FAIR TRADING COMMISSION

LONG RUN INCREMENTAL COST (LRIC) INTERCONNECTION RATES

DECISION

Document No.: FTC/URD/DECLRIC 2015-01 **Date: March 27, 2015**

DOCUMENT NUMBER: FTC/URD/DECLRIC 2015-01
DOCUMENT TITLE: LONG RUN INCREMENTAL COST INTERCONNECTION RATES DECISION

ANTECEDENT DOCUMENTS

Document Number	Description	Date
FTC NO. 0002/12	Decision on Digicel Application for a review of LRIC Guidelines	June 11, 2012
FTC/DEC2011/01	LRIC Guidelines for implementation by Cable & Wireless (Barbados)Limited	December12, 2011
FTC/UR/2010-01	Consolidated Reference Interconnection Offer Decision	February 22, 2010
FTC/03/03	Interconnection Guidelines Accounting, Costing and Pricing Principles Decision	June 30, 2003

TABLE OF CONTENTS

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Fair Trading Commission (the Commission) required Cable & Wireless (Barbados) Limited (C&W) to adopt a forward-looking, Long Run Incremental Cost (LRIC) methodology in order to determine interconnection rates. This necessitated the development of fixed and mobile LRIC models for deriving the costs that an efficient operator would incur in providing interconnection services in a competitive market. The resulting costs for fixed and mobile, termination and transit services were used to inform the rates that would be applied for interconnection purposes.

The Commission having analysed the results of the models therefore determined that the interconnection rates for Fixed Transit, Fixed Termination, Mobile Transit and Mobile Termination interconnection services in $BDS/min are as follows:

- Fixed Transit - $0.010;
- Fixed Termination - $0.011;
- Mobile Transit - $0.011;
- Mobile Termination - $0.055

The rate structure for interconnection services will be based on a single per minute tariff (instead of the current two-part tariff) and will replace relevant rates in the Consolidated Reference Interconnection Offer 2010 (RIO 2010).

The Fixed Transit Service rate will replace the PSTN[1] Transit Service Charge in the RIO 2010, as well as the Transit Part of the Domestic Fixed to Mobile Service Charges. The Fixed Termination Service rate will replace the charges for the PSTN Terminating Access Service in the RIO 2010. The Mobile Transit Service rate did not exist in the RIO 2010 but it is a rate in the Variation Agreement[2] between Digicel Barbados Limited and C&W that was approved by the Commission on December 9th, 2014. This new rate will replace the PLMN[3] Transit Service rate in the Variation Agreement. The Mobile Termination Service rate will

[1] Public Switched Telephone Network (PSTN)
[2] Variation Agreements are required when, for example, there are changes in operating conditions that necessitates amendments to the existing Interconnection Agreement between two telecommunication operators
[3] Public Land Mobile Network (PLMN)

replace the Mobile Termination part of the PLMN to PLMN Terminating Access Service of the RIO 2010.

It should be noted that these LRIC-based interconnection rates are significantly lower than the interconnection rates in C&W's existing RIO 2010 and the implementation approach to be adopted will be effected using a glide path, which will entail a larger change being done in the initial phase. There will be an initial 60% decrease in the difference effective May 1, 2015 and the remaining 40% on April 1, 2016.

The rates for other interconnection services currently included in the RIO 2010 Tariff Schedule, namely National Directory Enquiry (DQ) services, Emergency Services and Incoming International Services, will remain unchanged.

1. INTRODUCTION

This document sets out the Decision of the Fair Trading Commission (Commission) on the determination of the interconnection rates which were determined by modelling the forward looking long run incremental costs (LRIC) of an efficient operator and using Cable & Wireless (Barbados) Limited (C&W's) fixed and mobile telecommunications networks. The Commission retained the expertise of consultants to support this process.

The entire process was accomplished in three phases:-

Phase 1 established model guidelines and specifications for model building. Following public consultation on the draft LRIC Guidelines, the Commission issued a decision entitled "LRIC Guidelines for Cable & Wireless (Barbados) Limited FTC/DEC2011". This decision formed the basis for C&W to commence drafting specifications for building the LRIC models. In July 2012 C&W submitted the required draft specifications document for Barbados Fixed and Mobile LRIC models. A period of stakeholder consultation ensued and having received input from interested parties as it related to the specifications, the Commission approved the draft specifications for the Barbados fixed and mobile models. C&W was then given the approval to proceed with building the LRIC models.

Phase 2 involved the construction of the LRIC models and evaluation of the model results which established the LRIC costs. The Commission in association with its consultants reviewed all submissions from stakeholders before issuing directives to C&W relating to the finalisation of the LRIC models.

Phase 3 determined the LRIC interconnection rates and implementation approach to be adopted in effecting the LRIC rates.

2. BACKGROUND

The process for the development of LRIC based rates was initially prompted by the terms set out in the Commission's Decision (FTC/03/03) on interconnection pricing which required the development of LRIC models for deriving interconnection costs for fixed and mobile call termination and transit services. The Commission in a later decision on C&W's RIO 2010 dated February 22, 2010, determined that C&W should undertake an LRIC study to determine interconnection costs and tariffs.

