



Telecom Policy Review –
Context, business models and
promotion of new technologies

Report presented to:

MTS Allstream Inc.

August 15, 2005



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1. Introduction

Following direction from the 2005 Budget, the Federal Government established a three-member Telecommunications Policy Review Panel. The Panel is looking at ways of modernising Canada's telecom policy in order to benefit industry and consumers and to ensure that the telecommunications industry continues to support Canada's competitiveness.

The present Report was prepared for MTS Allstream to provide a basis for discussion of the telecom policy framework in Canada focusing on key issues relative to the competitor business model and promotion of new technologies and investment in the Canadian industry. The Report is based on independent research and on the opinions of Lemay-Yates Associates Inc. (LYA).¹

2. The Canadian industry structure and context need to be considered before using precedents from other countries

There is a significant level of activity in many countries surrounding the development of new or modified telecom policies and regulations. The reasons for this, and the nature of the developments, vary from country to country. Many issues are complex and there is a risk of translating international activities into the Canadian context without considering the underlying aspects in the other countries.

¹ See also "State of Telecom Policy Framework in Canada", Lemay-Yates Associates Inc., prepared for MTS Allstream Inc., December 2004

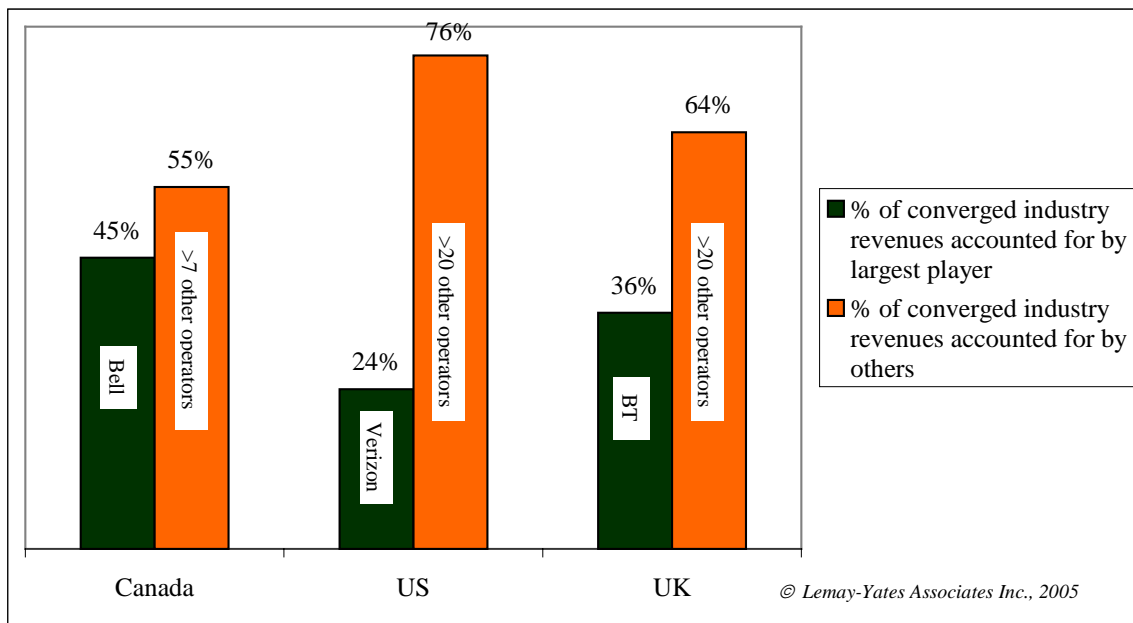


It is important to understand the Canadian industry before considering regulatory and policy precedents from other countries. One key difference is that the Canadian industry is more concentrated than it is elsewhere and there are fewer large players.

As a proportion of the total of the largest entities – when revenues from the “converged industry”, i.e. telecom, Internet, wireless and cable television/direct-to-home (DTH) services, are considered – the largest player in Canada in 2004 (Bell Canada) had almost twice the market weighting of the largest player in the US (Verizon). Bell Canada also had 25% greater market weighting than the largest player in the UK (BT).

