



هيئة تنظيم الاتصالات  
Telecommunications Regulatory Authority

**An Order issued by the Telecommunications Regulatory Authority (“TRA”) on the  
Reference Interconnection Offer and Reference Access Offer of the Bahrain  
Telecommunications Company B.S.C (“Batelco”)**

**Reference Offer Order**

25 January 2011

Ref: MCD/01/11/006

**Non Confidential Version**

**Confidential information has been replaced by [X]**

Purpose: To set the fair, reasonable and non-discriminatory charges of Batelco’s Reference Offer.

**Reference Offer Order**  
REFERENCE OFFER ORDER

**REFERENCE OFFER ORDER**

1. Pursuant to:
  - a. The exercise of its powers under article 3(c)(1), 57(b) and 57(e) of the Legislative Decree No. 48 for the year 2002 promulgating the Telecommunications Law, and articles 2,3,4,5 and 6 of the Access Regulation issued on 30 April 2005 (the "Access Regulation").
  - b. The Dominance in Interconnection Markets issued 9 August 2003; the Dominance Determination in Wholesale Markets by Batelco issued 22 January 2006; the Dominance Determination in Wholesale Broadband Markets issued 14 September 2009; and the Dominance designation for termination services on individual mobile networks issued 1 February 2010.
  - c. The legal basis and reasoning set out in Annex A to this Order. Annex A forms an integral part of the Order.
  
2. The Authority hereby orders the charges as detailed in the following table to be implemented by Bahrain Telecommunications Company B.S.C ("Batelco"). The Authority's decisions must be reflected in Batelco's Reference Offer ("RO") within 10 working days following the date of issuance of this Order. Batelco shall inform all its wholesale customers and the Authority by email of the new charges and their associated implementation date within 2 working days following the date of issuance of this Order.



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**Table 1: The Authority's 2010 ordered charges**

Chargeable activity	Approved in 2009	Batelco proposed charge in 2010	TRA fair and reasonable charge in 2010	Evolution as compared to 2009
<b>ISI and CSI Link Services</b>				
<b>ISI Link services ( 1-1 )</b>	<b>in BD</b>			
1-1.5A - ISI Link - Port and E1 line rental for unilateral traffic routes - <b>1-21 links</b>	67	98	<b>60</b>	- 10%
1-1.5B - ISI Link -Port and E1 line rental for unilateral traffic routes - <b>22-42 links</b>	56	72	<b>42</b>	- 24%
1-1.5C - ISI Link -Port and E1 line rental for unilateral traffic routes - <b>43-63 links</b>	44	49	<b>39</b>	-12%
1-1.12 - ISI Link -Signalling Link rental	73.6	119	<b>50</b>	- 32%
<b>CSI Link services ( 1-2 )</b>	<b>in BD</b>			
1-2.2A - CSI Link Rent (Basic) - <b>1-21 Links</b>	150	184	<b>154</b>	3%
1-2.2B - CSI Link Rent (Basic)- <b>22-42 Links</b>	105	124	<b>75</b>	- 29%
1-2.2C - CSI Link Rent (Basic) - <b>43-63 Links</b>	64	69	<b>58</b>	-9%
1-2.11 - CSI Link -Signalling Link rental	73.6	119	<b>50</b>	- 32%
<b>Interconnection services</b>	<b>in fils</b>			
1-3.1 - GMSC PTSN terminating calls	3.040	3.040	<b>3.040</b>	0%
1-3.2 - PSTN terminating access using either double or single tandem	2.382	2.382	<b>2.382</b>	0%
1-3.3 - Delivery to tone or announcement	2.000	2.000	<b>2.000</b>	0%
1-4.1 - Mobile call conveyance <b>GMSC</b>	6.124	6.725	<b>6.203</b>	1.3%
1-4.2 - Mobile call conveyance <b>Transit switch</b>	6.556	7.144	<b>6.553</b>	- 0.04%
1-4.3 - Delivery to tone or announcement	2.000	2.000	<b>2.000</b>	0%
1-5.1 - Paging call delivery	<b>REMOVED</b>			
1-5.2 - Delivery to tone or announcement	2.000	2.000	<b>2.000</b>	0%
1-6.1 - SMS Terminating access	0.437	1.856	<b>0.443</b>	1.5%
1-7.1 - Conveyance of emergency call to 999	1.591	1.462	<b>1.045</b>	- 34.3%
1-7.2 - Conveyance of emergency call to 990	2.711	2.382	<b>2.382</b>	-12.1%
1-7.3 - Conveyance of emergency call to 992	2.711	2.382	<b>2.382</b>	-12.1%
1-7.4 - Conveyance of emergency call to 994	2.711	2.382	<b>2.382</b>	-12.1%
1-7.5 - Conveyance of emergency call to 998		2.382	<b>2.382</b>	
1-8.1 - Freephone from Mobile	8.060	9.030	<b>8.060</b>	0%
1-8.2 - Freephone from PSTN	2.710	2.710	<b>2.710</b>	0%
1-11.1 - MMS delivery service	84.109	136.363	<b>124.495</b>	48.0%
2-2.1 - Directory assistance service for call to 181	115.750	170.891	<b>121.402</b>	4.9%
2-2.2 - Directory assistance service for call to 188	118.820	172.940	<b>123.884</b>	4.3%
2-4 - Dial-up Internet Access Service	<b>REMOVED</b>			
2-9.1 - Inter-Operator Transit Access Service Fixed	1.724	1.724	<b>1.724</b>	0%
2-9.2 - Inter-Operator Transit Access Service Mobile	1.988	1.910	<b>1.490</b>	- 25.1%
<b>Duct access ( 2-3.9 )</b>				
2-3.9 – Duct Rental charge	0.178	0.259	<b>0.189</b>	5.8%



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Chargeable activity	Approved in 2009	Batelco proposed charge in 2010	TRA fair and reasonable charge in 2010	Evolution as compared to 2009
<b>CAT/LLCO ( 2-5, 2-6 )</b>				
<b>CAT/LLCO Narrowband</b>	<b>in BD</b>			
		<b>Charges apply for open period</b>		
64Kbps	58.00	88.25	<b>58.00</b>	0%
128Kbps	61.00	92.21	<b>61.00</b>	0%
256Kbps	68.00	100.14	<b>68.00</b>	0%
384Kbps		108.07		
512Kbps	81.00	115.99	<b>81.00</b>	0%
768Kbps		131.84		
1024Kbps	119.00	158.76	<b>119.00</b>	0%
1536Kbps	145.00	190.24	<b>145.00</b>	0%
2048Kbps	171.00	222.22	<b>171.00</b>	0%
<b>CAT/LLCO Broadband</b>	<b>maximum price in BD * (price ceiling)</b>			
DS3		5,207.67	<b>4,686.31 *</b>	
STM1		8,777.50	<b>6,630.69 *</b>	
STM4		17,342.95	<b>15,211.84 *</b>	
<b>IPLC ( 2-10 )</b>				
<b>IPLC - Zone 1 – Low speed IPLC</b>	<b>in BD</b>			
64Kbps		192	<b>168</b>	
128Kbps (2x64Kbps)		226	<b>198</b>	
256Kbps (4x64Kbps)	380	294	<b>258</b>	-32%
512Kbps (8x64Kbps)	576	432	<b>379</b>	-34%
768Kbps (12x64Kbps)		569	<b>499</b>	
1Mbps (16x64Kbps)	961	706	<b>626</b>	-35%
1,5Mbps (24x64Kbps)		981	<b>866</b>	
2Mbps (32x64Kbps)	1,441	1,262	<b>1,107</b>	-23%
<b>IPLC - Zone 1 – High speed IPLC</b>	<b>maximum price in BD ** (price ceiling)</b>			
DS3		7,287	<b>7,186 **</b>	
STM-1		15,532	<b>15,296 **</b>	
STM-4		31,396	<b>30,565 **</b>	
* The price ceiling applies when the IPLC uses the following international cable and landing partner:				
<b>Destination</b>	<b>International Cable</b>	<b>Landing Partner</b>		
UAE	FOG	Etisalat		
Kuwait	FOG	Ministry of Communications (MOC)		
Oman	FALCON	OmanTel		
Qatar	FOG	Qtel		
Saudi Arabia	SFO	STC Saudi		
Prices may differ from the above prices ceilings if another international cable and landing partner are requested by the ordering party.				
<b>IPLC - Zone 2</b>	<b>in BD</b>			
64Kbps		223	<b>196</b>	
128Kbps (2x64Kbps)		289	<b>254</b>	
256Kbps (4x64Kbps)	606	422	<b>370</b>	-39%
512Kbps (8x64Kbps)	940	686	<b>602</b>	-36%
768Kbps (12x64Kbps)		951	<b>834</b>	



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Chargeable activity	Approved in 2009	Batelco proposed charge in 2010	TRA fair and reasonable charge in 2010	Evolution as compared to 2009
1Mbps (16x64Kbps)	1,510	1,215	<b>1,072</b>	-29%
1,5Mbps (24x64Kbps)		1,744	<b>1,536</b>	
2Mbps (32x64Kbps)	2,565	2,280	<b>2,000</b>	-22%
<b>IPLC - Zone 3</b>	<b>in BD</b>			
64Kbps		231	<b>203</b>	
128Kbps (2x64Kbps)		305	<b>267</b>	
256Kbps (4x64Kbps)	913	452	<b>397</b>	-57%
512Kbps (8x64Kbps)	1,331	747	<b>655</b>	-51%
768Kbps (12x64Kbps)		1,042	<b>914</b>	
1Mbps (16x64Kbps)	2,050	1,337	<b>1,179</b>	-42%
1,5Mbps (24x64Kbps)		1,927	<b>1,696</b>	
2Mbps (32x64Kbps)	3,383	2,524	<b>2,214</b>	-35%
<b>Wholesale DSL (2-11)</b>	<b>in BD</b>			
<b>Wholesale DSL- Residential</b> Contention Ratio of 15:1	<b>in BD</b>			
256Kbps: (GB 2)	7	5.7	<b>6.21</b>	-11%
512 Kbps: (GB 8)	14.084	9.8	<b>10.31</b>	-27%
640Kbps: (GB 2)		5.95	<b>6.45</b>	
640Kbps: (GB 5)	11.634	7.92	<b>8.42</b>	-28%
1Mbps: (GB 8)		10.13	<b>10.63</b>	
1Mbps: (GB 15)	20.405	14.72	<b>15.23</b>	-25%
2Mbps: (GB 15)		15.38	<b>15.88</b>	
2Mbps: (GB 20)	25.41	18.66	<b>19.16</b>	-25%
4Mbps: (GB 25)	31.18	23.26	<b>23.74</b>	-24%
8Mbps: (GB 40)	46.96	35.73	<b>36.20</b>	-23%
10Mbps: (GB 50)	56.971	43.61	<b>44.06</b>	-23%
16Mbps (80 GB)	86.97	67.24	<b>67.66</b>	-22%
<b>Wholesale DSL- Business Threshold - Cost with CPE</b> Contention Ratio of 8:1 except 256 Kbps with a contention ratio of 15:1	<b>in BD</b>			
256Kbps: (GB 2.5) – without CPE	9.23	6.15	<b>6.54</b>	-29%
256Kbps: (GB 5)	19.24	18.23	<b>12.32</b>	-36%
512Kbps: (GB 10)	23.84	21.88	<b>15.90</b>	-33%
1Mbps: (GB 15)	28.8	25.78	<b>19.80</b>	-31%
2Mbps: (GB 20)	34.48	30.3	<b>24.30</b>	-30%
4Mbps: (GB 130)	130.66	104.92	<b>98.90</b>	-24%
6Mbps: (GB 160)	158.98	127.07	<b>121.03</b>	-24%
8Mbps: (GB 200)	195.78	155.77	<b>149.71</b>	-24%
10Mbps: (GB 250)	241.06	191.04	<b>184.96</b>	-23%
16Mbps: (350 GB)	334.46	264.04	<b>257.90</b>	-23%
<b>Wholesale DSL- Business Flat rate - Cost with CPE</b> Contention Ratio of 8:1 except 256 Kbps with a contention ratio of 15:1	<b>in BD</b>			
256 Kbps Flat	14.23	18.54	<b>12.56</b>	-12%
512 Kbps Flat	29.27	25.59	<b>19.62</b>	-33%
1Mbps Flat	41.1	35.54	<b>29.56</b>	-28%



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Chargeable activity	Approved in 2009	Batelco proposed charge in 2010	TRA fair and reasonable charge in 2010	Evolution as compared to 2009
2Mbps Flat	74.77	55.97	<b>49.79</b>	-33%
Over the threshold charge per incremental GB (Usage tariffs DSL.8)	0.848	0.656	<b>0.656</b>	-23%
<b>Bitstream (2-12)</b>				
<b>Bitstream- Residential</b>				
New Contention Ratio of 15:1 (no longer at 10:1)	<b>in BD</b>			
256Kbps	3.789	3.29	<b>3.64</b>	-4%
512Kbps	4.076	3.46	<b>3.80</b>	-7%
640Kbps	4.219	3.54	<b>3.88</b>	-8%
1Mbps	4.648	3.79	<b>4.13</b>	-11%
2Mbps	5.793	4.44	<b>4.78</b>	-17%
4Mbps	8.084	5.67	<b>6.09</b>	-25%
8Mbps	12.665	8.4	<b>8.70</b>	-31%
10Mbps	14.956	9.72	<b>10.01</b>	-33%
16Mbps	15.72	13.67	<b>13.92</b>	-11%
<b>Bitstream- Business</b>				
New Contention Ratio of 15:1 (no longer at 10:1)	<b>in BD</b>			
256Kbps	3.861	3.44	<b>3.78</b>	-2%
512Kbps	4.219	3.74	<b>4.09</b>	-3%
640Kbps	4.398	3.9	<b>4.24</b>	-4%
1Mbps	4.934	4.36	<b>4.70</b>	-5%
2Mbps	6.366	5.6	<b>5.92</b>	-7%
4Mbps	9.229	8.07	<b>8.37</b>	-9%
6Mbps	12.09	10.54	<b>10.82</b>	-10%
8Mbps	14.956	13.01	<b>13.27</b>	-11%
10Mbps	17.819	15.48	<b>15.72</b>	-12%
16Mbps	26.39	22.9	<b>23.07</b>	-13%
<b>One-off charges applicable to Bitstream and WDSL</b>				
<b>Bitstream</b>				
<b>in BD</b>				
BS.4 - Port Connection	10.00	10.50	<b>0.00</b>	-100%
BS.5 - Charges for rejects, reversals, and withdrawals associated with Bitstream Order	5.00	5.25	<b>5.00</b>	0%
BS.6 - Charges for a Change of Speed	5.00	5.25	<b>5.00</b>	0%
BS.7 - External Removal charge	5.00	5.00	<b>5.00</b>	0%
<b>Wholesale DSL</b>				
<b>in BD</b>				
DSL.3 - Fee for processing DSL Transfer Request and completion	8.00	8.40	<b>0.00</b>	-100%
DSL.4 - Charges for rejects, reversals, and withdrawals associated with DSL Transfer, Invalid Transfer	5.00	5.25	<b>5.00</b>	0%
DSL.5 - Fee for a change of speed associated with DSL Transfer if applicable	5.00	5.25	<b>5.00</b>	0%
DSL.6 - External Removal or Change Number	Equivalent to retail tariff	Equivalent to retail tariff	Equivalent to retail tariff	

Source: The Authority

**Reference Offer Order**  
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3. The Authority hereby orders Batelco to reflect the following changes in its RO:
- a. ISI CSI Link services (1-1 and 1-2): cancellation charges shall only apply during the first 3 years of service, measured from the Ready For Test ("RFT") date of the service. Any cancellation, irrespective of whether it occurs before or after the 3-year cut off for cancellation charges, is subject to a 6-month notice period.

Batelco shall amend the cancellation charge formula in its RO schedule 4 clause 8 as follows:

$$P = \frac{(1 - RF) \times RC \times (3 - Y)}{(1 + CC)^{(3-Y)}}$$

The above formula shall apply to both existing and new services.

- b. Mobile call conveyance MTC (1-4.1); the Authority orders that the service be renamed "Mobile call conveyance GMSC". The name change shall be reflected in the product list used by Batelco.
  - c. Mobile call conveyance OLO (1-4.2); the Authority orders that the service be renamed "Mobile call conveyance Transit switch". The name change shall be reflected in the product list used by Batelco.
  - d. Paging terminating access (1-5): the Authority approves Batelco's request to remove item 1-5 Paging Terminating Access from its RO.
  - e. Conveyance of emergency call to 998 (1-7.5), the Authority orders Batelco to introduce service 1-7.5 in its RO under the name "Conveyance of emergency call to 998".
  - f. PSTN Transit Service (2-1): the service shall be maintained in its RO.
  - g. Dial-up Internet Access Service (2-4); the Authority approves Batelco request to remove the Dial-Up Internet Access Service from its RO.
4. The Authority also orders Batelco to report on a quarterly basis:
- a. new high speed CAT/LLCO (i.e. speed above 2 Mbps); and
  - b. new high speed IPLC (i.e. speed above 2 Mbps) to Zone 1 destinations (i.e. GCC countries).

The quarterly reports shall be submitted no later than 5 working days from the end of the relevant calendar quarter. The first two quarterly reports shall also include all existing circuits. The reports must follow the template provided by Batelco to the Authority on 12 December 2010. This template may be amended as required by the Authority.

**Compliance**

5. Batelco shall comply with the terms of this Order. Failure to comply with the terms of this Order may constitute a material breach of the Telecommunications Law and may consequently be subject to enforcement action pursuant to the relevant provisions of the Telecommunications Law.



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**Entry into force**

6. This Order is effective on the date of its issuance. The charges shall apply from 1 February 2011 with the exception of Wholesale DSL charges which shall apply from the start of the next billing cycle following the date of issuance of this Order. Batelco shall inform all its wholesale customers and the Authority by email of the new charges and their associated effective dates within 2 working days following the date of issuance of this Order.
7. This Order is without prejudice to any further orders, regulations and determinations that the Authority may consider necessary pursuant to its powers and duties under the Telecommunications Law.

**Signed on 25 January 2011**



Dr. Mohammed Al Amer  
Chairman of the Board of Directors and Acting General Director  
Telecommunication Regulatory Authority  
Manama, Kingdom of Bahrain



**Reference Offer Order**  
Annex – Order Legal Basis and Reasoning

**Annex – Order Legal Basis and Reasoning**

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Annex – Order Legal Basis and Reasoning

**List of acronyms and definitions**

APM	Accounting Procedures Manual
Batelco	Bahrain Telecommunications Company B.S.C
BB	Broadband
BD	Bahraini Dinar
CAPEX	CAPital EXpenditure
CAT	Customer Access Tail
CSI	Customer Sited Interconnect
FAC	Fully Allocated Cost
G1	Grade 1
GCC countries	Gulf Cooperation Council countries
GBV	Gross Book Value
GRC	Gross Replacement Cost
ISC	Interconnect Specific Charge
ISI	In-Span Interconnect
ISP	Internet Service Provider
Kbps	Kilobits per second
LLCO	Local Leased Circuit for OLO
LLU	Local Loop Unbundling
LRIC	Long Run Incremental Cost
MB	Megabytes
Mbps	Megabits per second
MPLS	Multiprotocol Label Switching
MSAN	Multi-Service Access Node
NA	Network Activity
NB	Narrowband
NBV	Net Book Value
NGN	Next Generation Network
OLO	Other Licensed Operator
POP	Point Of Presence
RAN	Radio Access Network
RAO	Reference Access Offer
RIO	Reference Interconnection Offer
RO	Reference Offer
S&M	Support and Maintenance
SHDSL	Symmetrical High-speed Digital Subscriber Line
TRA	Telecommunications Regulatory Authority of the Kingdom of Bahrain
UC	Un-attributable Costs
WACC	Weighted Average Cost of Capital
WDSL	Wholesale Digital Subscriber Line



## Reference Offer Order

### Annex – Order Legal Basis and Reasoning

#### 1 Introduction

8. Batelco's Reference Offer ("RO") is a key regulatory instrument that drives competition in the telecommunications market in the Kingdom of Bahrain.
9. This Annex contains the legal basis on which the decisions of the Authority have been made, and detailed reasoning for the ordering of regulated charges. It also sets out the premise of fair, reasonable and non-discriminatory tariffs as well as the context of this review of Batelco's RO submission.
10. This final Order follows the same structure as the draft Order. It includes the original text of the draft Order with minor amendments. A summary of the points raised by Batelco is provided along with the Authority's analysis and conclusions.

#### 2 Legal basis

11. Article 57 (b) of the Legislative Decree No. 48 of 2002 promulgating the Telecommunication Law (the "Telecommunications Law"), and article 57 (c) of the Telecommunications Law and article 4 of the Access Regulation issued 30 April 2005 require operators determined by the Telecommunications Regulatory Authority (the "Authority") to have a dominant position in a particular telecommunications market to publish a RO after obtaining the Authority's approval of the offer.
12. Pursuant to article 57 of the Telecommunications Law and articles 5 and 6 of the Access Regulation, in reviewing the proposed offer, the Authority must assess whether the terms and conditions and tariffs are fair, reasonable, non-discriminatory and based on forward-looking costs or benchmarked against tariffs in comparable telecommunications markets. When doing so, the Authority shall:
  - a. pursuant to its obligations under article 3(a) of the Telecommunications Law, exercise its powers inter alia reasonably, in a non-discriminatory, and in transparent manner.
  - b. pursuant to its obligations under article 3(b) of the Telecommunications Law, ensure that when assessing such terms or tariffs, carry out its duties in a manner best calculated to:
    - i. protect the interests of Subscribers or Users as set out in article 3(b)1; and
    - ii. promote effective and fair competition as set out in article 3(b)2.
13. In accordance with article 57 of the Telecommunications Law, should the Authority consider that the proposed tariffs are not fair, not reasonable and discriminatory, then the Authority may issue an order specifying the terms and conditions and tariffs.
14. Bahrain Telecommunications Company B.S.C. ("Batelco") having been found dominant in certain markets pursuant to the Dominance in Interconnection Markets issued 9 August 2003, the Dominance Determination in Wholesale Markets by Batelco issued 22 January 2006, the Dominance Determination in Wholesale Broadband Markets issued 14 September 2009, and the Dominance designation for termination services on individual mobile networks issued 1 February 2010, submitted its latest RO for review and approval on 1 April 2010.