The provision of interconnection facilities on fair and efficient terms is widely recognised as an essential requirement for the creation of a competitive telecommunications market. This is because operators in a competitive market need to terminate calls on other operators' networks and similarly to receive calls originating on other operators' networks. Furthermore in a small market it makes sense economically, especially as competition develops, for competing operators to use each other's core networks for transit purposes rather than have multiple points of interconnection. Often this will be the most efficient way that a new entrant can provide some services. Interconnection charges can account for a significant share of an operator's total costs and as such, it is important that interconnection rates be derived from appropriate costs in order to provide a proper economic basis on which operators can make decisions.

LRIC models are used to estimate the cost that an efficient operator would incur in providing interconnection services in a competitive market. Some of the benefits of having interconnection rates based on LRIC are that they:

(a) encourage efficient competition in the wholesale market which leads to competition in the retail market;
(b) promote efficient forward-looking investment decisions;
(c) facilitate effective means of interconnection; and
(d) are non-discriminatory and non-preferential.

There are several approaches[4] based on LRIC methodology that were considered by the Commission in undertaking cost studies for the determination of interconnection pricing. These approaches include pure LRIC, total service LRIC (TSLRIC), total element LRIC (TELRIC) and long run average incremental cost (LRAIC). The design of these models can be top-down, bottom up or a hybrid. A top-down design starts with the operator's reported costs and removes the non-incremental costs. A bottom-up design estimates the costs that a hypothetical network operator would incur in order to meet a given level of demand based on a series of engineering rules. The hybrid design combines the bottom-up design with the top-down to strike a balance between accuracy and reflecting efficient forward looking cost.

The Commission determined Total Service Long Run Incremental Cost (TSLRIC) as the modelling approach to be adopted as opposed to other forward looking methodologies for determining interconnection rates, because it provides for the inclusion of a share of joint and common costs from all services. This approach encourages competition in telecommunications markets by promoting efficient entry and exit in relevant downstream markets; encourages economically efficient investment in infrastructure and provides the appropriate incentives for further investment in the most efficient technology available. The Commission also decided in the approved LRIC Guidelines to adopt a hybrid approach to modelling costs by using a bottom-up approach to derive network capital cost estimates and a top-down approach to derive operating costs.

Digicel, however, was dissatisfied with the LRIC Guidelines Decision and sought a review of the said decision, pursuant to section 36 of the Fair Trading Commission Act on a number of grounds. Digicel further sought, from the Commission, an Order staying the LRIC Guidelines Decision and Order of the Commission dated 12 December, 2011, until a final determination could be reached on all the matters raised. The Commission did not grant the stay and dismissed Digicel's Application for Review of the Guideline Decision.

The Commission's Guidelines Decision further required C&W to provide the Commission with the proposed specifications for the fixed and mobile LRIC models which were consistent with the said Guidelines. The proposed specifications were submitted and reviewed by the Commission; and subsequently, feedback was provided to C&W on

[4] See Appendix 1

required amendments. Once amended, the Commission approved the model specifications which then formed the basis for development of the LRIC models. C&W was then directed to develop the model, which was reviewed by the Commission with the advice of its consultants.

The modelling exercise for C&W involved:

(a) Estimating the direct costs of providing the interconnection service over the long run, allowing for inclusion of all associated capital investments which would not necessarily be incurred annually;

(b) Including a capital cost component that reimburses the operator for the cost of financing network equipment associated with interconnection services; and

(c) Taking into consideration a reasonable attribution of costs that are not directly caused by interconnection services but are incurred by C&W in connection with its interconnection facilities and services, referred to as joint and common costs, such as salaries.

3. Legislative Framework

The Commission is a statutory body established by the Fair Trading Commission Act CAP. 326B of the Laws of Barbados, with responsibility for, *inter alia*, regulating utility services, safeguarding the interests of consumers and promoting and maintaining effective competition in the Barbados economy. The Commission currently regulates the domestic and international telecommunications services of C&W and the country's sole provider of electricity, the Barbados Light & Power Company Limited.

Section 4 (3) (a) of the Fair Trading Commission Act allows the Commission to:

> "*Establish principles for arriving at the rates to be charged by service providers*."

