competitive environment. The ACCC is also responsible to review price controls applied to Telstra. Telstra has been subjected to a price cap regime for retail services for a number of years. The ACCC also sets prices for wholesale services provided by Telstra to competitors.

In October 2004, the Australian Communications Authority (ACA) published a discussion paper entitled “Regulatory Issues Associated with Provision of Voice Services Using Internet Protocol in Australia”. The Discussion paper states that VoIP services will generally be “carriage services” and “standard telephony services”, as per the traditional definitions used for conventional telephony services⁴⁸. The discussion paper focused on issues related to numbering and the potential determination of specific numbering options

⁴⁷ Although it is considering sale of its stake, the Australian government currently owns 51% of Telstra. This creates "tensions" with the regulatory bodies. Since the government has the power to provide "direction" to the ACCC, certain rulings could be interpreted as helping to maximize Telstra's value rather than protecting consumers. Comments by Warwick Davis, Telecommunication Branch, ACCC, at the Policy Review Forum, October 26, 2005.

⁴⁸ “Regulatory Issues Associated with Provision of Voice Services Using Internet Protocol in Australia”, Australian Communications Authority (ACA), October 2004, par. 3.4.



for VoIP, customer equipment regulations, potential quality of service (QoS) requirements and what should be monitored or reported, access to emergency services, interception, other consumer protection requirements such as privacy, call charging accuracy, options to implement number portability, etc..

The ACA paper does not address economic regulation of VoIP as this is under the responsibility of the ACCC.

The DCITA indicated three main approaches for the development of a VoIP regulatory framework. The first one is a uniform regulatory framework applied to all voice services. The second approach is a two or multi-tiered regulatory framework with uniform regulation i.e. conventional feature sets for standard voice services in the first tier and less regulation for other tiers of VoIP services offered. The third approach is referred to as the NGN (Next Generation Networks) approach, which would seek to address the “significant changes expected in the operations of networks and provision of services”⁴⁹. The latter approach is “not considered a viable approach in the short term, but the issues will be examined further over a longer timeframe”⁵⁰.

DCITA had indicated that it is “continuing to examine overseas approaches to the regulation of VoIP services⁵¹” across a number of countries including Canada. A decision has yet to be rendered following the VoIP consultation.

⁴⁹ DCITA, Discussion Paper: Policy and Regulation Framework for Emerging Voice Services”, November 29, 2004.

⁵⁰ Idem

⁵¹ Idem



Due to the lack of alternate facilities to bring competing services to residential customers, access to Telstra's facilities is a critical element to bring competition for not only voice but also for broadband Internet. There have been discussions and a government commitment to introduce operational separation of Telstra to provide Telstra customers with “confidence that they will receive the same treatment from Telstra Wholesale as equivalent to that provided to Telstra's own retail arm”⁵². This is similar to the initiatives currently under way in the United Kingdom and the separation of BT into two operational entities.

In summary, the approach used by ACMA and ACCC is similar to the CRTC in that VoIP services are treated as within the same markets as conventional voice services. The outcome may be very different due to the specific industry structure found in Australia. In particular, due to the lack of alternate ubiquitous facilities such as cable television networks, Australia is considering operational separation of Telstra into retail and wholesale units to ensure that competitors get adequate access to underlying facilities at reasonable prices. In this case, the measures that would be taken by Australia to promote competition far exceed the scope and magnitude of the price control measures in place in Canada.

⁵² “Update on recent regulatory developments in the telecommunications market”, speech of Mr. Ed Willett, Commissioner, ACCC, July 27, 2005.



5 Concluding Remarks

A key conclusion of this Report is that most regulators have so far only addressed issues related to consumer protection, access to emergency services, access to telephone numbers and lawful intercept. Issues related to the impact of VoIP on the competitive environment for local voice services have yet to be discussed in most countries. Therefore, the need for economic regulation of VoIP services provided by incumbent local exchange carriers is still on the future agenda of many regulators.

For all countries reviewed, the principle of technology neutrality when assessing VoIP services is a key driving principle. Service attributes and usage of VoIP by consumers are determinant factors. The notion that a different regulatory treatment is required for VoIP services because it is a new technology is not accepted as a premise by regulators worldwide.

Where regulatory agencies have completed the assessment of VoIP, such as in Canada, Singapore and Hong Kong and to some extent in Sweden and in France, VoIP services have been integrated in the overall framework for local voice services as PSTN interconnected VoIP services are deemed to be substitutes to local voice services. In Hong Kong, the market share loss of the incumbent telephone company has reached 30% and local voice services were forborne from *ex-ante* economic regulation at the start of 2005. Thus, the new regulatory regime applies to VoIP services as well. In Canada, a key reason provided by the CRTC to regulate VoIP provided as local services by incumbent local telephone companies within their own serving territories is their negligible market share loss to date in local voice services, an approach which is entirely consistent with that pursued in Hong Kong and elsewhere.