When considering the “converged” industry, Bell Canada accounts for 45% of the Canadian industry. In the US, for comparison on the same basis, Verizon accounts for 24% (including the recent acquisition of MCI), and in the UK, BT (the incumbent telephone company) accounts for 36%. The remainder of the industry in the US and the UK is accounted for by more than 20 other players. This is illustrated below.²

² Reflecting 2004 year-end revenues as reported by the individual operators and expressed as a percentage of totals estimated by LYA. US industry total estimated by LYA based on FCC reports on the telecom and video distribution industry segments. As a former incumbent monopoly, BT’s market share is relatively low compared to other countries. This is due at least in part to the fact that BT no longer has mobile operations. Its former Cellnet mobile operator is O2. Combining BT and O2 would account for 43% of industry revenues. UK operator figures for year based on December 2004 or March 2005 Company reporting, and LYA estimates for certain small operators, and percentage expressed as total industry.



There are many other differences between Canada and other countries.

Canada is not a country where there was once a national government owned monopoly (like the UK, Australia and many other countries), neither is it one where there are multiple giant firms (like the US).

With respect to the US there are multiple regulatory regimes in place. The US has 50 individual State regulators as well as one Federal regulator, and each has its own priorities and responsibilities.

This is unlike Canada where the CRTC is the only regulator.

The Federal Communications Commission (FCC) – the US federal regulatory body – has responsibility only for interstate and international telecom. The current US Telecom Act does not set out to define broad policy objectives, which instead come from the Executive



Branch (The President). The Act is narrowly focused on interstate and foreign communications, with the pre-supposition of regulation.

So for example in the case of voice over Internet protocol (VoIP) services, these are considered to be interstate services. And since US ILECs only play a small role in interstate services, their VoIP offerings have been exempted from tariff and other regulatory requirements by the FCC.

The US system is also distinct due to the involvement of the Court system. Even when there are seemingly reasonably clear policy directives, the FCC gets caught up in jurisdictional issues and the Courts' interpretation of what it can or should do. This environment led even the former Chairman of the FCC himself to declare that the US system is "broken" and has resulted in the FCC being "sued on everything".

In July 2005, a bill was introduced in the US Senate to modify the Telecom Act. The new "Broadband Investment and Consumer Choice Act" proposes to replace the sections of the old Act dealing separately with common carrier, mobile and cable communications by new provisions that would apply to all providers. This is intended to allow, among other things, "functionally equivalent services to compete fairly". Common carriers, cable companies and mobile providers would be replaced with new definitions of service provider that would distinguish between "narrowband" and "broadband" providers.³

³ The proposed "Broadband Investment and Consumer Choice Act" was tabled in the US Senate by Senator John Ensign, co-sponsored by Senator McCain, on July 25, 2005. The proposed new Act would replace Title I (Definitions), Title II (Common carrier regulation), and Title VI (cable communications) along with Section 332 (mobile) of the existing Telecom Act. The changes would not effect Title IV (FCC procedures), Title V (penal provisions) and Title VII (covering various provisions regarding penalties, war measures, closed captioning and other things). The proposed Act does not mention Title III of the existing Act, which concerns "radio" regulation, notably outlining the process of license awards and auctioning, among other things.



One possible effect of the proposed Act would be to have replaced one set of difficult definitions with another. The proposed changes to the Act could reduce the problem of dealing with the industry in “silos”. On the other hand, the Act does not necessarily result in any greater clarity and by using the more generic term “communication service provider” could see regulatory oversight expanded rather than lessened.

The US framework is not directly comparable to the Canadian framework.

The European framework is also quite different from that of Canada. Europe has focused on developing broad policies that apply across many different countries, each with its own national regulator. At a high level the objectives bear resemblance to those of Canada. However, implementation can vary within each of the European Union (EU) member countries.

The European system is somewhat like the earlier regime in Canada where there were national policies, but individual provinces could implement them and regulate the industry in different ways.

This is the case, for example, for VoIP services in Europe. In some countries VoIP providers have a separate numbering plan as mobile services do in Europe, in other cases VoIP providers are required to use local numbers matching the area where service is provided.

In the UK, as part of the process of implementing the EU framework, Ofcom – the regulator – conducted a “Strategic Review of Telecommunications” which was completed in June 2005. One of the main outcomes was a set of undertakings by BT intended to



address “the ability and incentive for BT to distort competition”.⁴ A set of undertakings is intended to address this by providing true equality of access.