## Reference Offer Order

### Annex – Order Legal Basis and Reasoning

15. Other than as detailed in this Order, the Authority has used costs as set out in the 2008 Fully Allocated Cost (“FAC”) and Long Run Incremental Cost (“LRIC”) regulatory accounts in setting tariffs determined in this Order by the Authority. Those costs have been adjusted where appropriate. The regulatory accounts are prepared in accordance with Batelco’s Accounting Procedures Manual (“APM”) approved by the Authority. The APM sets the principles and methods according to which Batelco’s regulatory accounts must be prepared. It provides some details on the accounting treatment of costs and their allocation.
16. After having conducted a review of the tariffs contained in the initial RO submission, requested, received and reviewed additional information considered necessary by the Authority to complete its analysis as well as reviewed the Batelco submission in response to the draft Order; the Authority considers that certain tariffs listed in the initial RO submission are not fair, reasonable and non-discriminatory.
17. Consequently the Authority has decided to exercise its power in accordance with articles 3(c)(1) and 57 of the Telecommunications Law and article 5.3 of the Access Regulation to issue this Order to Batelco with respect to its RO submitted on 1 April 2010.
18. The effective dates for the final charges are the first calendar day of the month following the issuance date of the order for wholesale services billed with Batelco’s wholesale billing platform and on the next billing cycle date in all other cases (e.g. Wholesale DSL).

### 3 Premise of fair, reasonable and non-discriminatory tariffs

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19. The Authority considers tariffs to be fair and reasonable if such tariffs are based on relevant, efficiently incurred economic costs calculated on a forward-looking incremental basis, including the regulated rate of return on capital employed.
20. In assessing whether charges are fair and reasonable and non-discriminatory, the Authority also considers the relative relationship between the prices of wholesale services and the equivalent retail services. To this end the Authority has consistently applied the same competition-based analytical framework to analyse wholesale and retail tariffs in order to ensure that there is consistency between the charges applicable at various levels of the value chain. This framework looks at whether retail services can be replicated by OLOs which rely on wholesale regulated products and remain profitable, thereby ensuring that tariffs are compatible with the development of sustainable competition. The objective of introducing wholesale products which give access to bottlenecks controlled by dominant operators is to enable competitors that do not control such bottlenecks to compete at the downstream level. This is a core premise of the wholesale regulation of dominant operators.
21. In setting charges which are fair and reasonable, the Authority must also take into account the principle of non-discrimination referred to in article 57(b) of the Telecommunications Law and article 6 of the Access Regulation.



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**Summary of Batelco's response**

22. Batelco's submission contained several comments in relation to the Authority's view on fair, reasonable and non-discriminatory tariffs as well as on replicability. Batelco is of the view that the Authority should not adopt such an "inflexible pricing policy position" (Batelco's response, paragraph 18). It also takes the view that the Authority has taken "the notion of replicability too far" (Batelco's response, paragraph 26).

**The Authority's analysis and conclusion**

23. Batelco has not articulated the relevance of its comments on the decisions made by the Authority in relation to the charges ordered for individual services. These generic comments do not appear to call for any specific actions in relation to this Order.
24. In response to Batelco's comment made at paragraph 25 of its response, the Authority has not modified its view regarding commercial agreements.

**4 Context of this year RO review**

**Draft Order Text**

25. In accordance with article 57 of the Telecommunications Law, the Authority's overarching objective of the review of Batelco's RO submission is to ensure that the final charges approved are fair, reasonable and non-discriminatory and reflect forward looking costs. The charges should be sustainable and consistent with the promotion of competition. This is to the long term benefit of both Batelco and the telecommunications market in the Kingdom of Bahrain.
26. In that regard, this review presents significant challenges. The cost base of Batelco is in a state of transition with the introduction of new technologies in Batelco's fixed and mobile networks that impact costs in different ways. 2008 saw the introduction of new cost elements in the regulatory accounts, increased capitalization of NGN assets and 3G assets as well as changes to network utilization and traffic. 2008 was also a transition year for services provided on both legacy and NGN networks.
27. In turn the cost stacks have been impacted by these changes resulting in dramatic changes to certain unit costs. Whilst some unit costs have increased by very substantial percentages others have dropped equally dramatically. These dramatic changes have been exacerbated by significant modifications to Batelco's approach to and/or parameters of the costing of some services (see sections below). In some cases, Batelco altered previously ordered and/or agreed positions without providing supporting rationale. As a collective consequence of these changes, the charges proposed by Batelco show significant variations both upward and downward (e.g. +46% for duct rental, ~+40% for leased lines, -30% for a 4Mbps bitstream) compared to the previous year. The cost base is, as a consequence not in a steady state and the price points proposed by Batelco for some products are unlikely to be sustainable. This uncertainty is further compounded by



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the fact that utilisation factors have not yet reached their steady state and neither the NGN nor 3G assets are fully capitalised.

28. Despite Batelco being fully cognisant of the evolutions taking place in its network it failed to provide the Authority with any supporting explanation or justification for the changes proposed in its original submission. Batelco also failed to highlight any of the issues arising from the state of transition of its cost base. During the preliminary analysis of Batelco's RO submission a number of elements stood out that required further explanation from Batelco. Consequently in order for the Authority to be able to understand the key drivers underpinning these undocumented changes, a request for information under article 53 of the Telecommunications Law was issued on 17 May 2010 as:
- a. significant decreases and increases for certain services were proposed without supporting explanation or justification. Since the transition to NGN is still occurring and the underlying cost has not yet achieved a steady state some of these significant changes are a cause of concern to the Authority. This applies to services delivered over both the fixed and the mobile networks.
  - b. the absence of explanation and justification of changes proposed and the lack of documentation of assumptions used and calculations resulted in the Authority having to expend a considerable amount of time and resources during the review.
29. More generally, the further analysis of Batelco's RO submission has shown that:
- a. the lack of transparency and traceability (e.g. cost allocation, allocation destinations, allocation basis) of the APM is a significant impediment to the review of costing information provided by Batelco and of the regulatory accounts;
  - b. there are issues with the costing of the MPLS core – the cost of the MPLS core feeds into a large number of products. The movement in the costs of the MPLS core voice and MPLS core data between 2007 and 2008 is of concern to the Authority. The observed evolution ([X] for core voice, [X] for core data and - [X] overall) is illogical when the level of capitalisation of those assets has increased significantly between 2007 and 2008;
  - c. the level of working capital in the regulatory accounts is not justified and generates a substantial extra profit requirement of [X] per year. This inflates the cost base and gives rise to artificial variability in the cost of certain network elements from one year to the next (e.g. for the MPLS core); and
  - d. there are inconsistencies in the data provided (e.g. wholesale cost, operational data), errors (e.g. calculation of fibre cost per km) and problems in the costing of certain services (e.g. CAT/LLCO).
30. The Authority notes that the review of Batelco's RO was significantly delayed by Batelco's failure to properly document its RO submission, to provide consistent and accurate data and to provide appropriate explanations for these issues at the date of the original submission and subsequently upon the Authority's further requests for information. The Authority also notes that it is only after repeated questioning that Batelco eventually provided explanations or admitted errors or issues with the data.
31. The Authority stresses the need for Batelco to provide consistent information across its submissions. With systematic cross-checks, Batelco can identify possible gaps and inconsistencies. Where discrepancies are identified, Batelco will be requested to re-submit the data and provide adequate explanation.



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**Summary of Batelco's response**

32. Batelco makes several comments in relation to the “Context” and “Chronology” sections of the draft Order. Those comments can be summarized as follow:

a. Three steps process: The RO assessment is the third and final stage of a three steps process:

- i. APM submission, assessment and approval;
- ii. Audit and production of the regulatory accounts; and
- iii. Submission of the RO for assessment.

It indicates that there has been some overlap between step 2 and step 3 as questions in relation to step 2 were still pending when the RO was assessed by the Authority. It also contends that it had in effect only five weeks to prepare its RO submission.

b. RO submission: It disagrees with the view expressed by the Authority that the RO submission was not adequately documented.

c. Pre-submission meetings: Batelco regrets that no meetings took place prior to the RO submission. In the previous year's RO approval letter dated 17 September 2009, a number of areas where meetings could be beneficial were identified by the Authority. Batelco is of the view that such meetings could have been useful to gain a broader “understanding of the changes taking place between accounting periods before submission of the Reference Offer” (Batelco's response, paragraph 47).

d. Sustainable pricing: Batelco considers that the Authority's reference to sustainable pricing is quite unfortunate, as one of the significant variation (on duct rental) was specifically foreshadowed by Batelco in its previous submission. It raised a similar flag in relation to SDH transmission costs and urges the Authority to take this into account in formulating prices.

e. RO submission assessment: Batelco is of the view that the process followed by the Authority to review the RO which consisted of issuing information requests under article 53 and subsequent iterations when further clarifications were required and/or when there remained unanswered questions, could have been avoided by instead “investing time in the working relationship through face to face workshops rather than through a time consuming written process” (Batelco's submission, paragraph 55). Batelco also asked the Authority to remove the Context and Chronology sections should a final order be issued.

**The Authority's analysis and conclusion**

33. The Authority would like to emphasise that the RO submission of Batelco should be self-contained and enable an assessment by the Authority of whether the tariffs proposed are fair, reasonable and non-discriminatory in line with article 57 of the Telecommunications



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Law. As demonstrated throughout this Order, the various information requests and communications exchanges between the Authority and Batelco, this was not the case.

34. A self-contained submission which can be assessed by the Authority against article 57 of the Telecommunications Law and other relevant provisions pre-supposes notably that Batelco: adequately documents its submission; explains and justifies changes made to its cost stacks and costing approach; provide supporting spreadsheets which are both active i.e. contain live formula etc. and adequately documented; highlights any matters considered noteworthy; ensures that all data used is accurate and consistent. Failure to adhere to these basic requirements serves to impede a timely and efficient assessment of the RO by the Authority and result in delays damaging to the market and ultimately to Batelco. If Batelco makes a change to the costing of a particular service, there must be a reason and this reason should be documented.<sup>1</sup>
35. As part of the RO assessment it may be necessary for the Authority to ask further questions and request additional information on various matters (including for example on operational data, costing, network architecture) in order to fulfil its duties. Although the Authority sought to be as specific as possible, Batelco required a number of iterations in order to answer questions and provide consistent data.<sup>2</sup>
36. The Authority considers that while meetings can be useful, they are not a substitute for written submissions. As a transparent and fact-based regulator, the Authority, as other regulatory bodies, relies principally on written material in its decisions. It is standard practice for a regulator to request information necessary to make an informed decision. With regards to the pre-RO submission meetings, the Authority notes that in its letter dated 17 September 2009, it specifically invited Batelco to propose a timetable. However, no such proposals were received. Batelco also makes reference to an email dated 24 March 2010 informing it that the Authority will not be able to meet during that week. In fact, the Authority had clearly previously indicated that this will be the case during a conversation as part of a meeting with OLOs on LLU on 11 March 2010. Based on this conversation, the Authority was expecting files on the 15 March 2010 and a meeting on the 18 March 2010.<sup>3</sup> No meeting was organised in mid-April as the Authority was going through the files and preparing a list of questions with a view to complete its assessment of the RO. By the time the Authority had obtained all of the information it had requested, the Authority considered that it was in a position to complete its assessment without the need to have meetings.
37. The Authority does not accept Batelco's suggestion to remove the Context and Chronology from the final Order since these sections provide transparency to the market regarding the review process and context of the RO assessment.
38. With respect to Batelco's comments on the "three steps process" and overlap, the Authority considers that an element of overlap is inevitable as issues that come up in the context of the costing of individual products may necessitate looking at the regulatory accounts and allocation bases for example. The Authority also notes that the overlap was to a significant degree as a consequence of the limited time period between the regulatory

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<sup>1</sup> For instance Batelco did not deem it necessary to mention that it had included protection lines in the ISI – CSI cost stacks and why it was necessary in its original submission.

<sup>2</sup> See for instance the sections on CAT/LLCO regarding the number of E1s and protection lines as well as on the ISC.

<sup>3</sup> Email from Alexandre Serot (Authority) to Ali Mostafa (Batelco) dated 24 March 2010.



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accounts submission and the RO submission. In turn this was a consequence of various requests for extensions submitted by Batelco. While initial submission dates for the regulatory accounts were respectively 30 June and 30 September 2009 for FAC and LRIC and 4 December 2009 for the RO, actual dates were respectively 25 February 2010 for FAC and LRIC accounts and 1 April 2010 for RO.

39. With regards to Batelco's comment on sustainable pricing, the Authority notes that in the 2009 RO review a compromise position has been reached in relation to duct rental. This was intended to mitigate the potential effect of Batelco's problems with respect to the costing of duct rental. The Authority also notes that the issue mentioned by Batelco in relation to SDH was not highlighted by Batelco in its initial RO submission but identified by the Authority only after repeated questioning.
40. These types of issues discussed in the preceding two paragraphs illustrate the inherent limits of relying on regulatory accounting information to set prices as accounting cost may show significant variations from year on year (due to changes in accounting methodologies for example) without changes to the underlying economic cost. This suggests that more reliance should be placed on developing forward-looking cost estimates, using alternative cost models in conjunction with the regulatory accounts, and setting prices for multiple years. The introduction of prices applicable for multiple years would provide visibility to Batelco and the market, incentives for cost minimisation (as Batelco will be allowed to keep whatever profit it achieves) and minimise regulatory cost (as regulatory intervention will be more focussed and there will not be a need to prepare an extensive annual RO submission).

## 5 RO review chronology

41. In the 2008 APM approval letter (MCD/02/10/015) dated 7 February 2010 Batelco was requested to submit its RO for review and approval on 1 April 2010.
42. On 1 April 2010, Batelco submitted its proposed RO prices and supporting cost files with a cover letter (GCL/129/10).
43. On 8 April 2010, Batelco sent another email to the Authority with updated cost files for:
  - a. Bitstream "20100408 Annex I Bitstream\_Updated.xlsx";
  - b. NB CAT and LLCO "20100408 Annex D NB CAT and LLCO 2008 - Updated.xlsx"; and
  - c. a revised Schedule 3 "20100408 Sch 3 09 RO Charges - revised.docx".
44. On 18 April 2010, the Authority sent an email requesting Batelco to confirm that it had submitted rates for high speed IPLC as part of the 2010 RO submission. Another email on 19 April 2010 requested Batelco to provide the two letters that were mentioned in the RO submission (Batelco letter dated 13 Sept 2009, ref GCL/428/09 and the Authority letter dated 17 Sept 2009, ref GD/0909/031).
45. On 9 May 2010, Batelco indicated by email that it had not proposed high speed IPLC charges. On 10 May 2010, Batelco sent another email with two attached documents:
  - a. 20090913 Summary of RO agreed position - BTC.doc; and
  - b. 10 09 2009 Sch 3 09 RO Charges (TRA).docx.



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46. On 17 May 2010, the Authority requested Batelco to provide further information related to its RO under article 53 (MCD/05/10/054) (“the article 53 request”). The information requested and specific instructions were set out in two files:
- a Word document containing questions on the RO submission; and
  - Excel spreadsheets containing tables to be used with the questions set in the Word document.

47. The deadlines for submitting Batelco’s response were as follows:

Item	Submission date required
Routing factors; MPLS Cost; ISI/CSI;CAT/LLCO; Duct Rental; ISC charge	31 May 2010 no later than 4pm
Bitstream, WDSL	7 June 2010 no later than 4pm
Interconnection services, IPLC	14 June 2010 no later than 4pm
RO price submission for higher speed IPLC	14 June 2010 no later than 4pm

48. On 18 and 20 May 2010, Batelco sent emails to the Authority as a response to the article 53 request seeking a meeting to discuss a number of questions relating to the article 53 request.
49. On 23 May 2010, the Authority replied to these emails (MCD/05/10/057) and proposed a meeting on Monday 24 May 2010 to discuss the questions with Batelco.
50. Further to the meetings with Batelco on 25 and 26 May 2010, Batelco sent an email on 26 May requesting the following time extensions, which the Authority granted:
- Routing factors, MPLS cost, ISI/CSI, Duct rental, ISC charge, Bitstream, WDSL – 14 June 2010 (from 31 May and 7 June);
  - Interconnection services and IPLC – 21 June 2010 (from 14 June); and
  - RO price submission for high speed IPLCs – 28 June 2010 (from 14 June).
51. Batelco did not request an extension for questions on the CAT/LLCO products, the due date for which was 31 May 2010.
52. On 8 June 2010, the Authority sent an email to Batelco detailing the question regarding the change in the cost of MPLS core between 2007 and 2008 (MPLS Core Bahrain.xls).
53. On 14 June 2010, Batelco submitted its response to part one and part two of the article 53 request (Routing factors, MPLS cost, ISI/CSI, Duct rental, ISC charge, Bitstream, WDSL) with the following attachments:
- 20100614 RO assessment article 53 response phase one.docx;
  - 20100614 RO assessment article 53 question 49 annex 2007 Duct Process.docx;
  - 20100614 RO assessment article 53 response phase one excel.xlsx; and
  - 20100614 Annex response to question 25 - part one.pdf.
54. Batelco did not submit the requested information regarding CAT/LLCO on 14 June 2010. On 15 June 2010 the Authority sent a letter (MCD/06/10/66) to Batelco informing it of the breach of article 53 of the Telecommunications Law.
55. On 20 June 2010, Batelco submitted its response relating to CAT and LLCO (20100620 Responses to RO price terms article 53 request CAT LLCO - part two.docx and 20100620 RO assessment article 53 request - phase two excel.xlsx).



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56. On 20 June 2010, further to the Authority's analysis of Batelco's response to part one and part two of the article 53 request for information (Routing factors, MPLS cost, ISI/CSI, Duct rental, ISC charge, Bitstream, WDSL), the Authority sent a letter to Batelco (MCD/06/10/068) requesting further information and clarification on Batelco's response. The deadline for submitting the requested information was 27 June 2010.
57. On 21 June 2010, Batelco submitted its response to Part Three of the article 53 request (Interconnection services and IPLC) which includes the following attached documents:
  - a. 20100621 RO responses phase three - interconnection and IPLC products.docx;
  - b. 20100621 RO response DQ (181 188 191) annex.xlsx;
  - c. 20100621 RO assessment article 53 response - phase three excel.xlsx; and
  - d. 20100621 RO assessment article 53 response - PSTN Transit annex.pdf.
58. On 23 June 2010, the Authority sent a letter (MCD/06/10/069) to Batelco requesting further information and clarification on Batelco's response regarding CAT and LLCO. The 2010 deadline for submitting the requested information was 24 June 2010. On 23 June, Batelco requested an extension to submit the requested information on RO part one to 30 June 2010.
59. The Authority reviewed the information submitted by Batelco on 21 June 2010 regarding the interconnection service and IPLCs and on 27 June 2010 sent a letter to Batelco (MCD/06/10/070) indicating some outstanding points to be clarified by Batelco no later than 4 July 2010.
60. On 28 June 2010, Batelco submitted its responses to CAT/LLCO further questions with the following attachments:
  - a. 20100627 RO price terms article 53 request CAT LLCO - phase 1 part 2\_Further Details\_WS Updates.docx;
  - b. 20100627 RO assessment article 53 request - phase 1 part 2 excel (2).xlsx; and
  - c. 20080410 Batelco NGN Overview.pptx.
61. On 28 June 2010, Batelco submitted its RO price submission for high speed IPLCs (20100628 IPLC cost on FOG and SFO.xls).
62. On 29 June 2010, the Authority sent another letter to Batelco (MCD/06/10/071) specifying a number of outstanding points regarding the requested information on CAT/LLCO with an annex attached for Batelco to complete.
63. After analysis of the submitted information regarding high speed IPLCs, on 30 June 2010 the Authority sent a letter to Batelco (MCD06/10/071) requesting further information / clarification.
64. On 30 June 2010, Batelco sent responses to part one and part two follow up questions with the following attachments:
  - a. 20100630 RO assessment article 53 response phase;
  - b. 20100630 RO assessment article 53 response phase one excel\_Further Details\_FINAL.xlsx; and
  - c. 20100630 CSI ISI 2008 Submission\_Updated for Further Details Phase 1.xlsx.



