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PROMOTING INVESTMENT IN INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE CARIBBEAN

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Foreword

The development of an information-based society and the incorporation of Information and Communication Technology (ICT) into every day social and economic activity are contingent on the availability of physical –telecommunications- infrastructure, which allows people, businesses and governments to communicate and exchange information. Once the proper infrastructure is in place, ICT can be a powerful tool for participating in global markets, promoting political accountability; improving the delivery of basic services; and enhancing local development opportunities.

Much, however, depends on the accessibility of this infrastructure to those who want to communicate, hence the focus of this study on the telecommunications infrastructure in the Caribbean. The telecommunications sector in the Caribbean region has undergone significant transformation in the past few years. Yet, the process of change is far from complete. This report reviews in detail the current situation in policy implementation and the establishment of competitive regulatory structures for the sector, as well as the basic infrastructure for ITC in the region. Emphasis is placed on The Bahamas, Barbados, Belize, the Dominican Republic, Guyana, Jamaica, the Organization of Eastern Caribbean States (OECS), Suriname, and Trinidad & Tobago. The report also identifies regulatory barriers to investment and recommends a number of regional initiatives to reduce these barriers.

This report was prepared by Peter Stern, President of PS Associates, and coordinated by Iwan Sewberath Misser (Country Office of Bahamas) and Juan Belt, formerly Senior Economist in Region 3 and currently Director of the Office of Infrastructure and Engineering at the U.S. Agency for International Development. The author wants to thank Karlene Francis, former specialist at the Bank's Jamaica Office and currently Director of Telecommunications, Government of Jamaica, Steven Benoit, ITC Consultant and Managing Partner of GlobalMarketing & Services, Danilo Piaggese (Chief, SDS/ITD) for providing comments and suggestions for the final draft of the study, as well as all the people in the region interviewed in the process of drafting of the report.

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¹ Response by Lucent Technologies to Questionnaire 2, usage of Lower Frequency Bands in the AP Region, 2nd Meeting of the APT Wireless Forum

Promoting Investment in Information and Communications Technologies (ICT) in the Caribbean: Action Plan

Executive Summary

The telecommunications sector in the Caribbean has undergone significant transformation in the past few years but the process of change is far from complete.

This report was commissioned by the Inter-American Development Bank (IADB) to define technical assistance programs to promote the development of the Information and Communication Technologies (ICT) sector in the region. The premise for this is that investment in ICT has a positive impact on economic development because of its contribution to growth and labour productivity¹. Development of an information-based society and the realization of an ICT strategy and its incorporation into every day social and economic activity are, however, dependent on the availability of physical infrastructure which allows people, businesses and governments to communicate and on how easily this infrastructure is accessible to all who have or want to communicate².

The report reviews the basic infrastructure for ICT in the Caribbean and compares the current telecommunications policy and regulatory framework with that of the mid 1990s when governments in the region began earnestly to think about reform. At that time twelve of them participated in the World Trade Organization negotiations on basic telecommunications. The report also examines telecommunications pricing issues, the current free trade negotiations which impact the ICT sector and some noteworthy regional initiatives to promote ICT. Finally it discusses regulatory barriers to investment in the telecommunications sector and recommends a number of actions to overcome these.

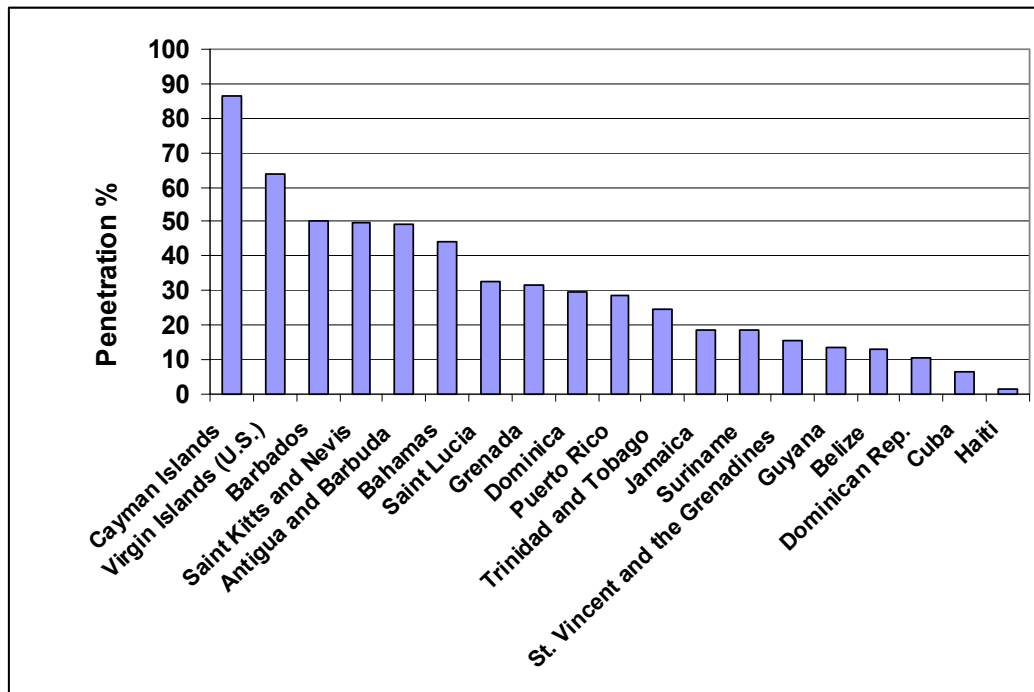
Basic Infrastructure for ICT in the Caribbean

There is good infrastructure in the Caribbean but it is unevenly distributed and expensive to use. Fixed telephone penetration, an index often used to measure the state of development of telecommunications infrastructure, in the 24 countries and territories in the region for which the International Telecommunication Union (ITU) gathers statistics, varies between 85 % in the Cayman Islands and 1.7 % in Haiti. There is a similar variation in mobile penetration across the Caribbean. (See figures below).

¹¹ ICT investment helps firms become more efficient and innovative and by contributing to the creation of knowledge, training and education. In the countries of the Organization for Economic Development and Cooperation (OECD) the contribution of ICT investment alone was 0.3 to 2.8 percentage points of the per capita GDP growth between 1995 and 2001. See: *ICT and Economic Growth, Evidence from OECD Countries, Industries and Firms*, OECD, Paris, 2003. One of the studies cited in this report shows that in the period 1995 to 2000 Canada's GDP grew at an annual rate of 4.9% and that the contribution of ICT investment to this growth was 0.7 %.

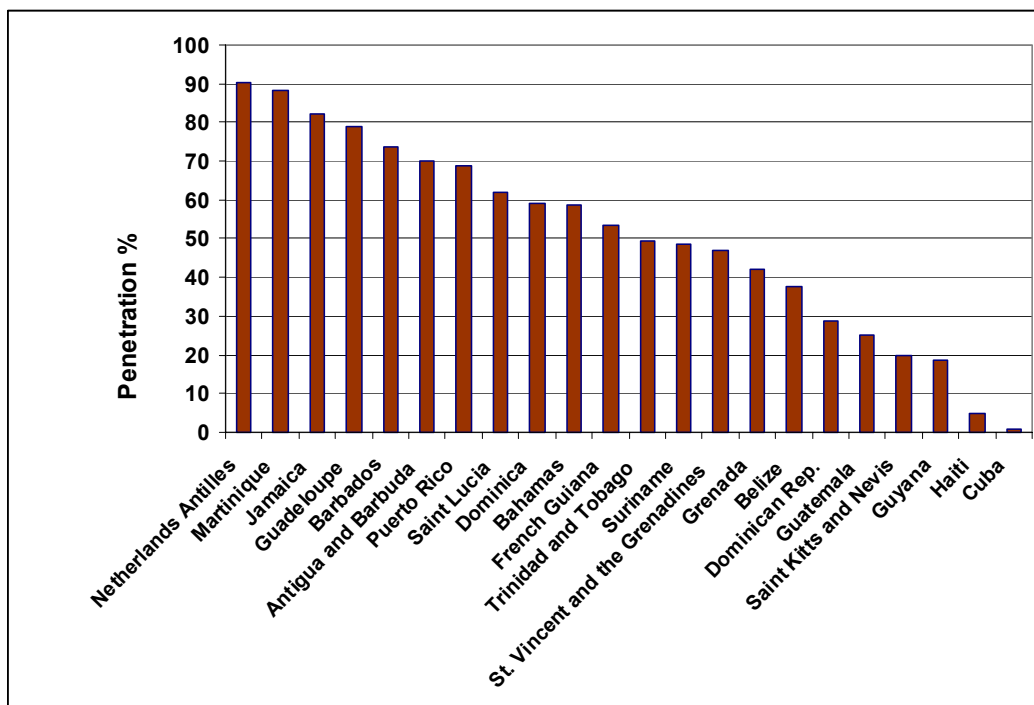
² The Telecommunications Annex of the WTO's General Agreement on Trade in Services recognizes the dual role of telecommunications services as both a tradable service and a means of delivery of other services.

Main Line Telephone Penetration in the Caribbean



Source: ITU WTI 2005

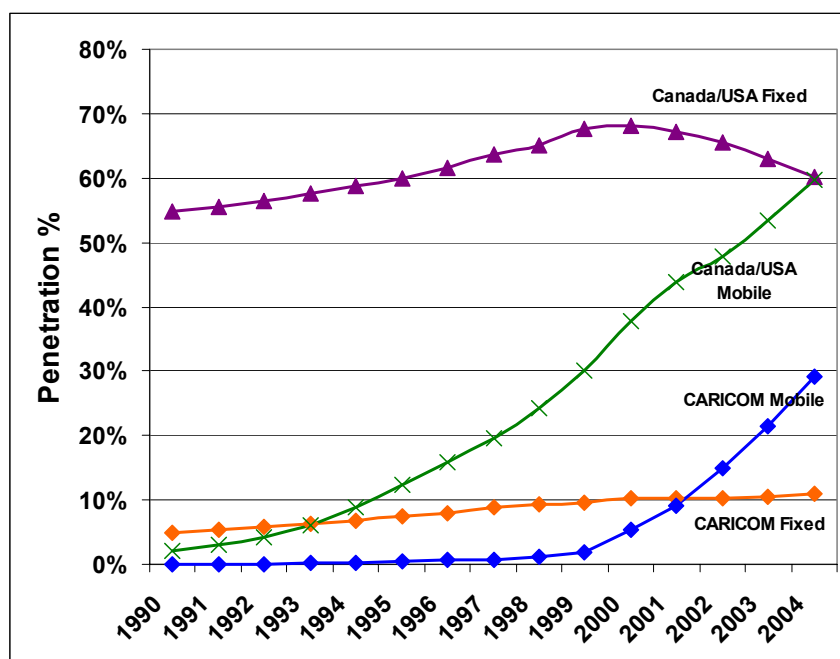
Cellular Mobile Penetration in the Caribbean



Source: ITU WTI 2005

The average fixed telephone penetration in the CARICOM Member States and the Dominican Republic is less than 11% compared with about 60% in North America (Canada and USA). Since 1990 the Compound Annual Growth Rate (CAGR) in these countries, when the penetration rate for fixed telephone was just 4.9%, has been 8.3%. Like in other parts of the world mobile penetration has grown much more rapidly, rising from a negligible 0.017% in 1990 to 29% at the end of 2004 (CAGR = 75.9 %)³. The figure below compares growth of fixed and mobile telephone penetration in CARICOM. The tremendous growth in mobile can be attributed in a large part on the introduction of competition. Of the 30 countries and territories surveyed in the region only a half dozen continue to have monopoly provision of mobile services. Most have 3 and some have 4 operators. In Jamaica one new entrant has been able to capture 60 % of the mobile market in just a few years.

Growth of Fixed and Mobile Telephones in North America (Canada and USA) and the CARICOM



Source ITU WTI 2005

Infrastructure for ICT in the Caribbean

There are about 90 licenced mobile operators in the region and there is competition in all but six of the countries and territories with most having two, three or even four operators⁴. A few countries have as many as seven licence holders. Not all of these may, however, be operating. One of the main obstacles to new entrants' delaying their service offerings has been their inability to sign interconnection

³ With the real impact of the opening of the cellular mobile market in the region just starting to be felt, mobile penetration rates in 2004 are probably well above this figure.

⁴ The level of competition was recently reduced with the acquisition by Digicel of Cingular's (formerly ATT Wireless) Caribbean assets.

agreements with the incumbent fixed line operators, an issue which is dealt with in the chapter of this report on regulatory barriers to investment.

There are currently 20 fibre optic submarine cable systems in the Caribbean. Of these fourteen primarily serve the region. The other six serve other regions (mainly South America) but have landing points in the Caribbean. The combined total capacity of the thirteen “Caribbean” cables at the time of this construction was about 70 Gbps. Their combined potential capacity, however, is nearly 3 Terabits/second (Tbps) due largely to the huge potential capacity of Arcos-1 cable system.

While the existing and potential capacity is enough to serve the needs of the region not all countries have equal access to these. Of some 25 countries and territories in the Caribbean more than half have access to only one cable system, which for nine of them is the older (1995) Eastern Caribbean Fiber System. In the other countries, where more than one cable lands users may not have many options because a single operator has the landing licences for all of them. This is the case in Trinidad & Tobago where the fixed line monopoly, TSTT, has the landing rights for the Americas-1, Americas-2, and ECFS cable systems. Only in Puerto Rico and the U.S. Virgin Islands is there competition among cable owners.

Limited access to these systems results in higher prices for bandwidth capacity. Even though many of these cables are owned by a consortium of operators and a member of a consortium may have capacity up to a cable landing point, it will find it difficult to offer a full (end-to-end) cable circuit at competing prices because the cost for leasing the local loop between the cable landing station and the customer’s premises may be prohibitive.

Several systems either recently been completed (FibraLink which connects Jamaica and the Arcos cable landing station in the Dominican Republic), or are currently under construction (Antilles Crossing which will connect Barbados and St. Lucia with the Global Crossing cable landing point in St. Croix and the global Caribbean Cable which will connect Guadeloupe and Puerto Rico) or in the late planning (Trans-Caribbean Cable Company (TCCC) is planning a cable which will connect Haiti, Jamaica and the Dominican Republic with the NAP of the Americas in Miami which it is later planned to extend to Aruba, Venezuela and Colombia).

There are currently 34 geostationary satellite systems with a footprint over the Caribbean. These have a combined total transmission capacity of 55.8 GHz which is evidently not all available for all countries and territories in the region.

Market Structure Prior to Reform

Until quite recently virtually all (basic fixed and mobile telephone, both domestic and international and value-added including Internet) telecommunication services were provided by monopoly operators in all countries in the Caribbean except the Dominican Republic. In the English-speaking Caribbean Cable & Wireless (C&W) was and continues to be the predominant investor in the telecommunications sector owning between 49% and 100% of the telephone companies in these countries and territories, directly or through the fully owned Cayman Islands based subsidiary Cable & Wireless (West Indies). More recently Digicel, a new entrant in the mobile market in 16 Caribbean Countries has gained significant market share from C&W. These monopoly operators often had long term exclusive licences whose terms favoured the foreign strategic investor and not the government or the population. They paid little or no taxes, were exempted from rules concerning the hiring of foreigners and their tariffs were generally not regulated.

The telecommunication laws in most of these countries were old and in need of revision. Some pre-dated the Second World War and only applied to the radio frequency spectrum or more specifically the licencing of equipment that uses the radio frequency spectrum.

In February 1997 seven countries (Antigua and Barbuda, Belize, Dominica, Dominican Republic, Grenada, Jamaica, and Trinidad and Tobago) made commitments at the conclusion of the WTO's negotiations on basic telecommunications (NGBT); however, with the exception of the Dominican Republic these were necessarily modest allowing immediate competition only in some value added, Internet, and other non-basic services because of the near exclusive arrangements these countries had with the exclusive suppliers of telecommunications services at the time. They all committed to open competition once the periods of exclusivity ended.

C&W started to sense the wind of change and the growing dissatisfaction among its customers and began to recognize that maintaining monopolies in telecommunications was no longer tenable. It agreed to begin negotiations to end the exclusive agreements it had throughout the region.

The Current Situation

By the end of 2005 in the English speaking Caribbean Jamaica, Barbados, Belize Trinidad and Tobago and the five Organization of Eastern Caribbean States (OECS) had implemented new legal and regulatory frameworks, which included the establishment of independent national regulators and, in the case of the OECS, national and one regional regulators. With the exception of Montserrat the five British Overseas Territories (Anguilla, British Virgin Islands, Cayman Islands, Montserrat, Turks & Caicos,) passed new laws and had or were in the process of licensing competing operators. The Bahamas passed a new telecommunications law in 1999, amended its Public Utilities Commission Act in 2000 and issued a telecommunications Sector Policy in 2001 (amended in 2002); however, it was unable to carry through with a planned privatization of the state-owned monopoly telephone company, BTC, which it initiated at the end of 2002 but which ended in failure in mid 2004. Guyana had never fully implemented provisions of the Telecommunications Act of 1990 but had developed a new policy for the sector. In Antigua & Barbuda Cable & Wireless has exclusivity (until 2012) for international communications and the 100% government-owned Antigua Public Utilities Authority (APUA) maintains a monopoly for a local fixed line services; however, there are three mobile operators and the new government is contemplating introducing new legislation which will liberalize the market.

In the non English-speaking Caribbean Suriname established an independent regulator by decree in 1998 but which had not yet been given effect even though a new Telecommunications Act was passed by Parliament in September 2004. The Dominican Republic passed the new telecommunications law in 1998 which, inter alia, established the independent regulator, Instituto Dominicano de Telecomunicaciones (INDOTEL). Haiti has maintained a structure similar to the one it had back in 1997

Pricing Issues

Because of the lack of competition international calls can cost up to 30 times more than in North America. Intra Caribbean rates are as expensive as rates for calls made from North America to the Caribbean. Even in Jamaica where new entrant, Digicel, has taken significant market share from the incumbent Cable & Wireless in mobile services, it can cost 7 times more than making a call to the same

international destination from North America; however, monthly line rental and local calling charges in most Caribbean countries are by comparison low.

While competition will drive down the price for international calling the high cost of leased circuit capacity has been and continues to be a serious impediment to the development of an ICT sector and the establishment of the Information Society in the Caribbean. Because of the lack of competition the price of a T1 (1.544 Mbps) lease between Trinidad & Tobago and Miami costs about 15 times more than the lease of an E1 (2.048 Mbps) between Amsterdam and Madrid, a little more than half the distance, when compared on a per Mbps basis for a comparable capacity lease. It is not surprising, therefore, that consumers have to pay double or triple for dial up or high speed Internet access as do consumers in North America.

There are basically two ways to address the high cost of leased circuit capacity: (i) promoting competition in the provision of domestic and international backbone capacity; and (ii) where there is little or no competition to impact prices, regulating the monopoly's or the dominant operators' prices for such capacity.

The first of these requires a regulatory framework which allows and promotes domestic and international facilities-based competition when new entrants are able to build, operate, and offer services on competing domestic and international backbone infrastructure. In The Bahamas, Belize, the Dominican Republic, Trinidad and Tobago, Anguilla and even Jamaica, for example, cable TV operators which have extensive national fiber optic networks are offering or will be able to offer bandwidth capacity to private enterprises, ISPs, the government, and even individuals. In Barbados the electricity company, which has its own fiber optic network, will be able to offer capacity on these and new undersea fiber optic cable consortia will be able to apply for and obtain landing licenses for their systems.

The government and the regulator, however, also need to develop policies and regulatory provisions on fair, non-discriminatory access and interconnection arrangements as well as on site sharing and collocation.

Where there is no or little competition in the provision of leased circuit capacity, the regulator must ensure that conditions exist for users to obtain the bandwidth capacity they need under non-discriminatory, transparent conditions and at cost- base prices.

Anguilla, The Bahamas and the Dominican Republic have the cheapest high speed Internet access and Trinidad & Tobago has the most expensive. In the former three countries (and territories) cable TV operators and to a lesser extent fixed wireless operators compete with incumbents' ADSL services.

Interconnection charges appear to be in line with international benchmarks.

Free Trade Negotiations involving the Caribbean

The Caribbean is currently engaged in the following inter-regional, hemispheric, and bilateral trade negotiations.

- At the multilateral level within the framework of the WTO Doha Agenda negotiations which had initially been targeted for conclusion by 1 January, 2005;

- At the inter-regional level with the framework of the CARIFORUM-European Union (EU) negotiations for an Economic Partnership Agreement (EPA), which were officially in 2004, represents the regional configuration of the CARICOM countries (Antigua and Barbuda, The Bahamas, Barbados, Belize, Commonwealth of Dominica, Grenada, Guyana, Haiti, Jamaica, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago) together with the Dominican Republic, which is not a member of CARICOM. These negotiations are set to end December 31, 2007. The Economic Partnership Agreements will include services.
- At the hemispheric level within the framework of the Free Trade Area of the Americas (FTAA), which also were initially planned to be concluded by January 2005. The current (public) version of the draft FTAA Agreement contains text on telecommunications pricing and introduces competitive safeguards such as the requirement that dominant operators and service providers (“major suppliers of public telecommunications services”) make available to enterprises and other operators and service providers leased circuits, interconnection, access to rights of way, co-location facilities and unbundled network elements on reasonable and non discriminatory conditions and at cost oriented (and flat rate for leased lines) prices. It also requires the regulator to be independent of any supplier of public telecommunications services, that there be technology neutrality, that the regulatory process and licencing procedures be transparent and that procedures and obligations related to universal service and allocation of scarce resources be non discriminatory and transparent.
- Bilateral negotiations between the Caribbean and individual countries or groups of countries. CARICOM already has bilateral free trade agreements with Costa Rica (2003), Dominican Republic (2001), Cuba (2000), Colombia (1994 amended in 1998) and Venezuela (1992).

In mid 2005 the Dominican Republic along with five Central American countries⁵ agreed on the Central America - Dominican Republic Free Trade Agreement (CAFTA-DR) with the USA.

The Caribbean Regional Negotiating Machinery (CRNM) was established by the Conference of Heads of Government of CARICOM in 1997 with the main purpose of developing and executing an overall negotiating strategy for the various negotiations in which the region is involved and leading the Region’s negotiating team

Noteworthy Regional ICT Initiatives

Two recent and noteworthy initiatives are supporting the development of the ICT sector in the Caribbean. These are the Master’s Degree in Telecommunications Regulations and Policy (MRP) of the University of West Indies and the Caribbean Knowledge and Learning Network (CLKN). The former, a two year master’s level program was developed in response to a resonantly articulated need for training in telecommunications policy and regulation in the region and the lack of any resources to provide such training. It is pitched at an executive level audience and its purpose is to expand teaching resources by calling upon a virtual community of academics, professionals, and practitioners to share their knowledge and experiences with students but also to develop a community of interest in the subject in the Caribbean and beyond.

⁵ Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua. The Agreement was agreed by the USA Congress in July 2005 and signed by the USA President on August 2 of the same year. It has been ratified by all countries except Costa Rica.

The CLKN was officially launched on 4 July 2004 at the CARICOM Heads of Government Meeting in Grenada and has as its main objective to support the enhancement of the competitiveness of Caribbean countries by upgrading and diversifying skills and knowledge through increased regional collaboration and use of ICT to connect citizens. It is in this respect consistent with the strategy in the CARICOM Caribbean Connectivity Agenda which is to promote major increases in citizen access to the global information infrastructure and to produce on-line communities (e-communities), on-line companies (e-business), and on-line government (e-government). It will consist of satellite based network connecting tertiary institutions in the Caribbean and the distance education centers of the University of the West Indies to offer and receive distance learning courses and other online services.

Regulatory Barriers to Investment

One of the main objectives of this study was to identify regulatory barriers to investment in the region and to recommend action to reduce these barriers as a way of promoting the development of the ICT sector in the Caribbean. Two general types of barriers were identified: a) Barriers which relate to regulatory institutions and b) Barriers which result from deficiencies in the legal and regulatory framework in these countries and territories. Barriers under a) include: i) a newly established competitive environment where one operator continues to dominate; ii) real or perceived political interference in the functioning of the regulator; iii) lack of experience and training in disputes resolution; and iv) a lack of sufficient expert resources within the regulatory body and under b): i) unpredictable and sometime unstable regulatory environments and ii) absence of harmonized regulations and policies in the region.

Recommended Action

The following general policy initiatives are recommended as a means for reducing these barriers.

- Establish a comprehensive regional program of resource sharing, training, and information exchange among regulators and policy makers;
- Facilitate interaction among the region's regulators to review, improve, revise, and harmonize policies, legal and regulatory frameworks, procedures and standards to diminish uncertainty and simplify procedures for investors;
- Enable the newly established regulatory institutions in the region to become more effective and to assert their independence of political and other influences;
- Familiarize telecommunications regulators and government officials with i) the principles and best practices in the area disputes resolution and develop on a cooperative basis within the region increased capacity to deal with disputes resolution and ii) business planning and finance to enhance their understanding of the financial and economic implications of their decisions and their impact on the flow of investment into the telecom sector; and
- Familiarize policy makers, regulators, trade negotiators, other government officials and the private sector with telecommunications and ICT related issues of the Doha Round trade negotiations and other trade negotiation issues, and to provide any necessary technical support they may require in negotiations .

More specifically four ongoing mechanisms primarily for the newly established independent regulators and government officials in the region are recommended as a way of realizing these general policy initiatives:

1. a program of resource sharing, information exchange, and training for regulators and government officials;
2. a virtual network of academics and experts in telecommunications policy and regulation;
3. a regional forum for consensus building and disputes resolution in the Caribbean; and
4. a mechanism to support the establishment of a regional non-commercial high speed research and education network in the Caribbean. This latter would provide basic infrastructure to facilitate the realization of the other three mechanisms and would have the additional benefit of supporting the academic and research community in the Caribbean and enhancing the opportunity to implement distance learning programs in the region.

Also given that the role of and implications for telecommunications and ICT of these free trade negotiations is neither well understood nor sufficiently well appreciated by policy makers, regulators and trade officials in the Caribbean. Given their importance for economic development of the region it is strongly recommended that a comprehensive program of awareness raising and capacity building in this area be developed and maintained in the Caribbean. This should typically consist of:

- i. a capacity building program including training, exchange of experiences and policy research of key issues;
- ii. promoting policy dialogue among policymakers (telecommunications, ICT and trade officials), regulators and operators; and
- iii. establishing an easy-to-use database with key indicators to facilitate monitoring developments and preparing negotiating positions. This latter should be tied in with the data base being proposed for regulators and government officials.

Much of the information for this study was gathered in interviews with over 80 stakeholders in the region and outside observers representing both the private and public sectors. They included representatives of: governments; the new regulators; operators and service providers; regional and international funding and cooperative organizations; lawyers, consultants, academics, and NGOs; and trade associations and users. I wish to thank all for the information they provided and their support for this study. I wish particularly to thank those that took the time to comment on various parts of the text that I sent them for review.

p.a. stern, April 2006

Acronyms

ACP	Asia, Caribbean, and Pacific
ACS	Agencia de Control y Supervisión
ADEC	Asociación Dominicana de Empresas de Cable
ADORA	Asociación Dominicana de Radiodifusoras
ADSL	Asymmetric Digital Subscriber Line
AHCIET	Asociación Hispanoamericana de Centros de Investigación y Empresas de Telecomunicaciones
AHTIC	Association Haïtienne pour le développement des TIC (Haiti)
APT	Asia Pacific Telecommunity
APUA	Antigua Public Utilities Authority
ARCOS	America's Region Caribbean Optical-ring System
ATN	Atlantic Tele-Networks
BC	Broadcasting Commission
BGC	Bahamas General Communications
BICS	Bahamas Internet Cable System
BOTs	British Overseas Territories
BTC	Bahamas Telecommunications Company Limited
BTL	Belize Telecommunications Limited
BVI	British Virgin Islands
BWA	Broadband Wireless Access
C & W	Cable & Wireless
CAC	Consumer Affairs Commission (Jamaica)
CAGR	Compound Annual Growth Rate
CANTO	Caribbean Association of National Telecommunications Organizations
CARAC	Caribbean Atlantic Cable System
CARAC	Caribbean Atlantic Cable System
CARICAD	CARICOM Centre for Development Administration
CARICOM	Caribbean Community and Common Market
CARIFORUM	Caribbean Forum of ACP (Asia, Caribbean and Pacific) States
CCJ	Caribbean Court of Justice
CCT	Caribbean Cellular Telephone
CCTT	Cable Company of Trinidad and Tobago
CDB	Caribbean Development Bank
CDERA	Caribbean Disaster Emergency Response Agency
CDMA	Code Division Multiple Access
CIDA	Canadian International Development Agency
CITEL	Inter-American Telecommunication Commission of the Organization of American States
CITI	Columbia Institute for Tele-Information
CJFS	Cayman Jamaica Cable System
CKLN	Caribbean Knowledge and Learning Network
CLARA	Cooperación Latinoamericana de Redes Avanzadas
CMI	Caribbean Meteorological Institute

CMO	Caribbean Meteorological Organization
CONADEF	Conseil National de Développement et de Planification
CONATEL	Consejo Nacional de Telecomunicaciones (Dominican Republic)
CONATEL	Conseil National des Télécommunications (Haïti)
CPA	Cotonou Partnership Agreement
CPE	Customer Premises Equipment
CPP	Calling Party Pays
CRNM	Caribbean Regional Negotiating Machinery
CSME	CARICOM Single Market and Economy
CTL	Caribbean Telecommunications Ltd.
CTU	Caribbean Telecommunications Union
CUDI	Corporación Universitaria para el Desarrollo de Internet (México)
CUG	Closed User Group
DEL	Direct Exchange Line
DOCSIS	Data Over Cable Service Interface Specification
DOM	Département d’Outre Mer, Eastern Caribbean and French Overseas Departments
DRN	Dirección de Regulaciones y Normas
DSL	Digital Subscriber line
DTH	Direct-to-Home
DWDM	Dense Wavelength Division Multiplexing
EC	European Commission
ECFS	Easter Caribbean Fibre System
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
ECTEL	Eastern Caribbean Telecommunications Authority
EDUCONS	Education and Communication Network Suriname
EPAs	Economic Partnership Agreements
ETECSA	Empresa de Telecomunicaciones de Cuba S.A.
EU	European Union
FTAA	Free Trade Agreement of the Americas
FTC	Fair Trading Commission
FWA	Fixed Wireless Access
GATS	General Agreement on Trade in Services
GBps	Giga Bits/second
GBSI	Global Broadband Satellite Infrastructure
GEANT	Pan European backbone connection national research and education networks
GSM	Global System for Mobile Communications
GT&T	Guyana Telephone and Telegraph Co.
IACD	Inter-American Agency for Coordination and Development
IADB	Inter-American Development Bank
ICA	Institute for Connectivity of the Americas
ICT	Information and Communication Technologies
IDRC	International Development Research Center
INDOTEL	Instituto Dominicano de Telecomunicaciones
IPLC	International Private Leased Circuit

IRUs	Indefeasible Rights of User
ISMI	International Mobile Subscriber Identity
ISPs	Internet Services Providers
IT	Information Technology
ITSO	International Telecommunications Satellite Organization
ITU	International Telecommunications Union
JAMPRO	Jamaica Promotions Corporation
JCCE	Joven Club de Computación y Electrónica (Cuba)
JNAP	Digicel and Jamaica Network Access Point
JTAC	Jamaica Telecommunications Advisory Council
LACEA	Latin American and Caribbean Economic Association
MAC	Mid Atlantic Crossing Cable System
MBps	Megabits/second
MIC	Ministry of Information and Communications
MMDS	Line-of-sight multi-channel, multi-point
MOU	Memorandum of Understanding
MRP	Master's Degree in Telecommunications Regulation and Policy
MTPTC	Ministère des Travaux Publics, Transport et Communications (Haïti)
MTPTC	Ministère des Travaux Publics, Transport et Communication (Haïti)
NAP	Network Access Point
NARUC	National Association of Regulatory Utility Commissions
NFMU	National Frequency Management Unit
NGBT	Negotiations on Basic Telecommunications
NRRI	National Regulatory Research Institute
NTRCs	National Telecommunications Regulatory Commissions
OAS	Organization of American States
OECD	Organization for Economic Cooperation and Development
OECS	Organization of Eastern Caribbean States
OOCUR	Organization of Caribbean Utility Regulators
OUR	Office of Utilities Regulation
PDH	Plesisynchronous Digital Hierarchy
PLC	Power Line Communications
PSTN	Public Switched Telecommunications Network
PSTN	Public Switched Telephone Network
PUC	Public Utilities Commission
PURC	Public Utility Research Center
RETINA	Red Teleinformática Académica en Argentina
REUNA	Red Universitaria Nacional en Chile
RFP	Request For Proposals
RIO	Reference Interconnection Offer
RLL	Radio-in-the-Lloop
RPBG	Rosheuval & Partners Business Group (Suriname)
RPP	Receiving Party Pays
RTA	Regional Trade Agreements
S&D	Special and Differential Treatment
SAC	South American Crossing Cable System
SDH	Synchronous Digital Hierarchy

SDR	Software Defined Radio
SMA	Spectrum Management Authority
SMITCOMS	Sint Maarten International Telecommunications Services
SMP	Significant Market Power
SMPR	St. Martin Puerto Rico Cable System
SMS	Short Message Service
SRG	Systems Resources Group
STL	Studio Transmission Link
TAS	Telecommunications Authority Suriname
TASF	Technical and Advisory Support Facility
TATT	Telecommunications Authority of Trinidad and Tobago
TBps	Terabits/second
TCCC	Trans-Caribbean Cable Company
TCCN	Trans-Caribbean Cable Network
TDMA	Time Division Multiple Access
TELECO	Les Télécommunications d'Haïti S.A.M.
TEMIC	Telecommunications Executive Management Institute of Canada
TSTT	Telecommunications Services of Trinidad & Tobago
UNDP	United Nations Development Program
USAid	United States Agency for International Development
UWB	Ultra Wide Band
VAS	Value Added Services
VoIP	Voice over Internet Protocol
WiFi	Wireless Fidelity
WiMAX	An air interface standard for fixed broadband wireless access (BWA) systems employing a point-to-multipoint architecture
WLAN	Wireless Local Area Network
WLL	Wireless Local Loop
WRC	World Radio Conferences
WSIS	World Summit on the Information Society
WTO	World Trade Organization

INTRODUCTION:

THE CURRENT STATUS OF TELECOMMUNICATIONS IN THE CARIBBEAN

The countries and territories of the Caribbean, which have until now been very dependent on agriculture (bananas, sugar, coffee), tourism, and in the case of Trinidad and Tobago on oil, gas and chemical exports, have been seeking to diversify these mainly resource based (except tourism) economies. Many have been looking to develop information-based industries including data entry, data manipulation, data conversion, information processing, and information management. The Caribbean has many advantages which would support the development of such activities including a strong affinity to North America, a common language and time zones, relatively easy and quick access from the USA and Canada, a basic core of highly skilled professionals, wages which may be high with respect to other centers of outsourcing but are nevertheless lower than those in the USA and Canada, and some experience already gained in information base industries. In addition, there is an important Caribbean Diaspora, living mainly in the USA, Canada, the United Kingdom and to a smaller extend in France and the Netherlands which has the skills and the wealth, which can be tapped to support the development of dynamic Information and Communication Technologies (ICT) in the region. Many countries and territories have been seeking to use ICT to connect their citizens for education, commerce, health and cultural development.

In this respect the ICT strategy adopted by regional Ministers responsible for ICTs in October 2004 recognizes the need for “an aggressive and focussed” ICT strategy for the region and urges the CARICOM members to adopt new approaches to ICT policymaking and regulation, capacity building, and research and innovation. The strategy also encourages CARICOM member states to develop publicly-funded ICT programmes that address the need for “disenfranchised and under-served” communities to reap the benefits associated with investments in ICTs. Special mention is made to programs and policies linked to e-literacy, e-government, and skills training for cultural organisations/entrepreneurs to enable them to effectively market Caribbean cultural products and particular attention is paid to the need for member states to provide low-cost high-bandwidth connectivity to the region’s citizens. Finally, the strategy urges national and regional organisations to prepare "with the utmost emergency" action-oriented ICT projects in key areas such as ICC Cricket World Cup 2007, disaster management and mitigation, and trade facilitation through the CARICOM Single Market and Economy (CSME).

Similarly, the focus of the CARICOM Connectivity Agenda adopted in July 2002 by the Conference of Heads of Government of CARICOM is to increase competitiveness in services, harness the potential of electronic commerce particularly for small and medium-sized enterprises (SMEs) and develop national and/or regional/sub-regional information and broadcast communications and media services.

What is, of course, important is the implementation of these strategies plans and proposed actions of which there has been relatively little evidence so far in the region.

While it is clear that the region has been making some progress in seeking to address the challenges being created by digital convergence and seize the many opportunities the information revolution is making possible, it is clear that there are significant levels of fragmentation at both the regional and national levels that have inhibited the region’s ability to create a true information society within the Caribbean. Countries that have taken initiatives in this direction are: (a) Antigua and Barbuda which in 2003 unveiled an ICT policy to govern the introduction of digital technologies into the country’s schools with a stated mission to “improve the teaching, learning and administrative processes in the

education system with the use of ICT and to provide all students with the basic ICT skills that are necessary for the information age”; (b) The Bahamas which in released a policy statement on Electronic Commerce and the Bahamian Digital Agenda which outlined a vision of transforming the country into a centre of hemispheric excellence in e-commerce; (c) Barbados whose National ICT Strategic Plan completed in 2005 seeks to bring some order to a fragmented sector as well as chart the country’s path towards realization of the knowledge-based society and diffusing the new digital technologies more effectively throughout the economy and society; (d) Belize where the governing People’s United Party of Belize has promised the creation of “a high tech Belize” that will make the computer an integral part of the economic, social and political life of the country; (e) ECTEL which recently embarked on a World bank funded project on behalf of its five member states to design and implement a broadband deployment strategy and the development of guidelines for universal service implementation; (f) Guyana which has drafted an IT policy containing national and strategic ICT objectives, strategies for the development of e-government, ICT policies linked to support for the educational sector, and approaches to facilitating growth within the nation’s information technology productive sector; (g) Jamaica where an IADB funded project will contribute to Jamaica’s e-readiness and support the development of the ICT sector, in order to increase competitiveness, diversify exports and expand productive employment; and (h) Trinidad & Tobago, which issued its National Information and Communication Technology Plan in December, 2003. and where an IADB funded ICT project is about to be initiated..

Noteworthy regional ICT initiatives discussed in the report include the University of the West Indies’ Master’s Degree in Telecommunications Regulation (MRP) to provide much needed training in telecommunications policy and regulation particularly with a Caribbean focus and the establishment of a Caribbean Knowledge and Learning Network (CKLN) whose main objective is to enhance the competitiveness of Caribbean countries by upgrading and diversifying skills and knowledge through increased regional collaboration and use of ICT to connect citizens.

Development of an information-based industry and the realization of an ICT strategy and its incorporation into every day economic activity are, however, dependent on general factors including i) the availability of physical infrastructure which allows people, businesses and governments to communicate and ii) how easily this infrastructure is accessible to all who have or want to communicate. There is good infrastructure in the Caribbean but it is unevenly distributed and expensive to use. Fixed telephone penetration, an index often used to measure the state of development of telecommunications infrastructure, in the CARICOM Member States and the Dominican Republic varies between about 50% in Barbados, Antigua & Barbuda and St. Kitts & Nevis and 1.7 % in Haiti. Similarly, there is a wide disparity in the penetration rates of cellular mobile, Internet access and Internet use. Table 1 shows data for the CARICOM Member States.

This report focuses on the infrastructure necessary to deliver ICT services such as e-government, e-learning, and e-health to the citizens of the Caribbean and to facilitate e-commerce among its people and businesses. It does not provide a detailed review of the status of application of these applications in the region.

Table 1
Population, per Capita GDP, Fixed and Mobile Telephone Penetration in the CARICOM
Member States and the Dominican Republic

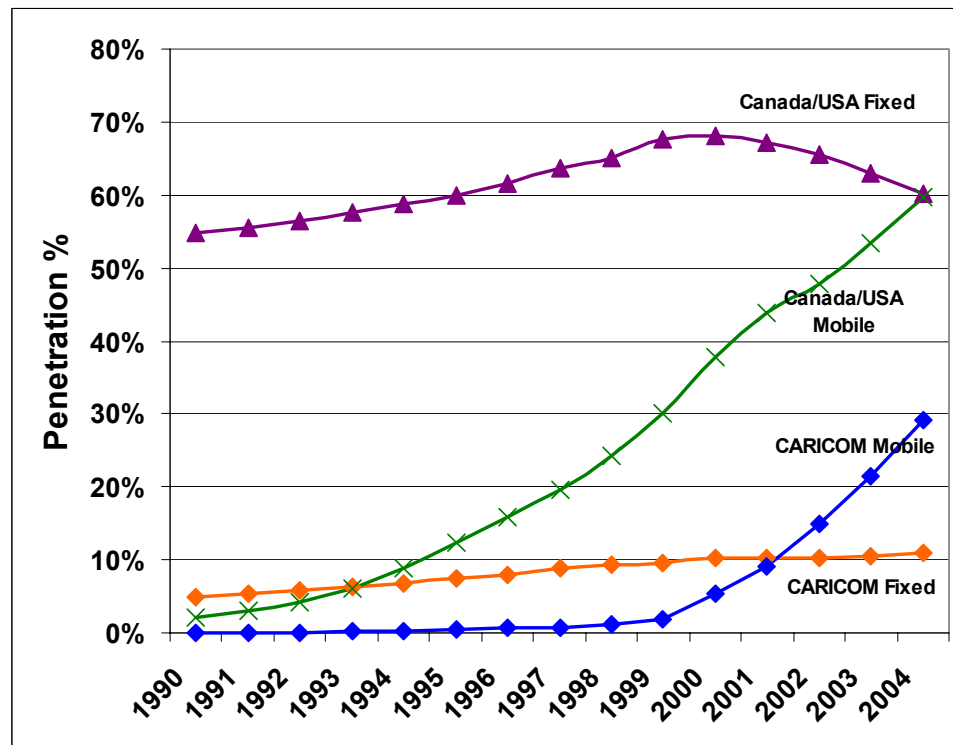
CARICOM Member State	Population 2004	per capita GNP (2004)	Penetration rates % (2004)	
			Main Line	Mobile
Antigua and Barbuda	77,000	\$11,000 *	49.4	70.1
Bahamas	317,000	\$17,700	44.1	58.7
Barbados	271,000	\$16,400	50.1	73.9
Belize	261,000	\$6,500	12.9	37.5
Dominica	71,000	\$5,500 **	29.5	58.9
Grenada	103,000	\$5,000 *	31.8	42.1
Guyana	767,000	\$3,800	13.4	18.8
Haiti	8,437,000	\$1,500	1.7	4.7
Jamaica	2,676,000	\$4,100	18.7	82.2
Montserrat	9,300	\$3,400 *		
Saint Kitts and Nevis	50,000	\$8,800 *	50.0	20.0
Saint Lucia	150,000	\$5,400 *	32.2	62.0
St. Vincent and the Grenadines	121,000	\$2,900 *	15.7	47.1
Suriname	439,000	\$4,300	18.5	48.5
Trinidad and Tobago	1,307,000	\$10,500	24.6	49.6
Total	15,056,300			
Average			10.8	29.0

Source: ITU WTI 2005 * 2002 ** 2003

The average fixed telephone penetration in the CARICOM Member States and the Dominican Republic is less than 11% compared with about 60% in North America (Canada and USA). Since 1990 the Compound Annual Growth Rate (CAGR) in these countries, when the penetration rate for fixed telephone was just 4.9%, has been 8.3%. Like in other parts of the world mobile penetration has grown much more rapidly, rising from a negligible 0.017% in 1990 to 29% at the end of 2004 (CAGR = 75.9 %)¹. Figure 1 below compares growth of fixed and mobile telephone penetration in CARICOM

¹ With the real impact of the opening of the cellular mobile market in the region just starting to be felt, mobile penetration rates in 2004 are probably well above this figure.

Figure 1
Growth of Fixed and Mobile Telephones in North America (Canada and USA) and the Caribbean



Source ITU WTI 2005

Four countries from the Caribbean were included in the World Economic Forum's (WEF) Global Competitiveness Report 2005-2006, which evaluates the perceptions and observations of business leaders with respect to three component indices (technology index, public institutions index, and macroeconomic environment index) in 117 countries. Trinidad & Tobago, Jamaica, Dominican Republic and Guyana ranked, respectively 60th, 70th, 102nd, and 115th out of 117². The technology index is subdivided into the innovation, technology transfer and ICT sub indices. A separate report by the same institution ranks Jamaica, Trinidad & Tobago and the Dominican Republic 49th, 59th, and 78th out of 104 countries in its 2004-2005 Global Information Technology Report. The latter, which highlights the policy, institutional, and structural obstacles that prevent countries from fully capturing the benefits of ICT, establishes a country's networked readiness based on three so-called pillars. (i) the environment for ICT development, such as the regulatory regime and the legal framework for ICT, the available infrastructure, and other technological development factors; (ii) the actual levels of networked readiness of individuals, businesses, and governments; and (iii) the actual levels of usage of ICT by individuals, businesses, and governments.

² Rankings are based on perceptions and observations of business executives in each country surveyed by the World Economic Forum in 117 countries in collaboration with academic and other institutions. See World Economic Forum, The Global Competitiveness Report 2005-2006.
<http://www.weforum.org/site/homepublic.nsf/Content/Global+Competitiveness+Programme%5CGlobal+Competitiveness+Report>

The high prices that users have to pay for international calling, Internet use, and leased lines has been one of the main obstacles to developing an information-based industry in the Caribbean. This impacts not only the traditional industries such as tourism and agriculture which depend on communications to market and sell their services and goods but also the new information-based sectors where high costs affect Caribbean firms' abilities to compete effectively internationally. There is a large potential for developing a variety of information based services in the Caribbean from the fairly basic (mainly outbound calling) through the more sophisticated (customer care and technical support) call centre services to the more highly specialized network services. Boxes 1, 2 and 3 illustrate examples from Belize, St Lucia, and The Bahamas. For these, however, the costs of communication to and from and within the region including the cost of leased lines and the conditions attached to their use remain a significant barrier to further developing such activities.

A landmark 1996 study by the World Bank identified the high price of communications identified as a barrier to the development of services exports in the Caribbean³. At the time all but one country (Dominican Republic) had monopoly suppliers of telecommunications networks and services; however, pressure was growing to follow other countries around the world which had or were reforming their telecommunication sectors. Negotiations were under way in the WTO to liberalize not only value added but also basic telecommunications, and the European Commission had announced that telecommunications in the European Union would be fully liberalized on 1 January 1998.

Nearly a dozen countries in the Caribbean participated in these WTO negotiations. Of these seven made market opening commitments (Antigua & Barbuda, Belize, Dominica, Dominican Republic, Grenada, Jamaica, Trinidad & Tobago) within the constraints of the exclusive arrangements they had with the monopolies operating in their countries.

Around that time several began drafting sector policies, preparing legislation, and planning negotiations to revise exclusive arrangements with the monopoly suppliers. The Organization of Eastern Caribbean States (OECS) and the Dominican Republic began the process of reform and sought financial support from the World Bank. Others such as Trinidad & Tobago, Haiti, Barbados, Jamaica, and Guyana got support from other funding institutions including the Inter-American Development Bank (IADB), International Telecommunications Union (ITU), the World Bank, the Canadian International Development Agency (CIDA) and the United States Agency for International Development (US Aid).

Nine years after the conclusion of the WTO's negotiations on basic telecommunications in February 1997 the process of sector reform has advanced in the whole region. Nearly all countries have put new legal and regulatory structures into place and have established independent regulators. Some have yet to complete the process. Yet, in spite of this the benefits of reform still elude most Caribbeans who continue to pay high prices in most countries and territories and for whom the availability of good affordable telecommunications services continues to be a barrier to the development and growth of the ICT sector.

This report reviews the current state of the telecommunications sector in the region and examines why the desired efforts of reform have not yet been achieved and suggests some regional cooperative action to support both regulators and governments in achieving these objectives of the reform process.

³ Schware, Robert, Susan Hume, *Prospects for Information Service Exports from the English-Speaking Caribbean*, The World Bank, Latin America and Caribbean Region, March 1996

Box 1: Ready Call Centre in Belize: Benefits & Constraints of such Undertakings in the Region

Ready Call Center – Belize*

Ready Call Center (RCC) is an Internet based, backend call center operation established in June 2005, in Belize City, Belize. It is the only call centre in Belize. The company is owned by the family of Mrs. Nubia Ramirez-Gomez and managed by Mrs. Ramirez, who is originally from Colombia. The company currently provides offshore, turnkey backend customer services, including activation, reactivations and some technical support for a single client - TracFone Wireless, the leading independent provider of nationwide prepaid wireless telecommunications services in the United States. The TracFone Wireless product is a pay-as-you-go, off-the-shelf mobile phone and prepaid airtime that features no annual contracts or activation fees. It is offered nationally through more than 60,000 retail outlets, including Walmart and 7-Eleven. Headquartered in Miami, Florida, TracFone Wireless is a 98%-owned subsidiary of América Móvil, Latin America's largest provider of wireless telecommunications.

RCC's business model implies exciting prospects both for the company and for Belize. A key determinant of RCC's decision to bring its investment to Belize was the characteristics of the local labour force, specifically, a young orientation, a high literacy rate (at least to high school level), amenable pay rates, bilingual abilities (with an emphasis on English), limited employment opportunities (12% unemployment), proximity to and an influence and penchant toward American culture. For Belize, the benefits are investment and development of a viable export industry (ICT services), and substantial employment opportunities for the largest unemployed sector of the labour force.

RCC started business with twenty five employees. Growth since then has been astounding! By December of 2005, the company had grown to six hundred agents and administrative staff. RCC's agents work in shifts of 5 – 8 hours and are paid a little over \$4.00 Belize dollars per hour or double the minimum rate. Working in its favour is the fact that the exposure to the characteristics of foreign markets, international standards of customer service, and technology transfer make the jobs appealing to the local labour market. Also assets are its performance based systems and efficient task technology, a clear purpose and vision, obvious leadership and extreme growth potential.

The call center uses primarily VoIP transmitted via four E1's rented on the ARCOS submarine cable system at a cost of US\$ 3,600/month each from Belize Telecommunications Limited. BTL as a general practice does NOT allow VoIP transmissions via its E1s and an exception was made in this case only because RCC agreed to transmit only incoming VoIP calls. Outgoing VOIP is strictly prohibited by RCC's agreement with BTL.

The union between RCC and Belize has not been without significant challenges. Cultural and contextual unfamiliarity of the senior management and failure of administrative systems to evolve in concert with the growth and needs of the organization, undermine its achievements. Additionally, it does not have enough physical facilities including computers, E1s and even office space to meet its growth trajectory. In terms of challenges associated with the host country, a major barrier to Belize competing effectively with other call centre locations is the less than welcoming investment climate, meaning that there is a general lack of transparency and accountability, inconsistencies in the investment information (depending on source) and complexity in the investment procedures. Additionally labour laws that are less than enabling or silent on labour and employee issues specific to the working environment of a call center complicate the call center's relationship with its employees and the local authorities.

*Prepared by Celene Cleland, Managing Partner, Launchpad Consulting, Belize City

Box 2: Helen IT, St.Lucia's Only Call Centre

Helen IT – St Lucia

Helen IT is the only call centre in St Lucia. It is locally owned and operated and serves primarily the North American market. It is also set up to service clients in the Europe. It currently employs about 220 people who work in two 8-hour shifts and are paid at an equivalent of a bank clerk's salary. It provides primarily outbound call centre services to a variety of clients, including collections, (e.g. calling customers with overdue payments); health care, and telemarketing (e.g. sale of vacation packages). It also provides some inbound customer service support. In this respect it is still a "first generation" call centre which aspires to move into more sophisticated "inbound" type services such as customer care and technical support. It is equipped with 250 agent stations and call centre software I which allows for the updating of customer information, in databases located either at the call center or remotely in the US. The center accesses client's databases in the US, and uses a Virtual Private Network and firewalls to ensure data security. A predictive dialler from Stratasoft, places all outbound calls and receives inbound calls which are routed to agents. The facility is state of the art and compares with similar call center in the USA. The facilities provide a pleasant working atmosphere. Because the head microphones are unidirectional they do not pick up the background music which is provided or the permitted discussion among line staff and supervisors. Currently Helen IT has space to expand to almost four times its current size.

A major barrier to its competing effectively with other call centre locations such as India and Egypt is the cost of transmission facilities between St Lucia and North America. Helen IT is currently paying in the order of US\$ 18 000/month to lease an EI capacity circuit between its call centre near Castries and the USA passing via the Eastern Caribbean Fibre Optic Cable System. By way of comparison the price for leasing an EI between India and the USA is in the order of US\$ 8,000 including the local loops. Satellite provides an alternative; however, with a cost of US\$ 12,000/month for an EI this option is still quite expensive. Satellite as compared to fibre has the disadvantage of having higher latency, the time it takes for the signal to travel from St.Lucia to its final destination. (500 milliseconds on satellite, 110 milliseconds on fibre). In addition, many large users of call centre services do not want satellite links because of the latency issue. In spite of lower overall costs and access to a higher skilled work force many North American companies prefer call centers in the Caribbean (near sourcing) for several reasons including:

- a certain preference for the Caribbean English accent
- familiarity in the Caribbean with North American culture through easy access to television and radio transmissions and interaction with North Americans tourists on the islands. This also facilitates face to face communications between the staff and North American trainers;
- significant lower turnover of staff than in the USA, India and other call center locations. This facilitates developing a long term training program aimed at giving the centre the capacity to provide more sophisticated (higher generation) call centre services;
- greatly facilitates client audits of the call centre. In many cases it is possible to fly into the island from the USA, visit the call centre and return home in the same day.

Developing higher level call centers in the Caribbean will, however, require training in technical, commercial and other skills, and require government support in the form subsidies for training.

Box 3: BGC Freedom, Bahamian IT Service Provider with Caribbean-wide Ambitions

BGC Freedom - Bahamas

BGC Freedom which began as a wireless Internet service provider in The Bahamas has expanded its activities to provide network services to the financial services sector and other businesses in partnership with the Swiss-based LANexpert SA. Network service which BGC Freedom offers include: maintenance of hardware and software, operating systems, communications and networking, security and firewalls, voice mail, e-mail, and messaging systems.

The partnership agreement grew out of a need of the Swiss based company to have a local partner to service its Swiss-based banking clients in The Bahamas. BGC Freedom is using this partnership to build up its own expertise in network services. It has already hired several new IT professional staff since signing the agreement with LANexpert SA and is looking to provide these services across the Caribbean.

This report was commissioned by the Inter-American Development Bank (IADB) to define technical assistance programs to promote the development of the Information and Communication Technologies (ICT) sector in the region. The premise for this is that investment in ICT has a positive impact on economic development because of its contribution to growth and labour productivity⁴. Development of an information-based society and the realization of an ICT strategy and its incorporation into every day social and economic activity are, however, dependent on the availability of physical infrastructure which allows people, businesses and governments to communicate and on how easily this infrastructure is accessible to all who have or want to communicate⁵.

The report reviews the basic infrastructure for ICT in the Caribbean and compares the current telecommunications policy and regulatory framework with that of 1996 and 1997 when governments in the region began earnestly to think about reform. At that time twelve of them participated in the World Trade Organization negotiations on basic telecommunications. The report also examines telecommunications pricing issues, the current free trade negotiations which impact the ICT sector and some noteworthy regional initiatives to promote ICT. Finally it discusses regulatory barriers to investment in the telecommunications sector and recommends a number of actions to overcome these. While the focus in the report is on six countries (Barbados, The Bahamas, Guyana, Jamaica, Suriname, and Trinidad & Tobago) and the Organization of Eastern Caribbean States (Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines) most other countries and territories of the region are also reviewed and compared.

⁴ ICT investment helps firms become more efficient and innovative and by contributing to the creation of knowledge, training and education In the countries of the Organization for Economic Development and Cooperation (OECD) the contribution of ICT investment alone was 0.3 to 2.8 percentage points of the per capita GDP growth between 1995 and 2001 See: *ICT and Economic Growth, Evidence from OECD Countries, Industries and Firms*, OECD, Paris, 2003. One of the studies cited in this report shows that in the period 1995 to 2000 Canada's GDP grew at an annual rate of 4.9% and that the contribution of ICT investment to this growth was 0.7 %.

⁵ The Telecommunications Annex of the WTO's General Agreement on Trade in Services recognizes the dual role of telecommunications services as both a tradable service and a means of delivery of other services.

This report is divided into the following chapters:

1. An overview of telecommunications sector reform in the Caribbean starting with a review of the situation about 10 years ago prior to reform and looking at the current situation in terms of the progress achieved during the last few years and the various models of reform which have been established throughout the region;
2. The current state of sector reform and specific recommendations for action in The Bahamas, Barbados, Guyana, Jamaica, the ECTEL members of the OECS (Dominica, Grenada, St. Lucia, St. Kitts and Nevis, and St. Vincent and the Grenadines), Suriname, and Trinidad and Tobago;
3. An examination of regional telecommunications related issues and initiatives including: (i) the persistent high retail and wholesale prices for telecommunications services; (ii) regional integration in the form of CARICOM and the CARICOM Single Market and Economy (CSME); (iii) the various multi and bilateral free trade negotiations involving the Caribbean; and (iv) the ICT related initiatives of various global, regional and national cooperative and funding organizations;
4. An overview of infrastructure for ICT in the Caribbean including fiber optic cable networks and satellite systems and cellular mobile operations;
5. Identification of regulatory barriers to investment in the region; and
6. Recommended action for the region's governments, regulators, the IADB and other cooperative and funding organizations.

Following are the exchange rates which have been used in this study:

US \$ 1	=	Barbados \$	2.00
		Belize \$	2.00
	=	Dominican Republic	30
	=	Eastern Caribbean \$	2.70
	=	Euro	0.77
	=	Guyana \$	179.50
	=	Jamaica \$	61
	=	Suriname Guilder	2500
	=	Trinidad & Tobago \$	6.25

I TELECOMMUNICATIONS SECTOR REFORM IN THE CARIBBEAN: REGIONAL OVERVIEW

This chapter presents an overview of telecommunications sector reform in the Caribbean. It reviews the situation about 10 years ago prior to reform and looks at the current situation in terms of the progress achieved during the last few years and the various models of reform which have been established throughout the region.

I.1 Market structure prior to reform

Until quite recently virtually all (basic fixed and mobile, domestic and international and value-added services including Internet) telecommunication services were provided by monopoly operators in all countries in the Caribbean except the Dominican Republic. In the English-speaking Caribbean Cable & Wireless (C&W) was and continues to be the predominant investor in the telecommunications sector owning between 49% and 100% of the telephone companies in these countries and territories, directly or through the fully owned Cayman Islands based subsidiary Cable & Wireless (West Indies). In The Bahamas, Haiti, Guyana, and Suriname telecommunications operators were wholly owned by the government.

In February 1997 when 69 countries signed the agreement on basic telecommunications in the WTO these Caribbean operators all had licences whose terms very much favoured the foreign strategic investor and that in one case had two years earlier been extended to 2020⁶. C&W's licences, which resembled each other in all the countries and territories in which it operated, are illustrative of the favorable conditions accorded to this investor:

- C&W paid a small percentage of the local operator's revenues as a fee in the form of a royalty to the government. C&W did not pay for frequencies and was the de facto manager of the spectrum.
- The local operator had a virtual monopoly over all telecommunication services for the period of the licence⁷.
- The local C&W company was exempted from certain duties and taxes and from certain rules pertaining to the hiring of expatriates, privileges not always accorded to other companies.
- The government had little control over prices and received little information about the operation of the local operator even in cases where it was a part owner⁸.

The telecommunication laws in many of these countries pre-dated the Second World War and only applied to the radio frequency spectrum or more precisely the licencing of equipment that

⁶ Dominica had renewed C&W's exclusive licence for 25 years in 1995. In Guyana ATN's current licence ends in 2010 but the operator has the possibility, at its option, to have it extended for another 20 years.

⁷ This was stated in practically all of C&W's operating licenses in the Caribbean in the following terms: "to provide, own, install, maintain, operate and augment national telecommunications systems and services within (the country) and to provide, own, install, maintain, operate and augment international telecommunications systems and services both between (the country) and places or mobile stations within or outside (the country) and passing in transit through (the country)". International telecommunications systems and services were defined as "services which included transmission and reception of voice, record, data, facsimile or any other services or facilities as may be developed and become available from time to time".

⁸ It has been reported that in Board Meetings dealing with Government matters the Government's Board members were often not given company information necessary for the deliberations.

uses the radio frequency spectrum. The local monopoly operators were generally regulated not by these laws, but by the licence agreements, which were often vague and difficult for the government to enforce. In 1997 only Haiti had a sector specific regulatory body (CONATEL) which also regulated broadcasting. Trinidad & Tobago was developing a sector policy framework and the Dominican Republic and The Bahamas were drafting new legislation, which would establish independent regulators.

By late 1996 and early 1997 many governments of the region were starting to contemplate reform of their telecommunications sectors and eager to participate in the WTO's NGBT. For one, they understood that liberalization was a global phenomenon which would also encompass the Caribbean and that without reform they would be left behind in their efforts to promote development of information-based economies. At the same time ordinary citizens and businesses, which had had enough of paying high prices for international calls and leased circuits while receiving inadequate quality of services were starting to put pressure on their governments to act. They were comparing their situation with that of consumers in North America and elsewhere who were being offered choice, lower prices and improved quality of services. Trade negotiators and telecommunications policy makers in these countries began to understand that denying competition in this and other sectors was inconsistent with the basic principles of global and regional free trade negotiations such as the General Agreement on Trade in Services (GATS), the Caricom Single Market Economy (CSME), and the Free Trade Agreement of the Americas (FTAA).

As mentioned earlier seven countries (Antigua and Barbuda, Belize, Dominica, Dominican Republic, Grenada, Jamaica, and Trinidad and Tobago) made commitments at the conclusion of the NGBT; however, with the exception of the Dominican Republic⁹ these were necessarily modest allowing immediate competition only in some value added, Internet, and other non-basic services because of the near exclusive arrangements these countries had with the exclusive suppliers of telecommunications services at the time. Some countries also liberalized cellular mobile services. They all committed to open competition once the periods of exclusivity ended. Six other countries that participated in the NGBT did not make commitments in 1997; These were i) St Kitts & Nevis and Guyana, which had made earlier commitments at the conclusion of the Uruguay Round in 1995, and ii) St. Vincent & The Grenadines, St.-Lucia, Montserrat, and Barbados, which did not make any commitments but stated that they intended to do so later. Of these only Barbados and Suriname made subsequent commitments (in 1998).

C&W, which was also sensing the wind of change and the growing dissatisfaction among its customers, began to acknowledge that maintaining monopolies in telecommunications was going against the world wide trend and that change was inevitable. The exclusive arrangement it had in these countries and territories, even though legal, was becoming untenable. New technology made bypass of its network easier and the large difference between its local and international rates provided the incentive for such bypass to happen. It understood that it had little choice but to agree to renegotiate its exclusive agreements with the various governments in the region was better than trying to maintain it. Table 2 summarizes the situation in 1997 and 1998¹⁰.

⁹ The Dominican Republic committed to liberalizing virtually all basic services under the only condition that the operator establish a legal domicile in the country.