Under this approach, BT will be split into distinct wholesale and retail entities, which will operate under their own brands and management. Services to competitors will be provided by the new Access Services Division. It will provide local network and access services to competitors on the same basis as it does to the retail arm of BT.

3. A measure of the viability of a policy framework is the extent to which the industry can flourish, including ensuring that new technologies find their way into the system

“Disruptive” technologies are new technologies that emerge to change the value proposition and cost structure of an industry. A measure of the viability of a policy framework is the extent to which the industry can flourish, including ensuring that these new technologies find their way into the system. This benefits consumers as well as the industry, and is consistent with policy goals of stimulating innovation.

The role of the regulator in this context has evolved. Management of new technologies by the operators is no longer an orderly process of standardisation of new features and capabilities. It is one in which service providers – competitors and incumbents alike – are faced with more rapid change.

New disruptive technologies however have different effects on incumbents versus competitors. Incumbents (ILECs) can manage new technologies in the context of their

⁴ Consultation on undertakings in lieu of a reference under Part 4 of the Enterprise Act 2002, Ofcom, 30 June 2005, page 9



ubiquitous existing network and customer base. Competitors and new entrants on the other hand are faced with exploiting new technologies and competing in well-established incumbent markets.

Based on research into management of disruptive technologies by Clayton Christensen of Harvard University, this difference is reflected in the relative ability of incumbents and competitors to be successful.

In Professor Christensen's research, firms entering established markets with a new unproven (disruptive) technology had virtually **no** chance of success. Success for an entrant was only found when the entrant could both be a leader in introducing a disruptive technology and at the same time could create the market for it.⁵

This paradigm is clear from experience when considering new disruptive technologies in the telecom industry.

Mobile and high-speed Internet were both disruptive technologies when they emerged. Mobile was a "green field" opportunity for both incumbents and entrants. With high-speed Internet, it was early entry by cablecos using cable modem technology that stimulated competition and customer choice and spurred faster development of DSL service by the ILECs. Both the ILECs and the cablecos were incumbents and competitors at the same time.

⁵ Christensen, Clayton M., "The Innovator's Dilemma", First HarperBusiness Essentials edition, 2003 (Note – first edition publication was 1997). Note – Professor Christensen's research focused on computer disk drives. Entrants using new technology to enter established markets gained less than 1% market share and not one had more than \$100 million in sales in at least one year from 1976 to 1993 (used to define the 0% success rate).



The diffusion of new technology in the telecom industry is important to the overall development of the information economy. Advanced telecom services are a widely recognised enabler for economic growth, and are particularly important in Canada with its disperse geography.

Investment in information and communications technologies (ICT) “establishes the infrastructure for the use of ICT ... and provides productive equipment and software to businesses” according to the OECD. The issue for the telecom industry – and for the policy and regulatory discussion – is how to best support both the ICT sector and businesses that are increasingly using ICT to create growth and find new opportunities.

Telecom service development and innovation is stimulated by competition and the development of competitive alternatives, ultimately meaning small user firms will be better positioned to reap the benefits of broadband-based business models.

The policy and regulatory regime should thus be concerned with the dynamic of competition and the ability of firms in the telecom industry to invest in new and disruptive technologies. Disruptive technologies, such as mobile and high speed Internet, required (and continue to require) regulatory intervention.

Both benefit from key regulatory and policy decisions that ensure competition develops on a reasonably even playing field. There has been forbearance for retail pricing, but key examples of regulation that facilitate and support these services are interconnection services for mobile carriers and wholesale access tariffs for high-speed Internet operators. These services are certainly not de-regulated, nor should they be.

And mobile has come “full circle”. From its origins as a disruptive technology, it is now a sustaining technology and central to the investment plans of incumbent local exchange



carriers (ILECs) – the large telcos – and competitors alike. This is similar with High-speed Internet, now also a sustaining technology.

Other cases from the regulatory archive point to the same result.