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65. On 4 July 2010, Batelco submitted further follow up responses regarding interconnection services and IPLC requested by the Authority on 27 June 2010 with the following attachments:
  - a. 20100704 RO responses phase three - interconnection and IPLC products - further Batelco comments (2).docx;
  - b. 20100704 BTC RO interconnection further response annex working Q86 Q97 (2).xlsx; and
  - c. 20100621 RO response DQ (181 188 191) annex Q95 resubmitted.xlsx.
66. On 11 July 2010, Batelco submitted further information regarding CAT/LLCO requested on 29 June 2010 (GCL/235/10) and its response regarding High Speed IPLC (20100711 High speed IPLC further responses.docx).
67. After reviewing the last submission regarding CAT/LLCO, the Authority sent an email to Batelco on 14 July 2010 including some outstanding points and unanswered questions (20100714 TRA comments on CATLLCO response 2 11 July).
68. On 19 July 2010, Batelco submitted its response in regard to some outstanding and missing information related to CAT/LLCO (20100719 RO price terms article 53 request CAT LLCO - phase 1 part 3\_Further Details 3 submitted Final.pdf).
69. After reviewing Batelco's submission, the Authority noticed that there are still missing and outstanding points regarding CAT/LLCO information. Therefore, on 20 July 2010 the Authority sent a letter to Batelco specifying the unanswered questions and on 22 July 2010 another communication regarding the same issue (Analysis of Batelco response CATLLCO 22072010.docx).
70. On 21 July 2010, Batelco submitted further answers regarding CAT/LLCO 20100721 RO price terms article 53 request CAT LLCO - phase 1 part 4\_Further Details.docx.
71. After reviewing Batelco's response, on 22 July 2010 the Authority sent an email to Batelco highlighting some other outstanding points regarding CAT/LLCO. Another email was sent on 25 July 2010 requesting clarifications on some of the same points and a "New Question".
72. On 25 July 2010, Batelco sent its response in regard to the outstanding points (answer to question 51) with two attachments (20100725 RO price terms article 53 request CAT LLCO - phase 1 part 5\_Further Details\_Question 51.docx and 20100725 RO assessment article 53 request - phase 1 part 5\_Q51 Response.xlsx).
73. On 26 July 2010, the Authority sent a letter to Batelco under article 53 requesting information relating to the derivation and allocation of wholesale costs, wholesale and mobile traffic.
74. On 29 July, Batelco sent further clarification on CAT/LLCO (20100729 RO price terms article 53 request CAT LLCO - phase 1 part 5\_Further Details.docx)
75. On 1 August 2010, the Authority sent an email to Batelco informing them that the submitted information on 29 July 2010 was still incomplete.
76. On 2 August 2010, a conference call was held between the Authority, Batelco and TERA to discuss the outstanding points on CAT/LLCO and Batelco agreed to submit the requested information about CN52 and Q59 (protection line figures, explanation of architecture and difference between fibre length and cable length).



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77. On 5 August 2010, Batelco sent the first part of outstanding information regarding CAT/LLCO and on 9 August 2010 Batelco sent the second part of the outstanding information.
78. On 10 August 2010, the Authority requested Batelco to incorporate its responses relating to CAT/LLCO into one document which will be considered as a final response from Batelco. Batelco was also requested to provide some explanation and confirmation on some points regarding its CAT/LLCO response.
79. On 16 August 2010, Batelco provided the clarification requested regarding CAT/LLCO.
80. On 19 August 2010, Batelco sent two emails the first one regarding CAT/LLCO which included a consolidated document of all Batelco responses and the Authority's requests for clarifications (20100819 - RO price terms article 53 request CAT LLCO - 6th iteration.docx). The second email included Batelco's submission regarding wholesale costs. This email included the following documents:
  - a. 20100819 Batelco response and mark up to TRA letter 26 July RO assessment.docx;
  - b. 20100819 Annex - Batelco's article 53 response to TRA's further RO questions inc WS traffic.xls; and
  - c. 20100819 Annex - Batelco article 53 response WS support activities - further questions to Batelco.xlsx.
81. After reviewing Batelco's submission regarding wholesale costs, the Authority sent the following two documents to Batelco on 23 August 2010 to request further clarifications:
  - a. 20100823 Further questions Wholesale.xlsx;
  - b. 20100823 Batelco response and mark up to TRA letter 26 July RO assessment.docx.
82. In response to the article 53 request, Batelco provided to the Authority the following files:
  - a. 20100825 Traffic 2009 details –TRA.xls on 25 August 2010;
  - b. 20100826 Batelco a 53 RO response to further questions wholesale costs.xls and 20100826 RO a 53 response re wholesale traffic and wholesale cost - follow up.doc.
83. On 23 September 2010, the Authority sent the draft RO Order to Batelco (MCD0910089 Draft Reference Offer Order.pdf) requesting Batelco to provide its response by Sunday 24 October 2010.
84. In an email sent to James Ibbetson on 29 September 2010, the Authority offered to provide the spreadsheets used for the draft order's calculations. The interconnection services spreadsheet was sent to Batelco on 30 September 2010. The interconnection links (CSI/ISI) and the ISC calculation spreadsheets were sent on 4 October 2010.
85. On 11 October 2010, Batelco asked the Authority for 10 working days extension to submit its response to the draft Order. The Authority granted the time extension the following day by setting the revised submission date to 4pm 7 November 2010.
86. On 7 November 2010, Batelco sent its Response to the RO draft Order ("the response") which included four files:
  - a. 20101107 ROPTDO Final.pdf;



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- b. 20101107 Draft RO Order – Annex A confidential info.pdf;
  - c. 20101107 Annex B part 1 final.pdf; and
  - d. 20101107 Annex B part 2 comparative retail IDD rates.xlsx.
87. On 24 November 2010, the Authority offered to meet with Batelco to clarify several points of Batelco's response.
88. In preparation for the clarification meeting, the Authority sent the following two documents to Batelco on 25 November 2010 which seek to clarify several points of the response:
  - a. 2010 RO price submission Clarification meeting.docx;
  - b. 2010 11 25 ISC.xlsx.
89. On 1 December 2010, Batelco sent the following two documents (GCL/445/10) in preparation of the meeting held in the Authority's premise on the same day.
  - a. 20101201 RO price submission Clarification meeting Batelco comments - Final.docx;
  - b. SDH Mig status 29112010.pptx.
90. As per Batelco's request, the Authority agreed to meet a second time to clarify any outstanding points raised by the parties. In preparation for this second clarification meeting, the Authority sent a document seeking further clarification from Batelco on 25 November 2010 ("Agenda for second RO draft order clarification meeting.docx").
91. On 12 December 2010, Batelco sent the following four documents (GCL/454/10) in preparation of the second clarification meeting held in the Authority's premise on the same day.
  - a. 20101212 RO response annex A + B.xlsx;
  - b. 20101212 Batelco Huawei inventory - SDH - annex C.xlsx;
  - c. 20101212 Agenda for second RO draft order clarification meeting - Batelco response.docx; and
  - d. 20101212 RO agenda response additional - Batelco.docx.
92. As part of its response to the LLU draft Order (GCL/460/10) sent on 14 December 2010, Batelco also submitted a document on the treatment of ISC (Annex C Ernst & Young report on TRAs approach to ISC\_final\_141210.pdf) which the Authority agreed to consider as part of this regulatory proceeding.
93. Following the second clarification meeting, Batelco sent a document on 30 December 2010 showing the cost impact of the draft proposed mobile data conversion factor (20101230 TRA Mobile data conversion impact\_30122010a.xlsx) (GCL/472/10). On 6 January 2011, Batelco sent an additional document detailing its approach to calculate the aforementioned impact (20110106 TRA Mobile data calculation.xlsx) (GCL/01/11).



## 6 ISI and CSI Link Services

**Draft Order Text**

### Services definition

94. According to Batelco's RO, "[t]he In-Span Interconnect ("ISI") Link Service is used, at the Licensed Operator's request, by the parties to jointly establish the facility for delivery of agreed traffic types between the parties' Networks. The In-span Interconnect Link Service is one option to establish interconnection between a Batelco Switch Connection and a Licensed Operator Switch Connection."<sup>4</sup>
95. According to Batelco's RO, "[t]he Customer Sited Interconnect ("CSI") Link Service is provided by Batelco, at the Licensed Operator's Seeker's request, to establish the facility for delivery of traffic between the parties' Networks. The CSI Link Service is an alternative to use of the In-Span Interconnect Link Service to establish interconnection between a Batelco Switch Connection and a Licensed Operator Switch Connection."<sup>5</sup>

### Information provided by Batelco

96. On 1 April 2010 Batelco submitted to the Authority its RO submission. The submission included one Excel file called "20100401 Annex K CSI ISI 2008.xlsx" in which calculations details of ISI and CSI Link services charges were provided.
97. On 30 June 2010 Batelco submitted a revised file called "20100630 CSI ISI 2008 Submission\_Updated for Further Details Phase 1".
98. On 5 July 2010 Batelco submitted a revised file called "20100630 CSI ISI 2008 Submission\_Updated for Further Details Phase 1 resent".
99. Further clarifications were sought by the Authority to assess whether the proposed charges were fair, reasonable and non-discriminatory. Batelco subsequently sent additional information in a number of diverse submissions.
100. The calculations of Batelco's 2010 proposed charges and cost stacks for the ISI and CSI link services are detailed in the following tables.

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<sup>4</sup> Batelco, SERVICE DESCRIPTION 1-1: IN-SPAN INTERCONNECT LINK SERVICE.

<sup>5</sup> Batelco, SERVICE DESCRIPTION 1-2: CUSTOMER SITED INTERCONNECTION SERVICE.



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Table 2: CSI submission charges proposed by Batelco

CSI Link Service				
Yr 2008 Cost (LRIC)				
SDH Transmission	15	25	63	Signalling
SDH Transmission cost (LRIC)	[X]	[X]	[X]	
E1 total capacity	[X]	[X]	[X]	
<b>Total cost per E1</b>	[X]	[X]	[X]	[X]
Additional Network Elements				
DDF Cost	[X]	[X]	[X]	
ODF Cost	[X]	[X]	[X]	
Core Huawei port per OLO	[X]	[X]	[X]	
OSN 3500 per OLO	[X]	[X]	[X]	
Average no. of E1 per OLO	15.0	25.0	63.0	
Average no. of ports per OLO	15.0	25.0	63.0	
<b>Cost per E1</b>	[X]	[X]	[X]	[X]
<b>Cost per Port</b>	[X]	[X]	[X]	
Access Fibre Cost				
Access Fibre Cost	[X]	[X]	[X]	
Total Fibre Km	[X]	[X]	[X]	
<b>Cost of 2 fibre per E1</b>	[X]	[X]	[X]	[X]
<b>Total cost per E1 pa</b>	[X]	[X]	[X]	[X]
<b>Total cost per E1 pm</b>	[X]	[X]	[X]	[X]
<b>Total cost per Port pa</b>	[X]	[X]	[X]	
<b>Total cost per Port pm</b>	[X]	[X]	[X]	
<b>Total per mth</b>	<b>184</b>	<b>124</b>	<b>69</b>	<b>119</b>

Source: Batelco, 20100630 CSI ISI 2008 Submission\_Updated for Further Details Phase 1 resent

✂Table 3: ISI submission charges proposed by Batelco



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ISI Link Service				
Yr 2008 Cost (LRIC)				
SDH Transmission	21 *	42 *	63	Signalling
SDH Transmission cost (LRIC)	[X]	[X]	[X]	
E1 total capacity	[X]	[X]	[X]	
<b>Total cost per E1*3</b>	[X]	[X]	[X]	[X]
Additional Network Elements				
Core Huawei port per OLO	[X]	[X]	[X]	
Joining Box	[X]	[X]	[X]	
<b>Average no. of E1 per OLO</b>	15.0	25.0	63.0	
<b>Cost per Port</b>	[X]	[X]	[X]	[X]
Fibre Cost				
Access Fibre Cost	[X]	[X]	[X]	
Total Fibre Km	[X]	[X]	[X]	
<b>Cost per 2 Km per E1</b>	[X]	[X]	[X]	[X]
<b>Total cost per E1 pa</b>	[X]	[X]	[X]	[X]
<b>Total cost per E1 pm</b>	[X]	[X]	[X]	[X]
<b>Total cost per Port pa</b>	[X]	[X]	[X]	
<b>Total cost per Port pm</b>	[X]	[X]	[X]	
<b>Total per mth</b>	<b>98</b>	<b>72</b>	<b>49</b>	<b>119</b>

\* The Authority understands that Batelco meant to write 15 instead of 21 and 25 instead of 42  
Source: Batelco, 20100630 CSI ISI 2008 Submission\_Updated for Further Details Phase 1 resent

101. The proposed charges with prior year comparator are summarized in the following table.

**Table 4: Summary of proposed charges for ISI CSI link services**

	Approved in 2009	Batelco's proposal in 2010 submission	Evolution* as compared to 2009
1-1.5A - ISI Link - Port and E1 line rental for unilateral traffic routes - 1-21 links	67	98	46%
1-1.5B - ISI Link -Port and E1 line rental for unilateral traffic routes - 22-42 links	56	72	29%
1-1.5C - ISI Link -Port and E1 line rental for unilateral traffic routes - 43-63 links	44	49	11%
1-1.12 - ISI Link -Signalling Link rental	73.6	119	62%
1-2.2A - CSI Link Rent (Basic) - 1-21 Links	150	184	22%
1-2.2B - CSI Link Rent (Basic)- 22-42 Links	105	124	18%
1-2.2C - CSI Link Rent (Basic) - 43-63 Links	64	69	8%
1-2.11 - CSI Link -Signalling Link rental	73.6	119	62%

\* Evolution is to be interpreted with careful consideration as the tariff bands change in the 2010 submission  
Source: Batelco, 20100630 CSI ISI 2008 Submission\_Updated for Further Details Phase 1 resent



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#### Minimum contract commitment period

102. The Authority understands that Batelco has de facto established a contractual commitment period of 10 years for the ISI CSI link services. Any OLO requesting the service is therefore bound by contract for a minimum service period of 10 years. The Authority does not consider the 10-year period to be fair or reasonable. Active equipment on the end side of the OLO's POP have asset lives of 5 years which means that the costs of equipment are fully recovered in 5 years of monthly charges payments from OLOs. Any commitment period should logically not exceed 5 years. Moreover, if an OLO decides to cancel the service before 5 years, Batelco recuperates the active equipment and can redeploy it for other uses. Finally it is important to consider the question in terms of average tenure of contract. That is to say any uncovered cost resulting from a potential early cancellation will be compensated by the over-recovery of costs from OLOs staying longer than 5 years as actual useful lives of active equipment tend to be greater than their accounting useful lives.
103. For the above reasons, the Authority is of the view that the contractual commitment period must be amended to 2 years with a 6-month notice period. These amendments must be included in the service description of both ISI and CSI link services and shall apply to both existing and new services.

#### The Authority's analysis of Batelco's methodology for calculating ISI and CSI charge

##### *New proposed bands for charges*

104. Batelco is proposing to change the tariff bands for ISI and CSI link services. In the current RO, the tariff bands are 1-21 links, 22-42 links and 43-63 links. Batelco would like the tariffs bands to be 1-15 links, 16-25 links and 26-63 links.
105. To support such change, Batelco refers to an email sent to the Authority on 13 September 2009 in which a word document was summarizing agreed points supposedly reached during the 2009 RO review process. The Authority has never agreed to nor approved this document prepared by Batelco. The Authority invites Batelco to refer to the RO Approval letter dated 17 September 2009 in which there is no mention of an agreement for ISI CSI tariff band change. Moreover the Authority has given Batelco an opportunity<sup>6</sup> to justify the introduction of new tariff bands which Batelco has failed to provide.
106. The Authority considers that the current tariffs bands should remain but is of the view that the methodology to calculate services cost should be modified to be fair and reasonable. At present the value used for the number of Ports/E1 in the calculation is the upper limit of the band. The Authority considers that it is more appropriate to use the average number of Ports/E1 of each band as it better reflects costs. For example in the 22-42 links band, the value currently used is 42 when it should be 32, the arithmetic average of 22 and 42. While this change increases the cost of services, it better reflects cost and is therefore preferable to the current approach.

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<sup>6</sup> Question 43 of article 53 information request dated 17 May 2010.



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#### **SDH Transmission cost**

107. The annual 2008 LRIC cost for SDH transmission amounts BD [X] for a total equivalent capacity of [X] E1s. The Authority does not have enough information to assess the accuracy and fairness of this amount and reserves the right to further investigate this point in the future.

#### **Access fibre network cost**

108. Access fibre network cost amounts to BD [X] in 2008. This amount does not reflect the change in duct cost calculation as detailed in the duct section of this document. The Authority has calculated the impact to be a cost decrease of BD [X]. However it has decided in this instance to not apply such decrease in the ISI CSI charge calculation. The Authority expects changes in duct costs to be reflected in Batelco's future RO submissions.

109. For the same reasons exposed in the CAT/LLCO section of this document, the Authority considers that the access fibre cost should be calculated based on unadjusted cable length ([X]) and not adjusted cable length ([X]). The adjusted length is the duct length and not the cable length. The monthly cost of fibre per band is calculated with the following formula:<sup>7</sup>

$$\begin{aligned} & \text{Monthly cost of fibre per band} \\ &= \frac{\text{Total access fibre cost} \times \text{Average Access fibre length} \times \text{Average number of E1 per band}}{12 \times \text{Unadjusted cable length}} \\ &= \frac{\text{BD [X]} \times [\text{X}] \times [\text{X}]}{[\text{X}] \times [\text{X}]} \end{aligned}$$

110. As the calculated charge takes now into consideration an average fibre length, chargeable item 1-2.3 *CSI Link Rent (per additional km or part)* must be removed from the RO schedule 3. Moreover, chargeable items 1-2.2 A, 1-2.2 B and 1-2.2 C (*CSI Link Rent (Basic)*) should no longer mention a limitation to one kilometre in the charging unit. "*Per point of interconnection per 2Mbit/s/ per month for link up to first km*" becomes "*Per point of interconnection per 2Mbit/s/ per month*".

#### **Protection Line**

111. Batelco claims that the cost of fibre per E1 is based on the cost of 4 fibres, 2 for each end and 2 protection lines for redundancy. This is a change from last year. Batelco has indicated that protection lines were not accounted for before.

112. The Authority is of the view that the use of a factor 2 for protection lines is not fair or reasonable as the fibre cable cost will be allocated twice to the service. Batelco has not demonstrated that the cost of a protection line is non-negligible. Batelco confirms that by

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<sup>7</sup> The above formula includes an error which is corrected at paragraph 146.



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default where fibre strands are available within the serving cable these will be used for the protection lines. Since the cost of this cable and therefore all of the fibre strands within the cable has been allocated there is no incremental cost to the provision of effectively idle dark fibre.<sup>8,9</sup> The only situation in which the cost of a protection line may be considered is when a dedicated fibre cable is used for each protection line and when that cable follows a different path from the path of the working line. The Authority believes this configuration to be very uncommon.<sup>10</sup>

113. Further the Service Description of ISI CSI does not make reference to protection lines. The Authority also notes that in countries where protection lines that go through a different path than the working line are offered, they are generally optional.

#### **Network equipment cost**

114. While Batelco indicated that the equipment cost are based on actual supplier cost, the Authority is not in a position to ascertain the appropriateness of the cost submitted based on the information provided.
115. For the same reasons exposed in the CAT/LLCO section, the Authority considers that the S&M and UC factors proposed by Batelco are neither fair nor reasonable. The Authority has therefore used the S&M and UC of the CAT/LLCO (i.e. 9% for S&M applied to capital employed and ~~8~~ % for UC applied to depreciation and OPEX).
116. To be fair and reasonable, the return on capital should be calculated by applying the cost of capital to the capital employed and not to the equipment price. The Authority considers that network equipment used for ISI - CSI are on average 2 years old. With this assumption, the net book value is 60% of gross book value as most equipment have an asset live of 5 years ( $\frac{5-2}{5} = 60\%$ ).
117. Taking into account the above elements, the correct formula to calculate equipment cost is:

$$\text{Equipment cost} = (\text{Depreciation} + \text{OPEX}) \times (1 + \text{Unattributable cost factor}) + \text{Return on capital}$$

with:

$$\text{Depreciation} = \frac{\text{Equipment Price/Equipment capacity}}{\text{Asset life}}$$

$$\text{OPEX} = \text{Equipment Price/Equipment capacity} \times 9\%$$

$$\text{Unattributable cost factor} = \frac{1}{(1 - 9.2\%)} - 1$$

$$\text{Return on capital} = \frac{\text{Equipment Price}}{\text{Equipment capacity}} \times \frac{\text{NBV}}{\text{GBV}} \times \text{WACC with } \frac{\text{NBV}}{\text{GBV}} = 60\% \text{ and } \text{WACC} = 12.2\%$$

<sup>8</sup> See Batelco's document Ref. CAT/LLCO GCL/279/10 - #4, on 21 July 2010, Batelco's response to question 59: "Is the protection line following the same path as the other fibre line (same trench, same cable)? YES in the Access side and in the core side, it's a ring configuration".

<sup>9</sup> Batelco confirmed further by email dated 10 August 2010, that "if and when the cable has spare fibre, then that fibre will be used for the protection line and will be in the same cable".

<sup>10</sup> Batelco's email to the Authority on 10 August 2010 states that "Batelco cannot provide absolute assurance that protection lines are in the same cable. If and when the cable has spare fibre then that fibre will be used for the protection line and will be in the same cable. However it may be in a separate cable when no spare fibre is available and we do not have records of the split without carrying out site surveys of all the circuits."



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118. The following table presents the cost of equipment proposed by Batelco and calculated by the Authority with the above formula.