¹⁰ Stern, Peter A., *Caribbean Telecommunications Overview prepared for the Interamerican Development Bank*, August 1997

Table 2: Situation in 1997 and 1998: Market Structure and WTO Commitments of CARICOM Members and the Dominican Republic

* international operator only; ** several operators; *** renewable at the request of the company for another 20 years; **** commitment made in 1998; CUG = closed user group; ISP = Internet Service Provider; VAS = value added

Country	% Foreign Ownership of Operator(s)	Foreign Strategic Investor	Term of Exclusive Licence	WTO Commitment		
				Competition in Basic Telecoms	Adopts Reference Paper	Market Opening (with some or no limitations on market access and national treatment)
Antigua & Barbuda	100*	C & W	2012	2012	yes	VAS, CUG, ISP, satellite-based mobile & fixed satellite, CPE, teleconferencing
The Bahamas	0	B'TC, govt. owned	indefinite	no commitment	no commitment	ISP, trunking, paging, CPE
Barbados****	85	C & W	2011	01.01.2012	yes	CUG, ISP (1999), terrestrial and satellite based mobile (1999), cellular mobile (1999), mobile data (1999), PCS (1999), paging (1999), fixed satellite, private VSAT
Belize	23	MCI	2002	no commitment	yes	some VAS, ISP and paging after 30.12.2007; trunking, teleconferencing after 30.12.2002
Dominica	80	C & W	2020	no commitment	yes	CUG, VAS, ISP, mobile & fixed satellite, teleconferencing.
Dominican Republic	30-100**	GTE Motorola	no excl. licence	no commitment	yes	most basic services; commercial presence required
Grenada	70	C & W	2006	2006	yes	CUG, some VAS, ISP, trunking, CPE, mobile & fixed satellite
Guyana	80	ATN	2010***	no commitment	no commitment	some VAS, cellular telephone
Haiti	1	govt owned	-	no commitment	no commitment	no commitment
Jamaica	79	C & W	2013	09.2013	yes	some CUG, VAS, ISP, digital cellular telephone, CPE, teleconferencing
Montserrat	100	C&W	2013	no commitment	no commitment	no commitment
St. Kitts & Nevis	65	C & W	2015	no commitment	no commitment	some VAS
St. Lucia	100	C & W	2001	no commitment	no commitment	no commitment
St. Vincent & The Grenadines	100	C & W	no commitment	no commitment	no commitment	no commitment
Suriname****	0	govt. owned	Indefinite	01.01.2003	yes	duopoly in basic (incl. terrestrial and satellite based mobile, cellular mobile and PCS) until 01.01.2003; packet and circuit switched data; ISP; private telephone; mobile data; paging; trunking
Trinidad & Tobago	49	C & W	2009	2010	yes	VAS, terrestrial and satellite-based mobile, fixed satellite, CPE, teleconferencing.

service provider; CPE = customer premises equipment

I.2 The current situation

I.2.1 Regional overview: Progress achieved

By the late 1990s and at the beginning of this decade most countries and territories in the Caribbean had begun to develop pro-competitive policies for the sector and to initiate negotiations with their monopoly providers to revise the exclusive arrangements they had with C&W. Many had agreed new arrangements with the incumbent monopolies whereby the latter were to exchange their exclusive for non exclusive licences. These were, nevertheless, allowed to operate all networks and provide all services they did under the old arrangements.

By the end of 2005, Barbados, Belize, the five Organization of Eastern Caribbean States (OECS), Jamaica, and Trinidad and Tobago had implemented new legal and regulatory frameworks, which included the establishment of independent national regulators and, in the case of the OECS, a national and a regional regulator. All had and/or were in the process of licencing new operators and service providers. The five British Overseas Territories (Anguilla, Cayman Islands, Montserrat, Turks & Caicos, British Virgin Islands) had reformed or were in the process of reforming their telecommunications sectors including the passing of new pro competitive laws, establishing independent regulators and also licencing competing operators and service providers. The Bahamas passed a new telecommunications law in 1999, amended its Public Utilities Commission Act in 2000 and issued a telecommunications Sector Policy in 2001 (amended in 2002); however, it was unable to carry through with a planned privatization of the state-owned monopoly telephone company, BTC, which it initiated at the end of 2002 but which ended in failure in mid 2004. Guyana had never fully implemented provisions of the Telecommunications Act of 1990 but was developing a new policy for the sector.

In the non English-speaking Caribbean Suriname established an independent regulator, TAS, by decree in 1998 which has, however, still to be given effect. This will occur when the new Telecommunications Act, which was approved by parliament in September 2004, is promulgated. The Dominican Republic passed the new telecommunications law in 1998 which, inter alia, established the independent regulator, Instituto Dominicano de Telecomunicaciones (INDOTEL). Haiti has maintained a structure similar to the one it had back in 1997. In Antigua & Barbuda, where Cable & Wireless has exclusivity (until 2012) for international communications and the 100% government-owned Antigua Public Utilities Authority (APUA) maintains a monopoly for a local fixed line services, the government now has plans to liberalize the sector in early 2006.

Table 3 summarizes the situation today (March 2006).

Table 3: The Current (2005) Situation with Respect to Market Access in CARICOM Members and the Dominican Republic

Country	Current market access	Pro comp. Legislation.	Ind. Reg.	Cross border supply (mode 1)	Foreign ownership limits	Some of the main current players
Antigua & Barbuda	competition permitted in mobile and Internet access	new legislation planned	none		none	APUA PCS, C&W, and Cingular, Kelcom Intl.
The Bahamas	duopoly in fixed voice; monopoly in mobile and cable TV; some ISPs and others;	Telecom Act, 1999; PUC Act 1993 (Amended 2000)	PUC			BTC, Cable Bahamas, Indigo
Barbados	fully liberalized since Feb. 2005	Telecom Act, 2002	FTC	Not prohibited in Act	None, 75% for mobile	C&W, Digicel, Telebarbados, Antilles Crossing, Kelcom Intl.
Belize	Fully liberalized since Aug. 2002	Telecom Act, 2002	PUC	Not prohibited in Act		Belize Telecommunications Ltd., Speednet
Dominica	fully liberalized since Mar. 2003	Telecom Act, 2000	ECTEL, NTRC	Not prohibited in Act	none	C&W, Digicel, Orange Caribe, SAT, Marpin
Dominican Republic	fully liberalized	Ley 153-98 (1998)	INDOTEL		none	Verizon Dominicana, TRICOM, Orange Dominicana, Centennial,
Grenada	fully liberalized since Mar. 2003	Telecom Act, 2000	ECTEL, NTRC	Not prohibited in Act	49% in trunking	C&W, Global Network Providers, TWTC, Digicel
Guyana	only domestic mobile services and ISP are liberalized	none; Telecom Act, 1990 still valid	PUC			GT&T, Cel*Star, CTL
Haiti		none; outdated law of 1977	Conatel			Teleco, Haitel, Comcel, Digicel, Rectel
Jamaica	fully liberalized since 1 March 2003	Telecom Act, 2000	OUR, FTC, SMA			C&W, Digicel, Oceanic, FibraLink, InfoComm, N5
Montserrat	has not undertaken sector reform		none			C&W
St. Kitts & Nevis	fully liberalized since Mar. 2003	Telecom Act, 2000	ECTEL, NTRC	Not prohibited in Act		C&W, Digicel, Caribbean Cable, St. Kitts Cable, Cariglobe
St. Lucia	fully liberalized since Mar. 2003	Telecom Act, 2000	ECTEL, NTRC	Not prohibited in Act		C&W, Digicel, Antilles Crossing
St. Vincent & The Grenadines	fully liberalized since Mar. 2003	Telecom Act, 2001	ECTEL, NTRC	Not prohibited in Act		C&W, Digicel, Kelcom Intl.
Suriname	new Telecom Act has not yet been proclaimed	Telecom Act 2004 (not yet proclaimed)	TAS		40 %	Telesur, RTBG
Trinidad & Tobago	fully liberalized since June 2004	Telecom Act 2001; Telecom (Amendment) Act, 2004	TATT	Not prohibited in Act	none	TSTT, Digicel, Laqtel, Lisa, CCTT

I.1.2 Models of regulation

Whereas the models that these countries and territories adopted in reforming their telecommunication sectors and for the transition to a liberalized market have many similarities, there are differences in the way they have established the institutions which regulate the ICT sector. (See Table 4)

In Trinidad and Tobago (TATT) and Suriname (TAS) one body is responsible for virtually all regulatory functions including economic and technical regulation and spectrum management. In Barbados these functions are shared between the Fair Trading Commission (FTC), which is responsible for consumer protection, price regulation and competition and the Telecommunications Unit in the Ministry of Energy and Public Utilities responsible for regulating the technical aspects of the sector. In Belize the Public Utilities Commission (PUC), which was established under the PUC Act in 1999, regulates telecommunications, electricity and water. Its functions with respect to telecommunications are described in the Telecommunications Act, 2002. It also manages the radio frequency spectrum. In the Bahamas the sector is also regulated by a PUC. In Jamaica responsibilities are shared among four regulatory bodies: 1) the Jamaica Fair Trading Commission (FTC) which is responsible for monitoring and encouraging fair competition; 2) the Office of Utilities Regulation (OUR) which receives and processes license applications and makes recommendations to the Minister for the provision of utility services and also regulates the quality of services and prices of utility services; 3) the Broadcast Commission, which receives, processes, and recommends the issuance of licenses for radio and television broadcast services and which monitors technical quality and program content standards of licensees in this sector; 4) the Spectrum Management Authority (SMA), which manages the radio frequency spectrum; and 5) the Consumer Affairs Commission (CAC) whose functions are to protect the consumer. The Broadcast Commission reports to the Minister responsible for information, while the Fair Trading Commission, the Office of Utilities Regulation, the Consumers Affairs Commission and the Spectrum Agency report to the Minister of Commerce, Science and Technology with Energy. In Anguilla, a newly established Public Utilities Commission (PUC) has responsibility of all regulatory functions except spectrum management, which remains with the ministry responsible for the sector¹¹. In the Cayman Islands the Information and Communications Authority established by law in 2002 regulates the whole ICT sector and is responsible for promoting competition in the sector and managing the spectrum. In the OECS a regional regulator, Eastern Caribbean Telecommunications Authority (ECTEL), is responsible for coordinating and harmonizing policy and regulations and advising the national regulators (NTRCs) in each of the 5 member states. Guyana has a PUC and provision for a Director of Telecommunications (in the Telecommunications Act of 1990), a position which has never been filled. In the Dominican Republic INDOTEL is responsible for virtually all regulatory functions including spectrum management. The Cayman Islands has the only convergent regulator in the Caribbean, the Information and Communication Technology Authority (ICTA) whose responsibilities include the promotion of competition in ICT networks and services, managing the radio frequency spectrum and the Cayman Islands' .ky Internet domain name. The following chapter provides a more detailed discussion of the current situation in several of these countries.

¹¹ Ministry of Infrastructure, Communications, Utilities and Housing

Table 4: Organs Responsible for Regulating the Information and Communications Technology Sector in the Caribbean

Country	Organism responsible for setting policy	Telecommunications regulator	Other entities responsible for controlling and supervising the telecommunications sector	Entity responsible for managing the spectrum	Broadcasting regulator	Anti-monopoly Commission
Anguilla	Ministry of Infrastructure, Communications, Utilities and Housing	Public Utilities Commission		Ministry of Infrastructure, Communications, Utilities and Housing	none	none
Antigua & Barbuda	Ministry of Public Works & Communication	none	none	Ministry of Public Works & Communications	none	none
Bahamas	Ministry of Works and Utilities	Public Utilities Commission (PUC)		Public Utilities Commission (PUC)	Television Regulatory Authority Board	none
Barbados	Ministry of Energy and Public Utilities	Fair Trading Commission (FTC)	Ministry of Energy and Public Utilities (Telecommunication Unit)	Ministry of Energy and Public Utilities (Telecommunication Unit)	none	Fair Trading Commission
Belize	Minister of Communications	Public Utilities Commission	None	Public Utilities Commission	Broadcasting Authority	none
Cayman Islands	Minister responsible for information and communications technology	Information and Communications Technology Authority		Information and Communications Technology Authority	none	none
Cuba	Ministerio de Información y las Comunicaciones	Dirección de Regulaciones y Normas within the Ministerio de Información y las Comunicaciones	Agencia de Control y Supervisión within the Ministerio de Información y las Comunicaciones	Agencia de Control y Supervisión within the Ministerio de Información y las Comunicaciones		none
Dominican Republic	Instituto Dominicano de las Telecomunicaciones (INDOTEL)	Instituto Dominicano de las Telecomunicaciones (INDOTEL)	none	Instituto Dominicano de las Telecomunicaciones (INDOTEL)	Comisión Nacional de Espectáculos Públicos	none
ECTEL Member Countries (Dominica, Grenada, St. Kitts, St. Lucia, St. Vincent)	Ministries responsible for telecommunications in each country	National Telecommunications Regulatory Commissions (NTRC)	Eastern Caribbean Telecommunications Authority (ECTEL)	National Telecommunications Regulatory Commissions (NTRC)	Ministries of Information and the NTRCs	none
Guyana	Prime Minister and Minister of Public Works and Communications	Public Utilities Commission (PUC)	Director of Telecommunications*	National Frequency Management Unit (NFMU)	none	Public Utilities Commission
Jamaica	Ministry of Science and technology with Energy	Office of Utilities Regulation (OUR)	Consumer Affairs Commission (CAC)	Spectrum Management Authority (SMA)	Broadcasting Commission	Fair Trading Commission
Suriname	Ministry of Transport, Communication & Tourism	Telecommunications Authority Suriname (TAS)	none	Telecommunications Authority Suriname (TAS)	Broadcasting Council*	
Trinidad and Tobago	Ministry of Public Administration and Information	Telecommunications Authority of Trinidad and Tobago (TATT)	none	Telecommunications Authority of Trinidad and Tobago (TATT)	none	none

* Has not yet been established

II COUNTRY OVERVIEWS

This chapter presents the current state of sector reform and in certain cases specific recommendations for action in the following countries: The Bahamas, Barbados, Belize, the Dominican Republic, Guyana, Jamaica, the ECTEL members of the OECS (Dominica, Grenada, St. Lucia, St. Kitts and Nevis, and St. Vincent and the Grenadines), Suriname, and Trinidad and Tobago. Observations on regulatory barriers (Chapter V) and recommendations for regional initiatives (Chapter VI) pertain also to these countries.

II.1 The Bahamas

II.1.1 Introduction

The Bahamas has a population of approximately 300,000 and a per capita GDP of US\$ 16,000, of which tourism and financial services account for 40% and 15%, respectively. Of the 700 islands that make up the archipelago, there are only 30 which are inhabited. Of these the most populated are New Providence, Grand Bahama and Abaco with, respectively, 70%, 16% and 4% of the population. The islands of Andros and Eleuthera each have about 2½ % of the population. The area covered by The Bahamas is 5,358 sq. miles (13,878 sq km) extending some 760 miles east of Florida to almost Haiti.

The Bahamas has a fixed line penetration rate of about 43%, a mobile penetration rate of 64%, an Internet access penetration of 13%. Also, of the some 88,000 households over 70 % subscribe to the country's only cable TV network.

II.1.2 Telecommunications service provision and prices

Telecommunications service provision is dominated by one company, the 100% state owned Bahamas Telecommunications Company Limited (BTC), which has exclusivity for cellular mobile service and is one of two fixed voice telephone licence holders. All other services except cable TV distribution are open to competition. Like other Caribbean countries, where until recently virtually all telecommunications services were provided by a single company, local fixed telephone services have been very inexpensive while inter island and international calling have been relatively expensive. Regular calling rates range from U \$ 0. 18/min to US\$ 0.51/min for calls among the islands and to the USA, US\$ 0.54/min for calls to Canada, US\$ 1.75 for calls to Cuba, US\$ 0.70/min for calls to the rest of the Caribbean and US\$ 0.89/min for calls to the rest of the world. Because of these high rates there has been a significant growth of illegal Voice over Internet Protocol (VoIP) alternatives such as Vonage, which under one of its plans offers unlimited calls in all North America for a flat fee of US\$ 25/month and calls to other destination at rates which are substantially lower than those of BTC. Some observers estimate that up to 70% of outgoing international traffic bypasses BTC's network with 30 – 40% of business subscribers using such alternatives. Because of this and the recently announced rates of the new entrant in the fixed voice telephone market, System Resources Group (Indigo), BTC in October 2004 reduced its international calling prices by up to 70%.

These reductions were initially valid for 4 months to February 2005. The PUC and BTC reviewed BTC's action and BTC subsequently applied to have the reduced rates remain in effect permanently. In March 2005, the PUC approved BTC's application to provide reduced international and domestic long distance rates. The relevant PUC documents are listed below and are available at <http://www.pucbahamas.gov.bs>:

1. Public Consultation "On a proposal by The Bahamas Telecommunications Company Limited to reduce International and Domestic Long Distance Rates, January 2005; and
2. Statement of Results on Public Consultation "On a proposal by The Bahamas Telecommunications Company Limited to reduce International and Domestic Long Distance Rates", March 2005.

Table 4 compares prices for international calls to various destinations in The Bahamas, the Caribbean and beyond for BTC services (regular and reduced rates), SRG (Indigo) and the illegal but widely used Vonage¹² and Skype¹³.

Table 5
The Bahamas: Comparison of International Calling Charges Using Various Operators and Service Providers (in US\$/min)

Operator and/or service provider	Destination of call							
	Inter-island	Caribbean			North America		Rest of World	
		Jamaica	St. Lucia	Trinidad & Tobago	USA	Canada	UK	Brazil
Skype (computer to computer)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skype (computer to telephone)	0.09	0.13	0.26	0.16	0.02	0.02	0.02	0.06
Vonage	0.10	0.12	0.22	0.14	0.00	0.00	0.03	0.09
SRG (Indigo)	0.17	0.65	0.65	0.65	0.49	0.49	0.79	0.79
BTC (reduced)*	0.18	0.70	0.70	0.70	0.51	0.54	0.89	0.89
BTC (regular)	0.40	2.25	2.25	2.25	0.99	1.25	2.75	2.75

* valid until 3 February 2005

Following the PUC's Statement of Results (Item 2 above), BTC's regular rates have been replaced with the reduced rates and its Licence modified accordingly.

Residential and business monthly line rental charges by BTC are US\$15.00 and US\$36.00, respectively; SRG's rates are slightly less.

¹² Vonage provides all of its customers with a free phone adapter (packetizer/depacketizer) which converts the telephone's analog signal to packets (and back) which can be transmitted over the Internet. Customers can get a US or Canadian number in any area code region they want and for \$ 25/month they get unlimited free calling anywhere in North America. Calls to other parts of the world are charged according to the destination. For most western European countries this is about US \$ 0.02/min. <http://www.vonage.com/index.php>

¹³ Skype's computer-to-computer voice service is free as is the enabling software which can be down loaded from Skype's web site, <http://www.skype.com/>

BTC's international leased circuits are priced at US\$ 9,496/month for a T1 (US\$ 10,853/month for an E1) with a one year contract. Installation is US\$ 2,000. Island to island leases are US\$1,330 and US\$ 1,580 per month for a T1 and an E1, respectively also for a one year contract. The local loop costs US\$ 475 and US\$ 665 per month for a T1 and an E1, respectively¹⁴.

High prices for international telephone calling have had and are continuing to have an impact on other sectors which depend on telecommunications. For many businesses telecommunications is the highest or second highest cost item in their overall operating budgets. The high cost of telecommunications is also discouraging the export of services for which The Bahamas would otherwise have certain comparative advantages. For example, one of the reasons conference organizers are reluctant to choose The Bahamas is because of the very expensive prices for making international calls and roaming on The Bahamas' only cellular mobile network.

Internet access, on the other hand, is offered at competitive prices which are equal to those found in North America. (See Section III.2.3 of this report). For example, Cable Bahamas, the cable TV operator, offers an unlimited use high speed Internet access (2 Mbps down link; 512 Mbps up link) for US\$ 37/month, a price which is comparable to that of ISPs in the United States and Canada for similar high speed services. Cable Bahamas also offers a basic, more economical service, which is limited to 10 hours of use per month but with down link speeds of up to 512 Mbps for US\$ 10/month.

ISPs are not permitted to offer voice; this has, however, not prevented their customers from acquiring equipment and software with which they can bypass BTC's circuit switched voice network and obtain substantial savings in their long distance calls.

II.1.3 The current framework

The current framework for the telecommunications sector in The Bahamas is set out in three basic documents: The Telecommunications Act, 1999; the Public Utilities Commission Act of 1993 (Amended in 2000), which establishes the regulator and the Telecommunications Sector Policy of July 2001, revised in October 2002. The latter was to have applied only until two years after the privatization of BTC, which was to have occurred in 2003.

The Telecommunications Act, 1999 establishes the framework for competition in the sector. It distinguishes between the roles of the Minister (responsible for the sector) whose main function is to make policy¹⁵ and the regulator, the Public Utilities Commission (PUC), which implements this policy and, inter alia "promotes effective and sustainable competition in the sector".¹⁶ Broadcasting including cable TV is

¹⁴ See http://www.btcbahamas.com/main_flash.html

¹⁵ The Minister is also responsible for ensuring that The Bahamas' international obligations for the sector are met and for setting fees for licenses and use of scarce resources (frequencies, numbers), where he determines that the fees should be enhanced beyond those necessary to recover regulatory costs incurred by the PUC to reflect the market value of the licences. This is currently the Minister for Works and Utilities who is also responsible for the state owned Bahamas Telecommunications Company.

¹⁶ There is no competition law in The Bahamas. The obligation to prevent anti-competitive behavior is a condition of each licence;

regulated by the Broadcasting Commission under the responsibility of the Ministry of Tourism. The Act also introduces and defines dominance and describes additional obligations, which the regulator may impose on dominant operators. It introduces the concept of individual and class licences and defines these. It sets out the basic principles of an interconnection regime in which interconnection has to be provided by the dominant operator under transparent and non-discriminatory conditions at cost oriented, unbundled prices at technically feasible points. It limits requirements of technical standards to protecting the network, promoting the efficient use of the spectrum, ensuring interoperability and protecting health and safety. The Act requires the PUC to act in a transparent, objective and non-discriminatory manner.¹⁷ It also protects licensees when the conditions of their licences have to be modified generally in the public interest or to satisfy The Bahamas' international obligations.

Under the Telecommunications Act 1999 (Section 13) the PUC can require dominant operators to publish reference interconnection offers. BTC has so far failed to do this even though it has entered into an interconnection agreement with System Resources Group (Indigo), the only other operator licensed to provide voice telephony services.

While it was intended that the PUC regulate water and electricity in addition to telecommunications, it regulates, for the time being, only the latter. It is also responsible for spectrum management including spectrum planning, allocation, administration and licensing and monitoring control and enforcement. The PUC lacks specialist staff in certain areas and especially in economic regulation. It has often to resort, like other regulators, to outside consultants to help it deal with certain regulatory files. In the spectrum management area it currently has only one mobile (no fixed) monitoring station and no automated spectrum administration system.

The Telecommunications Sector Policy states the Government's intention to sell 49% of the shares of the newly corporatized BTC and give management control to a strategic investor and to introduce competition in the cellular mobile market (currently a monopoly) one year after (the partial) privatization and further competition in fixed voice and leased circuit (for voice) services (currently a duopoly) two years after privatization subject to a review of the status of the sector by the PUC at the time. All other telecommunications networks and services including value added services, customer premises equipment, and Internet access (except to provide voice) were opened to full competition in July 2001 when the Policy was issued. Internet service provision requires an individual licence.

With respect to prices the Policy like the provisions of the Telecommunications Act states that only the tariffs of dominant operators should be regulated, that BTC's tariffs should be rebalanced "over a suitable period of time", and that interconnection charges and leased circuit prices of dominant operators be cost oriented and made available under non discriminatory and transparent conditions. All public network operators now have the same privileges of using public rights of

¹⁷ For example, all licences issued by the PUC have to be made public.

way that had previously been reserved for BTC. It is planned to implement a price cap scheme in a new licence to be issued to BTC to replace its current interim licence.

There is no competition law in The Bahamas. It is, however, a condition of operators' and service providers' licences that they not engage in anti-competitive practices and that they comply with any instructions of the PUC in this respect.

The Bahamas is not a member of the WTO but has applied for accession. In anticipation of its joining many of the provisions of the Telecommunications Act, such as those pertaining to interconnection, reflect provisions of the Regulatory Principles Reference Paper.

The PUC has made recommendations to the Government with respect to the revision of the sector policy.

II.1 4 Universal access/service

The Policy also sets out the basic principles of universal services in The Bahamas, which are:

- Free Internet access to all public and church operated schools, public libraries and certain colleges and schools of higher learning, public hospitals, clinics, senior citizens homes, and orphanages;
- Funding through a Universal Service Fund to which all licensed telecommunications operators will contribute on a proportional basis;
- Obligation to provide universal access/service imposed on the dominant operator, BTC, at least until the expiration of its exclusivity period. This includes continuation of the current postalized installation and usage charges throughout The Bahamas, provision of free emergency calls to all subscribers, payphone users, and for ships and aircraft and provision of Internet access in designated places in the Family Islands at reduced prices.

The PUC is currently conducting a public consultation¹⁸ on Universal Service and is seeking views, inter alia, on:

- the fundamental requirements of BTC's universal service obligations which are stated in its draft (fixed) licence and require it "to satisfy all demand for voice telephony service¹⁹ and basic Internet service²⁰ at affordable prices";

¹⁸ See <http://www.pucbahamas.gov.bs> Public Consultations

¹⁹ Voice telephony is defined as "the commercial provision to the public of the direct transport and switching of speech in realtime between public switched network termination points enabling any user to use customer premises equipment connected to such a network termination point to communicate with customer premises equipment connected to another network termination point, and any service that is functionally and commercially substitutable therefore",

²⁰ A basic Internet service connection is defined as "the provision of a connection to the Licensed System at a fixed location that is capable of supporting data communications at a rate that is sufficient to provide functional Internet service".

- the method of calculating the net cost of BTC's universal service obligation²¹;
- the mechanism for computing BTC's access deficit;
- Contributions to and the functioning and administration of the Universal Service Fund.

II.1.5 Operators

Even though the Act foresees class licences for operators, none have been issued so far. Class licences have, however, been issued for spread spectrum and other low power radiocommunication devices. BTC and Systems Resources Group (SRG) have individual licences, which allow them to offer public fixed voice telephone services and build and operate networks that offer these services; however, only BTC is allowed to operate a mobile voice telephone network and offer cellular mobile services. SRG (trading as "Indigo") has been able to offer fixed voice telephony services only since January 2004²². Its licence allows it to offer all other services except cellular mobile, paging, trunking and cable TV distribution on the islands of New Providence, Grand Bahama and Abaco. SRG offers fixed wireless access using MMDS technology (2.5 MHz frequency band). Cable Bahamas has an exclusive cable TV licence (issued and regulated by the Ministry of Tourism) valid until 2009. BTC and Cable Bahamas have cable landing licences and there are about 20 ISPs (including BTC, SRG and Cable Bahamas), 9 public paging operators and 10 public trunking operators each with individual licences.

BTC is operating under a temporary (interim) licence which was to be replaced by a permanent licence when it is privatized; however, in view of the failure of the privatization efforts, a new licence may be issued sooner.

SRG, which has the right to offer competing fixed voice services since the beginning of 2004, is obliged to acquire international call termination services from BTC as BTC is the only available licensed provider of transmission capacity for voice telephony services. Caribbean Crossings, which has a competing submarine cable system, is allowed under its licence conditions to provide such services only to BTC. BTC's reduced international calling rates were offered a few weeks after SRG announced the launch of its competing international services on 1 September 2004.

SRG's licence requires it to provide coverage to 90% of the total population on the three islands to which its licence applies by the 3rd quarter 2007 (54% by the 3rd quarter 2004). Other conditions such as ones pertaining to interconnection, leasing of circuits, accounting separation, respecting rules of fair competition, cross subsidization, linked sales, etc. resemble more those of a dominant operator than of a new entrant.

²¹ The net cost of the USO is the difference between the costs that BTC would have avoided if no USO were in place (i.e. the avoidable costs) minus the revenues that would have been foregone if BTC did not provide the related services.

²² Individual Licence Issued under the Telecommunications Act, 1999 to Operate Public Fixed Radiocommunications Systems and Provide Telecommunications Services to Systems Resource Group Limited, October 23, 2002, para. 2.3

Both SRG and Bahamas General Communications (BGC) offer fixed wireless for high speed Internet access mainly for business customers and the Government. BGC and other ISPs also have a number of WiFi hotspots which also service visiting boats. Both SRG and BGC may lease capacity on the Caribbean Crossings' cable system for non-voice services.

There is only one cable TV operator, Cable Bahamas, which has a 15-year exclusive licence ending in 2009. Since its cable network was built from the outset with two way, broadband capability, it has been able to provide Internet services without requiring any modification to its network. It can do this since 2000 when it obtained its ISP licence. Today Cable Bahamas provides 100% coverage in New Providence (the main island), 98 % in Grand Bahama, 98% in Abaco, and 80% in Eleuthera. All in all it can provide service to about 94% of The Bahamas' 88,000 families. Cable Bahamas has 68,000 cable TV and 28,000 Internet customers. The latter are all high speed.

II.1 6 Fiber optic cable systems

The three current fiber optic cable systems in The Bahamas are: Bahamas II, Arcos-1, and Caribbean Crossings (see Section IV.2.2 of this report for more detailed discussion of these and other Caribbean fibre optic cable systems). Bahamas II, which connects The Bahamas with Florida, is partly owned by BTC which is also The Bahamas' landing partner of ARCOS. Both of these cable systems have plenty of spare capacity. In its current configuration the Caribbean Crossings cable system runs from Nassau to Freeport and to Boca Raton in Florida. A second loop runs from Nassau to Eleuthera, Abaco, Freeport and through a separate segment to Florida.

FibraLink, a sister company of Caribbean Crossings, was one of two companies that was awarded a cable landing licence in Jamaica at the end of 2004. The original plans were to extend the Caribbean Crossings' existing domestic cable to touch a number of islands in The Bahamas, which are currently not being served by any undersea fibre optic cable including Andros, Exuma, Long Island, Crooked Island and Inagua, subject to regulatory approval of the PUC; however, following the acquisition of ARCOS by Columbus Communications, the holding company of FibraLink and 30% owner of Caribbean Crossings, it was decided instead to build a link directly between Jamaica and the ARCOS cable station in the Dominican Republic.

In August 2005 BTC awarded a contract to build a US\$ 60 million domestic fibre optic cable system (Bahamas Domestic Submarine Cable Network) connecting 14 islands in The Bahamas. It was to be built in three phases. Phase I (planned to be completed by December 2005) was to connect New Providence to Inagua via Andros, Exuma, Long Island and Ragged Island. Phase II, which was planned to be completed by June 2006, was to connect Inagua to New Providence and Mayaguana, San Salvador, Rum Cay, Cat Island, Eleuthera, Abaco and Grand Bahama. Phase III is an international connection.

II.1.7 The failed privatization of BTC

The process of selling 49 % of the newly corporatized BTC and giving up management control began in October 2002 with the Government's invitation to register interest in the privatization process²³. It ended in December 2003 when the government decided to terminate the process because none of the offers that it had received met its expectations especially with respect to the amounts being offered. The Government's stated purpose in privatizing BTC was to:

- associate itself with a strategic partner which would give BTC the necessary technical, financial, and management capabilities for it to operate in a competitive environment. Management control was to be transferred to the new strategic partner;
- raise money for the national treasury.

The process was to be conducted in three stages, namely: 1) registration and qualification of bidders; 2) submission of preliminary bids; and 3) submission of final bids by bidders on the short list. The latter was to be established by a Tenders Committee of about 15 officials of government and BTC.

On 13 June 2003 three bidders were invited to submit final bids. These were the Bahamatel Consortium led by JP Morgan and Citigroup, Blue Telecommunications, a local investment group with Detecon International, the German ICT consulting firm owned by Deutsche Telecom and Transworld Telecom Bahamas Ltd., a subsidiary of Transworld Telecommunications Caribbean, a US based company with mobile and fixed licences in some other Caribbean countries.

On 8 September 2003 the Government announced that its preferred bidder was the Bahamatel Consortium and that it would begin a period of exclusive negotiations with this bidder; however, on 30 October 2003 the Government announced it was breaking off negotiations with Bahamatel and that would begin negotiations with the second ranked bidder, the Blue Telecom consortium. Both negotiations ended in failure.

The advisor of the Ministry of Finance, which was responsible for the process on behalf of the Government was the investment bank, Deutsche Bank (London).

Failure of the process may be attributed to:

- the failure to have clearly established ground rules for the process. Bidders were allowed to negotiate conditions of their prospective licences during the tender process and, indeed, the Government continues to this day to be prepared to receive and consider offers;

²³ The Bahamas Telecommunications Company Limited, Invitation to register in the privatization process, Public Announcement, 23 October 2002. All public announcements related to the process can be found at <http://www.bahamas.gov.bs/finance> Press Releases and Notices

- the awarding of a competing voice telephone licence to SRG at about the same time as the privatization process began;
- the failure of the Government to have rebalanced BTC's tariffs or at least to have defined a timetable for rebalancing;
- the absence of a comprehensive regulatory framework including the absence of details of the universal service program and universal service fund which are mentioned in the Government's Telecommunications Sector Policy;
- a number of uncertainties related to the scope of the new licence as for example, whether it included the Grand Bahama Port Authority Free Trade Area or not;
- the large spending program of BTC and, in particular, the planned US\$ 60 million project to construct a domestic fiber optic network. There was also the GSM cellular mobile project estimated to cost approximately US\$ 30 million. This had a significant impact on the price which potential investors were willing to pay and the disappointment it caused the Government whose expectations were not met²⁴;
- the Government's concern about the potential loss of jobs at BTC²⁵;
- the Government's misunderstanding and/or miscalculation of the impact of new technologies in the sector and the scope they offered for bypassing BTC's circuit switched based network.

During the past year the Government and BTC have been taking steps to prepare the company for privatization. The PUC has conducted a public consultation on universal service and expects to make regulations and put in place the necessary mechanisms for the universal service program and fund. Currently, also, BTC is receiving advice from outside consultants on how to function in a competitive environment.

In spite of this there are sceptics in The Bahamas who believe that BTC will never be privatized, that the window of opportunity has passed and that of the Government's conflicting objectives of advancing the liberalization agenda and maintaining the value of BTC, the latter will prevail.

²⁴ The Government had also expected larger telephone companies to be the main bidders.

²⁵ The number of employees at BTC had been reduced in 1999.

II.1.8 Conclusions

The Bahamas can boast of a certain success in making high speed Internet access available to the residents of Nassau, Grand Bahama and Abaco at affordable prices. However, most of the other Islands do not enjoy this same level of access. More needs to be done to deliver access to broadband to the Family Islands for their continued economic growth and development. There is a good level of competition among the three principle modes of access: DSL, offered by BTC; cable modem, offered by Cable Bahamas and fixed wireless offered by several smaller operators. As a result consumers in The Bahamas are paying prices similar to and in certain cases lower than in the USA and Canada and generally half of those found in other countries in the Caribbean. The situation is not the same for voice telephony where the absence of competition (due to policy) has kept the prices for international calling relatively high. The incentives to bypass BTC's public network are so overwhelming that individuals as well as small enterprises are not intimidated by the threats of huge fines for defying the law²⁶.

The Government finds itself caught between opposing objectives of proceeding with reform of the telecommunications sector as part of its overall program of reforming the public sector in The Bahamas, on the one hand, and the desire to extract the maximum possible from the sale of part or all of BTC, on the other. The rapidly evolving technology is, however, offering users easy alternatives to bypass BTC's traditional network and to pay prices which are fractions of those charged by BTC even after price reductions of up to 70 % are taken into account. The value of BTC is diminishing as these new technologies are becoming more widespread and accessible.

While the evolving new technology may be having a negative impact on the value of BTC, it carries tremendous long-term potential benefits in strengthening the economy and helping to diversify The Bahamas' dependence on tourism and financial services. Best practice suggests that in the long run this will be found most likely to outweigh the loss in income resulting from the sale of BTC.

It may be wise for the government to take stock of the current situation, understand the realities of this technology and its impact on prices, recognize the futility of trying to stop its progress or to police its use, and instead encourage BTC to take into account and embrace VoIP technology to reduce the overall cost of the delivery of telecommunications services in The Bahamas, reflect on the reasons why the previous attempt to privatize BTC failed, and develop a long term policy and plan which will promote the long term development of the information and communication technology sector in The Bahamas.

²⁶ In March 2004 the PUC issued a Public Notice which stated that "any person who, without a Licence from the Public Utilities Commission, establishes, operates or provides VOIP services or aids and abets the unlicensed provision of these services shall be guilty of a criminal offence and may be fined up to three hundred thousand dollars (\$300,000) in accordance with Section 35 of the Telecommunications Act." and that "Violators can be expected to be prosecuted to the fullest extent of the law" The Public Notice further "invites the public, including operators and consumers, to provide information on such illegal activities to the PUC." and assures that "Such information will be treated in the utmost confidence." Public Notice Telecommunications Act, 1999, Voice over Internet Protocol (VoIP), PUC 18.03.04

II.1.9 Recommendations

The Government through public consultation should develop and adopt a long term policy for the Information and Communication Technology (ICT) sector in The Bahamas. This policy should include specific steps (with specific dates) in the continuing process of reforming the telecommunications sector with a view to alleviating the bottlenecks to potential growth, which have resulted in stagnation of the ICT sector in The Bahamas and have had a negative impact on tourism, financial services and the development of new sectors. More specifically, the policy with respect to telecommunications should indicate:

- A commitment to proceed with the privatization of BTC and an indication that the Government is prepared to accept a fair market price for the company. The policy should indicate a definite timetable for partial and/or full privatization, the proposed method and any conditions²⁷ which the government may wish to attach on the privatization;
- A clear indication of how long the Government intends to maintain market entry restrictions in the cellular mobile and voice telephony markets and how it intends to open these;
- When the Government and/or the PUC intends to have in place all the necessary rules regulation, and mechanisms for a universal service program and fund;
- When and by how much BTC's tariffs will be rebalanced.
- A process to educate and inform the public on the importance of the ICT sector to the overall economic development of The Bahamas and how competition in the sector will contribute to that growth.

At the same time, the Government and/or the PUC should continue with action already initiated to put in place the necessary structures for the privatization to take place and for the reform process to continue to proceed. These include:

- establishing a working universal service program and fund;
- rebalancing of BTC's tariffs and implementing an incentive based pricing scheme;
- preparing BTC for privatization and competition.

²⁷ To include, inter alia, conditions for retaining staff, employee stock options, pensions plans etc.

II.2 Barbados

II.2.1 Introduction

Barbados has a population of 275,000, a per capita GDP of US\$ 15,000 and receives 1.2 million tourists per year (about half by air and half by sea). Its telephone and Internet user penetration rates of over 50% and 6 %, respectively, compare well with the rest of the Caribbean. Like many other countries in the region that continue to have or had monopoly suppliers of telecommunications services or have recently moved to open these markets Barbados today has relatively inexpensive domestic but expensive international calling rates. (See price comparisons in Table 14, Section III.2.2, below).

II.2.2 Transition to a competitive telecommunications market

The process of sector reform began in October 2001 with the signing of a Memorandum of Understanding (MOU) between the Government and Bartel and BET, respectively, the monopoly local and international operators which were both owned 85% by Cable & Wireless and 15% by the Government. The MOU allowed these two operators along with cellular mobile and a data services affiliates to amalgamate and C&W agreed to exchange the exclusive domestic (Bartel) and international (BET) licences (both valid until 2011) for non exclusive licences according to a three phased transition timetable for achieving a fully liberalized telecommunications sector in Barbados. This transition was dependent on the Government's implementing a new regulatory framework (including policies, laws, regulations, guidelines) and introducing an incentive based (price cap) price controls scheme. The new Telecommunications Act was proclaimed on 30 September 2002.

Phase 1 of the transition began on 1 December 2001 (a year later than that foreseen in the MOU) when the following services were opened to competition: facilities-based cellular mobile services, some customer premises equipment (CPE), inside wiring, value added services, resale of C&W's international voice telephone services and some private (call center) networks. Internet was always competitive. In March 2003 three new operators. Digicel, AT&T Wireless (which has been acquired by Digicel), and a local operator, Sunbeach were awarded cellular mobile licences to compete with the incumbent C&W. At the start of Phase 2 on 10 November 2003 C&W (Barbados) surrendered its exclusive (Bartel) for a non-exclusive domestic licence. At the same time markets for all customer premises equipment (CPE) and domestic fixed wireless facilities-based services were liberalized²⁸. On 13 September 2004 Antilles Crossing and Kelkom International were awarded submarine cable landing licences²⁹. Phase 3 began on 21 February 2005 when C&W surrendered its exclusive (BET) international services licence and received in exchange a non

²⁸ Liberalization of the CPE market was delayed because subscribers were not adequately prepared for the transfer to them of their CPEs. Single line customers had no choice. Ownership and responsibility for the equipment was transferred to them. Businesses with multi-line systems had the choice of taking over responsibility for their equipment or entering into an arrangement with C&W.

²⁹ See Feature Address delivered by The Hon. Anthony P. Wood, Minister of Energy and Public Utilities, Barbados, at the 8th Caribbean Telecommunications Union Policy Seminar held at the Savannah Hotel on September 13, 2004.

exclusive licence and when Antilles Crossing, Digicel, and TeleBarbados along with C&W were awarded non exclusive international licences.

According to the MOU Phase 2 was to have started on 1 December 2002 and Phase 3, on 1 August 2003³⁰. Like Phase 1 the start of Phase 2 was delayed by almost a year. Phase 3, full liberalization, was to have started only when the regulatory framework (law and regulations) was in place, when “cost oriented pricing for domestic line service (was) completed” and an incentive based pricing mechanism (price cap) scheme was put into place³¹; however, because the interpretation of Memorandum of Understanding between the Government and C&W was that the FTC had only to hold a hearing and not necessarily change the rates, it was decided to proceed with Phase 3 before rebalancing actually occurred.

Unfortunately the MOU does not specify the interim tariffs (for local and international calls) which were to be applied before an incentive based price controls scheme could be implemented. Also, while it provides for the FTC to intervene to resolve interconnection disputes, it does not give any deadlines for their resolution³². The regulatory framework which the Government (along with the Fair Trading Commission) had undertaken to implement by 1 December 2001 was not completed until recently. The new Telecommunications Act was proclaimed in September 2002 and the regulations, policies, and guidelines identified in the MOU were completed in August 2003. BET, Bartel, C&W Cellular and C&W Information Systems were amalgamated into Cable & Wireless (Barbados) Limited on 1 April, 2002 and the process of rate rebalancing began in July 2003 when the newly amalgamated Cable & Wireless company applied to the Fair Trading Commission (FTC), for an increase in monthly rental and domestic calling charges.

During the second half of 2002 the Government issued a Request for Proposals (RFP) for mobile licences³³. Applicants had until 31 December 2002 to submit applications. This was not a competitive tender. Applicants were free to apply for the frequencies that they wanted in the 900 MHz and 1900 MHz bands. The only conditions that applied were that the applicant had to be registered in Barbados and had to have at least a 25% Barbadian shareholding. In March 2003 the Government announced that three new operators (Digicel, AT&T Wireless, and a local operator, Sunbeach) had been selected to provide cellular mobile services in competition with C&W. Carrier, service provider, and spectrum licenses were awarded to the three on August 08, 2003. By December 2003 Digicel and AT&T Wireless had fully operational networks installed and were ready to offer service to the public. Digicel had already spent US\$ 7 million and has hired 42 of 52 local staff; however, neither was able to offer service because they did not have interconnection agreements, which were dependent on (i) C&W's agreeing to the terms in the Reference Interconnection Offer (RIO), which C&W submitted to the FTC in August 2003 as required under the Act (Section 26) and indirectly (ii) on the conclusion of rate

³⁰ See Section 1 of Memorandum of Understanding between the Government of Barbados, Cable & Wireless (Bartel) and Cable & Wireless (BET), 16 October 2001. The dates for each phase are specified with the proviso “or such later date as agreed by the parties”.

³¹ Memorandum of Understanding between the Government of Barbados and Cable & Wireless BET Limited, 16 Oct. 2001.

³² Also absent in provisions on interconnection in the Act and the regulations.

³³ Ministry of Economic Development (Industry and International Business Division), *Request for Proposals, Licence to Provide Mobile cellular Telecommunications Services in Barbados*.

hearings to establish interim tariffs for local services. On 28 October 2003 the FTC issued a decision on C&W's RIO agreeing to some but not all of C&W's proposed interconnection rates³⁴. Sunbeach, which had difficulties in finding financing, had by February 2006, not yet built out a network. It was, however, in the process of being taken over by Trinidad & Tobago based Telecom Holdings, the owner of LaqTel, which had recently been awarded one of two new mobile licences (along with Digicel) in Trinidad & Tobago³⁵.

In its rates proposal C&W made a reduction in interconnection charges conditional on a rebalancing of local and international call charges³⁶; however, under pressure from the Government agreement on interconnection rates was reached between C&W and each of the new entrants on 28 December 2003 and on 14 January 2004 the FTC issued a decision approving these agreements. C&W issued a revised RIO reflecting the agreed charges (C&W issued a RIO to be used for Domestic Fixed Wireless)³⁷. AT&T Wireless and Digicel began offering service in February 2004 after the necessary interconnection equipment had been installed in C&W's premises.³⁸

Because the Act requires that carriers are "persons who have been granted a licence"³⁹ to interconnect, C&W refused to negotiate with the new entrants until they were issued licences on 8 August 2003 even though the results of the tender to select new operators were known 5 months earlier and the new entrants accused C&W of deliberately delaying interconnection⁴⁰.

Four applications to provide domestic telecommunications services including fixed wireless (FWA) and data were received on 8 December 2003 in response to a Request for Proposal⁴¹. They are Caribbean companies Blue Wave Networks, Last Mile Holdings, TeleBarbados Inc. (a subsidiary of Antilles Crossing Limited, which is a joint venture between Leucadia National Corporation⁴² and Light & Power Holdings Limited of Barbados), and WisCom Technologies⁴³. The Government has not yet issued the 15-year (renewable) licences which also have a 75% foreign ownership limit and cost US\$ 10,000 each⁴⁴.

Antilles Crossing's 40 Gbps fibre optic cable (one of two companies which was awarded a submarine cable landing licence on 13 September 2004) will connect into TeleBarbados Inc.'s planned domestic FWA and fibre optic network. The cable is

³⁴ See: Fair Trading Commission, Reference Interconnection Offer, October 28, 2003, No. 4 of 2003

³⁵ It has been reported that TH was to acquire 51% of Sunbeach for US\$ 5 million. See Business News Americas, February 1, 2006

³⁶ See C&W's Application for Rate Adjustments Pursuant to Section 16 of the Utility Regulations Act 2000-30

³⁷ See Barbados, Fair Trading Commission, *Decision on Interconnection Agreement between Cable & Wireless (Barbados) and Cellular Communications (Barbados) SRL filed December 29, 2003 and January 8, 2003*, Decision No. FTC04/02, January 14, 2004 and C&W Reference Interconnection Offer for Phase 2 of the Liberalization Process (referred to as RIO Domestic Fixed Wireless).

³⁸ Under the conditions of the Interconnection Agreement the new entrants have had to pay for procurement of this equipment installed in C&W's premises. Also it is understood equipment was not ordered by C&W until after the agreements had been signed.

³⁹ Barbados, *Telecommunications Act, 2001*

⁴⁰ "Digicel still on hold", Daily Nation 3 December 2003

⁴¹ Frequencies were offered in several bands including for multipoint and point-to-multipoint systems in the 2.4 GHz band, for fixed wireless access (FWA) in the 3.5 GHz band, for R-LANs in the 5 GHz band, and for local multipoint distribution systems (LMDS) in the 26, 28, 32, and 40 GHz bands. See Ministry of Energy and Public Utilities (Telecommunications Unit) Request for Proposal: Licence to Provide Domestic Telecommunications Services in Barbados including Fixed Wireless and Data Communications Networks

⁴² A NYSE-listed company and currently owns WiTel Communications Group, Inc., one of the largest broadband network operators in the USA.

⁴³ See *Govt. Receives 4 fixed wireless proposals* – Barbados, Thursday, February 12, 2004, Business News Americas <http://www.bnamerica.com>

⁴⁴ This, it is understood, has been delayed because due diligence of the four applicants has not yet been completed.

currently being installed along Barbados Light and Power's high voltage lines between substations. The combination of wireline and wireless local networks and international fibre optic cable will allow TeleBarbados Inc. to offer high speed domestic and international connectivity which it intends to market to both residential and businesses customers⁴⁵.

II.2.3 Rate rebalancing and incentive-based price control scheme

As mentioned, the MOU does not indicate by how much C&W can adjust its charges for local services but requires that it apply to the FTC for a revision. In its 20 July 2003 rate application C&W proposed limiting the number of free minutes in domestic calling to 2,000 per month and initially leaving the monthly line rental charge at B\$ 28, increasing the latter to B\$ 32 six months later. Additional minutes would be charged as follows: 2,000 to 4,000 minutes, B\$ 10 or 2,000 to unlimited minutes at B\$ 20. C&W also proposed to increase business line rental, PABX and Centrex systems charges and stop offering unlimited free local calling for this category of customer. C&W did not commit to any specific reduction in international charges, which it said can only be determined after the FTC has approved adjustments in local rates⁴⁶. Furthermore, C&W stated that the exact nature of the second phase of rebalancing would only be determined once the first phase has taken effect⁴⁷.

The rate hearings, which were well organized, conducted in a professional and transparent manner, quickly become politicized and mired in what most observers would consider to be unfortunate and unnecessary controversy⁴⁸. Some arguments that were made inside and outside the hearings and some in parliament, suggest a general lack of understanding why there is a need to rebalance tariffs and why this is a necessary consequence of the Government's 2001 decision to permit competition in the sector. One can only surmise that the Government's 2000 Green Paper on Policy for the Telecommunications Sector⁴⁹, which was never fully debated in Parliament, was poorly explained and/or not well understood by the general population.

⁴⁵ TeleBarbados Inc. has not yet determined which wireless technology it will deploy. It will not be able to offer international services until Phase 3

⁴⁶ Paragraph 76 of C&W's proposal.

⁴⁷ By contrast the Agreement between Cable & Wireless and the Government of Anguilla specifies the maximum amounts the C&W may charge for each of five regulated service categories (Connection and reconnection charges, line rental charges, domestic local call charges, lifeline, directory query and international direct dial telephone charges, and itemized billing services) each year until tariffs have been rebalanced and a price cap scheme has been implemented. See Schedule 2 of the Agreement between Cable & Wireless (West Indies) and the Government of Anguilla, April 11, 2003. For example, according to that Agreement Cable & Wireless can increase its residential and business line charges to EC \$ 42 (= US \$ 15.73 and EC \$ 87 (=US \$ 32.58) but had to reduce its international calling charges by 20% the day the new law came into force on June 10, 2003. Schedule 4 of the same Agreement describes the principles of price cap regulation.

⁴⁸ The opposition party in parliament seized on the general sentiment which opposes abolishing unmetered local calling by suggesting that local calling be left unchanged for two years and that only international and mobile calling rates be unregulated (See "Talk phone rates in two years", The Daily Nation, 27 Nov. 2003). The leader of the opposition has implied that the unexplained sudden resignations of the former minister responsible for the sector in August and, more recently, the Chairman of the FTC were proof of political interference. (See "DLP cries interference with FTC", The Barbados Advocate, 4 December 2003 and "Mascoll: Untimely FTC resignations", The Daily Nation of the same day).

⁴⁹ Ministry of Industry and International Business, Green Paper on Telecommunications Sector Policy, Government of Barbados 20th December 2000. <http://www.barbados.gov.bb/Docs/GreenPaperTelecomSecPoll.pdf> Some observers have suggested that the drafting of this Paper was influenced by C&W.

After a lengthy rate hearing which did not end until 24 May 2004 C&W's rate application was denied on 20 July 2004⁵⁰. Subsequently, C&W filed a notice of motion to review the FTC's decision and the FTC invited written comments which were to be submitted by 12 October 2004. In a Decision and Order dated 17 January 2005 the PUC rejected C&W's request to review the PUC's earlier decision stating that C&W had failed to demonstrate that important errors in law and fact had been committed⁵¹.

The FTC has been working on an incentive based price control scheme since the start of Phase 1. An initial version (quasi price cap) which was to have been put into place in early 2002 was never implemented. On 6 September 2004 the FTC issued a consultation paper on a price cap scheme to be implemented at the start of Phase 3⁵². Responses were due before 15 October 2004.

II.2.4 Interconnection

In July 2003 C&W (Barbados) submitted a Reference Interconnection Offer (RIO)⁵³ to the FTC in accordance with Section 26 of the Telecommunications Act, 2001. The charges proposed by C&W in this Phase I RIO along with the FTC's Decision (after public consultation and analysis) issued in October 2003⁵⁴ are summarized in Table 6.

Inter alia, the FTC questioned why there should be anything charged to the mobile operator for terminating a call which originated in C&W's network since C&W's charges to its fixed line telephone customers already cover costs that it incurs with these calls.

⁵⁰ Fair Trading Commission, Decision on Cable & Wireless Application for Rate Adjustment and the Introduction of Usage Based/Flat Rate Plans. No. 4 of 2004, July 20, 2004

⁵¹ Fair Trading Commission, Decision and order, In the Matter of the Application for a Review of the Decision of the Fair Trading Commission of 20 July 2004, No. 4 of 2004 filed by Cable & Wireless (Barbados) Ltd., 17 January 2004

⁵² Fair Trading Commission, Consultation on Price Cap Mechanism, Document No. FTC/CONS02/04, September 6, 2004

⁵³ Cable & Wireless, Reference Interconnection Offer (RIO) for Phase 1 of the Barbados Liberalization Timetable, 22 August 2003

⁵⁴ See: FTC Decision RIO – Phase 1 RIO v 1.0, No. 4 of 2003, October 28, 2003

**Table 6: (Anytime, Anywhere) Domestic Interconnection Charges in C&W's RIO v.1
Phase I**

Service/Charge	C&W Offer (US \$)		FTC Decision
	call set up	per minute	
Mobile to fixed (= fixed termination)	0.0300	0.011	Accepted
Mobile to mobile	not included		Requested further precision
Transit for mobile to fixed	0.0245	0.0090	Accepted
Mobile termination (for C&W's fixed subscribers) ⁵⁵	0.0305	0.0105	Rejected on the basis that C&W's costs are covered by revenues received from its customers for local calls (currently in the monthly line rental charge)
Emergency Services Access Fee	0.0315	0.0115	Accepted
National Directory Enquiry Services	0.0315	0.3705	Accepted
International Directory Enquiry Services	0.0315	0.4460	Accepted
Access Deficit Contribution ⁵⁶		0.0715	Rejected on the basis that universal service provider has not yet been identified

The FTC also rejected the proposal that access deficit contributions be included with the interconnection charge.

A revised RIO was issued by C&W in January 2004. (See Table 7). These are compared with interconnection fees in other countries in the Caribbean and in Europe in Section II.2.5 below.

**Table 7: (Anytime, Anywhere) Domestic Interconnection Charges in C&W's RIO v.1
Phase II**

Service/Charge	C&W Offer (US \$)			
	call set up		per minute	
	before 01.08.04	after 01.08.04	before 01.08.04	after 01.08.04
Mobile to fixed (= fixed termination)	0.0212	0.0201	0.0780	0.00735
Mobile to mobile	0.0165	0.0155	0.0060	0.0055
Transit for mobile to fixed	0.0165	0.0155	0.0042	0.0055
Mobile termination	0.0165	0.0155	0.0042	0.0055
Emergency Services Access Fee	Same as RIO Phase I			
National Directory Enquiry Services	Same as RIO Phase I			
International Directory Enquiry Services	Same as RIO Phase I			

⁵⁵ The current regime in Barbados is Receiving (or Mobile) Party Pays. Under a Calling Party Pays (CPP) regime, which is found in Europe and other regions of the world, the mobile termination rate which covers the mobile operator's costs to terminate the call on its network would be in the order of US \$ 0.13 – 0.15, which is also the range of rates imposed by the Botswana regulator for such calls. (See footnote above)

⁵⁶ The supplementary interconnection payments per call imposed on competitors to the incumbent fixed line operator to help the latter subsidize the below cost prices it charges for residential exchange connections before full rebalancing can take place.

II.2.5 Observations on the regulatory framework

The Telecommunications Act divides responsibility for regulation of telecommunications between the Minister responsible for the sector, currently the Minister of Energy & Public Utilities, and the Fair Trading Commission (FTC). This bifurcation of responsibilities creates confusion for many. Whereas it is consistent with best practices giving responsibility for policymaking, international relations, assigning of licences, and in many cases managing of scarce resources to the government, it is not clear why the Minister should also be responsible for regulating the sector (Section 4 (1) of the Act), for categorizing services and determining which are to be regulated, and for monitoring and ensuring compliance with license conditions which according to the Act are also responsibilities of the FTC which “shall exercise its regulatory functions in respect to telecommunications in accordance with (the Telecommunications) Act” (Section 6 (1) (b))⁵⁷. A mobile operator might rightly ask why the FTC says that it does not regulate the mobile sector⁵⁸ or why the Act in defining the powers and duties of the Minister (Section 4(2)) distinguishes the specifying of interconnection policy from developing other policy making for the sector.

The regulations, policies, and guidelines which the MOU required the government and the FTC to complete before the process of liberalization could proceed and which were issued by July 2003 included the following regulations: interconnection, licencing, universal service, standards, data communications, spectrum management, and numbering. These along with the Telecommunications Act, 2001, The Fair Trading Commission Act 2000, the Fair Competition Act, 2002 and the Consumer Protection Act, 2002 describe a solid legal and regulatory framework for a liberalized telecommunications sector in Barbados. The regulations are considered by some observers as being complicated and convoluted. For example, a policy on interconnection issued two years after the Act largely repeats the basic provisions on interconnection found in Part VI of the Act. Interconnection regulations, which were issued at the same time as the policy, are limited to defining some additional terms and conditions to be included in an RIO. It has also been suggested that a shortcoming of the interconnection provisions are their weakness with respect to deadlines on achieving agreement between negotiating parties.

There is also a perception, fueled by some politicians that the FTC is subject to political influence. While there does not appear to be any hard evidence of this, the fact that the FTC is a statutory body reporting to a minister may in part support such speculation. The rate adjustment decision of July 2004 which was considered to be independent helped soften this perception; however, it gained strength again after the April 2005 price cap decision, which some observers believed favoured C&W.

⁵⁷ By comparison the new Telecommunications and Public Utilities Commission Acts in Anguilla clearly distinguish responsibilities of the Minister responsible for telecommunications and the PUC. The former makes policy, regulates the spectrum and numbers, and is responsible for international matters as they relate to the sector. The latter regulates the sector including the implementation and enforcement of the Telecommunications Act, monitors and enforces and ensures compliance with license conditions, regulates prices and quality of service, classifies services, is responsible for consumers protection, helps resolve interconnection and other disputes, and regulates technical standards. The PUC also advises the Minister of policy and determines license applications according to the Act (See Anguilla Telecommunications Act 2003 and PUC Act 2003).

⁵⁸ See Paragraph 22 of FTC Decision RIO – Phase 1 RIO v 1.0, No. 4 of 2003, October 28, 2003

Also, the need for rebalancing was poorly understood by the general public and likely also the business community. This ignorance was unfortunately being exploited by some politicians and opponents of local rate increases. In the wider context most Barbadians probably were unaware of the policy of the Government which had resulted in initiating reform even though this had been quite well explained in the 2000 Green Paper.

The following issues continue to be of concern to stakeholders (new entrants, users, and government officials):

- The continued high cost of international calling, leased circuits, and interconnection;
- In addition the new mobile operators are concerned with anti-monopoly issues including what they consider to be predatory pricing by the incumbent⁵⁹ and the threat that Caribbean regulators (including Barbados) will obliged them to use distinct International Mobile Subscriber Identity (IMSI) codes resulting in significantly increasing the costs for all mobile operators. (See Box 4)

⁵⁹ Revolving around the prices that competing mobile operators are currently obliged to pay C&W (which continues to maintain its monopoly on international until the start of Phase 3) to route outgoing international calls. These were initially set at Retail - 30 %; however, C&W has been offering discounts to retail customers at given times below these rates.

Box 4: International Mobile Subscriber Identity

International Mobile Subscriber Identity (ISMI) Code

This concerns the ISMI code, a 15 digit number (of which the first 5 or 6 digits are the Mobile Country Code and Mobile Network Codes), which defines the home network of the subscriber and his/her unique identity. While there is a telephone number associated with the IMSI the customer can change his/her telephone number. The IMSI code is essential to identify that subscriber when he or she roams. Digicel uses its Jamaica IMSI code and AT&T, its USA and Bermuda IMSI code for all their Caribbean operations. This allows them to replicate roaming agreements that they already have with GSM operators around the world for Jamaica and North America, respectively, throughout the Caribbean without the need to negotiate, agree, test, and establish separate roaming agreements for each and every country and territory where they have operation. In addition to the savings in time and transaction costs, they also save through economies of scale in buying terminals (handsets) which can be ordered for the Caribbean market as a whole. To distinguish billing AT&T Wireless uses a distinct Public Land Mobile Network (PLMN) code, for the USA, Bermuda and the Caribbean. While the IMSI code is transparent to the subscriber several regulators in the region have been contemplating making mobile operators use distinct codes in their countries and territories as C&W has done historically; C&W is, however, making roaming arrangements with mobile operators in other countries in block just as AT&T Wireless and Digicel are doing.

Another concern of regulators is the potential anti-competitive impact of using a common ISMI code in all countries. When roaming a handset will always prefer the home network ISMI. Therefore, for example, the handset of an AT&T Wireless USA subscriber in Barbados will home onto AT&T Wireless' network instead of that of its competitors'; however, even if the ISMI codes were not the same AT&T Wireless (now owned by Digicel) could still program the SIM cards of its subscribers to give preference to its own networks in other countries. This is the case of Vodafone.

II.2.6 Recommended action

The criticism that the regulator is subject to political influence can be addressed in two ways: i) through some structural adjustments in the institutional arrangements and ii) by strengthening the existing institutions. The first may be somewhat difficult in that it likely requires modifications to existing legislation. On the other hand, it may be possible to make adjustments within the existing legal and regulatory framework with minimal modifications designed to remove overlapping or conflicting responsibilities. A review of the regulatory and policy making functions, as they pertain to the sector, and responsibilities of each institution might therefore be merited. Such a review might also examine the enforcement powers of the FTC.

Certain measures designed to strengthen or better emphasize the independence of the FTC might also be considered. Among these might be the staggering of appointment of members of the commission, giving the FTC a budget which is funded by levies on regulated companies rather than the current arrangements where the FTC gets a grant from the Government and then recovers the cost of regulation from the regulated companies, and giving it the means (including flexibility in remuneration packages) to attract highly qualified politically independent people.

The FTC, which was established in 2000 recently began in earnest to address some of the most critical issues in the process of liberalization telecommunications in Barbados having so far done an admirable job with its young staff in dealing with two very difficult and important issues, namely, interconnection and rate rebalancing. Its resources are, however, limited (It regulates other utilities also) and not currently adequate for regulating such a complex and demanding sector. It might therefore be appropriate to conduct a brief review of existing and required resources within the FTC (and also the Ministry) with a purpose of identifying shortfalls, which could be met in a number of ways including: i) the hiring and training new staff; ii) seeking temporary help from outside experts; and iii) establishing a program of sharing these highly specialized resources among regulators in the Caribbean as discussed further on in this report.

The FTC and the Government should continue to ensure that Barbadians, be they the general public, the business community, or the politicians are properly informed about reform of the telecommunications sector and the specific issues involved. They should continue to engage the incumbent as well as the new entrants and existing competitors in this campaign, which can be undertaken with modest means. A generally easy and effective way to do this is through benchmarking (used also in this report) whereby the general public, business community, and politicians can be shown comparisons of retail prices for local and international telephone calls, Internet access, and mobile communications and the type of services and choices that are available in other countries (in the region and outside) where telecommunications markets have been liberalized. Such an information campaign might also address the more general issues related to reform in the telecommunications sector such as:

1. The importance of telecommunications in promoting the development of the information and communication technologies (ICT) sector and more generally the Information Society in Barbados and how this can contribute to competitiveness through increased productivity and;
2. The socio-economic impact of increased competition in the telecommunications sector including the impact on employment, investment and tax revenues for the government;
3. The benefits to consumers through lower prices, greater choice, and better quality of service;

4. The impact on the sector through an increase in its value and the value of the players in the market;
5. The necessary evils of reform such as the need to rebalance retail tariffs.

With respect to the high prices for wholesale services such as domestic and international bandwidth capacity the FTC should ensure that the prices charged for these are “fair and reasonable” as required by the Utilities Regulation Act and the GATS Telecommunications Annex⁶⁰. The FTC should invite C&W, which for the time being controls the only undersea cable coming into Barbados, to show why the prices it charges should not be lower and more in line with international benchmarks. Issuing of licences to land competing submarine cables as the Government has already done also help. This puts pressure on prices for international bandwidth capacity. The Government should also implement regulations to permit collocation in submarine cable stations.

With respect to the issue of IMSI code, if the regulator (the Telecommunications Unit) has not been convinced by operators that having a distinct IMSI code for Barbados is costly and unnecessary and will cause significant delays in implementing international roaming in the region, it should seek independent advice from the GSM Association and/or the ITU on the costs and benefits, advantages and disadvantages of its imposing a distinct home country network code for Barbados. While not necessary this could be done in a special workshop organized with the assistance of the ITU and/or the CTU where independent expert(s) and other interested parties could present their views. Other Caribbean countries and territories contemplating similar action should also be invited.

