Office of Utilities Regulation

Consultation Document – Public Version

Cost Model for Fixed Termination Rates – Draft Model

2016 June 22

OFFICE OF UTILITIES REGULATION

3rd Floor
PCJ Resource Centre
36 Trafalgar Road
Kingston 10
Jamaica
West Indies

Abstract

This document has been prepared to facilitate discussion and consultation with operators and industry stakeholders in relation to the development of a Bottom-up Long Run Incremental Cost (BULRIC) Model for fixed networks being carried out by the Office of Utilities Regulation (OUR), with the support of Axon Partners Group Consulting (Axon Consulting).

A Draft BULRIC Model for fixed networks has been developed based on the outcome of the public consultation on “BULRIC Modelling” launched in 2015 January. The model takes into account the stakeholders’ feedback, as described in the Determination Notice “Consultation Document on Cost Model for Fixed Termination Rates – Principles and Methodology” Document Number 2015/TEL/006/DET.002 (the Methodology) published on 2015 July 1.

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Consultation Process

Persons who wish to express opinions on this Consultation Document are invited to submit their comments in writing to the Office of Utilities Regulation ("OUR") by post, facsimile or email addressed to:

Office of Utilities Regulation
P.O Box 593
36 Trafalgar Road
Kingston 10

Attention: Evona Channer

Fax: (876) 929-3635
Email: evona.channer@our.org.jm

Responses are requested by 2016 August 3

Responses which are not confidential pursuant to sections 7(6) and 7A of the Telecommunications Act will be posted to the OUR's website (www.our.org.jm). Respondents are therefore requested to supply their responses in electronic form to facilitate such postings.

COMMENTS ON RESPONSES

There will be a specific period for respondents to view other responses (non-confidential) and to make comments on them. The comments may take the form of either correcting a factual error or putting forward counter arguments. As in the case of the responses, comments which are not confidential pursuant to the Telecommunications Act will be posted to the OUR's website.

Comments on responses are requested by 2016 August 17

Arrangement for Viewing Responses

This Consultation Document and the responses and comments received by the OUR will also be made available to the public through the OUR's Information Centre ("OURIC"). Persons who wish to view this Document, responses and comments should make an appointment by contacting:

Ms. Kishana Munroe
Co-ordinator OURIC/Information Officer
Telephone: (876) 968-6053
Fax: (876) 929-3635
Email: kishana.munroe@our.org.jm

Individuals with appointments should visit the OUR's offices at:

3rd Floor, PCJ Resource Centre,
36 Trafalgar Road,
Kingston 10

Photocopies of selected responses and comments may be provided on request at a price which reflects the cost to the OUR.

CONSULTATIVE TIMETABLE

The timetable for the consultation is summarized in the table below**:**

Event	***Date***
Publish Consultation Document	2016 June 22
Responses to Consultation Document	By 2016 August 3
Comments on Responses	By 2016 August 17
Issue Determination Notice	By 2016 November 30

Chapter 1 : Introduction

1.1. Having determined that C&WJ is dominant with respect to the fixed call termination service offered, and given the mandatory requirement that interconnection tariffs must be cost oriented, the OUR needs to ensure that the charges imposed for this service conforms to statutory requirements. While C&WJ is currently the only operator which has been found dominant with respect to fixed call termination service, the developed model estimates a cost of interconnection services for a generic fixed line operator such that the rates obtained can be applied to any fixed network operator found to be dominant in the future. That is, the model does not calculate a cost specifically for C&WJ's fixed network.

1.2. The OUR has developed a cost model to determine the cost oriented rate for interconnection services. The purpose of this consultation is to present the results of the draft model to operators and other stakeholders so they can provide comments.

1.3. After this process is finished, the OUR plans to determine the wholesale interconnection rates for a period of five (5) years (from 2016 to 2020), taking into account stakeholders' comments.

1.4. The OUR is of the opinion that the Jamaican operators are in a good position to contribute to the development of this model. Therefore, the OUR invites them to provide their views and comments on the Draft Model through their response to this document.

1.5. The OUR encourages participants to support all comments with relevant arguments and also data, analysis, benchmarking studies and information based on the national situation, or on the experience of other countries, (if relevant), to support their comments. The OUR is likely to give greater weight to comments supported by relevant, appropriate arguments and evidence.

1.6. As determined in the "Methodological Document" for the "Cost Model for Fixed Termination Rates", published by the OUR on July 1, 2015: "The Office will model a reference operator with similar characteristics to the

incumbent" (Determination #11). Therefore, a portion of the data required for the model can best be provided by Cable & Wireless Jamaica Limited (C&WJ). Additionally, the OUR has observed that the details provided by the other market players regarding information that is common to multiple operators (such as transmission equipment unit prices), have been very limited.