**Table 5: Fair and reasonable network equipment cost for ISI CSI link services**

	The Authority's fair and reasonable calculation							
	Proposed cost by Batelco	Asset lives	Depreciation	OPEX (S&M)	Un-attributable cost	Return on capital	Total cost	TRA F&R vs. Batelco
DDF Cost	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
ODF Cost	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
[X] per OLO	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
[X] per OLO	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Joining Box	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Signalling Port	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]

Source: the Authority from Batelco, 20100630 CSI ISI 2008 Submission\_Updated for Further Details Phase 1 resent

119. From the cost stack formula in the submitted Excel file, the Authority understands that the 2006 price of signalling equipment per port is USD [X]. Batelco has decreased this price by [X]% to account for changes in the price of the equipment. The 0.377 factor is the foreign exchange rate to convert USD in BHD. The Authority does not understand why signalling equipment cost per port has been treated differently from other equipment. To be consistent with other equipment, the Authority has calculated the cost of signalling equipment using the formula above. To calculate the equipment price in 2008, USD [X] was multiplied by  $(1-[X]\%)^2$  to account for 2 years of price change and then multiplied by 0.377 to convert the price to BHD. To calculate depreciation, the Authority made the assumption of a 5 year asset life.

#### **Wholesale cost**

120. The Authority is of the view that fair and reasonable charges for ISI CSI link services should include an additional charge to cover wholesale activity costs incurred in the provision of the service. As wholesale costs are not proportional to the capacity of links but to number of links, a wholesale cost per link is added to the signalling rental charge. As no wholesale cost information is available for ISI CSI link services, the Authority has decided to apply the same bottom-up estimated cost of [X].



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#### The Authority’s decisions on fair and reasonable charges

121. Taking into consideration all the above paragraphs, the Authority has recalculated the ISI and CSI link services charges. They are presented in the following table. Tariff bands for 2010 remain unchanged compared to the 2009 approved RO.

**Table 6: Fair and reasonable charges for ISI CSI link services**

	Approved in 2009	Batelco's proposal in 2010 submission	TRA 2010 Fair and reasonable	Evolution as compared to 2009
1-1.5A - ISI Link - Port and E1 line rental for unilateral traffic routes - <b>1-21 links</b>	67	98	<b>60</b>	-10%
1-1.5B - ISI Link -Port and E1 line rental for unilateral traffic routes - <b>22-42 links</b>	56	72	<b>42</b>	-24%
1-1.5C - ISI Link -Port and E1 line rental for unilateral traffic routes - <b>43-63 links</b>	44	49	<b>39</b>	-12%
1-1.12 - ISI Link -Signalling Link rental	73.6	119	<b>50</b>	-32%
1-2.2A - CSI Link Rent (Basic) - <b>1-21 Links</b>	150	184	<b>154</b>	3%
1-2.2B - CSI Link Rent (Basic)- <b>22-42 Links</b>	105	124	<b>75</b>	-29%
1-2.2C - CSI Link Rent (Basic) - <b>43-63 Links</b>	64	69	<b>58</b>	-9%
1-2.11 - CSI Link -Signalling Link rental	73.6	119	<b>50</b>	-32%

Source: The Authority



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122. The following tables are the cost stacks from which fair and reasonable charges for ISI CSI link services were derived.

**Table 7: Fair and reasonable cost stacks for ISI link service**

ISI Link Service				
Yr 2008 Cost (LRIC)				
SDH Transmission	21	42	63	Signalling
SDH Transmission cost (LRIC)	[X]	[X]	[X]	
E1 total capacity	[X]	[X]	[X]	
<b>Total cost per E1*3</b>	[X]	[X]	[X]	[X]
Additional Network Elements				
Core Huawei port per OLO	[X]	[X]	[X]	
Joining Box	[X]	[X]	[X]	
Minimum	[X]	[X]	[X]	
Maximum	[X]	[X]	[X]	
Average no. of E1 per band	[X]	[X]	[X]	
<b>Cost per Port</b>	[X]	[X]	[X]	[X]
Fibre Cost				
Access Fibre Cost	[X]	[X]	[X]	
Total Fibre Km	[X]	[X]	[X]	
Cost of cable fibre Km	[X]	[X]	[X]	
Average cable length	[X]	[X]	[X]	
<b>Cost of fibre per E1</b>	[X]	[X]	[X]	[X]
Fibre Cost				
<b>Wholesale annual cost per link</b>				177
Total cost per E1 pa	[X]	[X]	[X]	[X]
Total cost per E1 pm	[X]	[X]	[X]	[X]
Total cost per Port pa	[X]	[X]	[X]	
Total cost per Port pm	[X]	[X]	[X]	
<b>Total per month</b>	<b>60</b>	<b>42</b>	<b>39</b>	<b>50</b>

Source: The Authority from Batelco's submission



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Table 8: Fair and reasonable cost stacks for CSI link service

CSI Link Service				
Yr 2008 Cost (LRIC)				
SDH Transmission	21	42	63	Signalling
SDH Transmission cost (LRIC)	[X]	[X]	[X]	
E1 total capacity	[X]	[X]	[X]	
<b>Total cost per E1</b>	[X]	[X]	[X]	[X]
Additional Network Elements				
DDF Cost	[X]	[X]	[X]	
ODF Cost	[X]	[X]	[X]	
Core Huawei port per OLO	[X]	[X]	[X]	
OSN 3500 per OLO	[X]	[X]	[X]	
Minimum	[X]	[X]	[X]	
Maximum	[X]	[X]	[X]	
Average no. of E1 per band	[X]	[X]	[X]	
Average no. of ports per band	[X]	[X]	[X]	
<b>Cost per E1</b>	[X]	[X]	[X]	[X]
<b>Cost per Port</b>	[X]	[X]	[X]	
Access Fibre Cost				
Access Fibre Cost	[X]	[X]	[X]	
Total cable Fibre in Km	[X]	[X]	[X]	
Cost of cable fibre Km	[X]	[X]	[X]	
Average cable length	[X]	[X]	[X]	
<b>Cost of fibre per E1</b>	[X]	[X]	[X]	[X]
Wholesale Cost				
Wholesale annual cost per link				[X]
<b>Total cost per E1 pa</b>	[X]	[X]	[X]	[X]
<b>Total cost per E1 pm</b>	[X]	[X]	[X]	[X]
<b>Total cost per Port pa</b>	[X]	[X]	[X]	
<b>Total cost per Port pm</b>	[X]	[X]	[X]	
<b>Total per month</b>	154	75	58	50

Source: The Authority from Batelco's submission

### Summary of Batelco's response

#### Removal of 10 years cancellation charge period

123. Batelco rectifies the Authority's assertion that ISI and CSI interconnection links have a 10 year contractual commitment period. As presented the Supply Terms clause 2.2 of schedule 7, both services have an automatic annual renewal and no specific contract period or minimum contract period. However, there is a charge which applies in the event of cancellation which is calculated with a formula last reviewed by the Authority in 2005. The early cancellation charge has the effect of establishing minimum service duration of 10 years. Batelco agrees that there may be grounds to revisit the existing formula if the change only applies to new services and not retrospectively. Moreover, Batelco submits to the Authority that active equipment is not the only component of the interconnection link which also consists of fibre, duct and chamber space. Contrarily to what the Authority



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expressed in the draft order, Batelco asserts that active equipment cannot be redeployed in all cases and its tenure sometimes does not pass 5 years.

#### Bands

124. Batelco reiterates its view that the change of bands was previously agreed with the Authority in September 2009 although it was not documented. Batelco submits that the Authority should use actual average number of links in each band instead of arithmetic average. Based on link figures at the end of 2008, this would lead to [X] for the first band, [X] for the second band and [X] for the third band.

#### SDH transmission cost

125. Batelco states that the number of E1s is currently overstated due to problems identified by the Authority after repeated questioning and anticipate that SDH cost per E1 will increase in next year submission.

#### Access Fibre Network Cost

126. Batelco considers that fibre cost calculation should use the adjusted cable length and not the unadjusted cable length which leads to under recovery of access fibre cost. On the premise that the number of used fibres will increase in the future, the Authority should allow a “cost buffer”. Batelco also refers to previous documents illustrating and explaining Batelco’s duct allocation methodology which was approved as part of the APM on 7 February 2010.

127. Finally, Batelco raises concerns regarding the formula of the Authority at paragraph 84 of the draft Order. It would appear that there is an error in the published formula (a multiplication by the number of E1s per band instead of a division) but not in the final result (the calculation is correct).

#### Protection lines

128. Batelco is in the view that its assessment of protection lines is appropriate because protection lines are part of the cost of fulfilling the service levels associated with the interconnection services. Physical protection currently forms part of Batelco’s RO. Should the Authority not take into account the protection implemented, Batelco would withdraw protection circuits from the wholesale service configurations as it would not be able to recover the additional costs incurred.

#### Network and equipment cost

129. Batelco believes that the Authority only takes into account existing OLOs and not new OLOs as the network equipment used for new OLOs is not on average 2 years old. Regarding the formula set out in paragraph 117 of the draft Order, Batelco would like the Authority to clarify the expression “equipment capacity”. Batelco also accepts the Return on Capital formula but disagrees with the percentage of 9% used by the Authority for S&M cost. Batelco considers that this S&M ratio is not relevant as it is totally out of line with the ratio extracted from Batelco’s 2008 costing model (between 50% and 75% depending on



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the type of network equipment) and will not enable Batelco to cover its own maintenance costs.

#### Wholesale activities

130. Batelco considers that applying the same CAT/LLCO wholesale cost bottom-up assumption to ISI/CSI is problematic. The support costs for ISI/CSI are allocated under the ISC and recovered on a per minute basis. Moreover, the bottom-up assumption of BD 14.73 does not reflect all the support cost on these links.

#### Ordered Price

131. Batelco would like the Authority to reconsider its decision and to follow the calculation methodology of the last RO assessment in order to avoid any sharp proposed price increased next year.

### The Authority's analysis and conclusion

#### Removal of 10 years cancellation charge period

132. The Authority remains of the view that the current cancellation charge scheme for ISI and CSI link services is not fair and reasonable and that it unnecessarily limits the operational flexibility of OLOs. The Authority considers that cancellation charges should only apply during the first 3 years of service, measured from the Ready For Test ("RFT") date of the service. Further the Authority is of the view that any cancellation, irrespective of whether it occurs before or after the 3-year cut off for cancellation charges, should be subject to a 6-month notice period.

133. The Authority's draft decision in paragraphs 102 and 103 consisted of limiting the minimum contractual period to 2 years with a 6-month notice period. In light of Batelco's recent investment to upgrade its SDH network the Authority has reviewed its draft decision and has increased the contractual period from 2 years to 3 years with a 6-month notice period. As per the decision, Batelco will be allowed to collect a cancellation charge if the removal order is placed for an effective removal date within the first 3 years following the RFT date.

134. The Authority's decision of limiting any cancellation charge to the first 3 years is fair and reasonable for the following reasons:

- a. Batelco suggests that the minimum period for which cancellation charges should apply should at least be greater than five year to take into account passive infrastructure which is included in the ISI/CSI cost stacks (such as fibre, duct and chamber space). However Batelco does not consider the fact that the passive infrastructure is a long term investment and that reutilisation of the passive infrastructure by Batelco is almost certainly guaranteed. Moreover, in certain cases, Batelco over-recovers the costs of passive infrastructure. This happens when several clients are in the same building and/or when the same client has ordered more than one wholesale service from Batelco. In these situations, which are common in Bahrain, Batelco recovers the shared passive infrastructure cost



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more than once. Therefore, the Authority is of the view that the points raised by Batelco in relation to passive infrastructure do not justify a change of position.

- b. The Authority's considers that active equipment are the only element to be considered when setting the minimum period for which cancellation charges apply. Batelco indicated to the Authority that active equipment are depreciated over a period of five years. However the Authority has decided to limit the early cancellation charge period to 3 years for a number of reasons, including:
  - i. Equipment can be redeployed elsewhere in most cases;
  - ii. The same equipment can be shared among different services in the same location;
  - iii. Once fully depreciated, Batelco does not necessarily replace them right away. There is therefore a period during which Batelco may perceive a monthly rental price for a piece of active equipment that is already fully depreciated.

135. For the above reasons, the Authority orders Batelco to amend the cancellation charge formula in its RO schedule 4 clause 8 as follows:

$$P = \frac{(1 - RF) \times RC \times (3 - Y)}{(1 + CC)^{(3-Y)}}$$

136. Notwithstanding the change of early cancellation charge period to 3 years, the Authority is of the view that the ISI –CSI cancellation framework (i.e. current cancellation charge formula and associated conditions) remains not fair and reasonable. It suffers from a number of deficiencies which the Authority intends to address in the next RO review. They include:

- a. unnecessary complexity of the framework (e.g. formula calculates the present value of expected cash flows);
- b. unreasonableness as it implies a possible re-utilisation of equipment and infrastructure in only 10% of cases, 6 months after cancellation;
- c. inappropriate reference as the formula takes into account the retail charge and not the wholesale charge (although there is clearly no retail equivalent for ISI/CSI links);
- d. lack of limitations. The Authority is of the view that in specific circumstances the early cancellation charge should not apply, including for partial removal of capacity or migrations (hot migrations, as well as cold migrations i.e. cease and re-provide).



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**Bands**

137. The Authority does not agree to calculate the average number of ports per band based on actual number of ports as it will lead to price volatility. This would be neither in the interest of Batelco nor the interest of OLOs. Setting the average number of ports by taking the arithmetic average allows price stability from one year to the next. Market averages for the number of ports are respectively [X], [X] and [X] while the arithmetic averages are 11, 32 and 53. The Authority was not able to recalculate market averages from the table provided by Batelco but notices the different values in both approaches. However, the possible under-recovery for links in the second band (lower arithmetic average than market average) is compensated with the over-recovery for links in the third band.

**SDH costs**

138. The Authority notes the comment of Batelco; it also notes that the problem with SDH costing was identified after repeating questioning by the Authority. Absent information, the Authority has used the SDH cost submitted by Batelco.

**Access fibre network costs**

139. With respect to access fibre network costs, the Authority would like to clarify that it has not criticized the use of adjusted fibre length for the allocation of duct costs but its use for the calculation of access fibre network costs.

140. For the reasons set out below and in the draft Order, the Authority remains of the view that its calculations of fibre costs are correct and that the fibre cost estimated by Batelco are incorrect. The average cost of a fibre is equal to:

$$\text{Average cost of a fibre} = \frac{\text{Total cost allocated to fibres}}{\text{Total length of fibres}} \times \text{Average length of fibre}$$

141. The question at stake is therefore: what is the definition of the length of a fibre that should be used to calculate the average cost of a fibre? In fact, the use of both the adjusted and the unadjusted length are possible, **provided that they are not mixed**. If adjusted length is used for the “Average length of a fibre”, then adjusted length must also be used for the “Total length of fibre” to compute the average cost of a fibre. This is illustrated by the following example (also used in the RO draft Order at paragraph 322) where a duct of 1 km has 2 fibre cables in it and where total duct cost is 100. Each fibre cable has then an average adjusted length of 0.5 km and an average unadjusted length of 1 km. The average price of a fibre can then be calculated using either of the following two approaches:

- a. By always using the unadjusted length (it is the Authority’s approach in the draft RO Order). In this case, the average cost of a fibre cable is:  $100/1 \times 0.5 = 50$ . Total access fibre revenue for the two fibres is then 100 (i.e.  $50 \times 2$ ) and is equal to total duct cost.
- b. By always using the adjusted length. In this case, the average cost of a fibre cable is also:  $100/2 \times 1 = 50$ . Total access fibre revenue for the two fibres is also 100 ( $50 \times 2$ ) and is equal to total duct cost.



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142. Whilst Batelco proposed another approach the Authority considers that approach incorrect. Batelco's approach divides the total access fibre cost by the total access fibre adjusted length ([X]). This is inconsistent with the average adjusted length of fibre ([X]). This latter length is calculated by dividing the total access fibre adjusted length ([X]) by the total number of fibre pairs in use for 2008 ([X]). The Authority remains of the view that Batelco's approach is erroneous as it leads to fibre costs being over-recovered (Batelco's average fibre length assumption is about 3 times higher than the length measured).

143. Moreover, Batelco is also incorrect when asserting that the Authority's proposal would not allow costs to be recovered because the total actual fibre length includes both used and unused fibres. The average unadjusted length of a fibre used by the Authority is calculated by dividing the total unadjusted length by the total number of fibre pairs in use. Hence, the above formula can be written as follows:

$$\begin{aligned} \text{Average cost of a fibre} &= \frac{\text{Total cost allocated to fibres}}{\text{Total length of fibres}} \times \frac{\text{Total length of fibres}}{\text{Total number of fibre pairs in use}} \\ &= \frac{\text{Total cost allocated to fibres}}{\text{Total number of fibre pairs in use}} \end{aligned}$$

144. As a consequence, all costs are covered by the fibres in use. This can easily be verified by multiplying the unit price per fibre (BD [X] for two ends) by the number of fibre in use ([X]). Total annual revenue are then equal to total costs: [X]x[X]x[X]=BD [X]. As a consequence, costs are fully recovered (see following formula).

$$\begin{aligned} &\text{Total number of fibre pairs in use} \times \text{Average cost of a fibre} \\ &= \text{Total number of fibre pairs in use} \times \frac{\text{Total cost allocated to fibres}}{\text{Total number of fibre pairs in use}} \\ &= \text{Total cost allocated to fibres} \end{aligned}$$

145. For these reasons, the charges stated in the draft Order related to access fibre costs remain unchanged. Incidentally it should be noted that the approach followed by the Authority is very conservative because it assumes that each fibre cable supports only one single fibre pair in use, while several fibre pairs can be used in a single fibre cable. It is therefore probable that there is some over-recovery of access fibre costs because of cases such as several customers at the same location and customers having more than one link or having additional services requiring an extra fibre pair.

146. Batelco's comment on the formula at paragraph 84 of the draft Order has been reviewed and the formula adjusted. The correct calculation was completed by the Authority but the formula should be written as follows:

$$\begin{aligned} &\text{Monthly cost of fibre per band} \\ &= \frac{\text{Total access fibre cost} \times \text{Average Access unadjusted fibre length} \times \text{Average number of E1 per band}}{12 \times \text{Unadjusted cable length} \times \text{Average number of E1 per band}} \end{aligned}$$



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#### Network and equipment costs

147. When the Authority refers to equipment capacity in paragraph 117, it means the quantity of ports on the core network side that can be supported by the equipment ([X]).
148. With respect to network and equipment costs and the associated S&M rate, it should first be noted that the rate used by the Authority (9%) and the rate quoted by Batelco ([X]) cannot be directly compared. The S&M rate used by the Authority compares the S&M costs to investment (CAPEX) and is defined as follows:  $S\&M\ rate = S\&M\ costs / investment$ . The S&M rate used by Batelco is defined as follows:  $S\&M\ rate = S\&M\ Costs / Total\ Costs = S\&M\ Costs / (S\&M\ Costs + Depreciation + Return\ of\ Capital + Unattributed\ Costs)$ .
149. Using the split between depreciation and S&M costs provided by Batelco's 2008 costs,<sup>11</sup> the Authority estimates that the same rates expressed as a percentage of investment is [X].<sup>12</sup> Besides, the Authority observes that these results rely on the split between depreciation and S&M provided by Batelco which appears to be inaccurate: in computing this split, Batelco has fully accounted duct costs as S&M costs<sup>13</sup> while a large part are depreciation costs. If duct costs were accounted in the depreciation category, the S&M rate, based on Batelco's data but as defined by the Authority, would range from 2% to 4%. Thus the S&M rate of 9%, expressed as a percentage of investment, is fair and reasonable.
150. Further, as explained in the draft order at paragraph 331, the Authority is of the view that it is not appropriate to use S&M costs related to the copper network as submitted by Batelco. For these reasons, the Authority confirms its conclusion of the draft Order: in the absence of reliable data from Batelco, the most appropriate S&M rate needs to be based on a benchmark value which is 9%, expressed as a percentage of investments.

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<sup>11</sup> The split has been calculated by Batelco in the following file: "20100401 Annex K CSI ISI 2008.xls".

<sup>12</sup> The estimate is based on the following:

- Amortization costs include 50% of depreciation costs and 50% of capital costs (which is conservative);
- Investment = depreciation costs x asset life;
- Average asset life of 33 years (weighted average between assets of 40 years (2/3) and assets of 20 years (1/3), following the analysis done for the Draft Order for "An Access Order Relating to the Local Loop Unbundling and Ancillary Services Terms and Conditions in the Reference Offer of the Bahrain Telecommunications Company (BCS)");
- $S\&M\ rate = S\&M\ costs / Investment$

<sup>13</sup> NP10 [Access Network Duct & Infrastructure] and NP10 [Access Network Duct & Infrastructure].



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**The Authority's ordered charges for ISI and CSI services**

151. For all the above reasons, the Authority maintains its draft order decision. The final charges for ISI and CSI services are presented in the following table.