In Europe, the process to review the regulatory framework for VoIP is multiphased. To date, most European regulators have concluded that PSTN interconnected VoIP is a substitute for Plain Old Telephone Service (POTS). Before deciding to apply any economic regulations to VoIP services provided by incumbent telephone companies, European National Regulatory Agencies (NRAs) must first complete an assessment of the Significant Market Power in the local fixed telephone markets which would include VoIP, before implementing *ex ante* economic regulations to these services. Most of the NRAs have yet to complete this exercise, thus the lack of final decisions regarding the economic regulation of VoIP. However, for the moment, VoIP services are being offered in most European countries without economic regulation for different reasons. These reasons include in some cases that the market is perceived to be in its early stage of emergence and thus too difficult to assess. Other reasons are that high-speed Internet penetration is much lower than in Canada, hence the lack of market impact of VoIP offered on a broadband access link. The fact that many countries already enjoy significant competition in metered local calls is also a factor impacting these decisions as VoIP services compete head-on with the traditional circuit-switched local calling services.

Based on the review of industry structure for local access services in the countries included in this Report, it is expected that the conclusions regarding the need for economic regulation of local VoIP services provided by incumbent telephone companies could vary significantly from country to country. In other words, some countries may choose to economically regulate incumbent local VoIP services while others may not and the critical factors impacting this decision are expected to be indicators of the local market structure, i.e. the degree of the market power of the incumbents and their market share loss in local phone service, as well as the penetration of high-speed Internet access.



This assessment is more complex in European countries where the structure of local voice markets is very different than the one found in Canada. In Europe, carrier pre-selection introduced over the last few years means that a subscriber can choose a service provider different than the incumbent telephone company for its local calls, which are metered, while retaining the incumbent telco for its voice access line, where there is no alternative. This situation is also expected to continue to prevail in many European countries since cable television networks have not been deployed to a significant extent. What this means is that often an incumbent telco will have lost a significant market share in revenues from local calls while maintaining a close to complete monopoly position on access lines. Examples of this situation are France and Norway where the incumbent telephone companies have lost 30% and 19% of call revenues respectively but still maintain greater than 95% market share in access lines in the residential markets. Thus the assessment of market power in local services in those countries needs to take into account the market share loss in call revenues, a fact often overlooked when only discussing market share in local access lines. This situation likely also explains the strong focus of European regulators on wholesale services being offered to competitive service providers as one of the key enablers of competition in local services.

Therefore, the approach followed by CRTC is consistent with what is being done elsewhere including in the European Union and its conclusions as to the need for economic regulation owing to the significant market power of the ILECs could be supported in other jurisdictions. In this context, we also note that the CRTC has just recently completed the oral hearing portion of a public consultation with the objective of developing a set of criteria for the forbearance of local voice services in Canada. These determinations would apply to VoIP services as per the current approach and hence VoIP would be forborne when local voice services are forborne.



❖ Appendix A

LYA Expertise and Experience

Lemay-Yates Associates Inc. (LYA) founded in 1993, is a leading independent research and management consulting firm focused on communications markets at large. Our extensive project background combined with a solid reputation is the foundation on which high-value services are built. Coupling this with continuous monitoring of the global industry and staying abreast of the latest developments gives us the ability to meet and exceed the needs of a demanding clientele. LYA is a leader in high value-added advice and analysis.

LYA has continually enhanced its position at the forefront of the evolution of telecommunications markets and technologies.

LYA has six key types of intervention: (1) strategy and business planning, (2) support in acquisition, investment analysis and due diligence, (3) regulatory support, expert testimony, policy development, (4) license applications, licensing processes and auctions, (5) research and monitoring of markets and technologies telecommunications, and (6) seminars and conferences.

We are active in four major segments of the industry:

- Wireless communications, both mobile and fixed,
- Broadband deployment and IP,
- Telecommunications and cable TV,
- Broadcasting, new media and digital television.



The principals of LYA are Johanne Lemay and Robert K. Yates. Both are widely recognized experts in the telecom field and both have prepared expert testimony and appeared as witnesses in regulatory proceedings focused on broadband services, cable television, development of competition, regulatory framework and interconnection, VoIP services, and others.

Our broad scope and extensive background gives us the tools to see the whole picture across an array of issues, integrating strategies, markets, technologies, networks, finance, and regulations. Selected areas of specialization and experience:

Telecom Policy and Regulatory Framework

LYA provided support to MTS Allstream during the Canadian Government's Telecom Policy Review. This included preparation of expert evidence, filed as part of MTS Allstream's comments. The Report is entitled "**Telecom Policy Review – Context, business models and promotion of new technologies**". LYA also provided other background research and supporting analyses and participated in the three-day public consultation.

In preparation of the Telecom Policy Review, LYA completed a major independent report for MTS Allstream - **State of Telecom Policy Framework in Canada (December 2004)**. The report analyses the framework in Canada, comparing it to that of the US and Europe. It also considers in more detail the regime being developed in the UK. It also looks at the impact of technology change on the role of regulation and sets out areas of concern for Canadian policymakers.