A similar provision exists under Section 3 (1) (a) of the Utilities Regulation Act, CAP. 282 of the Laws of Barbados while Section 6 (d) of the Telecommunications Act CAP. 282B of the Laws of Barbados states that the Commission shall:

> *"Establish and administer mechanisms for the regulation of prices in accordance with this Act, the Fair Trading Commission Act and the Utilities Regulation Act;"*

The Telecommunications Act CAP 282B at Section 25 (1) and (2) (e) also requires the facilitation of interconnection by C&W with other providers of telecommunication services:

> *(1) A carrier shall provide, on request from any other carrier, interconnection services to its public telecommunications network for the purpose of supplying telecommunications services in accordance with the provisions of subsection (2).*
>
> *(2) Interconnection services referred to in subsection (1) shall:*
>
> *a) be offered at points, in addition to network termination points offered to the end-users, subjects to the payment of charges that reflect the cost of construction of any additional facilities necessary for interconnection;*
>
> *(e) be offered at charges that are cost-oriented;*

Further, the provisions of the Telecommunications Act CAP. 282B Section 27 (3) also state, *inter alia* that, in deciding whether to approve or refuse a RIO, the Commission shall:-

> *"(a) consult with the carrier providing the RIO and any other carriers likely to seek interconnection to that carrier's network."*

The Commission is of the view that this provision also supports its duties as it relates to the development of LRIC-based interconnection rates.

In carrying out its duties as a regulator, the Commission must operate in a transparent, accountable and non-discriminatory manner. Consultative documents and the public consultation process are the main ways in which the Commission discharges its responsibilities relating to transparency and accountability.

Section 4 (4) of the Fair Trading Commission Act, CAP. 326B states:

> *"The Commission shall, in performing its functions under subsection (3) (a), (b), (d) and (f), consult with the service providers, representatives of consumer interest groups and other parties that have an interest in the matter before it."*

4. METHODOLOGY

The process followed for the LRIC exercise was as outlined in the LRIC Guidelines, which required C&W to develop the LRIC models for the fixed and mobile networks. Stakeholder input was used to inform the principles, the specific assumptions and the methodology adopted in the LRIC modelling process. The Commission was mindful that the overall LRIC process needed to be transparent and efficient to allow for active participation by all interested stakeholders, subject to confidentiality concerns. Therefore, through an iterative and interactive process, stakeholders were consulted and the various submissions received were taken into account by the Commission and its consultants. At all stages of the modelling process, feedback was communicated to C&W and the stakeholders as necessary.

The Commission also required that once the draft LRIC models were built and populated, C&W should submit these models, including detailed model documentation to the Commission. The Commission reviewed the various submissions (i.e. model templates, input data and supporting documentation) to ensure that the models were in line with the requirements set out in the LRIC Guidelines. Only when the Commission was satisfied that compliance with these requirements had been achieved - were the LRIC models and the unit cost results for interconnection services accepted. The Commission determined that it would not publish the LRIC models or any underlying data, given the commercially sensitive nature of the information contained therein.

The overall approach was designed to ensure efficient and timely delivery of the LRIC-based rates for interconnection services and was accomplished in three (3) phases:-

Phase 1 established model guidelines and specifications for model building. Phase 2 involved the construction of the models and evaluation of the model results which established the LRIC costs. Phase 3 then determined the LRIC interconnection rates and implementation approach to be adopted in effecting the LRIC–based rates.

Appendix 3 of this document sets out the chronology of the LRIC modelling process in tabular form.

5. KEY ISSUES CONSIDERED DURING THE PROCESS

The objective of the LRIC model exercise was to establish the efficient level of costs for providing certain interconnection services in Barbados from which the rates for these interconnection services would be determined.

The exercise, which required C&W to build forward-looking cost models in keeping with the terms set out in the LRIC Guidelines, presented the Commission with several opportunities for engaging stakeholders. All pertinent issues deriving from the exercise were shared with interested parties, who provided helpful feedback. The input provided was thoroughly examined and taken into account by the Commission in arriving at its final position.

The key issues raised in the exercise are presented below:

Weighted Average Cost of Capital (WACC)

Digicel, in the development of the LRIC Guidelines, raised the issue of holding a consultation on the Weighted Average Cost of Capital (WACC)[3], as well as establishing separate WACC estimates for each of the fixed and mobile network services. This issue was again raised by Digicel at the model specification stage of the LRIC exercise.

> **Commission's Position**
>
> **In the Guidelines Decision, the Commission advised that a consultation on the approach and parameters used to determine the WACC was considered but it was of the view that a separate consultation process was not required for establishing the WACC, nor was it necessary to have separate estimates for fixed and mobile service-related WACC.**

At the specifications stage, the Commission again considered the matter of the WACC and it was decided to wait until the draft LRIC models became available in order to conduct sensitivity analysis[5] on the impact of different WACC assumptions. C&W's proposed WACC is the same as that underlying the current Price Cap Plan. The WACC sensitivities

[5] See Appendix 2

conducted on the final LRIC models confirmed that the final results from the LRIC models were not very sensitive to the underlying WACC assumption.

Commission's Position

The Commission therefore remains of the view that a separate consultation process was not required for establishing the WACC nor was it necessary to have separate estimates for fixed and mobile service-related WACC and therefore the WACC assumptions are as determined in the LRIC Guidelines decision.

Fixed Access Network Elements

Digicel was of the opinion that the LRIC model should not include fixed access network elements which are not relevant to the provision of interconnection services.

Commission's Position

The Commission agreed and is of the view that only those elements of the network whose costs are relevant and appropriately recovered from interconnection services should be allocated to the said services in the LRIC models.