**Table 9: Ordered charges for ISI and CSI link services**

Chargeable activity	Approved in 2009	Batelco proposed charge in 2010	TRA fair and reasonable charge in 2010	Evolution as compared to 2009
<b>ISI and CSI Link Services</b>				
<b>ISI Link services ( 1-1 )</b>	<b>in BD</b>			
1-1.5A - ISI Link - Port and E1 line rental for unilateral traffic routes - <b>1-21 links</b>	67	98	<b>60</b>	- 10%
1-1.5B - ISI Link -Port and E1 line rental for unilateral traffic routes - <b>22-42 links</b>	56	72	<b>42</b>	- 24%
1-1.5C - ISI Link -Port and E1 line rental for unilateral traffic routes - <b>43-63 links</b>	44	49	<b>39</b>	-12%
1-1.12 - ISI Link -Signalling Link rental	73.6	119	<b>50</b>	- 32%
<b>CSI Link services ( 1-2 )</b>	<b>in BD</b>			
1-2.2A - CSI Link Rent (Basic) - <b>1-21 Links</b>	150	184	<b>154</b>	3%
1-2.2B - CSI Link Rent (Basic)- <b>22-42 Links</b>	105	124	<b>75</b>	- 29%
1-2.2C - CSI Link Rent (Basic) - <b>43-63 Links</b>	64	69	<b>58</b>	-9%
1-2.11 - CSI Link -Signalling Link rental	73.6	119	<b>50</b>	- 32%

Source: The Authority



## **7 Interconnection services**

**Draft Order Text**

152. This section reviews Batelco's proposed charges and associated cost stacks for interconnection services.

### **Information provided by Batelco**

153. On 1 April 2010 Batelco submitted to the Authority its RO for interconnection services. It included two Excel files, detailing the calculations of interconnection charges:

- a. the first, "*20100401 Annex B RIO costs.xlsx*", relating to the network costs for interconnection services; and
- b. the second, "*20100401 Annex C ISC and ASC.xlsx*", relating to the wholesale activities costs for interconnection services, called ISC charge.

154. Further clarifications were then sought by the Authority to assess whether charges are fair and reasonable. Additional information was consequently sent by Batelco in a number of subsequent submissions.

### **Proposed interconnection charges in the 2010 RO submission**

155. Interconnections charges are composed of:

- a. network costs as per the 2008 LRIC regulatory accounts which are allocated to services on the basis of routing factors; and
- b. wholesale activities costs called ISC ("Interconnection Specific Charge") which allocate wholesale interconnect specific costs to all interconnect minutes.

156. The following table summarizes the proposed interconnection charges by Batelco for 2010 along with approved charges for 2008 and 2009.



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**Table 10: Summary of proposed charges for interconnection services**

Reference	Charge description	Approved 2008 (fils)	Approved 2009 (fils)	Proposed 2010 with ISC charge	Evolution 2010-2009
1-3.1	GMSC PTSN terminating calls	3.040	3.040	3.040	0.0%
1-3.2	PSTN terminating access using either double or single tandem	2.382	2.382	2.382	0.0%
1-3.3	Delivery to tone or announcement	2.000	2.000	2.000	0.0%
1-4.1	Mobile call conveyance MTC	6.626	6.124	6.725	9.8%
1-4.2	Mobile call conveyance OLO	7.332	6.556	7.144	9.0%
1-4.3	Delivery to tone or announcement	2.000	2.000	2.000	0.0%
1-5.2	Delivery to tone or announcement	2.000	2.000	2.000	0.0%
1-6.1	SMS Terminating access	0.456	0.437	1.856	324.6%
1-7.1	Conveyance of emergency call to 999	1.429	1.591	1.469	-7.7%
1-7.2	Conveyance of emergency call to 990		2.711	2.711	0.0%
1-7.3	Conveyance of emergency call to 992		2.711	2.711	0.0%
1-7.4	Conveyance of emergency call to 994		2.711	2.711	0.0%
1-8.1	Freephone from Mobile	7.830	8.060	9.030	12.0%
1-8.2	Freephone from PSTN	2.710	2.710	2.710	0.0%
1-11.1	MMS delivery service	150.851	84.109	136.363	62.1%
2-2.1	Directory assistance service for call to 181		115.750	170.891	47.6%
2-2.2	Directory assistance service for call to 188		118.820	172.940	45.5%
2-9.1	Inter-Operator Transit Access Service Fixed		1.724	1.724	0.0%
2-9.2	Inter-Operator Transit Access Service Mobile		1.988	1.910	-3.9%

Source: Batelco



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**Submitted cost stacks for mobile interconnection services**

**Mobile call conveyance MTC (item 1-4.1)**

157. Batelco has submitted the following cost stack to the Authority:

**Table 11: Submitted cost stack for Mobile call conveyance MTC**

950d Mobile Terminating Access from OLO GMSC		Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LIRIC	Routing Factor %	2008 Cost
MN01	MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02	MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03	MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04	MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05	MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11	MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12	MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13	MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14	MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18	MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19	MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20	MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21	MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23	MN23 Mobile MGW – GMSC	[X]	[X]	[X]	[X]	[X]
MN30	MN30 Mobile GMSC - HLR platform	[X]	[X]	[X]	[X]	[X]
<b>SUB-TOTAL</b>						[X]
CN90	CN90 Interconnect Specific			1.12	1.00	1.120
<b>TOTAL</b>						<b>6.725</b>

Source: Batelco (completed by the Authority with LRIC account information)

158. The proposed charge in the 2010 RO submission is 6.725 fils per minute which is a **9.8 % increase** compared to the 2009 approved charge of 6.124 fils.



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**Mobile call conveyance OLO (item 1-4.1)**

159. Batelco has submitted the following cost stack to the Authority:

**Table 12: Submitted cost stack for Mobile call conveyance OLO**

951e Mobile Terminating Access from OLO Transit	Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
CN03 CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN15 CN15 Transit switch – GMSC	[X]	[X]	[X]	[X]	[X]
MN01 MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02 MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03 MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04 MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05 MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11 MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12 MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13 MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14 MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18 MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19 MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20 MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21 MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23 MN23 Mobile MGW – GMSC	[X]	[X]	[X]	[X]	[X]
MN30 MN30 Mobile GMSC - HLR platform	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 CN90 Interconnect Specific			1.12	1.00	1.120
<b>TOTAL</b>					<b>7.144</b>

Source: Batelco (completed by the Authority with LRIC account information)

160. The proposed charge in the 2010 RO submission is 7.144 fils per minute which is a **9.0 % increase** compared to the 2009 approved charge of 6.556 fils.



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**SMS Terminating access (1-6.1)**

161. Batelco has submitted the following cost stack to the Authority:

**Table 13: Submitted cost stack for SMS Terminating access**

950f SMS Terminating Access		Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
MN01	MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02	MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03	MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04	MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05	MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11	MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12	MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13	MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14	MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18	MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19	MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20	MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21	MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23	MN23 Mobile MGW – GMSC	[X]	[X]	[X]	[X]	[X]
MN30	MN30 Mobile GMSC - HLR platform	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>				[X]		[X]
CN90	CN90 Interconnect Specific			1.12	1.000	1.120
<b>TOTAL</b>				<b>10.33</b>		<b>1.856</b>

Source: Batelco (completed by the Authority with LRIC account information)

162. The proposed charge in the 2010 RO submission is 1.856 fils per SMS which is a **324.6 % increase** compared to the 2009 approved charge of 0.437 fils.



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**Conveyance of Emergency call to 999 (1-7.1)**

163. Batelco has submitted the following cost stack to the Authority:

**Table 14: Submitted cost stack for Emergency call to 999**

Emergency Call Access Service 999 from OLO Transit	Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
CN03 CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 CN90 Interconnect Specific			1.12	1.000	1.120
<b>TOTAL</b>					[X]

Emergency Call Access Service 999 from OLO GMSC	Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
CN03 CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN15 CN15 Transit switch – GMSC	[X]	[X]	[X]	[X]	[X]
MN02 MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 CN90 Interconnect Specific			1.12	1.000	1.120
<b>TOTAL</b>					[X]

	Network Cost	Weighted cost	Traffic	% traffic
Emergency Call Access Service 999 from OLO Transit	[X]	[X]	[X]	[X]
Emergency Call Access Service 999 from OLO GMSC	[X]	[X]	[X]	[X]
CN90 Interconnect Specific			1.12	
<b>Total Cost (with ISC charge)</b>			<b>1.469</b>	

Source: Batelco (completed by the Authority with LRIC account information)

164. The proposed charge in the 2010 RO submission is 1.469 fils per minute which is a **7.7 % decrease** compared to the 2009 approved charge of 1.591 fils.



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**Freephone from Mobile (1-8.1)**

165. Batelco has submitted the following cost stack to the Authority:

**Table 15: Submitted cost stack for Freephone from Mobile**

951k Free phone Call originating access (using Postpaid to OLO Transit)		Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
CN03	CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN14	CN14 Transit switch - MGW	[X]	[X]	[X]	[X]	[X]
MN01	MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02	MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03	MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04	MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05	MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11	MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12	MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13	MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14	MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18	MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19	MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20	MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21	MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>						[X]
CN90	CN90 Interconnect Specific			1.12	1.000	1.120
<b>TOTAL</b>						<b>7.25</b>
951m Free phone Call originating access (using Prepaid to OLO Transit)		Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
CN03	CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN14	CN14 [Transit switch - MGW]	[X]	[X]	[X]	[X]	[X]
MN01	MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02	MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03	MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04	MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05	MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11	MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12	MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13	MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14	MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18	MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19	MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20	MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21	MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN41	MN41 Mobile prepaid platform	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>						[X]
CN90	CN90 Interconnect Specific			1.12	1.000	1.120
<b>TOTAL</b>						[X]
951j Free phone Call originating access (using Postpaid to OLO GMSC)		Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
MN01	MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02	MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]



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MN03	MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04	MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05	MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11	MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12	MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13	MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14	MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18	MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19	MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20	MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21	MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23	MN23 Mobile MGW – GMSC	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>						[X]
CN90	CN90 Interconnect Specific			1.12	1.000	1.120
<b>TOTAL</b>						<b>6.72</b>

9511 Free phone Call originating access (using Prepaid to OLO GMSC)		Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
MN01	MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02	MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03	MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04	MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05	MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11	MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12	MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13	MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14	MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18	MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19	MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20	MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21	MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23	MN23 Mobile MGW – GMSC	[X]	[X]	[X]	[X]	[X]
MN41	MN41 Mobile prepaid platform	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>						[X]
CN90	CN90 Interconnect Specific			1.12	1.000	1.120
<b>TOTAL</b>						[X]

	Cost		% traffic	
Postpaid to OLO Transit	[X]	[X]	[X]	[X]
Prepaid to OLO Transit	[X]	[X]	[X]	[X]
Postpaid to OLO GMSC	[X]	[X]	[X]	[X]
Prepaid to OLO GMSC	[X]	[X]	[X]	[X]
CN90 Interconnect Specific			1.12	
<b>Total Cost (with ISC charge)</b>			<b>9.030</b>	

Source: Batelco (completed by the Authority with LRIC account information)

166. As there are four different calling scenarios for the Freephone service, the cost of each one of the scenarios is calculated. The proposed charge for the service is the traffic weighted average of the four scenarios.

167. The proposed charge in the 2010 RO submission is 9.030 fils per minute which is a **12.0 % increase** compared to the 2009 approved charge of 8.060 fils.



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**MMS delivery service (1.11.1)**

168. Batelco has submitted the following cost stack to the Authority:

**Table 16: Submitted cost stack for MMS Terminating access**

950i MMS Terminating Access		Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
MN01	MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02	MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03	MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04	MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05	MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11	MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12	MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13	MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14	MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18	MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19	MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20	MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21	MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23	MN23 Mobile MGW – GMSC	[X]	[X]	[X]	[X]	[X]
MN25	MN25 Mobile GMSC - SMS platform	[X]	[X]	[X]	[X]	[X]
MN26	MN26 Mobile BSC - GPRS platform	[X]	[X]	[X]	[X]	[X]
MN30	MN30 Mobile GMSC - HLR platform	[X]	[X]	[X]	[X]	[X]
MN40	MN40 SMS Platform	[X]	[X]	[X]	[X]	[X]
MN43	MN43 GPRS Platform	[X]	[X]	[X]	[X]	[X]
MN44	MN44 MMS Platform	[X]	[X]	[X]	[X]	[X]
MN45	MN45 WAP Platform	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>						[X]
CN90	CN90 Interconnect Specific			1.12	1.000	1.120
<b>TOTAL</b>						<b>136.363</b>

Source: Batelco (completed by the Authority with LRIC account information)

169. The proposed charge in the 2010 RO submission is 136.336 fils per MMS which is a **62 % increase** compared to the 2009 approved charge of 84.109 fils.



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**Directory assistance service for call to 181 (2-2.1)**

170. Batelco has submitted the following cost stack to the Authority:

**Table 17: Submitted cost stack for directory assistance service for call to 181**

951n Directory Assistance Service from OLO Transit (181)	Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
CN03 CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN18 CN18 Transit switch - DQ Services	[X]	[X]	[X]	[X]	[X]
CN63 CN63 Directory Query ( DQ )	[X]	[X]	[X]	[X]	[X]
Operator weighted average costs per call *			[X]	[X]	[X]
<b>SUBTOTAL</b>					<b>[X]</b>
CN90 CN90 Interconnect Specific			1.12	1.00	1.120
<b>TOTAL</b>					<b>170.461</b>

\* Operator weighted average cost per call is not based on LRIC account submission but on excel file "20100621 RO response DQ (181 188 191) annex Q95 resubmitted.xls" submitted by Batelco on 21 June 2010  
Source: Batelco (completed by the Authority with LRIC account information)

171. The proposed charge in the 2010 RO submission is 170.891 fils per call which is a **47.6 % increase** compared to the 2009 approved charge of 115.750 fils. The charge is taken from the submitted RO schedule 3 and does not match the charge from the cost stack which equals 170.461 fils.



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**Directory assistance service for call to 188 (2-2.2)**

172. Batelco has submitted the following cost stack to the Authority:

**Table 18: Submitted cost stack for directory assistance service for call to 188**

951y Directory Assistance Service from OLO GMSC (188)	Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
CN03 CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN15 CN15 Transit switch - GMSC	[X]	[X]	[X]	[X]	[X]
CN18 CN18 Transit switch - DQ Services	[X]	[X]	[X]	[X]	[X]
CN63 CN63 Directory Query ( DQ )	[X]	[X]	[X]	[X]	[X]
MN02 MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN25 MN25 Mobile GMSC - SMS platform	[X]	[X]	[X]	[X]	[X]
MN40 MN40 SMS Platform	[X]	[X]	[X]	[X]	[X]
Operator weighted average costs per call *			[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 CN90 Interconnect Specific			1.12	1.00	1.120
<b>TOTAL</b>					<b>172.940</b>

\* Operator weighted average cost per call is not based on LRIC account submission but on excel file "20100621 RO response DQ (181 188 191) annex Q95 resubmitted.xls" submitted by Batelco on 21 June 2010  
Source: Batelco (completed by the Authority with LRIC account information)

173. The proposed charge in the 2010 RO submission is 172.940 fils per call which is a **45.5 % increase** compared to the 2009 approved charge of 118.820 fils.

**Inter-Operator Transit Access Service Mobile (2-9.2)**

174. Batelco has submitted the following cost stack to the Authority:

**Table 19: Submitted cost stack for Inter-Operator Transit Access Service Mobile**

950o Inter-Operator Transit Service ITAS (OLO GMSC/Transit to OLO Transit/GMSC)	Total of operating and capital costs BD	RF Volume Minutes	AS cost per minute LRIC	Routing Factor %	2008 Cost
CN03 CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN15 CN15 Transit switch - GMSC	[X]	[X]	[X]	[X]	[X]
MN02 MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 CN90 Interconnect Specific			1.12	1.00	1.120
<b>TOTAL</b>					<b>1.910</b>

Source: Batelco (completed by the Authority with LRIC account information)

175. The proposed charge in the 2010 RO submission is 1.910 fils per minute which is a **3.9 % decrease** compared to the 2009 approved charge of 1.988 fils.



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**Network costs**

176. The following section reviews the various points of the methodology adopted by Batelco that the Authority considers requires amendment or that invite comments.

***50/50 Split between 2G and 3G***

177. Batelco has split mobile traffic between its 2G and 3G networks in equal proportions, i.e. 50-50. Batelco did not create new traffic categories but divided by two the routing factors of the Radio Access Network (“RAN”) network elements applicable to voice. Batelco states that the 50:50 split has been used due to system limitations that do not allow separate reporting of 2G and 3G traffic.

178. The Authority acknowledges Batelco’s allocation methodology and reserves the right to further investigate its impact on mobile services cost in future.

***Radio Access Network Routing Factors for SMS and MMS***

179. For consistency purposes, the routing factors of the RAN network elements applicable to mobile data services, SMS, and MMS should also be divided by 2. Not doing so would be unfair and unreasonable. The final charges calculated by the Authority reflect this change.

***Discrepancies in routing factors between on-net SMS/MMS services and terminating SMS/MMS services.***

180. The Authority has identified a number of discrepancies related to routing factors. In the routing factor table used in the 2008 regulatory accounts submitted by Batelco on 29 April 2010 (excel file “20100429 Additional RF table actual 2008”), on-net messaging services have a routing factor equal to 1 for Mobile Switching Centre Server (MN01) and Media Gateway (MN05) while for terminating messaging services, the routing factors are rightfully equal to the conversion factor of the service (0.025 for SMS and 0.358 for MMS). The difference of treatment is incorrect, not fair and not reasonable. Consequently the Authority has adjusted on-net messaging routing factors to align them with terminating messaging services routing factors. Batelco is requested to correct its routing factor table.

***Mobile data services conversion factors***

181. Batelco is currently using a conversion factor of 0.458 for mobile data services such as GPRS and O-net. This conversion factor means that every minute of voice is equivalent of 2.18 MByte of data. On 26 July 2010, the Authority sought justifications from Batelco regarding the conversion factors as they appear excessive.

182. In an email sent by James Ibbetson on 11 August 2010, Batelco has provided the following justification for the routing factors of mobile data:

“The derivation of 3G data conversion factors is based on technical information in relation to each data service. For example, SMS and MMS products, the factors ordered by the TRA as a result of a consultant study were applied. For GPRS and O-Net however, the throughput rates were used to count the expected download times in seconds for each data technology type. The average of all types were calculated and used as factor for the conversion to minutes.



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The above represents the approach used in 2008 and provisionally in 2009 (subject to audit) for the conversion.

For further illustration on how the conversion is applied, below is the 2008 sample of actual conversion factors applied.

For GPRS and O-Net, the file size is 1Mbyte = 8Mbit or 8192 Kbit

The throughput rates to be used are

EDGE: [X]

WCDMA [X]

HSDPA: [X]

[X]

EDGE [X]

WCDMA [X]

HSDPA: [X]

Average [X]

Convert to minutes [X]= 0.458 minute

As the routed traffic between 2G and 3G was 50:50, the calculated average rate of 0.458 was split equally between 2G and 3G nodes.”

183. The Authority considers that the methodology employed by Batelco is incorrect for the following reasons:
- Batelco seems to confuse maximum theoretical throughput rates with real-world achieved throughput rates on loaded networks.
  - Batelco seems to omit that mobile data throughput is subject to many factors which limit the maximum throughput that could be obtained in ideal conditions such as in a laboratory environment. A non-exhaustive list of possible factors include: weather condition, spectrum bandwidth, cell load and cell usage (mix between voice and data), distance of terminal from the BTS/Node B (line of sight, indoor or outdoor), antenna and baseband chip of user terminal, type of mobile data application used by subscribers etc...
  - Batelco has taken an average which implies that 1/3 of mobile data traffic uses the 2G RAN (EDGE) while 2/3 uses the 3G RAN (UMTS R99, HSDPA). The methodology is not consistent with the 50/50 traffic split convention used to allocate RAN cost between 2G and 3G.

184. Not surprisingly, the methodology produces results which are out of step with normal practice (see table of benchmarks below). In the absence of technical reports of system usage generated from files such as CDR or TAP and having regards to the issues identified above with the methodology used by Batelco, the Authority is of the view that



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benchmarking is preferable although the Authority acknowledges that the use of actual technical data would be superior.<sup>14</sup>

185. The Authority has therefore compiled the following benchmark of conversion factors for mobile data services that are used in regulatory cost models.

**Table 20: Benchmark of conversion factors for mobile data services**

Regulator/ Operator	Country	2G DATA (MByte per Equivalent Minute)	3G DATA (MByte per E. Min)	SMS (SMS per E. Min)	MMS (MMS per E. Min)	Source
ARCEP	France	0.087	0.092	650 (2G) 610 (3G)		Conversion factors: BH traffic units to BH Mbps and Mbps (from ARCEP mobile model available at <a href="http://www.arcep.fr">http://www.arcep.fr</a> )
Batelco	Bahrain	2.180	2.180	[X]	[X]	Batelco's email to TRA on 11 August 2010
Ficora	Finland	0.015		144		<a href="http://www.ficora.fi/">http://www.ficora.fi/</a>
Middle East regulator	Middle East country (confidential)		0.690			Confidential
NITA	Denmark	0.123 (0.1795 in LRIC Model)	0.150	1150		<a href="http://www.npt.no/">http://www.npt.no/</a>
PTS	Sweden	0.152	0.131 (R99) and 0.556 (HSPA)	102 (2G) and 3030 (3G)	-	<a href="http://www.pts.se/">http://www.pts.se/</a>
Vodafone Australia	Australia	0.152		144		<a href="http://www.accc.gov.au/">http://www.accc.gov.au/</a>

Source: The Authority from regulators' websites

186. The benchmark confirms that Batelco's conversion factor for mobile data is significantly out of line with values used at the international level. The value of 2.18 MBytes per equivalent minute is between 15 to 20 times greater than the conversion factors used in other countries which range from 0.015 to 0.152 MB for 2G networks and 0.131 to 0.690 for 3G networks.

187. The current conversion factor (1 MByte = 0.458 Equivalent Minute) leads to a low network equipment use by mobile data services in comparison to voice services. If the conversion factor is increased then the total use of equipment by data services increases (in equivalent minute) and unit cost of equipment per equivalent minute decreases in proportion. In other words, with the current conversion factor, the portion of network cost allocated to voice services is too high while the remaining portion allocated to data services is too low. Having regards to the available evidence, the Authority is of the view that mobile data services routing factors are not fair and reasonable.