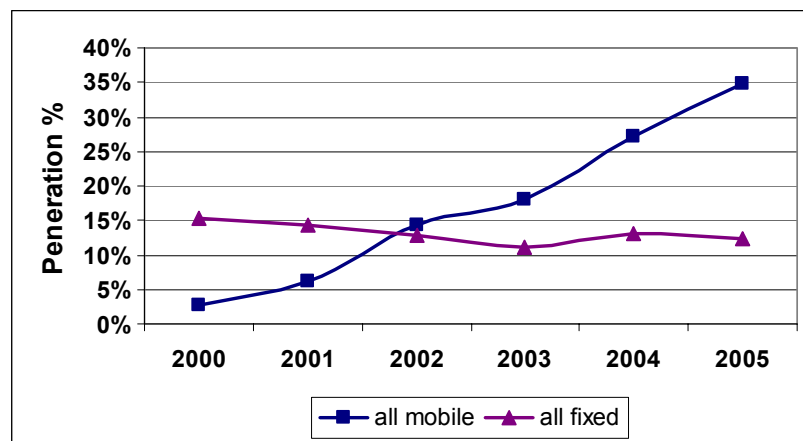
⁶⁰ As mentioned earlier in Section I.5 this means that in Barbados, which scheduled no limitations on market access (or national treatment) for Internet and Internet access, Internet Service Providers must be given access to leased circuit capacity on reasonable and non-discriminatory terms and conditions, namely, under the same terms and conditions which Cable & Wireless offers its ISP affiliate.

II.3 Belize

II.3.1 Introduction

Belize (British Honduras until 1993) has a population of just under 300,000, an area consisting of the mainland and cayes of 23,000 km² and a per capita GNP of US\$ 6,500. The country's greatest length from north to south is 280 km and its greatest width is 109 km. The country lies on the eastern or Caribbean coast of Central America, bounded on the north and part of the west by Mexico, and on the south and the remainder of the west by Guatemala. There is a low coastal plain, much of it covered with mangrove swamp, but the land rises gradually towards the interior. The Maya Mountains and the Cockscomb Range form the backbone of the southern half of the country, the highest point being Doyle's Delight (1124 meters above sea level) in the Cockscomb Range. Belize's economy is based on tourism, agriculture (citrus, sugar, bananas) and garments. As of the end of 2005 the main (fixed) line and mobile penetration rates were 12.9% and 37.5%, respectively. Like in other countries in the region mobile penetration has surpassed fixed. Figure 2 shows data for the period before March 2005 when Speednet, the new mobile entrant started offering service. Speednet presently has about 20,000 customers. Of these about 1,000 are postpaid.

Figure 2
Belize: Fixed and Mobile Penetration



Source: PUC

The Public Utilities Commission has so far issued three Individual License, one each to The Belize Telecommunications Limited (the Incumbent), International Telecommunications Limited (in Receivership) and Speednet Communications Limited (actively operating) which allows them to provide the full telecommunication services to the country. BTL and Intelco were issued their licences in December 2002 to coincide with the entry into force of the new telecommunications act and the termination of BTL's monopoly. In addition there are about 20 ISPs that have class licences. Of these only about 10 are operating. There are also 29 local cable TV operators throughout the country. Some of these also offer cable modem high speed Internet access in competition with the

incumbent telephone company's ADSL service. Telecommunications companies are subject to a 19% business tax.

There is one call centre, Ready Call, which is located in the centre of Belize City and which began operation in mid 2005. By December 2005 it was employing about 500 agents and was planning to hire more. It has only one client, a prepaid mobile service provider, TracFone, the USA based subsidiary of the Mexican America Movil. The call centre provides technical support to TracFone's customers. It currently leases 10 E1 from BTL. (See Box 1)

II.3.2 Legal and regulatory framework for the telecommunications sector

The Belize Telecommunications Act, 2002 is a progressive piece of legislation which foresees the implementation of a competitive telecommunications sector intended to provide users with reliable and affordable telecommunications services throughout Belize, meet their economic and social requirements including for the handicapped and provide them with access to emergency services, promote investment and innovation in the sector and ensure the efficient use of the radio frequency spectrum. The 2002 Act replaced the Telecommunications Act of 1987 under which Belize Telecommunications Limited (BTL) had a 15 year exclusive licence, until 29 December 2002. The main features of the new Act are the following:

- The task of regulating the sector is assigned to the Public Utilities Commission (PUC) which was established in 1999 and is currently subject to the provisions of the Public Utilities Commission Act, 2000. The PUC is responsible for technical and economic regulation of the sector and for implementing policy which is set on behalf of the Government by the Minister responsible for the sector but who is not necessarily the same minister (the Minister of Public Utilities) to whom the PUC reports. The PUC, which is an autonomous institution composed of seven commissioners and a small professional staff, also regulates water and electricity⁶¹ and manages the radio frequency spectrum. Some observers have suggested that the only way for competition to become really effective in Belize the PUC must become more pro active and for this to happen it needs to have more resources.
- A license is required to operate a telecommunications network, to provide a telecommunications service⁶² that offers real time voice or data, to operate a system that uses the radio frequency spectrum and to land and operate a submarine cable system. Licenses are granted by the PUC "if market conditions warrant" and subject to a number of criteria being met including that the service be in the public and national interest, it promotes universal access throughout the country and the technical and electromagnetic aspects of the network be compatible with other networks;

⁶¹ Belize, Public Utilities Commission Act Chapter 223, revised Edition 2000 showing the Law as at 31st December 2000.

⁶² The definition of telecommunication service includes value added services.

- All licensed public telecommunications services providers are required to provide interconnection to all other licensed public telecommunications services providers under conditions which are consistent with the principles of the GATS Reference Paper, namely, under non discriminatory, transparent terms, in a reasonable time frame, at any technically feasible point, unbundled and at cost oriented prices. The obligation to provide collocation and infrastructure sharing is also foreseen in the Act. The PUC arbitrates in the case of interconnection disputes.
- Resale is permitted unless otherwise stated in an operator's license;
- Tariffs are regulated on services provided by the dominant operator or service providers. Others are determined by the principles of supply and demand;
- The Act also foresees the establishment of a universal access program and fund. The PUC has yet to develop annual universal service objectives.

There is a high degree of transparency. Most data and documents which operators are required to file with the PUC including contracts and agreements between operators and service providers, licenses and tariffs are available to the public unless they have been designated as confidential by the source.

The licensing regulations (Telecommunications (Licensing Classification, Authorization and Fee Structure) Regulations, 2002), define two types of Licences: i) Individual licenses which are granted for basic fixed line telephone, mobile and wireless services, any service that requires frequency spectrum.; and ii) class licenses which are given where an Individual License is not justified but there is need to place certain conditions on the provision of the services such as for data transmission, resale, Internet services provision, value added services and private networks.

II.3.3 Ownership structure of BTL and the process of liberalization

In 1987 the Government of Belize divested itself of the then publicly owned domestic operator, Belize Telecommunications Authority, which was granted a license to provide the international telecommunications services formerly provided by Cable and Wireless, the outgoing international operator. The new company, Belize Telecommunications Limited (BTL), was given an exclusive license until 29 December 2002 to provide virtually all national and international telecommunications services including the establishment and operation of all types of facilities as well as directory services and customer premises equipment (CPE).

In 1987 British Telecom acquired 24.99% of BTL⁶³ and subsequently sold this to US telecommunications operator, MCI in 2000. At the same time the government bought 4.5% of the company⁶⁴. By 1997 the BTL ownership structure was as follows:

MCI	24.99% (two board members)
Carlisle Group	25.00%
Local investors	43.51%
Government	4.50% (one board member = the Chairman)

The Carlisle Group actually owned 27% but was prevented from registering the shares due to the Articles of Association of BTL. When MCI sold its shares to Carlisle Holdings in 2001 the Government allowed it to be a Permitted Person to register all its shareholdings which totaled 52%.

The remaining 5 board members were Belizeans including the Governor of the Central Bank. At the time BTL had about 29,000 DELs, 365 employees, a telephone penetration rate of nearly 14%, gross revenues of B\$ 72.4 million (= US\$ 36.2 million), with a return on capital of 21%. Assets were B\$ 111 million.

By 2002, when its exclusivity was about to expire, BTL was 52.5% owned by Carlisle Holdings Ltd. (controlled by local investor, Lord Michael Ashcroft), 24.2% by the Belize Social Security Board, 3.8% by the Government and the rest by small shareholders. On 20 December 2002 BTL and a new entrant, International Telecommunications Company (Intelco), were issued new 15 year non-exclusive licences to come into effect on 30th December 2002 in accordance with the new Act which had been promulgated in August of that year.

Intelco, which had invested US\$ 60 million in building a GSM 1900 (soft launched in August 2003 and commercially launch in October 2003) and a domestic fibre optic cable network, went into receivership in November 2004. It had had difficulties in coming to an agreement with BTL on interconnection. While it had been successful in getting an agreement for interconnection of its mobile services, there was no physical interconnection and it was able to offer only on-net (mobile to mobile) and international services for its own customers. In September 2003, two years after both companies were issued their licences, Innovative Communications Company (ICC), a US Virgin Islands based holding company controlled by Jeffery J. Prosser⁶⁵, in an arrangement with the RBT Merchant Bank of Trinidad & Tobago, Intelco's creditor, took over Intelco's assets and assumed its debts. At the same time the Government put pressure on Carlisle Holdings to sell it its 51% share (with an option to buy it back). The Government in turn sold 83.7% of the company in April 2004 to ICC, for US\$ 85.5 million of which about 30% (US\$ 28.5 million) was paid

⁶³ There was a 25% foreign ownership limit

⁶⁴ The Government had the right of first refusal but at the time could not afford to buy all of BT's share

⁶⁵ Jeffrey Prosser was the original joint owner with Cornelius Prior of Guyana Telephone & Telegraph Company through the US Virgin Island based Atlantic Tele-Networks (ATN). ICC owns and operates telecommunications and media companies (mobile, cable TV and fixed) in the US Virgin Is., British Virgin Islands, St. Martin, Guadeloupe, and Martinique.

in cash and the rest (US\$ 57 million) in the form of promissory notes. ICC also agreed to assume the debts of the failed Intelco.

The PUC approved an Operations, Administration and Maintenance agreement for ICC's Belize subsidiary, Belize Telecoms, to operate Intelco through the newly acquired BTL; however, the 2002 Act did not allow the transfer of Intelco's license to ICC⁶⁶. When ICC failed twice to pay the latter the Government took back control of the company in February 2005. ICC sued the Government of Belize and a judge in Miami initially agreed that the company should be returned to ICC and imposed a US\$ 50,000/day fine on the Government until the order was obeyed; however in August 2005 the same judge reversed that decision, which was being appealed by ICC. The Government now had 52%, ICC, 30%, small investors 10% and Carlisle Holdings, which had bought out some small investors, 8%. The Government, which sought Carlisle Holding's support in its litigation with ICC, sold back initially 15% and later 12% of the company to Carlisle, which at the same time was continuing to buy out more small investors. Carlisle also purchased 5% which the Government had offered to the public but found no takers. By November 2005 Carlisle had over 40% of the company, which it was able to acquire for less than it had sold it to the Government a year earlier. The Government put the remaining 20% in a trust for the company's union. As a result the current ownership of BTL is roughly as follows:

Carlisle Holdings	42%
BTL unions (in trust)	20%
ICC	30%
Small investors	8%

What remains in doubt today is the ownership of Intelco whose licence is under threat of revocation by the PUC for failure to meet its licence conditions. The PUC had given Intelco the three months notice required under Condition 27 of its licence for failing to meet an number of license conditions including failure to provide it with its network rollout plans⁶⁷. RBTT Merchant Bank, the creditor bank of Intelco, threatened to sue the PUC because this effectively eliminates the value of Intelco, whose equipment is currently in BTL's premises and being operated by the latter.

A new, privately owned company, Speednet, which was granted an Individual Licence in August 2003, is owned by the Briceño brothers⁶⁸, Eduardo Santiago, the CEO, and some venture capitalists and is supported by a loan from Belize Bank (controlled by Carlisle Holdings). Speednet had wanted to build a GSM 900 network; however, since the only frequency that the PUC could make available was in the 800 MHz band it decided instead to implement a more costly CDMA system⁶⁹. Speednet

⁶⁶ Section 19 (3) of the Telecommunications Act requires that any transfer, assignment or sale of a licence has to be approved by the PUC, which it may refuse if it goes against the principles of the Act.

⁶⁷ See Condition 27, Telecommunications Individual Licence granted by the Public Utilities Commission to international Telecommunications Company (Intelco)

⁶⁸ One of the brothers, The Hon. John Briceño is Deputy Prime Minister, Minister of Natural Resources, Local Government and the Environment. And Minister of State in the Ministry of Finance

⁶⁹ Speednet was initially only able to get 2 x 2.5 MHz and later another 1 x 1.25 MHz of frequencies in this band. For the backhaul network Speednet wanted to use the 7 GHz band or the 5.8 Ghz band and decided to use the 5.8 GHz. band.

had been successful in negotiating interconnection and site sharing arrangements with BTL in early 2004 at a time when the ownership of the latter was being changed; however, contrary to the provisions of both the Telecommunications Act and BTL's licence, Speednet has not been able to get direct access and collocation at the ARCOS cable landing station which is controlled by BTL. While it had been able to obtain an interconnection agreement by about February 2004, the actual physical interconnection was not provided by BTL, then owned and controlled by ICC, until one year later. As a result Speednet was not able to launch service until March 2005.

When the network rollout is completed at the end of March 2006 Speednet will have 29 base stations and a microwave backbone network which will provide international connectivity through the Maya 1 cable system in Cancun, Mexico. Most of the 29 base stations are on sites shared with BTL. For the time being Speednet has chosen to offer only outgoing international calls to its own mobile customers and is in negotiations with BTL to determine whether termination to Speednet's numbering plan will be via BTL or direct to Speednet's Gateway. In the meantime callers from outside of the country cannot call any of Speednet's customers.

Speednet plans to upgrade its CDMA 2000 1x system to a CDMA 1x EV-DO which can theoretically offer downstream and upstream speeds of up to 2.4 Mbps and 384 Kbps, respectively, and use this to offer fixed broadband Internet access.

II.3.4 Retail and wholesale prices of telecommunications services

The relatively high retail and wholesale prices for telecommunications services in Belize reflect the fact that in spite of having liberalized regime de jure, the market is de facto still quite closed and very much dominated by one player.

Local, national and international long distance rates are regulated. Peak time local calls cost US\$ 0.05/min (US\$ 0.025/min off peak) and national long distance calls vary between US\$ 0.05 and 0.20/min depending on the time of day and distance. Monthly line rental cost US\$ 10/month for residential and US\$ 25/month for a business. The telephone set rental costs US\$ 2.50/month in each case and installation US\$ 50.

International calling charges which for the time being are not subject to competition are expensive⁷⁰. BTL's recently reduced, peak time, direct dial rates are US\$ 0.70/min to the USA, US\$ 1.10/min to the rest of the Caribbean and US\$ 1.50/min to the UK⁷¹. These have to be compared with C&W Jamaica's US\$ 0.26/min anywhere, anytime rate, which are substantially cheaper than those of BTL but are still quite high by the standards of competitive markets. (See Section III.2.2 of this report). Like TSTT in Trinidad & Tobago BTL offers its own competing "line side alternate access carrier" or 10-10-199 calling card service with a saving of about 40% when comparing regular peak time rates with 10-10-199 off peak rates⁷².

⁷⁰ The PUC does not set rates but establishes ceilings. See PUC, Tariff Decision for the Telecommunications Sector May 7, 2004. BTL's current rates are below this ceiling.

⁷¹ New rates were introduced on 1 December 2005 and are about 15% cheaper than previously.

⁷² It is understood that the 10-10-199 service is often busy.

BTL like cable TV operator Channel Broadcasting Cable (CBC) offers an entry level (128 Kbps downstream; 64 Kbps upstream) high speed Internet access. BTL charges about US\$ 50/month for an ADSL connection, whereas CBC charges US\$ 60/month for a cable modem connection. BTL's 1,024 Kbps down/512 Kbps up service costs US\$ 250/month, which is quite expensive when compared with service offerings in that range of speeds which can cost 1/10th of this in more competitive markets. (See Section III.2.3)

The lease of an E1 (2.048 Mbps) between Belize City and Miami costs between US\$ 7,000 and US\$ 10,000/month including the local loop, which is similar to leases in other Caribbean countries but orders of magnitude higher than leases in competitive markets. (See Section II.2.4) The lease agreement, however, stipulates that the circuit cannot be used for voice communications. Indeed it is understood that BTL is reluctant to quote a price for a lease which will allow the company leasing it to provide voice services. This has discouraged more than one potential call centre operator from contemplating setting up a call centre in the country⁷³. An exception is Ready Call Centre (See Box 1). For ISPs a dedicated E1 with IP Transit (access to the Internet) costs about US\$ 5,700/month.

With respect to interconnection Speednet pays BTL the following termination rates:

Mobile termination	\$US 0.100
Fixed termination (local)	\$US 0.025
Fixed termination (long distance)	\$US 0.075

The mobile termination rate compares favorably with those of C&W in Barbados and Jamaica⁷⁴. On the other hand, the fixed termination rates appear to be quite high when compared with others in the Caribbean (See Section III.2.5)

II.3.5 Recommendations

Areas which it has been suggested need attention include the following:

- Review of spectrum allocation and assignments
- Clarify the line of responsibility of the PUC and provide it with more professional resources to the PUC so that it can more effectively carry out its functions and especially enforce provisions of the Act and licences;
- Develop and issue a full set of regulations including for interconnection;

⁷³ The practice of charging for leased lines according to usage is not allowed under the Central American Free Trade Agreement (CAFTA) which requires major suppliers to offer leased circuits at flat rate, cost oriented prices. (See Section 6 (b) of the CAFTA)

⁷⁴ See C&W Reference Interconnection Offers for Jamaica and Barbados

- Support private sector industry associations including the Belize Business Bureau and the Belize Chamber of Commerce so they can become more effective advocates of a truly liberalized telecommunications sector in Belize.

II.4 Dominican Republic

II.4.1 Introduction

The Dominican Republic has an area of 48,700 km² divided into 32 provinces, a population of about 9 million, a per capita GDP of US \$ 2,500 and receives over 3 million tourists per year.

Telecommunications services have been provided by private companies since 1930. CODETEL (Compania Dominicana de Telefonos), later GTE and now Verizon Dominicana⁷⁵ held a monopoly until 1992 when a concession was awarded to TRICOM, which in addition to fixed telephone services provides cellular mobile, Internet (dial up, ADSL and cable modem) and cable TV services. All America Cable and Radio (AAC&R), now Centennial, was awarded a licence a short time later. Its predecessor, Compañía Telegráfica de la Antillas had operated a submarine telegraph cable built in 1883 which connected the Dominican Republic with Cuba and Puerto Rico. There are 3 submarine cable systems (Antillas-1, ARCOS, and TCS-1) connecting the Dominican Republic to the rest of the world. A fourth, FibraLink Jamaica, a subsidiary of Columbus Communications⁷⁶ was put into service between Jamaica and the ARCOS landing station at Puerto Plata on 31 March 2006.

In the period since 1998 when the current law was proclaimed telecommunications has been among the sectors experiencing the highest rates of growth in the Dominican Republic. The sector has played an important role in the diversification of the economy away from primary industries such as agriculture, mining and fishing to manufacturing and services based activities such as tourism and transportation⁷⁷. Between 1997 and 2004 the telecommunications sector grew consistently each year by more than 15% (25% in 2001) and represented between 4 and 9.75% of GNP.⁷⁸ (See Figures 3 and 4)

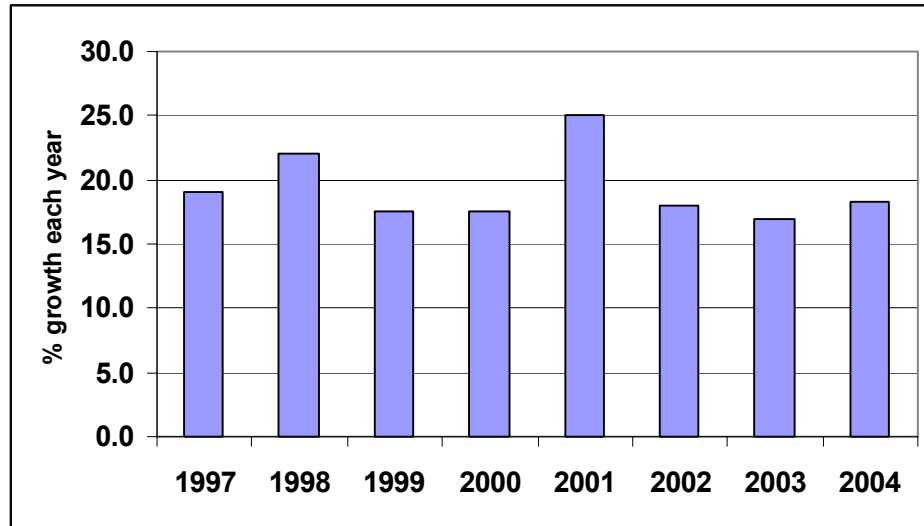
⁷⁵ On 3 April 2006 1000% of Verizon Dominicana was acquired (along with 52% of Telecomunicaciones de Puerto Rico and 28.5% of Venezuelan CANTV by the fixed line operator TELMEX and the mobile operator America Movil, both controlled by Mexican billionaire Carlos Slim *Financial Times, 4 April 2006.

⁷⁶ Columbus Communications is a newly established, Barbados-based company which owns Cable Bahamas, the only cable TV company in the Bahamas, the Bahamas Internet Cable System (BICS), a submarine cable system connecting The Bahamas to the USA, the Cable Company of Trinidad & Tobago (CCTT), the dominant cable TV operator in Trinidad & Tobago, and 85% of the Arcos submarine cable system.

⁷⁷ The part of GNP of primary industries (agricultural, mining and fishing) has decreased from 25% in 1980 to 15% in 2002.

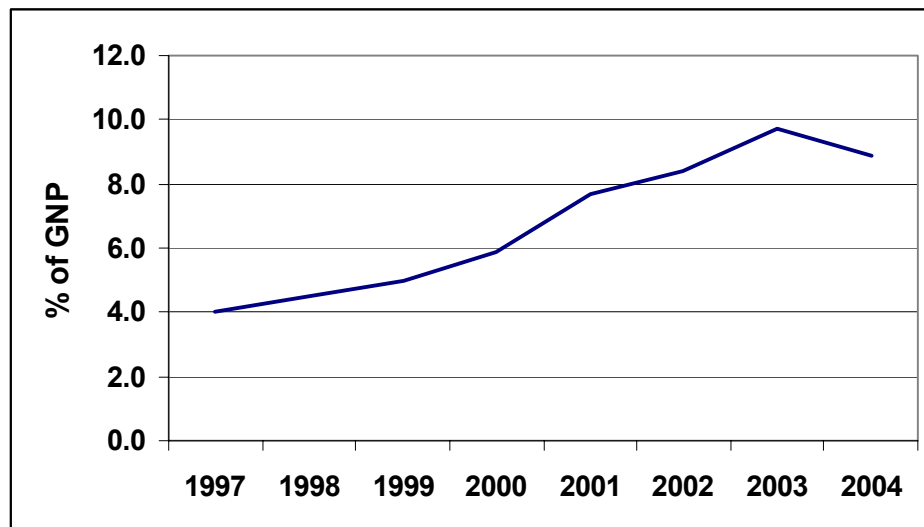
⁷⁸ Preliminary figures from the Banco Central de la República Dominicana.

Figure 3
% Annual Growth of the Telecommunications Sector in the Dominican Republic



Source: Banco Central

Figure 4
% of GNP represented by the Telecommunications Sector in the Dominican Republic



Source: Banco Central

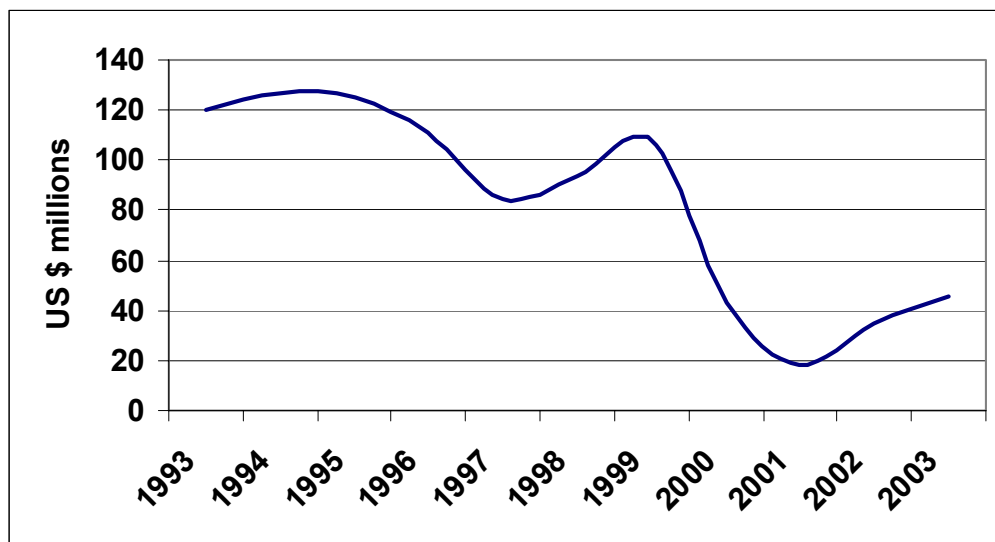
According to TeleGeography⁷⁹ in 2002 the Dominican Republic was the 6th largest international destination for telephone traffic from the USA accounting for 2.9% of all of the latter's outgoing telephone traffic, which amounted to 1.2 billion minutes in

⁷⁹ TeleGeography 2004

2002. In the same year 72% (160 million minutes) of the Dominican Republic's outgoing traffic was destined for the USA.

In spite of increasing levels of incoming traffic net settlement payments for telephone traffic from the USA decreased by more than 50% between 1993 and 2003. (See Figure 5) The lower revenues are a result of decreased settlement rates which have officially reached the FCC benchmark rate of US\$ 0.19 in 1999 but are in reality less than half of this⁸⁰.

Figure 5
Net Settlement Payments for International Telephone Services for Traffic Originating in the USA



Source: FCC Trends in the International Telecommunications Industry, September 2005

II.4.2 Legal and regulatory framework

Ley 153-98, the current sector law, which was promulgated in May 1998 and which replaced Ley 118-1966 has, inter alia, the following general objectives (Art.3):

- Promote development of the telecommunications sector based on the principle of universal access;
- Guarantee sustained competition by implementation of provisions in the Law;
- Defend rights of consumers of telecommunications services as well as the interests of telecommunications operators and service providers applying

⁸⁰ Much international traffic bypasses the networks of US international carriers and is routed through alternative routes purchased through spot markets or electronic market places such as Arbinet and Band-X. For example the Skype Out rates for terminating on fixed and mobile networks are, respectively, US\$ 0.087 and US\$ 0.172.

appropriate sanctions to one and the other when they fail to meet their obligations;

- Guarantee the rational and effective use of the radio frequency spectrum.

Ley 153-98 also created an independent, administratively decentralized telecommunications regulator, Instituto Dominicano de las Telecomunicaciones (INDOTEL) with judicial and financial autonomy and legal personality (Art. 76). INDOTEL which is the only government institution that has regulatory and policy setting responsibility for the sector is headed by a 5 member Executive Council appointed for a 4-year period by the Executive branch of the Government, which coincides with the 4-year mandate of the President of the Republic⁸¹. The President of the Executive Council has the rank of Secretary of State. Three members represent, respectively, the public telecommunications operators, the broadcasting industry, and the users. A fourth represents the President of the Republic. The Executive Director of INDOTEL is also a member of the Executive Council and acts as its Secretary. He has a voice in the Council's deliberations but no vote. Membership of the Council changes completely with each change of Administration.

INDOTEL's functions, which are described in Article 78 of Ley 153-98, can be categorized as follows⁸²: (i) regulatory including the making of regulations, regulating anti-competitive behaviour, ensuring that technical and quality of service standards are respected through the development of technical plans, and the type approval of equipment; (ii) application of the law including the awarding of concessions and licences, planning of the use of scarce resources such as the radiofrequency spectrum (including satellite orbital positions), numbers and rights of way and applying sanctions; (iii) dispute resolution between operators and service providers and between the latter and users; (iv) control including control of the radio frequency spectrum, the meeting of concession and licence conditions and obligations, inspection of equipment; (v) retail and wholesale price and tariff regulation in the absence of fair, effective and sustained competition; and (vi) administration of its own resources.

INDOTEL also administers the universal access fund in the Dominican Republic (Art. 49).

Law 153-98 inspired by the old 1987 Spanish *Ley de ordenación de telecomunicaciones* (LOT)⁸³ is based on a classification of four types of services: (i) bearer services, which supply the capacity necessary to transport signals between two defined network termination points and over which other public or private

⁸¹ The President of the Republic who is elected every 4 years by popular vote, appoints all ministers and governors of the 32 provinces and promulgates all laws approved by the Congress, which is made up of a 150 member Chamber of Deputies and a 32 member (one per province) Senate.

⁸² See: José María Chillón Medina, *Derecho de las Telecomunicaciones y de las Tecnologías de la Información*, Escuela Nacional de la Judicatura, Republica Dominicana, 2004, ISBN 99934-978-2-7

⁸³ The LOT was replaced in 1998 with the new pro-competitive *Ley General de las Telecomunicaciones* (LGT) which like telecommunications legislation in many other countries (including Jamaica, Trinidad & Tobago, Barbados and Anguilla) is based on the concept of (i) networks and (ii) services provided over these networks, both in a fully competitive environment. The LGT defines two types of authorizations, namely: (1) individual licences, which are required for the building and operating of public telecommunications networks and the provision of services or the operation of networks which use the radio frequency spectrum awarded through a tender or auction; and (2) general authorizations which are awarded to anyone that meets a set of minimum but basic conditions.

telecommunications services can be provided; (ii) end or teleservices which provide the capacity required for users to communicate; (iii) value added services, which use and add value to bearer, end, or transmission services; and (iv) broadcast services which are sound or visual (television) communications services provided simultaneously in a single direction to several points of reception. These telecommunications services may be public (provided to the general public under non-discriminatory conditions in exchange for economic compensation) or private (Art. 13-18)⁸⁴. This classification, which is quite rigid and out of tune with more modern legislation for the sector, makes it difficult for anyone wanting to enter the market to build a telecommunications network and/or provide a telecommunications service over an existing network and the fact that Verizon is dominant in practically all networks and services does not make matters easier.

Concessions are required to provide a public telecommunications services whereas licences are required to use the radio frequency spectrum. All concessions and licences are awarded by means of a public bidding process.

It has not been possible in the nearly eight years since Law 153-98 was promulgated to transform any telecommunications or broadcast concession, which was awarded under the 1966 Telecommunications Act, into conformity with the new regime as required under Article 119 of this law and which was to have been done within a year of the new Law being proclaimed. For one thing concession holders have been reluctant to undertake the process because they find the requirements (extent of financial reports, technical details and legal and other information that needs to be submitted and in the case of broadcasters, the need to form a company, and other requirements⁸⁵.) to be too onerous. As a result INDOTEL has to deal with two parallel regimes, one operating within the framework of the 1998 Act for new entrants and one, under the old 1966 regime.

Since Ley 153-98 was passed INDOTEL has issued a number of implementing regulations, developed a full set of technical plans and internal procedures. (See Box 5). Several regulations are currently under development. Others are planned for 2006.

⁸⁴ Peru, Ecuador and Bolivia are among other countries in the region which have telecommunications laws based on the Spanish LOT.

⁸⁵ See: Art. 20. Requisitos para Solicitar una Concesión, Reglamento de Concesiones, Inscripciones en Registros Especiales y Licencias para Prestar Servicios de Telecomunicaciones en la Republica Dominicana. For example under the area, technical requirements the applicant must, inter alia, give a detailed description of all network and terminal equipment, a detailed description of the entire backbone and local access network including technologies to be applied and signaling and transmission planes to be used, certificates of type approval of all equipment, etc.

Box 5: INDOTEL: Prepared and Approved Regulations, Technical Plans and Internal Procedures

Regulations

(a) provision of telecommunication services

- dispute resolution between users and service providers (Res. 124-05)
- tariffs and service costs (Res. 103-05)
- free and fair competition (Res. 022-05)
- shared infrastructure (Res. 151-04)
- electronic commerce (Res. 042-02)
- interconnection (Res. 042-02)
- concessions (Res. 004-00)
- contributions to the universal access fund (Res. 86-04)

(b) management of the radio frequency spectrum

- use of the radio frequency spectrum (Res. 128-04)
- National Frequency Allocation Plan (Res. 012-02)

(c) broadcasting

- cable TV broadcasting (Res. 32-05)
- TV broadcasting (Res. 120-04)
- AM broadcasting (Res. 094-02)
- FM broadcasting (Res. 073-04)
- radio amateurs (Res. 013-02)

Technical plans

- synchronization (Res. 061-05)
- access (Res. 060-05)
- transmission (Res. 059-05)
- tariffs (Res. 058-05)
- numbering (Res. 121-04)
- routing (Res. 1039-04)

Internal procedures

- conducting public consultations (Res. 0123-04)
- functioning of the Cuerpos Colegiados
- outside experts used to resolve disputes (Res. 046-03)
- ethical behaviour of INDOTEL employees
- strengthening procurement practices (Res. 023-01)

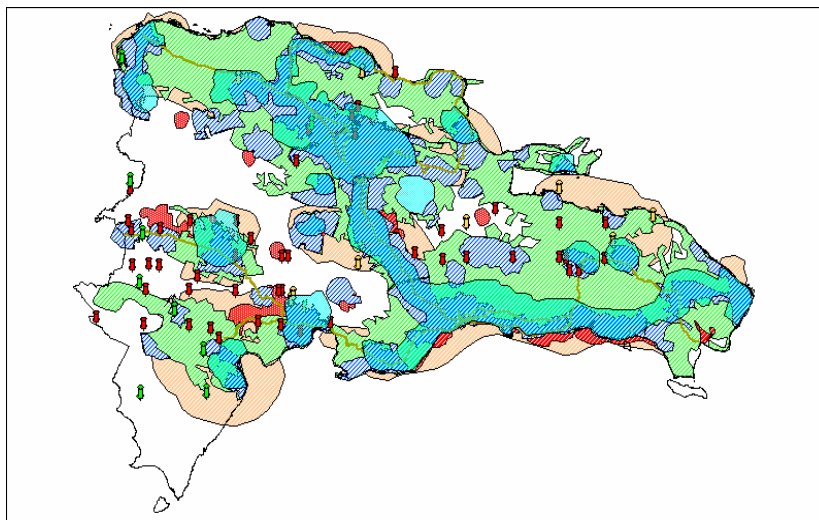
II.4.3 Operators and service providers in the market

Of the 24 facilities-based concession holders there are only 8 which are actually operating (See Table 8). Four of the latter, Verizon Dominicana, Orange Dominicana, a subsidiary of France Telecom, TRICOM, and Centennial, are operating mobile networks with respective market shares of 40%, 25%, 20% and 15%. They have a total of about 2,400,000 subscribers (mobile penetration ~ 38.2%) and together they provide coverage to about 75% of the national territory. (See Figure 6). The areas which have no coverage (in white) correspond to the poorest provinces.

Table 8: Number of Concession Holders for Each Type of Service

Service	No. of Concesión Holders	Operating
Telephone (DEL)	24	8
Internet (Accounts)	8	8
Cable TV Operators	60	60
AM Broadcasters	145	145
FM Broadcasters	225	225
UHF TV Broadcasters	37	37
VHF TV Broadcasters	8	8

Figure 6
Superimposed Coverage of the 4 Cellular Mobile Operators in the Dominican Republic⁸⁶



There were five cellular mobile operators that were assigned spectrum in the 900 and 1900 MHz bands but one, Global Com, never began to offer service with the result

⁸⁶ Source Pyramid Research and Salvador Ricourt, WB/Regulatel/ECLAC Universal Access Project, 2005

that 2 x 10 MHz in the 1900 MHz band remain unused. (See Table 9) Frequencies in the 900 MHz have been allocated mainly for FM broadcasting and in the 1800 MHz band for fixed radio applications including studio transmission links (STL). The dominant mobile standard with about 75% of the market is CDMA. Orange is the only operator which uses GSM.

Table 9: Spectrum Assigned for Cellular Mobile Operators

Operator	Technology	800 MHz band	1900 MHz band	Total assigned (MHz)
Verizon	CDMA	2 x 12.5	2 x 15	2 x 27.5
TRICOM	CDMA	2 x 12.5	2 x 15	2 x 27.5
Centennial	CDMA		2 x 10	2 x 10
Orange	GSM		2 x 15	2 x 15
Global Com*			2 x 10	2 x 10
Total		2 x 25	2 x 65	2 x 90

* does not operate

There are only two fixed line operators, Verizon Dominican and TRICOM. They are also the two dominant Internet Service Providers, both offering dial-up and high speed access for residential and business customers. Centennial which provides only cellular mobile telephone services offers dial-up Internet access in Santo Domingo. Two smaller companies, Economitel and Turitel, resell long distance telephone services and operate call centres using their own gateways and satellite links. In addition, Skytel, now called Digitec, offers national and international VoIP services and sells telephone equipment and Skymax, which operates primarily in Santiago, offers international and calling card services.

Verizon Dominicana, TRICOM, and Centennial also offer WiFi hotspots in various locations throughout the country and on university campuses.

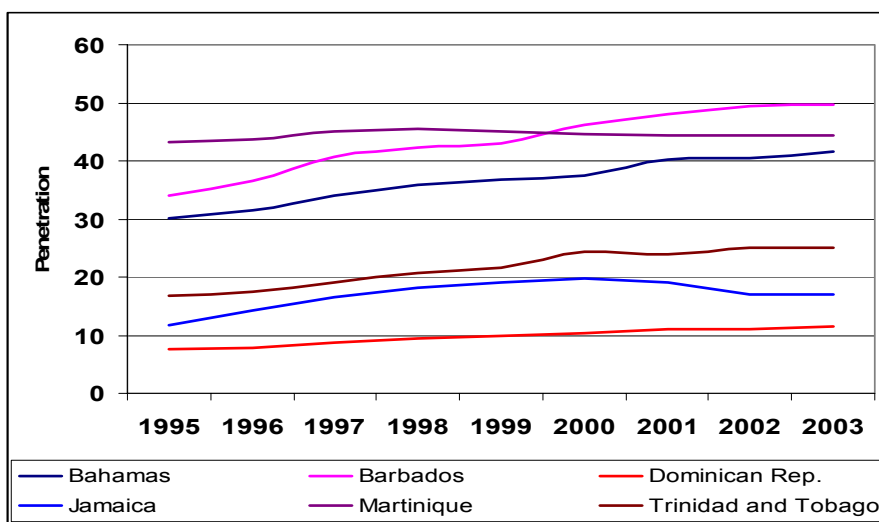
There are over 100 small cable television operators throughout the country. Sixty-five of these are members of the Asociacion Dominicana de Empresas de Cable (ADEC). They operate in 70 municipalities and have a combined total of about 115,000 subscribers. The two largest cable TV operators with a combined total of 85,000 subscribers are Telecable, a subsidiary of TRICOM which operates in Santo Domingo, La Romana, and Puerto Plata and Aster, which operates mainly in Santo Domingo and Santiago. Both also offer cable modem high speed Internet access. There are also 37 UHF and 8 VHF free-to-air TV broadcasters who pay the two large cable operators in Santo Domingo (but not the small operators elsewhere) to distribute their signals to households not within reach of their wireless signals. There are no national satellite or MMDS-type TV transmissions. Of the 370 AM and FM broadcasters 223 are members of the Asociacion Dominicana de Radiodifusoras (ADORA).

The many illegal cable TV and radio operators continue to present a problem for INDOTEL.

II.4.4 Growth of the sector and level of access

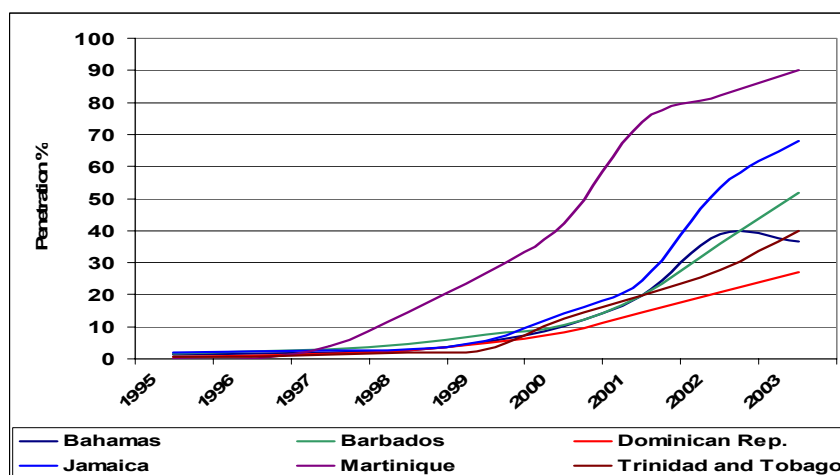
Figures 7 and 8 show the evolution of fixed and mobile penetration rates in the Dominican Republic as compared with some other countries in the Caribbean.

Figure 7
Growth of Fixed Line Penetration in the Dominican Republic and Some Other Caribbean Countries



Source: ITU WTI 2004

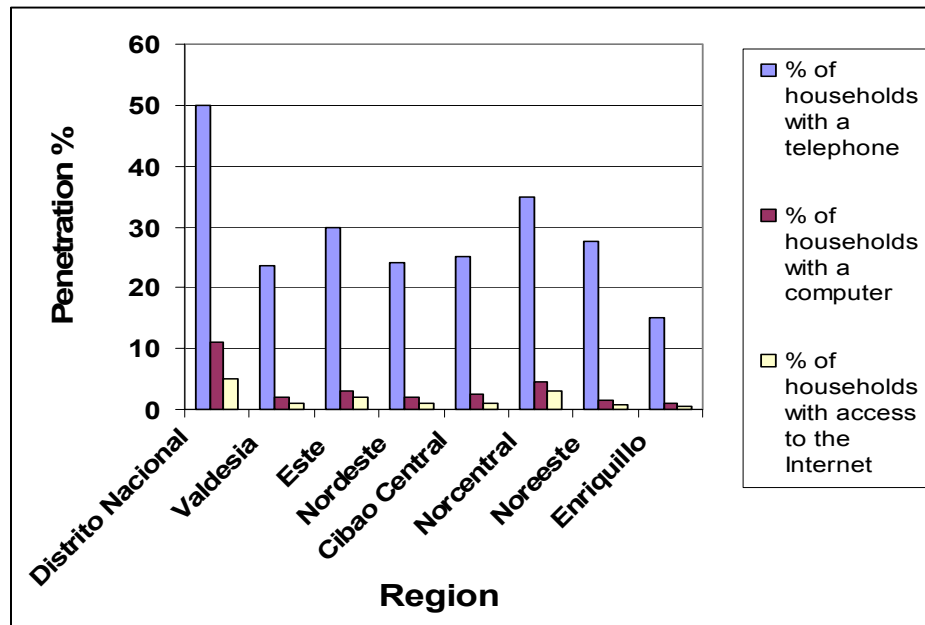
Figure 8
Growth of Mobile Penetration in Selected Caribbean Countries



Source: ITU WTI 2004

Current fixed and mobile penetration rates for the entire country are, respectively, 11% and 38.2% (the latter was about 28% in 2003). Fixed line penetration rates vary between 15% in Enriquillo and 50% in the capital region of Santo Domingo. Similarly, access to the Internet varies between less than 1% and about 5% in the same two regions. (See Fig. 9)

Figure 9
Dominican Republic: Percentage of Households that have Access to a Telephone, a Computer and the Internet in the 8 regions of the Country⁸⁷



Source: ITU WTI 2004

II.4.5 Universal access

The Dominican Republic has one of the best developed universal access programs in Latin America. The 1998 Telecommunications Law established a Universal Access Fund (Fondo para la financiación de proyectos de desarrollo) to which each subscriber of a public telecommunications service contributes 2% of his/her monthly bill. 40% of this Fund is used to finance the operations of INDOTEL, the regulator, which is also responsible for administering the Universal Access Fund and 60% is used to finance development projects which are awarded through minimum subsidy auctions. Two types of projects are eligible for funding: (i) Development projects which form part of biannual project plans and are approved every two years by the Executive Council and (ii) Special projects which are of a strategic and social nature and can be approved by the INDOTEL Executive Council on an as-required basis so long as they do not surpass a defined maximum amount.

⁸⁷ Source Salvador Ricourt, WB/Regulatel/ECLAC Universal Access Project, 2005

During Phase I (2000 – 2004) the universal access fund subsidized Verizon Dominicana, the dominant fixed line operator to deploy 500 payphones in population centres with more than 300 inhabitants. Also under this phase a tele-education portal, the establishment of 9 telecentres in 7 provinces and telemedicine projects in 18 provinces, were funded. In the second phase (2004 – 2008) the Fund has already subsidized the installation of pay telephones in 1,750 population centres. Since its inception in 2000 the universal access fund has subsidized a number of different ICT projects including: rural public payphones; community telecentres and Internet access; education and computer literacy; computers for schools, telemedicine; e- government, public security and tourism promotion.

Separately the Dominican government has partially financed the installation of Little Intelligent Communities (LINCOS), community telecentres, which offer not only telephone and low cost Internet access in remote areas but also photocopying, computer training and even low power (25 watt) radio transmitters for local community broadcasts. The first 5 LINCOS were installed in 2000. Since then more LINCOS have been installed in subsequent project phases.

II.4.6 Free trade agreements

Following are commitments of the Dominican Republic under the WTO (GATS) Basic Telecommunications Agreement of February 1997 and the Central America-Dominican Republic-United States Free Trade Agreement (CAFTA-DR) of 2005.

WTO (February 1997)

With respect to market access and national treatment the Dominican Republic committed to free market access for the following services which can be provided without limitations except for the need to establish a legal presence in the Dominican Republic and obtaining a concession from INDOTEL, the telecommunication regulator: voice telephone, packet switching, telex, telegraph, facsimile, private leased circuit services, paging, connection and interconnection and maritime mobile and aeronautical mobile services. With respect to regulatory and trade disciplines, legal obligations and foreign ownership limits the Dominican Republic committed to all non-discrimination, transparency, regulatory, licencing interconnection, competitive safeguard, and access to and use provisions of the framework agreement, the Telecommunications Annex and the regulatory principles Reference Paper including the establishment of an independent regulator.

There are no foreign ownership restrictions.

CAFTA – DR (August 2005)

The Central America-Dominican Republic-United States Free Trade Agreement (CAFTA-DR) which creates the United States' second largest free trade zone in Latin America after Mexico, includes seven signatories: the United States, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua. It was approved by the U.S. Congress in July 2005 and the President signed it into law on the 2nd of August. The Agreement which will enter into force on a date to be agreed upon by all parties, has been approved by the legislatures in the Dominican Republic, El Salvador, Guatemala, Honduras and Nicaragua but not in Costa Rica. Inter alia, the Agreement includes trade in services including telecommunications.

Contrary to the GATS the CAFTA-DR uses a negative list approach in commitments meaning that all sectors and sub-sectors are covered unless an exception is listed. Agreed trade disciplines are automatically extended to new services. Commitments under the GATS use the positive list approach meaning that only sectors and sub-sectors which are listed are subject to limitations on market access and national treatment indicated in the schedules. Commitments in services cover both cross-border supply (mode 1 as described in Ch. 11) and the right to establish (mode 3 as described in Ch. 10).

Ch. 13 deals with telecommunications and reflects many of the disciplines contained in the GATS regulatory principles reference paper and Telecommunications Annex. It contains provisions adapted for this particular Agreement that require parties to ensure: (i) access to and use of public telecommunications services (including leased circuits) on reasonable and non-discriminatory terms and conditions; (ii) access to unbundled network elements, rights of way, submarine cable facilities (including landing stations) and interconnection, leased circuit, co-location, and resale services from a major supplier of public telecommunications services⁸⁸ under reasonable, non-discriminatory and transparent conditions and where applicable at cost oriented prices; (iii) direct or indirect interconnection with any (dominant or not) supplier of public telecommunication services and the protection of the confidentiality of commercially sensitive information; (iv) availability of dialling parity and number portability (if technically feasible) on a timely basis and on reasonable terms and conditions; (v) independence of regulator with respect to any supplier of public telecommunications services including if the latter is government owned; (vi) transparent, non-discriminatory and competitively neutral universal service obligations that are no more burdensome than necessary; (vii) transparency in licencing procedures; (viii) technology neutrality; (ix) objective, timely, transparent and non-discriminatory administration of procedures for the allocation and use of scarce resources; (x) the establishment and implementation of enforcement and dispute resolution mechanisms relating to the obligations contained in the Agreement. The Agreement also contains provisions on competitive safeguard

⁸⁸ Defined as “a supplier of public telecommunications services that has the ability to materially affect the terms of participation (having regard to price and supply) in the relevant market for public telecommunications services as a result of: (a) control over essential facilities; or (b) use of its position in the market” See Art. 13.17 of CAFTA-DR

measures applied to major suppliers and on encouraging forbearance from regulation of services which are provided under effective competition.

With respect to broadcasting the CAFTA-DR states that in conformity with Law 153-98 (Ch. V, X, and XI) it is required to have a legal domicile in the Dominican Republic and be a stock company (*compañía por acciones*) or a non-profit organization incorporated under the laws of the Dominican Republic in order to be authorized to install and operate broadcast networks and to provide broadcast services in the Dominican Republic. Only Dominican nationals may own and control an enterprise that provides public radio broadcasting services that originate in the Dominican Republic.

With respect obtaining an authorization to the install and operate telecommunications networks and/or the provide telecommunications services to users in the Dominican Republic, it is required in conformity with Law 153-98 (Ch. V) to have a legal domicile in the Dominican Republic and be a stock company (*compañía por acciones*) incorporated under the laws of the Dominican Republic.

The CAFTA-DR does not affect rights and obligations that parties have under other agreements including the WTO.

II.5 Guyana

II.5.1 Introduction

Guyana has an estimated population of about 880,000 (2003) and a per capita income of US\$ 3,800 (2003)⁸⁹. The fixed and mobile penetration rates are, respectively 9.2 % and 9.9 %. There is some competition in the sector but it is limited.

II.5.2 The current situation

The legal and regulatory framework has not changed since 1990 when the Telecommunications Act was passed and when the newly privatized Guyana Telephone & Telegraph Co., GT&T, which is 80 % owned by Atlantic Tele-Networks (ATN) of the US Virgin Islands and 20 % by the Government⁹⁰, obtained what GT&T and ATN argue is a 20-year exclusive licence for all national and international fixed voice and data networks and services, all public payphone, radio telephone and private line services, and all sale of phone directory advertising. The exclusivity ends in 2010 but is renewable for another 20 years at the request of the company⁹¹. GT&T also had a 10-year exclusive license, renewable for an additional ten years in the Customer Premises Equipment (CPE) terminal, telefax, telex and telegraph markets. It has a non exclusive licence for cellular mobile services.

The Agreement between the Government and ATN entitles GT&T to earn a minimum rate of return of 15 % on “capital dedicated to public use” based on “GT&T’s entire property, plant and equipment”⁹². In addition, GT&T can pay ATN or a subsidiary a management fee (in US\$) approved by the Board of Directors⁹³. No foreign exchange controls or withholding taxes apply to dividends that GT&T pays to ATN⁹⁴ but the company is required to pay an annual assessment or regulatory fee of 0.1 % of the gross revenues derived from its services. GT&T has disputed the amount of the assessment arguing that it is discriminatory since it is not capped like that of other regulated utilities and has refused to pay more than the cap of G\$ 25 million (approx. US \$139,000), thereby significantly constraining the Public Utility Commission’s budget, which is largely dependent on such assessments.⁹⁵

In addition to about six (17 registered) Internet Service Providers (ISPs) there are currently three cellular mobile operators, the incumbent, Guyana Telephone and Telegraph Co. (GT&T), Cel*Star which operates a GSM 900 MHz network and Caribbean Telecommunications Ltd.(CTL), which provides a very limited service in

⁸⁹ CIA Data Base <http://www.cia.gov/cia/publications/factbook/geos/gy.html>

⁹⁰ It is understood that ATN has expressed an interest at various points in purchasing the 20% of GT&T it does not already own.

⁹¹ Agreement between the Government of Guyana and Atlantic Tele-Networks (ATN) for the sale to ATN of 80% of the shares of the formerly state-run telephone administration, renamed Guyana Telephone & Telegraph Company (GT&T), 18 June 1990 and Licence Granted to GT&T to Run Telecommunications Systems under Section 7 of the Telecommunications Act 1990, 19 December 1990

⁹² According to Section 33 of the Public Utilities Commission Act the Agreement between the Government and ATN takes precedence over any rate setting legislation or regulation.

⁹³ Sections 6.9 and 6.10 of the Agreement between the Government of the Cooperative Republic of Guyana and Atlantic Tele-network Inc.(ATN), June 18, 1990. This is under dispute because the PUC has disallowed inclusion of the 6% management advisory fee in GT&T’s rate base.

⁹⁴ Section 6.12 d of the same Agreement

⁹⁵ The only other source of income for the PUC is the Guyana Light and Power Company which also pays G \$ 25 million/year.

just one region (Berbice) of the country. It is believed that the latter, licensed in sub-band A in 800 MHz band, has less than 200 customers⁹⁶. In September 2004 when it launched its GSM network operating in the 900 MHz band it had approximately 100,000 TDMA customers (sub-band B in 800 MHz band) whom it plans to transition all to GSM. Cel*Star which began operating at the end of 2004 has about 28,000 customers (November 2005). A fourth company, Caribbean Wireless Telecom, licensed for a PCS system in the 1900 MHz band, never started operations. There is no auction system and competitive licences were granted on a first come-first served basis according to the availability of spectrum. In February 2006 the Government announced its intention to award a licence to Digicel.

In spite of having signed an interconnection agreement with GT&T on 3 April 2003 Cel*Star Guyana was not been able to begin offering service until the end of 2004. In effect GT&T suspended the completion of interconnection works because of a dispute between the former owner of Cel*Star (Guyana) and its previous business partners in relation to the propriety of early share transactions⁹⁷. GT&T claimed that the dispute clouded its ability to deal with the current owners and management of Cel*Star. The ownership issue is currently being litigated in the Guyana High Court and may take time to resolve. Pending a resolution, GT&T and the current owners of Cel*Star reached a Consent Agreement, entered as an order of the High Court. This allowed interconnection to be implemented. Under the current legal and regulatory arrangements Cel*Star Guyana will be able to compete in the domestic cellular but will have to provide international services via GT&T's network until GT&T's exclusivity expires (or GT&T is determined not to have exclusivity).

Cel*Star's Guyana's GSM 900 (2 x 12.25 MHz) network runs along the northern coast from Corriverton (on the border with Suriname) to Parika in the west and inwards to Linden past the international airport providing coverage to about 86 % of the population. It also plans to provide coverage in some remote areas including Lethem (2,800 people) on the border with Bofin (6,000 people) in Brazil. Cel*Star Guyana has not been able to lease capacity on the Americas 2 fibre optic cable system which comes into Guyana via a land route passing through French Guyana and Suriname and whose termination in Guyana is controlled by GT&T.

The operating ISPs are offering service generally using fixed wireless access technologies. ISPs, which do not require a licence and need only to be registered with the National Frequency Management Unit (NFMU), must normally obtain a connection to the Internet via the facilities of GT&T based on GT&T's assertion that it has exclusive rights in national and international voice and data transmissions. GT&T charges US\$ 31,600 per month for an E1 to Florida including IP Transit (connection to the Internet) via the Americas-2 fiber optic cable system with

⁹⁶ One of the reasons for it having such a low subscriber base, it has been suggested, is its inability to obtain adequate interconnection facilities from GT&T.

⁹⁷ The change in ownership of Cel*Star had taken place in March, 2003. An application by Cel*Star (Guyana) to have the Public Utilities Commission order interconnection notwithstanding the litigation was heard and GT&T made preliminary objections. The PUC referred the matter to the Court of Appeal for an opinion on jurisdiction. The Court directed that the Commission continue to deal with the application, but the Consent Agreement on interconnection reached between GT&T and Cel*Star has made any further action by the PUC on interconnection moot for now.

restoration via satellite or US\$ 25,600 without any restoration (See Section III.2.4)⁹⁸. Many ISPs, however, bypass GT&T's network using VSAT connections for which they typically paid US\$ 12,000 per month for an E1 lease.

Dial-up Internet rates vary between US\$ 28 and 33 per month. GT&T's ADSL service with download speeds of 128 Kbps costs US\$ 65/month for residential and US\$ 175/month for business subscribers. In addition, there are charges of US\$ 100 for installation, US\$ 100 for activation and US\$ 175 to buy the modem⁹⁹.

There are about 50 Internet cafés, half of which get their Internet service directly from GT&T. Many of these offer Voice over IP (VoIP) international calling¹⁰⁰, although GT&T would take the position that their doing so is inconsistent with the exclusive rights that it argues it enjoys under its licence. Rates for such Internet based calling can vary from between US\$ 0.084 and 0.11/min. for calls to the USA and Canada and between US\$ 0.39 and 0.44/min. for calls to Trinidad and Tobago and Barbados. Internet access in these cafés is offered at between US\$ 1.11 and US\$ 1.67/hour which compares favourably with some other countries in South America such as Peru, Bolivia and Argentina. VSAT's provide international connectivity for call centres.

There is one (unlicensed) cable TV operator offering limited service in the outskirts of Georgetown.

Acrimony between the Government and GT&T has a number of roots including GT&T's claim that the Government is authorizing and/or providing services that infringe on its exclusive rights, the dispute between GT&T and the PUC concerning the latter's refusal to admit the 6% management fee in GT&T's rate base¹⁰¹, the amount of licence fees and disagreements on outstanding taxes and information requested by the Government.

II.5.3 Tariffs and rate making

The rate making procedure begins with GT&T's presenting a proposal to the PUC, which after holding a public hearing, makes a decision. Rate proposals must be filed on no less than thirty (30) days notice and become effective as a temporary rate if a permanent rate has not been fixed by the PUC by that time. If at the conclusion of the rate hearing it is not satisfied with the PUC's determination, GT&T can ask for a review of the ruling which, if denied by the PUC, can appeal to the Court of Appeal whose decision is final and binding. This process is drawn out and, unfortunately, many rate proposals have been appealed in this way¹⁰².

Tariffs have not been rebalanced and while Guyanese enjoy among the lowest local and national calling charges in the region. International calling rates are among the

⁹⁸ A 64 simplex circuit from Georgetown to Miami (including local loop) costs \$US 1,200/month

⁹⁹ See www.gtt.co.gy

¹⁰⁰ GT&T has brought lawsuits against these Internet cafes.

¹⁰¹ See Part 5 of the Consultation Paper

¹⁰² The PUC has had to allow surcharges to help make up for delays in allowing rate increases due to such drawn out litigation.

highest in the region. International incoming calls are settled at the FCC imposed benchmark rate of US\$ 0.23/min¹⁰³. Leased circuit prices are very high.

Local and domestic calling rates are, as mentioned, very low while international calling is among the most expensive in the region. Peak time calls to the USA are US\$ 0.56/min. (US\$ 0.50/min. off peak); to Canada, US\$ 0.70 (US\$ 0.52/min. off peak); to Barbados and Trinidad and Tobago, US\$ 0.40/min. (US\$ 0.28/min peak); to OECS countries US\$ 0.51/min. (US\$ 0.36/min.) and to the UK, US\$ 0.76/min. (US\$ 0.68 off peak)¹⁰⁴. The cost of terminating a Skype computer-to-telephone VoIP call is at US\$ 0.45/minute amongst the highest in the region.. On the other hand, monthly residential line rental charges are US\$ 2.50 (US\$ 7.50 for business lines) and local calls are US\$ 0.004/min. during peak hours (US\$ 0.002/min. off peak) and long distance charges vary between US\$ 0.012 and 0.043/min. depending on the distance and time of day. A 1998 comparison of local telephone rates in Guyana and 19 countries in the Caribbean and South and Central America shows that Guyana had the lowest monthly customer bill for 240 minutes of local calling among the 20 countries surveyed¹⁰⁵. This has been a contentious issue for a number of years. GT&T has wanted to increase local rates; however, these have not been approved by the PUC which considers that GT&T was and is earning way over the minimum 15% it is allowed, which GT&T denies. GT&T has argued that it has not earned the 15% return to which it believes it is entitled. The PUC has argued that it cannot get GT&T to provide meaningful cost information. This has resulted in a longstanding stalemate.

II.5.4 Sector reform

The Government has recognized the importance of telecommunications for the development of an information-based society in Guyana including for the promotion of e-government¹⁰⁶, e-learning and e-commerce and has stated its desire to modernize this sector. In August, 2001 the Office of the Prime Minister and Minister of Public Works & Communications issued a Consultation Paper¹⁰⁷ which outlined the issues and options for sector reform. Among the issues identified are the following:

- The Public Utilities Commission Act, 1999 and the Posts and Telegraph Act are outdated and do not take into account the substantial (institutional and technical) changes that have occurred in the telecommunications sector around the world since the early 1990s;

¹⁰³ Federal Communications Commission, In the Matter of International Settlement Rates, IB Docket No. 96-261, Report and Order, FCC 97-280, August 1997

¹⁰⁴ These rates apply also to post paid cellular services. Prepaid customers pay between 10 and 27 % more for the same calls.

¹⁰⁵ Annex 2, Consultation Paper on Reform of the Guyana Telecommunications Sector

¹⁰⁶ The Government has constructed the initial section of a wireless network to connect all Ministries and to let them initially share a common payroll, human resources and an integrated Financial Management System (management of the Governments Expenses and revenues). This is a first step in decentralizing government services and offering of on-line government services such as licence renewals, issuing of birth certificates, etc. This work, being done under IADB's public sector modernization project, was interrupted by a lawsuit brought by GT&T against the IADB.

¹⁰⁷ *Reform of the Telecommunications Sector in Guyana, Consultation Paper on Issues and Options for Reform of the Telecommunications Sector*, Office of the Prime Minister and Minister of Public Works and Communications, Project Execution Unit for Modernization of the Telecommunications Sector, August 2001

- There are inconsistencies and uncertainties among the basic legal instruments governing the sector. The Telecommunications Act, 1990 and GT&T's Licence were based respectively on the British Telecommunications Act of 1984 and the British Telecommunications PLC Licence also of 1984 whereas the Purchase Agreement (for GT&T) and the Public Utilities Commission Act are based on US and North American jurisprudence. The provisions in the Telecommunications Act do not deal adequately with new types of services such as Internet;
- The Government has failed to implement the regulatory framework envisaged in the 1990 Telecommunications Act. Principally, it has failed to establish the Office of Director of Telecommunications, to which are delegated certain statutory functions under the Act, including the regulation of access and interconnection. These functions overlap to a certain extent with those of the PUC. The demarcation of responsibilities between the PUC and the Director remains unclear. Furthermore, the PUC is seriously under-resourced and under-funded. The NFMU does not have the necessary equipment to adequately monitor the spectrum and enforce its use;
- The sector is characterized by excessive litigation, which the Paper suggests has led to "litigation gridlock" and has increased regulatory uncertainty and delays and is one of the main reasons why competition did not develop until late 2004 in the cellular markets where legal entry restrictions never existed.

The Paper proposed reform based on the following:

- Adoption of a national telecommunications policy;
- Negotiating an early end to GT&T's monopoly and the implementation of a three phased liberalization process. The monopoly has been under legal attack for years, with arguments being made that the original grant of a monopoly to GT&T was unconstitutional or otherwise violated applicable law;
- Rate balancing and replacement of GT&T's rate-of-return based regulation with incentive (price cap) regulation;
- Reorganization of the regulatory institutions with one option being the establishment of a single telecommunications regulator combining the functions of The Director of Telecommunications, the National Frequency Management Unit and the telecommunications activities of the PUC;
- Creation of a licensing regime with only two types of licenses: 1) Individual licenses for the operation of networks which provide domestic and international public voice telephone services and which are interconnected

with GT&T's network and/or which use the radio frequency spectrum; and
2) General authorizations for all other types of networks and services including ISPs, resellers, private networks, and value added service providers. The latter would only need to register;

- Establishment of a transparent, non-discriminatory interconnection regime with cost based interconnection charges;
- Establishment of an objective, timely, transparent and non-discriminatory regime for licensing and regulating scarce resources (spectrum, numbers, rights of way);
- Incorporating basic anti-competition safeguards into the regulatory regime, including asymmetric regulation for dominant and non-dominant operators, safeguards against vertical price squeezing and cross ownership restrictions¹⁰⁸.

The Government has been determining how best to negotiate with ATN on various issues, including the development of a new licence and legislative framework and an early introduction of competition on a phased-in basis¹⁰⁹.

In early 2004 both ATN and the Government talked separately with Cable & Wireless about a possible sale of their respective shares in GT&T. For ATN this was seen as a possible alternative to an impasse in its negotiations with the Government whereas for the Government it would have been a way to support its strategy to liberalize the sector¹¹⁰. Any sale is, however, dependent on the willingness of ATN, the 80% shareholder of GT&T to sell and, obviously, the price the buyer is willing to pay. The Government apparently terminated its discussions with Cable & Wireless in mid-2004.