Network Sharing

Digicel was also concerned that there should be no network sharing between jurisdictions.

Commission's Position

The Commission is of the view that Digicel's proposal that network sharing should not be assumed between jurisdictions would lead to costs being set above the actual level of costs incurred by the operators and as such would not be indicative of the cost of an efficient operator.

Technology Assumptions

The network technology used by C&W for the mobile network was based on 2G technology. The Commission examined this issue during the development of the LRIC Guidelines and determined in the approved LRIC Guidelines that the mobile LRIC model should reflect the current technologies in Barbados. At the time this decision was taken, 2G technology was the predominant technology in use by C&W in Barbados. This was being used for the majority of voice traffic, although the current mobile networks now consist of both 2G and 3G.

Commission's Position

The Commission notes that the 3G technology was largely introduced to allow for a significant growth in data demand. If the 3G technology was used in the modelling, then issues pertaining to the correct recovery of fixed costs of the network as well as the incremental costs of the 3G equipment would arise. Conversely, setting interconnection prices based upon a standalone 2G technology model means that the resulting prices would not be significantly affected by the take up of data services in the short run.

The Commission has accepted the use of 2G-only technology assumptions in the model.

Owned vs Leased Mobile Cell Sites

Digicel queried the assumptions within the draft model specifications that mobile cell sites are "owned" as opposed to "leased", since all of Digicel's sites are leased.

Commission's Position

The Commission reviewed this assumption and determined that the assumption in the final mobile LRIC model should reflect that all sites are "leased", thus in line with Digicel's experience.

Mark-up Methodology

The issue pertaining to mark-up methodology for calculation of operating unit costs within the models was raised with regards to common costs across both fixed and mobile network LRIC models. C&W submitted that the methodology proposed by the Commission which required them to use the latest mark-ups from the Enhanced Allocation Model (EAM) was flawed, as this could reflect exceptional costs and inefficiencies in that single year and that a 3-year average of EAM data was more appropriate. Digicel raised a further issue of the markup on transport and duties.

Commission's Position

The Commission agrees with the proposal from C&W that a 3-year average of EAM data was more appropriate as it prevents over-reliance on a single EAM. In the case of Digicel's concern relating to markup on transport and duties, the Commission is of the view that this mark-up reflects the costs of importing internationally traded equipment. Therefore, as part of the review process, the decision was made to develop more disaggregated mark-ups to allow for a more accurate estimation of unit capital expenditure for each network element.

Transparency and Confidentiality

Throughout the process, Digicel raised transparency concerns and during Phase 2, which involved the construction of the LRIC Models, Columbus raised concerns on the need for greater transparency in assumptions. Columbus was also of the view, that to improve transparency, allocation rules, processes and key outputs should be disclosed to other market participants.

Commission's Position

The Commission notes that Digicel appears to be of the view that the LRIC models should have been developed by the Commission with input from both C&W and Digicel. The Commission in the LRIC consultation document had described the process to be followed whereby C&W would be required to develop the LRIC models for the fixed and mobile networks. These models would need to be developed in line with the LRIC guidelines and the model specifications consistent with these guidelines. The burden of proof will be on C&W to satisfy the Commission that the model and its inputs are accurate and consistent with the guidelines. The review process will finish when the Commission is satisfied that the model is fit for purpose.

The Commission is of the view that several steps were taken to ensure a high level of transparency during the entire process, balancing this with the need for confidentiality as it related to commercially sensitive information. The Commission is also satisfied that the model specifications is clear on how costs in general are to be allocated, and regrets that, having invited interested parties to

provide alternative data to validate the model results, this information was never submitted.

Sensitivity Analysis

Digicel suggested that the sensitivity analysis[6] which was done on the final LRIC modelling results was inadequate. As part of its submission, Digicel provided some data of mobile termination rates used elsewhere as a 'sanity check' in order to demonstrate that C&W's final LRIC unit cost results were too low (i.e., significantly below regional and other comparator rates).

Commission's Position

The Commission is of the view that Digicel's 'sanity checks' are based on benchmarks and jurisdictions that are not representative of the Barbados market. Any international termination rate benchmark is constrained by underlying differences in the approach to setting the rates, differences in the market, regulatory and economic environments and technology and network deployments. In contrast, the Commission notes that the LRIC models prepared for Barbados aim to estimate the cost of providing for Fixed Transit, Fixed Termination, Mobile Transit and Mobile Termination interconnection services and thus will provide a better basis for cost-based interconnection rates than any benchmarks. Barbados also has different characteristics in terms of topography, size, population density and average income to many of the countries contained in Digicel's sample.

The Commission is also of the view that its sensitivity analysis undertaken throughout the LRIC model review process is adequate and in line with its LRIC Guidelines.