In the case of terminal attachment (i.e. allowing non-ILEC owned customer equipment to be connected to the ILEC network – CRTC decisions from 1980 to 1982), initially there were claims of network harm, the spectre of lost revenues and of potential subsidisation to support competitive entry. But over the long run the ILECs have clearly benefited from the establishment of the new regulatory regime.

The disruptive terminal technologies “morphed” into sustaining technologies in two ways: via direct ILEC participation in the terminal market as well via innovations in ILEC network services such as Centrex (packaged network-based services that compete with advanced private branch exchanges), voice mail and other optional features.

Similarly in the case of equal access (i.e. providing the capability for ILEC local customers to pre-select their long distance carrier – CRTC decisions in 1992 and earlier), disruption initially resulted in declines to ILEC market share. However more recently there has been little movement in the share figure. Since 1997 Bell Canada’s in-territory long distance market share has remained relatively stable, fluctuating in the range of 60% to 70% (and other Canadian ILECs have a similar experience).

As disruptive equal access technology matured, the ILECs have held their own and still maintain a commanding share of the market.

The most recent emergent disruptive technology is consumer voice-over-Internet (VoIP). VoIP stands in stark contrast to the mobile and high-speed Internet cases.



Unlike the mobile and high-speed Internet cases, entrant VoIP providers are not playing into a market where there is uncertainty of demand, pricing, forecast, etc. Local telephone service is a well-established market and retail prices are low, particularly for the basic service set. So while VoIP may be disruptive from some perspectives, the “hurdle” for entrants to successfully attack such a large and already well served market is very high.

Far from disrupting ILEC operations, VoIP services are destined to become a key sustaining technology. VoIP will give the ILEC network a new lease on life and enable it to retain its position in the local market as competitive alternatives – whether from cable companies, competitive local exchange carriers (CLECs), VoIP service providers or mobile providers – emerge and develop.

4. The regulatory system needs to consider the “whole” competitive picture

As part of the MTS Allstream (then AT&T Canada) appeal of the CRTC’s price cap decision in 2002, LYA conducted an analysis of the business case for various entry options for a *pro forma* competitor in a typical Canadian local market.⁶

The “all-build” competitor scenario implied massive investment relative to what has been achievable in Canada to date – even before “last mile” considerations. With a payback in the range of 20 years, the “all-build” scenario was a non-starter, and illustrated the danger

⁶ “The implication of facilities-based competition in telecom”, Report by Lemay-Yates Associates Inc., filed with PETITION TO HER EXCELLENCY THE GOVERNOR IN COUNCIL, PURSUANT TO SECTION 12(1) OF THE *TELECOMMUNICATIONS ACT* IN THE MATTER OF TELECOM DECISION CRTC 2002-34, REGULATORY FRAMEWORK FOR THE SECOND PRICE CAP PERIOD 30 MAY 2002, MTS Allstream, 27 August 2002



inherent in pre-supposing how competition should develop and in narrowly promoting facilities-based competition over other forms.

With a payback of up to 9 years, hybrid models of operation also represent a very difficult business case. The regulatory regime supporting the hybrid model of operation thus also has to be in place for a significant period of time in order for competition to develop.

Note – The hybrid competitor defined herein is assumed to operate using ILEC unbundled local loops for the bottleneck “last mile” connection. It is then assumed to build and/or lease the other parts of its network to provide the various services. The hybrid competitor is not assumed to use wholesale DSL access or other forms of service resale. The hybrid competitor uses the whole loop (i.e. the high and low speed portions) to provide voice and data/Internet service to the end customers.

Hybrid competitors have a natural incentive to replace recurrent carrier costs with capital investment, and to innovate by building new networks and deploying new technologies. Or put another way, a viable business model promotes investment.