The Consultation Paper does not deal with frequency management except to indicate that responsibility for this function lies with the NFMU¹¹¹ which took over the spectrum management functions of GT&T's predecessor, Guyana Telecommunications Corporation, at the time of its privatization. It currently has a staff of 25 but is seriously under-resourced in monitoring equipment, which impedes it in effectively controlling the illegal use of spectrum, which is quite prevalent especially in the 2.4 GHz band. Spectrum licenses are currently awarded on a "first-come, first-served" basis. After processing an application the NFMU will advise the applicant that the license is ready to be issued. The license fee is G\$ 500 (US\$ 3.00). There are annual frequency usage fees which vary according to the different types of wireless services. These are contained in regulations made under the Telecommunications Act, 1990 and the Posts and Telegraph Act and are used to

¹⁰⁸ The current regime does not distinguish between dominant and non dominant operators and service providers. New entrants are regulated the same as the incumbent. For example, any public utility (which includes the competing mobile operators) which wants to change any of its rates must justify the change and give the PUC 30 days notice. See Sec. 41 of the PUC Act.

¹⁰⁹ It is understood that even though earlier negotiations broke down GT&T is prepared to negotiate based on the options contained in the Consultation Paper

¹¹⁰ *Gov't pursuing Cable and Wireless interests in GT&T*, Stabroek Business, January 22, 2004.

¹¹¹ According to the Guyana Frequency Management Unit Order, 1990 the NFMU is responsible for all aspects of spectrum management from planning and allocation through licensing to monitoring and enforcement.

fund the operation of NFMU with any surpluses sent to the Government's Consolidated Fund.

The Consultation Paper also does not address the under resourced status of the PUC which currently has only one financial analyst and no technical or legal staff (except the Chairman) and no resources in rate making. Also not mentioned is the lack of enforcement powers of the PUC and the inadequacy of fines permitted under the Act.

A revised version of the National Telecommunications Policy was prepared for Cabinet, along with a draft of a new Telecommunications Act. These have not been submitted to public comment. There is no schedule for review or approval of these documents. The Telecommunications Authority, which would be established under the proposed legislation, would have a mainly technical function including the development of standards, numbering and frequency management, and the technical aspects of interconnection. The PUC would regulate tariffs and anti-competitive behaviour and would be responsible for consumer protection and dispute resolution. Both the latter are required to be implemented under the CSME by 31 December 2005. A separate broadcasting commission would regulate content.

Other critical issues which have been identified as having to be dealt with before liberalization can take place are the rebalancing of GT&T's tariffs and the development of a cost allocation model to establish interconnection charges and local tariffs in conjunction with the rebalancing and.

There is as of yet no policy for the use of license-exempt frequencies, which have been allocated in the 2.4 and 5 GHz bands at the 2000 and 2003 World Radio Conferences (WRC)¹¹². Indeed, users of frequencies who currently have licences in these bands are complaining that unauthorized users are interfering with their signals and are not respecting allowed power limits for licence free use.

¹¹² 2,400 – 2,483.5 MHz in the 2.4 GHz band and 5,150 – 5,350 MHz and 5,725 – 5,875 MHz in the 5 GHz band. The 2003 World Radio Conference (WRC) agreed to allocate 455 MHz of spectrum in the bands 5.15 to 5.35 GHz and 5.47 to 5.725 GHz for wireless access systems.

II.6 Jamaica

II.6.1 Introduction

Jamaica (population ~ 2.7 million) has made significant progress in liberalizing its telecommunications sector since 1998 when the Government adopted the Telecommunications Policy which presented the principles for a policy framework for the future and opened the way to reform was adopted in 1998¹¹³. This led to the Government's renegotiating Cable & Wireless' (*C&WJ*) licence which gave its virtual exclusivity for operating all telecommunication networks and providing all telecommunications services in Jamaica until 2013¹¹⁴ and adopting a new Telecommunications Act, which confirms the three phased transition to a fully liberalized telecommunications market which had been agreed with Cable & Wireless in these negotiations. The 2000 Act established the Spectrum Management Authority (SMA), the Jamaica Telecommunications Advisory Council (JTAC) and provided for a Telecommunications Appeals Tribunal. Also in 2000 two additional mobile licenses were awarded by way of a spectrum auction.

On March 1, 2000 at the start of Phase 1 mobile and data transmission services including Internet access (using *CWJ*'s facilities), the provision of single line and multi-line customer premises equipment, the wholesaling of *CWJ*'s international switched voice minutes and free trade zone carrier services were opened to competition. Two additional mobile licenses were awarded by way of a spectrum auction. On September 1, 2001, the start of Phase 2, WLL, the resale of *CWJ*'s switched domestic voice minutes and Internet access over facilities of subscriber television operators were opened. The whole telecommunications market was liberalized on 1 March 2003, three years after the passage of the Act. Since then there have been nearly 400 licenses of all types issued to 137 companies. Among these there are about 77 Internet Service Providers (ISPs).

II.6.2 The telecommunications sector today

Since the beginning of the liberalization process in March, 2000¹¹⁵, the growth in cellular mobile subscribers has been spectacular, increasing from about 117,000 subscribers to nearly million today (end 2005), a compound annual growth rate of 53.6 %. *C&WJ* and new entrant Digicel share about 90% of the market, Oceanic, the second new entrant, has started to gain market share after a slow beginning. Together, the three offer coverage at virtually every point on the island. Mobile penetration in Jamaica today exceeds that of the rest of the Caribbean and even North America; however, according to the 2001 Population Census household fixed line telephone penetration rate is only about 45 % and out of a total of 750,000 households nearly 40% do not have access to a telephone at home or at a neighbour. Also while there is a relatively large number of Internet users per 100 population (estimated in 2000 to be nearly 25) the number of people with Internet access is estimated to be in the order of 100,000 (penetration = 3.7 %) which is still quite low

¹¹³ Ministry of Commerce and Technology, Telecommunications Policy: A Framework, October 1998

¹¹⁴ Heads of Agreement between the Government of Jamaica and Cable and Wireless Jamaica Limited, 30 Sept. 1999

¹¹⁵ When the current Telecommunications Act came into force

and is likely as a result of a relatively low fixed line penetration, the absence of many alternatives and the relatively high price of Internet access. Of the 100,000 Internet subscribers there are only about 10 % that have high speed access over wireless and wireline facilities.

Up to the end of 2004 none of the 51 regional cable TV operators offers Internet access services and there was only one operator (N5) which offered high speed wireless access and only in the Kingston area at prices about 60 % of those of Cable & Wireless' ADSL service. Notably, however at the end of 2005 at least two providers had begun testing to offer a high speed service. At the beginning of 2005 prices for dial-up were in the order of two times and for high speed about three times rates for North America and Europe. It is not surprising therefore that penetration rates for Internet access in Jamaica have remained behind those found in more competitive markets presenting a serious obstacle to the realization of the Government's objectives to develop a strong and effective information technology (IT) sector in Jamaica.

While overall international incoming and outgoing traffic volumes have increased and continue to do so, net settlement payments from international carriers to *C&WJ* have been decreasing after reaching a peak in 1998 and 1999.

A certain demonstration of the success of liberalization has been the significant reduction in international calling charges. Five years ago it cost close to US\$ 1.00/min to call to Jamaica from the USA or Canada today it costs about 1/10th of that. Calls from Jamaica have also dropped significantly in price; however, in spite of the significant progress achieved since the beginning of liberalization in 2000, the full benefits have not yet been felt across the whole sector. There continue to be areas of concern among which are the following:

- The 2003 figure for the number of subscribers to the Internet at 2.69% of the population represents a very low figure even when it is considered that this allows for multiple access benefiting some 350,000 people or 13.46% of the population. This may be partly the result of the relatively low fixed line penetration the absence of alternatives means of connection and the relatively high price of Internet access.
- International and domestic leased circuit capacity continues to be very expensive when compared with other regions of the world. This is a problem, for firms in the ICT and other sectors that require cheap bandwidth to connect to their suppliers and customers at home and overseas¹¹⁶.
- While some cellular mobile calling is relatively cheap (e.g. calls between subscribers of the same operator) other such as calling between subscribers of different cellular networks or calling from a fixed telephone to a mobile telephone remain quite expensive.

¹¹⁶ This problem is beginning to be resolved with the awarding of two new submarine cable landing licences late last year

These are a result of continuing structural problems and outstanding regulatory issues. The following stand out:

- There continues to be basically one fixed line and local access provider, C&WJ. While there are a few small companies that provide mainly fixed wireless access, they serve mainly business customers. Also, there are currently no regulatory provisions to permit infrastructure sharing and local loop unbundling (LLU)¹¹⁷, which would permit competing operators to provide local access in competition with C&WJ using C&WJ's facilities. Also, the cable TV market, which has island wide coverage is too fragmented and cannot under its current structure provide alternative local access for telecommunications services especially high speed Internet and Voice over Internet (VoIP).
- Smaller wireless access carriers, resellers and ISPs claim they have been unable to make a significant impact on the market because of incidences of anti-competitive practices of the incumbent, which include predatory pricing, delaying tactics, price and margin squeezing, and price and quality discrimination. There is a limit on the extent to which these practices can be addressed under the current regulatory regime given that the legislation (Telecommunications Act) requires that anti-competitive issues be referred to the FTC and that a 2001 Supreme Court ruling substantially constrained the FTC's ability to enforce the Fair Competition Act with regard to such practices¹¹⁸.

II.6.3 The legislative, regulatory and institutional framework for telecommunications

The primary legislative instruments for telecommunications in Jamaica today are: The Telecommunications Act, 2000; The Office of Utilities Regulation Act, 1995; The Broadcast and Rediffusion Act, 1949 (amended in 1986 and 2001), The Office of Utilities Regulation Act, 1995; The Radio and Telegraph Control Act, 1970; The Television and Sound Broadcasting Regulations (1996); the Fair Competition Act 1993¹¹⁹, the Consumer Protection Act 2005, and the Post Office Act.

The framework for the telecommunications sector is contained in The Telecommunications Act, 2000, which also describes the functions and duties of the Office of Utilities Regulation (OUR) established in 1995 under the Office of Utilities Regulation Act, 1995. The Telecommunications Act contains provisions on licensing, spectrum management, interconnection, numbering, rights of way, equipment

¹¹⁷ OFCOM, the UK communications regulator, explains local loop unbundling as follows: "Local Loop Unbundling (LLU) enables operators to connect directly to the consumer via BT's copper local loops and then add their own equipment to offer broadband and other services. This process involves operators accessing BT's local exchange buildings to connect to BT's network of copper lines which connect them to homes and businesses. There are two types of unbundled line: (i) A fully unbundled line gives operators the exclusive use of the copper line, and (ii) A shared access line only gives operators the use of the high frequency channel used for broadband and will also be used by the customer's fixed-line voice provider."

¹¹⁸ In the *Jamaica Stock Exchange v. the Fair Trading Commission*, 2001 (an appeal case) the courts ruled that there is a structural defect in the configuration of the Fair Trading Commission which breaches the principle of natural justice because the FTC investigates and adjudicates at the same time and there is no clear separation between these functions. This ruling has therefore made it virtually impossible for the FTC to convene hearings to deal with allegations of anti-competitive conduct.

¹¹⁹ Currently under review

standards, universal services, and consumer protection and defines the relationship between the OUR and the Minister (who may give it general policy direction) and between the OUR and the Fair Trading Commission (FTC) with respect to matters which OUR may refer to the latter. It defines dominance and sets out the obligations of dominant operators with respect to the filing of a Reference Interconnection Offer (RIO), the pricing of interconnection, the resolution of disputes, indirect access, and number portability. The Act defines the powers of the OUR and operators to prevent unauthorized bypass of international services.

Section 13 of the Telecommunications Act 2000 defines three types of licences: a carrier licence which authorizes the licensee “to own and operate the facilities specified in the application”; a service provider licence which authorizes the licensee “to provide the services specified in the application”; and a dealer licence which authorizes the licensee “to sell, trade in or import any prescribed equipment”. In reality, however, 14 different types of licences have been issued. (Table 2). These correspond roughly to different sub-categories of licences issued by the Minister of Commerce, Science and Technology during the different phases of the transition according to Section 78 of Act.

On the institutional side policy setting responsibility for the sector rests primarily with the Minister of Commerce, Science and Technology with Energy. The Minister of Information oversees the Broadcasting Commission and the Minister responsible for Development in the Office of the Prime Minister presently oversees the Office of Utilities Regulation. Responsibility for regulation is divided among the following: The Office of Utilities Regulation (OUR) regulates several utilities including telecommunications; the Spectrum Management Authority (SMA) manages the spectrum on behalf of the Minister; and the Broadcasting Commission (BC) regulates the broadcasting sector; The Fair Trading Commission (FTC) and the Consumers Affairs Commission (CAC) have responsibility to enforce competition and protect consumers for all sectors, respectively. For the time being CAC does not operate under an act and has no enforcement powers. The proposed Consumer Protection Act will give the CAC some powers.

The OUR has drafted a number of rules, none of which has yet been passed by Parliament as required by the Telecommunications Act.¹²⁰ Table 10 lists the rules which have been drafted and submitted for approval and those which are to be completed. Until now OUR has regulated largely by way of decisions which are developed through a process of public consultations and which so far have primarily concerned interconnection, the establishment of dominance, universal services, directory information services, numbering, pricing (rebalancing *C&WJ*'s rates and price caps), indirect access (= equal access), and prepaid calling cards.

¹²⁰ Section 71 says that the OUR can make rules “subject to affirmative resolution (i.e. approval by Parliament). According to section 72 enabling regulations are made by the Minister.

Table 10: Licences for Telecommunications Services in Jamaica
(Licences issued by the Minister of Commerce, Science and Technology)

Licence		Description
Name	Designation	
Data Service Provider	DSP	The Licensee is authorized to provide specified non-voice services within Jamaica.
Domestic Carrier	DC	The Licensee is authorized to own and operate fixed network facilities used in the provision of specified services between points in Jamaica.
Domestic Voice Service Provider	DVSP	The Licensee is authorized to provide specified voice services, originating in a fixed network, between points in Jamaica.
Free Trade Zone (FTZ) Carrier	FTZC	The Licensee is licensed to own and operate facilities used in the provision of specified services between points in a Jamaican Free Trade Zone and points outside Jamaica.
Free Trade Zone Service Provider	FTZSP	The Licensee is authorized to provide specified services through the use of facilities of a duly licensed FTZ carrier.
International Carrier	IC	The Licensee is authorized to own and operate facilities used in the provision of a transit service or a specified service between points in Jamaica and points outside Jamaica, or with ships at sea and small vessels in coastal waters.
International Service Provider	INT'L SP	The Licensee is authorized to provide international voice and data services to the public through the use of facilities owned and operated by a licensed telecommunications carrier.
International Voice Service Provider	IVSP	The Licensee is licensed to resell international switched minutes obtained from a licensed telecommunications carrier.
Internet Service Provider	ISP	The Licensee is authorized to provide telecommunications services in relation to internet access.
Internet Service Provider for Subscriber Television Operators	ISP (STVO)	Issued to entities licensed under the Broadcasting and Radio Redifusion Act to provide subscriber television service, authorizing the provision of services in relation to internet access.

Table 11: Rules Drafted and to be Drafted by OUR

Rule	Section (Act)	Drafting completed	Drafting to be completed
Appeals	60.4	X	
Application for License	11	X	
Certification of Standards	57		X
Competitive Safeguards	35		X
Functions of the Office	4	X	
Indirect Access	36		X
Interconnection	29.3	X	
International Service	50		X
Number Portability	37	X	
Numbering	8.2		X
Penalties	71		X
Pre-contract Dispute	34.2	X	
Price Caps	46	X	
Quality of Service Standards	44		X
Referral to FTC	5		X
Resale of International Minutes	79.3		X
Rights of Carriers & Service Providers	51		X
RIO by Dominant Carrier	32		X

II.6.4 Proposals for reform

The OUR has the legal and structural underpinning to effectively regulate the telecommunications sector in Jamaica but has come under growing criticism by stakeholders and especially the new entrants who suggest that it reacts too slowly to rapidly changing circumstances in the sector, has not been giving sufficiently high priority to telecommunications, is too cautious and lacks the will and determination to take the difficult and sometimes unpopular decisions that are required to regulate a sector where a powerful incumbent continues to dominate. Such observations, which may or may not be founded, overlook the many positive achievements of the OUR in managing the critical first steps in the liberalization process, in spite of its relative youth and shortage of expert resources. The OUR acknowledges that there is a number of factors which are hampering it from being as effective. Among these are:

- Inadequate human and financial resources needed to regulate effectively;
- Perceived inability under the current Telecommunications Act for it to regulate certain activities and sub sectors such as interconnection of data networks, wholesale markets (ex post), anti-competitive agreements or abuse of dominance in retail markets;

- The confusion resulting from overlapping responsibilities of the Minister and the OUR, on the one hand, and of the FTC and the OUR, on the other. The requirement to refer matters to the FTC and the defect in the FCA which hinders the FTC from dealing effectively with such issues is viewed as a paramount difficulty;
- The failure of the Government to recognize the needs of the OUR especially with respect to its financial and human resources requirements.

There is agreement among stakeholders that basically two types of action need to be taken to consolidate progress achieved so far and to reinforce the framework for the sector, namely:

- the current Telecommunications Act needs to be revised, if not completely redone. While it served its purpose well in defining the process of reform, it is too specific in certain areas and fails to address others. A more generic law accompanied by enabling regulations would be more appropriate now that the main objective of the current Act, to liberalize the market in a three stage process has been achieved;
- the role and functions of the regulatory institutions need to be clarified. A recommendation to create a single telecommunications regulator is currently under consideration by a sub-committee of Cabinet¹²¹. This should be put into effect with the drafting and passing of a new Act;
- the urgent need to fix the defect in the Fair Competition Act and the resulting institutional difficulty it poses for the FTC;
- the regulatory capacity of the Spectrum Management Authority (SMA) and the Office of Utilities Regulation (OUR) as it pertains to telecommunications needs to be strengthened. Inter alia, the SMA should get support in establishing and running the universal access program for which it was recently given responsibility and the OUR, which has generally done a very good in managing the liberalization of the sector needs support and strengthening to deal with some of the issues mentioned, and more specifically by:
 - implementing measures necessary to prevent anti-competitive practices of the incumbent including the drafting of rules and/or regulations and establishing a mechanism to monitor compliance with these rules and to enforce them;

¹²¹ See Stern, Peter A., Review of the Legal, Institutional and Regulatory Framework for the Telecommunications Sector and Recommendations for Reform, July 2004. The World Bank through PPIAF will be financing a regulatory impact assessment to review the current institutional and regulatory frameworks for utility regulation and competition policy for a number of regulatory agencies including the OUR, SMA, BC and the FTC.

- putting in place measures to facilitate and promote competition and entry including (in addition of the anti-competitive safeguard mentioned above) facilitating local loop unbundling, facilities sharing, and the establishment of a fair, transparent and non-discriminatory numbering plan for Jamaica.

A Multilateral Investment Fund (MIF) funded project is currently under way to assist the OUR in a number of highly specialized regulatory areas including indirect access, competitive safeguards, local loop unbundling and facilities sharing, and number administration. This assistance is being provided in the form of consultancies to help in the drafting of regulations, human resources development and capacity building.

II.6.5 The bandwidth squeeze

In spite of now having a fully liberalized telecommunications market Jamaica like most of the rest of the Caribbean continues to suffer from excessively high costs for bandwidth. The scope for *C&WJ*'s competitors' offering services especially at prices much below those of *C&WJ* is limited because of the high cost of: i) the local loop (The downstream bottleneck); ii) connecting to the Internet (The upstream bottleneck); and iii) acquiring incoming local telephone lines (channelized T1s) and toll free (1-800) numbers necessary to offer dial up Internet services.

If not the only supplier of these facilities and services, *C&WJ* is dominant in all three.

While not yet widespread a number of technologies have or are being developed as complements or alternatives to copper in the local loop. Among these are satellite and terrestrial based wireless technologies such as variations on spread spectrum, smart antennas, agile or cognitive radios and software defined radios whose impact has been to effectively increase the amount of spectrum available for various fixed and mobile applications including broadband local access. At the same time these technological developments are inciting policy makers to reflect on new, more efficient ways of managing the radio frequency spectrum.

On the upstream side private companies, cellular mobile operators, and ISPs have until now had little choice beyond those of *C&WJ*'s domestic and international leased capacity offerings. Satellites can provide both backhaul (backbone) and local loop facilities. Satellite operators offer up-stream connectivity to the Internet to ISPs and others either through two way links which includes IP Transit or through a one way link, typically with the return (higher capacity) via satellite. As backhaul the maximum capacity that a satellite transponder offers is typically 36 MHz of bandwidth (approximately 18 E1s); however, because of the latency, inferior throughput offered by satellite and generally higher prices, ISPs prefer fiber optic cable connections¹²². Like in the rest of the Caribbean prices for international leases using submarine fibre optic links are substantially higher in Jamaica. For example, the price for a lease of an E1 circuit in Europe over a distance roughly equal to the

¹²² Users of call centers also prefer cable over satellite links. See Box 2, above.

distance between Jamaica and Miami (as the crow flies in both cases) is in the order of US\$ 500 per month, less than 1/25th of the price of a Jamaica – Miami lease when compared on a per Mbps basis. This does not include the one time installation charge which is in the order of US\$ 6,000 for a T1. The high international leased circuit prices could be attributed to the limited fiber optic cable circuits which were available to users in Jamaica where until very recently there were just two undersea fiber optic cables which landed in Jamaica, the Trans-Caribbean Cable System (TCS-1) and the Cayman - Jamaica Fiber System. On the Jamaican side *C&WJ* controlled both. FibraLink finished laying its new cable connecting Jamaica with ARCOS in the Dominican Republic in February 2006. (See below).

While the joint owners of the Dominican Republic - Kingston segment of TCS-1 own capacity up to the cable landing station in Kingston, they have no means of breaking out this capacity and bringing it to a potential client on the island. They would need to make arrangements with *C&WJ*, install multiplexers, and other equipment in *C&WJ*'s cable station and then find a means to connect to the local customer through the domestic network.

II.6.6 New submarine fibre optic cable links

On 12 August 2004 OUR issued a Request for Proposal for submission of applications for a licence to build, own and operate an additional submarine fibre optic cable carrier facility¹²³. Submissions were due on 25 October 2004 and just before the end of the same year it was announced that two operators (FibraLink Jamaica a subsidiary of Caribbean Crossings of The Bahamas and Trans Caribbean Cable Company, a consortium of some 38 companies) had been awarded cable landing licences¹²⁴.

Originally FibraLink had until September 2005 and TCCC, until the end of 2006 to build and put their cables into service. This was later extended in the case of FibraLink to May 2006. Its 800 km 160 Gbps DWDM cable whose construction has been completed connects Montego Bay, Ocho Rios and Bull Bay (near Kingston) with the ARCOS landing station at Puerto Plata in the Dominican Republic. The three Jamaican points are connected among themselves with festoon (undersea) and terrestrial links.

These along with some other Caribbean submarine fibre optic cable networks are discussed in further detail in Section IV.2.2 of this report.

¹²³Notice of Invitation for Carrier Licence Applications pursuant to the Telecommunications Act, 2000 and Directive No. 3/2004 Tel issued by the Ministry of Commerce, Science and technology to the Office of Utilities Regulation dated July 28, 2004 See <http://www.our.org.jm>

¹²⁴ See; *Government Awards Licenses for Fibre Optic Networks*, Ministry of Commerce, Science and Technology (with Energy) at <http://www.mct.gov.jm/optic.htm>

II.6.7 International facilities based competition

Since the market for international facilities based operators was opened to competition at the start of the third and final phase of the transition, 59 international carrier licences have been issued (in addition to C&WJ whose licence already permitted it to be an international operator). This licence permits a licensee to operate an international gateway and to act as a transit point for international incoming and outgoing telecommunications traffic in Jamaica.

International operators complain that they are being squeezed between continually decreasing settlement payments on the one hand and the fixed termination rates they have to pay, on the other. Those that are receiving incoming Voice over IP (VoIP) traffic at the going rates were clearly disadvantaged. Given the strong opposition to the imposed rates, OUR in April 2004 rescinded an earlier decision effectively deregulating international settlement rates completely and leaving a decision on termination rates for incoming international calls on fixed and mobile networks for a later date. This was confirmed in a further decision by OUR on June 9, 2004. Rates for terminating calls on fixed and mobile networks will henceforth be those negotiated between the international operator and the operators of the fixed and mobile networks. To this will be added a US\$ 0.035/min contribution to the Universal Services Fund levied by the Ministry of Commerce, Science and Technology. (See below).

Other than for termination of international originated calls interconnection rates in Jamaica appear to be in line with international benchmarks.

II.6.8 Interconnection of international operators and service providers

With respect to interconnection C&WJ has argued that it should not be obliged to interconnect with any international operators and service providers because under the Telecommunications Act the obligation to interconnect is restricted to international operators and service providers that have customers. Since many of these do or may not, strictly speaking, have their own customers C&WJ has argued it is not covered by the obligation to offer them cost based interconnection.

Promoting a competitive market in international telecommunications in Jamaica has been one of OUR's main preoccupations since the beginning of liberalization. This is not surprising given the importance of this market segment. The OUR has correctly concluded that it is impossible to regulate the rates (settlement rates) which foreign international operators are prepared to pay to have calls that they originate terminate in Jamaica;

II.6.9 Universal service

In May 2005 the Ministry of Commerce, Science and Technology with Energy (MCST) established a Universal Services Fund to be administered by a special purpose company called the Universal Service Fund Company and owned jointly by the SMA and the Ministry. The Company is managed by a Board of Directors whose Chairman is also the Chairman of the SMA and whose members represent the MCST the Ministry of Finance and the private sector including two operators. The functions of the Company are to collect the levies, determine projects for funding, make recommendations to Cabinet for its approval, organize for the disbursement of funds for selected projects, and to manage and disburse funds collected.

Income for the Fund is derived from a US\$ 0.03 levy on incoming international calls terminating on a fixed network and US\$ 0.02 on incoming international calls terminating on cellular networks. The funds are to be used to implement Jamaica's e-learning project.

II.7 Organization of Eastern Caribbean States (OECS)

II.7.1 Establishment of the Organization

The Organisation of Eastern Caribbean States (OECS), a formal grouping of nine Eastern Caribbean States (Anguilla, Antigua and Barbuda, British Virgin Islands, Dominica, Grenada, Montserrat, St Kitts and Nevis, St Lucia and St. Vincent and the Grenadines (Anguilla and British Virgin Islands are Associate Members). The OECS countries have a combined population of about 550,000 and the Organisation was created on 18 June 1981, by the signing of the Treaty of Basseterre under which these countries agreed to cooperate and promote unity and solidarity among its Members. The Treaty defines the objectives of the Organisation, which are to (i) promote co-operation among the Member States; (ii) defend their sovereignty, territorial integrity and independence; (iii) assist the Member States in the realization of their obligations and responsibilities to the international community with due regard to the role of international law as a standard of conduct in their relationships; (iv) establish and maintain wherever possible arrangements for joint overseas representation and common services; (v) promote economic integration among the Member States; and (vi) pursue the objectives through its respective institutions by discussion of questions of common concern and by agreement on common action.

In 2001 the OECS Heads of Government decided to create an economic union, which will facilitate the free movement of people, goods, services and capital within the OECS region. It is expected that the Economic Union will result in economic diversification and growth, greater export competitiveness and more employment and human resource development in the region.

The Secretariat of the OECS headquartered in St. Lucia also comprises two overseas offices, Export Development Unit located in Dominica and the Directorate of Civil Aviation located in Antigua, and two joint overseas diplomatic missions located in Ottawa and Brussels. Affiliate institutions of the OECS are the Eastern Caribbean Central Bank (ECCB), the Eastern Caribbean Telecommunications Authority (ECTEL), and Eastern Caribbean Supreme Court. The regional institutions with which the OECS collaborates include the Caribbean Community (CARICOM) Secretariat; the CARICOM Regional Negotiating Machinery (CRNM); and the Caribbean Development Bank (CDB).

II.7.2 Macro-economic overview

In the 1980s the OECS countries experienced a period of strong economic growth due to strong banana export earnings, increases in foreign investment resulting from an expansion in the tourism sector and large flows of concessional aid financing investments in infrastructure; however, growth began to decline in the 1990s and at the beginning of this decade due to losses in preferential access arrangements to external markets¹²⁵ and decreases in concessional aid. More recently, the slowdown in

¹²⁵ The WTO ruling against the preferential treatment of Caribbean bananas in June 1998 accelerated this trend. See Gillson, I., A. Hewitt and S. Page (2004), 'Forthcoming Changes in the EU Banana/Sugar Markets: A Menu of Options for an Effective EU Transitional Package', Overseas Development Institute.

the global economy and the increasing competition from other Caribbean destinations dampened growth in tourism and manufactured exports. The September 11, 2001 events worsened the situation in respect of the slowdown of the Tourism sector and a major drought put further pressure on declining crop production. The rate of growth of the economies of the OECS declined from 5.5% per annum in the 1980s to 3.2% in the 1990s. In 1999-2000 growth dropped further to 2.4 % per annum. A gradual shift from agriculture to services, mainly through tourism, but also offshore financial services and, more recently, telecommunications related services has, however, continued.

II.7.3 The ICT agenda and initiatives

Three regional ICT projects which are strongly supported by the OECS Secretariat are: i) the Caribbean Knowledge and Learning Network (CKLN), a physical infrastructure and an enabling environment for tertiary institutions in the Caribbean and the distance education centers of the University of the West Indies to offer and receive distance learning courses and other online services; ii) the Caribbean Culture and Internet Project which seeks to establish an online network among cultural organizations from the Eastern Caribbean and French Overseas Departments (DOM) and iii) The Telecommunications and ICT Project for ECTEL Member States.

The first two of these three initiatives are discussed in Sections II.5.4 and II.5.5 below. The Telecommunications and ICT Development Project, to be funded by a new US\$ 2.7 million loan and credit from the World Bank is intended “to improve the access, quality and use of telecommunications and ICT services to achieve socio-economic development in the OECS¹²⁶.” The project has four main components: (i) strengthen the national and regional regulatory frameworks and enhance competition including the updating of the telecommunications acts and tariff regulations of the member states, developing a regional forum for consensus building, developing a capacity for alternate dispute resolution and the development of costing methodologies; (ii) review the current universal access policy and help establish a universal access fund; (iii) improve growth and competitiveness in ICT-enabled services through the utilization of broadband infrastructure; and ensure management and administration of the overall project. There are similarities between the activities being undertaken under this World Bank project and that which is being proposed in this report for the Caribbean as a whole. (See Chapter VI).

II.7.4 OECS Telecommunications Reform Project

The OECS Telecommunications Reform Project was initially a part of a wider Economic Diversification Project, which recognized the importance and special role of telecommunications in diversifying the region’s economies from their excessive dependence on declining agricultural production and a maturing tourism sector. A number of barriers had, however, to be overcome to facilitate this sector’s playing the essential role in delivering goods and services and in the development of

¹²⁶ World Bank, Project Appraisal Document for a Telecommunications and ICT Development Project, April 18, 2005

information based societies in the countries of the OECS. Prime among these were: i) the very high cost of telecommunications services, ii) limited access to the telecommunications services and iii) limited trained personnel in the telecommunications sector. This had a huge impact on the ability of enterprises which are dependent on these services to compete with firms in other regions with access to more reasonably priced telecommunications.

Reform of the sector, which was characterized by monopoly provision of virtually all telecommunications services, was identified as being of paramount importance. Accordingly, in October 1998 five of these OECS members (Commonwealth of Dominica, Grenada, St. Lucia, St. Kitts and Nevis, and St. Vincent and the Grenadines) joined the OECS Telecommunications Project and agreed to the following action: (i) implement a wide ranging reform program to include regulatory policy and tariff reform; (ii) put into place of a new pro-competitive legal and regulatory framework in each of the 5 countries; (iii) harmonize laws and regulations for the sector; (iv) establish a regional telecommunications authority, which was to become the Eastern Caribbean Telecommunications Authority (ECTEL); and (v) start negotiations with Cable & Wireless to terminate the exclusive arrangements which this company enjoyed on each of these islands. A regional approach was considered to be particularly important in the view of the common issues faced by the OECS countries.

The OECS Secretariat through the OECS Telecommunications Reform Project was given the task of coordinating regional sector reform efforts. The proposed Regional Telecommunications Authority was to be responsible, inter alia, for (i) the design of transparent, objective and investor friendly license award procedures that would be implemented at a national level; (ii) number and frequency allocations for the 5 countries and (iii) acting as a forum for coordination of OECS governments' telecommunications policies for the region.

A loan of US \$ 6 million had originally been negotiated with the World Bank, complemented with a US \$ 4 million counterpart funding by the participating countries.

II.7.5 Eastern Caribbean Telecommunications Authority (ECTEL)

The Eastern Caribbean Telecommunications Authority (ECTEL) was established in 2000 by treaty among five OECS states, which participated in the Telecommunications Reform Project (Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, and St. Vincent & The Grenadines) (i) to promote the liberalization of telecommunications in a fair competitive environment, (ii) to harmonize policies and regulations and generally (iii) to promote the development of telecommunications in the OECS. Its prime role is to coordinate and recommend policies (e.g. on price regulation, on standards and type approval of equipment), regulations, and procedures (e.g. for licensing including license terms, conditions and fees) to the National Telecommunications Regulatory Commissions (NTRCs) in each of the Member States. ECTEL is also responsible for developing a regional spectrum

plan¹²⁷. ECTEL and the NTRCs are jointly responsible for managing the radio frequency spectrum.

There are three types of authorizations which are granted by the Minister in each member state: individual licences which are for larger, network build out type undertakings; class licences, which are issued on the same terms to each applicant of a category of users for the operation of a type of telecommunications network or provision of a specified telecommunications service and frequency authorizations.

Individual licenses and frequency authorizations (including those for mobile services) are awarded on a first-come-first serve basis. Applications are first received by the NTRC in the country concerned. The NTRC then refers them to ECTEL which evaluates the application against pre-established criteria and then makes a recommendation on the award of a licence to the NTRC. The NTRCs can accept or reject ECTEL's recommendations. Any rejection must, however, be explained to the applicant in writing.

This arrangement has come under criticism by some new entrants who argue that having both a regional and national regulators adds a layer of bureaucracy to the licencing and regulatory process and causes unnecessary delays in obtaining licenses and authorizations and in resolving disputes.

II.7.6 Status and results of sector reform

The agreement which in 2000 the five (ECTEL) Governments had negotiated with C&W foresaw a termination of its monopoly in the five states and a two phase transition to a liberalized telecommunications sector. Phase 1 was to have started on 1 April 2001 with licences to have been awarded to Internet Service Providers (ISPs) and cellular mobile telephone operators. C&W was to have been issued a new, non-exclusive operating licenses in each of the five states at the start of Phase 2 (full liberalization) in March 2003. A condition for the start of Phase 2 according to the agreement between the governments and C&W was that C&W's tariffs would be "substantially" rebalanced.

The new telecommunications acts came into effect in 2001 in each of the five ECTEL States and later that same year, Cable & Wireless was granted non-exclusive licences in each of the countries for the services it had been providing up to that time. Full competition was allowed by the legislation passed in 2001 and the first competing licences were issued early that year for ISPs. There were delays in the process of awarding licences for mobile operators. These were not issued until later in 2002 and the new entrants were not able to offer service in St. Lucia and St. Vincent until February 2003 when they finally had interconnection agreements with the incumbent.

¹²⁷ Treaty Establishing the Eastern Caribbean Telecommunications Authority 4 May 2000.

The following individual and class licences have been awarded to date:

In Dominica the following individual licences have been awarded: 3 fixed (C&W; SAT Telecoms¹²⁸ and Marpin); 3 mobile (C&W, Digicel, AT&T Wireless, Orange Caraïbe). The class licences have also been granted to 2 ISPs.

In Grenada: Individual licences have been granted as follows: 3 fixed Public Telecommunications Licences (C&W, Global Network Providers, Trans-World Telecoms Caribbean Ltd.), 5 Public Mobile Telecommunications Licences (C&W, Digicel, Global Network Providers Inc., Trans-World Telecoms Caribbean Ltd. and AT&T Wireless) and 2 Internet Networks/Services (C&W, Global Network Providers Inc). The following class licences have also been awarded: 3 ISP; 1 each for Land, Maritime, and Aeronautical Mobile services

In St. Kitts and Nevis: 2 fixed (C&W and The Cable), 1 ISP, and 3 mobile (CariGlobe, AT&T Wireless and C&W) licences have been awarded.

In St Lucia: Individual Licences [1 fixed Public Telecommunications Licence (C&W), 3 Public Mobile Telecommunications Licences (C&W, Digicel, and AT&T Wireless) and 1 Internet Networks/Services (C&W)]; Class Licences [2 full and 1 restricted Internet Service Provider Licences, 1 Private Network/Services licence (Helen IT); and 3 International Simple Resale Licences]]. Antilles Crossing Limited has been granted an undersea cable landing license (See Section IV.2.2). An application for a cable landing licence from Island Fibre/Kelcom International is currently being evaluated. Both these companies obtained cable landing licenses in Barbados on 13 September 2004.

Also in St. Lucia C&W operates a cable TV network, which covers the entire island. There is another operator, which has a small cable TV network in the south of Castries, the capital. Neither provides high-speed Internet access.

The power company, St Lucia Electricity Services Ltd. (Lucelec) has a fiber optic cable running along its high voltage power lines in the form of two loops (one north of Castries; the other in the south) encircling the whole island¹²⁹. The cable is currently being used for the company's internal (control) communications and so far Lucelec has not exploited this facility to provide high capacity leased circuit services and access for new entrants, call centers and other businesses as an alternative to the incumbent's domestic facilities; However, until another submarine cable is installed these users would still be dependent on the only cable system which lands on the island, namely, the C&W controlled Eastern Caribbean Fiber Optic Cable System. To access capacity of other owners of this cable (or holders of IRUs) collocation arrangements would have to be made with Cable & Wireless in its Sans Souci cable station. For the time being, the regulatory framework does not cater for this.

¹²⁸ SAT Telecommunications has built a fibre optic network on the island and just set up a call centre (Call 767). The latter was scheduled to start operation in January 2006 and employ some 200 people.

¹²⁹ A small portion of the southern loop needs to be joined.

In St Vincent and the Grenadines: the following licences have so far been granted: Individual licences [1 fixed Public Telecommunications Licence (C&W), 3 Public Mobile Telecommunications Licences (C&W, Digicel, and AT&T Wireless) and 2 Internet Networks/Services (C&W) and Karib Cable]; Class licences [3 Value Added Service Provider Licences; 4 Internet Service Provider; 4 Private Networks/Services Licences; and 5 International Simple Resale Licences]

II.7.7 Pricing issues

Retail prices are being rebalanced. Currently, peak time international rates in St. Lucia range from US\$ 0.19/min for calls to the other OECS (ECTEL) countries and US\$ 0.47/min – US\$ 0.49/min for calls to North America, Europe and the rest of the world. While still high by international standards these are significantly lower than those in Barbados where fixed line rates have not yet been adjusted. Line rental charges have increased from EC\$ 24.25 (US\$ 9.00) in 2000 to EC\$ 27.25 (US\$ 10.09) currently. Local call charges vary between EC\$ 0.04 and 0.06/min (US\$ 0.015 and 0.022 min) depending on the time of day.

In St. Lucia Internet cafes charge between US\$ 0.37/min for VoIP calls to USA and Canada and US\$ 0.57/min for VoIP calls to the Caribbean. Postpaid (contract) mobile calling charges lie in the range US\$ 0.15-0.35/min. depending on the package, the time of day, whether the call is to a fixed or mobile subscriber and whether the latter is a subscriber of the same operator or a competing mobile operator. These prices are comparable with those in Barbados. Internet access charges remain relatively expensive. C&W's unlimited dial-up access costs EC\$ 129 (= US\$ 48.50) while the cheapest ADSL access (256 Kbps down/128 Kbps up) costs EC \$149 (=US\$ 56). Internet cafes charge in the order of US\$ 2.80 per half hour.

Leased circuit prices remain very high. In the OECS where it can cost anywhere from US\$ 24,000 to 32,000/ month to lease an E1 circuit to the USA (International Private Leased Circuit or IPLC) and in the order of US\$ 21,000 for an E1 with access to the Internet (IP Transit).

II.7.8 Current situation

ECTEL has identified a need for a comprehensive review of the legal framework for regulation of the telecommunications sector in the 5 member countries including a revision of the Treaty which established ECTEL and the telecommunications acts in each state. The main aspects which need to be clarified include: the relationships between ECTEL and the NTRCs; the enforcement provisions in the laws do not have appropriate penalties for the infringement of the law; proper protection against abuse of dominant position; comprehensive dispute resolution regulations; reinforcing the independence of the regulator; licensing and collocation.

Other issues concern wholesale rates which are currently not subject to regulation and prone to abuse by the incumbent, the absence of penalties and fines in the current regulatory framework, and anti-competitive practices by some operators and service providers.

In addition, ECTEL has identified the following areas for strengthening and joint action:

- dispute resolution and consensus building;
- cost studies for interconnection, Internet access and certain mobile retail tariffs;
- expansion of the integrated spectrum management and monitoring system including on going training;
- developing a universal access program and establishing a universal services fund.

These are being addressed in the new World Bank financed Telecommunications and ICT Development Project.¹³⁰

¹³⁰ There is a larger e-development agenda before the OECS countries as they attempt to increase competitiveness. Various grant providers are considering supporting regional collaboration in training and resource sharing, development of a regional e-strategy (i.e for the development of national ICT plans), development of call centers in Grenada establishment of a regional Internet portal to promote e-commerce and support for the development of a hub for the Caribbean Knowledge Learning Network.

II.8 Suriname

II.8.1 Introduction

In 2004 Suriname has an estimated population of 450,000 and a per capita GDP of US\$ 4,000. Most of the population lives along the 386 km coast lying between Guyana and French Guyana with the interior accounting for 2/3 of the country's 163,000 sq km populated by only about 30,000 people who live mainly in small villages of less than 200 inhabitants. Many of these villages are accessible only by river. A handful are connected by VSAT or fixed wireless access systems provided by Telesur, the state owned monopoly telecommunications company and by some NGOs.

The telephone penetration rate is 20%. There are about 6,700 Internet subscribers with roughly 2,200 of these being customers of the only private Internet Service Provider (ISP), Rosheuval & Partners Business Group (RPBG) and the remainder, of Telesur, the state owned telephone monopoly. Typical of countries which have not yet completed the process of sector reform, monthly line rental and local calling charges are very low, while international rates are very high.

Telesur, the exclusive fixed and mobile telephone company, has asked the government permission to increase the line rental charges from the current US\$ 1.25/month to between US\$ 5 – 10 per month and to double the per unit usage charge which currently is US\$ 0.0175 (the length of which varies depending on the time of day). The Government has so far refused but has recently established a commission on tariffs consisting of members representing the Government, TAS, Telesur and the Chamber of Commerce and Industry. The only competition in international calling is a Voice over Internet (VoIP) service offered by RPBG¹³¹. Rates are 10 % to 50 % cheaper than those of Telesur depending on the destination but are still relatively high by comparison with those found in other countries which have competitive telecommunications markets¹³².

The only cellular mobile operator is Telesur with 167.000 customers (TDMA 60.000; GSM 125.000) customers. Mobile tariffs are shown in Table 12.

Table 12: Mobile Calling Rates (Telesur)

Service	Rate (US\$ per minute)
TDMA	0.20
GSM	0.25
SMS	0.10

¹³¹ The service is called Greentone (<http://www.greentone.com>), a net to telephone VoIP service which was developed by RPBG and is marketed around the world.

¹³² In Canada it is possible to call countries in Western Europe for rates as low as US\$ 0.04/min. Rates from the USA are comparable. The European Commission compares calling rates in the 25 member countries of the European Union. In August 2004 the rates per minute for a 10 minute call to the USA using the incumbent's network varied between about US\$ 1.03 from the Cyprus and about US\$ 8.12 from Latvia with the weighted average for the 25 being US\$ 3.12. Competitors' rates for a 10 min call to the USA varied between US\$ 0.71 for Tele2 in the Netherlands and US\$ 4.79 for Invitel of Hungary. See Commission of the European Communities, Technical Annexes of the Tenth Report on the Implementation of the Telecommunications Regulatory Package, Brussels, Brussels, 2.12.2004, SEC(2004)1535

Telesur controls the only domestic and international fiber optic cable link essentially an STM-1 (155 Mb/s) connecting Paramaribo with French Guyana (landing site of the Americas-2 cable system) on one side of the country and Guyana at Nickerie on the other¹³³. Telesur also has an international satellite link via Intelsat. The lease of a domestic E1 circuit costs US\$ 2,057/month (US\$ 2,275 to install). An international E1 to Hollywood, Florida costs US\$ 17,409/month with a 1-year contract or US\$ 15,975 with a 5 year contract¹³⁴.

II.8.2 Status of telecommunications sector reform

The prevailing regulatory framework for the sector is based on the 1945 Telephone and Telegraph Act and a 1998 Decree which provisionally established the regulator, Telecommunicatie Autoriteit Suriname (TAS). A draft new telecommunications law (Wet Telecommunicatievoorzieningen) submitted to Parliament in October 2003 was finally passed on 10 September 2004 but has not yet been promulgated. The Government wishes to do this when essential rules, resolutions and regulations identified in the Act have been drafted and are also ready for publication. The new Act will legitimize the TAS, which currently has a physical presence and only a total staff of 9 including, the Director, a head of the legal department and a legal officer.

The licence of a second operator, ICMS, awarded in 1998, was revoked in 2003 because of this company's failure meet its licence obligations and temporary interconnection obligations and after the company went bankrupt as a result of an interconnection dispute with Telesur¹³⁵. The only entities which compete with Telesur are: 1) RTBG, which is essentially an ISP offering Internet access and some VoIP to individuals and fixed wireless broadband access (spread spectrum in the 2.5 and 5.8 GHz bands) to businesses (including hotels), Internet cafés (for US\$ 175/month) and some schools¹³⁶; and 2) EDUCONS, a not-for-profit organization, whose prime purpose is to create and diffuse education content and to promote access to the Internet, provides Internet access (at US\$ 10/month for unlimited use) and has 22 Internet education centers (knowledge centers) throughout the country, where anyone can get access for US\$ 1/ month; and 3) the Post Office which has just begun offering a fixed wireless service in conjunction with EDUCONS at US\$ 700/month for a 256 Kbps down load speed service with 4 static IP addresses. (Installation charge is US\$ 500 and there is an up front guarantee to be paid of US\$ 1000). Many stakeholders have questioned the legality of the Post Office service offering even though the latter claims that it has the right under the old law which is still valid until the new Act is proclaimed.

In conjunction with promulgating the new Act and enabling rules, decrees and resolutions the Government has stated its intention to license two and perhaps three new operators/service providers to compete with Telesur¹³⁷. It is currently evaluating four or five serious short listed proposals, which had been received since 1999 under

¹³³ Guyana also has an STM-1 connecting to the Americas-2 cable via Suriname and French Guyana

¹³⁴ Because of falling prices for leased circuit capacity it is not usual for anyone to sign anything longer than a 1 year contract.

¹³⁵ It has been suggested that the company owed Telesur more than US\$ 2 million in interconnection charges.

¹³⁶ RPBG currently does not have authorization to use frequencies for its fixed wireless broadband access services, having initially leased these from ICMS, whose licence was revoked in 2003.

¹³⁷ The successful bidders will not necessarily have full concessions covering all services.

the old regime under which the President had the right to award concessions at his discretion. While there has never been a formal request for proposals for these concessions/licences the Minister did explain the process at a press conference held in July 2002. During this time there have been over 20 individuals or companies that had indicated interest; however, of these there have only been 7 or 8 which the Government considered to be serious. The Government had requested that each bidder put US\$ 1 million into an escrow account to guarantee that if successful it meet its commitment to build out its network in the southern remote region of the country. One of the ideas of the Government was to divide this region into three (west, centre and east) and assign each to one of the successful bidders. The following 5 sets of criteria were used to establish a short list of proposals: i) know how in the field of telecommunications; ii) financial solvency; iii) presence of strategic foreign partner; iv) managerial experience; and v) undertaking to provide telecommunications simultaneously in the interior, which is a priority for the Government.

The short list of candidates that most closely satisfied the 5 criteria was submitted by the Minister by the President who will decide on the number of concessions to be granted and to whom they will be granted. It is understood that all proposals are only for mobile licences.

None of the proponents has been advised about the names on the short list. The licencing process has been conducted in the absence of formal rules, a timetable for award of concessions and, in the opinion of some, transparency.

II.8.3 Stakeholders' observations

Following are some concerns expressed by stakeholders:

- There is a lack of a clearly defined policy and timetable to complete the process of sector reform. Stakeholders including Telesur, potential investors, new and existing operators and competitors want to know the Government's policy with respect to Telesur, namely, whether or not it intends to privatize the state owned company. They wish to know when the new law and enabling regulations will be promulgated, when the regulatory body will be given the capacity to regulate and when and by how much Telesur will be allowed to rebalance its tariffs. Users want to know when they can start reaping the benefits of competition such as better quality of service, lower prices and choice of suppliers.
- Telesur needs to know if it can begin to rebalance its tariffs, by how much, and when. (Liberalization of the telecommunications market cannot proceed without this);
- The regulator has to be provided with the professional resources and training it needs to effectively regulate a competitive telecommunications environment;

- Assurance needs to be given by the Government to all stakeholders that the process of selecting competing operators is fair and transparent;
- Stakeholders and especially new entrants need to have a clearer picture of the new regulatory framework. They need have a better understanding of what will be the interconnection, licencing, universal services and spectrum management regimes under which they will operate and/or provide services;
- The Government needs to dispel doubts in stakeholders' minds of political interference in the day to day operation of TAS.

II.8.4 Recommended action

In order to reassure stakeholders and confirm that it is truly committed to sector reform the Government should as promptly as possible:

1. issue a statement which, inter alia:
 - i. gives a definite and credible timetable for key events in the sector reform process to occur including: issuing of new concessions according to a well defined, transparent process, drafting of rules, resolutions and decrees; rebalancing of Telesur's tariffs; licensing of new operators; staffing of the regulator; issuing a policy on ICT; etc.
 - ii. (in conjunction with the TAS) confirms what will be the basic elements of the new interconnection, licensing, spectrum usage, universal services, and tariff regimes including the tariff rebalancing timetable for Telesur;
 - iii. confirms the staffing and resources, which will be made available to TAS over the next five years;
 - iv. indicates its intentions with respect to Telesur.
2. continue the process of staffing TAS with a few key professional staff;
3. continue the process drafts of the substantial regulations (interconnection, licencing, universal service obligation, tariffs, spectrum and scarce resources management) and procedures for the TAS (dispute resolution, procedures for investigating and resolving complaints, conducting public consultations, etc.) to give effect to the new legal framework.

II.9 Trinidad & Tobago

II.9.1 Introduction

Trinidad & Tobago with a population of 1.3 million and a per capita GDP of US\$ 10,000 (2002 est.) has a fixed line telephone penetration rate of 25 %. According to the ITU there are about 7,000 Internet hosts (estimated 140,000 users) giving a penetration of about ½ %. In terms of subscriber numbers there are about 80,000 dial-up (of which about 90 % are customers of TSTT) and about 3,000 high-speed. There are 2 cable television operators (Cable Company of Trinidad & Tobago (CCTT)¹³⁸ and Trico Industries which operates on the island of Tobago). CCTT has 85,000 customers and Trico, 2,500. CCTT offers cable modem Internet access at rates that vary between US\$ 64 and 256/month depending on the speed. CCTT's cable network passes by approximately 229,000 homes (out of an estimated total in Trinidad of about 300,000) to which it could provide telecommunications services when permitted. High speed connections range from 64 Kbps uplink/128 Kbps downlink to 64 Kbps uplink / 256 Kbps downlink.

Over 50% of Trinidad & Tobago's outgoing international telephone traffic (40.4 million minutes per year) is toward the USA. A little less than 10% (7.7 million minutes) is to Canada and about 25% (20.4 million minutes) is with Caribbean countries and territories¹³⁹.

Telecommunications Services of Trinidad & Tobago (TSTT), which is 51% owned by Government and 49%, by Cable & Wireless, is the only operator of a facilities-based telephone network and provider of fixed telephone service. It is also the only cellular mobile telephone provider. It provides Internet access in competition with nine private Internet Service Providers (ISP).

II.9.2 Status of sector reform

The process of telecommunications sector reform in Trinidad & Tobago has been protracted. In 1997 the government adopted a national policy framework for the sector with the following mission statement:

Telecommunications will be the main catalyst in the creation of a quality driven rich nation through effective and reasonably priced communications services.

¹³⁸ CCTT was recently acquired by Barbados-based Columbus Communications Inc. which has controlling interests in a number of telecommunication and cable TV operators in the Caribbean. including: (i) 100% of New World Networks, which in turn owns 88.2 % of the 8,200 km Americas Region Caribbean Optical-ring System (ARCOS), the other owners being operators such as MCI Worldcom, AT&T, Cable & Wireless, Avantel, CANTV and Verizon.; (ii) 30% of Cable Bahamas Ltd., which currently is the only cable television TV operator in The Bahamas and which in addition to television provides high speed Internet access; (iii) 30% of Caribbean Crossings, a Cable Bahamas subsidiary, which operates a 1,000-kilometer submarine fibre optic cable system linking the Bahamas and the United States; (iv) Merit Communications Ltd., a facilities-based broadband data communications provider in Jamaica; and (v) FibraLink Jamaica, also a subsidiary of Cable Bahamas, which is currently constructing a submarine cable connecting Jamaica to the Arcos cable system in the Dominican Republic.

¹³⁹ TeleGeography 2004

This policy framework defined a new competitive telecommunications environment and contemplated the establishment of an independent regulator. Based on this policy the Government drafted a new Telecommunications Act, which was passed by Parliament in July, 2001. It was amended by the Telecommunications (Amendment) Act, 2004 and was promulgated in June 2004¹⁴⁰. In 2000, the Government undertook to negotiate a new licence for TSTT, though licence negotiations were suspended as focus shifted towards the preparation of the new telecommunications legislation. In May 2005, Government agreed to re-commence negotiations with Cable and Wireless Limited in order to advance the process of liberalizing the telecommunications sector; chief among the issues to be resolved is the Shareholders Agreement and any potential conflict with the Telecommunications Act 2001. A Negotiating Team has been appointed which is chaired by a senior official of the Ministry of Finance.

Under the Telecommunications Act 2001, the Minister for Telecommunications is responsible for sector policy and for granting of licenses and concessions on recommendation of the regulator, Telecommunications Authority of Trinidad and Tobago (TATT) whose function is to regulate the sector including enforcing the new Telecommunications Act, determining and administering the universal services program, setting industry standards, managing the spectrum and numbers, and protecting consumers. The Telecommunications Authority is headed by a Board comprising a Chairman, Deputy Chairman and nine members. There is an Executive Director who functions as the Chief Executive Officer of the Authority and attends and participates in Board Meetings but does not vote. The Executive Director was appointed in July 2004 when the Telecommunications Act 2001 was fully proclaimed. TATT has a staff of 35 who are mostly professionals (October 2005) and is located in San. Juan on the outskirts of the capital, Port of Spain. A permanent headquarters is due to be constructed in a few years. Organizationally it is divided into the following 6 areas of specialization: policy, research and development; legal, regulatory and licencing; technical services including spectrum management; information systems (MIS); finance, administration and human resources; and communications

An Information and Communication Technology (ICT) Division has been created within the Ministry of Public Administration and Information (MPAI) to serve as the policy-making, oversight and program management agency for ICT matters. The Division headed by a National Chief Information Officer who is assisted by a Deputy Chief Information Officer and nine executive and senior managers. The Ministry will therefore be responsible for broad policy formulation for the telecommunications sector, e-government, e-commerce, e-learning and international relations pertaining to the ICT sector.

The process of developing policies and regulations to adequately enforce the Telecommunications Act 2001 has been drawn out. In the second quarter of 2005 the Government with the assistance of the Inter-American Development Bank selected international consultants to work with the Authority towards finalizing the

¹⁴⁰ Under the modified Act, for example, ISPs need a concession to provide a public telecommunication service.

required policies and regulations. The consultants have since submitted their first set of draft policies and regulations to the Telecommunications Authority and the Ministry. These have been submitted to a second round of public consultation and include: authorization framework; interconnection and access; spectrum management and fees methodology. Subsequent policies and regulations will deal with quality of service among operators, consumer rights, universal access and competition policy. Certain stakeholders have criticized the process arguing that the time given for public comment is too short.

A Request for Proposal (RFP) to provide domestic public mobile telecommunication services had been issued by the Telecommunications Authority in August 2004 with a deadline for response of 24 November 2004. Five companies were prequalified including Laqtel, a locally owned company, Digicel Trinidad and Cingular (which was subsequently acquired by Digicel). Only two companies Laqtel and Digicel, which had posted bonds, participated in the on-line simultaneous multiple round auction held on 23 June 2005¹⁴¹. The government received about US\$ 3 million which was the reserve price for the spectrum. TATT subsequently recommended to the Minister that these two companies be awarded concessions. On 27 October 2005 the Cabinet agreed that concessions would be granted to Digicel and Laqtel. Both companies were keen to get interconnection agreements with TSTT so they could start offering service during the important Christmas season. Negotiations between Digicel and TSTT were particularly acrimonious with much of what was referred to as the “cell wars” being carried out in the local press and revolving around the availability of the required interconnection equipment in TSTT’s premises¹⁴².

A RFP for concessions/licences for international telecommunication services was issued by TATT in November 2004. The number of licences to be awarded was not specified. Eleven companies¹⁴³ submitted proposals by the cut off date of 10 January 2005. The Cabinet agreed with the recommendations of TATT to award five licences for the provision of international telecommunication services. In respect of cable television services five companies¹⁴⁴ submitted applications for concessions. Existing licence holders were required to apply for concessions under the new Law. The Cabinet also agreed with the recommendation of TATT to award three licences. There is no limit on the number of cable TV concessions that can be awarded nor is there any time limit for applications to be submitted.

The delay in implementing the sector reform program, in fully proclaiming the new law, in staffing TATT, and in licencing new entrants, especially in the cellular mobile market, had raised doubt in the minds of many local and international investors about the Government’s resolve in implementing an effective, new, competitive environment which satisfies the objectives of the 1997 Policy Framework. Trinidad

¹⁴¹ Digicel acquired 2 x 5 MHz in the 800 MHz band and 4 x 5 MHz in the 900 MHz band while Laqtel got 2 x 5 MHz of 800 MHz spectrum and 2 x 5 MHz of 900 MHz spectrum. In total 4 x 5 MHz in the 800 MHz band and 16 x 5 MHz in the 900 MHz band was put up for auction.

¹⁴² See various press clippings in the Express, Trinidad Guardian and Newsday during the first weeks of November 2005.

¹⁴³ Lisa Communications, Open Telecom, Iluminat, Digicel, Laqtel, Cable Company of Trinidad & Tobago, Astra Communications, Antel Communications, S4B, Antilles Crossing, and Island Fibre/Kelcom International

¹⁴⁴ TSTT, Computer Technologies and Services Ltd., RVR Intl. Ltd., Independent Cable Network of Trinidad & Tobago and Columbus Communications, which acquired CCTT)

& Tobago, which was among the first countries in the region to develop a new open policy direction for the Information Society, had fallen behind other countries in the region. Even today (March 2006) users in Trinidad and Tobago continue to pay relatively high prices for telecommunications (including international calling, leased lines and Internet access) and do not have the choice available in other countries in the region that have advanced further in liberalization. In the final analysis there are indications that the Government is working to have competition in the telecommunications sector by December 31, 2005

Trinidad & Tobago is one of the first in the region to have established a National Information and Communication Technology (NICT) Plan¹⁴⁵ with a clearly defined implementation timetable including the undertaking to having a fully open telecommunication sector by 2005. Also, the Government of Trinidad and Tobago has prepared a draft National Strategic Development Plan (Vision 2020) designed for the country to achieve developed country status by 2020. It covers all the economic and social sectors and has an ICT component.

¹⁴⁵ Trinidad & Tobago's National information and Communications Technology (ICT) Strategy ("Fastforward") issued in December 2003.

II.10 Other Countries and Territories

III.10.1 Introduction

This section presents a brief overview of several Caribbean countries which were not subject to a detailed analysis in this study but for which, nevertheless, some information was made available. Time did not permit surveys of the French Départements d'Outre mer or DOM (Guadeloupe, Martinique and French Guyana), and the Netherlands Antilles.

II.10.2 Antigua & Barbuda

Antigua & Barbuda has an estimated resident population of 75,741 people (census 2001), a per capita GDP of US\$ 6,405 (EC\$17,403), and a teledensity of over 50%. Cable & Wireless has exclusivity (until 2012) for international communications and the quasi-government statutory company, Antigua Public Utilities Authority (APUA) maintains a monopoly for a local fixed line services. Competition is allowed in the domestic mobile market where there are three operators (APUA PCS, C&W, and Cingular which was acquired recently by Digicel). Competition is also allowed in the provision of Internet access, with two providers C&W and local operator Antigua Computers Technologies (ACT) currently in the market.

The agency responsible for setting policy and promulgating laws and regulations for the sector is an arm in the Ministry of Telecommunications, which is headed by the Telecommunications Minister. There is no independent regulatory authority at present; however, since coming to power in the general elections on March 23, 2004 the new Government has openly talked about liberalizing the sector and has since then granted an operating license to another company, Karibe Cable Kelcom International, to provide cable television and broadband Internet services. There are also plans to issue licences for other value added services (VAS).

In October 2005, the Minister of Telecommunications put forward a draft policy document which he intends to submit to cabinet by the end of 2005 and that will enable full liberalization of the telecoms sector in Antigua & Barbuda in 2006.

II.10.3 The British Overseas Territories

Of the five British Overseas Territories (BOT) Anguilla and the Cayman Islands have new telecommunications laws and have established independent regulators.

On April 11, 2003 the Government of Anguilla signed an agreement with C&W (West Indies) liberalizing the telecommunications sector in Anguilla (population 13,000). Under this Agreement C&W Anguilla was to be issued a new operator licence which would allow it to provide the same telecommunications services that was providing at the time of the Agreement including a TDMA/AMPS cellular mobile service in the 800 MHz frequency band, but on a non exclusive basis. The Agreement also allowed C&W Anguilla to rebalance certain of its tariffs.

In conjunction with the signing of the Agreement the Government on 10 June 2003 passed the Telecommunications Act and on 17 June 2003, the Public Utilities Commission (PUC) Act. The former came into force on 10 June 2003 but The PUC Act was not proclaimed until 7 April 2004¹⁴⁶

The Agreement has attached to it Regulatory Principles (Schedule 3) and a preliminary Telecommunications Code (Schedule 7), which along with the Telecommunications and PUC Acts form the basis of the new regulatory framework.

Administration of the telecommunications sector is divided between the Ministry and the PUC. The former is responsible for planning and setting policy for the sector, for managing the spectrum, and for administering the numbering plan and Internet domain names. The latter is responsible for regulating the sector including, inter alia, implementing and enforcing the provisions of the Telecommunications Act, regulating prices, implementing standards, determining licence applications, collecting fees, helping to resolve disputes, and protecting consumers' rights. All public telecommunications operators and service providers have to contribute to the funding of the PUC on a pro rata basis. All spectrum authorization holders have to contribute to the cost of managing the radio frequency spectrum through a spectrum usage fee. The PUC will regulate prices only when and where it determines that because of the lack of adequate competition, prices cannot be determined in accordance with the principle of supply and demand in the market.

The Telecommunications Act requires a licence to operate a public telecommunications network and to provide a public telecommunications service and a frequency authorization to use the radio frequency spectrum but like Trinidad and Tobago Telecommunications Act, 2001 prior to it being amended in 2004 requires no licences, concessions or authorizations to provide value added services, closed user group services, and private telecommunications services.

The new regulatory framework established a fair, transparent, non discriminatory interconnection regime in which network elements will be disaggregated and prices will be cost based and dominant operators is required to publish a reference interconnection offer. Operators of public telecommunications networks are obliged to provide interconnection and access to their facilities. The PUC has regulatory powers with respect to these.

Enabling regulations were enacted and a three-member PUC was appointed by Government. The PUC became operational on in April 2004 with the appointment of an Executive Director.

The Agreement foresaw a three phased transition to a fully liberalized telecommunications market in Anguilla. On 10 June 2003, at the start of Phase 1, domestic mobile, value added (including Internet access), closed user group and private telecommunications services were opened to competition. During this Phase

¹⁴⁶ Ref. PUC 2004 Annual Report – “The Commission is a corporate body and came into effect with the enactment of the Public Utilities Act (2003) on 7 April 2004.”