[6] See Appendix 2

6. MODEL RESULTS, DETERMINATION AND IMPLEMENTATION

Model Results and Validation

The Commission is cognisant that forward-looking cost models are inevitably based on simplifications of cost patterns with further uncertainties introduced by the process of analysis and assumptions made. Given these uncertainties, the results from the LRIC models were assessed using model validation tools, which included testing the sensitivity of the outcomes to changes in the input data and in the key functional relations before reliance was placed on them. Therefore, as stated previously, several revisions of the draft models were undertaken by C&W as required by the Commission, based on stakeholder and consultant inputs.

Implementation of LRIC-Based Rates

The Commission, having concluded its review of C&W's fixed and mobile network LRIC models and supporting documentation to ensure compliance with the LRIC Guidelines, sought to obtain a view from stakeholders on how to transition from the output interconnection costs to the LRIC based interconnection rates. As part of that process, further stakeholder involvement was solicited on the results of the final LRIC model and the implementation of LRIC-based interconnection rates as it related to interconnection rate structure, interconnection rate level and transition to new interconnection rates. Several submissions received from parties to the process were considered and taken into account by the Commission in arriving at its decision on the LRIC-based rates.

The Commission's decisions on the rates and their implementation are as outlined below:-

i) Interconnection Rate Structure

The rates for Fixed Transit, Fixed Termination, Mobile Transit and Mobile Termination interconnection services in the current RIO provide a two-part tariff for several interconnection services by calculating separately i) the fixed per-call setup fee and ii) the variable per-minute termination fee, which is more reflective of cost-causation. Within the LRIC models, interconnection unit costs are calculated on a per-minute of use basis to provide the total incremental costs necessary to produce a given amount of interconnection calls and degree of interconnection traffic. This total cost is divided by the given volume of interconnection traffic (measured in minutes) in order to establish a single per-minute cost for each interconnection service. Unit costs associated with termination services are therefore derived as a single per-minute charge within the LRIC model.

C&W proposed that the current two-part interconnection tariff system comprising a call set up charge and a per-minute termination charge should be replaced by a single per-minute charge. C&W also submitted that whilst the current two-part system is more in line with cost causality, a single charge would be simpler and easier to administer. Digicel was not opposed to a move to a single per-minute charge that was consistent with cost causality but suggested that billing should be on a per-second basis.

The Commission is of the view that adopting a single per-minute tariff is appropriate on the grounds that it is simple and easier to administer and follows international practice which is moving towards adopting a single, per-minute charge for call termination services.

Commission's Decision

The Commission determines that interconnection rate structure for interconnection services will be charged based on a single per-minute tariff (instead of the current two-part tariff).

ii) Interconnection Rate Level

It was proposed that interconnection rates should be based on the unit cost results in C&W's final LRIC models. This is because economic theory suggests that cost-based pricing in the context of call termination is generally efficient in the absence of significant externalities[7]. Given the complexity of determining any potential externalities, and the limited international precedent on taking account of these when setting termination rates, the Commission did not consider it prudent to apply externality adjustments. As a result, the Commission considers it appropriate to use the final LRIC results as the basis for interconnection rates for the Fixed Transit, Fixed Call Termination, Mobile Transit and Mobile Call Termination.

[7] See Appendix 1

The table below shows the interconnection rates derived from the LRIC models as well as the current RIO 2010 rates. It clearly shows that the LRIC rates are significantly lower than the interconnection rates in C&W's RIO 2010.

Table 1: LRIC-based Rates and Current RIO Rates

Interconnection service	RIO 2010 rates* *(BDS$/min)*	Final LRIC based rates *(BDS$/min)*
Fixed Transit	0.022	0.010
Fixed Termination	0.030	0.011
Mobile Transit	0.022	0.011
Mobile Termination	0.255	0.055

Source: C&W's final LRIC models

* Given the two part-tariff structure of C&W's current interconnection charges (consisting of a set up charge and call duration charges), the per-minute RIO charges presented in this table are based on an average call length of 2 minutes. This is in line with C&W's assumption in its draft model submission and the traffic data available to the Commission.

Commission's Decision

The Commission determines that the interconnection rates will be based on the unit cost results in C&W's final LRIC models.

iii) Transition to New LRIC-Based Interconnection Rates

As noted previously the LRIC based interconnection rates for the referenced services are significantly lower than the current rates. Generally, the transition to new interconnection rates where a large change to interconnection rates is required can be achieved using different approaches ranging from glide path (phased implementation) to immediate implementation.

Many regulatory authorities implement significant interconnection rate changes using a multi-year glide path, where rate decreases are phased in over a period of several years. This reflects a desire to minimise the impact of sudden changes in termination rates on the operator's pricing structures and on retail markets. The actual length of the glide path will depend on the observed difference between the current interconnection rates and target rates based on the LRIC model, with the aim of ensuring that the overall transition path allows a smooth transition to the revised rate level and/or the regulatory review cycle for these rates, thereby minimising any adjustment cost.

C&W, whilst recognising the use of glide-paths by some regulators and pointing out the regional precedence for immediate implementation of termination rates, considered the swift transition to LRIC-based rates to benefit consumers and competition within the sector. C&W therefore proposed that LRIC-based rates be implemented immediately at the conclusion of the LRIC review proceeding based on a one-off change, or alternatively over a short period, not to exceed 6-months.