1.7. Consequently, the OUR will, simultaneously with the current public consultation on the model, be undertaking a private consultation with C&WJ, on inputs and information used in the model that have been obtained from C&WJ . Note that the information of C&WJ which the OUR has classified as confidential in light of the provisions of the Telecommunications Act, and other information deemed confidential, has been excluded from this public consultation document and the associated attachments.

1.8. After the conclusion of this consultation process and the private consultation with C&WJ, the OUR will address the contributions provided by all operators and industry stakeholders and a final version of the BULRIC Model for fixed networks will be developed.

1.9. This consultation document is structured into four chapters as set out below:

- Introduction
- Legal and Regulatory Framework
- BULRIC Model for Fixed Networks.
- Relevant aspects

Chapter 2 : Legal and Regulatory Framework

2.1. As part of its overall functions to regulate services and facilities under section 4(1) of the Telecommunications Act, and in keeping with its express power to determine the rates which may be charged in respect of the provision of a prescribed utility service under section 4(4) of the Office of Utilities Regulation Act ("OUR Act"), the OUR is authorised to determine the prices charged by telecommunications operators for the provision of interconnection services.

Section 4(1)(a) of the Telecommunications Act states:

> "(1) The Office shall regulate telecommunications in accordance with this Act and for that purpose the Office shall -
>
> (a) regulate specified services and facilities"

Section 4(4) of the OUR Act states:

> "(4) The Office shall have power to determine, in accordance with the provisions of this Act, the rates or fares which may be charged in respect of the provisions of a prescribed utility service."

2.2. A "specified service" is defined in section 2 of the Telecommunications Act to mean, inter alia, a telecommunications service, while a "prescribed utility service" is defined in section 2 and the First Schedule of the OUR Act to include the provision of telecommunications services.

2.3. The legal framework governing interconnection, which is a type of telecommunications service, can be found in Part V (sections 27-37A) of the Telecommunications Act.

2.4. The Telecommunications Act at Section 29 (1) states:

> *"Each carrier shall, upon request in accordance with this Part, permit interconnection of its public network with the public network of any other carrier for the provision of telecommunications services".*

2.5. The Telecommunications Act grants the OUR specific powers with regard to the determination of tariffs charged for interconnection services. Sections 29 (4)(a) and (5) state:

> *"(4) The Office may -*
>
> *(a) on its own initiative, in assessing an interconnection agreement, make a determination of the terms and conditions, including charges;*
>
> *…*
>
> *"(5) When making a determination of an operator's interconnection charges, the Office shall have regard to -*
>
> *(a) the principles of cost orientation or reciprocity;*
>
> *(b) local or international benchmarks; or*
>
> *(c) any other approach that is relevant to the determination of interconnection charges."*

2.6. Section 30 of the Telecommunications Act requires that dominant public telecommunications carriers provide interconnection in accordance with various principles. In particular section 30 (1)(a)(iii) requires that charges for interconnection services "*…shall be cost oriented and guided by the principles specified in section 33".*

2.7. These principles of cost orientation are stated in section 33 as follows:

> *"(1) Where the Office is required to determine the charges for the provision of interconnection by a dominant carrier, it shall, in* making that determination, be guided by the following principles -
>
> *(a) costs shall be borne by the carrier whose activities cause those costs to be incurred;*
>
> *(b) non-recurring costs shall be recovered through non-recurring charges and recurring costs shall be recovered through recurring charges;*

(c) costs that do not vary with usage shall be recovered through flat charges and costs that vary with usage shall be recovered through charges that are based on usage;

(d) costs shall include attributable operating expenditure and depreciation and an amount estimated to achieve a reasonable rate of return;

(e) with the exception of interconnection charges for wholesale termination services, interconnection charges shall be established between the total long run incremental cost of providing the service and the stand alone cost of providing the service, so, however, that the prices shall be so calculated as to avoid placing a disproportionate burden of recovery of common costs on interconnection services;

(f) where appropriate, interconnection costs shall include provision for a supplementary charge, being a contribution towards the access deficit of the interconnection provider; and

(g) in the case of charges for wholesale termination services, charges shall be calculated on the basis of forward looking long run incremental cost, whereby the relevant increment is the wholesale termination service and which includes only avoidable costs.

(2) Where the Office has been unable to obtain cost information that it is reasonably satisfied is relevant and reliable it may take into account local and international benchmarks, reciprocity and any other approach that in the opinion of the Office is relevant."