C&W Anguilla was able to maintain its exclusivity in the operation of public telecommunications networks and the provision of public telecommunications services. C&W Anguilla obtained a new non-exclusive licence at the same time as two new mobile operator licences which were awarded by way of tender during this Phase. In March 2004 the Government completed the tender to grant two new mobile operator licences, one to Weblinks, a local operator (in September 2004) and a second, to Wireless Ventures Anguilla Limited (then majority owned by AT&T Wireless) on November 5, 2004. AT&T Wireless's share was acquired by Cingular and then in June 2005 by Digicel which launched service on 2 December 2005.

Phase 2 which began on 19 July 2004 was conditional on: a) the PUC Act coming into force, b) certain specified regulations (interconnection, licencing, universal services) consistent with the Regulatory Principles affixed to the Agreement having been promulgated, c) other regulations (PUC's procedures, spectrum management, numbering, and price regulation) having been drafted, d) the PUC's adopting a Telecommunications Code and finally, e) 45 days having elapsed from the date on which the PUC announced that C&W's new licence was available for issuance which it was to do only after events a) to d) had occurred. During this Phase any holder of a licence and frequency authorization other than C&W was able to provide domestic facilities-based fixed and mobile wireless telecommunications services, resell C&W Anguilla's domestic and international public telecommunications services, and provide international public telecommunications services using C&W's Anguilla's telecommunications network.

Full liberalization occurred at the beginning of Phase 3 on 19 January 2005, which according to the Agreement was to have commenced on the later of one year after the Telecommunications Act went into force or 180 days after the start of Phase 2. As of January 2005 anyone has been permitted to provide any telecommunications service and operate any telecommunications network in Anguilla including the provision of international public telecommunications services over the licencees own international facilities. A license to provide fixed-line public telephone service was issued to Caribbean Cable Communications in December 2004. This company had plans to launch its service by mid-December 2005.

The British Virgin Islands (BVI) has a population of 21,000 and about 16,000 fixed lines. Cable & Wireless has a legal monopoly (under a 1968 licence) to operate virtually all telecommunications networks and provide virtually all telecommunications services until 2007. There is one cellular mobile company, Caribbean Cellular Telephone Ltd. (CCT Boatphone), which provides service in agreement with C&W under C&W's licence, is 100 % locally owned, has an annual turnover of about US\$ 12 million and in mid 2005 about 11,000 subscribers. There is one cable TV operator, BVI Cable TV, which is a sister company of the cable TV operator in the US Virgin Islands and at the end of 2004 had about 6,200 active customers covering about 85% of households. The Telecommunications Unit of the Ministry of Communications and Works is responsible for policy, regulation and spectrum management.

In October 2005 the Government of the British Virgin Islands issued a policy statement and timetable for liberalizing the telecommunications sector in the BVI¹⁴⁷. In the policy it is proposed to draft a new pro-competition Telecommunications Act and regulations and establish an independent regulator (The Telecommunications Regulatory Commission or TRC) which in addition to regulating the sector will be responsible for issuing (with consent of the Minister for network licences), supervising and enforcing network and services licences, type approval of customer premises equipment, advising the Minister on telecommunications matters, managing numbers and eventually the spectrum, administering a universal services fund, protecting consumers. It is also proposed to licence four cellular mobile operators including C&W and Digicel via a beauty contest as opposed to an auction and liberalize the services and customer premises equipment markets. Under the new arrangements the Minister will remain responsible for setting policy, international relations and initially at least spectrum management.

The Cayman Islands group consists of 3 islands with a total of 262 km² and a population of 44,300. The per capita GDP is US\$ 32,300 and the highest point on the islands is only 60 feet above sea level. Fixed line and wireless penetration rates are not published; however, it is believed that they are quite high and amongst the highest in the Caribbean. Fixed line penetration is in the order of 85% and mobile above 50%. There are two submarine cable systems which land on the Cayman Islands: Maya 1 whose only Caribbean land is on the Cayman Islands¹⁴⁸ and which lands at Half Moon Bay and C&W's privately owned Cayman Jamaica Fibre System (CJFS) which lands on both Grand Cayman and Cayman Brac.

The telecommunication market was opened in 2003 with the establishment of the only convergent (ICT) regulator in the Caribbean, the Information and Communication Technology Authority (ICTA) whose responsibilities include the promotion of competition in ICT networks and services, determining categories of licences for ICT networks and services and granting these licences, resolving interconnection, facilities sharing and other disputes, managing the radio frequency spectrum and the Cayman Islands' .ky Internet domain name, protecting consumers and advising the Minister responsible for ICTs. The ICTA currently has a staff of 8.

The awarding of licences by ICTA is based on the applicant's meeting a number of criteria laid out in the Act¹⁴⁹ including: technical qualification, his/her readiness to meet licence obligations, users' and the Islands' interests, and the level of domestic and outside investment (There is no prescribed foreign investment limit). A decision to not grant, revoke, suspend or modify a licence must first be appealed to the ICTA and thereafter to the Grand Court.

There is a Universal Services Fund managed by the ICTA, which can be used to compensate a network operator or service provider who is obliged to provide universal service (indicated in its licence). Two categories of universal access are defined in the Act: public voice telephone service along with free calls to emergency

¹⁴⁷ Telecommunications Liberalization in the British Virgin Islands, Final Draft, British Virgin Islands Government, 6 October 2005

¹⁴⁸ Maya – 1 connects Miami with Central America and the northern South America.

¹⁴⁹ Section 26 of the Act

services and directory assistance; and Internet access along with free Internet access for educational and health facilities¹⁵⁰. Contributions to the Fund are not defined in the Act.

Provisions for interconnection and facilities sharing generally respect the principles of the GATS Reference Paper¹⁵¹. Interconnection disputes are referred to the ICTA which can impose an agreement when parties do not agree. There are Interconnection and Infrastructure Sharing Regulations. Interconnection Agreements have to be filed with the ICTA but are not made public.

Licences are specified for all types of telecommunications and broadcasting networks and services. There are 26 companies which have different licences ranging from fixed wireline and wireless networks, through mobile, satellite and cable networks, fixed and mobile telephony, ISP and retail sales. There are three operating fixed operators: C&W which operates a traditional wireline public switched telephone network, and TeleCayman and WestTel which both operate Broadband Wireless Access (BWA) networks in the 3.5 and 2.5 GHz band, respectively. There are three operating cellular mobile operators. Cingular which is now owned by Digicel and is operated as a separate company, Digicel and C&W. They have frequencies in the 850 MHz (AT&T, C&W), 900 MHz (Digicel), 1800 MHz (Digicel) and 1900 MHz (AT&T, C&W, Digicel) bands and all operate GSM systems. Two other companies plan to build and operate mobile networks. E Technologies has a licence and frequencies in the 1900 MHz band and is currently deploying a CDMA network. Blue Sky which does not yet have a licence beyond handling incoming roaming traffic is also planning to build a comprehensive mobile network. There are as of yet no cable TV networks but there is one operator (WestStar) which provides an MMDS TV access. Infinity Broadcasting is planning to build a HCF (Hybrid Coax Fibre) system using the poles of the electricity company (Caribbean Utilities Company) and offer telephone, high speed Internet along with cable TV services. There are 14 FM stations. There are about a dozen ISPs offering both dial up and high speed Internet access.

In spite of an open market retail and wholesale wireline prices are still quite high in the Cayman Islands. C&W's peak time international calling rates to Jamaica, USA and Canada are US\$ 0.54/min (US\$ 0.42/min on weekends) and US\$ 0.66/min (US\$ 0.54/min on weekends). Like TSTT in Trinidad & Tobago and BTL in Belize, C&W offers a "line side alternate access carrier" (10-10-335) service with a 33% discount off regular DDD rates after paying an initial US\$ 6. C&W's and TeleCayman's (sister company of TeleBermuda) high speed Internet access services are priced at US\$ 48/month and US\$ 118/month for their 256/128 Kbps and 1544/512 Kbps services, respectively. Leased circuit prices are expensive. An E1 (half circuit only without the local loop¹⁵²) to Miami costs US\$ 11,100/month, to the UK US\$ 15,600/month and to Jamaica US\$ 8,300/month and comes with a number of conditions including a prohibition to resell any of the capacity, resell any public traffic, and refile any traffic from one country to another. The local loop costs

¹⁵⁰ Section 41(3) of Act.

¹⁵¹ The Cayman Islands, a Crown Colony of the UK is not by itself a member of the WTO.

¹⁵² Dedicated, fixed, point-to-point digital transmission channels to a virtual mid point outside of the Cayman Islands.

between US\$ 1,000 and US\$ 1,200 for an E1 depending on the length of the contract. These are list prices which are very likely much more than the rates can be obtained through negotiation; however, they are still order of magnitude more expensive than leased circuit prices on competitive routes where for example the current prices for a full circuit lease (without the local loop) between Los Angeles and Tokyo is in the order of US 1,350/month¹⁵³. Dedicated Internet access rates vary between US\$ 3,400 and US\$ 5,700 for an E1 depending on the length of the contract signed with C&W.

In Montserrat Cable and Wireless (West Indies), which provides both basic and value added services including cellular telephone and Internet access, has an exclusive licence to provide and operate domestic and international services in Montserrat until 18 March 2007. C&W has a right-of-first refusal for the provision of any new system and/or service. There are no restrictions in the provision of customer premises equipment (CPE).

A private company provides a 35-channel cable TV service throughout the island, primarily US entertainment programming and there are several private and government owned radio stations and one TV station.

Telecommunications policy is the responsibility of the Chief Minister who is also responsible for information and broadcasting. The Ministry of Communications, Works, and Public Utilities regulates the sector. It approves tariffs submitted to it by C&W as well as the price of the basic 12-channel cable TV service.

The current legal framework consists of: *The Telecommunications Act CAP 192 of 11 June 1951*; *The Telecommunications Rules* dated 1 June 1951 made Under Section 18 of the Telecommunications Act (Regulations); and C&W's *Operating Licence* of 18 March 1987

The Turks & Caicos Islands Telecommunications Ordinance 12 of 2004 established the 7 member Telecommunications Commission of Turks & Caicos Is. whose main functions are to promote and regulate competition in the telecommunications sector, protect consumers, help settle disputes and especially those related to interconnection, and manage the spectrum and numbers. A Director General, who has been recently (December 2005) appointed, reports to the Commission. Telecommunications Regulations were issued in 2005.

A separate regulator known as the Broadcasting Commission of Turks & Caicos Is., established under The Broadcasting Ordinance 35 of 1994, Amended in 1998, regulates the content of the public broadcasting service.

Four types of authorizations are contemplated in the 2004 Ordinance: a carrier licence to operate a telecommunications network; a service provider's licence; spectrum licences; and special licences which may be granted in an emergency for example. Licences are awarded by the Minister on advice of the Commission. The

¹⁵³ See section II.2.4 of this report.

Ordinance provides for operators and/or service providers being classified as dominant and consequently being subject to a higher degree of regulation than non dominant operators and service providers. The interconnection regime satisfies the principles of the WTO Reference Paper¹⁵⁴

On 25 January 2006 C&W and the Government of Turks & Caicos signed an agreement which gives C&W a 15-year, non exclusive licence to continue to provide the services it had been providing until now including fixed and mobile telephone and Internet services in accordance with Section 13 of the 2004 Telecommunications Ordinance. C&W began rebalancing its tariffs in 2005. At the same time three previously selected new entrants, Digicel and Island Com for mobile and Andrews Communications for Internet were also awarded licences.

II.10.4 Cuba

Cuba has a population of 11,237,000 and a per capita GDP of US\$ 2,800 and an area of 110,860 km² divided into 14 provinces. The GDP grew by 2.6% in 2003 and 5% in 2004 due mainly to growth in tourism (currently at over 2 million visitors per year), mining (nickel, crude oil and natural gas extraction) and fisheries and (non sugar cane) agriculture sectors.

As of September 2005 there were 919 263 fixed telephones installed of which 799 361 were in service. The annual rate of growth over the past 5 years has been 14 %. At the same time there were 113 600 mobile subscriber of which 70 875 were GSM and 42 725, TDMA. The principal backbone currently is a microwave network. A parallel 2,100 km fibre optic link is currently under construction. Connections to points outside the country are via satellite. The level of national data traffic was 88 Mbps at the end of 2004 (increase from 2 Mbps in 1999). It is estimated that Cuba has 150,000 Internet users, 1,200 .cu domain names and 1,500 web sites. All 12,000 educational institutions (2 million students) have access to ICT. A health network (Infomed) with capability to transmit medical images currently connects 444 clinical libraries, 48 blood banks and 76 first year medical school computer classrooms and laboratories.

The Ministry of Information and Communications (Ministerio de Información y las Comunicaciones (MIC)) was created to promote the increased use of ICT, to manage and set policy for the sector, to regulate, and to set standards. Within the MIC the regulatory function is divided into two parts. The Dirección de Regulaciones y Normas (DRN) is responsible for conformation and establishing regulations in accordance with policy for the sector. The Agencia de Control y Supervisión (ACS) is responsible for regulatory control and supervision including spectrum management and technical plans.

The former Ministry of Communications became MIC in January 2000 (Decree Law No. 204 of 11 Jan. 2000) adding to its responsibilities the information and electronic industry functions of the Ministry of Industry and Electronics. Its current

¹⁵⁴ Turks & Caicos Is. is not a member of the WTO

responsibilities encompass the telecommunications and broadcasting sectors, spectrum management, postal services and the electronic and automatic control industries.

The following decrees and agreements define the legal framework for the telecommunications sector in Cuba today (There is no Telecommunications Law):

Decreto No.167 of 22 January 1992, which defines the concession given to Cubacel to provide AMPS cellular mobile telephone service in the 800 MHz band in Cuba.

Decreto No. 190 of 17 August 1994, which defines the concession given to ETECSA to provide public telecommunication services in Cuba.

Decreto No. 209 of 14 of June 1996, which defines the scope of the operation of the global information networks in Cuba.

Decreto No. 221 of 15 August 1997, which defines the quality of service modernization, expansion, financial and technical planning obligations of ETECSA.

Acuerdo No. 3807 of 16 November 2000, which defines the concession given to TDATA CUBA to provide Internet interactive information network services and add-value telecommunications services related.

Acuerdo No. 3833 of 15 December 2000, which defines the concession given to C-Com to provide GSM cellular mobile telephone service in the 900 MHz band in Cuba.

Private networks are permitted for circuit and packet switched networks for domestic and international services and international services; however, these have to be provided over facilities leased from authorized facilities-based operators and cannot be resold. Interconnection with the public network is permitted at one end only.

In 1994 Empresa de Telecomunicaciones de Cuba, S.A. (ETECSA), a joint venture between the Cuban government holding company, Telcel S.A. (51%) and STET International (29.29%) was granted a 25-year concession (to 2019) to develop, install, operate, maintain and commercialize the following public services:

- (a) domestic and international basic telephone services;
- (b) transmission of domestic and international signals;
- (c) domestic and international data transmission services;
- (d) domestic and international telex services;
- (e) public telephone cabins;
- (f) value added services;
- (g) trunking

For (a), (b), (c) and (d), the concession the exclusivity was for 12 years (to 2006).

Teléfonos Celulares de Cuba (Cubacel) was launched in 1992 as a 100% foreign owned company with a 20-year license (to 2012) to provide cellular mobile telephone service using AMPS/TDMA technology in the 800 MHz band. In December 1991 it became a joint venture between a Cuban government enterprise (50%) and a Canadian and Mexican investors (50%). In 2001 a 20 years concession was granted to Empresa de Telecomunicaciones Celulares del Caribe S.A (C-Com), a joint venture between CUTISA (50%) and Copextel (50%) to provide a GSM 900 service throughout the island. Both Copextel and CUTISA were Cuban companies. Telefonica de España had a management assistance contract with C-Com.

RadioCuba, established in 1995 operates and maintains radio and television transmission facilities throughout the country and also offers external radio transmission services. Movitel S.A, which is owned 90% by Radio Cuba and 10% by another state enterprise, Empresa Industrial de Comunicaciones, operates a trunking and a paging network in the 400 and 800 MHz bands.

A non exclusive concession to provide Internet interactive information network services and value-added telecommunications services related was awarded to TDATA CUBA, a joined venture between the Spanish Telefonica Data (50 %) and the Cuban company CITMATEL (50 %).

In December 2003 ETECSA was reorganized as a fixed and mobile operator (Operador Unificado de Telecomunicaciones por decreto 275 del 16 de diciembre 2003) owned 73% by Cuban enterprises and 27% by Telecom Italia. Cubacel S.A and C-Com S.A were incorporated into the reorganized company. Today ETECSA is the only mobile in Cuba providing both TDMA and a GSM services under the Cubacel brand name.

Under Cuba's WTO (Uruguay Round) commitment there are no limitations after the ending of the exclusivities granted to ETECSA and Cubacel on the provision of most basic services (voice telephone, circuit and packet switched data transmission, telex, telegraph and facsimile services). However, the number of licenses to be awarded is subject to a test on an economic needs and convenience to the country.

Cuba has no universal access fund such as the ones found in Chile, Colombia, Peru and recently established in Jamaica. Rather the Government has imposed build out obligations on the fixed and mobile operators (essentially ETECSA) which includes the installation by 2008 of 50,000 payphones using national (peso) non convertible currency, providing access to all localities with 300 people or more, providing access to the handicapped, and providing Internet access anywhere where there is a fixed telephone.

A particularly successful initiative has been the Joven Club de Computación y Electrónica (JCCE) (<http://www.jcce.org.cu/>), nearly 600 telecentres (including 5 mobile units) throughout the country which offer free IT (computers and electronics) instruction to anyone that wants it. Since the start of the program nearly

900,000 children, young people, workers, retirees and others have been trained. The JCCEs which each have at least 10 computers and peripherals, an administrator and 5 instructors, also serve as a place to confirm technical and professional qualifications in IT, develop specialized software as, for example, the tourism industry, identify talented young people for a career in computer science and IT, web development and communications. In addition Cuba has put computers in all schools and universities and implemented a comprehensive e-government (health culture, and social security) program.

II.10.5 Haiti¹⁵⁵

Introduction

The Republic of Haiti covers about one third of the island of Hispaniola which it shares with the Dominican Republic. It covers an area of 27,750 sq km and has a population of over 8 million. With a per capita GNP of just over US\$ 400 it is the poorest country in the Western Hemisphere and it continues to sink deeper into poverty. It has had a negative economic growth rate in 2002 of – 3.5 % while the population has been growing at a rate of 2.8%. More than 60% of the population is under 30; however, it is largely unemployed. In the past few years Haiti has experienced a high degree of political instability which culminated in September 30 1991 with the ouster of President Jean-Bertrand Aristide and again with his forced departure in February 29 2004 In spite of this, the information technology sector has been quite buoyant.

Status of sector reform: The current legal and regulatory framework

The current legal framework for telecommunications in Haiti is based on a 1977 decree which gives the State monopoly powers with respect to the sector and by which it can award as many concessions and permits as it wants to individuals and/or legal persons¹⁵⁶. At the time the national telecommunications company Les Télécommunications d'Haïti S.A.M. (TELECO)¹⁵⁷, which was established in 1968, had a monopoly on virtually all telecommunications services. Attempts to privatize TELECO have so far failed. New licences have been awarded since 1995; however on a case-by-case basis and without much transparency.

The 1977 Decree also establishes the Fond National des Telecommunications to be administered by the Conseil National de Développement et de Planification (CONADEP) and intended to be used for developing systems, improving services and supporting the activities of the centre de formation Professionnel des telecommunications

¹⁵⁵ Written with the assistance of members of The Association Haïtienne pour le développement des TIC (AHTIC) and coordinated by Paolo Chilosì, Chief Operating Officer, MULTILINK SA

¹⁵⁶ Décret accordant à l'Etat haïtien le monopole des services de télécommunications (12 Oct. 1977) Journal officiel de la République d'Haïti, 132ème Année No. 80-A, Lundi 21 Nov. 1997

¹⁵⁷ Owned 97% by state through Banque de la République d'Haïti (BRH)

The agency responsible for regulating the sector, the Conseil National des Télécommunications (CONATEL), which was established by decree in 1969¹⁵⁸, is a decentralized unit of the Ministère des Travaux Publics, Transport et Communication (MTPTC) which also has a specialized unit, Direction des Communications, responsible for the sector. CONATEL oversees the technical aspects of the telecommunications regulation including the spectrum as described in the 1977 Decree and advises the Government on matters related to the sector. This situation has created ongoing tensions between the CONATEL and the Direction des Communications in the Ministry

According to another 1969 decree which defines its technical and administrative structure. CONATEL is supposed to have a board with representatives of different sectors and an Executive Director as the head of the organization¹⁵⁹. In reality, no board has ever been appointed and the Executive Director has had full power to run the institution. Also in the opinion of industry CONATEL has never been independent of the Government and its decisions have often been influenced by the President, who normally appoints the Executive Director. Exceptionally, the current Executive Director was appointed by the Minister of Public Works, Transport and Communications with the result that the relation between the regulator and the Ministry has been better.

Various stakeholders have suggested that instead of paving the way for new investments and services the regulator has been over regulating while introducing new fees and taxes that are prohibitive and possibly even illegal under the taxation laws of the country. This is a particularly sensitive issue given that the sector is currently among the healthier ones in the country and a large contributor to the country's taxes. The structure of these taxes and fees is contested by operators suggest they are unfair because they are apply, for example, to installed rather than used capacity or are proportional to the number of ports on network equipment rather than on the value of the equipment, etc. These fees and taxes are passed on to the consumer.

Thanks to an initiative of the private sector and the support of the UNDP the position of Secretary of State for Telecommunications was created in March 2004 but only to be abruptly eliminated at the end of 2005 after the new Secretary, who had been appointed by the Prime Minister, proposed a new draft telecommunications act (called 'avant-projet' in French) putting him at odds with both the Minister of MTPTC and the Director of CONATEL.

The debate about the new legal and regulatory framework continues. An industry association, Association Haïtienne pour le développement des TIC (AHTIC)¹⁶⁰, and

¹⁵⁸ Décret du 27 Septembre 1969 créant un Organisme dénommé, Conseil National de Télécommunications

¹⁵⁹ L'Arrêté du 10 Novembre 1969 organisant la structure technique et administrative du Conseil National de Télécommunications.

¹⁶⁰ The Association Haïtienne pour le développement des TIC (AHTIC), an association of businesses and operators in ICTs (but not the large telecommunications operators), was established in 2005 in support of advocacy efforts of UNDP. Inter alia, AHTIC is currently dealing with (i) the creation of a National Commission for the Information Society, following the recommendations of the WSIS; (ii) the elaboration of a position paper in regards of the new regulatory framework for ICTs; and (iii) the adoption of a National Action Plan for ICTs by the Government

several individuals representing civil society are presently working on a position paper for a new legal and regulatory framework designed to foster competition, increase choice, improve quality of service and lower prices. This, it is hoped, will foster new investments through the introduction of transparency and fair competition. It is intended to present this position paper to the new Parliament that is expected to be elected in June 2006. This debate is taking place in a virtual forum animated by a UNDP sponsored project¹⁶¹.

Network infrastructure and telecommunications services

Generally speaking the telecommunication infrastructure is underdeveloped and there apparently no immediate national plans and/or incentives in place to promote its development. While the capital (Port au Prince) appears adequately served, nothing has been done to improve service in provincial towns and the rural areas where there has been little interest by the established telephone companies to provide service. All Internet and data connectivity needs of the provinces are presently being satisfied by satellite solutions.

International services have traditionally been provided by the state owned monopoly, TELECO, via an Intelsat earth station. Some ISPs, the new cellular mobile operators, banks, and other institutions have, however, been issued licences to connect directly to their international correspondents via VSAT terminals. Other companies use land based microwave networks to connect into submarine cables landing in the Dominican Republic. These companies have had to build their own facilities since the telephone operators have been unwilling to lease any capacity. In this respect data transmission networks were built in 2004 by Multilink SA followed by Hainet SA in 2005.

There are three submarine cable projects currently being planned or under discussion. One is a 600 E1 capacity cable planned by the TCCN consortium of 61 private companies including several in Haiti (Access Haiti, Alpha Communications, Comcel, Datasys, Digicel, Focus Data, Haicom, Hainet, Haitel, Haiti Data Networks, Multilink, Fondation Intermonde, and Teleco de' Haiti), which will connect Haiti, Jamaica and the Dominican Republic with the NAP of the Americas in Miami¹⁶². Another is a possible extension of the Bahamas Domestic Submarine Cable Network announced by the governments of the Bahamas and Haiti in 2005. A third possibility is a future branch connecting to the FibrLink cable system, which runs between Kingston, Jamaica and the ARCOS cable station at Puerto Plata in the Dominican Republic and which was put into service on 31 March 2006. The cable has a branching unit off the coast of Haiti which could make it easy to extend the system once the required financing and permits are obtained (See below).

¹⁶¹ UNDP Project HAI/02/007 (Accompagnement d'Haiti dans la Société de l'Information). The UNDP is currently in the process of designing a new project planned to start in 2006 and that will focus more on e-governance and the problem of the telecommunications legal and regulatory framework. The project will support the efforts of civil society and the private sector towards establishing an enabling environment for the development of the ICT sector in Haiti.

¹⁶² See: Trans-Caribbean Cable Company (TCCC), Press Release, "Haiti License Awarded to TCCN Consortium", November 23, 2005 (<http://www.trans-caribbeancable.com/>)

It is estimated that TELECO has a built out capacity of 125,000 lines of which only about 65,000 are working properly. In reality TELECO has 81,000 customers. There is a waiting list of 150,000 and it is estimated that there are another 150,000 who have not bothered to put themselves on the waiting list. TELECO has about 3,500 employees. It also is an ISP and offers home zoning cellular network based on UT-Starcom technology, covering low-income, high-density neighborhoods.

The development of mobile telephony in the country has followed the world trend, with today's mobile penetration rates exceeding the most optimistic predictions. Two mobile companies, Haitel and Comcel entered the market respectively in 1996 and 1998. Haitel, which is mostly Haitian-owned, operates a CDMA network in the 1800 MHz band covering the metropolitan area of Port-au-Prince with limited coverage in rural areas side. ComCel, originally established a TDMA network that has been recently been converted to GSM. ComCel which has coverage in the Port-au-Prince metropolitan area and part of the country outside the metropolitan area operates in the 1,800 MHz band. It also offers SMS. It is mostly American-owned. Together they have reached over 425,000 subscribers (~ 5% penetration) more than seven times the current number of main fixed lines. ComCel recently launched a GSM service and will progressively migrate its TDMA customers to GSM. Within a month of launch, it registered about 16,000 new subscribers, and is increasing that at a rate of about 1,000 a day.

Digicel, the Irish based mobile operator which already has 14 other licenses in the Caribbean, was awarded a license in 2005 and is planning to launch a GSM service in 2006. The GSM network is now in an advanced state of construction and is planned to give full coverage of the provincial main towns at the start of operation expected by May or June 2006.

Since 1995, the number of Internet Service Providers (ISP) has grown from 1 to about 8, not including two official satellite based resellers of *Starband* and *Directway*, and a number of independent satellite connection resellers. All ISPs in Haiti are local companies.

Connections offered are mostly wireless point-to-point and point-to-multipoint connections operating in 2.4 and 5.8 GHz bands. The dial-up service is inadequate due to the deficiencies of the copper line operator. There are a few ISPs providing wireless local loop services using licenced spectrum. Recently, two Haitian data and Internet providers began offering international backhaul for data and Internet access through fiber-optic cables landing in the Dominican Republic via a microwave link to the cable landing stations. These two operators are progressively servicing other ISPs thereby putting downward pressure on the cost of Internet access in Haiti. One of these is currently experimenting with WiMAX in the metropolitan area of Port-au-Prince.

The development of the Internet in Haiti has been considered by some as a model of how low-cost wireless communications can be used in mountainous areas where basic infrastructure is lacking and wireline infrastructure expansion is expensive.

The growing availability of Internet connectivity and the development of IP-based telephony has fostered the opening of cybercafés throughout the country. A UNDP study in March 2002 revealed that in less than two years more than 200 cybercafés have been established and that the number is increasing. The study showed that:

- 25% of users in Cybercafés are aged 20 to 34 years
- 17% of cybercafés owners are women
- VoIP is the most common service used in cybercafés in Haiti (63% of users) because of the low cost of communications. This has driven down the price of international calls.

Some other services based on the Internet are also available such as call centers but not much is known about them because of the lack of public information. Also a project to build an Internet Exchange Point (NAP) in Haiti is in progress.

A list of operators and service is shown in Table 13.

Table 13: Licenced Operators and Service Providers in Haiti

Operator	Ownership	Services offered	Market	Infrastructure/Technology
TELECO	State 97%; Compagnie de Téléphone Continental, 3 %	traditional fixed telephone service; domestic and international leased lines	Institutional; business; residential	Microwave to DR Earth station Microwave Backbone Wire Lines
A.C.N.	100% family owned	wireless internet service; dial-up Internet service;	business; residential	Earth station 2.4 GHz wireless local loop
Access Haiti	100% family owned	wireless Internet; satellite Internet service; dial-up service	business; residential	Earth station 2.4 GHz wireless local loop
Comcel	Western Wireless and Haitian interests	cellular telephone services	business; residential	D-AMPS/TDMA/GSM Earth station National microwave Backbone
Digicel	Digicel	new mobile operator will start service at the beginning of 2006	residential business	D-AMPS/TDMA/GSM Earth station National microwave Backbone
Hainet	100% family Owned	wireless Internet; satellite Internet service; dial-up service	business; residential	Microwave connection to international fiber-optic cable in the Dominican Republic Local loop 2.4, 2.5 and 5.8 GHz
Haitel	MCI and Haitian interests	cellular telephone and dial-up Internet service	business; residential	PCS wireless coverage of xx% of territory; CDMA
HDN	100% owned by local partners	Metropolitan wireless lease lines	Institutional	Point to multipoint 3.5GHz Local loop
MULTILINK	100% owned by local partners	international, metropolitan and satellite leased lines (64Kbs to E1); wireless internet dedicated access (128kbs to 4mbs)	Institutional	microwave connection to international fiber-optic cable in the Dominican Republic; Point to multipoint 3.5GHz Local loop; Satellite hub
Netcom	100% owned by local partners	not in operation	Institutional	Satellite Data Lines Microwave Point-to-Point
Rectel	TELECO and Haitian interests	not in operation	cellular	AMPS/FDMA

III. REGIONAL ISSUES AND INITIATIVES

III.1 Introduction

This chapter examines regional telecommunications issues the most important of which are the persistent high retail and wholesale prices for telecommunications services and discusses some important regional initiatives for the sector. These are: (i) regional integration in the form of CARICOM and the CARICOM Single Market and Economy (CSME); (ii) the various multi and bilateral free trade negotiations involving the Caribbean; and (iii) the ICT related initiatives of various global, regional and national cooperative and funding organizations.

III.2 Pricing issues

III.2.1 Introduction

As indicated earlier, one of the most important barriers to the development of the Information Society in the Caribbean has been and continues to be the high prices that users have to pay for international calling, Internet access and leased lines. This also impacts traditional industries such as tourism and agriculture on which the Caribbean continues to be very dependent. New entrants and other competitors pass on to their customers the high prices they have to pay for leasing of circuit capacity and other wholesale telecommunications services such as telephone ports and 1-800 numbers.

This section looks at pricing in four areas: (i) international calling; (ii) circuit leases; (iii) Internet access; and (iv) interconnection¹⁷⁰. While the present study does not permit an exhaustive analysis of prices and related policies it does highlight the extent of a problem which needs to be addressed if the goal of developing an ICT sector in the Caribbean is to be realized. The mechanisms proposed in Chapter VI do this.

Prices in these four areas are compared with those in the very competitive North American and European markets. Because of the size of countries being compared, the relatively sparser populations in the Caribbean, the much longer experiences that

¹⁶³ Décret accordant à l'Etat haïtien le monopole des services de télécommunications (12 Oct. 1977) Journal officiel de la République d'Haïti, 132ème Année No. 80-A, Lundi 21 Nov. 1997

¹⁶⁴ Owned 97% by state through Banque de la République d'Haïti (BRH)

¹⁶⁵ Décret du 27 Septembre 1969 créant un Organisme dénommé, Conseil National de Télécommunications

¹⁶⁶ L'Arrêté du 10 Novembre 1969 organisant la structure technique et administrative du Conseil National de Télécommunications.

¹⁶⁷ The Association Haïtienne pour le développement des TIC (AHTIC), an association of businesses and operators in ICTs (but not the large telecommunications operators), was established in support of advocacy efforts of UNDP. Inter alia, AHTIC is currently dealing with (i) the creation of a National Commission for the Information Society, following the recommendations of the WSIS; (ii) the elaboration of a new regulatory framework for ICTs; and (iii) the adoption of a National Action Plan for ICTs by the Government

¹⁶⁸ UNDP Project HAI/02/007 (Accompagnement d'Haïti dans la Société de l'Information). The UNDP is currently in the process of designing a new project planned to start in 2006 and that will focus more on e-governance and the problem of the telecommunications legal and regulatory framework. The project will support the efforts of civil society and the private sector towards establishing an enabling environment for the development of the ICT sector in Haïti.

¹⁶⁹ See: Trans-Caribbean Cable Company (TCCC), Press Release, "Haïti License Awarded to TCCN Consortium", November 23, 2005 (<http://www.trans-caribbeancable.com/>)

¹⁷⁰ Time did not permit study of another important area, namely, pricing in the cellular mobile (retail and wholesale) market.

Europeans and North Americans have had with liberalized telecommunications sectors, the presence in these regions of well established and well resourced regulators, and other factors it is not possible strictly speaking to compare prices in the Caribbean with those in the other two regions; however, given that in certain cases there are orders of magnitude differences in wholesale and retail prices for essential telecommunications services between the Caribbean and North America and Europe, the benchmarking exercise in this study does indicate a need to address the level of prices for these services in the Caribbean.

Price information for this study was obtained from published tariffs of operators and service providers either directly from them or via the Internet; regulators, users and market intelligence sources; C&W's Reference Interconnection Offers (RIO) in Barbados and Jamaica; and price related studies of organizations such as the European Commission and the Organization for Economic Cooperation and Development (OECD).

III.2.2 High international calling charges and the need to rebalance

Table 14 compares current calling charges to selected overseas destinations from various Caribbean countries with charges to the same destinations from Canada and the USA and from any location in the world using two Voice over Internet Protocol (VoIP) service providers, Vonage and Skype. While the rates in the table may not always be strictly-speaking comparable because daytime, non-discounted rates in the Caribbean countries may be compared with discounted rates available in the USA and Canada, they do nevertheless underline the significant differences between the two regions¹⁷¹.

Calling destinations in North America and Western Europe cost subscribers in North America about US\$ 0.05/min., whereas in the Caribbean they generally pay 10 to 20 times more for calling the destination. Intra Caribbean rates are as expensive as rates that subscribers in North America have to pay to call the Caribbean.

Monthly line rental and local call charges in most Caribbean countries are by comparison relatively low. For example, the monthly charge in Barbados is US\$ 14 which is higher than in Trinidad & Tobago and Suriname, but includes unmetered, unlimited calls on the island. Business customers in Barbados pay B\$ 81.75 (=US\$ 40.88) and also enjoy unmetered local calling.

¹⁷¹ A recent study on international calling prices in the OECD countries shows that the average price for calls between the 30 countries of the OECD decreased from US \$ 1.24/minute in 1993 to US \$ 0.33/minute (discounted rate) in 2003. The off peak rate in 2003 was US \$ 0.28/minute. The average standard (non-discounted) rate for calls among the 30 countries in 2003 was US \$ 0.54/minute. In the USA the average standard rate for international calling to the OECD countries increased from US \$ 1.33/minute in 1993 to US \$ 2.78/minute in 2003 (109 % increase). During the same period the average discounted rate decreased from the same US \$ 1.33/minute to US \$ 0.18/minute, a 86 % decrease, which explains why most international calls in the USA and Canada (where there has been a similar decrease in discounted rates) use discounted rather than standard rates. See: OECD, Trends in International Calling Prices in OECD Countries, Working Party on Telecommunication and Information Services Policies, Committee for Information, Computer and Communications Policy, DSTI/ICCP/TISP(2003)2/Final, 19 Dec 2003. Telecommunication Services of Trinidad and Tobago (TSIT) has various discount plans among which the 10-10 plan which offers a 40% saving on international calls after the first four minutes. In February 2004 TSIT began offering a Voice over Internet Protocol (VoIP) service at US \$ 0.17/min. to any international destination; however, the service is only available using a public pay phone and with a pre-purchased calling card. See <http://www.tsit.net.tt/>

Table 14
Comparison of International Telephone Calling Charges from Various Countries in the Caribbean to Some Selected Destinations (in US\$/min.)

Country from where call originates	Service provider	Destination of call								
		Caribbean				North America		Rest of World		
		Anguilla	Jamaica	St. Lucia	T&T	USA	Canada	UK	France	Brazil
Any	Skype (computer to computer)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Skype (computer to telephone)	0.18	0.13	0.26	0.16	0.02	0.02	0.02	0.02	0.06
	Vonage	0.18	0.12	0.22	0.14	0.00	0.00	0.03	0.03	0.09
Canada	Goldline (anytime)	0.23	0.14	0.21	0.16	0.02	0.02	0.02	0.04	0.09
USA	MCI (anytime)	0.61	0.52	0.41	0.35	0.05	0.05	0.07	0.08	0.15
Anguilla	Cable & Wireless (Anytime)		0.67	0.67	0.67	0.67	0.67	0.67	0.89	0.89
The Bahamas	BTC (reduced)	0.70	0.66	0.70	0.70	0.51	0.54	0.89	0.89	0.89
	BTC (regular)	2.25	2.25	2.25	2.25	0.99	1.25	2.75	2.75	2.75
Barbados	C&W (daytime)	0.40	0.40	0.40	0.40	0.65	0.65	0.65	0.75	1.00
	C&W (evening)	0.23	0.23	0.23	0.23	0.50	0.50	0.50	0.60	0.75
Belize	BTL DD Peak	1.10	1.10	1.10	1.10	0.70	1.10	1.50	1.50	1.10
	BTL 10-10-199 Off Peak	0.62	0.62	0.62	0.62	0.39	0.62	0.84	0.84	0.62
Guyana	GT&T (peak)	0.51	0.73	0.51	0.40	0.56	0.75	0.76	1.91	1.51
	GT&T (off peak)	0.36	0.51	0.36	0.28	0.50	0.52	0.69	1.33	1.06
Jamaica	Digicel	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
	Cable & Wireless (Anytime)	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
St. Lucia	Cable & Wireless	0.25	0.25		0.25	0.47	0.47	0.47	0.49	0.49
Suriname	Telesur	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
	Greentone	0.33	0.34	0.36	0.29	0.15	0.18	0.22	0.22	0.22
Trinidad and Tobago	TSTT (daytime)	0.33	0.33	0.17		0.32	0.32	0.32	0.48	0.80
	TSTT (night saver)	0.27	0.27	0.14		0.27	0.27	0.27	0.41	0.68

Source: Own research

Introduction of metered calling is a controversial issue currently being addressed in Barbados (see section on Barbados). The monthly telephone line rental charge in Trinidad & Tobago is TT\$ 40 (= US\$ 6.40) for residential customers and TT\$ 365 (=US\$ 58.40) for business customers. Here domestic call charges vary according to the distance and time of day. A call from Port of Spain to Scarborough on the island of Tobago costs US\$ 0.11/minute during the day and half that at night. For shorter distances calls can be as cheap as US\$ 0.01/minute and for a local call in Port of Spain there is a one time charge of US\$ 0.04 irrespective of the length of the call or when it is made.

In The Bahamas calls to subscribers on the same island are free; however, inter island charges are quite high even after BTC's reduced rates are taken into account. Indeed, it is cheaper for a subscriber in Nassau (New Providence) to use Skype (US\$ 0.09/min) or Vonage (US\$ 0.10/min) to make a call to someone in Grand Bahamas or Abacco.

In some countries the incumbent offers rates which are "competitive" with its own regular rates. For example in Trinidad & Tobago TSTT offers its own "competitive" 10-10 type ("line side access alternate carrier") international call rates which are 40 percent cheaper than the normal rates after the first 4 minutes. In Belize BTL's 10-10-199 service costs 20% less than its direct dial international rates. In 2004 in The Bahamas BTC reduced its rates by up to 60 % for four months; however, even these were quite high and did not prevent people from using VoIP alternatives even at the risk of being fined up to US\$ 300,000, if caught¹⁷².

¹⁷² See Section 35 of the Bahamas Telecommunications Act, 1999

In Suriname also there is a large imbalance between international and local charges. The latter are shown in Table 15.

Table 15 : Local Line Rental and Call Charges in Suriname

Monthly line rental	Per unit charge	Where a unit is:
US\$ 1.25/ month	US\$ 0.0175	1 min. between 06:00 and 17:00; 2 min. between 17:00 and 22:00; and 3 min. between 22:00 and 06:00

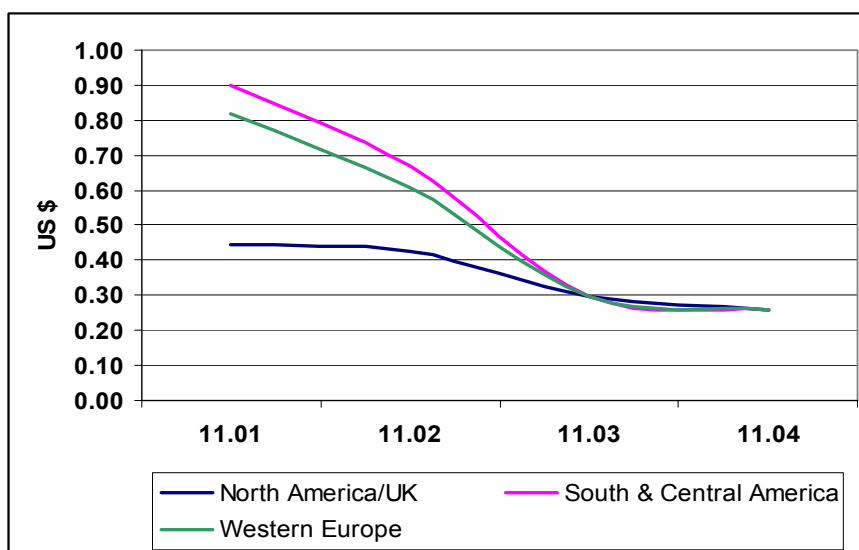
Source: Telesur

The only competition in international calling in Suriname is a VoIP service offered by a local ISP, RPBG. Because it is the only competitor, it can offer rates which are below those of the incumbent but which are still high in comparison with those available to North American customers. (Table 14).

The effect of rebalancing, the decrease in C&W's international calling charges and the concurrent increase in line rental charges for residential and business lines since 2001, in Jamaica where the telecommunications market has been completely open since March 2003 is shown in Figures 10 and 11.

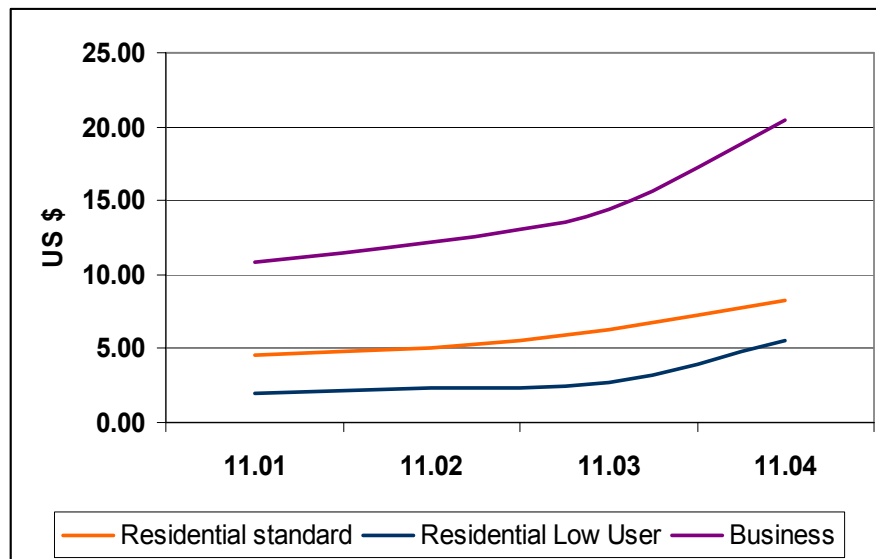
VoIP presents a particularly attractive alternative to long distance and international calling especially where prices on the PSTN continue to be high and where access to high speed Internet at reasonable prices is becoming more readily available.

Figure 10
Evolution of C&W's International Calling Charges in Jamaica (in US\$/min)



Source: C&W (Jamaica)

Figure 11
Evolution of C&W's Line Rental Charges in Jamaica (in US\$/month)



Source: C&W (Jamaica)

This is the case as we have seen in The Bahamas where the incumbents rates are still very high even after substantial discounts and where competition in high speed Internet access (via cable, ADSL, and fixed wireless) is available to most homes at prices which are equal to those in North America. The cable TV operator is not allowed to offer voice services; however this does not prevent its Internet customers from connecting hard and/or “soft” VoIP telephones to their Internet access even at the risk of being fined.

Several new types of companies offer different types of VoIP services along with a number of features. In this study we have used the prices of Vonage and Skype for comparison. Others are Net2Phone, deltathree, CallServe, Dialpad, 8X8 and Go2Call. Vonage (www.vonage.com) which is reported to have 240,000 customers in the USA offers an unlimited North American calling plan for the USA and Canada for US\$ 25/month. Per minute rates for calls outside of North America are very competitive as Table 14 indicates. As an added feature Vonage offers its customers a virtual USA, Canada, Mexico or UK telephone number for an extra US\$ 5/month regardless of where they actually live. The customer chooses the country and area code he/she wants. For example, small family run hotels and travel agencies in Peru subscribe to Vonage and get local numbers, say in Miami, allowing their USA customers to reach them by simply making a domestic or local call to a Miami number. Vonage supplies the IP Phone and router to be installed in the subscriber's home free of charge. Vonage has been particularly popular in The Bahamas where many individuals have subscribed (with USA numbers) even at the risk of substantial fines if caught. Their friends and family can call them by making a domestic or local call in the USA. Vonage has apparently just introduced a WiFi phone which will allow its customers to call from anywhere where they can access the Internet via a WiFi hotspot¹⁷³.

¹⁷³ “Innovation that has shaken telephony, Paul Taylor, Financial Times, 5 January 2005.

Skype (www.skype.com) offers free PC to PC calling anywhere in the world and PC to phone calling (SkypeOut service) for as low as € 0.017/min (~US\$ 0.022) for anywhere in North America and most of Western Europe. Rates to the Caribbean are more expensive since a call via the PSTN still requires a local interconnection. Skype's rates are independent of the origin of the call. Thus a call to the USA or Canada costs US\$ 0.022 whether the call originated in Trinidad and Tobago, France or Singapore. Use of Skype requires that its free software be downloaded onto one's laptop or desktop computer. PC to phone service requires an account to be set up with Skype. Both its PC to PC and PC to phone service are easy to use and offer very good quality of service.

Both Skype and Vonage offer a number of added features such as instant messaging and conference calls and in the case of Vonage free voice mail, call waiting, call forwarding, and caller ID with name.

International VoIP traffic is growing rapidly. Telegeography estimates that in 2003 there were 24 billion minutes of international VoIP traffic representing about 12 % (up from about 10 % the year before and 6 % from the year before that) of all international voice traffic (PSTN and VoIP)¹⁷⁴.

III.2.3 Internet access

Tables 16 and 17 compare prices for dial up and high speed Internet access in various countries of the Caribbean, North and South America, and Europe. In Anguilla and The Bahamas the real competitors to the incumbent telephone company in providing high speed Internet access have been the cable TV companies. This is also true in Belize and the Dominican Republic but without the same effect (so far at least) on prices.

¹⁷⁴ See TeleGeography 2004, Primetrica Inc. For an excellent discussion on VoIP see Downes, Richard, The Regulator and the IP Network Cloud: Regulatory Challenges Arising from Network Evolution Prepared for the Meeting of the Organization of Caribbean Utility Regulators (OOCUR) and the Regulated Industries Commission, Port of Spain, Trinidad and Tobago, September 16-19, 2003

Table 16: Comparison of Internet Dial up Access Prices (shown in ascending order of monthly charge)

Country	Service Provider	Name of service	Monthly charge (US \$)	Set up charge (US \$)	Comment
Suriname	EDUCONS	Dial up	10.00		unlimited
Argentina	Ciudad	Ciudad Premium	10.30	0	
Canada	Sprint Canada	Basic Unlimited	14.00		Cheaper if bundled with long distance services
Dominican Republic	Verizon	Dial up	15.55	7.40	
Jamaica	Cybervale	Unlimited	16.39	12.30	
Canada	Bell Canada	Unlimited Plan	17.00	0	
Canada	Videotron	Acces téléphonique	17.00	0	3 users/account; 5 Mb web storage included
Canada	Primus	Unlimited plan	17.00	0	Cdn \$ 3 cheaper if bundled with long distance services; 20 Mb web storage included
Jamaica	emoquad	Dialup	17.00		
USA	Sprint		17.00		
Jamaica	Angel	Unlimited	20.70	9.43	
USA (Washington D.C.)	Verizon		23.00	10.00	
France	Neuf Telecom	Internet Illimité	24.00		Unlimited no. of e-mail addresses
Barbados	C&W		30.00		
Argentina	Telecom	Arnet Premium fam.	33.00	0	
Jamaica	C&W	Voyageur flat rate	35.00	?	Requires J \$ 2000 = US \$ 33 deposit; 1 user/account
Jamaica	Infochan	Marathon Accelerator	35.00		
Jamaica	Infochan	Sprint pak	35.00		per pack of 40 hours
Jamaica	Kasnet	Unlimited	37.00	40.00	
Trinidad & Tobago	TSTT	Dial up access	56.00	18.75	1 user/account
Trinidad & Tobago	TSTT	Dial up access	130.00	18.75	3 users/account

Table 17
Comparison of Monthly Charges for High Speed Internet Access (installation and activation not included)

Country	Service Provider	Service	Techn.	Speed (Kbps)		US \$/m
				Down	Up	
Argentina	Ciudad	Flash	Cable	512	128	15
Finland	Elisa Comm.	Elisa ADSL	ADSL	256	256	21
Argentina	Ciudad	Flash	ADSL	1,200	256	23
Sweden	Telia	Upp till 0,25	ADSL	250	128	25
Finland	Elisa Comm.	Elisa Adsl	ADSL	1,000	512	29
France	FT	Internet 512	ADSL	512	128	30
Barbados	C&W	ADSL 256	ADSL	256	64	31
Canada	Videotron	Haut Vitesse	Cable	3,000	820	32
Spain	Jazztel	Hasta 20 M	ADSL	20,480	1,024	35
Bahamas	Coralwave	Lite	Cable	2000	512	37
Switzerland	Swisscom	Bluewin	ADSL	600	100	37
Canada	Bell Canada	Sympatico	ADSL	3,000	800	38
Jamaica	C&W	Ultra	ADSL	128	64	40
Jamaica	C&W	Premium	ADSL	768	256	40
Bahamas	Coralwave	Groove	Cable	3,000	768	55
Jamaica	N5	Wireless	MMDS	256	128	55
Belize	Channel Broadcasting	128K	Cable	128	56	59
Belize	BTL	DSL	ADSL	128	64	60
Dominican Republic	Tricom	Turbo Plan 1	ADSL	128	128	60
Bahamas	Coralwave	Rock	Cable	4,000	1,000	70
Trinidad & Tobago	TSTT	High Speed	ADSL	128	64	74
Jamaica	Kasnet	Res. Silver	MMDS	256	128	75
Barbados	C&W	ADSL 768	ADSL	768	128	86
Barbados	C&W	ADSL 1544	ADSL	1,544	256	108
Trinidad & Tobago	TSTT	Business 1	ADSL	128	64	184
Dominican Republic	Tricom	Turbo Plan 7	ADSL	1,536	768	259
Belize	BTL	DSL	ADSL	1025	256	265
Trinidad & Tobago	TSTT	Business 2	ADSL	256	64	286
Trinidad & Tobago	TSTT	Business 7	ADSL	1,544	256	693

III.2.4 Leased circuits

The differences in prices for leased circuit capacity offered to users in the Caribbean and in other regions of the world, where there is competition in the provision of bandwidth capacity, are just as significant as for international telephone calling. Table 18 shows that the lease price for an International Private Leased (E1) Circuit (IPLC) between Amsterdam and Madrid (~ 1,500 km as the crow flies) costs less than 9 % of a T1 (1.544 Mbps) lease between Kingston (on Maya 1) and Miami (~ 932 km), when compared on a *per Mbps* basis. The difference is even more remarkable when prices are compared on a *per Mbps per km* basis. For example, the monthly lease for an E1 between New York and Bangalore, India (location of many call centers) is less than US\$ 4,000/month or about US\$ 0.31/Mbps per km. The published price for a St. Lucia to Miami (or New York) E1 circuit (US\$ 6.45) is more than 20 times that amount.

In Trinidad & Tobago, where Telecommunications Services of Trinidad & Tobago (TSTT) is the joint owner and landing licence holder for the three fiber optic cable systems¹⁷⁵, which land in the country, the lease of an international T1 (1.544 Mbps) full¹⁷⁶ circuit to the USA costs US \$ 11,553¹⁷⁷ per month (US \$ 7,124/Mbps/month) for a twelve month lease plus US\$ 1,000 for installation. In Barbados the same lease costs US \$ 15,500/month¹⁷⁸. A 1 Mbps VSAT lease costs somewhere between US\$ 4,500 and 8,000/month.

Table 19 shows that the prices per Mbps for higher capacity leases (STM-1, STM-4, or OC-48) can be lower than US\$ 50/month.

The non-Caribbean prices shown in Tables 18 and 19 are the actual average market prices as of mid 2004. By mid 2005 these prices had decreased by more than 15%. The current monthly price for an E1 between London and Paris is US\$ 425/month, between London and New York, US\$ 625/month and between Los Angeles and Tokyo, US\$ 1,350 (without the local loop).

¹⁷⁵ Eastern Caribbean Fiber Optic System, Americas-1, and Americas-2

¹⁷⁶ A “full circuit” refers to an end-to-end lease in a cable system. This is possible when the operator who offers the lease owns the capacity from one end to the other in the facility. If the ownership is shared between two operators at each end of the facility any one of the operators could offer only a “half circuit” for lease.

¹⁷⁷ Recently reduced from US \$ 32,677/month

¹⁷⁸ Half of what it was in 1997

Table 18: Comparison of Prices for International Private Leased Circuits (IPLC) on Fibre Optic Cables (US \$)¹⁷⁹

Route	Distance* (km)	Capacity/Speed		Avg. price/month (US \$)		
		Type	Mbps	per circuit	per Mbps	per Mbps per km

Intra Europe

Frankfurt - London	634	E1	2.048	593	290	0.46
London - Paris	634	E1	2.048	603	294	0.46
London - Madrid	1,261	E1	2.048	879	429	0.34
Frankfurt - Madrid	1,434	E1	2.048	963	470	0.33
Amsterdam – Madrid	1,477	E1	2.048	981	479	0.32

Trans Atlantic

London - New York	5,585	E1	2.048	812	396	0.07
New York - Paris	5,850	E1	2.048	922	450	0.08
Frankfurt - New York	6,215	E1	2.048	943	460	0.07

Trans Pacific

Hong Kong – Los Angeles	11,640	E1	2.048	1,992	973	0.08
Sydney - Los Angeles	12,049	E1	2.048	5,058	2,470	0.20
Mumbai - New York	12,566	E1	2.048	6,932	3,385	0.27
Bangalore - New York	12,049	E1	2.048	7,642	3,731	0.31

Europe to Asia

Hong Kong – London	9,740	E1	2.048	3,537	1,727	0.18
London - Mumbai	7,205	E1	2.048	8,576	4,188	0.58
Bangalore - London	7,939	E1	2.048	12,118	5,917	0.75

Caribbean

Belize City - Miami (Arcos 1)	3	877	E1	2.048	3,600	1,758	2.00
Kingston - Miami (Maya 1)	2	932	E1	2.048	10,500	5,127	5.50
Bahamas - Miami	1	288	E1	2.048	10,853	5,299	18.40
Kingston - Miami (Maya 1)	2	932	T1	1.544	8,700	5,635	6.05
Paramaribo - Miami	1	3,550	E1	2.048	17,409	8,500	2.39
Paramaribo - Miami	1	3,550	T1	1.544	14,620	9,469	2.67
Georgetown - Miami	1	3,162	1/2 E1	0.512	5,950	11,621	3.68
Barbados – Miami	1	2,584	T1	1.544	23,900	15,479	5.99
Barbados – Miami	1	2,584	E1	2.048	31,900	15,576	6.03
St Lucia - Miami	1	2,414	E1	2.048	31,900	15,576	6.45
St Vincent & The Grenadines - Miami	1	2,431	T1	1.544	31,667	20,510	8.44
Barbados - London	1	6,777	E1	2.048	62,000	30,273	4.47
St Lucia - London	1	6,816	E1	2.048	63,037	30,780	4.52
St Vincent & The Grenadines - London	1	6,886	T1	1.544	49,407	31,999	4.65
Barbados - London	1	6,777	T1	1.544	49,600	32,124	4.74

1. full circuit, includes local loop
2. international half circuit, w/o local loop
3. for data only (no voice allowed)

¹⁷⁹ Source: Own research for Caribbean routes; TeleGeography/PriMetrica Bandwidth Pricing Database, Second Quarter (2003) Report for the other routes and TIM Perú for Lima to Miami lease price.

Table 19: Comparison of Prices for Higher Capacity International Private Leased Circuits (IPLC) Leased Circuits on Fibre Optic Cables¹⁸⁰ (US \$)

Route	Distance* (km)	Capacity/Speed		Avg. price/month (US \$)		
		Type	Mbps	per circuit	per Mbps	per Mbps per km
Trans Atlantic						
London - New York	5,585	STM-4/OC-12	622.08	9,364	15	0.003
London - New York	5,585	STM-1/OC-3	155.52	4,870	31	0.006
North America						
Atlanta - New York	1,204	OC-48	2488.32	32,710	13	0.011
Chicago - New York	1,158	OC-48	2488.32	34,236	14	0.012
Montreal - New York	537	STM-1/OC-3	155.52	2,306	15	0.028
Chicago - New York	1,158	STM-1/OC-3	155.52	3,593	23	0.020
Atlanta - New York	1,204	STM-1/OC-3	155.52	3,648	23	0.019
Los Angeles - New York	3,961	STM-1/OC-3	155.52	8,098	52	0.013
Intra Europe						
London - Madrid	1,261	STM-1/OC-3	155.52	6,060	39	0.031
Trans Pacific						
Hong Kong – Los Angeles	11,640	STM-1/OC-3	155.52	27,534	177	0.015
Sydney - Los Angeles	12,049	STM-1/OC-3	155.52	68,835	443	0.037
Europe Asia						
Hong Kong – London	9,740	STM-1/OC-3	155.52	43,842	282	0.029
Caribbean						
Kingston - Miami (Maya 1)	932	E1	2.048	10,500	5,127	5.50
Bahamas - Miami	288	E1	2.048	10,853	5,299	18.40
Kingston - Miami (Maya 1)	932	T1	1.544	8,700	5,635	6.05
Paramaribo - Miami	3,550	E1	2.048	17,409	8,500	2.39
Paramaribo - Miami	3,550	T1	1.544	14,620	9,469	2.67
Georgetown - Miami	3,162	1/2 E1	0.512	5,950	11,621	3.68
Barbados – Miami	2,584	T1	1.544	23,900	15,479	5.99
Barbados – Miami	2,584	E1	2.048	31,900	15,576	6.03
St Lucia - Miami	2,414	E1	2.048	31,900	15,576	6.45
St Vincent & The Grenadines - Miami	2,431	T1	1.544	31,667	20,510	8.44
Barbados - London	6,777	E1	2.048	62,000	30,273	4.47
St Lucia - London	6,816	E1	2.048	63,037	30,780	4.52
St Vincent & The Grenadines - London	6,886	T1	1.544	49,407	31,999	4.65
Barbados - London	6,777	T1	1.544	49,600	32,124	4.74

Note Not all prices on these two tables are strictly speaking comparable because: (i) the current market prices shown for routes other than in the Caribbean are for leases between points of presence (pops) and do not include the local loop (i.e. the connection to the customer's premises) which in the Caribbean at least can be quite high. For the Caribbean some of the prices shown do include the local loop, at least on the Caribbean side as these are generally provided by the same operator (Cable & Wireless) that also provided the international link; (ii) prices for some routes in the Caribbean do in fact include IP Transit; that is, connection to the Internet in Florida or New York. These can be offered at lower prices because capacity is shared among several customers; (iii) some of the Caribbean offerings are only for ½ circuits; that is without the lease of the distant half which is provided by another operator. The tables do nevertheless indicate that there are significant

¹⁸⁰ Source: Own research for Caribbean routes; TeleGeography/PriMetrica Bandwidth Pricing Database, Fourth Quarter (2003) Report for the other routes.

price differences for leased circuit capacity in the Caribbean and elsewhere where there is competition in this area.

Domestic leased circuit prices vary significantly across the Caribbean as Table 20 shows. In addition to the international bandwidth a business user or an ISP has to lease capacity between its premises and the cable station. In Barbados and St. Vincent the cost for this can be significant. By comparison Bandwidth Market, an on-line trader of bandwidth, is offering two DS-3 (44.736 Mbps) circuits between New York and Chicago for the same price that it costs to lease a local T1 in St Lucia¹⁸¹.

Table 20: Prices for Domestic Leases (in US\$)

Country	Operator	Capacity/Speed		Avg. price/month (US\$)	
		Type	Mbps	per circuit	per Mbps
Bahamas (local loop)	BTC	E1	2.048	700	342
Trinidad & Tobago	TSTT	T1	1.544	960	622
Bahamas (island to island)	BTC	E1	2.048	1,600	781
St. Lucia	C&W	E1	2.048	1,667	814
Jamaica	C&W	T1	1.544	1,451	940
Suriname	Telesur	E1	2.048	2,057	1,004
St. Lucia	C&W	T1	1.544	1,556	1,008
Barbados	C&W	E1	2.048	10,853	5,299
St. Vincent	C&W	E1	2.048	22,315	10,896
Barbados	C&W	T1	1.544	20,000	12,953

The European Commission each year compares rates for leasing bandwidth capacity (as well as prices for other services) in the member states¹⁸². The 2004 rates for domestic circuit leases in the European Union are shown in Table 21. These are published rates of European operators that do not reflect the true market prices which can be substantially lower as the above comparison of international capacity indicates.

Table 21: Weighted Average Domestic Full Circuit Leases in Europe

	Type	Distance	Cost/month (US \$)
National	64 Kbps	2 km	217
		200 km	650
	2 Mbps (E1)	2 km	650
		200 km	4,000

Source: EC

¹⁸¹ See Bandwidth Market, an on-line market for trading in bandwidth, Internet access, dark fibre, minutes of telephone traffic, collocation, and equipment at <http://www.bandwidthmarket.com/index.html> or Band-X, a competing on-line market, offering the same services as Bandwidth Market, at <http://www.band-x.com>

¹⁸² See Commission of the European Communities, Technical Annexes of the Tenth Report on the Implementation of the Telecommunications Regulatory Package, Brussels, 02.12.04 COM (2004) 759 final. It should be noted that these are published rates which would be higher than negotiated rates or those available through on-line markets.

Between 1998 and 2001 the price in the USA for leasing a domestic 300 km E1 circuit decreased from about US 1,400/month to US\$ 660/month. At about the same time Reuters, the news agency, was paying about US\$ 65/month in the UK and a little over US\$ 200/month in the USA for a local E1 lease (distance between the operator's technical centre and the customer's premises estimated to be on the average 3 km)¹⁸³. It is estimated that market prices for leased circuit capacity have decreased between 25% and 50% over the last two years.

The high leased circuit prices in the Caribbean represent significant costs to Internet Service Providers (ISPs) who access the Internet through IP Transit providers in the USA¹⁸⁴. Table 22 shows the wholesale price for an Internet transit services from various locations in the Caribbean. The price per Mbps is generally less than for an IPLC because the bandwidth capacity provider can share the same capacity among several users.