Caritel suggested a phased transition from the current termination rates to termination rates based on the model output, based on a three-year glide-path, in line with ECTEL's[8] approach in 2009. Columbus supported the immediate move to cost based prices based on the results of the LRIC models, believing this to be consistent with legislation. Digicel suggested that substantial changes to interconnection rates should be phased in over time so as to not jeopardise investments (i.e., the application of a multi-year glide-path).

Having considered the various submissions, the Commission proposes a 12-month phased implementation of LRIC-based interconnection rates. The Commission considers that no material benefit will accrue to consumers or competition from postponing or prolonging the implementation of LRIC-based prices in Barbados. However, the Commission is cognizant that, since the existing interconnection rates do not reflect current incremental costs and because a considerable difference exists between the four new LRIC-based interconnection rates and the current approved RIO tariffs, there may be the possibility of market disruption if the new rates are immediately implemented. In light of interconnection rates being above efficient costs for several years, a shorter glide path is justified with a 60:40 split. There will be an initial 60% decrease in the difference effective May 1, 2015 and the remaining 40% on April 1, 2016. (Table 2).

[8] Eastern Caribbean Telecommunications Authority

Table 2: Glide Path Implementation of LRIC Rates

Interconnection Services	Current RIO Rates BDS$/min	Initial Rate Reduction May 1, 2015 (60% of overall required reduction)	Final Rate Reduction on April 1, 2016 (remaining 40% of overall required reduction)
Fixed Transit	0.022	0.015	0.010
Fixed Termination	0.030	0.018	0.011
Mobile Transit	0.022	0.015	0.011
Mobile Termination	0.255	0.135	0.055

* Given the two part-tariff structure of C&W's current interconnection charges (consisting of a set up charge and call duration charges), the per-minute RIO charges presented in this table are based on an average call length of two minutes.

Commission's Decision

The Commission determines that transitioning to new LRIC interconnection rates will be effected using the glide path as set out in Table 2 above.

iv) Other Interconnection Services

The RIO 2010 also includes tariffs for other interconnection services including calls to Directory Enquiry (DQ) services, Emergency Services and Incoming International Call services. However, the LRIC modelling exercise only focused on key interconnection services relating to fixed transit, fixed call termination, mobile transit and mobile call termination. Columbus expressed concern that these interconnection services were not addressed in the LRIC model.

These services will be fully examined as part of the proposed RIO review which will be undertaken later this year.

Commission's Decision

The Commission determines that the, interconnection services such as DQ services, emergency services and incoming international call services currently included in the RIO 2010 Tariff schedule will remain unchanged. These rates will be examined during the upcoming RIO 2010 review proceedings.

v) Application of LRIC-Based Rates to the RIO 2010

Since the interconnection rates derived from the LRIC models for the Fixed Transit, Fixed Termination, Mobile Transit and Mobile Termination have been fully examined during the LRIC process, the Commission considered it appropriate that these will replace the relevant rates to the RIO 2010. These are identified in the Determination section of this Decision.

Digicel however indicated that they had not envisaged that LRIC-based interconnection rates would be introduced in advance of the review of the RIO. Digicel suggested that any transition to new rates should be done in the context of a review of the RIO 2010 decision. The Commission notes, however, that paragraph 27 of the RIO 2010 Decision provides for the Commission's review of the output of the LRIC study, including the interconnection costs and the issuing of new interconnection rates, as warranted. The Commission has staggered the move to LRIC based rates and notes that there is precedent for making rate changes on selected interconnection services only. The Commission in the RIO 2010 Decision adopted a similar approach of varying only a selection of interconnection rates.

Commission's Decision

The Commission determines that the unit costs that were the output of the LRIC modelling exercise, will be deemed to be the RIO rates and should be implemented as determined.

7. DETERMINATION

The Commission's determination on the LRIC interconnection rates for the termination and transit of fixed and mobile traffic on domestic telecommunications networks in Barbados pursuant to section 25(2) (e) of the Telecommunications Act of Barbados CAP282B are based on the approved C&W fixed and mobile LRIC models dated July 9, 2014.

These models, having been revised accordingly to address the matters previously discussed, provide a reasonable representation of the LRIC cost for Fixed Transit, Fixed Termination, Mobile Transit and Mobile Termination interconnection services:

The Commission therefore determines that the following approaches are to be adopted in regards to the interconnection rates for Fixed Transit, Fixed Termination, Mobile Transit and Mobile Termination interconnection services:

- **Interconnection Rate Structure**
  The Commission determines that the interconnection rate structure for interconnection services will be charged based on a single per-minute tariff (instead of the current two-part tariff).

- **Interconnection Rate Level**
  The Commission determines that the Interconnection rates will be the unit cost results as established in C&W's final LRIC models.