4.1 Evolution of competitor business case

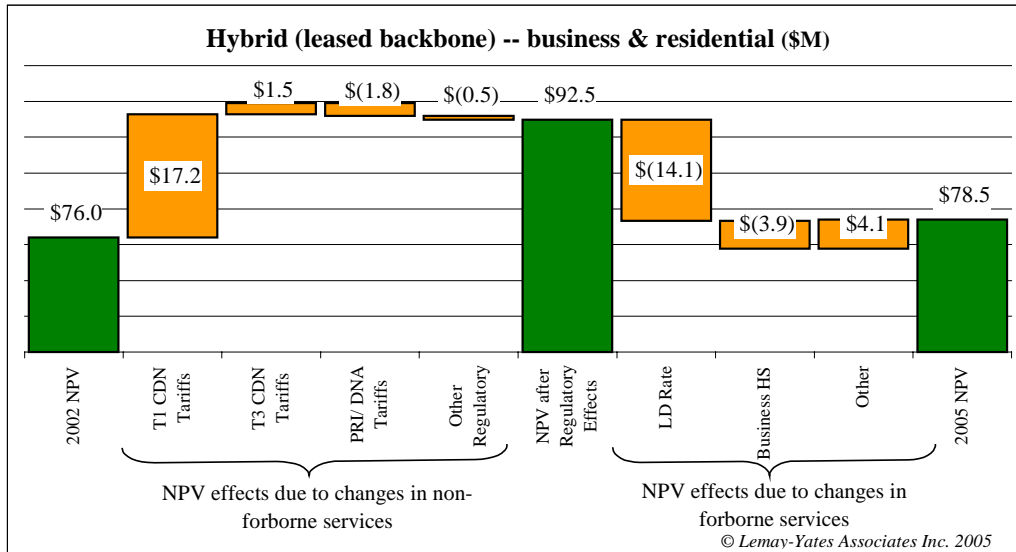
Since 2002, there have been numerous changes made to the regulatory regime. To assess the impact of changes such as the Competitor Digital Network (CDN) decision, LYA updated the 2002 business case. The update assumes the same demand profile for the *pro forma* competitor, but restates regulatory costs and market prices given the changes that have occurred since 2002.

Shown below are the results of the evolution of the business case for a competitor addressing business and residential markets on a “hybrid” basis. The results presented

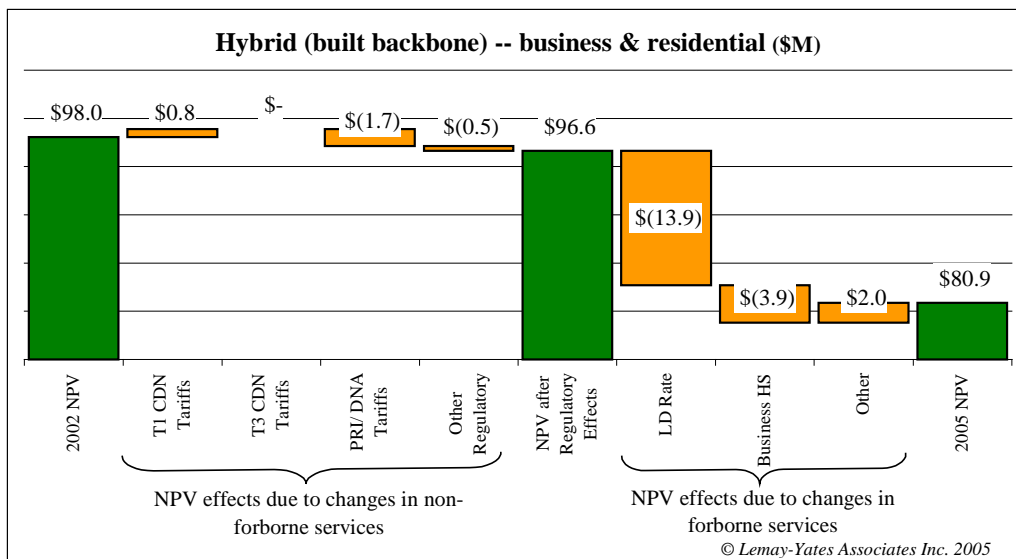


show the business case in “net present value” (NPV) terms – i.e. assessing the value today considering a 10-year deployment plan and reflecting the time value of money.⁷

Two sets of results are presented, one where the competitor makes extensive use of ILEC upstream services and one where the competitor builds its own backbone. Both exclude consideration of building the “last mile” of the network. Note – the figures shown are the NPVs and the incremental changes in NPV due to the effects identified. Increases in the figure represent improvements in the business case.



⁷ NPVs were calculated using 10-year pro forma cash flows valued using 10% cost of capital and an end of life value of eight times operating cash flow. These assumptions used in 2002 were not modified to ensure comparability of results.