Table 22: Wholesale Prices for Internet Transit Services from Various Points in the Caribbean (in US\$)

Country	Operator	Capacity/Features/Speed			Avg. price/month	
		Type	Features	Mbps	per circuit	per Mbps
Suriname	Telesur	1/2 E1	shared	0.512	1,250	2,441
Belize	BTL	E1	dedicated	2.048	5,683	2,775
Barbados	C&W	E1	shared	2.048	9,350	4,565
Jamaica	C&W	T1	dedicated	1.544	7,436	4,816
Trinidad & Tobago	TSTT	T1	dedicated	1.544	10,400	6,736
St. Vincent	C&W	E1	dedicated	2.048	15,848	7,738
Barbados	C&W	E1	dedicated	2.048	15,850	7,739
St. Vincent	C&W	T1	dedicated	1.544	12,678	8,211
Barbados	C&W	T1	dedicated	1.544	12,680	8,212
Barbados	C&W	T1	shared	1.544	14,190	9,190
Guyana	GT&T	E1	no restoration	2.048	25,600	12,500
Suriname	Telesur	1/2 E1	dedicated	0.512	6,500	12,695
St. Lucia	C&W	1/2 E1	dedicated	0.512	6,500	12,695
Hispasat	Hispasat	E1	100 terminals	2.048	29,900	14,600
Guyana	GT&T	E1	restoration	2.048	31,600	15,430
Guyana	GT&T	T1	restoration	1.544	24,332	15,759

There are basically two ways of addressing the high cost of leased circuit capacity in the Caribbean (i) by promoting competition in the provision of domestic and international backbone capacity; and (ii) where there is little or no competition to impact prices, by regulating the monopoly's or the dominant operators' prices for such capacity.

The first of these requires a regulatory framework which allows and promotes domestic and international facilities-based competition when new entrants are able to build, operate, and offer services on competing domestic and international backbone infrastructure. In The

¹⁸³ OECD, *Broadband Access for Business*, Working Party on Telecommunication and Information Services Policies, Committee for Information, Computer and Communications Policy, DSTI/ICCP/TISP(2002)3/Final, 04 Dec 2002

¹⁸⁴ The price of access to the internet (IP Transit) can vary between US \$ 50 and 200 depending on the amount of capacity contracted.

Bahamas¹⁸⁵, Trinidad and Tobago, Anguilla and even Jamaica, for example, cable TV operators who have extensive national fiber optic networks will be able to offer bandwidth capacity to private enterprises, ISPs, the government, and even individuals. In Barbados the power company which has its own fiber optic networks, will be able to offer capacity on these and new undersea fiber optic cable consortia will be able to apply for and obtain landing licenses for their systems.

In the second case, where there is no or little competition in the provision of leased circuit capacity, the regulator must ensure that conditions exist for users to obtain the bandwidth capacity they need under non-discriminatory, transparent conditions and at cost- base prices. In this respect in the chapter on recommended action we propose establishing specific measures for implementation on a Caribbean-wide basis to address the important issue of high leased circuit costs. These measures involve harmonization of conditions for leasing capacity and developing benchmarks along the lines of those presented here and should not present any particular difficulty to implement by mutual agreement of regulators and government officials in the region. Section V.3.2 of this report discusses harmonization measures and point to the example of the European Commission which implemented such measures more than 10 years ago and which has resulted in significant decreases in the price of leased circuits in the European Union.

III.2.5 Interconnection and facilities sharing

An important issue for backbone facilities is interconnection. Domestic competing backbone networks must be able to interconnect with the incumbent's international facilities under non-discriminatory terms and conditions, in a timely fashion and with cost-oriented prices which are reasonable and transparent as required by the WTO commitments of countries such as Antigua & Barbuda, Jamaica, Belize, Trinidad and Tobago, Barbados and Suriname (see next section of this report). Furthermore, to promote competition co-owners of international fiber optic cable systems¹⁸⁶ must be allowed to interconnect with competing domestic providers of backbone capacity or alternatively they must have access to and use of the dominant operators backbone facilities on "reasonable and non-discriminatory terms and conditions" as required by the General Agreement in Trade in Services Telecommunications Annex. The government and the regulator need to develop policies and regulatory provisions on fair, non discriminatory site sharing and collocation¹⁸⁷.

Figure 13 illustrates the arrangement whereby competing operators with local networks interconnect with C&W's public switched telephone network (PSTN). Transit arrangements are illustrated in Fig. 13. Fixed termination charges for local peak time calls in Jamaica, Barbados¹⁸⁸, St Lucia, Grenada, St. Vincent and the Grenadines and various countries of the European Union are compared in Fig. 14. These are per minute charges based on the first three minutes of a call at peak time (taxes excluded). Caribbean rates have been obtained

¹⁸⁵ Cable Bahamas is also owner of the competing BICS fibre optic cable system connecting The Bahamas to Florida thus allowing a complete bypass of the incumbent's network.

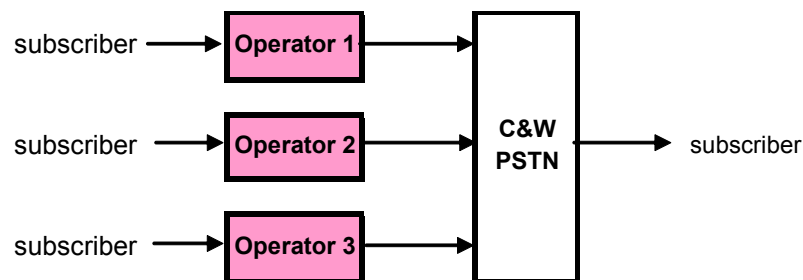
¹⁸⁶ For example the Eastern Caribbean Fibre Optic Cable System (ECFS), which lands in most Eastern Caribbean countries and territories, has more than 20 co-owners.

¹⁸⁷ See for example FCC Report 97-208 of 9 June 1997 which specifies 14 cost components for collocation in central offices. The same components can be applied to collocation in submarine cable stations.

¹⁸⁸ For Barbados charges shown are from the original RIO (Phase I, August 2003) and the revised RIO (Phase 2, January 2004) the latter issued after FTC's comments on RIO Phase I.(See section above on Barbados)

from Cable & Wireless' Reference Interconnection Offer (RIO) issued in various countries. European rates can be found in the European Commission's Tenth Report on the Implementation of the Telecommunications Regulatory Package¹⁸⁹. This report, which is issued each year, serves as a benchmarking tool for the Commission and regulators to determine the appropriateness of interconnection rates proposed by dominant operators (operators with Significant Market Power (SMP) in the European terminology) and as a means for following the evolution of these prices. Benchmarking can be a useful tool for regulators to determine whether or not such charges are justified particularly if they do not have the resources or time to do the extensive cost studies that are required to determine such costs¹⁹⁰. The recommendations in Chapter VI address this problem.

Figure 12
Fixed termination in C&W's PSTN



Per minute fixed termination rates for local calls in the Caribbean vary between US\$ 0.0068 in Jamaica and US\$ 0.0168 in St. Vincent and the Grenadines. With the exception of Jamaica charges in the Caribbean are still relatively high. They are higher than the EU weighted average of US\$ 0.0077 for the 15 pre expansion EU countries (EU (15)) and also higher than the weighted average of the 23 of the 25 current member countries (EU(23)). The EU analysis indicates a strong correlation between the level of charges and the timing of liberalization. Expansion countries such as the Czech Republic, Hungary, and Lithuania, which opened their markets later, have higher levels of charges than the older members.

Figures 15 and 16 compare interconnection charges at the regional level (single transit in Europe).

¹⁸⁹ Commission of the European Communities, Technical Annexes of the Tenth Report on the Implementation of the Telecommunications Regulatory Package, Brussels, 02.12.04 COM (2004) 759 final

¹⁹⁰ In Botswana last year the regulator, Botswana Telecommunications Authority (BTA), settled an interconnection charging dispute between the fixed line operator, BTC, and one of two mobile operators, Mascom, by relying on EU benchmark rates. In its ruling BTA imposed the following fixed termination rates: before 1 March 2004 peak time = US \$ 0.03, off peak time = US \$ 0.024; after 1 March 2004, peak time = US \$ 0.022, off peak time = US \$ 0.0176. See Botswana Mini-Case Study 2003, Recent Experience in Interconnection Disputes, ITU 2003, <http://www.itu.int/ITU-D/reg/index.html>

Figure 13
Transit Service via C&W's PSTN

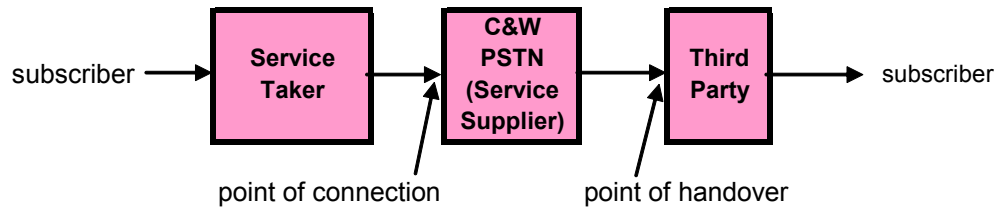
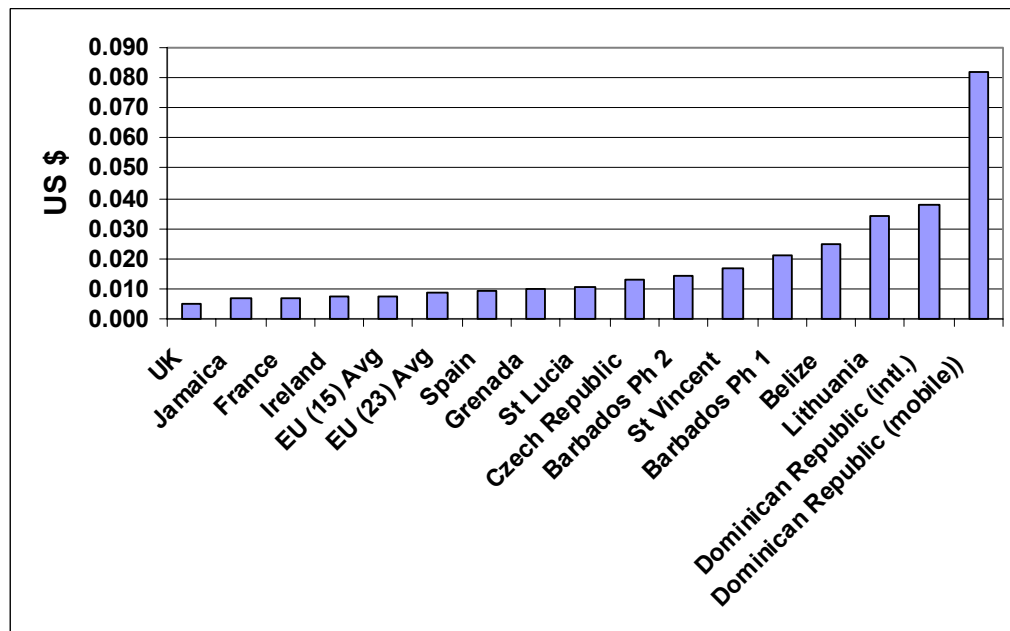
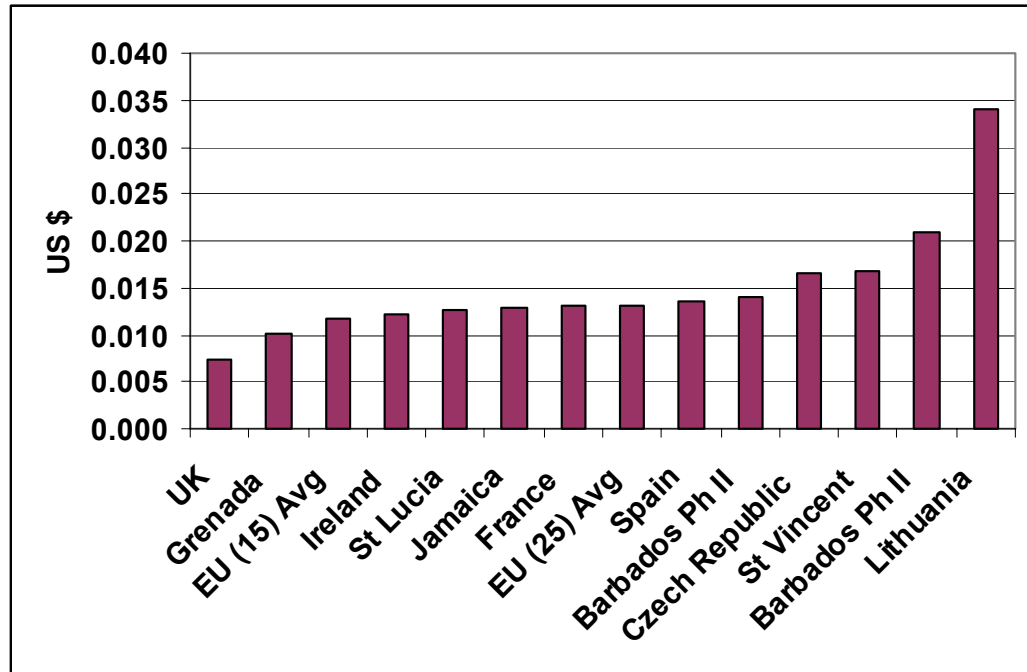


Figure 14
Comparison of per minute Fixed Termination Charges for Local Peak Time Call Charges (in US \$)



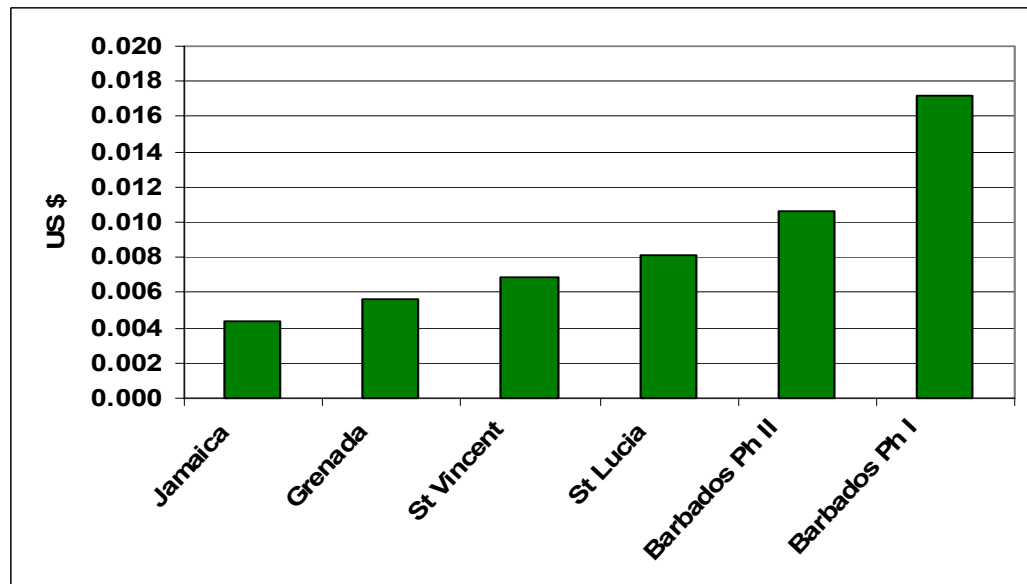
Source: European Commission and own research

Figure 15
Comparison of per minute Fixed Termination Charges for Regional Peak Time
Call Charges (in US \$)



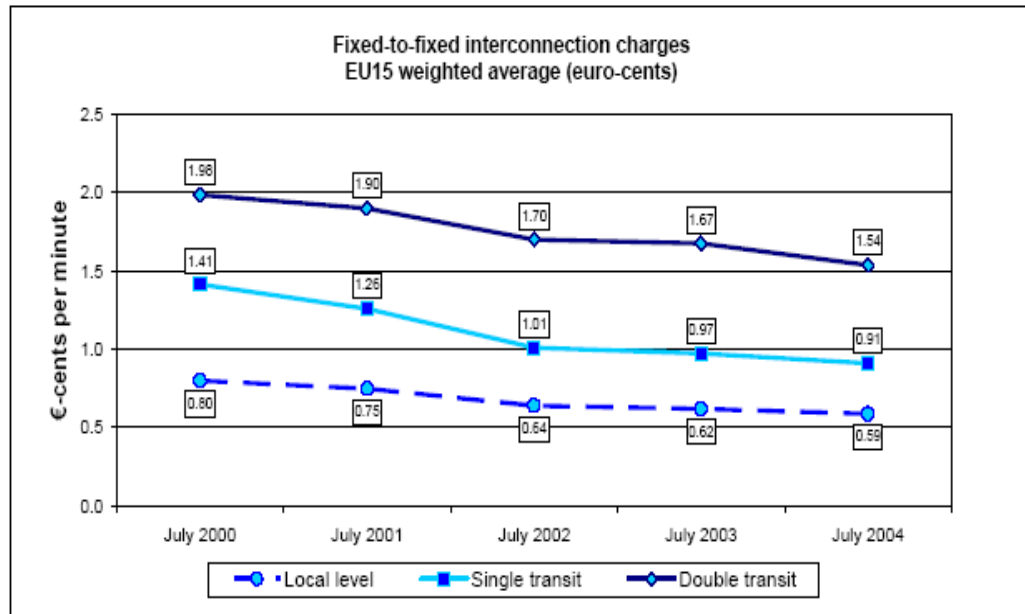
Source: European Commission and own research

Figure 16
Comparison of per minute Transit Regional Peak Time Call Charges (in US \$)



Source: European Commission and own research

Figure 17
Evolution of Fixed Termination Charges for Local Calls in the 15 Pre Expansion European Countries (in Euro Cents)



Source: European Commission

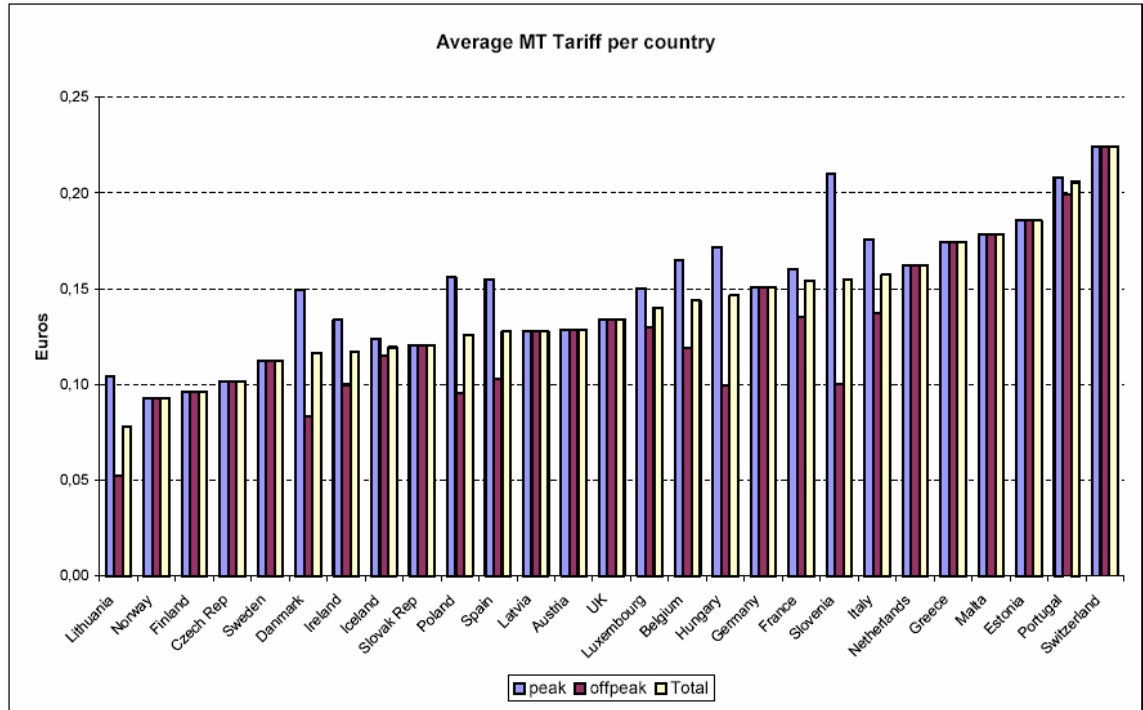
Figure 17 shows that since August 2000 the weighted average of charges for fixed termination in the European Union (EU 15) have decreased by 55%, 36% and 22% for single transit (regional), local and double transit, respectively.

Mobile termination rates in C&W (Jamaica)'s RIO 5 are US\$ 0.105/min during peak times, US\$ 0.0862/min during off peak times and US\$ 0.0672 during weekends. In Barbados the mobile termination charge payable to third party mobile operators in C&W's RIO Phase II is US\$ 0.10/min. By comparison the EU 25 weighted average of fixed-to-mobile interconnection charges for all mobile operators (those with Significant Market Power or SMP and those without) was € 0.147/min (US\$ 0.19/min) in July 2004¹⁹¹. A study done by the European Independent Regulators Group (IRG) shows that the average total mobile termination rate of all operators in each of the 27 European countries that constitute its membership varies between about € 0.075/min (US\$ 0.097/min) in Lithuania and € 0.225/min (US\$ 0.292/min) in Switzerland¹⁹². (See Figure 18).

¹⁹¹ Commission of the European Communities, Technical Annexes of the Tenth Report on the Implementation of the Telecommunications Regulatory Package, Brussels, 02.12.04 COM (2004) 759 final

¹⁹² The IRG bases its averages on a 2 minute (instead of 3 minute calls used by the European Commission) call and does not calculate an overall average for all 27 countries because it considers that different conditions and circumstances among countries to an extent justify the differences in these termination charges. The IRG's main concern is that these charges are determined in a competitive environment. It will use these to develop remedies in each country to achieve competitive levels of mobile termination charges.

Figure 18
Average Mobile Termination Rates in IRG Member Countries (€)



Source: European Independent Regulators Group

III.3 Regional integration: CARICOM and Single Market and Economy (CSME)

III.3.1 CARICOM

The Caribbean Community and Common Market (CARICOM) was established in 1973 by the Treaty of Chaguaramas with its main purpose being to promote human and social development, integrate the economies of the Member States and coordinate foreign policy¹⁹³. Its two principal organs are the Conference of Heads of Government, the Supreme Organ and the Community Council of Ministers consisting of ministers responsible for Community affairs. These are assisted by four Ministers' Councils (Council for Trade and Economic Development; Council for Foreign and Community Relations; Council for Human and Social Development and Council for Finance and Planning) and three bodies (Legal Affairs Committee; Budget Committee; and Committee of Central Bank Governors). A number of institutions have been established by or under the auspices of the Community among which are the Caribbean Disaster Emergency Response Agency (CDERA), the Caribbean Meteorological Institute (CMI) and the Caribbean Meteorological Organization (CMO). The Caribbean Development Bank, the University of Guyana, the University of the West Indies, the Caribbean Law Institute and Caribbean Law Institute Centre and The Secretariat of the Organization of Eastern Caribbean States (OECS) are all Associate Institutions of CARICOM. The Secretariat is located in Georgetown, Guyana, and is made up of three offices (Office of the Secretary-General, Office of the Deputy Secretary-General, and Office of the General Counsel) and three Directorates (Foreign and Community Relations, Regional Trade and Economic Integration, Human and Social Development)

Achievements of CARICOM include (i) adoption of the Charter of Civil Society dealing with the free press; a fair and open democratic process; the effective functioning of the parliamentary system; morality in public affairs; respect for fundamental civil, political, economic, social and cultural rights; the rights of women and children; respect for religious diversity; and greater accountability and transparency in government; (ii) establishment in 1999 of the Caribbean Court of Justice (CCJ) with the objective of providing legal certainty to the operations of the CSME; the Court has, however, not yet put into operation; and (iii) the establishment in 1997 of the Regional Negotiating Machinery (CRNM) to coordinate the Community's external trade negotiations.

More recently CARICOM has been focusing on: air transport and maritime infrastructure policy and development; telecommunications policy; employment generation, external trade negotiations and establishing the CARICOM Single Market and Economy (CSME) to replace the Common Market.

¹⁹³ CARICOM has 15 members (Antigua and Barbuda; The Bahamas; Barbados; Belize; Dominica; Grenada; Guyana; Haiti; Jamaica; Montserrat; St. Kitts and Nevis; Saint Lucia; St. Vincent and the Grenadines; Suriname; and Trinidad and Tobago) and 5 Associate Members (The British Virgin Islands, Turks and Caicos Islands, Anguilla, The Cayman Islands and Bermuda) The Bahamas is a member of the Community but not of the Common Market. In addition, a number of countries in Latin America and the wider Caribbean are Observers in the various organs and institutions of the Community. Puerto Rico, the first Overseas Commonwealth Territory of the USA, is seeking closer ties with CARICOM.

III.3.2 The CARICOM Single Market and Economy (CSME)

The CSME, created in 1989 by the Heads of Government to facilitate regional trade, production and investment within a single economic space in the Caribbean has included negotiation of nine Protocols, which effectively amended the original (1973) Treaty of Chaguaramas. Protocol 1 which provides for the restructuring of the organs and institutions of the Community and redefining their functional relationship, entered into force provisionally on July 4, 1997. The last two remaining protocols were signed in early year 2000 and the Revised Treaty of Chaguaramas was signed in 2001. Five additional Protocols pertain to e-commerce, government procurement; trade in goods from free zones, free circulation of goods and the rights contingent on establishment, provision of services and movement of capital.

The CSME which would involve coordination of macroeconomic and monetary policies, harmonization of fiscal policies and a common currency, is seen by its promoters as a means to contribute to the structural transformation and economic development of small, developing economies of the Caribbean. The enlarged market and larger pool of resources would help CARICOM members attain the economies of scale necessary to become more efficient and become internationally more competitive. It would help exporters in the transition to competing in global markets and it would provide a basis for common positions in external trade negotiations¹⁹⁴.

Unfortunately progress in implementing the CSME has been very slow. The original planned implementation date of 1993 has had to be pushed back several times and is now the end of 2005. It is estimated that 2/3 of legislative and administrative actions required by member states to give effect to the Revised Treaty of Chaguaramas and creating the Single Economy (including ones related to services) have not yet been passed. Norman Girvan, a regional scholar, suggests that this is primarily due to the unwillingness of member states to transfer a degree of their national sovereignty to a supranational institution as the Europeans have been willing to do and problems with financing. He also suggests that the motivations which existed and continue to exist in Europe (desire to avoid another war, strong financial and political support of the USA, desire to build an economic power to counter that of the USA, and strong support of the European business community) is missing in the Caribbean. Also, the widening gap between rich and poor members is making it politically difficult to push for integration as are the different priorities of countries (some giving higher priority to resource based industries; others to services)¹⁹⁵.

III.3.3 CARICOM Connectivity Agenda and Platform for Action

The CARICOM Connectivity Agenda and Platform for Action resulted from a decision at the 23rd Meeting of the Conference of the Heads of Government of CARICOM in July 2002. It recognized the potential benefit in helping to promote regional and hemispheric integration and trade and export (traditional and newer sectors), increasing the competitiveness especially of small and medium enterprises, developing information and

¹⁹⁴ Richard L. Bernal, The CARICOM Single Market and Economy and CARICOM's External Trade Negotiations, Caribbean Journal of International Relations, July 2004

¹⁹⁵ Norman Girvan, Reflections on the CSME, Keynote address to SALISES Conference on CSME, University of the West Indies, St. Augustine, Trinidad and Tobago, 31 March 2004.

broadcast services at the regional, sub regional and national levels and generally building a knowledge-based society in the Caribbean in order to increase citizens' access to the global information infrastructure, to promote the development government on line (e-government), business (e-commerce), education (e-learning) and health (e-health). The CARICOM Connectivity Agenda and Platform for Action, which was intended to be integrated into the hemispheric process being led by Inter-American Telecommunications Commission (CITEL) as agreed at the Quebec City Summit of the Americas in 2001, provides a conceptual framework and general guidelines for CARICOM member states to develop their connectivity agendas. It defines a three step process consisting of (1) countries' defining appropriate strategies, policies, plans and procedures to provide connectivity; (2) execution involving the putting in place or facilitating the development (through the establishment of an appropriate legal and regulatory framework) of the necessary infrastructure to provide universal access, promoting the utilization of the infrastructure and applications (e.g. e-government, e-commerce, etc.), promoting the development of content, and developing strategies for public and private financing of ICT projects; and (3) measurement of performance.

Relevant to this report and study are the 10 principles for a “modern national regulatory framework which must guide the design and implementation of a Connectivity Agenda in the countries of the region. These are:

- Equitable, universal and affordable access to information
- Transparency
- Technological neutrality
- A competitive ICT industry
- Effective civil society participation in the development of the regulatory framework
- Information protection mechanisms
- Training in the use of ICT services
- Protection the new information society's intellectual property
- Coordination of legislation governing the information and communications sectors
- Regional objectives as defined in the revised Treaty of Chaguaramas¹⁹⁶

The CARICOM ICT strategy of capacity building, research and innovation and promotion of e-learning and e-government was underlined at the 3rd Meeting of CARICOM Ministers responsible for ICTs in October 2004. Inter alia, the Ministers agreed at this meeting that “the provision of low cost high bandwidth communication access, for all citizens of this Region should be actively encouraged to facilitate this thrust”¹⁹⁷.

¹⁹⁶ See Towards CARICOM Connectivity Agenda 2003 and Platform for Action, <http://www.caricom.org/>

¹⁹⁷ CARICOM Ministers Adopt Aggressive ICT Strategy : Communique issued at the Conclusion of the Third Meeting of Ministers Responsible for Information and Communication Technology, 15 October 2004, Barbados, <http://www.caricom.org>

III.4 Free trade negotiations involving the Caribbean

III.4.1 Introduction

CARICOM member countries are currently engaged in a number of global, inter-regional, hemispheric, and bilateral trade negotiations.

- At the multilateral level within the framework of the WTO Doha Agenda negotiations initially targeted for conclusion on 1 January, 2005;
- At the inter-regional level the CARIFORUM-European Union (EU) negotiations for an Economic Partnership Agreement (EPA) were officially launched in Kingston, Jamaica, April 16, 2004 and are scheduled to be completed by December 2007;
- At the hemispheric level within the framework of the Free Trade Area of the Americas (FTAA) were initially planned to be concluded by January 2005;
- Bilateral negotiations between the Caribbean and individual countries or groups of countries.

III.4.2 WTO Commitments and the Doha Development Agenda

The World Trade Organization's (WTO) Council for Trade in Services restarted negotiations on services early in 2000 and the Ministerial Meeting in Doha in November, 2001 officially launched the Doha Round with an ambitious timetable to complete negotiations by 1 January 2005¹⁹⁸. Following the failure of the Cancun Ministerial Conference in September, 2003, it became evident that this was no longer possible. The enthusiasm of many countries had waned and the revised schedule for completing the Round was set back to 2006.

Prior to the 1997 conclusion of the negotiations in basic telecommunications many countries¹⁹⁹ in the Caribbean used the process very effectively to review the status of domestic policies for the sector and, more importantly, indicate to the incumbent and potential investors in a process that was receiving much international attention that their resolve to liberalize their telecommunications sectors was to be taken seriously. They did this even though they knew that their scope for maneuver was limited by the exclusive arrangements that the incumbents enjoyed. A valid argument can, nevertheless be made that their resolve paid off and the significant progress achieved in liberalizing since then is in part at least attributable to their participation in the WTO negotiations.

As indicated earlier seven CARICOM countries made new commitments in 1997. Another five or six had fully prepared commitments that they never submitted or submitted later (Barbados and Suriname, both in 1998). Guyana and Saint Kitts & Nevis, which had made

¹⁹⁸ Article 45 of the Doha Development Agenda states that "the negotiations to be pursued under the terms of this declaration shall be concluded not later than 1 January 2005".

See http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.htm

¹⁹⁹ The discussion here is limited to countries. The territories are not eligible to join the WTO on their own. In spite of this several British Overseas Territories have shown interest in making commitments.

commitments in 1995 at the end of the Uruguay Round, did not make new commitments in 1997.

The extent of the sector reform which all of these countries (except Guyana and Suriname) have undertaken since then would allow them to make much improved commitments. Services negotiations had been scheduled to move forward in 2005 in light of an agreement by the WTO General Council in July 2004 giving new impetus to the stalled negotiations (See below).

There are several good reasons why these should not be ignored in the Caribbean:

- First, the Doha Round is providing trade negotiators, telecommunications policy makers, and regulators the same opportunity to reflect on today's "leading edge" issues for the sector as their counterparts that participated in the Negotiating Group on Basic Telecommunications (NGBT) had between 1994 and 1997. The issues then included: the classification of services, accounting rates, and satellite based systems. These were to have a bearing on telecommunications in the late 1990s and the early part of this decade. The issues being dealt with in the Doha Round today will undoubtedly impact the sector in the years to come. These are discussed below.
- Secondly, countries will find that these same issues and indeed the structure of negotiations and potential agreement have a bearing on negotiations for a Free Trade Area in the Americas (FTAA) and the process of achieving the CARICOM Single Market and Economy (CSME). By familiarizing themselves with the Doha Round issues trade negotiators, telecommunications policy makers and regulators will gain a better understanding of the issues and be able to participate in the debates relating to them.
- Thirdly, while it may not be necessary that countries that have already implemented regulatory frameworks that remove most of the limitations which are contained in their commitments improve on these or make new commitments, they may nevertheless find it worthwhile to confirm in an international treaty the significant progress they have made in reforming their telecommunications sectors. This would give additional proof to potential investors that these countries now have the stable, predictable, and transparent regulatory framework which investors seek. Furthermore, trade negotiators may find that they can leverage such improved commitments to obtain concessions in other areas in the current process of requests and offers.

What are the Doha Round issues that are of concern to telecommunications policy makers, regulators and to trade negotiators?

The following summarizes two categories of issues of concern to negotiators in the Doha Round: 1) those which have resulted from the significant changes that have taken place in the sector since 1997 and 2) those which were left over from the 1997 negotiations²⁰⁰.

²⁰⁰ A comprehensive discussion of these issues can be found in the excellent paper prepared for the Asia-Pacific Telecommunity by G. Russell Pipe, *Guide to Telecommunications Trade Principles, WTO Commitments and DOHA Round Negotiations*, October 2003. See also Asia Pacific Telecommunity, Sub-Regional Seminar on Trade and Telecommunications for East Asia, Ulaanbaatar, Mongolia, 5-6 April, 2004,

The most remarkable changes that have taken place are in the mobile, broadband and Internet sub sectors. The growth in mobile communications has been phenomenal. No one could have predicted that the world total of about 200 million subscribers in 1997 would multiply by more than 6 times to 1.3 billion at the end of 2003. There are today more mobile than fixed subscribers in nearly 100 countries including about a dozen in the Caribbean (Table 1). The implication is that mobile has become a substitute for fixed and it may therefore no longer be appropriate to distinguish between them in trade negotiations or otherwise especially in a region like the Caribbean where the overall fixed penetration is still at a relatively low level of 16%²⁰¹. In Jamaica it has been competition from mobile services which has put pressure on international calling charges. Limitations in countries' WTO commitments pertaining to mobile but not fixed telephone services are therefore no longer sustainable.

Other issues which may be raised in the Doha Round with respect to mobile communications services include: the high interconnection charges between mobile and fixed operators and between mobile operators, which are being treated as trade issues and are considered to be impediments to investment²⁰²; the obligation to adopt certain standards when obtaining frequencies for mobile services as is the case in Europe, where contrary to practices in this hemisphere, the GSM air interface standard is imposed; high charges for international roaming and the implications of different charging arrangements such as Calling Party Pays (CPP) and Receiving Party Pays (RPP), which may also be imposed in certain cases on operators when they obtain their licences. The growth of wireless and fixed broadband and, in particular, WiFi and future WiMAX and Ultrawideband (UWB) access and the pressure to make more spectrum available on an unlicensed basis will no doubt become important topics of the Doha Round negotiations. (In WiFi, for example, dominance of supply and current high charges for WiFi roaming are issues of concern to policy makers and regulators²⁰³)

The just as impressive growth in the Internet since 1997 is also raising the number of trade related issues. In the existing WTO classification of services Internet is a value added service, which in many countries is either not regulated at all or subject only to minimal regulation and/or limitations; however, with rapidly improving technology Voice over the Internet (VoIP) is fast becoming a viable alternative for the basic circuit switched telephone service. The decrease in international calling prices can in part be attributed to competition from VoIP. The question then is, whether Internet should be treated as a basic telecommunications service (a view supported by the European Union and Australia) or whether it should continue to be treated as a value added service (as suggested by the USA), the implications being that if the Internet is treated as a basic service it would be subject to many of the disciplines in the General Agreement on Trade in Services (GATS) such as

<http://www.aptssec.org/meetings/2004/infodev/MNG/default.htm>

²⁰¹ In many countries where it was impossible get a fixed telephone or where waiting times were measured in years a mobile telephone can be obtained in less than an hour. In Cameroon for example the number of fixed lines has stagnated at about 80,000 for years. In contrast the number of mobile subscribers has grown from a few thousand in 2000 to close to 1 million today.

²⁰² In January 2003 it was reported that USTR and the FCC had launched an investigation to determine whether US telecommunications carriers were being overcharged by European wireless operators in trans Atlantic calls that terminated on these operators networks. The article in the January 20 issue of RCR Wireless News states that "the only reason mobile termination fees are a flash point in regulatory circles is because mobile phones are becoming a substitute for landline communications around the world."

²⁰³ See Trends In Telecommunications Reform, 2003, Promoting Universal Access to ICTs: Practical Tools for Regulators, International Telecommunication Union, Geneva, 2003

those contained in the regulatory principles Reference Paper and the Telecommunications Annex. The latter, for example, requires that “each member shall ensure that service suppliers of any other member have access to and use of public telecommunications transport networks or services (including private leased circuits) on reasonable and non discriminatory terms and conditions, for the supply of a service included in its schedule.”²⁰⁴ If the Internet is a basic service, then it might indeed fall within the scope of a public telecommunications transport service which is defined in the Annex as “any telecommunications transport service required, explicitly or in effect, by a member to be offered to the public generally” and might then have to be regulated to ensure that any supplier of a scheduled service (for example, financial services, air transport and tourism) has access to and use of the Internet under non-discriminatory and reasonable conditions. This also means that in Barbados and Jamaica, which scheduled no limitations on market access (or national treatment) for Internet and Internet access, Internet Service Providers must be given access to leased circuit capacity on reasonable and non-discriminatory terms and conditions, namely, under the same terms and conditions which Cable & Wireless offers its ISP affiliate²⁰⁵.

A related issue concerns the international Internet charging arrangements which, as we have seen in the previous section, require ISPs in the Caribbean and other regions to pay high prices for backbone capacity in submarine cables and satellite systems and transit charges to connect into the Internet mainly in the USA²⁰⁶. These high prices are reflected in the prices these ISPs charge their customers. Australia has argued that Internet delivery services are basic telecommunications services to which the principles of the Reference Paper should apply; that is, competitive safeguards and other provisions should apply to dominant or monopoly suppliers of backbone which are essential for ISPs to access the Internet. A study commissioned by Regulatel, the Forum of Latin American Regulators and AHCIET (Asociación Hispanoamericana de Centros de Investigación y Empresas de Telecomunicaciones) in 2001 showed that Latin American ISPs were paying nearly US\$ 300 million/year in providing connectivity between Latin America and North America and estimated that this would increase to over US\$ 1.7 billion/year by 2006²⁰⁷. The study did not break out figures for the Caribbean; however, given the high leased circuit prices the implications for Caribbean ISPs are the same. Other related Doha Round issues may concern billing for Internet use, quality of service and number portability for Internet²⁰⁸.

Doha Round issues left over from the Negotiating Group on Basic Telecommunications (NGBT) are proposals²⁰⁹ to:

- strengthen the Reference Paper especially with respect to interconnection and independence of the regulator, the latter being considered by some to be inadequate

²⁰⁴ Telecommunications Annex in The General Agreement on Trade in Services and Related Instruments, WTO, April 1994

²⁰⁵ Contrary to Barbados, Trinidad & Tobago did not remove limitations on market access in its 1997 Commitment for Internet and Internet Access.

²⁰⁶ Ovum, CybeRegulacion, Los flujos de tráfico de Internet y otros servicios de Telecomunicaciones en América Latina y dinámica de sus mercados, Un informe para Regulatel-AHCIET, Julio de 2001

²⁰⁷ See the Communication from Australia, Negotiating Proposal for Telecommunications Services, S/CSS/W/17, 5 December 2000 World Trade Organization, Counsel For Trade In Services, Special Session

²⁰⁸ Pipe, G. Russell, *Guide to Telecommunications Trade Principles, WTO Commitments and DOHA Round Negotiations, prepared for the Asia-Pacific Telecommunity*, October 2003

²⁰⁹ See various Communications of Switzerland, Canada, Australia, United States, Mexico, European Union and others in the WTO Council for Trade in Services S/CSS/W, 2000 - present

to ensure that the regulator not only is independent of major suppliers but also free of political interference;

- get countries that have made commitments to improve on them and countries that have not made any commitments (Haiti, Saint Lucia, and Saint Vincent and The Grenadines in the Caribbean) to table them. Improvements that have been suggested by Canada, Switzerland, European Union, USA, Australia and others include: 1) scheduling services, which were previously not scheduled and lifting the numerous limitations which are currently found in many countries' commitments including: limitations on the number of operators; limitations on the type of legal entity; limitations on the level of direct and indirect foreign ownership; limitations regarding national treatment such as residency and ownership requirements, and limitations on nationality of certain categories of personnel. Also it is being suggested that the long phase-in periods for achieving full liberalization, that are found in current schedules and that have come under criticism, should be revised.
- include other related services such as postal and courier services, audiovisual and broadcasting services, cable television and Direct-to-Home (DTH) satellite services, motion picture and mobile entertainment services, and radio and television production services.

Another issue which may receive renewed attention relates to the concept of structurally separating the infrastructure or pipeline over which a service is delivered from the service itself. The issue was recently raised in Europe in the context of unbundling incumbent operators' local loops and the question of who should own and operate the basic infrastructure over which competitive services are provided.

Finally it has been suggested that countries must implement measures to ensure greater transparency in domestic regulation, including the availability and general access to information on regulations, procedures, and other measures that affect interests of potential investors including procedurally fair and open treatment and potential investors' ability to comment on new and modified proposals.

The Doha Development Agenda foresees that negotiations on trade in services be conducted using a request and offer approach²¹⁰. As at the end of 2003 only 41 (55 countries including the 15 members of the European Union) initial offers had been made. A few of these were new commitments and only 12 were improvements over previous commitments. Most, however, simply presented the status quo; namely, their previous commitments. The only country in the region which presented an offer was St. Kitts and Nevis which as mentioned earlier had made a minimal commitment at the conclusion of the Uruguay Round (committing only to the opening of electronic mail, voice mail, on-line and data processing services) but nothing in February 1997 at the conclusion of the Negotiations on Basic Telecommunications. The majority of the 148 members of the WTO have not presented any offers in the current Round. Not much has happened since the 5th Ministerial Conference in Cancun, Mexico in December 2003.

²¹⁰ See Article 15 of the Doha Development Agenda.

The schedule for the Doha Round was revised by the General Council of the WTO in July 2004. With respect to services the so called “July 2004 Package” required countries to submit revised offers by May 2005 (See Box 4). A key milestone in the process was the December 2005 Sixth Ministerial Conference held in Hong Kong to review progress.

Box 6: Doha Development Agenda: Annex C of the July 2004 Package Concerning Trade in Services Negotiations²¹¹

**Annex C of the WTO July 2004 Package
Recommendations of the Special Session of the Council for Trade in Services**

- (a) Members who have not yet submitted their initial offers must do so as soon as possible.
- (b) A date for the submission of a round of revised offers should be established as soon as feasible.
- (c) With a view to providing effective market access to all Members and in order to ensure a substantive outcome, Members shall strive to ensure a high quality of offers, particularly in sectors and modes of supply of export interest to developing countries, with special attention to be given to least-developed countries.
- (d) Members shall aim to achieve progressively higher levels of liberalization with no a priori exclusion of any service sector or mode of supply and shall give special attention to sectors and modes of supply of export interest to developing countries. Members note the interest of developing countries, as well as other Members, in Mode 4.
- (e) Members must intensify their efforts to conclude the negotiations on rule-making under GATS Articles VI:4, X, XIII and XV in accordance with their respective mandates and deadlines.
- (f) Targeted technical assistance should be provided with a view to enabling developing countries to participate effectively in the negotiations.
- (g) For the purpose of the Sixth Ministerial meeting, the Special Session of the Council for Trade in Services shall review progress in these negotiations and provide a full report to the Trade Negotiations Committee, including possible recommendations.

During the course of Doha negotiations, issues relating to agriculture have dominated deliberations. Despite the principal focus on agriculture, the Hong Kong Ministerial declaration recognized that “much remains to be done in order to establish modalities and to conclude the negotiations.” Trade in services has been accorded a low priority during the Doha Round, but may receive greater attention in 2006 because the focus of expansion of services trade is on “promoting the economic growth of all trading partners and the developing and least-developed countries.”

The Ministerial Declaration²¹² (Annex 2 – Services) expresses agreement that Members should be guided by a number of market opening objectives, including greater liberalization of Modes 1-4, reduction of MFN exemptions, and calls for a second round of revised offers

²¹¹ See http://www.wto.org/english/tratop_e/dda_e/draft_text_gc_dg_31july04_e.htm

²¹² World Trade Organization, Ministerial Conference, Hong Kong, December 13-18, 2005, Ministerial Declaration (WT/MIN (05)/W/3/Rev2), December 18, 2005.

to be submitted by July 31, 2006. A rather new approach is taken to request–offer negotiations which is “collective requests” for “pluralistic negotiations” that are organized by a group of Members. This has been introduced “to facilitate the participation of all Members, taking account of limited capacity of developing countries. Due consideration shall be given to proposals on trade-related concerns of small economies.” Such a pluralistic approach may be applied to all service sectors and a number may be relevant for Caribbean countries. As CARICOM moves forward to a more regional approach to telecom development and trade dimensions, the WTO might offer a stronger option using a pluralistic rather than via bilateral approaches.

III.4.3 CARIFORUM-European Union (EU) negotiations for an Economic Partnership Agreement (EPA)

The Caribbean Forum of ACP (Asia, Caribbean and Pacific) States (CARIFORUM) represents the regional configuration of the CARICOM countries of Antigua and Barbuda, The Bahamas, Barbados, Belize, Commonwealth of Dominica, Grenada, Guyana, Haiti, Jamaica, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago together with the Dominican Republic, which is not a member of CARICOM.

ACP-EU relations are based on the three-pronged pillars of aid, trade and political co-operation and date back to the 1950s. Current relations with the ACP are governed by a partnership agreement, signed in Cotonou, Benin, in June 2000 (ratified in 2003). Called the Cotonou Partnership Agreement (CPA), it builds on twenty-five years of ACP-EU cooperation under four successive Lomé Conventions. Seventy-eight ACP countries are signatories to the CPA. The CPA establishes a comprehensive framework for ACP-EU relations, for a period of twenty years. At the centre of the partnership are economic development, the reduction and eventual eradication of poverty, and the smooth and gradual integration of ACP States into the world economy. In order to accomplish these objectives, the CPA provides for the conclusion between the ACP and the EU of new WTO compatible trading arrangements. This is to be achieved through the conclusion of EPAs, which are defined by the CPA as a major instrument of economic and trade co-operation. Initial EPA deliberations began in September 2002. These negotiations are set to end December 31, 2007. Negotiations are to be conducted for the region as a whole and are to be led by the Director-General of the CRNM as the CARIFORUM Principal Negotiator.

The CPA of 2000 allows for Economic Partnership Agreements (EPAs) between the European Union and the ACP countries to be extended to services, allows for Regional Trade Agreements (RTA) on services, and provides for the application of Special and Differential Treatment (S&D)²¹³ in services negotiations to benefit the ACP countries²¹⁴. Among the ACP countries CARICOM is the most advanced in services and will most likely want to include something on services in the EPA. Details will most likely be discussed

²¹³ S&D provisions in the GATS include: provisions aimed at increasing participation of developing countries; provisions under which WTO members should safeguard the interests of developing countries; provisions giving flexibility of commitments of developing countries; and provisions allowing for technical assistance to developing countries.

²¹⁴ Article 41.5 of the Cotonou Partnership Agreement

during Phase 2 of the negotiations (sub region specific) which began in April 2004²¹⁵. It is expected that the approach will be to adopt a positive list along with some aspects of S&D²¹⁶

Box 7 shows the countries which are members of CARICOM and CARIFORUM. It also indicates the countries which made GATS telecommunications and the year these were made.

²¹⁵ Phase 1 started in September 2002.

²¹⁶Overseas Development Institute, Special and Differential Treatment in post-Cotonou Services Negotiations, February 2004

Box 7: CARICOM and CARIFORUM Members

CARICOM (Caribbean Community and Common Market)

Members (15)

Antigua and Barbuda (1997)^{217*}

The Bahamas*

Barbados (1998)

Belize (1997)

Dominica (1997)

Grenada (1997)

Guyana (1994)

Haiti

Jamaica (1997)

Montserrat

St. Kitts and Nevis (1995)

Saint Lucia

St. Vincent and the Grenadines

Suriname (1998)

Trinidad and Tobago (1997)

Associate Members (5)

Anguilla

Bermuda

British Virgin Islands

Cayman Islands

Turks and Caicos Islands

*Member of the Community but not of the Common Market

CARIFORUM (Caribbean Forum of ACP States)

Antigua and Barbuda

The Bahamas*

Barbados

Belize

Dominica

Grenada

Guyana

Haiti

Jamaica

St. Kitts and Nevis

Saint Lucia

St. Vincent and the Grenadines

Suriname

Trinidad and Tobago

Dominican Republic (1997)

²¹⁷ *Indicates country that has made a GATS telecommunications commitment and year it was made.

III.4.4 Free Trade Area of the Americas (FTAA)

The FTAA negotiations aim to achieve a Free Trade Area for goods and services comprising 34 countries in North and South America and the Caribbean by 2005. The basis for negotiations is a set of principles and a plan of action resulting from the 1994 Summit of the Americas (Miami). As a regional agreement the FTAA will be consistent with rules and disciplines of the WTO which permit the establishment of customs unions and free trade areas (Article XXIV of the GATT; Article V of the GATS). The negotiations were to have been completed in January 2005.

Under the structure and organization established for the negotiations in 1998 the Ministers of Trade of the 34 countries²¹⁸ are responsible for oversight and management of the process. Negotiations are carried out within nine negotiating groups (investment, services, government procurement, dispute settlement, agriculture, intellectual property rights, subsidies and countervailing duties, and competition policy) whose work is supervised by the Trade Negotiations Committee (TNC) comprising the Vice Ministers of each country. In addition there are four committees dealing with issues relevant to the nine negotiating areas, namely: the concerns of the smaller economies; electronic commerce; involvement of civil society; and the institutional aspects of the Agreement.

Negotiations have been stalled since the last Ministerial Meeting (the 8th) which was held in Miami in November 2003. Since then there has been only one meeting of the TNC (Puebla, Mexico, February 2004). This, it has been suggested is due mainly to an impasse between the USA and Brazil on market access for agricultural products. This has not prevented the USA from negotiating bilateral free trade agreements with the Dominican Republic and Countries in Central America and the Andean Pact.

The current (public) version of the draft FTAA Agreement was issued over a year ago. This is the Third Draft Agreement of on 21 November 2003²¹⁹, which in Chapter XVI on Services contains text on telecommunications reflecting largely text proposed in March 2003 by the USA (along with text on financial services). This text is important with respect to some of the regional pricing and other issues which are discussed in other sections of this report because it introduces competitive safeguard and other provisions which for example require dominant operators and service providers (“major suppliers of public telecommunications services”) to make available to enterprises and other operators and service providers leased circuits, interconnection, access to rights of way, co-location facilities and unbundled network elements on reasonable and non discriminatory conditions and at cost oriented (and flat rate for leased lines) prices. It requires that interconnection offers and agreements and procedures for interconnection negotiations with major suppliers be transparent, that access to any supplier’s submarine cable system (including landing station) be made available at reasonable and non discriminatory conditions and that all suppliers be obliged to allow resale of their public telecommunication services and to provide number portability and dialling parity. This text, furthermore, contains provisions

²¹⁸ The 34 FTAA countries are: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Vincent and the Grenadines, St. Lucia, St. Kitts and Nevis, Suriname, Trinidad and Tobago, the United States, Uruguay, and Venezuela.

²¹⁹ See http://www.ftaa-alca.org/FTAADraft03/Index_e.asp

relating to the independence of the regulator (from any supplier of public telecommunications services), technology neutrality, transparency of the regulatory process and licencing procedures and the need to ensure that procedures and obligations related to universal service and allocation of scarce resources are non discriminatory and transparent.

A Tripartite Committee consisting of the Inter-American Development Bank (IADB), the Organization of American States (OAS), and the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) is providing analytical, technical and financial support during the negotiations.

III.4.5 CARICOM bilateral trade accords and negotiations

CARICOM's trade relations with the Western hemisphere have undergone significant changes over the last decade during which time CARICOM's trade with its hemispheric partners increased as a percentage of its trade with the rest of the world. Accordingly in 1996 Heads of Government of CARICOM agreed to give priority to negotiating free trade agreements with selected countries in Latin America and the wider/greater Caribbean. It is estimated that there are some 33 such agreements signed or under negotiation²²⁰.

CARICOM already has bilateral free trade agreements with Costa Rica (2003), Dominican Republic (2001), Cuba (2000), Colombia (1994 amended in 1998) and Venezuela (1992). Some of these are based on reciprocity. CARICOM has begun negotiating with Canada to establish a bilateral trade accord. Currently there exists CARIBCAN which is an economic and trade development assistance program for the Commonwealth Caribbean countries and territories established in October 1985 and whose objectives are to (i) enhance Commonwealth Caribbean trade and export earnings; (ii) improve the trade and economic development prospects of the region; (iii) promote new investment opportunities; and (iv) encourage enhanced economic integration and cooperation. The main feature of CARIBCAN is the unilateral extension by Canada of duty free access to the Canadian market for most commodities originating in Commonwealth Caribbean countries. Implementation of the program is currently made possible by a WTO waiver valid until 31 December 2006.

III.4.6 Caribbean Regional Negotiating Machinery (CRNM)

The CRNM was established on April 1, 1997, by the Conference of Heads of Government of CARICOM to assist Member States in maximizing the benefits of participation in global trade negotiations by providing sound, high quality advice, facilitating the generation of national positions, coordinating the formulation of a unified strategy for the Region and undertaking/leading negotiations where appropriate. Its mandate comes against the background of a global economic environment increasingly based on free trade and moving away from the traditional preferential arrangements that have benefited many Caribbean economies. Its mandate is to:

²²⁰ Norman Girvan, Reflections on the CSME, Keynote address to SALISES Conference on CSME, University of the West Indies, St. Augustine, Trinidad and Tobago, 31 March 2004.

- Develop and execute an overall negotiating strategy for the various negotiations in which the region is involved;
- Lead the Region's negotiating team and be the main spokesperson in the conduct of the negotiations, especially those at the decision making level;
- Develop and fine-tune the strategy for various negotiations within the timetable identified for the particular area; and,
- Maintain regular contact with sectoral negotiators and work with them in the identification of issues and the development of appropriate responses.

The CRNM undertakes technical studies, organizes technical working groups and consultations with member states²²¹ government officials, the private sector and civil society. It negotiates jointly on behalf of CARICOM in the FTAA but not in the WTO where each country negotiates on its own behalf. CRNM reports to the CARICOM Prime Ministerial Sub-Committee on External Negotiations and through this Sub-Committee to the Conference of Heads of Government of the Community.

CRNM's current priority areas of focus are the FTAA, post Lome IV, ACP-EU relations, non-economic initiatives of the Miami Summit including the Second Summit, and the World Trade Organization.

III.4.7 Awareness raising and capacity building

The role of and implications for telecommunications and ICT of these free trade negotiations is neither well understood nor sufficiently well appreciated by policy makers, regulators and trade officials in the Caribbean. Given their importance for economic development of the region it is strongly recommended that a comprehensive program of awareness raising and capacity building in this area be developed and maintained in the Caribbean. This should typically consist of: (i) a capacity building program including training, exchange of experiences and policy research of key issues; (ii) promoting policy dialogue among policymakers (telecommunications, ICT and trade officials), regulators and operators; and (iii) establishing an easy-to-use database with key indicators to facilitate monitoring developments and preparing negotiating positions. The latter should be tied in with the data base being proposed for regulators and government officials (See Chapter VI)

An immediate activity should be the organization of a regional seminar covering, inter alia, topics such as:

- The process and status of the Doha Round including the nature of requests and offers (with respect to commitments on basic and value added services and the Reference Paper including competitive safeguards, licencing, and investment limits);
- Implications of the competitive safeguard provisions contained in the text on telecommunications services in the current draft text of the FTAA;

²²¹ Independent states of the Caribbean Community and Cuba and the Dominican Republic.

- The increasing importance of telecommunications and ICT as engines for economic growth;
- The role of telecommunications and ICT in global, regional and bilateral trade arrangements;
- General and specific telecommunications and ICT-related objectives of the Doha Development Agenda, the FTAA, Cariforum-EU, and bilateral trade negotiations;
- Regional telecommunication and ICT trade negotiations and the development of common strategies and positions for market access, investment, coverage of new communication and information services such as cable TV, Internet, e-commerce, e-government, radio and television broadcasting, audiovisual services) in these trade negotiations;
- Free trade negotiations and issues related to mobile, wireless, and the treatment of Internet including international charging arrangements;
- WTO dispute resolution and the April 2004 Panel on Mexico–Measures affecting Telecommunications Services concerning provisions in Mexico's domestic laws and regulations on telecommunications which govern the supply of telecommunication services²²².

In April 2004 the Asia Pacific Telecommunity (APT), a regional organization of governments, operators, service providers, manufactures, research & development organisations and other stake holders active in the field of communication and information technology, organized a seminar on trade and telecommunications in Ulaanbaatar, Mongolia with the same purpose in mind²²³.

III.5 Regional initiatives of various cooperative and funding organizations

III.5.1 Regional cooperative organizations active in the sector

A number of cooperative and funding organizations have been active in the region and have provided financial and non financial support for sector reform. More details on these organizations and their activities can be found in Annexes G and H.

Following are intergovernmental, trade and other cooperative organizations which are active in the region.

The **Caribbean Telecommunications Union** (CTU), an intergovernmental organization established in 1989 to harmonize sector policy and frequency usage and to coordinate regional positions on international issues and obtaining resources and assistance for Caribbean telecommunications development. The CTU is headquartered in Port of Spain, Trinidad & Tobago.

The **Caribbean Association of National Telecommunications Organizations** (CANTO), a trade association of telephone operating companies in the Caribbean founded in 1985 to exchange information and expertise, formulate policy and

²²² See Mexico – Measures affecting Telecommunications Services, Report of the Panel, WTO WT/DS204/R 2 April 2004

²²³ See <http://www.aptscc.org/meetings/2004/infodev/MNG/default.htm>

consider matters of mutual interest to its members and generate inputs for orderly growth of the telecommunications sector in the Caribbean. CANTO is headquartered in Port of Spain, Trinidad & Tobago.

The **Organization of Caribbean Utility Regulators** (OOCUR), a non-profit organization established in July 2002 to assist in the improvement of utility regulation, to foster transparent and stable utility regulation through autonomous and independent regulators in member countries, to undertake research, training & development, to facilitate understanding of regulation issues, and to share information and experience. The secretariat of OOCUR is in Port of Spain, Trinidad & Tobago.

The **International Telecommunications Organization** (ITU), an international intergovernmental organization within the United Nations System where governments and the private sector coordinate global telecom networks and services whose main purpose is to maintain and extend international cooperation between all its Member States for the improvement and rational use of telecommunications of all kinds. It has a Caribbean area office in Barbados where, inter alia, it promotes and offers technical assistance to countries in the Caribbean region in the field of telecommunications, and also promotes the mobilization of the material, human and financial resources needed to improve access to telecommunications services in such countries. It also promotes the adoption of a broader approach to the issues of telecommunications in the global information economy and society, by cooperating with other world and regional intergovernmental organizations and those non-governmental organizations concerned with telecommunications.

III.5.2 Initiatives of international, regional and national funding organizations

Other international, regional, and national funding organizations active in the region are the following:

- Inter-American Development Bank (IADB)
- World Bank
- United Nations Economic Commission for Latin America and the Caribbean (ECLAC)
- European Commission (EC)
- Caribbean Development Bank (CDB)
- UNESCO
- Canadian International Development Agency (CIDA)
- Institute for Connectivity in the Americas (ICA)
- US Aid

Outside of these are initiatives of non-governmental (NGOs) and other organizations. One which is particularly noteworthy and very relevant to the sector and to the objectives of this study is there recently launched Master's Degree in Telecommunications Regulations and Policy of the University of West Indies which is described here. Also described are the new Caribbean Knowledge and Learning Network (CKLN) and the earlier initiatives of the Telecommunications Executive Management Institute of Canada (TEMIC)

III.5.3 UWI Master's Degree in Telecommunications Regulation and Policy (MRP)

An initiative of The University of the West Indies (Trinidad & Tobago) Electrical and Computer Engineering professor, Dr. Kim Mallalieu, this ambitious program was launched in December 2003 in St Lucia. The program was developed in response to a well articulated need for training in telecommunications policy and regulation in the region and the lack of any resources to provide such training. The two-year program comprises eight on-line courses, three face-to-face seminars and a final project. The online courses, delivered at a rate of two per semester are the following: (i) public policy frameworks; (ii) contemporary telecommunication networks and technologies; (iii) legal and regulatory frameworks; (iv) economics and pricing in telecommunications networks; (v) licensing of telecommunications services; (vi) interconnection; (vii) telecommunications sector planning; and (viii) the regulatory state in comparative perspective.

The program has a web site (<http://mrp.uwi.tt>) and a well organized course management structure which in addition to the program coordinator, deputy and an external program review committee provides for a course director and tutors for each of the eight courses. Course directors are responsible for preparing course and assessment exercises and grading students. Tutors provide on-line support to students and participate in discussions and chat room sessions. Like course directors, tutors are professionals, some being academics.

The program, pitched at an executive level audience, has been very successful in attracting secretaries general, chairmen, directors and regulators, among other senior professionals, from around the world. The first cohort comprised 25 participants from the Caribbean and 11 from other countries including Tunisia, Bulgaria, Bahrain, Mauritius, Sri Lanka, Cambodia and a number of African countries. The program has been promoted by the International Telecommunication Union, The Caribbean Telecommunications Union, and CANTO. Its only financial support so far has been from Cable & Wireless Virtual Academy scholarships.

One of the objectives of Dr. Mallalieu is to create a virtual community of academics, professionals, and practitioners. The purpose is not only to expand teaching resources by calling upon these people to share their knowledge and experiences with students but also to develop a community of interest in the subject in the Caribbean and beyond. One simple way of enriching this community is through a program of virtual visiting scholars in which prominent scholars undertake to participate in a "discussion board" for an MRP course over a period of one week or participate in one or two hours of scheduled live online chat sessions.

In order to enrich the course material Dr. Mallalieu is also very keen to develop a database of network diagrams, case studies, business cases, legal opinions, reports, and special studies in electronic form.

III.5.4 The Caribbean Knowledge and Learning Network (CKLN)

The CKLN will consist of the technical infrastructure and enabling the environment for tertiary institutions in the Caribbean and the distance education centers of the University of the West Indies to offer and receive distance learning courses and other online services. The physical infrastructure will consist of a satellite based network connecting these institutions,

suitable network administration and a comprehensive learning management system. Additionally, technical assistance and support will be put in place to build the necessary capacity among faculty, students and administrators to utilize modern teaching approaches.

The primary intended beneficiaries of the project will be tertiary level students wishing to study in the Caribbean who will be given access to high quality course offerings, including online courses, taught to international standards and accredited within the Caribbean and Tertiary Education Institutions who will have opportunities for knowledge sharing, joint course development and research with a critical mass of peers across the region and beyond

The CKLN was officially launched on 4 July 2004 at the CARICOM Heads of Government Meeting in Grenada and has as its main objective supporting the enhancement of the competitiveness of Caribbean countries by upgrading and diversifying skills and knowledge through increased regional collaboration and use of ICT to connect citizens²²⁴. In this respect it is consistent with the strategy in the CARICOM Caribbean Connectivity Agenda which is to promote major increases in citizen access to the global information infrastructure and to produce on-line communities (e-communities), on-line companies (e-business), and on-line government (e-government)²²⁵. The CKLN will also provide direction and coordination mechanisms which can assist donors and the others align their projects and investments.

At the heart of the project is as mentioned the installation of satellite broadband connectivity and related services in partnership with the Institute for Connectivity of the Americas (ICA)'s E-Link Americas Initiative for the provision of connectivity for social development and is supported by the OAS, IDRC, CIDA and the World Bank and will provide satellite low cost connectivity to all Tertiary Education Institutions in CARIFORUM countries. The E-Links Americas Initiative will directly support activities envisaged for @LIS and other projects and is expected to facilitate the development of Community Telecenters, Community Learning Centers and other ICT-related enterprises.