<sup>14</sup> It would give a better understanding of mobile data services use (average mobile data usage per subscriber, average data session duration, RAN technology used etc...)



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188. Considering the above benchmark, the Authority has decided to use a conversion factor for mobile data services of **0.250** to better reflect the usage of network elements by data services. The value of 0.250 is quite conservative since the benchmark average for 2G (GPRS, EDGE) is close to 0.100 and the benchmark average for 3G (UMTS R99 and HSDPA) is close to 0.325.

189. The change of conversion factor for mobile data services to 0.250 “increases usage” of mobile network elements as it increases the equivalent minutes. The impact is estimated to be an “increase” of 5.7% of equivalent minutes for RAN network elements in 2008. For 2009, the “increase” is even more pronounced for RAN usage with 15.9%.

#### Wholesale activities cost: ISC

190. In accordance with paragraph 519, the Authority has decided a fair and reasonable ISC charge at **0.7 fils** per call minute equivalent.

191. The correct routing factors used by the Authority to allocate the ISC to SMS and MMS services are respectively 0.025 and 0.333.

#### The Authority’s decision on fixed interconnection charges

##### *Frozen fixed interconnection charges*

192. The Authority and Batelco have reached an agreement in 2007 which stipulates that all fixed network interconnection charges are frozen pending a thorough review of the most appropriate form of costing for NGN based charges.

193. The approved charges for fixed interconnection services remain unchanged as summarised in the following table:

Table 21: Approved fixed interconnection charges

Reference	Charge description	Approved 2009 (fils)	Proposed and Approved 2010 (fils)	Evolution 2010-2009
1-3.1	GMSC PTSN terminating calls	3.040	3.040	0.0%
1-3.2	PSTN terminating access using either double or single tandem	2.382	2.382	0.0%
1-3.3	Delivery to tone or announcement	2.000	2.000	0.0%
1-4.3	Delivery to tone or announcement	2.000	2.000	0.0%
1-5.2	Delivery to tone or announcement	2.000	2.000	0.0%
1-7.2	Conveyance of emergency call to 990	2.711	2.711	0.0%
1-7.3	Conveyance of emergency call to 992	2.711	2.711	0.0%
1-7.4	Conveyance of emergency call to 994	2.711	2.711	0.0%
1-8.2	Freephone from PSTN	2.710	2.710	0.0%
2-9.1	Inter-Operator Transit Access Service Fixed	1.724	1.724	0.0%

Source: The Authority from Batelco’s RO submission



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#### 2-1 PSTN Transit Service

194. Batelco requested the removal of PSTN transit from the RO on the basis that there is no demand for the service. The Authority does not agree with this request as there could be demand for this service in the future.

#### The Authority's decision on mobile interconnection charges

195. The following section contains the Authority's decision on charges it considers fair and reasonable. The decision takes into account all the above points exposed in paragraphs 176 to 191.

196. In setting mobile interconnection charges for 2010, the Authority notes that mobile network costs are not in a steady state (see table below), notably because of the roll out of the 3G network. Other abnormal factors, and in particular the holding loss made on the sale of the land in Isa Town in 2008, have contributed to the variability of cost between 2007 and 2008. The Authority has undertaken some high level modelling of 2009 mobile network costs which suggest that mobile interconnection services should remain stable next year.

Table 22: LRIC variations between 2007 and 2008

	2007 - 2008 Variation in total LRIC costs (in %)	2007-2008 variation in average LRIC cost per RF minute (in %)
MN01 [Mobile Switching Centre Server ( MSCS )]	[X]	[X]
MN02 [Gateway MSC (GMSC)]	[X]	[X]
MN03 [Home Location Registers (HLR )]	[X]	[X]
MN11 [Base Station Controller (BSC)]	[X]	[X]
MN12 [Base Transceiver Station (BTS)]	[X]	[X]
MN20 [Mobile BTS - BSC]	[X]	[X]
MN40 [SMS Platform]	[X]	[X]
MN41 [Mobile prepaid platform]	[X]	[X]
MN43 [GPRS Platform]	[X]	[X]
MN44 [MMS Platform]	[X]	[X]

Source: The Authority from Batelco's LRIC accounts

#### 1-4.1 Mobile call conveyance GMSC

197. The Authority is of the view that the service "Mobile call conveyance MTC" should be renamed to "Mobile call conveyance GMSC" because this reflects the network element to which the operator is interconnected.

198. The Authority sets the interconnection charge for mobile call conveyance MTC service at 6.203 fils per minute as described in the cost stack below. The Authority's fair and reasonable charge represents a 1.3% increase compared to the approved charge in 2009 (based on 2007 LRIC accounts).



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**Table 23: The Authority's cost stack for Mobile conveyance MTC**

950d Mobile Terminating Access from OLO GMSC	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23 Mobile MGW - GMSC	[X]	[X]	[X]	[X]	[X]
MN30 Mobile GMSC - HLR platform	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					<b>[X]</b>
CN90 Interconnect Specific			0.70	1.00	0.700
<b>TOTAL</b>					<b>6.203</b>

Source: The Authority from Batelco submitted cost stack



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**1-4.2 Mobile call conveyance Transit switch**

199. The Authority is of the view that the service “Mobile call conveyance OLO” should be renamed to “Mobile call conveyance Transit switch” because this reflects the network element to which the operator is interconnected.

200. The Authority sets the interconnection charge for mobile call conveyance OLO service at 6.553 fils per minute as described in the cost stack below. The Authority’s fair and reasonable charge represents a 0.04% decrease to the approved charge in 2009 (based on 2007 LRIC accounts).

**Table 24: The Authority’s cost stack for Mobile conveyance OLO**

951e Mobile Terminating Access from OLO Transit	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN15 Transit switch - GMSC	[X]	[X]	[X]	[X]	[X]
MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23 Mobile MGW - GMSC	[X]	[X]	[X]	[X]	[X]
MN30 Mobile GMSC - HLR platform	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	1.00	0.700
<b>TOTAL</b>					<b>6.553</b>

Source: The Authority from Batelco submitted cost stack



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**1-5 Paging Terminating Access**

201. The Authority agrees with Batelco's request to remove item 1-5 Paging Terminating Access from the RO.

**1-6.1SMS Terminating access**

202. The Authority sets the interconnection charge for SMS Terminating access service at 0.443 fils per SMS as described in the cost stack below. The Authority's fair and reasonable charge represents a 1.5% increase to the approved charge in 2009 (based on 2007 LRIC accounts). Changes in routing factors are highlighted in green.

**Table 25: The Authority's cost stack for SMS Terminating access**

950f SMS Terminating Access	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23 Mobile MGW – GMSC	[X]	[X]	[X]	[X]	[X]
MN30 Mobile GMSC - HLR platform	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	0.025	0.018
<b>TOTAL</b>					<b>0.443</b>

Legend: Areas in green contain routing factors that have been modified by the Authority

Source: The Authority from Batelco submitted cost stack



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**1-7.1 Conveyance of emergency call to 999**

203. The Authority sets the transit charge for conveyance of emergency call access service to 999 at 1.045 fils per minute as described in the cost stack below. The Authority’s fair and reasonable charge represents a 34.3% decrease to the approved charge in 2009 (based on 2007 LRIC accounts).

**Table 26: The Authority’s cost stack for conveyance of emergency call to 999**

Emergency Call Access Service 999 from OLO Transit	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	1.00	0.700
<b>TOTAL</b>					<b>1.042</b>

Emergency Call Access Service 999 from OLO GMSC	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN15 Transit switch – GMSC	[X]	[X]	[X]	[X]	[X]
MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	1.00	0.700
<b>TOTAL</b>					<b>1.490</b>

	Network cost	Weighted cost	Traffic	% traffic
Emergency Call Access Service 999 from OLO Transit	[X]		[X]	[X]
Emergency Call Access Service 999 from OLO GMSC	[X]		[X]	[X]
CN90 Interconnect Specific		0.70		
<b>Total Cost (with ISC charge)</b>		<b>1.045</b>		

Legend: Areas in green contain traffic information that has been corrected by the Authority (previous traffic information in cost stack was mistakenly 2009 traffic)

Source: The Authority from Batelco submitted cost stack

**1-8.1 Freephone from Mobile**

204. The following cost stack gives an interconnection charge of 8.482 fils per minute for the Freephone from mobile service. This represents a 5.2% increase compared to the approved charge in 2009. This charge is a traffic weighted average of four calling scenarios. Although the cost stack is considered to be correct in the sense that, saved for the adjustments made, it reconciles back to the regulatory accounts, the Authority has decided to freeze the current approved rate of 8.06 fils per minute pending further investigation of the anti-competitive complaint against Batelco regarding international call rates which resulted in the issuance of the Emergency Order No. 3 dated 29 July 2010. The Authority considers that any increase in this charge at this point in time would only exacerbate the extent of the potential margin squeeze or any other anti-competitive pricing behaviour. The Authority also notes that Batelco claimed in response to Emergency Order



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<sup>15</sup> that its call origination cost are between [X] per minute. This is significantly less than the cost based on the cost stacks submitted by Batelco for its RO.

**Table 27: The Authority's cost stack for Free phone Call originating access**

951k Free phone Call originating access (using Postpaid to OLO Transit)	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN14 Transit switch - MGW	[X]	[X]	[X]	[X]	[X]
MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18 RNC - MGW	[X]	[X]	[X]	[X]	[X]
MN19 Node B - RNC	[X]	[X]	[X]	[X]	[X]
MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	1.00	0.700
<b>TOTAL</b>					<b>6.727</b>
951m Free phone Call originating access (using Prepaid to OLO Transit)	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN14 Transit switch - MGW	[X]	[X]	[X]	[X]	[X]
MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18 RNC - MGW	[X]	[X]	[X]	[X]	[X]
MN19 Node B - RNC	[X]	[X]	[X]	[X]	[X]
MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN41 Mobile prepaid platform	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	1.00	0.700
<b>TOTAL</b>					<b>8.871</b>
951j Free phone Call originating access (using Postpaid to OLO GMSC)	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]

<sup>15</sup> Batelco's response to Emergency Order No.3 of 2010 received by the Authority on 15 August 2010.



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MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18 RNC - MGW	[X]	[X]	[X]	[X]	[X]
MN19 Node B - RNC	[X]	[X]	[X]	[X]	[X]
MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23 Mobile MGW - GMSC	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	1.00	0.700
<b>TOTAL</b>					<b>6.203</b>
<b>951l Free phone Call originating access (using Prepaid to OLO GMSC)</b>	<b>Total of operating and capital costs BD</b>	<b>New RF Volume Minutes</b>	<b>New LRIC cost per RF minute</b>	<b>Routing Factor %</b>	<b>New 2008 Cost</b>
MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18 RNC - MGW	[X]	[X]	[X]	[X]	[X]
MN19 Node B - RNC	[X]	[X]	[X]	[X]	[X]
MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23 Mobile MGW - GMSC	[X]	[X]	[X]	[X]	[X]
MN41 Mobile prepaid platform	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	1.00	0.700
<b>TOTAL</b>					<b>8.346</b>
	<b>Cost</b>	<b>Traffic</b>	<b>Traffic</b>		
951k Free phone Call (using Postpaid to OLO Transit)	[X]		[X]		[X]
951m Free phone Call (using Prepaid to OLO Transit)	[X]	[X]	[X]		[X]
951j Free phone Call (using Postpaid to OLO GMSC)	[X]		[X]		[X]
951l Free phone Call (using Prepaid to OLO GMSC)	[X]		[X]		[X]
CN90 Interconnect Specific		0.70			
<b>Total Cost (with ISC charge)</b>		<b>8.482</b>			

Source: The Authority from Batelco submitted cost stack



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**1.11.1 MMS delivery service**

205. The Authority sets the interconnection charge for MMS terminating access service at 124.495 fils per MMS as described in the cost stack that follows. The Authority's fair and reasonable charge represents a 48% increase to the approved charge in 2009 (based on 2007 LRIC accounts). Changes in routing factors are highlighted in green.

**Table 28: The Authority's cost stack for MMS terminating access**

950i MMS Terminating Access	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
MN01 Mobile Switching Centre Server ( MSCS )	[X]	[X]	[X]	[X]	[X]
MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN03 Home Location Registers (HLR )	[X]	[X]	[X]	[X]	[X]
MN04 Mobile Packet Backbone Network - MPBN	[X]	[X]	[X]	[X]	[X]
MN05 Media Gateway ( MGW )	[X]	[X]	[X]	[X]	[X]
MN11 Base Station Controller (BSC)	[X]	[X]	[X]	[X]	[X]
MN12 Base Transceiver Station (BTS)	[X]	[X]	[X]	[X]	[X]
MN13 GSM 3G Radio N/W Controller-RNC	[X]	[X]	[X]	[X]	[X]
MN14 GSM 3G HSDPA Radio Base Stations-Node B	[X]	[X]	[X]	[X]	[X]
MN18 RNC – MGW	[X]	[X]	[X]	[X]	[X]
MN19 Node B – RNC	[X]	[X]	[X]	[X]	[X]
MN20 Mobile BTS - BSC	[X]	[X]	[X]	[X]	[X]
MN21 Mobile BSC - MGW	[X]	[X]	[X]	[X]	[X]
MN23 Mobile MGW – GMSC	[X]	[X]	[X]	[X]	[X]
MN25 Mobile GMSC - SMS platform	[X]	[X]	[X]	[X]	[X]
MN26 Mobile BSC - GPRS platform	[X]	[X]	[X]	[X]	[X]
MN30 Mobile GMSC - HLR platform	[X]	[X]	[X]	[X]	[X]
MN40 SMS Platform	[X]	[X]	[X]	[X]	[X]
MN43 GPRS Platform	[X]	[X]	[X]	[X]	[X]
MN44 MMS Platform	[X]	[X]	[X]	[X]	[X]
MN45 WAP Platform	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	0.333	0.233
<b>TOTAL</b>					<b>124.495</b>

Legend: Areas in green contain routing factors that have been modified by the Authority  
Source: The Authority from Batelco submitted cost stack



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#### 2-2.1 Directory assistance service for call to 181

206. The Authority sets the wholesale charge for directory assistance service for calls to 181 at 121.402 fils per call as described in the cost stack that follows. The Authority's fair and reasonable charge represents a 4.9% increase to the approved charge in 2009 (based on 2007 LRIC accounts).

**Table 29: The Authority's cost stack for directory assistance service for call to 181**

951n Directory Assistance Service from OLO Transit (181)	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN18 Transit switch - DQ Services	[X]	[X]	[X]	[X]	[X]
CN63 Directory Query ( DQ )	[X]	[X]	[X]	[X]	[X]
Weighted average operating costs per call *			[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	1.00	0.700
<b>TOTAL</b>					<b>121.402</b>

\* Calculation of Weighted average operating costs per call is described in ]Table 30  
Source: The Authority from Batelco submitted cost stack

207. The cost per call to directory assistance is composed of 2 categories:

- a. Networks costs; and
- b. Weighted average operating costs per call which refer to non-network related cost and more specifically to call centre costs.

208. The weighted average operating costs per call have been decreased by the Authority from [X] fils to [X] fils. The original value [X] fils per call is derived from the submitted file "20100621 RO response DQ (181 188 191) annex Q95 resubmitted.xls". It corresponds to the total cost of a directory assistance call when such call is made by a Batelco subscriber. It includes call centre costs, network and retail costs. When the call is made by an OLO subscriber, the only operating costs Batelco incur are the call centre costs. Therefore the Authority does not consider the methodology used by Batelco to calculate operating costs per directory call to be fair and reasonable as it includes irrelevant costs.

209. To calculate the fair and reasonable weighted average operating costs per call, the Authority has determined the following:

- a. all network costs included in operating costs shall be removed as they are already accounted for in the cost stacks of Table 29 and Table 31.
- b. all retail costs included in operating costs shall be removed with the exception of call centre costs.
- c. call centre costs per call (36110 – Customer Assistance Centre): unit cost per call shall be derived using traffic information submitted by Batelco. The methodology used by the Authority is described in the following table.

[X]Table 30: The Authority's methodology to calculate the weighted average operating cost of 181 and 188 calls



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#	Item	Value	Unit	Source
a	Numbered of 181 answered calls in 2008	[X]	answered calls	20100621 RO response DQ (181 188 191) annex Q95 resubmitted.xls
b	Numbered of 188 answered calls in 2008	[X]	answered calls	
c	Total traffic of 181 calls in 2008	[X]	seconds	
d	Total traffic of 188 calls in 2008	[X]	seconds	
e	Average duration of 181 and 188 calls	[X]	seconds	= ( a + b ) / ( c + d )
f	Total DQ traffic in 2008	[X]	minutes	Batelco submitted traffic information under article 53 (sum of traffic of 100b, 102b, 103e, 300b, 300g, 301f, 950k, 951n and 951y services)
g	Total DQ traffic in 2008	[X]	seconds	= f x 60
h	Operating cost of "36110 Customer Assistance Centre" in 2008 *	[X]	BD	20100621 RO response DQ (181 188 191) annex Q95 resubmitted.xls
i	Average cost per second	[X]	fls	= h x 1,000 / g
j	<b>Weighted average operating costs per call (181 and 188 calls)</b>	[X]	fls	<b>= e x i</b>

Source: The Authority

210. The annual 2008 cost for "36110 Customer Assistance Centre" amounts [X]. On 25 March 2008, Batelco submitted to the Authority a tariff proposal called "Revised Proposal for Implementation of Directory Enquiry Charging (DQ) and Application for Certain Exceptions" under the reference of TPR 139B. In the document, Batelco indicated that Customer Assistance Centre cost amounted [X] in 2006. In the same document, Batelco estimated this amount to be composed of [X] of variable costs. Although the quantity of directory calls in 2008 [X] compared to 2006, the cost of the call centre [X]. Therefore the Authority is not certain of the accuracy and fairness of this amount and reserves the right to further investigate this point in the future.



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**2-2.2 Directory assistance service for call to 188**

211. For the same reasons as above, the Authority sets the wholesale charge for directory assistance service for call to 188 at 123.884 fils per call as described in the cost stack that follows. The Authority's fair and reasonable charge represents a 4.3% increase to the approved charge in 2009 (based on 2007 LRIC accounts).

**Table 31: The Authority's cost stack for directory assistance service for call to 188**

951y Directory Assistance Service from OLO GMSC (188)	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN15 Transit switch - GMSC	[X]	[X]	[X]	[X]	[X]
CN18 Transit switch - DQ Services	[X]	[X]	[X]	[X]	[X]
CN63 Directory Query ( DQ )	[X]	[X]	[X]	[X]	[X]
MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
MN25 Mobile GMSC - SMS platform	[X]	[X]	[X]	[X]	[X]
MN40 SMS Platform	[X]	[X]	[X]	[X]	[X]
Weighted average operating costs per call *			[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	1.00	0.700
<b>TOTAL</b>					<b>123.884</b>

\* Calculation of Weighted average operating costs per call is described in ]Table 30  
Source: The Authority from Batelco submitted cost stack

**2-9.2 Inter-Operator Transit Access Service Mobile**

212. The Authority sets the transit charge for Inter-Operator Transit Access Service Mobile at 1.490 fils per minute as described in the cost stack that follows. The Authority's fair and reasonable charge represents a 25.1% decrease to the approved charge in 2009 (based on 2007 LRIC accounts).

**Table 32: The Authority's cost stack for Inter-Operator Transit Access Service Mobile**

950o Inter-Operator Transit Service ITAS (OLO GMSC/Transit to OLO Transit/GMSC)	Total of operating and capital costs BD	New RF Volume Minutes	New LRIC cost per RF minute	Routing Factor %	New 2008 Cost
CN03 Transit switches	[X]	[X]	[X]	[X]	[X]
CN15 Transit switch - GMSC	[X]	[X]	[X]	[X]	[X]
MN02 Gateway MSC (GMSC)	[X]	[X]	[X]	[X]	[X]
<b>SUBTOTAL</b>					[X]
CN90 Interconnect Specific			0.70	1.00	0.700
<b>TOTAL</b>					<b>1.490</b>

Source: The Authority from Batelco submitted cost stack



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**Summary of Batelco's response**

**Discrepancies in Routing Factors**

213. Batelco accepts the Authority's comments at paragraph 179 and 180 regarding the discrepancies in routing factors for SMS and MMS.

**CN90 routing factors for SMS and MMS services**

214. Referring to Table 25 and Table 28 relating to SMS and MMS terminating access, Batelco indicates that as CN90 ("ISC") is not a network element which is capable of being adjusted by a routing factor, the CN90 charge applicable to SMS and MMS should be the full ISC and not be subjected to a fractional routing factor percentage. Batelco therefore does not agree with the Authority's application of the SMS and MMS routing factor for the ISC.

**Mobile data services conversion factors**

215. Batelco acknowledges the position taken by the Authority based on benchmarks and suggests that the original conversion factor assumption remain unchanged until a survey based on actual measurements in Batelco's network is completed.

216. To support its assumption of equal split of mobile data traffic between 2G and 3G, Batelco refers its response to an article 53 sent on 21 June 2010<sup>16</sup> and on 19 August 2010<sup>17</sup> in which Batelco explains its difficulties obtaining exact measurements of the split of mobile traffic per radio access technology.