The evolution of the business case shows marginal improvement overall, when regulatory changes to non-forborne services are set against changes in prices for forborne services (and before considering any changes to the capital investment required).

The overall improvement in the *pro forma* business case using mainly leased services is approximately 3%.

The business case shows the risk of dominant provider activity on both sides of the “equation” – i.e. when the same provider controls bottleneck facilities, which are non-forborne, and also operates at retail offering forborne services.

Changes to the cost of access to bottleneck facilities can be counter-balanced by unchecked changes to retail pricing.

It should also be kept in mind that the regulatory changes shown above are largely occurring in 2005 – with the CDN decision issued in January 2005, whereas changes in



market pricing of nonforborne services occurred much earlier. Regulatory changes, even when beneficial, can be “too little too late”.

The hybrid competitor may also choose to build portions of its network, shown above for the case of building backbone facilities.

In this scenario since the non-forborne services are used less (replaced in part by backbone build), the model is more impacted by the changes to the market prices of forborne services. Overall the business case NPV declines by 17% when comparing the 2005 view to the 2002 view.

Interestingly the backbone build case for the *pro forma* hybrid competitor has a greater absolute value than the hybrid competitor relying primarily on leased facilities – even after the regulated reductions to competitor service costs. This is due to inclusion of large business revenues obtained via direct build that the backbone-build competitor would be assumed to be able to access. On the other hand, the backbone build case is riskier since the payback associated with this scenario is as long or longer than the “leased” case, and the up-front investment is higher.

Since forbearance of retail services means that prices can fall without regulatory scrutiny, the opportunity to build facilities has been worsened. Thus counter to the apparent objectives of the CRTC, facilities based competition has not been stimulated by the evolution of the regulatory regime.

It is not by requiring narrowly defined reductions in wholesale prices for certain services that one can be assured that competition will develop. The whole equation must be considered to ensure that the regulatory regime creates a viable platform for development of competition, regardless of how competitors choose to operate.



Premature forbearance at the retail level can simply mean nipping competition in the “bud”.

The benefits from regulatory decisions that have been made in isolation can be quickly outweighed by pricing adjustments by dominant ILEC players or by other market developments.

4.2 *Hybrid and non-facilities based VoIP*

The evolution of the hybrid competitor business case, discussed above, was based on assumptions and network structure in 2002, and evolved with regulatory and market changes that have occurred since. A new hybrid competitor starting today would likely build an IP-based network.

The conventional hybrid competitor was assumed to offer the full service suite since it makes use of loops and other services to serve the entire market. On the other hand, by assuming a VoIP platform, all of the competitor’s customers would have to have a high-speed Internet service.

Incorporating assumed reductions in the unit cost of the capital equipment, the hybrid VoIP operator, addressing a smaller revenue base, ends up with a similar investment payback profile to the conventional CLEC competitor.

Another approach to addressing the market – similar to the Vonage business model, also sometimes referred to as “access independent VoIP” – would be not to provide the entire suite of services, but to provide only VoIP. In this case the customer base would be the



same as the hybrid VoIP provider, except that the competitor is assumed not to supply the underlying high speed Internet service.

This case – the non-facilities VoIP provider – would still require some investment, notably in the softswitch and operations systems (“back office”) infrastructure, but would have no direct costs attributable to the access network or facilities. It would use tariffed ILEC services for connection to the telephone network.⁸

The evolution of the business case is summarised below, shown for the competitors addressing business and residential markets, and including assumed effects of equipment cost reductions in all cases.

	Payback		5 year capex
Hybrid/build CLEC - full service suite	6	\$	36,338,918
Hybrid VoIP - bundle HS Int/telephony	7	\$	17,077,227
Non-facilities VoIP - telephony only	4	\$	3,098,158

Scenario: Business and residential markets - leased backbone, assuming capex reductions

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The hybrid CLEC competitor case (shown for the “built backbone” scenario) with the full service suite improves from that discussed above due to the inclusion of equipment cost reductions (for comparison with the other cases). Payback for the updated hybrid (built backbone) CLEC is improved to 6 years and investment required is \$36 million.