There will also be an IT Center of Excellence, located on the campus of an existing tertiary education institution, fully integrated into its organizational structure and developed in partnership with private sector IT companies interested in expanding in the region (e.g. Microsoft) and offer certification in related programs. The Center will concentrate on building a broad base of highly trained IT professionals in the Caribbean at the undergraduate, postgraduate and professional levels. It will also provide an enabling environment for the incubation of micro-enterprise and potential commercial spin-offs, ideally in partnership with the private sector. Through contracts with government, the private sector and international agencies, the Center will provide support for the growth of

²²⁴ The project was developed in recognition that the Caribbean continues to rely heavily on agriculture, tourism and financial services and which is characterized by a lack of internal resources for investment, environmental and natural limitations, loss of preferential trade agreements and increasing pressures on the offshore financial institutions there is a growing need to strengthen competitiveness, to support economic diversification and labor mobility. This will require a skilled and flexible labor force, continued reinvestment of capital and most importantly a population with high levels of literacy and technical proficiency – including scientific, mathematical and computer skills. These can only be brought about through curricula reform, improvements in teacher qualifications, higher level professional capacities, such as engineering, economics and public administration, among others, and new general skills for a significantly larger proportion of the population including entrepreneurship, marketing, and team work. Tertiary education plays a pivotal role in providing the high quality training in these fields of study to assist countries in achieving the necessary levels of economic diversification and to stimulate the mobility of human capital.

²²⁵ Towards CARICOM Connectivity, Agenda 2003 & Platform for Action

high-level ICT applications in the Region, notably e-commerce and e-government. It will train people to both maintain and service computing and network facilities and to support the growth of community telecenters and Computers for Schools programs. It should also serve as a training centre for staff of the higher generation call centres (See Box 1 in the Introduction of this report)

The CKLN will be managed through a regional hub called the Caribbean Knowledge and Learning Center whose functions will be to provide (i) overall direction and financial management of the project together with regular monitoring and evaluation; (ii) identification of priority content needs of the region and the development of an initial distance learning pilot; (iii) creation and development of a regional portal; (iv) staff development in the generic use of the internet as well as the use of learning management systems and the e-learning platform; (v) technical assistance and advisory services relating to the technology, contract/vendor relations and maintenance; (vi) the regional accreditation and certification mechanism.

Following are the regional issues which influenced the design of this project:

- Lack of access to high quality tertiary education opportunities throughout the region.
- Little regional integration and lack of partnering and collaboration among tertiary institutions.
- A mismatch between traditional disciplinary approach and curriculum and the current and future needs of the Caribbean labor market.
- Lack of innovative approaches to the financing of tertiary education, these limit growth, innovation and adoption of new approaches and business models
- The relatively high cost of connectivity limits access and knowledge sharing as well as the emergence of IT-related enterprise and employment opportunities.

A number of funding institutions, who met at an initial donors' meeting in February 2004, have committed in excess of € 8.5 million to the project; OAS-IACD (€ 0.8 million), IDRC/ICA (€ 4.13 million), CIDA (€ 0.4); UNDP/Italy (around € 2.49 million) and the World Bank (€ 1.2 million under the OECS Telecoms II project).

It is envisaged that the connectivity element of the network will be provided on a non-profit basis through agreement with the E-links Americas Initiative. Subscription charges and an element of cost recovery will be required to cover local equipment maintenance and core services. In most cases hardware maintenance and operation will be the responsibility of the local institutions or carried out via contracts negotiated in the Caribbean.

At a later stage it should be possible to also use the regional non-commercial (Internet 2 type) high speed research and education network which is being proposed as a project in this report for the physical infrastructure.

III.5.5 CARICOM Centre for Development Administration (CARICAD)

The CARICOM Centre for Development Administration (CARICAD) has been mandated to set up a facility to guide CARICOM member states in the design and implementation of strategies for the development of e-government services. The organisation recently established the Technical and Advisory Support Facility (TASF) on e-government, and also has plans to set up a regional steering committee and regional advisory committee for this area. In this regard, there have been several assessments and studies done by various countries in the region but there is a lack of coordination with respect to these activities and to the design of national e-government strategies. Nevertheless, Jamaica, the Bahamas and Trinidad and Tobago are said to have prepared effective e-government strategies which are likely to be good benchmarks for other countries in the region, and Barbados has drafted its own approach that follows many of the best practices in the region and the world.

III.5.6 Caribbean Culture and Internet Project

This project seeks to establish an online network among cultural organizations from the Eastern Caribbean and French Overseas Departments (Département d'Outre Mer or DOM). Over 50 cultural organizations in the OECS, Martinique and Guadeloupe, working within the fields of living arts, music, painting, patrimony, environment, etc.) will participate in this exchange network of experiences and information, facilitated by the Internet. The € 370,000 project financed by the French Ministry of Foreign Affairs project aims to foster regional integration and facilitate relations between the OECS member states and the DOM. The network will enable the cultural organizations of the region to work directly with one another. The executive agency and coordinator for the project is the OECS Secretariat assisted by the regional steering committee, made up of a representative from each of the OECS Member states, Martinique and Guadeloupe, are responsible for the smooth implementation of the project over a 30 months period. To facilitate the access to ICT resources, the project has installed 36 computers in the six countries, in order to provide gateway access to the sister organizations and to enable them to manage their presence on the Net via all the tools available to them: namely, web, mail, listserve, and weblog.

III.5.7 The Telecommunications Executive Management Institute of Canada (TEMIC)

TEMIC has been supporting the development of telecommunications and ICTs in the Caribbean region for a number of years. Its main activities centered on HRD and capacity building at both the individual and institutional level. In the last 10 years one hundred and nine (109) senior policy makers, regulators as well as executives from operating entities attended TEMIC's regular training programs.

A training agreement, between TEMIC and the Caribbean Telecommunications Union (CTU), was signed in 1996. The agreement which ended in 2000 was designed to assist CTU Member States develop and implement policies, legislation and regulations aimed at sustaining ICT development through the building of appropriate capabilities. Under this agreement eighty four (84) senior managers were trained.

IV. INFRASTRUCTURE FOR ICT IN THE CARIBBEAN

This chapter presents a brief overview of infrastructure for ICT in the Caribbean. It compares fixed and mobile telephone penetration in each of the countries and territories, discusses the technologies and scope for deployment of broadband technologies for local access and indicates current and planned undersea fibre optic and current satellite backbone networks.

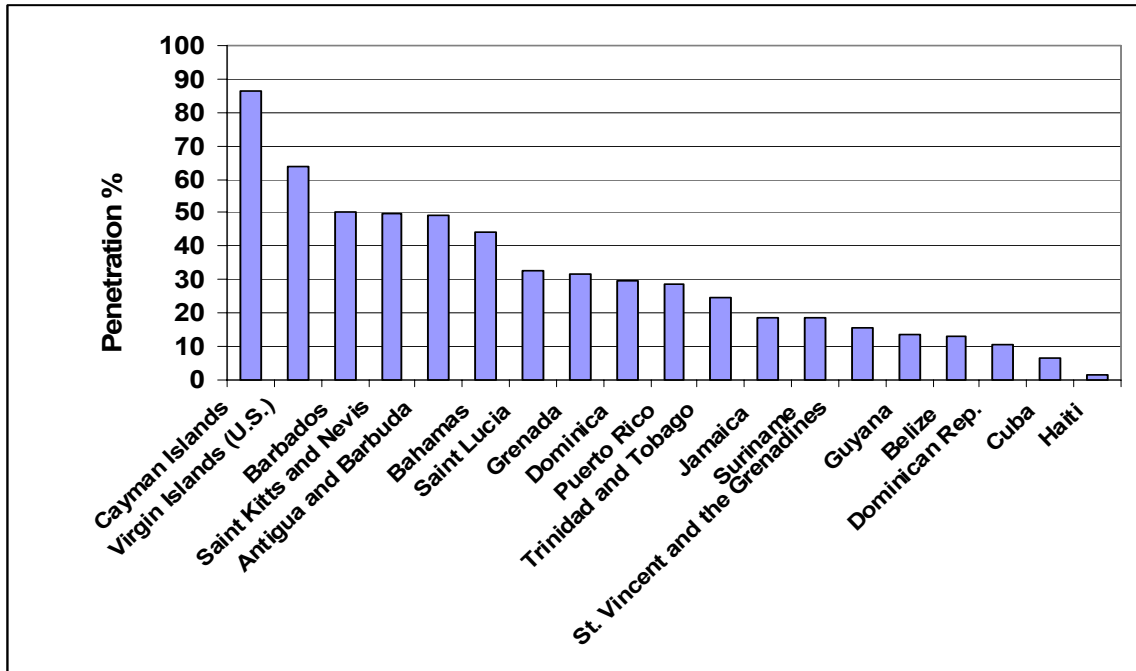
IV.1 Fixed and mobile (narrow band) networks in the Caribbean

Figures 19 and 20 compare the fixed and mobile penetration rates in 24 countries and territories for which the International Telecommunication Union gathers statistics.

There are about 90 licenced mobile operators in the region. (Table 23)²²⁶ There is competition in all but six of the countries and territories with most having two, three or even four operators. A few countries have as many as seven licence holders. Not all of these may, however, be operating. One of the main obstacles to new entrants' delaying their service offerings has been their inability to sign an interconnection agreement with the incumbent fixed line operators, an issue which is dealt with in the next chapter of this report on regulatory barriers to investment.

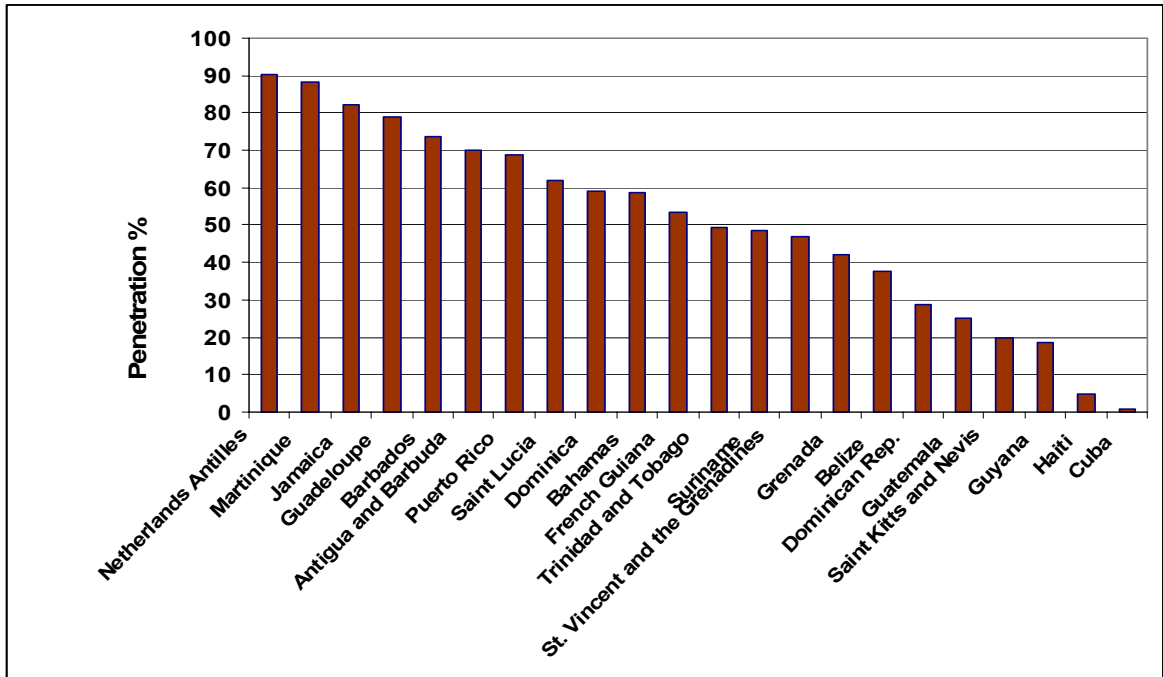
²²⁶ In mid 2005 Digicel entered into an agreement with Cingular Wireless to acquire the latter's Caribbean assets which it had purchased from AT&T Wireless a few months earlier. Through this acquisition Digicel added Bermuda, Anguilla, St. Kitts & Nevis, Dominica and Antigua & Barbuda to the countries in the region where it already had licences. As of February 2006 Digicel was seeking regulatory approval in 4 countries (Cayman Islands, Grenada, St. Lucia, Barbados, St Vincent & the Grenadines and Jamaica) where it already had a licence and the acquisition will result in a merger of two operators effectively reducing competition. As of mid December 2005 Digicel had received approval in Barbados, Bermuda, St. Lucia and Dominica. It was still awaiting approval in St. Vincent & The Grenadines, Grenada, the Cayman Islands and Antigua & Barbuda. Also in June 2005 Digicel obtained a licence in Haiti and was successful in an auction for mobile frequencies in Trinidad & Tobago. With the Cingular acquisition Digicel will have licences in 15 Caribbean countries and territories including Martinique, Guadeloupe and the Netherlands Antilles.

Figure 19
Main Line Telephone Penetration in the Caribbean



Source: ITU WTI 2005

Figure 20
Cellular Mobile Penetration in the Caribbean



Source: ITU WTI 2005

Table 23: Mobile Operators in the Caribbean (Status April 2006)

Country / Territory	Operator	Ownership		Technology employed	Operational
		Local	Foreign		
Anguilla (BOT)	C&W Anguilla		C&W 100%	AMPS/TDMA	✓
	Weblinks	Weblinks 100%		Not yet operational	
	Digicel		Digicel 100 %	GSM 1900	✓
Antigua & Barbuda	C&W Antigua		C&W 100%	AMPS/TDMA	✓
	APUA PCS	Govt. 100%		GSM 1900	✓
	Digicel		Digicel 85 %	GSM 900/1900	✓
Aruba	Digicel		Digicel	GSM 800/1800	✓
	SETAR	Govt 100 %		AMPS/TDMA, GSM 900	✓
	BTC	Govt 100 %		AMPS/TDMA, GSM 1900	✓
The Bahamas	C&W Barbados	Govt 20 %	C&W 80 %	AMPS/TDMA, GSM 1900	✓
	Cellular Comm. Barbados	Clico (consortium of companies) 35 %	Digicel 65 %	GSM 900/1900	✓
	Digicel	New Millenium 25 %	Digicel 75 %	GSM 900/1800/1900	✓
Barbados	Sunbeach		Telecom Holdings (T&T) 51%	GSM 900/1900	
	Belize Telecoms	Carlisle 62 %; small investors 8 %	ICC (US Virgin Is.) 30 %	AMPS/TDMA, GSM 1900	✓
	Speednet	Local investors 100%		CDMA 800	✓
British Virgin Islands (BOT)	CCT Boatphone	BVI Investment Club		AMPS/TDMA	✓
Cayman Islands (BOT)	C&W Cayman		C&W 100%	AMPS/TDMA, GSM 850, 1900	✓
	Digicel		Digicel	GSM 900/1800/1900	✓
	Gingular (AT&T)		Digicel	GSM 850,/1900	✓
	E-Technologies			CDMA	
Cuba	C&W Dominica	Govt. 73%	Telecom Italia 23%	TDMA/GSM 900	✓
	Digicel	Govt 20 %	C&W 80 %	AMPS/TDMA	✓
	ATT Wireless (Digicel)		Digicel	GSM 900/1900	
Dominica (OECS)	Orange Caribe		France Telecom	GSM 900/1800	✓
	Verizon Dominicana		Verizon 100%	IS-95A/CDMA 2000 1X	✓
	Tricom	Local Investors	Foreign Investors, Motorola	AMPS/IS-95A	✓
Dominican Republic	Orange Dominicana		France Telecom 86 %	GSM 1900	✓
	Centenial Dominicana		Centennial Dominicana 100%	IS-95A, CDMA 2000 1X	✓

Country / Territory	Operator	Ownership		Technology employed	Operational
		Local	Foreign		
French Guyana	Orange Caraïbe	Orange France 86 %		GSM 900/1800	✓
	Bouygues Télécom Caraïbes	Bouygues Télécom		GSM 900/1800	✓
	Outremer Télécom			GSM 900	
Grenada (OECS)	C&W Grenada	Govt. 30 %	C&W 70 %	AMPS/TDMA	
	ATT Wireless (Digicel)		Digicel	GSM 900/1800/1900	✓
	Trans World Telecoms Ltd.		Trans World 100 %	GSM 900/1800	
	Global Network Providers				
Guadeloupe (DOM)	Orange Caraïbe	Orange France 86 %		GSM 900/1800	✓
	Bouygues Télécom Caraïbes	Bouygues Télécom		GSM 900/1800	✓
	Outremer Télécom			GSM 900	
Guyana	Digicel		Digicel	GSM 1800	
	Caribbean Telecoms	Local investors		AMPS	✓
	Caribbean Wireless Telecom	Local investors 100 %		AMPS/TDMA	no
	GT&T	Government 20 %	ATN 80 %	TDMA/GSM 900	✓
	Cel*Star Guyana		Trans World Telecom 100 %	GSM 900/1800	✓
Haiti	Haitel	100%		CDMA	✓
	Comcel			TDMA, GSM	✓
	Digicel		Digicel	GSM	
Jamaica	CWJ	Local investors 18 %	C&W 82 %	AMPS/TDMA, GSM 1900	✓
	Oceanic Digital		Oceanic Digital 100 %	IS-95A, CDMA 2000 1 X	✓
	Digicel		Digicel 100 %	GSM 900/1800/1900	✓
Martinique (DOM)	Orange Caraïbe	Orange France 100%		GSM 900/1800	✓
	Bouygues Télécom Caraïbes	Bouygues Télécom		GSM 900/1800	✓
	Digicel		Digicel	GSM 1800	
Montserrat (BOT)	C&W Monserrat		C&W 100 %	AMPS/TDMA	✓
	Comm. Systems Curaçao		Digicel	GSM 1900	
	Curaçao Telecom			GSM 900/1900	
Netherlands Antilles (Curaçao)	UTS Wireless	PTT 100 %		GSM 900	✓
	Personal Communications Services N.V.		Oceanic Digital 100 %	CDMA 2000 1 X	
	Telcell N.V.			GSM 900	✓
Netherlands Antilles (St. Maarten)	UTC	PTT 100 %		GSM 1800	✓
	Eastern Carib. Cellular (ECC)			TDMA, GSM 900	✓
	Digicel		Digicel	GSM 900/1900	
	Paradise Wireless/Cellular One		Oceanic Digital 100 %	CDMA 2000 1 X	
Puerto Rico	Verizon Wireless		PRT/Verizon 100 %	AMPS/TDMA, CDMA 2000 1X	✓

Country / Territory	Operator	Ownership		Technology employed	Operational
		Local	Foreign		
	Cingular Wireless		Cingular 100 %	AMPS/TDMA, GSM 1900	✓
	Centennial de PR		Centennial 100%	IS-95A, CDMA 2000 1X, CDMA 2000 1xEV-DO	✓
	Cingular		Cingular 100%	TDMA, GSM 1900	✓
	Telefonica		Telefonica 49.9 %	IS-95A	✓
	Sprint PCS		Sprint 100 %	IS-95A, CDMA 2000 1X	✓
	SunCom			TDMA, GSM 1900	✓
	C&W St. Kitts		C&W 65 %	AMPS/TDMA, GSM 1900	✓
	CariGlobe				
St. Kitts & Nevis (OECS)	ATT Wireless (Digicel)		Digicel	GSM	
	C&W St. Lucia		C&W 100 %	AMPS/TDMA	✓
St Lucia (OECS)	Digicel		Digicel	GSM 900/1800/1900	✓
	ATT Wireless (Digicel)		Digicel		
St. Vincent & The Grenadines (OECS)	C&W St. Vincent		C&W 100 %	AMPS/TDMA	✓
	Digicel		Digicel	GSM 900/1800/1900	✓
	ATT Wireless (Digicel)		Digicel 100 %	GSM 900/1800	✓
	Orange Caraïbe	Orange France 100%		GSM 900/1800	✓
St. Martin (Guadeloupe)	Bouygues Télécom Caraïbes	Bouygues Télécom		GSM 900/1800	✓
	Outremer Télécom			GSM 900/1800	
	Dauphin Telecom			GSM 900	✓
	Digicel		Digicel	GSM 1800	
	St. Martin St. Barthélemy TelCell			GSM 900	
	St Martin Mobiles			AMPS	
Suriname	Telesur	Govt. 100 %		TDMA/GSM 900	✓
Trinidad & Tobago	TSTT	Govt. 51 %	C&W 49 %	AMPS/TDMA, GSM 1800	✓
	Digicel		Digicel	GSM 900	✓
	Laqtel	Local investors		GSM 900	
	C&W		C&W	AMPS/TDMA, GSM 1900	✓
Turks & Caicos Is. (BOT)	Digicel		Digicel		
	Island Com				
	CCPR		Cingular	AMPS/TDMA	✓
US Virgin Is.	Vitel Cellular	EmCom 100 %		AMPS/TDMA	✓
	Sprint		Sprint	CDMA	✓
	Centennial		Centennial Comm.	CDMA	✓

IV.2 Transmission technologies for local access and transport

IV.2.1 Introduction

Section III.2.4 of this report discussed issues related to the prices for leased circuit capacity and showed how lack of competition in the region has kept prices for backbone capacity well above international benchmarks. The high prices that Internet Service Providers must pay to access the Internet through these facilities are reflected in the prices they charge their customers for both low and high speed Internet services, the latter which more and more businesses, governments and even individuals want and need.

The evolving wireline and wireless transmission technologies offer various options for providing both local access and transport (backhaul) in the Caribbean depending on the particular circumstance, the type and location of the community being served, the services which are to be provided, and the way users will be accessing these services.

A telecommunications network consists of four main components: a) the user terminal; b) local network access; c) the transport or backhaul network; and d) the network control and management, billing and customer provisioning equipment. Table 24 shows these four components and the the currently available and new technologies being used.

Table 24: Network Components and Current Technologies

A. Terminal	B. Local access network	C. Transport network	D. Network management
<ul style="list-style-type: none">• Telephone• Mobile terminal (handset)• Payphone• Computer• Telecentre• Telemetry	<ul style="list-style-type: none">• PSTN with copper local loop• xDSL• Radio-in-the loop (RLL) and cellular mobile networks• VSAT networks and LEOs• BWA networks incl. WiFi and WiMAX• Fibre Optic Cable systems• MMDS and LMDS systems• Power Line Communications (PLC)• Coaxial cable and Hybrid Fibre Cable (HFC) networks	<ul style="list-style-type: none">• Geostationary and LEO Satellite (incl. VSAT) systems• Digital radio (microwave) links• BWA networks incl. WiFi and WiMAX• Fibre optic cable systems• Coaxial cable systems	<ul style="list-style-type: none">• Network management and control; billing, customer provisioning and care

IV.2.2 Local access

Local access can be achieved using either wireline or wireless technologies. Following are the former which have been deployed around the world including the Caribbean to provide broadband (high speed) access are: (a) Digital subscriber line (DSL) which use the copper loop of the telephone network into the home or business to provide a high speed data access which can provide speeds up to 52 Mbit per second but in a more common and economic version (ADSL-Lite) support down link speeds of up to 1.5 Mbps and up link speeds of up to 384 Mbps; (b) Coaxial cable systems, which when built with Data over Cable Service Interface Specification (DOCSIS), can support speeds of up to 30 Mbps (cable modem); (c) Fiber optic cable systems, which in addition to having superior quality when compared with coaxial cables (no crosstalk, no electromagnetic or radio interference, cheaper maintenance) can support speeds in the Tbps range; and (d) Power Line Communications (PLC) which uses the low (120 – 240 volt) and medium voltage (< 69 Kvolt) electrical power transmission lines to transmit voice and data and can provided connections at speeds similar to ADSL and has the advantage of using existing infrastructure. PLC is still being developed has so far not been widely used.

Fibre optic and coaxial cables can, of course, also be used in the transport component of a network.

All of these technologies are appropriate for providing local access in the Caribbean for providing broadband access. Table 25 summarizes the deployment of the two most prominent of these, DSL and cable modem, in the various countries and territories of the Caribbean. Wireless technologies are also used, however, until now to a lesser extent.

Table 25: Deployment of High Speed Access Systems Using Cable Modem and Fixed Wireless Technologies in the Caribbean

Country	Cable modem	Fixed Wireless Access
Anguilla	<i>Caribbean Cable Communications (Anguilla) Limited</i> covers the whole island and offers Internet access.	Two service providers, <i>Weblinks</i> and <i>Cable & Wireless</i> offer high speed Internet access using a WiFi (IEEE 802.11b protocol) network.
Antigua & Barbuda	<i>Cable Television (CTV)</i> offers cable television services but not Internet. However, a new company <i>Karibe Cable Keloam International</i> has promised to do both.	Karibe Cable Kelcom International expects to provide access in early 2005.
The Bahamas	<i>Cable Bahamas</i> has a 15-year exclusive licence (until 2009) for cable TV. Its network reaches about 94 % of The Bahamas' 90,000 families. It has 64,000 cable TV and 23,000 Internet customers.	There are several operators providing fixed wireless access
Barbados	There is one cable TV operator which does not however offer Internet access.	The Government has issued 3 fixed wireless access licences (TeleBarbados, Last Mile Holdings, Wiscom) but so far none is operating. There is a TV network which has an MMDS network.
Belize	There are 29 regional cable TV operators; some like CBC and Beyman Cable in Belize City also offer cable modem access.	
Cayman Islands	Weststar TV obtained a cable TV licence in October 2003. It, has an Internet licence	There are 9 companies that have FWA operator licences. Seven of these also have ISP licences.
Dominican Republic	There are two cable TV operators, Tricom S.A. and Aster, Both offer high speed Internet access via cable modem.	
Guyana	There is one small cable TV operator offering service outside of Georgetown. It does not offer Internet access.	
Jamaica	There are 51 regional cable TV (STV) operators offering services in 176 zones which correspond to Jamaica's 176 electoral districts. Many of these zones have 2 licence holders. None offer Internet access.	Two FWA operators offer Internet access, N5 and Kasnet N5 also has a nationwide STV licence.
OECS	In St. Lucia <i>C&W</i> covers the entire island and there is a smaller operator which provides limited service south of Castries, the capital. Neither offer cable modem Internet access. In St. Kitts & Nevis the Cable Television Company provides a high speed cable modem Internet access service which covers 50 % of the country. In St. Vincent and the Grenadines Kelcom provides cable TV and high speed Internet access (via cable modem) to 50 % of the country.	
Suriname	No cable TV network	Two operators, RPBG and Sicon (Educons with the Post Office) offer FWA service in the Paramaribo region. Sicons is testing a WiMAX system.
Trinidad and Tobago	There are 2 cable TV operators. CCTT operates on Trinidad and has about 90,000 customers. Trizo operates only on Tobago and has about 2,500 customers. CCTT has a very limited Internet offering of less than 500 customers on a trial basis. CCTT also offers internet access to the commercial sector via cable modem and direct fibre connections	There are 5 operators with licences to provide FWA. Of these 2 have quite extensive coverage of Trinidad and the south western part of Tobago. Two are virtually non operational. The regulator, TATT has asked for expressions of interest for various FWA systems (incl. subscription TV, Internet access and public telephone services)

Among the more promising current wireless access technologies are the following:

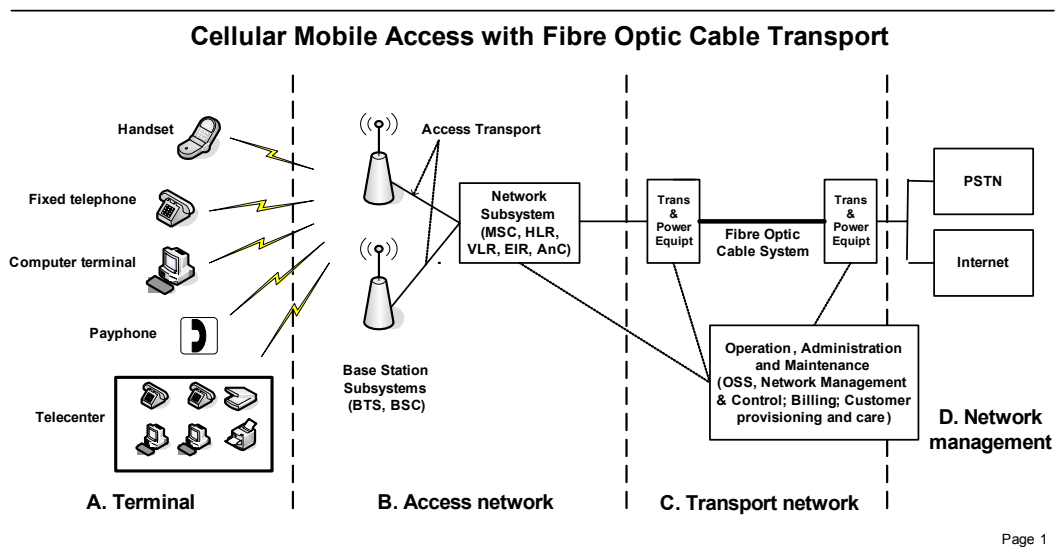
a. Second and third generation mobile technology options for providing local access

Given that distance from the existing network is normally not an issue on most Caribbean islands, the capacity and coverage of existing GSM or TDMA and in certain cases CDMA cellular mobile systems (operating in the 800/1800/1900 MHz bands) can simply be expanded to serve these areas, especially if the regulatory framework is conducive to investment²²⁷.

Figure 21 illustrates one such option for providing mobile and/or fixed wireless access, with a fibre optic transport link. Other transport options include VSAT, microwave, WiFi and WiMAX.

Cellular mobile is a mature technology for both voice and data. CDMA 2000 1x is the evolutionary step between the narrowband (2G) and full broadband (3G) CDMA and can offer (broadband) speeds up to 144 Kbps. The 3G version of CDMA (CDMA 2000 1x EV-DO²²⁸) offers theoretical maximum downstream (toward user) speeds of up to 2.4 Mbps and an upstream speed of 384 Kbps. The GSM equivalent 2.5G standard are GPRS and EDGE, offer similar throughput speeds; however, their implementation requires a network overlay. The 3G equivalent of GSM known as W-CDMA offers a downlink speed of 2 Mbps. Nokia recently launched a high speed version of the latter called Internet High Speed Packet Access (I-HSPA) which promises down and up-link speeds of 14.4 Mbps and 5.7 Mbps, respectively.

Figure 21
Cellular Mobile Access with Fibre Optic Transport



Page 1

²²⁷ For example, cellular coverage in Jamaica is very close to 100%.

²²⁸ 1x indicates that there is only one radio frequency (RF) carrier. EV stands for "evolutionary"; DO, for "data only" or "data optimized" and DV, for "data and voice".

Manufacturers of GSM equipment have been improving the design of traditional GSM (2G and 2.5G) base station and mobile terminal equipment. Through a combination of newer base station designs, which do not require shelters or long cables between the antenna and transceivers, and newer signal processing algorithms it has been possible to increase cell sizes by 30%, reduce interference and transmission power requirements, increase throughput capacity and improve speech quality. As a result the range for base stations for EDGE applications has been increased up to 70 km providing a coverage area of 9,555 km² and offering service up to 1,480 subscribers within one cell²²⁹.

b. Broadband wireless access (BWA) technology options

Because of their decreasing price and wide coverage areas BWA and pre-WiMAX²³⁰ systems are very promising solutions for providing affordable access to stand alone communities. Figure 22 shows a BWA access configuration with a satellite backhaul link. A single base station transmitting in the 2.5 – 2.7 GHz (licensed) frequency band²³¹ can cover an area with a radius of up to 30 km in flat or even hilly rural settings. These systems designed using so called orthogonal frequency division multiplexing (OFDM) techniques do not require line-of-sight between the transmitter and receiver. Indoor customer premises equipment (CPE) consisting of an indoor antenna, transceiver, and modem can be designed as a single, integrated unit which the subscriber can install himself or herself by simply plugging it into a power source and into a terminal which may be a residential VoIP telephone, a computer (via an Ethernet cable) or a public payphone. (See Figure 23) A system like the one illustrated in Figure 22 today costs less than US\$ 50,000 including a base station and remote network management and control functions. The CPE costs in the order of US\$ 200 – 250²³². The backhaul capacity required depends on the number of customers, the traffic type (continuous such as in business uses or bursty such as in residential uses). For a location with 50 customers a 128 Kbps link may be enough; however, for more intense use up to a 2 Mbps (E1) link may be needed.

²²⁹ The area of Barbados is 431 km², of St Lucia, 616 km² and of Belize, 23,000 km².

²³⁰ WiMAX is a wireless metropolitan network (MAN) technology that will provide broadband wireless (BWA) for fixed and mobile applications. WiMAX is based on the IEEE 802.16 wireless interface standard. The original version of 802.16 adopted in 2001 was a point-to-multipoint line-of-sight technology operating in the frequency range 10 to 66 GHz. WiFi standard IEEE 802.11b can support transmission speeds of up to 11 Mbps. The more recent version, IEEE 802.16a, is designed for fixed applications, operates in the frequency range 2 - 11 GHz and does not require that there be a line-of-sight between the base station and the user (NLOS). IEEE 802.16d offers a range of up to 50 km with typical cell radii of 6 to 10 km. and will offer variable channel sizes from 1.25 to 20 MHz. IEEE 802.16e, which is currently being developed, will allow for limited mobility (20 to 100 kph) and will operate in licensed bands in the 2 – 6 GHz range and is now foreseen for deployment in 2007/8.

²³¹ Other such pre-WiMAX and WiMAX systems operate in the 3.5 and 5.8 GHz bands

²³² Likely to drop below US\$ 200 by mid 2006

Figure 22
BWA Access with Satellite Transport

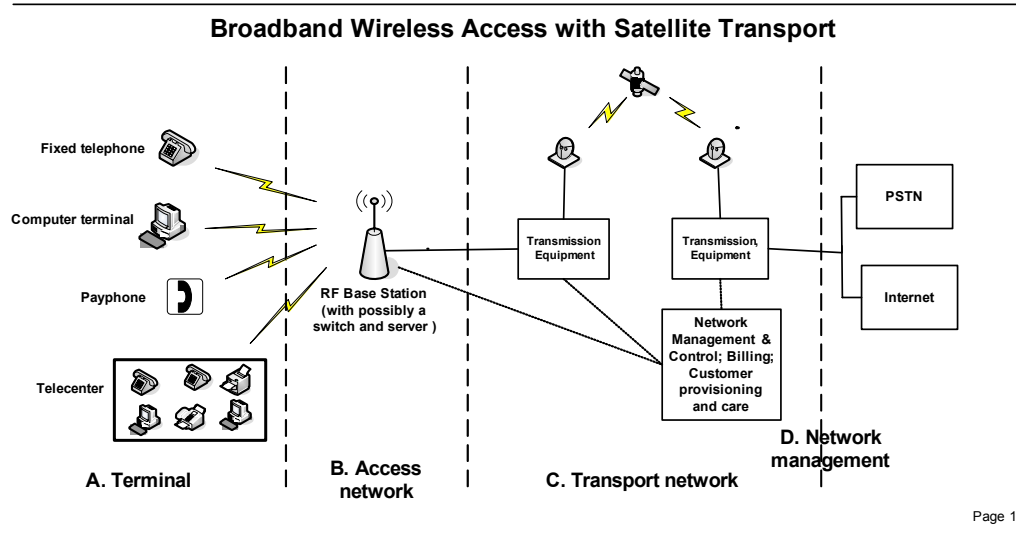


Figure 23
Pre WiMAX: Indoor Customer Premises Equipment (CPE) Containing an Antenna, Transceiver and Modem.

c. WiFi²³³ for providing local access and transport

Another access solution is the deployment of a cluster of WiFi hotspots covering a whole area of a community. Each hotspot can provide coverage within a radius of a few hundred meters of a WiFi base station. In Minnesota Maple Leaf Networks (www.mleaf.net) has built a network in and around the town of Harmony, Minnesota covering an area of nearly 200 km² using 12 WiFi Meshboxes supplied by LocustWorld (www.locustworld.com) situated on top of silos and water towers in this rural region. The capital cost of the whole network according to Maple Leaf was less than US\$ 20,000. Maple Leaf offers a 1 Mbps down/256 Mbps up service for US 30/month. An indoor (line-of-sight) CPE costs US \$ 125; an external unit costs US\$ 175. A similar network in the rural village of Sopachuy, Bolivia covers most of this village of 1,500 people with only 3 overlapping WiFi hotspots. Each WiFi transceiver/router has an individual IP address by which it can be controlled and managed by a local operator or centrally (at a location in the UK and/or USA) by the supplier. The system supports data, soft (computer based SIP) telephony and VoIP. Other suppliers/operators have deployed WiFi based networks which cover an entire city or town. Azulstar has deployed wireless mesh networks in four towns in the USA and is offering commercial WiFi Internet and VoIP services²³⁴. In March 2006 Toronto Hydro announced that it would build a city wide mesh network by putting 18,000 WiFi base stations on top of street lights and poles and connecting much of the network of base stations with its own 450 km long fibre optic cable system and offer connectivity to anyone on a commercial basis within the 630 km² area²³⁵.

An interesting variant of the WiFi mesh arrangement is its combination with solar powered streetlights where each street light carries a solar cell, an accumulator and a WiFi base station. The system which is still relatively expensive presents an interesting solution to providing both light and access in a village that has no electricity²³⁶.

Used in a point-to-point mode WiFi can also serve as a backhaul transmission link with line-of-sight ranges that can easily reach up to 20 km. depending on antenna gain and the power which can be applied to the radio which can be higher in rural areas than that which might be permitted in urban areas for the 2.4 MHz unlicensed band²³⁷. An agricultural community information system located in the Chancay–Huaral valley north of Lima, Peru uses a network of 12 WiFi backbone links (the longest of which is 10 km) operating in the 2.4 MHz frequency band to cover the

²³³ WiFi (Wireless Fidelity) is a wireless local area network (WLAN) technology based on the IEEE's 802.11 wireless interface standard. IEEE 802.11a operates in the 5 GHz band (between 5.725 and 5.850 GHz) and can support data transmission speeds of up to 54 Mbps. IEEE 802.11b operates in the 2.4 GHz band (2.4 to 2.4835 GHz) and can support data transmission speeds up to 11 Mbps in a range of up to about 300 m. in a hotspot wireless local area network (WLAN) 360° radiation configuration. When deployed in a point – to point mode IEEE 802.11b can be used for transmission links of up to 20 km. The power of the transmitter needs, however, to be increased and it has to be used in conjunction with high gain antennas. These frequency bands are unlicensed in many countries.

²³⁴ See for example: <http://www.azulstar.com>

²³⁵ Toronto Star, 7 & * March 2006

²³⁶ See www.starsightproject.com and www.kolam-partnership.com. The cost for 5,000 posts is about US\$ 20 million including the light posts, network control, billing, installation, etc.

²³⁷ The world record for an terrestrial- based unamplified WiFi point-to-point connection, achieved by a couple of students in 2005, is 124.9 miles (= 201 km) See Wired News, 2 august 2005

whole 22,000 hectare (200 km²) valley. The system is capable of providing a throughput of 1 Mbps. The installed cost for the tower, antenna, and radio equipment at each site was between US\$ 1,200 and US\$ 1,500.

In a consultation document issued in February 2005 the Spectrum Management Authority (SMA) of Jamaica proposes that ISM bands (902-928 MHz, 2.4-2.4835 GHz, and 5.725-5.850 GHz) be declared unlicensed with effect from April 1, 2005. No licence fees would be required and users would operate on a no interference/no protection basis. Licenced users in these frequency bands will be allowed to relocate if they wish and all equipment operating in these bands will need to be type approved before it is allowed into the country²³⁸. In April 2004 ISM bands 2.4-2.4835 GHz (within the owner's premises and for non commercial applications) and 5.725-5.850 GHz (within private premises and fixed point-to-point systems between sites) were declared licence free on a no interference/no protection basis in Trinidad & Tobago²³⁹.

d. Access using the 450 MHz frequency band

There has been growing interest in using the 450 MHz band and, in particular, CDMA 450 technology for rural, sub-urban and sparsely populated areas for both mobile and fixed applications. The advantages of the 450 MHz band are that (i) it permits relatively large cell sizes which makes deployment cheaper because fewer base stations are required to cover a given area as Table 25 shows, (ii) the commonality of design and commercially available standard which ensures that both the terminal and network equipment are produced in large quantities resulting in decreasing prices, and (iii) there is the possibility of deploying broadband systems that can simultaneously transmit high speed data, voice and VoIP. In-building coverage is also good in this frequency band.

There is also a 450 MHz version of GSM which has seen some limited deployment.

Table 26: Theoretical cell sizes that can be achieved using CDMA 2000 1x in the different frequency bands²⁴⁰

Frequency band (MHz)	Cell Radius (Km)	Cell Area (Km ²)	Normalized Cell Count
450	48.9	7,521	1
850	29.4	2,712	2.8
1900	13.3	553	13.6
2100	10	312	24.1

²³⁸ See Proposal for Declaring Licence-Exempt Spectrum in Jamaica, A Consultative Document, Spectrum Management Authority, Jamaica, February 2005

²³⁹ Telecommunications Division, Ministry of Public administration & Information, Free Spectrum for All, Policy on Licence Exempt Systems in the 2.4 GHz and 5.8 GHz Bands, April 2004

²⁴⁰ Response by Lucent Technologies to Questionnaire 2, usage of Lower Frequency Bands in the AP Region, 2nd Meeting of the APT Wireless Forum, Shenzhen, PR China, 5-8 September 2005

CDMA 450 in its current 2.5G version (CDMA 2000 1x Rev. A) can support about 70 voice users per base station with one carrier in each sector of a 3-sectored cell and can provide a peak data rate of up to 307.2 kbps on the downlink and 153.6 kbps on the uplink, per user. The peak data rate for the 3G version (CDMA2000 1xEV-DO) is predicted to be up to 3 Mbps on the downlink and up to 1.8 Mbps on the uplink.

In Huarochori Province, Peru small rural operator Valtron has deployed a CDMA 450 network to provide fixed access in an entire province in the Andes Mountains (5,700 sq km., 60,000 inhabitants and mountain peaks of up to 5000 m.) using only four base stations. The cost per base station is US\$ 25,000. With this network Valtron plans to offer services to about 1000 fixed telephone and 200 Internet subscribers and about 150 public payphones. It has also deployed a CDMA 2000 1x network with which it will serve up to 1000 mobile customers.

Other mature wireless local access technologies are:

- Line-of-sight multi-channel, multi-point (MMDS) and local multipoint (LMDS) distribution systems and spread spectrum systems which can support speeds of up to 38 Mbps, downlink, and 10 Mbps uplink speeds. MMDS (or MCS) operates in the 2.4 GHz band. LMDS, which operates in a much higher frequency band (26 GHz), is much more susceptible to attenuation as a result of rain limiting the scope for licencing; and
- Geostationary and low earth orbit satellite systems supporting speeds of up to 2 Mbps in the downlink and 384 Kbps in the uplink; Other technologies in this category, currently under development, will have the effect of increasing the amount of spectrum available for various fixed and mobile applications including broadband local access.

Newer wireless access technologies currently under development include Ultra Wide Band (UWB), Smart antennas, Agile or Cognitive Radios, and Software Defined radios (SDR)²⁴¹.

The following two sections elaborate on the two most prominent transport technologies used today in the Caribbean to connect local access networks to the global switched telephone network and the Internet:

IV.2.3 Fibre optic backbone networks

a. Existing systems

There are currently 21 fibre optic submarine cable systems in the Caribbean. Of these thirteen primarily serve the region. The other six serve other regions (mainly South America) but have landing points in the Caribbean. (See Figure 25 and Table 26). The combined total capacity of the thirteen “Caribbean” cables at the time of their construction was about 70 Gbps. Their combined potential capacity, however, is nearly 3 Terabits/second (Tbps) due largely to the huge potential capacity of ARCOS cable system.

²⁴¹ Ultra Wide Band (UWB) is a newer technology based on spread spectrum, designed to operate over a very large band with very low power just below the noise floor so as not to interfere with other signals which may also be using the same frequency band but with signal strengths well above the noise floor. UWB uses the spectrum very efficiently and offers good transmission qualities because it eliminates multipath signal distortion and can easily penetrate walls. Smart antennas, can determine where signals are coming from and are also good at suppressing interference and multipath signal distortion. For example, devices are being developed that can distinguish two signals depending on the angle of arrival allowing satellite and terrestrial systems to operate at the same time in the same frequency band. Agile or cognitive radios can identify frequencies that are not being used at a particular moment in time, use these frequencies to transmit signals for as long as they remain unused and, when they sense that another radio is trying to use this particular frequency, hop to another unused frequency; and Software defined radios (SDR) are multimode, multi-band devices which operate using different technologies and different frequency bands. An example of a SDR is a mobile radio that operates equally in a GSM or a CDMA environment irrespective of the frequency at which each may operate. GSM/WiFi are other types of SDR devices which are currently being developed and deployed.

²⁴² WiFi (Wireless Fidelity) is a wireless local area network (WLAN) technology based on the IEEE's 802.11 wireless interface standard. IEEE 802.11a operates in the 5 GHz band (between 5.725 and 5.850 GHz) and can support data transmission speeds of up to 54 Mbps. IEEE 802.11b operates in the 2.4 GHz band (2.4 to 2.4835 GHz) and can support data transmission speeds up to 11 Mbps in a range of up to about 300m. These frequency bands are unlicensed in many countries. WiMAX is a wireless metropolitan network (MAN) technology that will provide broadband wireless (BWA) for fixed and mobile applications. WiMAX is based on the IEEE 802.16 wireless interface standard. The original version of 802.16 adopted in 2001 was a point-to-multipoint line-of-sight technology operating in the frequency range 10 to 66 GHz. The more recent version, IEEE 802.16a, is designed for fixed applications, operates in the frequency range 2 - 11 GHz and does not require that there be a line-of-sight between the base station and the user. 802.16 offers a range of up to 50km with typical cell radii of 6 to 10 km. And will offer variable channel sizes from 1.5 to 20 MHz. IEEE 802.16e which is currently being developed will allow for limited mobility (20 to 100 kph) and will operate in licensed bands in the 2 – 6 GHz range. A proposed 802.20 standard (Mobile Fi) will permit greater mobility (up to 250 kph) and will operate in the licensed bands below 3.5 GHz. The 2003 World Radio Conference (WRC) agreed to allocate 455 MHz of spectrum in the bands 5.15 to 5.35 GHz and 5.47 to 5.725 GHz for wireless access systems.

²⁴³ The FCC has authorized UWB above 3.5 GHz in 2002 and in early 2005 the Canadian Government was conducting a consultation on developing an appropriate regulatory framework in Canada for UWB, See Industry Canada, Consultation Paper on introduction of Wireless Systems Using Ultra-wideband Technology, SMSE-002-05, February 2005. See also Reynolds, Taylor, Background Paper: Advanced Wireless Technologies and Spectrum Management, Workshop on Radio Spectrum Management for a Converging World, International Telecommunication Union, Geneva, 16 - 18 February, 2004.

²⁴⁴ Motorola (MP) and Nokia (Communicator 9500) are dual mode GSM/WiFi handsets. SonyEricsson is also understood to be developing multimode devices which incorporate WiFi.

²⁴⁵ See Proposal for Declaring Licence-Exempt Spectrum in Jamaica, A Consultative Document, Spectrum Management Authority, Jamaica, February 2005

²⁴⁶ Telecommunications Division, Ministry of Public administration & Information, Free Spectrum for All, Policy on Licence Exempt Systems in the 2.4 GHz and 5.8 GHz Bands, April 2004

While the existing and potential capacity is enough to serve the needs of the region not all countries have equal access to these. Of the 25 countries and territories listed in Table 27 more than half have access to only one cable system, which for nine of them is the older (1995) Eastern Caribbean Fiber System (ECFS). In the other countries, where more than one cable lands users may not have many options because a single operator has the landing licences for all of them. This is the case in Trinidad & Tobago where the fixed line monopoly, TSTT, has the landing rights for the Americas-1, Americas-2, and ECFS cable systems. Only in Puerto Rico and the U.S. Virgin Islands is there competition among cable owners.

Limited access to these systems results in higher prices for bandwidth capacity. Even though many of these cables are owned by a consortium of operators and a member of a consortium may have capacity up to a cable landing point, he will find it difficult to offer a full (end-to-end) cable circuit at competing prices because the cost for leasing the local loop between the cable landing station and the customer's premises may be prohibitive. One such operator was not able to make a competing offer for an international E1 link to a potential client because the E1 local loop needed to complete the domestic connection in Trinidad & Tobago was quoted to him at US \$ 25,000/month by the local monopoly.

Following the construction of the ARCOS and Global Crossing (Mid and South Atlantic and Pan American) and Cable Systems in 1999 and 2000 and the Bahamas Internet Cable System in 2001 no new cable systems were built until 2005. The SMITCOMS²⁴⁷ (Sint Maarten International Telecommunications Services Limited) St. Martin to Puerto Rico Cable System (SMPR-1) which connects St Martin to the ARCOS cable in Puerto Rico was inaugurated in March 2005 and on 31 March 2006 the FibrLink Submarine Fibre Network, which connects Kingston, Jamaica to the ARCOS cable landing station in Puerto Plata in the Dominican Republic, was put into service.

²⁴⁷ SMITCOMS, owned by the Island Territory of Dutch St. Maarten was officially established on May 10, 2000 to provide international telecommunication services on the Island of St. Maarten.

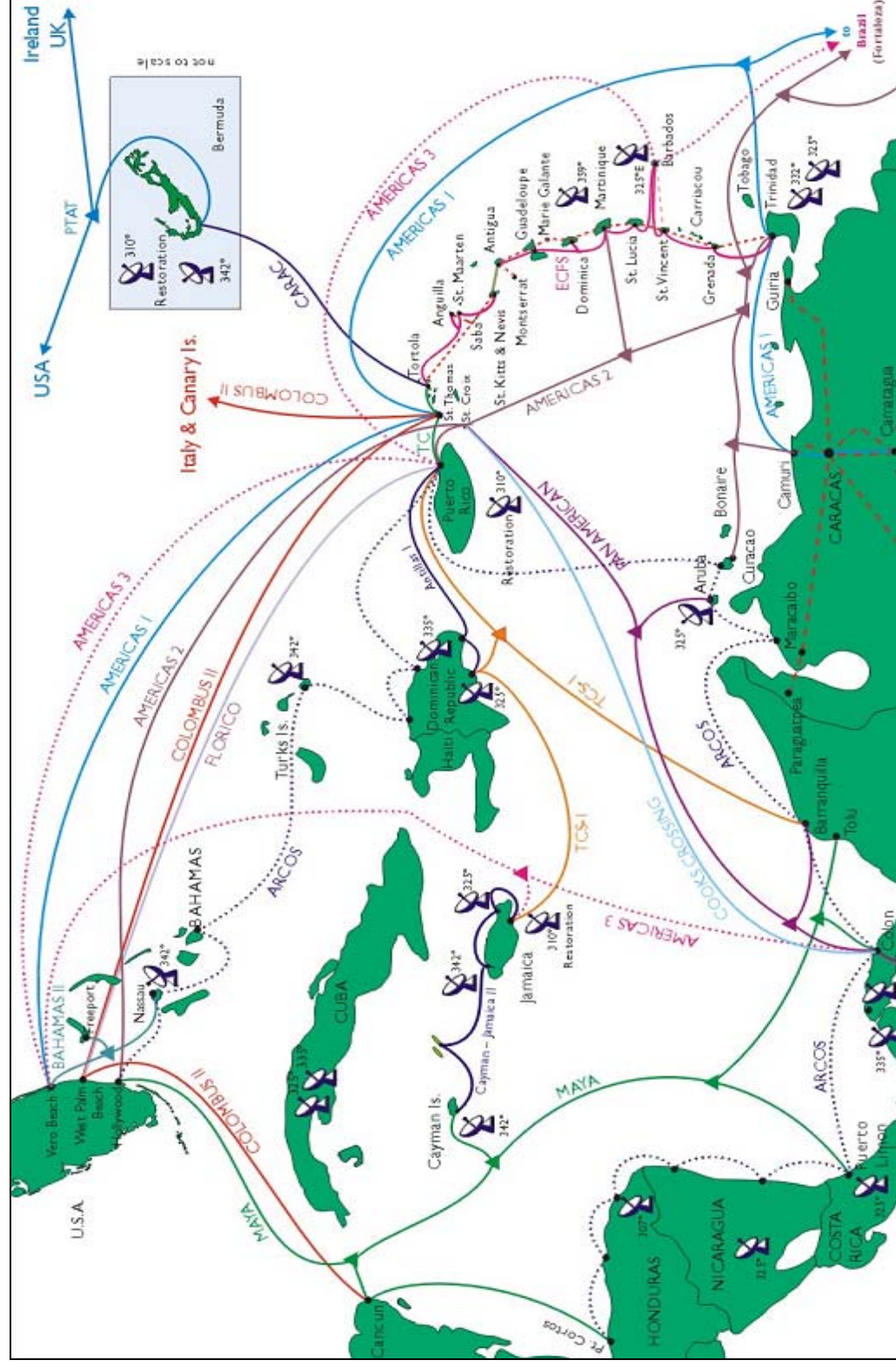


Figure 24
Caribbean Fibre Optic Cable Systems²⁴⁸

²⁴⁸ The ARCOS cable system continues (not shown on the map) on from Puerto Cortes in Honduras to Puerto Barrio, Guatemala, Belize City in Belize, Cozumel and Cancun in Mexico and to Hollywood Florida. The newest cables, SMITCOMS and FibrA-link are also not illustrated.

Table 27: Caribbean Fibre Optic Cable Systems (Status March 2006) (Primarily Caribbean cables are shaded)

	Year	Caribbean Landing Points	Interconnection with Other Cable Systems	Ownership	(Minimum – potential)
Alonso de Ojeda	1999	Aruba (Baby Beach), Curacao (Willemstad)	Amerigo Vespucci; Americas-2; Pan American	Consortium of Operators	20 GBps
Americas-1	1994	Trinidad (Macqueripe); US Virgin Islands (Magens Bay, St Thomas)	Americas-2; Eastern Caribbean Fibre System; Taino-Caribe; Atlantis-2; Pan American; Colombus-2	Consortium of Operators	1.12 – 1.68 GBps
Americas-2	1999	US Virgin Islands (St Croix); Puerto Rico; Curacao; Martinique; Trinidad (Changuaramas); French Guyana; Surinam via French Guyana; Guyana via French Guyana and Suriname	Americas-1; Antillas-1; Eastern Caribbean Fibre System; Taino-Caribe; Atlantis-2; Pan American; Colombus-3; MAC; Arcos-1; Maya; TCS-1	Consortium of Operators	80 GBps
Antillas-1	1997	Dominican Republic (Cacique, Punto Cana); Puerto Rico (San Juan, Isla Verde)	Americas-2; Arcos-1; TCS-1	Consortium of Operators	622 MBps – 3.7 GBps
Amerigo Vespucci (1999)	1999	Curacao (Willemstad); Netherlands Antilles (Bonaire)	Alonso de Ojeda; Americas-2; Pan American	Antelecom	15 GBps
Arcos-1	2000	Puerto Rico, Bahamas, Turks & Caicos, Dominican Republic, Curacao, Belize,		Columbus Communications	15 GBps (SDH) – 2.56 TBps (WDM)
Bahamas II	1997	Bahamas (Eight Mile Rock, Freeport, and Nassau)	CARAC, BICS	Consortium of Operators	5 GBps
Bahamas Internet Cable System (BICS)	2001	Bahamas (Boca Raton Florida, Freeport, Grand Bahamas, New Providence, Abaco and Eleuthera)	CARAC, Bahamas II	Private: Cable Crossings a wholly owned subsidiary of Cable Bahamas Ltd.	
Caribbean Atlantic (CARAC)	1990	British Virgin Islands (Tortola, Chalmell)	Atlantica-1, BUS-1, MAC, PTAT, ECFS, Taino-Caribe	Private C & W	420 MBps
Cayman Jamaica Fibre System (CJFS)	1996	Cayman Is. (Grand Cayman, Cayman Brac); Jamaica (Montego Bay, Kingston, Ocho Rios, Port Antonio)	MAC, TCS-1, Maya-1	Private: C & W (Cayman Islands); C&W (Jamaica)	2.5 – 10 Gbps
Eastern Caribbean Fibre System (ECFS)	1995	Anguilla, St Martin, St Kitts, Montserrat, Antigua, Dominica, Guadeloupe, Martinique, St Lucia, Barbados, St Vincent, Grenada, Trinidad & Tobago	Americas-1, Americas-2	Consortium of Operators incl. C & W	2.5 Gbps

System	Year	Caribbean Landing Points	Interconnection with Other Cable Systems	Ownership	Capacity (Minimum – potential)
Emergia		Puerto Rico (San Juan)		Consortium of Operators Telefónica 96 % Tyco 4 %	40 Gbps – 1.92 TBps
FibraLink	2006	Kingston, Ocho Rios, Montego Bay Jamaica, Puerto Plata Dominican Republic	ARCOS	Private, Columbus Communications	160 Gbps
Maya-1	1999	Cayman Islands (Half Moon Bay)	CJFS, MAC	Consortium of Operators	5 Gbps
Mid Atlantic Crossing (MAC)	2000	US Virgin Is. (St. Croix)	Pacific Crossing, Pan American	Private Global Crossing	20 – 80 Gbps
Pan American	1999	US Virgin Islands (St Croix, St Thomas); Aruba	Alfonso de Ojeda; Americas-1; Americas-2; PAC; MAC; SAC-1; Taino Caribe	Consortium of Operators	5 Gbps
South American Crossing (SAC-1)	2000	US Virgin Islands (St Croix)	Pan American Crossing (PAC)	Private Global Crossing	40 GBps – 1.28 TBps
Pan American Crossing (PAC)	2000	US Virgin Islands (St Croix);	South American Crossing (SAC-1), Mid-Atlantic Crossing (MAC), Pacific Crossing (PAC 1)	Private Global Crossing	20 GBps – 80 GBps
Taino Caribe	1992	Puerto Rico (Miramar, Isla Verde); US Virgin Islands (Magens Bay, St Thomas); British Virgin Islands (Chadwell, Tortola)	CARAC; Americas-1; Americas-2; Pan American; PAC; MAC; SAC-1	Consortium of Operators incl C & W	565 Mbps
Trans Caribbean System (TCS-1)	1991	Jamaica, Puerto Rico, Dominican Republic	Americas-2, Colombus-2, Arcos-1, Antillas-2, Taino-Carib, Pan American, CJFS	Consortium of Operators	560 MBps – 840 MBps
SMITCOMS SMPR-1	2005	Sint Maarten – Puerto Rico	ARCOS - 1	Island Territory of Sint Maarten – Government of Sint Maarten	

Table 28: Number of Fibre Optic Cable Systems which Land in Each Country and Territory

Country/Territory	No. of cables	Cable systems landing in country or territory
Anguilla	1	ECFS
Antigua & Barbuda	1	ECFS
Aruba	2	Pan American, Alfonso de Ojeda
Bahamas	3	Arcos-1, Bahamas II, Bahamas Internet Cable System (BICS)
Barbados	1	ECFS
Belize	1	Arcos-1
British Virgin Islands (Tortola) - BOT	2	CARAC, Taino
Cayman Islands (BOT)	2	CJFS, MAC
Curacao (incl. Bonaire)	3	Amerigo Vespucci, Americas-2, Alfonso de Quejeda
Dominican Republic	4	Antillas-1, Arcos-1, TCS-1, FibraLink
French Guyana	1	Americas-2
Grenada (OECS)	1	ECFS
Guyana	1	Americas-2 via French Guyana and Suriname
Jamaica	3	CJFS, TCS-1, FibraLink
Martinique/Guadeloupe	2	Americas-2, ECFS
Montserrat (BOT)	1	ECFS
Puerto Rico	7	Americas-2, Antillas-1, Arcos-1, Emergia, Taino, TCS-1, SMITCOMS
St. Kitts & Nevis	1	ECFS
St. Lucia (OECS)	1	ECFS
St. Martin/St. Maarten	3	ECFS, SMPR-1, SMITCOMS
St. Vincent (OECS)	1	ECFS
Suriname	1	Americas-2 via French Guyana
Trinidad & Tobago	3	Americas-1, Americas-2, ECFS
Turcs & Caicos (BOT)	1	Arcos-1
US Virgin Islands (St. Croix, St. Thomas)	7	Americas-1, Americas-2, Pan American, PAC, MAC, SAC-1, Taino

On
the

Jamaican side FibraLink is part festoon and part terrestrial link connecting Kingston, Ocho Rios and Montego Bay (See Figure 26). The technology used is Dense Wavelength Division Multiplexing (DWDM)²⁴⁹ with an initial capacity of 40 Gbps and a design capacity of 160 Gbps. FibraLink Jamaica, the owner and operator of FibraLink is indirectly owned by Columbus Communications Inc. which also has a controlling interests in Cable Bahamas, the Bahamian cable TV operator, New World Networks which owns 92% of the ARCOS cable system, Columbus Communications Trinidad, the cable TV operator, and Merit Communications a Jamaican Broadband operator. FibraLink was one of two companies awarded cable landing licences in Jamaica in December 2004²⁵⁰.

²⁴⁹ Dense wavelength division multiplexing (DWDM) is a fiber-optic transmission technique that employs light wavelengths to transmit data parallel-by-bit or serial-by-character.

²⁵⁰ See Jamaica Gleaner, 11 January 2005 and cable Bahamas Press Release, "Caribbean Crossings Subsidiary awarded Jamaica Telecommunications Licence", 21 December 2004. The other company awarded a licence is Trans-Caribbean Cable Company, a consortium of 38 companies.

Figure 25
FibraLink Submarine Fibre Network



The cable system has been built with a branching unit (BU) off Haiti. This will Haiti to be connected when the necessary permits and financing have been obtained.

Also under construction and partially completed (as of April 2006) is the Bahamas Domestic Submarine Cable Network (BDSNi) which will connect New Providence to Inagua via Andros, Exuma, Long Island and Ragged Island (Phase I) and Inagua to New Providence and Mayaguana, San Salvador, Rum Cay, Cat Island, Eleuthera, Abaco and Grand Bahama in Phase II planned to be completed by June 2006. The repeaterless 2,800 km cable system has been constructed and is owned by Bahamas Telecommunications Company Ltd. (BTC) and is being installed by Tyco Telecommunications of New Jersey. It will have a design capacity of 1.92 Tbps.

b. Systems currently under construction

Antilles Crossing, LP (<http://www.antillescrossing.com>) a joint venture between Leucadia National Corporation²⁵³ and Light & Power Holdings Limited of Barbados²⁵⁴, announced a plan to construct a 939-kilometre, 30 Gbps (expandable to 80 Gbps) twin fibre cable from

²⁵¹ See Jamaica Gleaner, 11 January 2005 and cable Bahamas Press Release, "Caribbean Crossings Subsidiary awarded jamaica Telecommunications Licence", 21 December 2004. The other company awarded a licence is Trans-Caribbean Cable Company, a consortium of 38 companies.

²⁵² Dense wavelength division multiplexing (DWDM) is a fiber-optic transmission technique that employs light wavelengths to transmit data parallel-by-bit or serial-by-character.

²⁵³ A NYSE-listed company and which until December 2005 owned WiTel Communications Group, Inc., one of the largest broadband network operators in the USA.

²⁵⁴ Holding company of The Barbados Light & Power Company, which is listed on the Barbados Stock Exchange.

Needham's Point, Barbados to Ham's Bay in St. Croix in the U.S. Virgin Islands with a spur into Saint Lucia and from there via microwave links to Dominica, Martinique, St. Vincent and Grenada. (See Fig. 27) In St. Croix the cable will be collocated with the facilities of Global Crossing interconnecting with this system's world-wide network including connections to the NAP of the Americas in Miami, Florida or to one of three teleports in the New York City region.

It is expected that the company will commission the cable for commercial use during the second quarter of 2006. The project has been fully-financed by equity contributions from Leucadia, Light & Power Holdings and the management group. It has received the required cable landing licences in the US Virgin Islands, Barbados and St. Lucia.

Eventually the company hopes to complete loops running from Barbados through Tobago, Trinidad, Grenada and St. Vincent to Saint Lucia (Southern Ring) and another loop from Saint Lucia through Martinique, Dominica, Guadeloupe and St. Kitts to St. Croix (Northern Ring) in Phases 2, 3 and 4²⁵⁵. (See Figure 28) Until these two loops are completed it is proposed to provide redundancy via earth stations in St. Lucia and Barbados. Antilles Crossing has received a draft offer of licence from the Telecommunications Authority of Trinidad and Tobago and upon receipt of all regulatory and environmental clearances plans to construct Phase Two in 2006.

Inter alia, the company proposes to provide bandwidth leases from T1/E1 through to STM1, voice (international inbound and outbound voice, direct access, local transport including origination and termination, toll free, calling card, VoIP termination) and data services, IP VPN services including ATM, Frame Relay, and IP Transit and a number of business services including web hosting, data storage, and collocation.

Antilles Crossing's domestic affiliate, TeleBarbados Inc. will provide a similar suite of services through a hybrid fibre optic and fixed wireless network in Barbados in the second quarter of 2006.