217. In a subsequent clarification meeting held in the Authority's premise on 12 December 2010, Batelco argued that the benchmark provided by the Authority in the draft order should not be used for setting the data conversion factor as it mainly contains European countries which do not share the same market characteristics as Bahrain notably in terms of maturity, service usage and network congestion. Batelco has further argued that no change should take place because it will shift a considerable amount of cost from voice to data services.<sup>18</sup>

**Frozen fixed interconnection charges**

218. Batelco acknowledges the arrangement with the Authority to freeze fixed interconnection charges but notes that such arrangements was reached in 2008 and not in 2007 as the Authority stated.

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<sup>16</sup> 20100621 RO responses phase three - interconnection and IPLC products.doc

<sup>17</sup> 20100819 Batelco response and mark up to TRA letter 26 July RO assessment.doc

<sup>18</sup> To support this view, Batelco submitted the following two files: 20101230 TRA Mobile data conversion impact\_30122010a.xlsx, 20110106 TRA Mobile data calculation.xlsx



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**PSTN transit service**

219. At paragraph 86 of its submission, Batelco details a number of reasons why this service is not currently or foreseeably demanded in Bahrain. Batelco also acknowledges the Authority's decision to decline its request to remove the service from the RO and commits to keep it whether or not a final order is made.

**Mobile interconnection charges**

220. Batelco notes that there are multiple reasons which cause variations in accounting costs from one year to the next including introduction, removal and/or merging of cost centres; change in cost drivers or allocation keys etc.

**Mobile call conveyance GMSC**

221. Batelco agrees with the Authority to rename the service "Mobile call conveyance MTC" to "Mobile call conveyance GMSC".

**Paging terminating access**

222. Batelco acknowledges the Authority's acceptance of the removal of item 1-5 Paging Terminating Access from the RO.

**Conveyance of Emergency calls**

223. Batelco informs the Authority that emergency calls are not all conveyed according to the 999 emergency call service cost stack. Emergency services to 990, 992, 994 and 996 have a different cost stack which is identical to standard fixed PSTN termination.

**Freephone from mobile**

224. Batelco does not agree with the Authority's approach to freeze the Freephone from mobile origination charge pending the investigation of the anti-competitive complaint against Batelco which resulted in Emergency Order No. 3 dated 29 July 2010.

225. Batelco submits that the Authority should not decline to order the increase of the Freephone charge since:

- a. The Authority would be ordering Batelco to supply a service below cost;
- b. a retail price floor has been already ordered to alleviate the allegedly anti-competitive behaviour; and
- c. at the time the Authority ordered the retail price floor, it already had the revised cost stack but did not take it into account to set the retail price floor.

226. Batelco further argues that it now experiences greater prejudice than set out in the Authority's analysis which it says justified the Emergency Order No. 3.

227. In the Annex B of its response to the draft order, Batelco also submits updated traffic data for freephone origination minutes and retail IDD offers by competitors.



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228. Batelco is of the view that the Authority should not be referring here to the assessment of call origination in Batelco's response to Emergency Order No. 3.

#### Directory assistance service for calls to 181 and 188

229. In its submission Batelco indicate that it may accept the Authority's approach in the calculation of the weighted average cost per call. However, Batelco disagrees with the volume of minutes used in arriving at the average cost per second as the Authority has added scenarios that are not related to the 181 and 188 call scenarios. Batelco states that the correct weighted average cost per call should be [X] fils.

230. As part of a subsequent clarification meeting held at the Authority's premises on 12 December 2010, Batelco has provided the cost allocation breakdown of 36110 [Customer Assistance Centre] which is presented hereunder.

Table 33: Cost allocation breakdown of 36110 [Customer Assistance Centre]

36110 [Customer Assistance Centre]	Allocation %
MR02 [Customer Assistance Centre - (181 & 188) Mobile]	[X]
FR02 [Customer Assistance Centre - (181 ) Fixed]	[X]
FR01 [Customer Assistance Centre - (151) Fixed]	[X]
MR01 [Customer Assistance Centre - (151) Mobile]	[X]
MR03 [Customer Assistance Centre - (191) Mobile]	[X]
FR03 [Customer Assistance Centre - (191) Fixed]	[X]
FR04 [Customer Assistance Centre - (100) Fixed]	[X]

Source: Batelco

## The Authority's analysis and conclusion

#### CN90 routing factors for SMS and MMS services

231. The Authority maintains its view regarding the routing factors to be applied to SMS and MMS for CN90. As the relevant traffic of CN90 is expressed in minute equivalent, the ISC applies to minute equivalent. Hence the ISC applicable SMS and MMS needs to reflect the Authority's adjustment.

#### Mobile data services conversion factors

232. The Authority reiterates its views on mobile data conversion factors and further elaborates with the following arguments:

- a. Since the current mobile data conversion factor of 2.18 used by Batelco is based on theoretical throughput rates and does not reflect real world conditions the Authority does not consider this to be reasonable. During the 12 December 2010 clarification meeting, Batelco admitted that the current theoretical value was not



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correct and argued for the status quo to be maintained until an independent study is undertaken.

- b. In absence of actual network measurements and a clear understanding of network engineering rules, the Authority is of the view that benchmarks are more appropriate than theoretical values. Moreover since the theoretical value is completely out of range (by a factor of between 10 to 20) from the benchmark values, the Authority considers that maintaining the status quo is not an acceptable option.
- c. The Authority's decision is reasonable as the conversion factor used is in line with the benchmark.
- d. The Authority also has strong reservations in relation to Batelco's current top-down allocation model as it considers total yearly traffic for cost allocation purposes when busy hour traffic analysis would be more appropriate in so far as it is normally the driver for network dimensioning. In general, investment decisions regarding capacity and coverage are usually driven by voice rather than data, a service which is delivered on a best effort basis. Therefore Batelco's cost modelling approach is likely to include a bias in the allocation of costs between voice and data. This bias is difficult to assess without further information regarding network engineering rules.
- e. The Authority also has reservation with regards to Batelco's convention to split equally data and voice traffic between 2G and 3G RAN. This 50% convention leads to the over allocation of 2G RAN cost to data services which the Authority estimates to be using the 3G RAN in a greater proportion.<sup>19</sup> If by convention 75% of the data traffic would be using the 3G RAN, a greater majority of its costs would be allocated to data services.

233. For the above reasons, the Authority maintains its decisions to set the mobile data conversion factor to 0.250 MByte per equivalent minute (routing factor of 4, i.e. 4 equivalent minutes per MByte of mobile data) for the purpose of setting interconnection charge. The same mobile data conversion factor is to be used by Batelco in the preparation of its 2009 regulatory accounts. However Batelco remains free to set the prices of its mobile retail services which are not regulated on an ex-ante basis though these remain subject to anti-competitive provisions. The Authority reserves the right to review its decision in the future.

#### **Frozen fixed interconnection charges**

234. The Authority welcomes Batelco's rectification of the agreement date which was reached as part of the 2009 RO review.<sup>20</sup>

#### **PSTN transit service**

235. The Authority notes the reasons given by Batelco to remove the PSTN transit services but orders Batelco to keep it in its RO.

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<sup>19</sup> For instance, Batelco's voice subscribers need to call customer services to activate 3G.

<sup>20</sup> RO approval letter dated 17 September 2009, Ref GDO/0909/031



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#### Mobile call conveyance GMSC

236. The Authority welcomes Batelco's agreement and orders the service "Mobile call conveyance MTC" to be renamed to "Mobile call conveyance GMSC".

#### Paging terminating access

237. The Authority approve Batelco's request to remove of item 1-5 Paging Terminating Access from its RO.

#### Conveyance of Emergency calls

238. The Authority welcomes Batelco's clarification regarding the cost stacks of Emergency calls services to 990, 992 and 994 which follow the fixed PSTN termination cost stack. The Authority also notes that Batelco refer to Emergency calls to 996 which is a protected number but not allocated. The Authority understands that Batelco was referring instead to the Emergency number 998 which has been recently allocated to the Child Protection Hotline.<sup>21</sup> As it is not part of the RO, the Authority orders Batelco to introduce it under the name "1-7.5 - Conveyance of emergency call to 998".

#### Freephone from mobile

239. The Authority maintains its view to freeze the freephone from mobile charge pending the completion of the on-going investigation against Batelco. The Authority notes in particular that Batelco is arguing in this regulatory proceeding that its cost per minute is 9.030 fils while it has submitted in the margin squeeze investigation that its 2009 network cost per minute for 123 and IDD calls range from [X] fils with a retail cost minute ranging from [X] to [X] fils.<sup>22</sup> [X]

[X]

[X]

[X]

#### Directory assistance service for call to 181 and 188

240. Based on the information provided by Batelco, the Authority is of the view that there are only two valid approaches to calculate the average call centre cost per call :

- a. Approach 1: Only 181 and 188 calls traffic is used in the average cost calculation. This is valid only if 93% of the total cost of 36110 [Customer Assistance Centre] is divided by this traffic as it weighs 93% in the total call centre traffic distribution.
- b. Approach 2: Alternatively if the total cost of 36110 is taken for the calculation it should then be divided by the total traffic of services. This is the Authority's preferred approach.

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<sup>21</sup> "9" series code blocks, TRA update of National numbering plan on 13 January 2011.

<sup>22</sup> Request for Assessment and Withdrawal sent by Batelco on 15 August 2010 in response to Emergency Order No. 3.



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241. The Authority considers that, since Batelco's calculations are based on approach 1 but take into account the total cost and not the relevant proportion of cost only, the calculation is incorrect.
242. The Authority remains of the view that its calculations are correct. The wholesale charge for 181 and 188 DQ services is set at 121.401 fils per call.

#### The Authority's ordered charges for interconnection services

243. For all the above reasons, the Authority maintains its draft order decision in relation to interconnection services with the exception of Conveyance of Emergency call services (1-7.2 to 1-7.5). The final charges for interconnection services are presented in the following table.

**Table 34: Ordered charges for interconnection services**

Chargeable activity	Approved in 2009	Batelco proposed charge in 2010	TRA fair and reasonable charge in 2010	Evolution as compared to 2009
<b>Interconnection services</b>	<b>in fils</b>			
1-3.1 - GMSC PTSN terminating calls	3.040	3.040	<b>3.040</b>	0%
1-3.2 - PSTN terminating access using either double or single tandem	2.382	2.382	<b>2.382</b>	0%
1-3.3 - Delivery to tone or announcement	2.000	2.000	<b>2.000</b>	0%
1-4.1 - Mobile call conveyance <b>GMSC</b>	6.124	6.725	<b>6.203</b>	1.3%
1-4.2 - Mobile call conveyance Transit switch	6.556	7.144	<b>6.553</b>	- 0.04%
1-4.3 - Delivery to tone or announcement	2.000	2.000	<b>2.000</b>	0%
1-5.1 - Paging call delivery	<b>REMOVED</b>			
1-5.2 - Delivery to tone or announcement	2.000	2.000	<b>2.000</b>	0%
1-6.1 - SMS Terminating access	0.437	1.856	<b>0.443</b>	1.5%
1-7.1 - Conveyance of emergency call to 999	1.591	1.462	<b>1.045</b>	- 34.3%
1-7.2 - Conveyance of emergency call to 990	2.711	2.382	<b>2.382</b>	-12.1%
1-7.3 - Conveyance of emergency call to 992	2.711	2.382	<b>2.382</b>	-12.1%
1-7.4 - Conveyance of emergency call to 994	2.711	2.382	<b>2.382</b>	-12.1%
1-7.5 - Conveyance of emergency call to 998		2.382	<b>2.382</b>	
1-8.1 - Freephone from Mobile	8.060	9.030	<b>8.060</b>	0%
1-8.2 - Freephone from PSTN	2.710	2.710	<b>2.710</b>	0%
1-11.1 – MMS delivery service	84.109	136.363	<b>124.495</b>	48.0%
2-2.1 - Directory assistance service for call to 181	115.750	170.891	<b>121.402</b>	4.9%
2-2.2 - Directory assistance service for call to 188	118.820	172.940	<b>123.884</b>	4.3%
2-4 – Dial-up Internet Access Service	<b>REMOVED</b>			
2-9.1 - Inter-Operator Transit Access Service Fixed	1.724	1.724	<b>1.724</b>	0%
2-9.2 - Inter-Operator Transit Access Service Mobile	1.988	1.910	<b>1.490</b>	- 25.1%

Source: The Authority



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**8 Duct access service**

**Draft Order Text**

**Proposed charge for duct access in the 2010 RO submission**

244. As can be seen from the cost stack submitted by Batelco to support its proposed charges for duct rental (see table below), the duct rental charge is made of two categories of cost: infrastructure cost and wholesale activities cost.

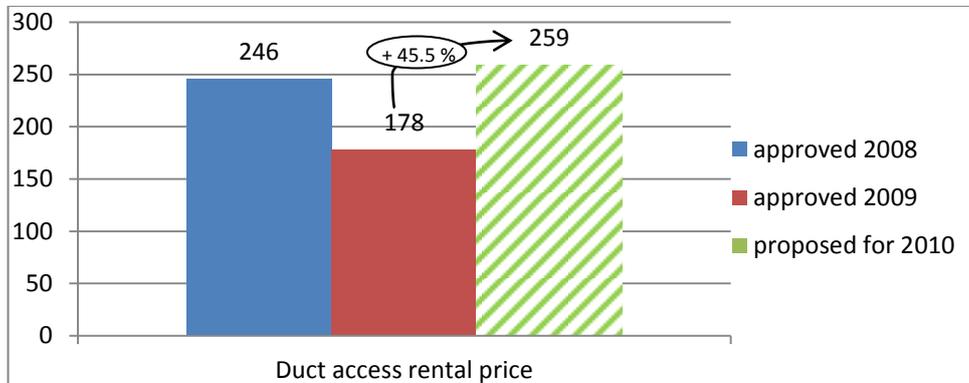
**Table 35: Cost stack submitted by Batelco to support its duct access charge**

Access ducts infrastructure	
<b>Access ducts infrastructure cost</b>	Total Costs [X]
<i>Total duct meters</i>	[X]
<b>Cost per metre (BD/mtr)</b>	[X]
<b>Wholesale activities</b>	[X]
<i>Total WS duct meters</i>	[X]
<b>WS activities Cost per mtr (BD/mtr)</b>	[X]
<b>Total Cost per metre per month</b>	<b>0.259</b>

Source: Batelco's RO submission

245. The proposed monthly charge for duct rental in the submitted RO is 259 fils/metre/per duct bore/month which represents an increase of 45.5% compared to the current charge approved in September 2009.

**Figure 1: Duct access proposed charge for 2010 in comparison with 2009 and 2008 approved charges**



Source: The Authority

246. The Authority's analysis of the Batelco submission raised a number of questions that were sent to Batelco under article 53 of the Telecommunications Law on 17 May 2010.

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247. Batelco provided a first set of answers on 14 June 2010. The Authority requested Batelco to provide further clarifications on 20 June 2010. Batelco's second set of answers were sent to the Authority on 30 June 2010.

#### Infrastructure costs

##### ***Incoming cost to NP10 [Access Network Duct & Infrastructure]***

248. The total cost of NP10 [Access Network Duct & Infrastructure] allocated to access ducts in the 2008 regulatory accounts is [X] which is [X] than in the 2007 regulatory accounts. The increase of [X] between 2007 and 2008 is mainly due to:

- a. a [X] increase of the allocated cost of NA02 [Plan & design the construction of ducts NW copper & fibre cables] to NP10 which accounts for 52% of the increase of NP10;
- b. a [X] increase of the allocated cost of NA03 [Implement the designs of the ducts NW copper & fibre cables] to NP10 which accounts for [X] of the increase of NP10, and;
- c. a [X] increase of the allocated cost NA05 [Manage the operation & maintenance of the access NW] to NP10 which accounts for [X] of the increase of NP10.

**Table 36: NP10 [Access Network Duct & Infrastructure] cost breakdown for 2007 and 2008**

NP10 [Access Network Duct & Infrastructure] - Breakdown	2008	2007	Delta08/07%
AS-12010 [Duct]	[X]	[X]	[X]
AS-12080 [Joint Chamber]	[X]	[X]	[X]
NA02 [Plan & design the construction of ducts NW copper & fibre cables]	[X]	[X]	[X]
NA05 [Manage the operation & maintenance of the access NW]	[X]	[X]	[X]
NA03 [Implement the designs of the ducts NW copper & fibre cables]	[X]	[X]	[X]
AS-12090 [Manholes]	[X]	[X]	[X]
NA04 [Access NW Technology, processes and system develop]	[X]	[X]	[X]
Total NP10	[X]	[X]	[X]

Source: Batelco's RO submission

249. Batelco indicated that the NA02 and NA03 increases are due to an allocation error in the 2007 regulatory accounts which was then corrected in the 2008 regulatory accounts. In its answers sent to the Authority on 14 June 2010, Batelco indicated that:

"between 2007-2008 accounts production, there was a transition in which the costing system upgrade has taken place. As a result, the non-minute related element, specifically core & access network plant NP10 & NP11 has been under-allocated in 2007 - i.e. the proportion of network activities allocation to NP10 is lower than it should have been. On the other hand, the remaining costs have been over-allocated on the other access elements such as fibre cable and secondary cable underground. For further clarification, please refer to the below table (example of NA03). Nonetheless, the 2007 model has been re-run with the proper adjusted allocation and the impact on the overall network element cost under the access network business was minimal. The proof can be found through comparing the access network business cost (AS regulatory accounts) of both years."



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250. The Authority acknowledges that Batelco has provided two tables presenting the cost allocation breakdown of NA02 and NA03 for 2008. The Authority also notes the considerable rebalancing of cost between NP10 and other access network elements (Cable, Distribution points, Poles, Cabinet, MPLS) whereby more cost are allocated to NP10 and less to other access network elements.
251. In reviewing the information provided, the Authority has observed several inconsistencies. First, with regards to NA03, the sum of allocated costs to NA03 does not equal the 2008 total provided in the NA03 cost allocation breakdown table.
252. Second, the cost allocated to NP10 from both NA02 and NA03 do not match either the values from “Table 1: Duct - NP10 [Access Network Duct & Infrastructure]” or those from NA02 and NA03 cost allocation breakdown tables (e.g. in one table the amount of NA02 allocated cost to NP10 in 2008 is BD [X] and in the other table it is BD [X]).
253. In clarifications sent by Batelco to the Authority on 30 June 2010, Batelco gives the following reason:
- “The reason of the discrepancy noted by the Authority between the illustrative table and ( Table 1: Duct - NP10 ) above, is because that the illustrative table reports the operating cost not taking into account the cost of capital , while table 1:Duct does include the total cost inclusive of the cost of capital.”
254. The Authority accepts the justification and encourages Batelco to provide detailed and consistent cost breakdowns in future submission to avoid the need for clarification.
255. The Authority not only remarks that the allocation of NA02 and NA03 have been modified but also that the total of these two network activities have increased significantly between 2007 and 2008. NA02 is subject to a [X] while NA03 to a [X]. In an explanatory note, Batelco justifies this increase by a “*normal staff and OPEX increase to meet the network operations requirements*”. The increase is counter-intuitive as network operations requirements cost should increase in proportion with network deployment - total duct length remained quasi unchanged between 2007 and 2008. The Authority would like Batelco to provide the reasons behind such a one-off increase in “network operations requirements”.

**Table 37: Evolution of NA02 and NA03 between 2007 and 2008**

	2008	2007	Evolution
NA02 [Plan & design the construction of ducts NW copper & fibre cables]	[X]	[X]	[X]
NA03 [Implement the designs of the ducts NW copper & fibre cables]	[X]	[X]	[X]

Source: Batelco

#### **Modification of asset lives**

256. The Authority has serious concerns over the asset lives used by Batelco in its regulatory accounts. As shown in the table below, the asset lives used by Batelco for ducts, distribution points, and poles are significantly lower than the asset lives used in a number of countries, including Ireland, France and the UK.



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**Table 38: Benchmark of equipment's asset lives**

Assets	Unit	Bahrain	Ireland	France	UK	The Authority's fair and reasonable
Cabinet	Years	20	20	25	20	20
<b>Duct</b>	<b>Years</b>	<b>20</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>
<b>Distribution Point (DP)</b>	<b>Years</b>	<b>10</b>	<b>20</b>	<b>25</b>	<b>20</b>	<b>20</b>
<b>Poles</b>	<b>Years</b>	<b>10</b>	<b>30</b>			<b>30</b>
Primary Cable	Years	20	20	25	20	20
Secondary Cable - Underground	Years	20	20	25	20	20
Secondary Cable - Overhead	Years	20	20	25	20	20

Source: Bahrain – Batelco  
Ireland – Review of the regulatory asset lives of Eircom Limited, 17 February 2009  
France – ARCEP, Decision No. 05-0834  
United Kingdom – OFCOM, Valuing copper access Part 2 proposals, 16 March 2005

257. The Authority considers that the asset lives used for those assets should be modified to better reflect the expected useful lives of these assets and to bring Batelco's regulatory asset lives in line with best practice. The Authority notes that construction work in Bahrain follows the same standards as the ones set in British construction (e.g. same specification for concrete quality). Because in the vast majority of cases the infrastructure is underground it is not affected by the high temperature and humidity in Bahrain. The Authority has therefore modified the asset lives of ducts from 20 to 40 years. As joint chambers are part of the ducts, their asset lives is also extended from 20 to 40 years.

258. To reflect the change of asset lives from 20 years to 40 years, the depreciation charge of AS-12010[Duct] and AS-1280[Joint Chamber] based on the 2008 regulatory accounts has been divided by two as detailed in the following table.