2.8. On 2015 January 19, the OUR issued a Consultation Document "Cost Model for Fixed Termination Rates – Principles and Methodology" Document Number 2015/TEL001/CON.001 to receive stakeholders views on the methodology to be applied for the determination of costs and associated charges for wholesale fixed interconnection services. Stakeholders' views were analysed and the document - "Determination Notice for Cost Model for Fixed Termination Rates – Principles and

Methodology" Document Number 2015/TEL/006/DET.002 (the Methodology) was published on 2015 July 1.

2.9. In keeping with its express statutory powers to determine the charges for interconnection services as mentioned above, the OUR now seeks comments on the draft of the cost model for the determination of costs and associated charges for wholesale fixed interconnection services which has been developed based on the Methodology.

Chapter 3 : BULRIC Model for Fixed Networks

Description of supporting documentation

3.1. The attached electronic documents contain the model's supporting documentation. Namely:

- **Draft BULRIC Model for fixed networks – Additional inputs** (file: BULRIC Fixed Model - Additional Inputs.xlsm): It contains the non-confidential inputs of the BULRIC model, that are not presented in this document (due to size).
- **Description of the BULRIC Model** (file: Description of the BULRIC Model for Fixed Networks.pdf): This document describes how the Draft BULRIC Model for fixed networks works and the algorithms used for modelling the network and calculating services' costs.

Topics that are considered of special relevance

3.2. The OUR welcomes all comments on the Model, especially those that address the topics of highest relevance and with highest impact on the outcome of the model. The OUR will dedicate special attention to those comments on topics of special relevance and which have greater impact on the results of the model. Therefore, the OUR would appreciate comments from stakeholders especially on the following aspects of the Model:

- Market demand considered in the model;
- Migration of the access nodes from legacy to NGN technology;
- Access network links' distance;
- Technical parameters and modelled network;
- Unitary costs and cost trends;
- Cost structure; and
- Cost allocation to services.

Chapter 4 : Relevant Aspects

Market demand considered in the model

4.1. The demand is one of the main inputs of the BULRIC model for fixed networks. The historic traffic consumption used is based on the data provided by operators. The traffic forecast has been calculated by applying the expected growth for each service category, also provided by operators.

The following table illustrates the voice traffic consumption considered in the Draft BULRIC Model:

Voice traffic (millions of minutes)	2013	2014	2015	2016	2017	2018	2019	2020
Incoming to Local	13.3	13.5	13.5	13.1	12.2	11.4	10.6	9.9
Incoming to National	216.1	219.4	219.4	212.1	197.7	184.3	172.0	160.5
Incoming Others	37.7	47.1	48.4	48.4	46.0	43.7	41.5	39.5
Transit	414.2	346.0	336.4	319.0	302.5	286.9	272.1	258.1
Outgoing	1,191.6	1,127.2	1,029.0	949.9	926.3	907.0	890.9	875.7

Table 1: Total market voice traffic [Source: Axon Consulting based on information provided operators]

Table 2 displays the evolution of the data traffic for Non-voice services considered in the Draft BULRIC Model:

Data traffic (Gbps)	2013	2014	2015	2016	2017	2018	2019	2020
Broadband	12.5	17.0	19.9	23.3	27.2	31.9	37.3	43.6
Leased lines - Intra Parish	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
Leased lines - Inter Parish	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4

Table 2: Total market non-voice traffic [Source: Axon Consulting based on information provided by operators]

Question 1: Do you agree that the demand presented above reasonably represents the Jamaican fixed market? Please explain your views.

Migration of the access nodes from legacy to NGN technology

4.2. According to the Methodology an important aspect considered in the model is the migration from legacy to NGN technology. The migration consists of replacing the legacy access nodes (remotes) with NGN access nodes (cabinets). The following percentage of legacy nodes to be migrated, has been considered:

Geotype	2013	2014	2015	2016	2017	2018	2019	2020
URBAN_DENSE			30%	70%	100%	100%	100%	100%
URBAN			30%	70%	100%	100%	100%	100%
SUBURBAN_DENSE			20%	40%	70%	100%	100%	100%
SUBURBAN			20%	40%	70%	100%	100%	100%
RURAL			20%	35%	50%	65%	80%	100%
RURAL_SPREAD			20%	35%	50%	65%	80%	100%

Table 3: Migration percentage of access nodes from Legacy to NGN technology [Source: Axon Consulting]
Note: Figures from 2013 to 2014 have been removed due to confidentiality issues

4.3. As shown in Table 3 above, the migration percentages have been defined for different geotypes[1], based on the following assumptions:

- The entire network will be fully migrated to NGN by 2020
- The migration will be progressive and faster in denser geotypes.
- Urban geotypes will be fully migrated by 2017
- Suburban geotypes will be fully migrated by 2018.