- **Application of rates arising from LRIC model results to the RIO 2010**
  The Commission determines that the four rates that were the output of the LRIC modelling exercise will also be deemed to be the RIO rates.

C&W's Final LRIC Cost Based Rates for Interconnection Services

Interconnection Service	Final LRIC -based Rates *(BDS$/min)*
Fixed Transit	0.010
Fixed Termination	0.011
Mobile Transit	0.011
Mobile Termination	0.055

The Fixed Transit Service rate will replace the PSTN[9] Transit Service Charge in the RIO 2010 as well as the Transit Part of the Domestic Fixed to Mobile Service Charges. The Fixed Termination Service rate will replace the charges for the PSTN Terminating Access Service in the RIO 2010. The Mobile Transit Service rate did not exist in the RIO 2010 but it is a rate in the Variation Agreement[10] between Digicel Barbados Limited and C&W that was approved by the Commission on December 9th, 2014. This new rate will replace the PLMN[11] Transit Service rate in the Variation Agreement. The Mobile Termination Service rate will replace the Mobile Termination part of the PLMN to PLMN Terminating Access Service of the RIO 2010.

- **Transition to New Interconnection Rates**

  The Commission determines that transitioning to new LRIC interconnection rates will be effected using a glide path which would entail a larger reduction being done in the initial stage. An initial reduction of 60% of the difference between the existing RIO 2010 rate and the LRIC-based rates will be effective May 1, 2015. The remaining 40% reduction to move the rate to the final LRIC-based rates would be applied on April 1, 2016.

[9] Public Switched Telephone Network (PSTN)
[10] Variation Agreements are required when, for example, there are changes in operating conditions that necessitates amendments to the existing Interconnection Agreement between two telecommunication operators
[11] Public Land Mobile Network (PLMN)

Glide Path Implementation of LRIC Rates

Interconnection Services	Current RIO Rates	Initial Rate Reduction May 1, 2015 (60% of overall required reduction)	Final Rate Reduction on April 1, 2016 (remaining 40% of overall required reduction)
Fixed Transit	0.022	0.015	0.010
Fixed Termination	0.030	0.018	0.011
Mobile Transit	0.022	0.015	0.011
Mobile Termination	0.255	0.135	0.055

- **Other Interconnection Services**

  The Commission determines that the rates for other interconnection services, such as National Directory Enquiry (DQ) Services, Emergency Services and Incoming International Call Termination services currently included in the RIO 2010 Tariff schedule, will remain the same, but will be considered during the upcoming RIO review proceedings.

APPENDICES

APPENDIX 1: DEFINITIONS

1. COSTING METHODOLOGIES

Costing methodologies can include fully-allocated cost (FAC) and incremental costs methods such as long run incremental cost (LRIC). FAC attributes the total cost incurred in producing a product or delivering a service to that service whilst LRIC methodology is used to derive estimates of the incremental direct and variable costs of interconnection services. Several approaches based on LRIC methodology are discussed below:

Pure LRIC - This approach excludes shared and common costs by setting the increment to be a single service such as termination.

Total Service Long Run Incremental Cost (TSLRIC) is a forward-looking, cost-based approach which relies on measuring the costs that a hypothetical efficient operator would incur in the longer term in the provision of a specified increment of output not the element. In other words, TSLRIC measures the incremental cost incurred of providing a service versus not providing a service. It measures the total costs of all services for the associated network elements and then attributes a proportion of those costs to the relevant interconnection services. The TSLRIC approach represents, therefore, a share of joint and common costs.

The TSLRIC approach involves three elements:

- the relevant increment which is defined as the total volume of a range of services which means that fixed and common costs between these services are included;
- the costs of ensuring the increment supplied over the longer run are included, – so that the capital stock is variable, and hence is included in the cost pool;
- and the concern is with the resources that would be needed to provide this service with current technology and management practices, i.e. on a forward-looking basis, as against those that may have been inherited from earlier periods.

Total Element Long Run Incremental Cost (TELRIC) is another LRIC approach that measures the forward-looking incremental cost of adding or subtracting a network element from a hypothetical efficient system using current technologies. In addition, this approach includes a reasonable allocation of forward-looking common costs, which allows the incumbent to recover a share of the fair value of their inputs in a competitive market in the long run.

Long Run Average Incremental Cost (LRAIC) is an approach used to measure the average cost of increasing output by a given quantity, based on the most efficient technology available. This is the average cost of output over the total period. It smoothes the price path by averaging out price peaks and troughs caused by the investment cycle.

Fully Allocated Costs (FAC)

FAC is an accounting method for attributing all the costs of the company to defined activities such as products and services. Typically this method would follow the principle of cost causality. This is also referred to as "fully distributed costs" (FDC).

Cost allocation and cost apportionment are methods for attributing cost to particular cost objects. Cost object is a term referring simply to any item associated with a cost figure of its own.