The hybrid VoIP competitor focused on bundles of VoIP and high speed Internet has a somewhat longer payback at 7 years, since it is addressing a smaller market, but with

⁸ For modeling purposes, Bell Canada tariff rates for primary rate interface (PRI) service were used including direct inward dialing capability. The VoIP provider was assumed to take a 5-year contract and have access to the Competitor Digital Network (CDN) tariff rates for the underlying T1 access lines.



much the same cost structure. Also, since the addressed business is smaller, the investment is also smaller at \$17 million.

The non-facilities VoIP competitor has the shortest payback at 4 years, but has a small business case since it is narrowly focused on the voice telephony market only. Since its investment is only in “back office” equipment, the amount is small at \$3 million.

While the non-facilities VoIP case also suffers from the risks associated with the dominant provider being active on both sides of the equation (as all resale models do), the absolute risk is lower than the hybrid cases. The non-facilities VoIP provider only needs to make a small investment to be in business and does not provide a direct competition to the overall bundle of services offered by the ILEC.

Both the hybrid cases (CLEC or VoIP) on the other hand require greater investment. And since the two hybrid cases also provide a broader “attack” on the market, would also go further in terms of development of competition overall. This also reinforces the conclusion that the regulatory regime needs to ensure that the hybrid business model represents a viable platform for development in order to promote competition and investment.

5. Conclusions

5.1 *Need to recognise the realities of the Canadian market*

There is a significant level of activity in many countries surrounding the development of new or modified telecom policies and regulations. The reasons for this, and the nature of the developments, vary from country to country. Many issues are complex and there is a



risk of translating international activities into the Canadian context without considering the underlying aspects of the activities in the other countries.

Canada has one national regime and is not hampered by the “broken” type system of the US. Canada’s processes, notably with respect to forbearance, can lead to the same results as the more complex European “significant market power” analyses. In fact for many services, Canada has forborne more quickly than other countries (in some cases too quickly).

The evolution of the regime in Canada needs to recognise that the solutions used elsewhere may or may not be applicable. The Canadian industry is generally more concentrated and dominated by one large player. It is not case of a battlefield of giants as in the US, nor a case of evolving from a government owned monopoly situation as in most other countries.

5.2 Disruptive technologies have required (and continue to require) regulatory intervention.

New technologies benefit from key regulatory and policy decisions that ensure competition develops on a reasonably even playing field. There has been forbearance for retail pricing for mobile and high-speed Internet services, but key examples of regulation that facilitate and support these services are interconnection services and wholesale access tariffs.

New disruptive technologies have different effects on incumbents versus competitors. Incumbents (ILECs) can manage new technologies in the context of their ubiquitous existing network and customer base. Competitors and new entrants on the other hand are



faced with exploiting new technologies and competing in well-established incumbent markets.

And from their origins in disruption, many new technologies become sustaining technologies, central to the investment plans of incumbents and competitors alike. This is the case with mobile as well as with high-speed Internet, both now sustaining technologies.

5.3 Need to get the regulatory model “right” – pitfalls of facilities-based approach

A practical look at the business case for competitive entry is illustrative of a number of key points:

- The difficulty of establishing a level playing field, particularly when the competitor is entering existing markets,
- The risk inherent in not considering the overall business model and the relationship between wholesale and retail pricing, and,
- That a focus solely on facilities-based competition does not necessarily lead to increased investment, counter to its apparent objective.

A review of the competitive entry business case highlights the importance of getting the regulatory model “right”.

The hybrid competitor business case shows the risk of dominant provider activity on both sides of the “equation” – i.e. when the same provider controls bottleneck facilities, which are non-forborne, and also operates a retail offering forborne services. Changes to the cost of access to bottleneck facilities can be counter-balanced by unchecked changes to retail



pricing. Since forbearance of retail services means that prices can fall without regulatory scrutiny, the opportunity to build facilities has been worsened.

Thus counter to the apparent objectives of the CRTC, facilities based competition has not been stimulated by the evolution of the regulatory regime. Facilities-based competition may be a long-term goal, but the regime needs to recognise the length of time required for the industry to develop.



6. ATTACHMENT – Lemay-Yates Associates Inc.



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.

Further information can be found on our web site: www.LYA.com.