Figure 26
Proposed Antilles Crossing Fibre Optic Cable System (Phase 1)



Source <http://www.antillescrossing.com>

²⁵⁵ The company has been offered a licence in Trinidad & Tobago

To take full advantage of the high capacity offered by undersea fiber optic cable systems a user has to be linked to the cable landing point by a fibre optic cable or other high speed system such as a microwave backhaul system. Where such local loops, tails or backhaul facilities are not available or too expensive an alternative is connection by geostationary satellite systems²⁵⁶.

Figure 27
Proposed Antilles Crossing Fibre Optic Cable System (Subsequent Phases)



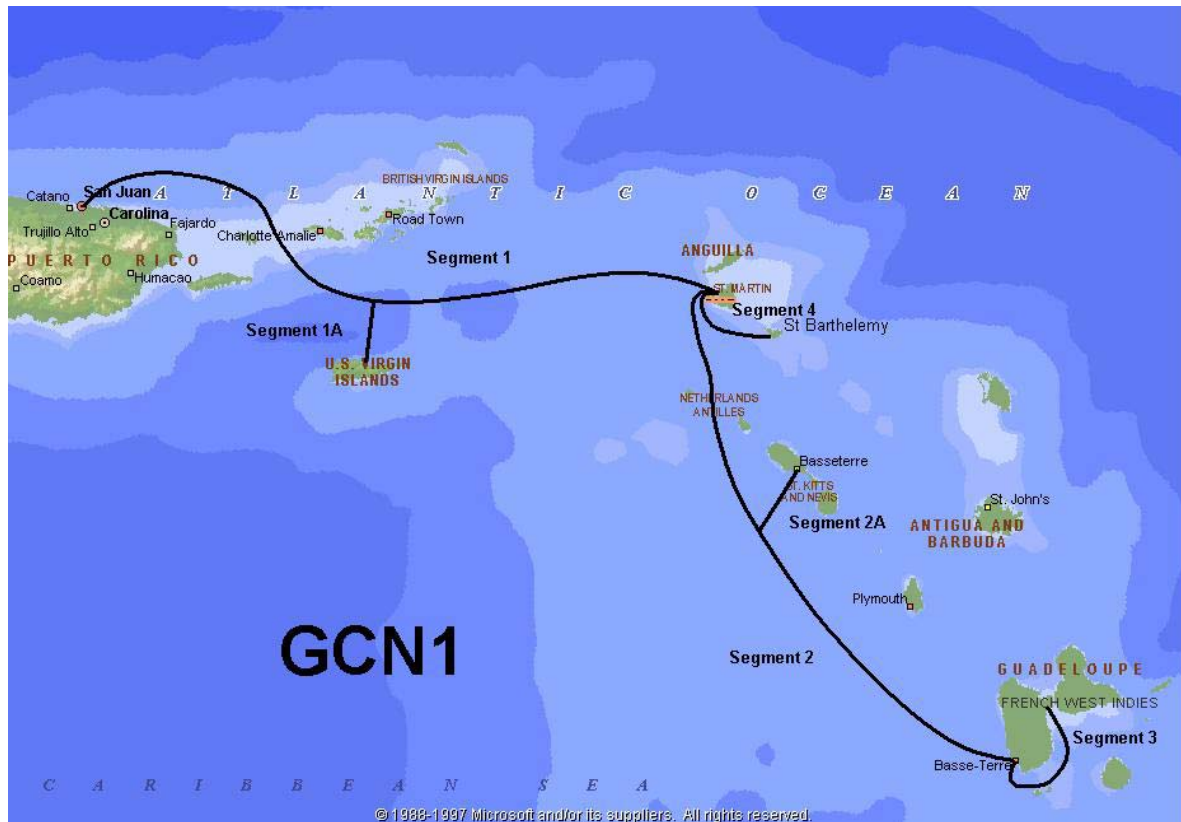
Source <http://www.antillescrossing.com>

Global Caribbean Network (GCN), (<http://www.globalcaribbean.net/index.htm>) an initiative of Region Guadeloupe, the regional government of Guadeloupe and some private investors. The northern section of the 1 TBps GCN cable is currently (February – March 2006) under construction. It will connect Guadeloupe with St. Croix and Puerto Rico and land in St. Kitts (branch) and St. Martin (See Fig. 29). The St. Croix – Puerto Rico segment is being built by Centennial one of the partners in the project. A planned southern section will connect Martinique, Dominica (branch) and eventually Trinidad & Tobago.

The € 21.9 million project is 75% publicly funded with € 7 million coming from the Region Guadeloupe, €9.4 million from the European Union (FEDER) and the rest from the private sector partners which include Groupe Loret, AT&T, Alcatel, Centennial and Global Crossing.

²⁵⁶ Even if an alternate operator has landing rights and can offer a full circuit to the cable station it still needs to lease a local loop. In the past the cost of such local loops have been prohibitively expensive even if they have been only a few km in length.

Figure 28
Northern Section of Global Caribbean Network (GCN)



c. Proposed systems

The following cable systems have been announced during the past 2 or 3 years; however, given the significant capital requirements and risks inherent in these projects it is very difficult to predict whether they will be built.

The *Trans-Caribbean Cable Network (TCCN)* (www.trans-caribbeancable.com) is a project of Trans-Caribbean Cable Company (TCCC) which had proposed to build, operate, and maintain a cable system with a current configuration connecting the NAP of the Americas in Miami with Port au Prince, Haiti, Jamaica and the Dominican Republic at Santo Domingo where it was to connect to existing systems and at least one of the planned Eastern Caribbean cables, (the Eastern Caribbean-1 and Win-1 systems' in Figure 30). Later the cable was to be extended to Aruba, Venezuela and Colombia. TCCC as a neutral operator and operate would own and/or control each landing station guaranteeing each subscriber of leased capacity equal access, collocation and other services in each station. The TCCN Memorandum of Understanding was signed by 61 companies including some of the incumbents and new entrants in the countries where it was planned to land the cable. In December 2004 TCCC was awarded a submarine cable landing licence along with FibraLink in Jamaica and had said that the system would be operating in early 2006.

Figure 29
Proposed Trans-Caribbean Cable Network



Source: <http://www.trans-caribbeancable.com/index.html>

Eastern Caribbean Fibre Optic Cable System (EC-1), an initiative of *Island Fibre* of St. Martin (www.islandfibre.com), was planned to be a 1,872 kilometers unrepeated 6 fiber pair submarine fiber optic cable system with an initial design capacity of 10 Gigabits per second (Gbps) and a maximum potential capacity of 1.92 Terabits per second (Tbps)²⁵⁷ connecting, Trinidad, Grenada, St. Vincent, Barbados, St. Lucia, Martinique, Dominica, Guadeloupe, Antigua, St. Kitts, St. Maarten, British Virgin Islands, and Puerto Rico (See Figure 31). The cost of the project was estimated to be US\$ 130 million.

²⁵⁷ Realized through 6 fibre pairs x 32 wavelength channels (Wave division Multiplexing) x 10 Gbps/wavelength

Figure 30
Projected Eastern Caribbean-1 Fibre Optic Cable System



Source: www.islandfibre.com

Eighteen companies originally signed the MOU which established *Island Fibre*. Most were new entrants on the twelve islands along the fibre route from Puerto Rico to Trinidad & Tobago (Antigua (APUA); Barbados (Sunbeach and Digicel); Dominica (Marpin); St. Martin (Dauphin, SMITCOMS); Trinidad & Tobago (Illuminat, CCTT)) and were expected to contribute about US\$ 13 million in equity to the project. By the end of 2004 *Island Fibre* had obtained landing licences in Barbados, Puerto Rico, Martinique, Guadeloupe and St. Martin and was expecting to receive licences from OECS member countries, Dominica, Grenada, St. Kitts, St. Lucia and St. Vincent.

It had originally planned to begin construction by mid 2004 (with an RFS date in 2006) and had discussed financing the project with the IADB and the European Investment Bank. The latter it was understood had been expected to provide about 35 % of project costs with a 12-year loan. An additional 20 % was expected to come from vendor financing²⁵⁸.

In addition to providing capacity (IRUs and leases) to operators, service providers and users, *Island Fibre* planned to make capacity available to connect schools, universities, as well as research and development, health and medical facilities in the Eastern Caribbean. It had also planned to provide connectivity to the Ampath high speed R&D network in Florida.

²⁵⁸ Telecom Finance Issue 117, 13 October 2004

It is understood that the EC-1 initiative may have been superseded by the Global Caribbean Network project with which certain relationships had been established..

Win-1 was planned to be an 8 fibre pair, self healing cable ring using SDH/SONET multiplexing technology with an initial total capacity of 5-10 Gbps expandable to 1.28 Tbps with a total length of 3,000 km running down the Eastern Caribbean and connecting Jamaica. *Win-1* service offerings were to have included the sale or lease of: T1, E1, STM-64, and OC-192 capacity interfaces, Lambda Wavelengths, and dark fibre and the sale of minutes of traffic and connectivity for ISPs. Like Island Fibre, Win-1 had discussed financing with the IADB. This project has probably been abandoned.

United Telecommunications Services (UTS).of Curacao has been contemplating building short links from St. Martin to Anguilla, Saba and Stacia and from Curacao to Aruba.

IV.2.4 Satellite systems

Satellites can provide both backhaul (backbone) and local loop facilities.

Satellite operators offer up-stream connectivity to the Internet to ISPs and others either through two way links which includes IP Transit or through a one way link, typically with the return (higher capacity) via satellite²⁵⁹. As backhaul the maximum capacity that a satellite transponder offers is typically 36 MHz of bandwidth (approximately 18 E1s); however, newer satellite systems can offer up to 72 MHz of bandwidth²⁶⁰.

The same satellite operators also offer high speed local services directly to end users. For example, *Hispasat*, the Spanish satellite operator, offers a bi-directional Internet access service with down-link speeds of 2,048 Mbps and up-link speeds of 256 Kbps to up to 50 terminals, each connected to one or several PC's via local wired or wireless (e.g. WiFi) links for about US \$43,000 a month or US \$ 861/terminal²⁶¹. The onetime purchase price of a terminal is about \$2,500. While relatively expensive such satellite based solutions present certain advantages in the remote areas where there are no other wireline or wireless alternatives.

There are currently 34 geostationary satellite systems with a footprint over the Caribbean. These have a combined total transmission capacity of 55.8 GHz which is evidently not all available for all countries and territories in the Caribbean. (See Table 28). These systems are used to provide a variety of services including: basic telephone service; wideband services including Internet access; virtual high speed private networks for voice, fax, data, and video; advanced services such as video conferencing, tele-education, tele-medicine, etc; and direct-to-home television and radio and other broadcast services.

Geostationary satellite systems have a number of desirable features, including: i) rapid deployment of new networks and services; ii) total and immediate coverage of large areas; iii) cost which is independent of distance; and iv) ideal for point-to-multipoint applications such

²⁵⁹ Sometimes where traffic is asymmetric a satellite link is used for the direction with lighter traffic flow and a fibre optic cable link for the direction

²⁶⁰ Hispasat 1 D Will offer bandwidth capacities of 33, 36, 48, 50, 54, and 72MHz

²⁶¹ An alternative service offered by *Hispasat* is a 2,048 Kbps/512 Kbps down/up link for up to 100 terminals at US \$ 53,700 or US \$ 537/terminal.

as broadcasting. Their disadvantages, however, are: i) the price of leases on satellites is higher than on fiber optic cable systems; ii) transmission via satellites suffers delays (latency) because of the considerable distance between the satellite and earth which is undesirable for certain applications; iii) the maximum bandwidth is limited by the capacity of the satellite transponder which is usually 36 MHz or 40 MHz. Fiber optic cable systems do not have such limitations. Table 29 compares fibre optic and satellite systems.

The Global Broadband Satellite Infrastructure (GBSI) Initiative of the Director General of the International Telecommunications Satellite Organization (ITSO), presented within the framework of the World Summit on the Information Society (WSIS), addresses some of the disadvantages of using satellite systems especially the higher prices associated with their use. (See Box 8). The GBSI Initiative was endorsed by the Geneva phase of the WSIS and tries to facilitate the creation of a mass market for satellite broadband services, through a joint initiative of governments and the private sector addressing specific issues related to: (i) the use of spectrum and orbital resources; (ii) standardization; and (iii) market access and would involve the:

- identification of frequency bands for consumer-oriented satellite broadband communications available worldwide and interference-free.
- use of an open transmission standard for the end-user equipment and
- development of common regulatory principles to facilitate the establishment of a worldwide market.

The specific service parameters targeted by this initiative, which are designed to improve participation in the global market for ICT-enabled services by developing countries and countries with economies in transition are:

- Reduced user terminal size (approximately 50 cm).
- Simple and affordable user terminal (less than \$150).
- Uplink: at least 128 Kbps.
- Downlink: at least 2 Mbps.
- Monthly subscription rates: equivalent to terrestrial broadband technologies.

A Memorandum of Understanding (the GBSI MoU) signed by a number of key industry stakeholders²⁶² on during 2004 and 2006 recognizes that a single, open and global standard for satellite broadband communications is an important factor for affordable broadband services. Signatories also recognize the importance of a harmonized and simplified regulatory regime as well as the benefits which would result from the identification of a small portion of spectrum (from the spectrum already used by the satellite operators) for satellite broadband services.

²⁶² Arabsat; Asiasat; Eutelsat; Hispamar Satellites; Hispasat; Intelsat; Intersputnik; New Skies Satellites; PanAmSat; Rascom; Star One; SES Global; SES Americom; Thuraya; Hunsat; Telespazio; Alcatel Space; EADS Astrium; EMS Technologies; Hughes Network Systems; Nera Satcom; Viasat; Telekomunikacja Polska; Cabase; ECOM-LAC; ASMS Task Force; ESOA; and SATNEX.

In June 2005 the GBSI Initiative was included in the International Telecommunications Union's "Connect the World" initiative, whose goal is to connect all communities notably in developing countries by 2015.

Table 29: Satellites with Footprints over the Caribbean

Operator	Satellite	Number of equivalent 36 MHz transponders			Total Capacity (MHz)
		C Band*	Ku Band**	Total	
Hispamar	Amazonas 1	19	32	51	1,836
Hispasat	Hispasat 1C		24	24	864
	Hispasat 1D		28	28	1,008
Horizons	Horizons-1		24	24	864
Intelsat	IS-801	64	12	76	2,736
	IS-805	36	6	42	1,512
	IS-903	76	22	98	3,528
	IS-905	76	22	98	3,528
Loral Skynet	Telstar 5	24	24	48	1,728
	Telstar 6	24	24	48	1,728
	Telstar 7	24	24	48	1,728
Nahuelsat	Nahuel 1		27	27	972
Panamsat	Brasilsat A1	24		24	864
	Galaxy 10R	24	24	48	1,728
	Galaxy 11	24	36	60	2,160
	Galaxy 3C	24	24	48	1,728
	Galaxy 3R	24	24	48	1,728
	Galaxy 4R	24	24	48	1,728
	Galaxy 5	24		24	864
	Galaxy 6	24		24	864
	Galaxy 9	24		24	864
	HGS-1	28	24	52	1,872
	PAS-1R	36	36	72	2,592
	PAS-3	25	25	50	1,800
	PAS-5	24	24	48	1,728
	PAS-9	24	24	48	1,728
Satmex	Solidaridad 2	24	24	48	1,728
SES Americom	AMC-1	24	24	48	1,728
	AMC-10	24		24	864
	AMC-2	24	24	48	1,728
	AMC-3	24	24	48	1,728
	AMC-4	24	32	56	2,016
	Satcom C3	24		24	864
	Satcom C4	24		24	864
TOTAL		120	80	200	55,800

* 4/6 GHz bands

** 11/14 and 12/14 GHz bands

Table 30: Fibre Optic Cable vs. Satellite Systems

Item	Fibre optic cable systems	Satellite systems
Technologies and characteristics	<p>PDH (Plesisynchronous Digital Hierarchy) is a first generation digital technology for high capacity systems.</p> <p>SDH (Synchronous Digital Hierarchy) is a more advanced technology for high speed transmission of digital signals using synchronous multiplexing based on byte instead of bit (as PDH) interleaving and providing for multiplexing structures from 64 kbps to the primary rates of 1,544 kbps (T1) and 2,048 kbps (E1).</p> <p>DWDM (Dense Wavelength Division Multiplexing) a more advanced a fiber-optic transmission technique that employs light wavelengths to transmit data parallel-by-bit or serial-by-character.</p>	<p>Geostationary satellite systems circulating in a distance of 36,000 km above earth transmitting in the following two bands:</p> <p>C Band between 3,925 and 6,425 GHz.</p> <p>Ku Band between 12.0 and 14.0 GHz.</p>
Capacity	Currently the potential capacity of the latest generation submarine cable systems can be as much as 2,500 Gbps (= 2.5 Tbps)	The approximate capacity of satellites with footprints over the region is 2,304 Mbps in the C Band and 1,296 Mbps in the Ku Band.
Principal uses	Voice, data and Internet traffic	Basic telephone service; Wideband services including Internet access; Virtual high speed private networks for voice, fax, data, and video; Advanced services such as video conferencing, tele-education, tele-medicine, etc.; Direct-to-home television and radio and other broadcast services.
Advantages	Offer very high capacity; Leases are cheaper than for satellite capacity; There is no signal delay	Rapid deployment of new networks and services; Total and immediate coverage of large areas; Cost which is independent of distance; Ideal for point-to-multipoint applications such as broadcasting.
Installation costs	Between \$US 27,000 and \$US 65,000 per km of cable.	The cost of a satellite is divided into three parts: 1) construction which can vary between \$US 75 and 100 million; 2) launch which can vary between \$US 75 and 100 million; and 3) insurance which is generally 15% of the two preceding items.
The price of leased circuits	155 Mbps (STM-1) between Rio de Janeiro or Sao Paulo and New York costs about \$US 50,000/month to lease	A transponder with 45 Mbps of capacity can cost between US \$1.2 y 5 million/year or between US \$100,000 y US \$ 420,000/month.

Box 8: The Global Broadband Satellite Infrastructure (GBSI) Initiative

Global Broadband Satellite Infrastructure (GBSI) Initiative

Background

The Global Broadband Satellite Infrastructure (GBSI) Initiative proposed by the Director General of the International Telecommunications Satellite Organization (ITSO) within the framework of the World Summit on the Information Society (WSIS) with the purpose of creating a global and open market for broadband equipment and services through the adoption of a universal technical standard for user terminals, the facilitation of effective access to the geostationary orbital and frequency spectrum resources and the creation of a minimal and pro-competitive regulatory environment. It was launched in 2002 against the backdrop of a number of barriers standing in the way of facilitating greater use of satellite capacity for not only basic telephony services but high-speed Internet access. ITSO estimates that more than 70 percent of the population in developing countries will never be served by cable-modem or DSL technologies.

1. Expensive user terminals built using proprietary standards, satellite systems which generally do not allow interoperability with other user terminals. This has proven to be an important barrier to achieving the economies of scale required for mass production of low-cost equipment.
2. Allocation of frequency spectrum and orbital locations for Fixed Satellite Services (FSS) which is not optimized for use by inexpensive terminals accessing broadband services. Decisions regarding these allocations had been based on a small number of large terminals (earth stations) coexisting with terrestrial stations. For example, the allotments under planned bands established by the International Telecommunication Union (Appendix 30B Plan) are based on 3m diameter Ku band earth stations.
3. Costly bandwidth provided over satellite. Satellite operators not only have to contend with lengthy and complex regulations to access spectrum and orbital resources, but also have to overcome many administrative, technical and regulatory hurdles in order to gain access to domestic markets. Some of the issues that satellite operators experience include restrictions on user terminals (including utilization taxes and fees), complex and costly type-approval procedures and reluctance to use so-called network “head-end” or “gateway” stations located outside the national territory.

The GBSI Initiative proposes a private-public partnership to facilitate widespread access to high-speed Internet through affordable, plug-and-play user terminals.

Role of Government

The role of government would be to encourage the establishment and development of a global broadband satellite infrastructure that would provide universal, two-way high-speed Internet access through individual or community low-cost terminals through:

- i. The identification of worldwide harmonized radio-frequency bands and orbital locations that are able to ensure global coverage, and which are primarily suitable for the provision of high-speed Internet services and the identification of one or more frequency bands not shared with terrestrial services, for the exclusive use of broadband access through simple and affordable user terminals. It is suggested in the short term and given the existing considerable in-orbit capacity, satellite operators could assist governments in this identification by agreeing to exclusively use parts of C and Ku band frequencies for broadband access by the means of

simple and affordable terminals. In the medium and long term, use of additional capacity in the Ka and V bands could be considered when such capacity becomes significantly available. This approach would have the advantage of speeding-up the advent of affordable broadband access making use of existing in-orbit C and Ku band capacity. Considering the progressive use of broadband connections, the spectrum needed in the short term might not exceed 250 MHz. Currently over 5,000 MHz is allocated to FSS and BSS services. In addition, large quantities of valuable spectrum recently have been returned to administrations in accordance with strict FCC and ITU rules, by projects like *Teledesic* and *Skybridge* and other satellite operators unable to bring their systems into service. This newly-available spectrum can now be freed for other uses and applications. This situation has created an opportunity for administrations around the world to identify around 500 MHz band for high-speed Internet access. As in the case of the terrestrial mobile industry, identification of these frequency bands not shared with terrestrial services should ultimately help to develop simple, cost effective and ubiquitous user terminals. It will also be conducive to a more efficient utilization of the spectrum and increased public use of satellite communications resources.

- ii. Promoting the concept of a harmonized and minimal satellite telecommunications regulatory framework is established that promotes competition and broadband services and the adoption of common principles to regulate satellite services. Considering the international nature of satellite services, these principles should promote the emergence of a global broadband market. Competition, access to market, and to spectrum and orbital resources would constitute the core of such principles. Such a framework should address key issues related to landing rights for satellite operators, licensing, fair competition, system interoperability and government support, whenever the market fails considering public funding for broadband services to benefit poor communities. It should also address the following: the licensing of qualified local service providers; the using of shared gateway services; and certifying user terminals.

Role of Private Sector

According to the proposed initiative the role of the private sector (the telecommunications industry, particularly satellite operators) is to participate in the development of a global broadband satellite services by:

- Voluntarily agreeing on a universal and open technical standard for user terminals to access high-speed Internet service. In addition to promoting the interoperability and interconnection among different broadband satellite networks, such a standard is necessary to foster mass production of user terminals. The current lack of interoperability and interconnection is one of the contributing factors to the current excess capacity in the satellite industry. Lower equipment costs would benefit all users, while also reducing the burden borne by governments that subsidize rural and underserved areas, especially in developing countries. It should be noted that the standard could be customized to only provide basic bit rate broadband connections for private users, while industry would retain the flexibility to develop higher bit rate solutions better suited for their requirements. In developing such a standard, the target cost for the user terminal plus satellite bandwidth should be less than or at least similar to terrestrial DSL or cable-modem broadband offers.
- Providing interconnection between their satellite network and the networks of all other satellite operators offering broadband connection services.
- Promoting the identification of orbital locations and spectrum resources for the global broadband satellite infrastructure on an exclusive basis. Private industry also should promote initiatives to ensure the interoperability among all broadband satellite systems.

V REGULATORY BARRIERS TO INVESTMENT

V.1 Introduction

In the previous chapters we described the significant transformation of the telecommunications sector in the Caribbean during the past few years. We described in greater detail what has and what is happening in three countries, Barbados, Trinidad & Tobago, and Suriname each of which are at a different stage in the liberalization process. These were the prime subjects of the current study. We also examined the issue of high prices at both the wholesale and retail levels and how these have dampened the enthusiasm of investors. The brief overview of infrastructure for ICT provided an indication of why there are bottlenecks in accessing bandwidth and how this affects prices. In this chapter we analyze regulatory barriers to investment in the region. We have categorized these according to barriers 1) which relate to regulatory institutions and 2) those which result from deficiencies in the legal and regulatory framework in these countries and territories. Among the former we describe barriers which result from: i) a newly established competitive environment where one operator continues to dominate; ii) real or perceived political interference in the functioning of the regulator; iii) lack of experience and training in dispute resolution; and iv) a lack of sufficient expert resources within the regulatory body. In the latter category are i) unpredictable and sometime unstable regulatory environments and ii) absence of harmonized regulations and policies in the region.

In the next chapter we recommend ways in which Caribbean governments and the newly established independent regulators can reduce these barriers. This, is could be done most effectively by a joint undertaking of the Inter-American Development Bank, the other organizations described in the first chapter of this report and the governments and regulators of the region.

V.2 Barriers relating to regulatory institutions

V.2.1 Regulating in a competitive environment where one operator is dominant

Following are anti-competitive practices of the dominant telecommunications operator identified by existing and potential competitors in the region. These are not unique to the Caribbean. They are characteristic of markets where for a considerable time after liberalization one or a few operators and service providers remain dominant. They include the dominant operator's practices of:

- subsidizing its competitive services such as Internet access and other value added services with revenues from services which are not subject to competition;

- overcharging for capacity on domestic and international fiber optic cable and satellite systems where one operator continues to control access to the only such facilities available in the country or territory. In most of the Caribbean submarine cable landing facilities on each island have been controlled by one company which did not allow any other company access to these facilities even if it was a joint owner of the cable;
- overcharging for telephone lines and 1-800 numbers which competing ISPs need to offer dial-up Internet access services making it impossible for these ISPs to compete for services which have little other distinguishing features;
- refusing to negotiate and otherwise delaying decisions and actions preventing new entrants from interconnecting and beginning to offer a competitive service. In Barbados and Trinidad & Tobago the incumbent would not negotiate interconnection arrangements or order the necessary interconnection equipment (to be paid for by the new entrants) until the new entrants had been issued their new licences or concessions even though in both countries the companies which were to be awarded these licences or concessions were known months before.

Dealing with these issues is especially challenging for the newly established regulators in the Caribbean given the particular circumstances and the protagonists involved. On the one side is a well organized, well prepared and well resourced incumbent who in return for giving up its long standing exclusivity has been given licences to operate the same networks and provide the same services that it has always operated and provided. This former monopoly can draw upon expert resources from all of its operations around the world to deal with the multitude of issues that have and will continue to arise in the process of liberalization. There are also the multinational new entrants like AT&T Wireless and Digicel who may not initially be dominant but are no less well prepared and organized and have access to required resources. On the other side are a few small local investors, who have aspirations to establish local and/or Caribbean-wide operations and, of course, the public and businesses that are impatient to enjoy the promised benefits of liberalization. Caught in the middle are the newly established regulators who are under pressure from all sides and who generally lack the experience, resources and training to cope effectively enough in this new competitive, rapidly evolving, high technology environment where having skilled and specialized professional experience is essential.

In the next chapter we recommend the establishment of regional mechanisms to address such issues through: the sharing of specialized resources; the building, maintenance and using of bases of information and data for benchmarking and precedents in decision making, and a comprehensive program of training and information exchange for the Caribbean region.

V.2.2 Evidence of political interference

In addition to the financial and political risks of a project an investor attaches great importance to the stability of the legal structures, the degree to which the regulator is independent and how well its mandate is defined in making an investment decision. Having a regulator who is independent and impartial and perceived to be so and having a regulatory process that is transparent are crucial to building confidence investors, who must be assured that these regulators can:

- supervise the proper functioning of the market with impartiality and avoid being pressured by interested parties;
- arbitrate and resolve conflicts with the full confidence of all interested parties;
- protect consumers' rights with impartiality.

It is therefore not surprising that independence and impartiality of the regulator are today among the most important aspects of a good legal and regulatory framework in a competitive telecommunications market and is one of the key elements of the WTO's regulatory principles Reference Paper, which has so far been accepted in part or in whole by 84 of 91 countries (9 out of 11 in the Caribbean) that have scheduled market opening commitments in the sector²⁶³. It is equally important in the legislation of the European Union where the national regulatory authorities in each of the member states have to be "legally distinct and functionally independent of the telecommunications organizations"²⁶⁴. In this region the Inter-American Telecommunication Commission (CITEL) underlines in its Guidelines and Practices for Interconnection Regulation the need for the regulator to be independent of all operators and "free from inappropriate political influence"²⁶⁵

How can one determine if a regulator is independent and impartial? There are a number of indicators that one can use among which are the following.²⁶⁶

- Is there in the legislation a clear definition of the mandate and functions of the regulator with respect to the other entities responsible for defining policy and managing the sector?
- Do unequivocal conflict of interest rules apply to members of the regulatory authority and their families?
- Is there is a clear definition of who appoints members of the regulatory body, the length of their appointment, if their mandates can be renewed and how they can remove be removed from office and for what reasons?
- What are the terms and conditions of office of members of the regulatory body and are their qualifications are defined in the legislation?

²⁶³ "The regulatory body is separate from, and not accountable to, any supplier of basic telecommunications services. The decisions of and the procedures used by the regulators shall be impartial with respect to all market participants" GATS Reference Paper

²⁶⁴ See EU Council Directives 95/62/CE and 97/13/CE

²⁶⁵ CITEL, Guidelines and Practices for Interconnection Regulation, PCC.I/Res 77 (XI-99), June 1999

²⁶⁶ Stern, Peter A. *Indicadores para medir el grado de independencia del organismo regulador de telecomunicaciones*, IV Encuentro del Foro Latinoamericano de Entes Reguladores de Telecomunicaciones, Lago Titicaca, Bolivia, 15-17 de Noviembre de 2001

- Are the regulator's financing and budgets independent of the government's and to what extent are these budgets free from political interference?
- Is the regulatory process transparent and is there scope for public consultation?
- What possibilities are there to appeal a decision of the regulator outside of the regulatory and political ambit?
- Is an independent entity able to overturn the decision of the regulator and for what reasons?
- To whom does the regulator report with respect to its finances, administration? Are its accounts public?

Independence of the regulators can be understood in two different ways: (i) independence from operators and service providers and other players in the market; and (ii) independence from the entity to which it has to report, namely, the government. The WTO's Reference Paper commits governments only to the former. It is, however, the latter which is more problematic because the regulator remains an institution of the government, whose policy it has to implement and to which it has to report. Yet it has to be able to act with impartiality and avoid political interference to instill the sort of confidence that investors need to mitigate the risks to their investments. It is for this reason that transparency in the decision making process is therefore essential.

Unfortunately there are lingering perceptions, many among investors, that the newly established regulators in the Caribbean lack such independence and impartiality and that they are subject to political influence²⁶⁷; however, such perceptions are often exaggerated or simply not true. Recent actions of the Fair Trade Commission in Barbados, which has been praised by many market participants for its initial actions in the process of market liberalization in this country would suggest that perceptions are not always well founded. It is, nevertheless, difficult, if not impossible, for small competitors, outside observers, or foreign investors to know whether or not the desired degree of independence is real or fictitious. The task of governments and regulators in the region is, therefore, to dispel such perceptions by ensuring that regulators have the tools and means to act independently. This would include: facilitating access to the technical, economic, legal and other staff resources needed to research issues and prepare well documented and well prepared decisions; establishing well structured and transparent decision-making procedures in which public participation is encouraged; developing models for decisions which can be understood by the experts as well as the general public and making such decisions available on the government's and regulators' web sites²⁶⁸, encouraging cooperation among regulators and policymakers in the region for sharing experiences and facilitating wider dissemination of important decisions.

²⁶⁷ After the unexpected resignation of the Chairman of the Fair Trading Commission on 3 December 2003 the leader of the Opposition was reported as saying that "it was not unreasonable to assume that there was an invisible hand manipulating the affairs of the FTC with Justice King's (The FTC Chairman) resignation following on the heels of Ronald Toppin's" (the former minister responsible for the FTC), The Barbados Advocate, December 4, 2003

²⁶⁸ The web site of the FTC in Barbados is a good example of how this should be done. See: <http://www.ftc.gov.bb/>

The recommendations in the next chapter of this report suggest ways in which the regulators in the region can be provided with such tools and means to combat perceptions of political interference and lack of true independence.

V.2.3 Lack of experience in dispute resolution

New entrants invariably find themselves involved in lengthy disputes with the fixed line incumbent about the terms and conditions of interconnection. Without agreement they are unable to offer a service and therefore seek the regulator's help in resolving the dispute. The latter often lacks the necessary experience and resources to deal with such disputes. On the other hand, the incumbent, who has an incentive to delay the advent of competition is often better prepared and has the necessary resources to deal with disputes. In at least one case a new entrant believed that the regulator was abdicating its responsibility because of its stated preference to have the disputing parties come to an agreement without the regulator's intervention rather than taking a more proactive role in the process as the new entrant would have preferred. The consequences with respect to investment, growth and development of the sector of failure to quickly and effectively resolve disputes can be serious because they result in:

- delays in the introduction of new services and infrastructure,
- reductions or stoppages in the flow of capital from investors in the telecom sector,
- continuing higher pricing and lower quality of service for consumers due to the absence of competition, and
- delays in sectoral liberalization and with it general economic and technical development²⁶⁹.

While a negotiated approach to disputes resolution has several advantages (i.e. less adversarial, less dependent on the resources of the regulator) there are disadvantages especially in the Caribbean where the difference in the market power and available resources between the parties to disputes and another can be significant and the dominant player has no incentive to resolve a dispute when it is not in its interest to do so. Other forms of dispute resolution such as regulatory adjudication, mediation, and arbitration or a combination of negotiation and these other techniques are probably more appropriate for the Caribbean.

What can Caribbean regulators do to develop an effective disputes resolution capability in their regulatory institutions? The International Telecommunication Union/World Bank study which was cited above suggests a number of ways, some of which could be easily adapted and implemented for the particular situation in the Caribbean. The recommended action in the next chapter builds on these ideas and includes establishing the following:

²⁶⁹ Bruce, Robert R. Rory Macmillan, et al, Disputes Resolution in the Telecommunications Sector: Current Practices and Future Directions, International Telecommunication Union and World Bank, December 2003

- A database with a special portal to give regulators access to previous decisions and procedures in resolving disputes in the telecommunications sector. While the data base would depend initially on material from outside the region, it could quickly be augmented as decisions from the region become available.
- A dispute resolution capability in the Caribbean through a comprehensive program of training and resource sharing. Training could take the form of courses, workshops or seminars and should emphasize opportunities of actual disputes to allow staff of one regulators to learn “on the job” in a dispute resolution proceeding involving another regulator. Sharing of experiences can be developed through the creation of informal networks among regulators, through which one regulator can consult his or her colleagues on a particular case by telephone or via the Internet on an ad hoc basis. Another possibility is to make provision for one regulator to make specialized resources available to another regulator for short periods of time.
- A regional panel or bank of arbitrators and mediators from which regulators could draw in cases where alternate dispute resolution (mediation and arbitration) options have been selected. Such resources could be made up of experts from within the regulatory bodies and from outside.

V.2.4 Insufficient specialized resources

In a remarkably short time some of the newly established regulators in the region have developed an excellent capacity to deal promptly and efficiently with current regulatory issues. A good example, as mentioned, is the FTC in Barbados which has been able to respond in an exemplary way to difficult issues related to interconnection, numbering and retail prices resulting from the introduction of competition in Barbados. The fact remains, however, that the FTC and its counterparts on the other islands do not have the required number of the highly specialized staff to regulate a complex, rapidly evolving sector such as telecommunications. For those who have not yet hired a full complement of staff (i.e. Anguilla, Trinidad & Tobago and Suriname) the challenge is to find qualified people or young professionals who can be trained if necessary and inserted into the regulatory process. While the telecommunications markets in the Caribbean are considerably smaller than those in North and South America and Europe, the difficulties and complexities of the issues are often no less daunting. A basic minimum of specialized resources is required in every regulatory body to function properly and efficiently. This minimum is difficult to achieve in countries with large populations not to mention countries and territories with very small populations and very few or no people with the required qualifications.

In the chapter on recommended action we suggest ways in which Caribbean governments and regulators can address the problem of insufficient qualified resources by jointly developing and implementing a comprehensive program of resource sharing, information exchange and training. The commonalities undergirding in the region - language, political system, legal structures and similarities in

the evolution of the telecommunications sector in these countries and territories - should favour regional cooperation in initiating such a program in the Caribbean.

V.3 Barriers in the legal and regulatory framework

V.3.1 Unpredictable and sometimes unstable regulatory frameworks

As mentioned, investors including investment and development banks attach high risk premiums to investments in countries where regulatory frameworks are unpredictable and unstable. Cases have been reported in the Caribbean where investors have delayed decisions to invest or have decided not to invest at all after some unfortunate experiences with the regulator or governments.

Following are factors which contribute to making regulatory frameworks in the Caribbean unpredictable and unstable:

- Absence of well-defined timetable and conditions for the transition from a monopoly to a fully liberalized market. The process has been particularly drawn out in Trinidad & Tobago and in Suriname;
- Licensing procedures where not all conditions and obligations have been clearly described, including information on the number of licenses to be awarded, conditions for awarding of licenses, timeframe for decisions to be rendered, etc. An investor who obtained a licence to construct and land a new submarine cable had to wait another six months get a licence which would allow him to operate it;
- Fragmentation and inconsistencies among the various instruments that constitute the legal and regulatory framework for the sector as, for example, among the various provisions found in interconnection, licensing, universal services, and pricing regulations, on the one hand, and those found in policies, laws, and procedures, on the other;
- Overlapping responsibilities of organs involved in regulating the sector as between and among the sector specific regulator, a fair trading commission, and the antitrust body where more than just one of these is responsible for regulating the sector. Operators and service providers in Jamaica, Barbados and the ECTEL Member countries have complained that their licence applications or regulatory decisions had been delayed because of the lack of coordination between or among the various bodies responsible for regulating and issuing authorizations;
- Deficiencies in the legal structure and organization of the regulatory body with respect to avoiding conflict of interest, ensuring transparency of the regulatory process, method of appealing decisions of the regulator, and other aspects pertaining to the mandate of the regulator;

- Absence of a clearly defined, well structured, and transparent process for defining policy for the sector in which there is a prominent place for public consultation.

An unpredictable and unstable regulatory environment creates considerable risks for investors in telecommunications infrastructures because of two important characteristics which distinguish such investments from many others. First, the decision to invest is usually based on a calculation of the expected return on investment over a 7 - 10 year period and the predicted value of that investment at the end of this period (terminal value) and, secondly, the installed assets are fixed and are not movable.

The initial capital required to build a mobile network in small country of say 1 million people is in the order of US \$ 60 -70 million, depending on the existing market share and expected market penetration of the new entrant²⁷⁰. To finance their initial capital outlay investors resort first to short term loans from the manufacturers of the equipment they are purchasing called “vendor financing”. Subsequent longer term loans from investment banks are used to refinance the initial vendor loans and to cover costs during the early period of operation when little cash is being generated. Five years may be required to generate enough cash to pay for ongoing operating and administrative costs and interest on the debt thereafter. Another two years may be required to earn enough to pay off expenses, support the ongoing capital expenditure program, and begin to pay down debts. The project becomes “cash flow positive”. The ease with which investors are able to secure longer term financing will depend on the risk that potential lenders associate with the project. Uncertainty created by an unstable and unpredictable regulatory environment increases this risk because of doubts about the ability of the project to generate enough cash. Borrowing becomes more difficult and, even if it is made available, it will be at a higher price. The financial crisis which has affected the sector particularly hard has not made it easier for investors seeking financing for their projects.

Government officials and regulators in the region who are keen to attract private investment in the ICT sector must understand what the implications of their decisions (or indecision) are and how an unpredictable and unstable regulatory environment can affect the bottom line of a business plan. They need to understand how a business plan is constructed, what investors have to show lenders to secure financing for their projects and to what extent investors are dependent on generating sufficient cash flow to pay off their debts.

Three types of activities are recommended (next chapter) as a way of reducing these:

1. Establish a regional mechanism whereby government officials and regulators will themselves be able to review, identified, and remove elements in the legal and regulatory framework of their telecommunications sectors which are the cause of such unpredictability and instability;

²⁷⁰ The figures quoted are based on an overall market penetration of 45 % and a market share of 30 %. The cost per subscriber (capex and operating losses) lies between US \$ 400 and 500. In Barbados, for example, Digicel plans to spend US \$ 30 million. It is reported to be spending over US \$ 350 million in Jamaica (See Seamus Lynch, Digicel - A Case Study presented at the CariCam Conference Puerto Rico, 3 Nov. 2003).

2. Create an opportunity for an on-going informal exchange of views among government officials, regulators and investors on these vital issues;
3. Establish a program of familiarization in business planning and financing for government officials and regulators.

V.3.2 Absence of harmonized policies and regulations in the region

Cellular mobile operators, AT&T Wireless (with about 12 licences in the region before it sold them to Cingular which in turn sold them to Digicel), Digicel (7 licences prior to acquiring Cingular's Caribbean assets), and Trans World Telecommunications Caribbean (2 licences), the promoters of new fibre optic submarine cable systems and some local investors have regional aspirations in the Caribbean²⁷¹. Having harmonized laws, regulations, procedures, and conditions simplifies their business decisions, reduces their transaction costs and helps increase the chances of their projects being viable. For example, today an investor who wants to build a submarine cable system connecting several points in the Caribbean has to cope with different rules and conditions in getting authorizations to construct and operate the cable in each country. He could realize considerable time and financial savings if there were harmonized licence conditions and procedures and coordination among authorities in the different countries and territories to grant authorization for such a Caribbean wide system²⁷². The project would benefit from economies of scale. Harmonization of the legal and regulatory frameworks across the Caribbean can also benefit policymakers and regulators through a simplification of their day-to-day functions and enhance the scope for regional cooperation including the development of a common position for the region in international fora such as those dealing with the allocation of frequencies. Harmonization will help in preventing competitive distortions across the Caribbean and will make training of regulators' and policy makers' staff more efficient, effective and economical²⁷³. Caribbean users ultimately benefit because the services they buy will be provided more economically. Having common standards will also make it easier for them to use their devices across the Caribbean seamlessly.

There are potential benefits to be gained by harmonizing conditions and provisions related to licensing, interconnection, treatment of dominant operators and service providers, universal service policies, conditions for leasing capacity and spectrum management.

For example, harmonizing the licencing regime value-added, closed user group, and some other non-basic services so that only registration, notification or nothing is required would result in more light-handed licensing regimes across the Caribbean encouraging greater participation of capital in the sector. In the area of spectrum

²⁷¹ C&W has 13 licences in the region.

²⁷² An investor in a submarine cable network figured he could have saved about US\$ 2 million in marine costs if he would have received construction licences for all potential landing points in time. This was additional cost of sending the cable laying ship back to pick up the extra cable required to connect the country where the granting of the licence was delayed.

²⁷³ See: Michele Thomas, "The Benefits of regional harmonization in Spectrum Management", presented at the 10th CTU Policy Seminar, Port of Spain 18-19 October 2005

management harmonization of frequencies for unlicensed use such as WiFi and possibly WiMAX standards will promote the development of these new technologies while regional policies on type approval will lead to reduced costs of terminal equipment. Common measures to determine dominance and a common set of requirements imposed on dominant carriers, such as the need to produce a standard Reference Interconnection Offers would be of great benefit to dominant operators. Also, investors would save in administration costs if application forms for licences, authorizations and permissions were common across the region.

Earlier we showed that the lack of choice and high prices of leased circuit capacity were important barriers to investment and development of ICT in the Caribbean. Faced with a similar situation the European Commission in 1992 issued a Directive to harmonize conditions – tariffs (which must be cost-oriented and transparent), technical characteristics, supply and usage conditions, and licensing requirements) - for the provisions of leased lines in the then twelve member states of the European Union²⁷⁴. EU harmonization directives were part of a wider policy of establishing a single market for goods and services which along with competition directives have, inter alia, resulted in bringing down prices for circuit leases as was shown earlier. Whether such harmonization measures are applied to promoting economic integration or simply to promote regional cooperation there are lessons to be learned from the European experience. By mutually agreeing to apply harmonization measures to conditions for leasing circuit capacity, procedures and conditions of licensing, use of frequencies, regulation of dominant suppliers and other measures, regulators, policymakers and citizens of the Caribbean can benefit through their impact on the development of ICT in the region.

Mechanisms to promote harmonization such as establishing a regional forum of policymakers and regulators to harmonize policies, laws, regulations, procedures and standards are discussed in the next chapter.

²⁷⁴ Council Directive 92/44/EEC. of 5 June 1992 on the application of open network provision to leased lines.

VI RECOMMENDED ACTION

The following initiatives are recommended as a means to help reduce the regulatory barriers to investment identified in the previous chapter and for promoting the development of the Information and Communications Technologies sector in the Caribbean:

- Establish a comprehensive regional program of resource sharing, training, and information exchange among regulators and policy makers;
- Facilitate interaction among the region's regulators to review, improve, revise, and harmonize policies, legal and regulatory frameworks, procedures and standards to diminish uncertainty and simplify procedures for investors;
- Support the newly established regulatory institutions in the region to become more effective and to assert their independence of political and other influences;
- Familiarize telecommunications regulators and government officials with the principles and best practices in dispute resolution and help develop a regional capacity to jointly deal with disputes;
- Familiarize regulators and government officials with business planning and finance practices by enhancing their understanding of the implications of their decisions on the flow of investment into the telecommunications sector; and
- Familiarize telecommunications policy makers, regulators, trade negotiators, other government officials and the private sector with the WTO Doha Round, FTAA, Cariforum and other trade negotiation issues, and to provide technical support they may require.

These objectives can be met through the implementation and maintenance on a permanent basis of two specific regional projects are accordingly being recommended. The first of these would establish ongoing mechanisms through which government officials, regulators and others could address issues and barriers described in the previous chapters. They are the establishment of: 1) a program of resource sharing, information exchange, and training for regulators and government officials; 2) a virtual network of academics and experts in telecommunications policy and regulation; and 3) a regional forum for consensus building and dispute resolution in the Caribbean. The second project would provide basic infrastructure and resources to facilitate the policy initiatives briefly identified above and outlined in further detail below.

VI.1 Project I - Establish a permanent framework for regional collaboration in ICT

The proposed framework would consist of the following three permanent mechanisms:

VI.1.1 A program of resource sharing, information exchange, and training for regulators and government officials

The following four elements would make up this program:

- A. A pool of experts in telecommunications law, economic and technical regulation and spectrum management who could be on the staff of individual regulators and/or could be centrally located. Under either scenario for deployment of expert resources, this pool of experienced advisors would be available to assist any regulator in the region, if and when required, according to predetermined arrangements. Where an expert is assigned to a particular regulator only a percentage of his or her time would be available on a regional basis with the remainder of time commitments being reserved for his or her home administration. In either case the pool could be supplemented by outside experts when additional pressing needs required (likely at the beginning). Experts from the pool and outside resources would also have a role and responsibility in training staff of regulators. For example, outside legal expertise could initially be made available through a contractual arrangement with one or several law firms which would provide certain number of days per year of legal advice plus training for newly recruited lawyers in the regulatory agency.
- B. A comprehensive regional program of training for staff of regulators and government officials consisting of: i) ad-hoc, focused courses in specific, current areas of telecommunication regulations; ii) short term, on-the-job training provided by staff of one regulator by the staff of another regulator, as agreed between the regulators concerned; iii) longer term, planned courses and programs such as the recently inaugurated Master's Degree in Telecommunications Regulation and Policy (MRP), the very commendable initiative of Dr Kim Mallalieu of the Department of Electrical & Computer Engineering at the University of the West Indies in Trinidad & Tobago; and iv) regional seminars and workshops on current topics organized and delivered in response to emerging needs.
- C. Means to encourage and facilitate ad hoc consultations and information exchange between staff of regulators on specific issues. Often a short telephone conversation or e-mail exchange is enough for one regulator to help a colleague resolve a pressing issue or simply to answer a question. Such a facility would be particularly beneficial when regulators must resolve disputes, develop opinions, and prepare decisions.
- D. The building and maintaining of a comprehensive database and information source of: 1) statistics (e.g. wholesale and retail prices for minutes of telephone use, Internet access prices, prices of leasing circuit capacity, and interconnection

charges and other data used to measure performance in the sector) which can be used as benchmarks by regulators when dealing with costing, pricing, quality of service and other issues; 2) documents, studies, precedents and other documents, which regulators can use as support in disputes or drafting decisions on various regulatory issues; and key indicators to facilitate monitoring developments and preparing positions in the various free trade negotiations in which the region is involved. The database would be accessible through a special portal with a public side for investors, operators and consumers. The latter would enable regulators and policy makers to more easily to identify laws, regulations, and procedures pertaining to telecommunications and ICT as well as prices and other conditions of service in all countries of the region, have addresses of agencies and others with whom they may need or want contact, and have all procedures, conditions and necessary forms available when applying for licenses, authorizations, and permissions.

This database and portal would provide the capability for not only gathering data and information but also analyzing and organizing it to suit the requirements of regulators, policymakers, and others. To make it an effective tool for regulators, policy makers and others the information would need to be easily accessible, informative and up-to-date. Resources, therefore, have to be provided to maintain, adapt, augment, and improve the data base and portal over time. On-going resources must also be provided for analysis and organizing the data and information to keep it relevant and suit the evolving needs of those who use it.

Resources will also be required to develop, organize and administer this program. While it might be conceivable to create a special organization to do this, it would be better and more efficient to build upon and strengthen one or several of the existing institutions with experience in running such programs. The Caribbean Telecommunications Union (CTU) is one such organization, which might be well suited to the task. Another is the newly established Organization of Caribbean Utility Regulators (OOCUR). Responsibility might be shared between both. Any such resource would develop cooperative ties and relationships with other regional and international bodies already engaged in collecting and assessing such data including the ITU, the European Commission, CITELE, Regulatel²⁷⁵ and other regional telecommunications sector entities around the world.

A first step would be to develop the concept (contents and functioning of each element of the program; financing; and administration) in a specially commissioned study undertaken on behalf of the region's regulators. Through this effort regional regulators would reflect on, discuss, and further develop, and eventually agree on a viable model at a meeting organized for the purpose. In addition to the IADB, support could be sought from other funding organizations such as the CIDA, the European Commission, ICA, US Aid and the World Bank to develop the concept and facilitate discussion and agreement among the region's regulators.

²⁷⁵ Forum of Latin American Telecommunications Regulators

VI.1.2 Virtual network of academics and experts in telecommunications policy and regulation

There is growing interest in the academic community around the world in telecommunication policy and regulation. Examples of universities in the USA which have programs in telecommunications policy in regulation are The Public Utility Research Center (PURC) at The University of Florida, The Columbia Institute for Tele-Information (CITI), The Institute of Public Utilities at Michigan State University, The Center For Public Utilities and New Mexico State University, and The National Regulatory Research Institute (NRRI) at Ohio State University. In addition to their research and their regular teaching these academics provide training and advice to regulators, policymakers and the private sector, and carry out studies on specific topics for them. The National Association of Regulatory Utility Commissions (NARUC) supports academics in these and other institutes. (See <http://www.naruc.org/>). Similar examples can be found in Europe, Asia and increasingly in Latin America. A more pertinent example for the Caribbean is the Latin American and Caribbean Economic Association (LACEA) network which is supported by the World Bank, the IADB, the International Development Research Centre (IDRC) and the William & Mary Ford and Flora Hewitt Foundations, which does research not in telecommunications but in political economic issues related to regional integration for the Caribbean and Latin America. (See: <http://www.lacea.org/>)

Academics and other unaffiliated experts have the advantage of being independent of regulators, policy makers, operators, service providers, and users. They also have the analytical capabilities and the time to research issues, analyze them and prepare informed opinions. They can also teach and develop specialized curricula for telecommunications policy makers and regulators.

It is accordingly recommended that a regional, virtual network of academics and experts in telecommunications policy and regulation be established and that on-going support be given for this network. This network, which would be independent of regulators and government officials, operators, service providers, and large users, would seek the advice and encourage the participation of all stakeholders in its reflections. While the core members of the network would be academics and experts from the region, participation of universities in North America, Europe, and Asia would be sought and encouraged especially during the formative stages of the network's development.

The general functions of this network would be to: (1) study complex and sometime contentious regulatory issues on behalf of all the regulators in the region, (2) assist in the training of members and staff of regulatory bodies and ministries responsible for the sector, (3) organize conferences, seminars, and workshops on current topics in telecommunications policy and regulation, (4) provide advice on and act as a sounding board for discussion on specific policy and regulatory issues, (5) provide independent advice on disputes between the regulator and operators, and undertake studies on behalf of the group of regulators and individual regulators.

The concept for such a network would be developed during a first phase of this proposed activity which would define the membership, working methods, procedures, the possible coordinating and administrative role for an organization (such as through the Caribbean Telecommunication Union), methods for interacting with regulators, policy makers and other stakeholders, annual funding requirements, and possible source of funding. A subsequent phase would launch the agreed concept. Support of existing academic networks in North America and Europe should be solicited in developing the concept for the Caribbean. Regional support should be sought from academics such as Dr Kim Mallalieu of the Department of Electrical & Computer Engineering at the University of the West Indies in Trinidad & Tobago who have an interest in telecommunications policy and regulation.

The network would become a complementary part of the other mechanisms which are being recommended.

VI.1.3 Regional forum for consensus building and dispute resolution

Given that the regulatory barriers described above are of a regional basis and given the growing interest in relying on dispute resolution as opposed to ex ante regulation, it is recommended that a regional forum for consensus building and dispute resolution be established in the Caribbean. The purpose of this forum would be to:

- seek consensus for agreement among industry players on business and commercial issues in areas such as: fixed-to-mobile and fixed-to-fixed interconnection; pricing and technical arrangements between ISPs (and other value-added service providers) and local fix line operators; use of rights of way; local loop unbundling; pricing of access; site sharing and collocation;
- develop proposals for new policies, legislation, regulations, and procedures or suggest modifications to existing instruments such as issues raised by overlapping responsibilities of regulatory institutions, where a country's legislation has not clearly defined the demarcation between these institutions or where in a country's legal and regulatory framework there is an obvious need to clarify ambiguities among legal, regulatory, and administrative instruments pertaining to the same regulatory matter. Examples of the latter are provisions for interconnection, licensing, and pricing, or where laws and regulations are considered deficient or where they lack complementarities.

The proposed forum would be flexible bringing together, in the first of these two cases, just industry participants and, in the second, industry participants, government officials and regulators. This would not exclude government officials and regulators from participating as observers in discussions related to commercial and business issues of concern to industry participants. In both cases outside experts and facilitators would be brought in to assist in the consensus building process or in resolving disputes.

Members of the forum would be operators, service providers, and investors representing the industry and government officials and regulators representing the public sector and consumers.

This recommended project which builds on an idea which was presented at the 2002 ITU Global Symposium for Regulators in a discussion paper prepared by Robert R. Bruce and Arthur Marriott of the law firm, Debevoise & Plimpton has a number of features which make the approach attractive especially in a regional setting.²⁷⁶

Such a forum would, inter alia:

- Provide a means for introducing international experience, standards and practices into policy formulation and the legislative and regulatory aspects of telecommunications and disputes settlement. We have seen that several players entering the Caribbean market have extensive experience in other regions of the world. The information, data and experiences which these firms could bring to such a forum would not only assist in building consensus on current issues being addressed and in resolving disputes but would also serve to train government officials and regulators. The experience of these firms could be augmented on a flexible basis by bringing in international experts, if and when required;
- Facilitate resolution of issues which have both a commercial and public policy dimension, such as the need to build a common understanding and consensus on why rebalancing of retail prices is necessary for liberalization to succeed. Today unfortunately such rationale is often missing in debates where the media restricts itself to reporting accusations of political interference as was recently the case in Barbados²⁷⁷;
- Provide a means of dispelling regulatory uncertainty and introducing a greater degree of transparency in the regulatory process that is so important in instilling confidence in investors, as Bruce and Marriott point out;
- Make it easier to deal with competing concerns relating to confidentiality and transparency, another issue which recently complicated rate hearings in Barbados²⁷⁸.

There are a number of other factors which may such an approach desirable:

²⁷⁶ Bruce, Robert R., Marriott, Arthur, QC, *Discussion Paper on the Use of Alternative Dispute Resolution Techniques in the Telecom Sector*, Debevoise & Plimpton, London, 27 June 2002. See also http://www.itu.int/ITU-D/treg/Events/Seminars/2002/GSR/Documents/12-Bruce_document.pdf

²⁷⁷ See: "DLP cries interference with FTC", The Barbados Advocate, 4 Dec. 2003

²⁷⁸ See "Keep it confidential, C&W opposed to sensitive information on its operations reaching public", Barbados Business Advocate, 24.11.03

- It facilitates consideration of issues which overlap jurisdictions of various regulators, when there is more than one with responsibility for regulating the sector;
- It makes it easier to deal with issues which overlap into related areas such as intellectual property rights.

As with the other recommended projects the first step in establishing this forum is the development of the concept in the concrete setting of the Caribbean region including: participation in the forum, modes of operation, administration, the sort of issues which could initially be addressed, funding, etc. Once developed the concept would be submitted to regulators, government officials, industry representatives, experts, and funding organizations for discussion refinement, and eventual approval and launch.

Even though they each may address a different set of stakeholders, these three mechanisms are interrelated. It is, therefore, recommended that they be developed and operated together under one project whose estimated total cost is US \$ 6.2 million (See Annex I) distributed over a 6 year period as follows for each of the three mechanisms:

1. Programme of resource sharing, information exchange, and training

1.A Pool of experts

Year	1	2	3	4	5	6	Total
Budget		272,800	272,800	272,800	272,800	272,800	1,364,000

1.B Program of training

Year	1	2	3	4	5	6	Total
Budget		445,500	445,500	445,500	445,500	445,500	2,227,500

1.c Ad-hoc consultations

Year	1	2	3	4	5	6	Total
Budget		10,000	10,000	10,000	10,000	10,000	50,000

1.d Building and maintaining a comprehensive data base

Year	1	2	3	4	5	6	Total
Budget		83,600	83,600	83,600	83,600	83,600	418,000

Total for 1

Year	1	2	3	4	5	6	Total
Budget	29,537	811,900	811,900	811,900	811,900	811,900	4,089,037

2. Virtual network of academics and experts

Year	1	2	3	4	5	6	Total
Budget	29,537	258,750	258,750	258,750	258,750	258,750	1,323,287

3. Regional forum for consensus building and disputes resolution

Year	1	2	3	4	5	6	Total
Budget	29,537	144,100	144,100	144,100	144,100	144,100	750,037

Total for project I

Year	1	2	3	4	5	6	Total
Budget	88,610	1,214,750	1,214,750	1,214,750	1,214,750	1,214,750	6,162,360

of which Management and administration

Year	1	2	3	4	5	6	Total
Budget	10,110	82,900	82,900	82,900	82,900	82,900	424,610

VI.2. Project II - Initiate and support the establishment of a regional non-commercial high speed research and education network in the Caribbean

Technical support and eventually some initial funding should be provided for the creation and operation of a Caribbean high speed research and development network. The network would replicate national networks such as Internet2 (<http://www.internet2.edu/>) in the USA, Canarie (<http://www.canarie.ca/about/about.html>) in Canada and CUDI (<http://www.cudi.edu.mx/>) in Mexico and regional networks such as CLARA in Latin America and GEANT (<http://www.dante.net/>) in Europe and provide high speed connectivity (STM-1 and higher) among universities and research institutions in the region. It would also be used to interconnect regulators and government officials to facilitate the operation of the previous three mechanisms.

This project should be tied in with the E-Link Americas initiative of the Institute for Connectivity in the Americas (ICA) which uses satellite and terrestrial wireless technologies to provide Internet access to users who are not well connected by terrestrial systems.

The recommended program of assistance should include: 1) support in developing the concept for the Caribbean including possible topography, membership, functioning, capacity requirements, cost and financing, and administration, 2) design and engineering of the network including assessment of equipment and facility requirements and determination of actual capital and operating costs; and 3) establishment and initial administration.

In addition to some of the initial capital some of the operating costs might also be supported. Other assistance could be in the form of: loans of experts; documentation (manuals); sponsored conferences and meetings; and training.

The initial step should be development of the concept to determine the needs and interests of universities and research and establishments in the region, the costs and benefits, the impact on the development of ICT in the Caribbean, and the availability and eventual cost of capacity in existing and planned fibre optic cable and satellite systems. A concept paper which should be commissioned would also suggest ways in which such a high speed network could be used in the previously proposed mechanisms for addressing regulatory barriers to investment. A study to develop the model might typically be done with the assistance of experts, who have been involved in establishing such networks elsewhere such as CUDI in Mexico, REUNA (<http://www.reuna.cl/>) in Chile, RETINA in Argentina (<http://www.retina.ar/>) Canarie in Canada or leading education institutions involved in Internet 2 in the USA.

The estimated total cost of this project is US \$ 1.25 million (Annex I) distributed over a 6 year period is as follows:

Year	1	2	3	4	5	6	Total
Budget	78,085	540,000	160,000	160,000	160,000	160,000	1,258,085

Of the total US \$ 2.3 million is for capital costs associated with the construction, upgrading, and expanding the network over a 6 year period. The first year cost of US \$ 92,600 is for the feasibility study and the meeting of stakeholders to agree on the concept including funding. The rest is for a share of the operating costs until the end of the 6th year after commissioning of the feasibility study.

VI.2.1 Proposed course of action

For each of the two projects the first step would be the commissioning of studies to further develop the concept and design including establishing: i) how each would function; ii) who would participate; iii) how each would be administered and run; iv) what they would cost and how it would be financed. The next step would be to present the concepts for discussion, refinement, and eventual approval by the stakeholders, which would include the funding and regional cooperative organizations and outside experts.

Given the urgency of some of the recommended action it is suggested that the following specific activities be implemented in parallel with developing and establishing the projects and permanent mechanisms described above. These activities would fall within these mechanisms.

(i) Training in dispute resolution

Organize a special regional workshop on dispute resolution for regulators. The workshop would be prepared and animated by one or two experts who would, in addition to presenting the basic methodologies of different approaches to dispute resolution as well as case studies, lead participants through some hypothetical case studies and disputes. Operators, service providers and others should also be invited to present their perspectives on actual disputes.

(ii) Develop a joint regional capability in economic regulation

Develop a joint regional capability in economic regulation of the ICT sector for regulators and government officials.

(iii) Consideration of issues for free trade negotiations

Organize a seminar to bring trade negotiators, policy makers and regulators up to date on current Doha Round and FTAA issues and to explain their implications for ICT in the region.

(iv) Establish a comprehensive program of training and familiarization in business planning and finance

Develop a comprehensive program of training and familiarization for Caribbean regulators in business planning and finance. The purpose of this program would be to raise awareness and understanding among regulators of the critical factors that investors in the telecommunications sector need to take into account when they make investment decisions and the impact of the regulator's actions on these decisions. The program would consist of a number of modules which would be developed with the help of business schools and experts from the region and elsewhere. Advice of investors, operators, and service providers would also be sought. Possible modules are the following:

- A short 3-5 day seminar or training course on finance, business planning, principles of business accounting, and functioning of financial markets. The course or seminar would be enhanced with discussion of actual sector experiences and case studies;
- Short term on-the-job experience for regulators with operators and service providers who have no ties or interest in the country of the regulator;
- Implementation of a program whereby MBA and other business school students are able to provide technical assistance and managerial advice to regulators in the region. Through the program, research on important managerial, policy, and regulatory topics of interest to the regulator to whom he or she is assigned would be undertaken. Through the program regulatory staff could develop increased familiarity with the basics of business and finance;
- Twining of professors with regulators to answer questions and assist on an ad hoc or more intensive basis as circumstances require;
- Building and maintenance of a data base of relevant case studies.

(v) Awareness raising and capacity building in various aspects of free trade negotiations related to telecommunications and ICT

An area of particular urgency for 2005 is the need to raise awareness and build capacity in the various aspects of free trade negotiations which involve and have important implications for telecommunications and ICT in the region. An immediate activity that is recommended is the organization of a regional seminar which would cover, inter alia, topics such as:

- The process and status of the Doha Round including the nature of requests and offers (with respect to commitments on basic and value added services and the Reference Paper including competitive safeguards, licencing, and investment limits);
- Implications of the competitive safeguard provisions contained in the text on telecommunications services in the current draft text of the FTAA;
- The increasing importance of telecommunications and ICT as engines for economic growth;
- The role of telecommunications and ICT in global, regional and bilateral trade arrangements;
- General and specific telecommunications and ICT-related objectives of the Doha Development Agenda, the FTAA, Cariforum-EU, and bilateral trade negotiations;
- Regional telecommunication and ICT trade negotiations and the development of common strategies and positions for market access, investment, coverage of new communication and information services such as cable TV, Internet, e-commerce, e-government, radio and television broadcasting, audiovisual services) in these trade negotiations;
- Free trade negotiations and issues related to mobile, wireless, and the treatment of Internet including international charging arrangements;
- WTO dispute resolution and the April 2004 Panel on Mexico–Measures affecting Telecommunications Services concerning provisions in Mexico's domestic laws and regulations on telecommunications which govern the supply of telecommunication services.

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Users and trade associations

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