2. WEIGHTED AVERAGE COST OF CAPITAL

The weighted average cost of capital (WACC) is the estimated rate that a company is expected to pay on average to all its security holders to finance its assets. The WACC is commonly referred to as the company's cost of capital. It is not a value dictated by management, but instead represents the expected return that a company must earn on an existing asset base to satisfy its creditors, owners, and other providers of capital, or they will invest elsewhere. In the case of telecommunications, it is a part of what efficient access providers will require to fully recover the costs of producing the service, thus promoting the legitimate business interests of access providers.

3. EXTERNALITIES

Call externalities are present when called parties obtain benefits from receiving calls. That is, calls generate benefits to both callers and recipients.

Network externalities arise when existing subscribers of a network benefit from a new subscriber joining the network. In fixed and mobile markets, the presence of additional subscribers can generate a positive externality to existing subscribers, because it creates the possibility of calling additional people and of being called by these new subscribers.

The economic literature suggests that, in the presence of network externalities, the efficient termination rate should be set above cost. This is because a higher termination rate induces operators to lower their subscription prices, thus promoting network participation at a level consistent with the social benefits of higher penetration.

The opposite happens under call externalities. In this case, the efficient termination charge is below cost, in order to increase traffic volumes and internalise call externalities. The combination of network and call externalities may therefore lead to above or below cost-efficient call termination charges, or even efficient cost in net terms.

The adjustment of interconnection rates to account for potential externalities, however, may be complex and unfeasible if the necessary information is not available. In practice, only few jurisdictions have adjusted termination rates for the inclusion of externalities. This is, for example, the case in the UK where Ofcom included a network externality surcharge in the mobile market reviews of 2004 and 2007; but in recent determinations no allowance for externalities has been included.

APPENDIX 2: SENSITIVITY ANALYSIS ON FINAL MODELLING RESULTS

This section provides the results of a range of sensitivities conducted by the Commission on the final modelling results for fixed and mobile interconnection services.

Fixed Network LRIC Model

Table 5: WACC Sensitivities

	Fixed Transit *(BDS$/min)*	**Fixed Termination** *(BDS$/min)*
Lower WACC Sensitivity (10%)	0.009	0.010
Base Case (WACC 15.76%)	**0.010**	**0.011**
Higher WACC Sensitivity (20%)	0.010	0.011

Table 6: Unit Cost Sensitivities

	Fixed Transit *(BDS$/min)*	**Fixed Termination** *(BDS$/min)*
Lower unit capex cost reductions (50% of base case assumptions)	0.010	0.012
Base Case	**0.010**	**0.011**
Higher unit capex cost reductions (200% of base case assumptions)	0.009	0.009

Mobile network LRIC model

Table 7: WACC Sensitivities

	Mobile Transit *(BDS$/min)*	**Mobile Termination** *(BDS$/min)*
Lower WACC Sensitivity (10%)	0.009	0.045
Base Case (WACC 15.76%)	**0.011**	**0.055**
Higher WACC Sensitivity (20%)	0.011	0.062

Table 8: Unit Cost Sensitivities

	Mobile Transit *(BDS$/min)*	**Mobile Termination** *(BDS$/min)*
Lower unit capex cost reductions (50% of base case assumptions)	0.011	0.057
Base Case	**0.011**	**0.055**
Higher unit capex cost reductions (200% of base case assumptions)	0.010	0.053

APPENDIX 3: CHRONOLOGY OF THE PROCESS

Table 9: The Chronology Of The Process

LRIC Guidelines	2011/12	• The Commission published draft LRIC Guidelines setting out the key principles and approach for the development of LRIC models of fixed and mobile networks • Public consultation on the draft LRIC Guidelines • The Commission then published final LRIC Guidelines, taking into account any comments received during the consultation period. • The final LRIC Guidelines (approved December 12, 2011) form the basis for the fixed and mobile network LRIC models developed by C&W
Review of draft model specifications	2013	• C&W submitted draft LRIC model specification providing details on its proposed approach for the LRIC models • The Commission reviewed the draft model specifications and invited comments from stakeholders
Review of draft LRIC models	2014/15	• C&W submitted draft LRIC models based on revised LRIC model specifications and a proposal on how to inform future interconnection rates based on the modelling results • The Commission conducted stakeholder meetings and invited stakeholders to provide further information to support its review process. • The Commission conducted a detailed review of the draft LRIC models and accompanying documentation, taking into account the stakeholder responses received on its call for inputs. • C&W submitted final LRIC models based on the revised, final LRIC model specifications, taking into account the required amendments identified in the Commission's review. C&W has further submitted its proposal on how to inform future interconnection rates based on the final modelling results. • The Commission issued a stakeholder note requesting input from parties on the transition to LRIC Interconnection rates • The Commission reviews all submissions and issues decision on LRIC Interconnection rates

Dated this day of March 2015

Original signed by
……..……………………………..
Neville V. Nicholls
Chairman

Original signed by
…………………………………….
Andrew S. Downes
Deputy Chairman

Original signed by
……………………………………
Herma E. Griffith-Ifill
Commissioner

Original signed by
…………………………..…………
Errol L. Humphrey
Commissioner