LYA provided regulatory support to Microcell in 2004 in the public consultation in the CRTC proceeding, Telecom Public Notice CRTC 2004-2 - Regulatory framework for voice communication services using Internet Protocol.

LYA worked closely with the Canadian regulator (Canadian Radio-Television and Telecommunications Commission, CRTC) concerning development of industry monitoring processes. This included reviewing what other regulators do and how they do it and making detailed recommendations (included in the Background Report prepared as part of TPN CRTC 2000-175).

LYA has also worked with the CRTC to implement the recommendations and in collection and processing of industry information and preparation of the CRTC's first report to the Governor in Council on the State of Competition in 2001. The approach and process put in place remains in use by the CRTC.

International Experience

➤ Mobile Licensing

LYA has supported private sector clients considering entry into many markets, in Canada and also Poland, Romania, Chile, Brazil, Vietnam, China and the US. This has included participation in licensing processes, which has included assessing markets and economic dynamics “in country” including mobile, fixed wireless, local telephony, IP telephony, cable television, business data, high-speed Internet and others. In 2004, LYA was engaged as part of a World Bank project to license a second mobile operator in Samoa.



➤ *Universal Service Funds: Canada / US Comparison*

LYA has analyzed and assessed universal funding arrangements as well as the financial impact of the different approaches on operators. This has included reports developed for Industry Canada and the CRTC. It has also included assessment of regimes and license obligations in the US and internationally, as part of policy analyses, due diligence activities and/or licensing. We have also assessed regulatory framework application (for operators and/or governments) and deployment economics in underserved rural and remote areas.

➤ *Termination Costs*

LYA has researched and assessed mobile and fixed call termination costs in a number of countries in Europe and Latin America on behalf of a private client.

Tariff Regulation and Pricing – Framework and Interconnection Charges and Rules

LYA has participated in many tariff and related regulatory proceedings, particularly relating to interconnection and assessment of interconnection charges. LYA represented clients on several CISC (CRTC Interconnection Steering Committee) committees and the CSCN (Canadian Steering Committee on Numbering). Tariff process and interconnection have also been key elements of licensing activities where LYA has been involved in countries such as Poland, Brazil and Samoa.

LYA has developed financial models of tariff impacts (retail and wholesale) for competitor business cases to support regulatory policy development. LYA has conducted



training on tariffs and associated regulatory issues, in workshops for private clients as well as via an independently developed seminar.

Spectrum Management

LYA advised Industry Canada on the value of mobile spectrum licenses in Canada, including economic resource rent analysis and assessment of ongoing spectrum needs and assessment of prices paid for spectrum. LYA is an expert in spectrum licensing processes, valuation and auctions. LYA prepared evidence relating to spectrum fees as part of Industry Canada mobile license fee review and has participated in spectrum award processes and auctions for various clients in fixed and mobile spectrum.

Other Projects

In terms of other projects, the following illustrate the scope of LYA's background and experience.

- Assessment of the business case and valuation of a Canadian mobile operator, focusing on market trends, needs for capital investment and financial forecasts.
- Due diligence review of a technology company developing a WiMAX 802.16a OFDM chip set to support applications in the broadband wireless space.
- Development of the business case for fixed wireless service in the 2.5 GHz band across Canada and related support for a joint venture that was formed in 2003.
- Evaluation of entry options for consumer VoIP service, including the business case for "Vonage"-style service, assessment of cableco opportunities and technologies.



- Ongoing monitoring of market developments in mobile messaging, focusing on applications of short message service (SMS) and multimedia message service (MMS) in the television broadcasting context.
- Report on the competitive environment in the context of a broadcast distribution undertaking presented to the CRTC as part of Look Communications submission in its license renewal process.
- Report on the Case for Four Mobile Carriers in Canada and related submissions associated with Industry Canada's review of the PCS and cellular licensing regime, on behalf of Microcell Telecommunications.
- Submission to, and appearance before, the House of Parliament Standing Committee on Industry, Science and Technology in February 2003 concerning foreign investment restrictions, on behalf of MTS Allstream.
- Development of business cases and assessment of facilities-builds by competitors, including capital cost estimation, analysis of regulatory costs and subsidy flows, and right-of-way and related infrastructure issues. Prepared for MTS Allstream (then AT&T Canada) in the context of an Appeal of Telecom Decision CRTC 2002-34.
- Assessment of the state of competition and review of telecom industry players and facilities in the Yukon Territory, completed for the Territorial government in 2003.
- Market research and assessment of telecom opportunities in non-urban areas of Canada, including throughout Atlantic Canada, across rural Quebec, Southwestern Ontario, and Northern Alberta.
- Business plan for development of mobile services and related interconnection and infrastructure in Iqaluit, Nunavut Territory.
- Due diligence reviews of facilities-based local carriers in Canada and the US, covering all types of operations, including assessing network capital costs, regulatory issues, operations and overall business case and financials.