4.4. Table 4 below represents the migration profile for access nodes obtained by the model:

[1] For further detail about geotypes see the Description of the BULRIC Model.

Access nodes	2013	2014	2015	2016	2017	2018	2019	2020
Legacy nodes								
URBAN_DENSE								-
URBAN								-
SUBURBAN_DENSE								-
SUBURBAN								-
RURAL								-
RURAL_SPREAD								-
NGN nodes								
URBAN_DENSE								92
URBAN								143
SUBURBAN_DENSE								15
SUBURBAN								45
RURAL								14
RURAL_SPREAD								152

Table 4: Migration profile for the access nodes [Source: Axon Consulting]
Note: Figures from 2013 to 2019 have been removed due to confidentiality issues

Question 2: Do you agree that the migration percentage above and the final number of nodes are reasonable and accurately represent the foreseeable future of Jamaican market? Please explain your views.

Access network links' distance

4.5. In order to properly characterise the average distances of backhaul network connection between network elements, a geographical analysis has been performed to calculate the road distances between elements, i.e. remotes nodes, local nodes, cabinets and edge nodes.

4.6. Two topologies have been modelled for the backhaul connections, Ring Topology for urban and suburban areas and Minimum Distance Tree Topology for Rural areas[2]. The average distance link depends on the topology and the technology, i.e. legacy or NGN, as shown in Table 5 and Table 6.

[2] Further detail on these topologies can be found in the Description of the BULRIC Model.

Geotype	Average link distance – Legacy (km)	Average link distance – NGN (km)
URBAN_DENSE	4.88	1.43
URBAN	2.78	3.00
SUBURBAN_DENSE	5.06	3.87
SUBURBAN	5.06	3.87

Table 5: Average distance of transmission links for connecting access nodes through ring topology [Source: Axon Consulting]

Geotype	Average link distance – Legacy (km)	Average link distance – NGN (km)
RURAL	5.00	5.00
RURAL_SPREAD	6.41	6.41

Table 6: Average distance of transmission links for connecting access nodes through Minimum Distance Tree topology [Source: Axon Consulting]

Question 3: Do you agree that the average distance extracted from the geographical analysis performed, reasonably represents the prevailing average length of the backhaul network in the geography of Jamaica? Please explain your views.

Technical parameters and modelled network

4.7. The model considers a number of technical parameters for modelling the network (for example, voice bitrate and maximum number of lines per chassis). The technical inputs are located on the worksheet 'INP NETWORK' of the Additional inputs file. Based on these parameters, the model obtains the following main resources to satisfy the demand:

Resource	2013	2014	2015	2016	2017	2018	2019	2020
Legacy nodes								
Remotes Chassis								-
DSLAM Chassis								-
Aggregation Chassis								-
Local Chassis								-
Tandem Chassis								-
Legacy ports								-
Ethernet ports								-

Resource	2013	2014	2015	2016	2017	2018	2019	2020
NGN nodes								
MSAN Chassis								1,612
Aggregation Chassis								461
Edge Chassis								55
Distribution Chassis								24
Core Chassis								6
Ethernet ports								2,475
Transmission								
Fibre (km)								3,355
Ethernet Chassis								558
TDM Chassis								-
DWDM Chassis								-
Lambdas								-
Legacy ports								-
Ethernet ports								1,413
MW hops								198
Towers								127
Core								
CSCF								2
AS								2
NMS								2

Table 7: Summary of draft resources obtained [Source: BULRIC Model]
Note: Figures from 2013 to 2019 have been removed due to confidentiality issues

Question 4: Do you agree that the resources obtained are reasonable to satisfy the demand? Please explain your views.

Unitary costs and cost trends

4.8. The unitary costs of the resources used in the model are listed on the worksheet 'INP UNITARY COSTS' of the Additional inputs file for the year 2013 and 2014.

4.9. The resources' cost trends used in the model are listed on the worksheet 'INP COST TRENDS' of the Additional inputs file.

Question 5: Do you agree that the unitary costs used for the resources are accurate for telecommunication operations in Jamaica? Please explain your views.

Question 6: Do you agree that the cost trends are reasonable? Please explain your views.

Cost structure

4.10. Cost is calculated based on unitary costs, cost trends and the number of resources. The model obtains the following cost structure for the reference operator:

Cost Category		2013	2014	2015	2016	2017	2018	2019	2020
Network OpEx		16.1%	15.9%	15.7%	15.4%	15.4%	15.5%	15.9%	16.6%
Depreciation	Sites	0.8%	0.8%	0.8%	0.9%	0.9%	0.9%	0.9%	1.0%
	Legacy switching equipment	2.2%	2.1%	1.8%	1.4%	1.2%	1.1%	1.0%	-
	NGN switching equipment	2.2%	2.2%	2.8%	3.7%	4.3%	4.2%	4.1%	4.6%
	Core equipment and platforms	1.6%	1.5%	1.5%	1.4%	1.3%	1.2%	1.2%	1.3%
	Transmission	12.0%	12.4%	12.4%	12.6%	12.5%	12.8%	12.7%	13.0%
Cost of Capital		28.4%	28.5%	28.1%	27.4%	26.9%	26.6%	26.5%	25.1%
Retail Costs		22.0%	21.9%	22.0%	22.3%	22.4%	22.5%	22.6%	23.0%
G&A		14.8%	14.8%	14.8%	15.0%	15.1%	15.2%	15.2%	15.4%
	TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 8: Draft cost structure in LRIC+ Standard [Source: BULRIC Model]

Question 7: Do you agree that the cost structure shown above is reasonable for an operator with the demand presented in Table 1 and in Table 2? Please explain your views.

Cost allocation to services

4.11. Costs are allocated to services based on routing factors. These routing factors represent the relative use that each service makes of a resource. The routing factors are introduced in the worksheet 'MAP ROUTING FACTORS' of the Additional inputs file.

Question 8: Do you agree with the routing factors used? Please explain your views.

4.12. Table 9 presents the resulting unit costs for voice termination:

Termination Service (JMD/minute)	2013	2014	2015	2016	2017	2018	2019	2020
To fixed local	0.10	0.11	0.10	0.08	0.07	0.07	0.07	0.08
To fixed national	0.12	0.12	0.11	0.10	0.08	0.07	0.08	0.08
To emergency services*	0.04	0.03	0.05	0.06	0.07	0.07	0.08	0.08
To weather warning service	0.12	0.11	0.14	0.15	0.16	0.17	0.18	0.18
To national DQ*	0.14	0.12	0.12	0.10	0.08	0.07	0.08	0.08
To international DQ*	0.14	0.12	0.12	0.10	0.08	0.07	0.08	0.08
To national freephone access service	0.12	0.12	0.11	0.10	0.08	0.07	0.08	0.08
To own freephone access service	0.04	0.03	0.05	0.06	0.07	0.07	0.08	0.08
To international freephone access service	0.14	0.12	0.12	0.10	0.08	0.07	0.08	0.08

Table 9: Draft unit costs obtained for voice termination services under Pure LRIC Standard [Source: BULRIC Model]

Question 9: Do you agree that the services' unit costs obtained are reasonable? Please explain your views.

* The figures do not include the outsourced costs of providing the service.

Annex A: Summary of Questions

Question 1: Do you agree that the demand presented above reasonably represents the Jamaican fixed market? Please explain your views.

Question 2: Do you agree that the migration percentage above and the final number of nodes are reasonable and accurately represent the foreseeable future of Jamaican market? Please explain your views.

Question 3: Do you agree that the average distance extracted from the geographical analysis performed, reasonably represents the prevailing average length of the backhaul network in the geography of Jamaica? Please explain your views.

Question 4: Do you agree that the resources obtained are reasonable to satisfy the demand? Please explain your views.

Question 5: Do you agree that the unitary costs used for the resources are accurate for telecommunication operations in Jamaica? Please explain your views.

Question 6: Do you agree that the cost trends are reasonable? Please explain your views.

Question 7: Do you agree that the cost structure shown above is reasonable for an operator with the demand presented in Table 1 and in Table 2? Please explain your views.

Question 8: Do you agree with the routing factors used? Please explain your views.

Question 9: Do you agree that the services' unit costs obtained are reasonable? Please explain your views.

Annex B: Glossary

BULRIC model	Bottom-up Long Run Incremental Costing model
Busy Hour	Period of 60 minutes during which occurs the maximum traffic load in a period of 24 hours
CSCF	Call Session Control Function
DSLAM	Digital Subscriber Line Access Multiplexer: equipment in charge of the connection of multiple subscriber line interfaces into a high-speed channel using multiplexing techniques
LRIC	Long Run Incremental Cost
MSAN	Multi-Service Access Node
NGN	New Generation Network
NMS	Network Management System