**Table 39: Submitted and fair and reasonable depreciation charges for AS-12010 [Duct] and AS-12080 [Joint Chamber] in NP 10**

	AS-12010 [Duct]	AS-12080 [Joint Chamber]
Depreciation 2008 for NP10 (in BD) Asset life: 20 years (submitted)	[X]	[X]
Depreciation 2008 for NP10 (in BD) Asset life: 40 years (fair and reasonable)	[X]	[X]

Source: The Authority from Batelco's submission

259. On this occasion, the Authority has decided not to adjust the amount of un-attributable cost allocated to NP10 following the adjustment made to the depreciation charge. However the Authority reserves the right to make necessary adjustments in the future.



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#### **Calculation of adjusted duct length**

260. Batelco has introduced in the 2008 regulatory accounts a new methodology to allocate duct cost based on adjusted duct and cable lengths. The methodology was presented to Authority on 9 December 2009.<sup>23</sup> As explained by Batelco, the previous methodology used to allocate the cost of duct to cables was inappropriate. It did not take into account the sharing of duct by multiple cables. It was inaccurate as it was based on cable length and therefore led to double counting of ducts shared by several cables. The Authority considers the new methodology is a welcome improvement as it captures duct sharing.
261. However the Authority notes that there appears to be some issue with total duct length. According to information provided by Batelco, the adjusted duct length measured on the same basis has decreased by [X] between 2007 and 2008. This would mean that Batelco has removed [X] of cables from ducts which are now empty. It is unclear to the Authority whether this is the case. The Authority therefore requests Batelco to shed light on this point in its response to this draft order.
262. Finally the Authority is of the view that the methodology could be further improved to take into consideration cable diameter to derive a charge per volume (per meter and cm<sup>2</sup>) of duct occupation. Such methodology could be presented during a workshop.

#### **Study and installation charges and revenues**

263. The Authority requested Batelco to clarify the scope of and justify the one-off charges applicable to duct rental (ref. Question 69 of the Information Requested issued 17 May 2010).
264. Batelco provided a document detailing the Duct Sharing Process. Such process is broken down in the following chargeable activities:
- a. Access request
  - b. Desk study
  - c. Field study stage 1
  - d. Field study stage 2
  - e. Field study stage 3
  - f. Material supply
  - g. Work ordering
  - h. Installation
  - i. Splicing
  - j. Testing
  - k. Recording

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<sup>23</sup> C.f. Presentation "TRA clarification Questions on: -Duct Cost Allocation – Effective Bandwidth Calculation, 9th December 2009"



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265. However, despite repeated requests,<sup>24</sup> Batelco has not provided a full explanation for the following charges:

**Table 40: Chargeable activities related to duct access**

Item	Chargeable Activity	Charge
2-3.2	Site Survey if required	BD 300
2-3.12	Scheduled installation, maintenance and removal Charges (Business Hours)	From BD14 to BD 21 Per hour (two hour minimum call out)
2-3.13	Scheduled installation, maintenance and removal Charges (Out of Hours)	From BD21 to BD 31.5 Per hour (two hour minimum call out)
2-3.14	Unscheduled installation, maintenance and removal Charges (Urgency Surcharge)	From BD36 to BD43 Per hour (two hour minimum call out)

Source: Batelco's RO

266. Thus the Authority is not in a position to assess whether those charges are fair and reasonable. The Authority is concerned that these charges are inflated.

267. The above charges are one-off payments by access seekers to Batelco. It is not fair or reasonable not to take into account such wholesale revenues in the duct access cost stack. The revenues derived from one-off activities should be deducted from NP10 [Access Network Duct & Infrastructure]. As Batelco incurs one-off cost in providing duct to access seekers and as these costs are charged back to the latter via one-off charges, it is only fair and reasonable that they are removed from the cost stack calculation. If not deducted, access seekers would be charged “twice” for desk/field studies and installation costs: the first time with the one-off charges and the second time through the monthly rental charge.

268. The issue of the treatment of one-off wholesale charges is relevant to all wholesale products. At present, it is not clear to the Authority how they are treated. Therefore, the Authority would like Batelco to:

- a. clarify how it records one-off charges in its regulatory accounts;
- b. provide a detailed breakdown of one-off revenues by wholesale products; and
- c. take into consideration one-off revenues by deducting them from the cost stacks of access products.

269. Adjustments for the revenues from one-off charges have been made to Infrastructure cost and Wholesale activities cost. They are detailed in the following table:

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<sup>24</sup> The first time the Authority has requested explanation was on 7 April 2009 during the RO submission review process. The last time was on 20 June 2010.



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**Table 41: Adjustments applied to Infrastructure cost and Wholesale activities cost**

#	Item	Value	Unit	Source
a	New wholesale ducts in 2008	[X]	metres	Batelco submitted information under article 53
b	Average estimated duct route length	1,500	metres	In absence of information, the Authority estimates an average duct route length of 1,500 metres
c	Quantity of new duct route in 2008	[X]	duct routes	= a / b
d	Processing Access Application Fee	100	BD/ application	Batelco' RO item 2-3.1
e	Total cost of access application handling	[X]	BD	= c x d
f	<b>Total revenues to be removed from Wholesale activities cost</b>	[X]	BD	= e
g	Total cost of desk study	0	BD	Included in general processing fee (20100614 RO assessment article 53 question 49 annex 2007 Duct Process.docx)
h	Average distance between each site survey	200	metres	In absence of information, the Authority estimates an average length of 200 metres between each manhole
i	Proportion of site survey of route which is unavailable at field study stage	33%		The Authority estimates that one third of sites are not available for cabling
j	Quantity of site survey per duct route	11	site surveys per duct route	= ( b / h + 1 ) x ( 1 + i )
k	Total quantity of site surveys	[X]	site surveys	= c x j
l	Site Survey cost	300	BD per visit	Batelco' RO item 2-3.2
m	Total cost of site surveys stage 1 to 3	[X]	BD	= k x l
n	Cost of installation per metre	1.50	BD	The Authority estimates based on international benchmark
o	Total cost of installation	[X]	BD	= a x n
p	<b>Total revenues to be removed from Infrastructure cost</b>	[X]	BD	= g + m + o

Source: The Authority from Batelco's submission

**Wholesale activities costs**

270. Based on a time analysis, Batelco is proposing to allocate [X] of wholesale activity costs to duct access. In previous year, no wholesale activity costs were included in the cost stack of duct rental. Batelco justifies this change by the increase in volume of wholesale duct rentals. Wholesale activity costs represent [X] of the proposed duct rental charge.

271. The [X] is applied to all wholesale activities:

- a. WS01 [Wholesale & Carrier Relations - Access Product Management]



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- b. WS02 [Commercial Operation- Access]
- c. WS03 [Finance Support Services - Reg & WS Support Access]
- d. WS04 [Legal & Regulatory Affairs - Access Support]
- e. WS05 [Fixed Billing - IAA Access]

272. The Authority considers that the 2009 figure of wholesale duct should be used for the calculation of wholesale activities unit cost in order to prevent over recovery of costs. As the rental charge will normally be effective for a year from the last quarter of 2010, the 2009 figure chosen as denominator in the calculation is conservative and largely off-set any wholesale activities cost increase due to a greater quantity of wholesale duct rentals.

**The Authority’s decision on fair and reasonable charge**

273. The Authority’s draft ordered charge is 0.189 BD and is based on the calculation detailed in the below table. The draft ordered charge represents an increase of 5.8% to the approved charge in 2009 based on the 2007 FAC accounts.

**Table 42: Fair and reasonable charge for duct rental in 2010**

NP10 [Access Network Duct & Infrastructure]	[X]
Adjustment for charge in asset depreciation (40 years)	[X]
Adjustment to discount one-off charges (desk/field study, installation)	[X]
<b>Adjusted ducts infrastructure cost</b>	<b>[X]</b>
<b>Total duct meters</b>	<b>[X]</b>
Cost per metre (BD/metre)	[X]
Wholesale activities	[X]
Adjustment to discount one-off charges (Processing Access Application Fee)	[X]
<b>Adjusted Wholesale activities cost</b>	<b>[X]</b>
<b>Total WS duct meters in 2009</b>	<b>[X]</b>
WS activities Cost per metre (BD/metre)	[X]
Total Cost per metre per month	0.188

Source: The Authority



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**Summary of Batelco's response**

274. Batelco considers that the emphasis given to the proposed increase in duct access service is somewhat unfortunate as this issue was foreshadowed by Batelco in 2009 and the Authority regrettably failed to give that prediction proper regard. In its response dated 6 August 2009 to the Authority's 2009 review of duct charge, Batelco urged the Authority not to force any change to the 2008 duct charge.
275. Batelco does not agree with the Authority's approach in reducing the cost base of duct access service. It considers that the Authority should not revisit duct asset life, doubling them, just 7 months after the approval of the detailed asset lives schedule used by Batelco in the APM on which the preparation of the audited 2008 Batelco regulatory accounts is based.
276. Batelco also argues that the change of asset life undermines the integrity of the regulatory accounts audit process; is potentially contrary to article 3 of Telecommunications Law; and is contrary to the expressed positions of the Authority in relation to asset lives used in the APM and regulatory accounts.
277. Moreover Batelco submits that the Authority should not construct and impute, without enquiry or evidence, the existence of significant administrative cost recovery through one-off charges which are deducted from the cost base.

**The Authority's analysis and conclusion**

278. Having reviewed and considered the comments raised by Batelco the Authority maintains its position on asset lives. The Authority would like to clarify that it has never indicated to Batelco that it would not change asset lives in the context of setting wholesale charges. Paragraph 625 to 628 sets out the Authority's view in relation to adjustments made to the outputs of regulatory accounts.
279. The Authority also notes that a compromise had been reached the previous year in relation to the duct rental access charge whereby due to problems faced by Batelco in costing this product the charge only decreased by a limited amount.
280. In regards to the deduction of one-off charges, as explained in the draft Order, the Authority is not in the position to assess whether the current level of one-off charges is fair or reasonable. Notwithstanding this point, even if the charges would be duly justified, they would still have to be deducted from the cost base. Each occurrence of the one-off charges corresponds to an activity performed by Batelco for which it incurs costs. The corresponding costs are recorded in the GL cost accounts and included in the cost base on which the wholesale service charge is calculated. Since Batelco has confirmed that one-off charges are set on a work and material basis, revenues from the collection of the one-off charges need to be removed from the service cost base to avoid any over recovery. If not removed from the calculation, Batelco would recover the installation costs twice; once through one-off charges and the second time through rental charges. Consequently the Authority maintains its position concerning the deduction of one-off charges from the cost stack.



## Reference Offer Order

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#### The Authority's ordered charges for duct access services

281. For the above reasons, the Authority maintains its decision and orders a duct access rental charge of BD 0.189 BD per metre and per month.

Table 43: Ordered charges for interconnection services

Chargeable activity	Approved in 2009	Batelco proposed charge in 2010	TRA fair and reasonable charge in 2010	Evolution as compared to 2009
<b>Duct access ( 2-3.9 )</b>				
2-3.9 – Duct Rental charge	0.178	0.259	<b>0.189</b>	5.8%

Source: The Authority



**Reference Offer Order**  
Annex – Order Legal Basis and Reasoning

**9 Dial-Up Internet Access Service**

**Draft Order Text**

282. The Authority agrees with Batelco request to remove the Dial-Up Internet Access Service from the RO.

**Summary of Batelco's response**

283. Batelco welcomes the Authority's approval to remove the service.

**The Authority's analysis and conclusion**

284. The Dial-up Access Service is to be removed from its RO.



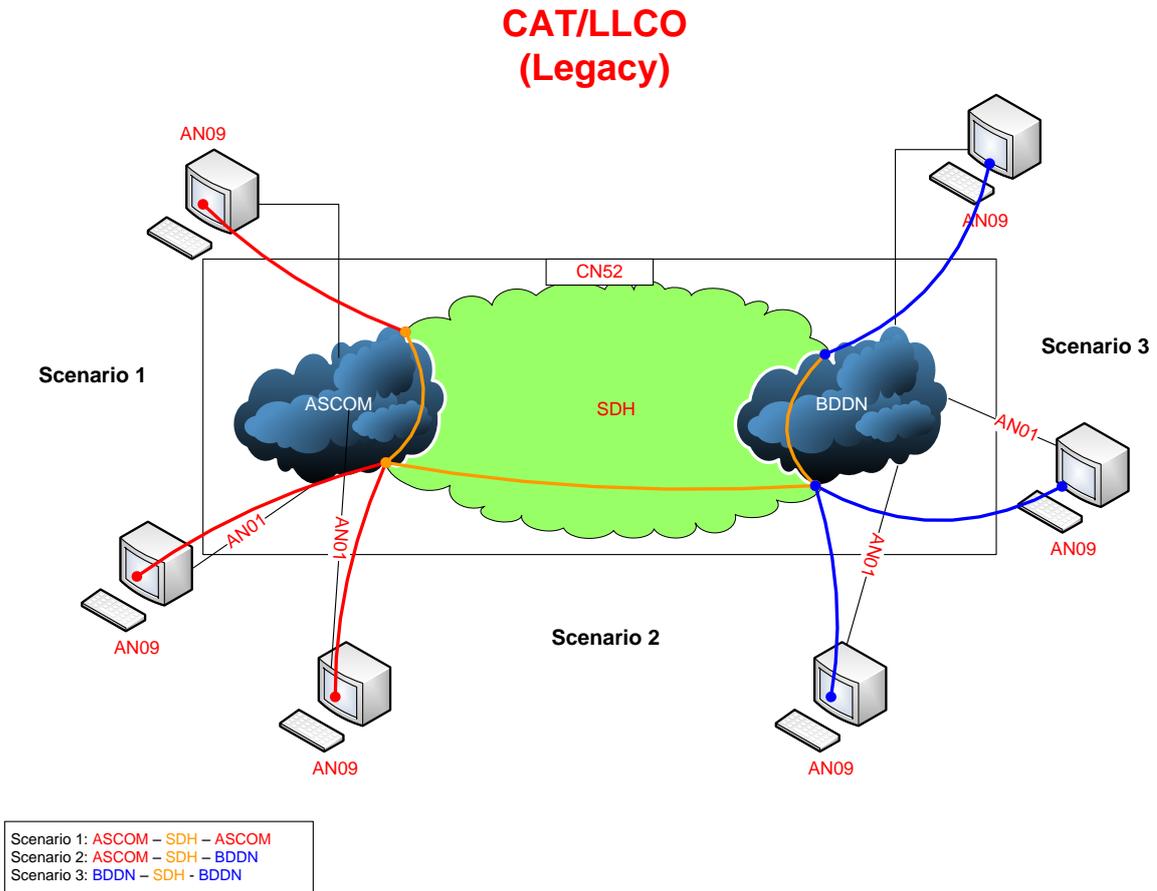
**10 CAT/LLCO services**

**Draft Order Text**

285. According to Batelco’s Reference offer, “[t]he CAT Service is a wholesale dedicated private leased circuit service for carrying Access Seeker’s traffic within Bahrain between an End User premises and an Access Seeker’s Point of Presence (OLO’s POP).” The Local Leased Circuit for OLO (“LLCO”) service is defined as “a wholesale dedicated private leased circuit service for carrying Access Seeker’s traffic within Bahrain between two of the Access Seeker’s Points of Presence”.<sup>25</sup>

286. The two following figures transmitted by Batelco describe how CAT/LLCO for existing speeds (also referred to as Narrowband or NB) are provided over the legacy and the NGN networks.

**Figure 2: CAT/LLCO for existing speeds over legacy network**

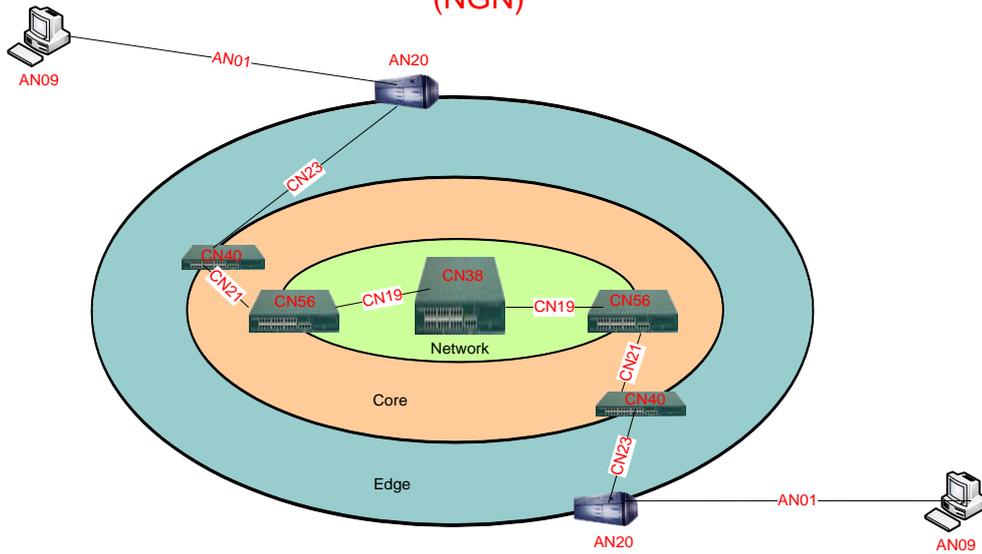


<sup>25</sup> Batelco, SERVICE DESCRIPTION 2-5: LOCAL LEASED CIRCUIT FOR OLO (LLCO).



**Reference Offer Order**  
Annex – Order Legal Basis and Reasoning

**NB LLC/CAT  
(NGN)**

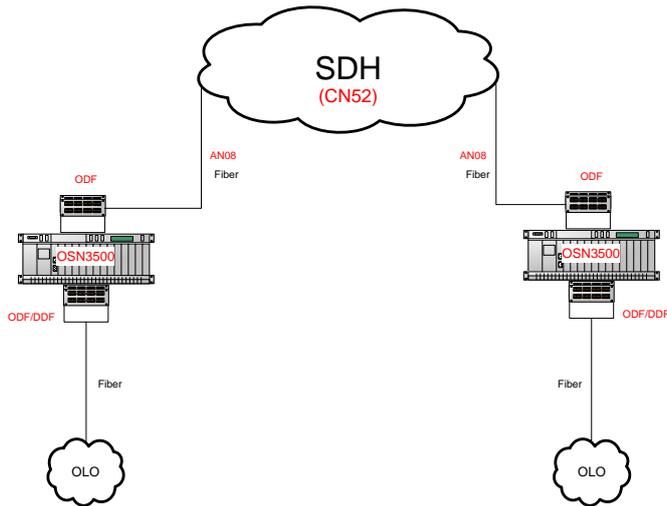


Source: Batelco

287. The following figure submitted by Batelco describes how CAT/LLCO for higher speeds (also referred to as Broadband or BB) are provided:

**Figure 3: CAT/LLCO for higher speeds**

**BB CAT/LLCO**



*Delivery of DS3, STM-1, STM-4, STM-16 Circuits*

Source: Batelco



**Reference Offer Order**

Annex – Order Legal Basis and Reasoning

**Information provided by Batelco**

288. On 1 April 2010 Batelco submitted to the Authority its RO submission for CAT/LLCO. It included two Excel files, detailing the calculations of CAT/LLCO costs:

- a. the first, “20100401 Annex D NB CAT and LLCO.xlsx” relates to the charges for CAT/LLCO of existing speed (i.e. with speeds up to 2Mbps); and
- b. the second, “20100401 Annex E BB CAT and LLCO.xlsx”, relates to the charges for high speed services (i.e. speeds of 34 Mbps (DS3), 155 Mbps (STM-1) and 622 Mbps (STM-4)).

289. Batelco later submitted revised files:

- a. The first, “20100408 Annex D NB CAT and LLCO 2008 – Updated.xlsx”, submitted on 8 April 2010, relates to the charges for CAT/LLCO of existing speed. The proposed charges for existing speed are detailed in the following Table.

**Table 44: CAT and LLCO NB submission charges proposed by Batelco**

speed	#pair / speed	WS Factor	Wholesale Activities Cost	Access Copper pair Cost per one Circuit	MSAN G.SHDSL per circuit	Cost per one circuit (2 CPEs)	Network Cost	Total cost
64k	[X]	[X]	[X]	[X]	[X]	[X]	[X]	88.25
128k	[X]	[X]	[X]	[X]	[X]	[X]	[X]	92.21
256k	[X]	[X]	[X]	[X]	[X]	[X]	[X]	100.14
384k	[X]	[X]	[X]	[X]	[X]	[X]	[X]	108.07
512k	[X]	[X]	[X]	[X]	[X]	[X]	[X]	115.99
768k	[X]	[X]	[X]	[X]	[X]	[X]	[X]	131.84
1024k	[X]	[X]	[X]	[X]	[X]	[X]	[X]	158.76
1536k	[X]	[X]	[X]	[X]	[X]	[X]	[X]	190.24
2048k	[X]	[X]	[X]	[X]	[X]	[X]	[X]	222.22

Source: Batelco

- b. the second, “20100401 Annex E BB CAT and LLCO 2008 –Updated.xlsx”, relates to high speed services. The proposed charges for high speed services are detailed in the following Table.



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**Table 45: CAT and LLCO BB submission charges proposed by Batelco**

Speed	WS Factor	Wholesale Activities Cost	Access Fibre Cost for 2 ends	Equipment Cost for two ends	Network Cost	Total cost
DS3	[X]	[X]	[X]	[X]	[X]	5,208
STM1	[X]	[X]	[X]	[X]	[X]	8,777
STM4	[X]	[X]	[X]	[X]	[X]	17,343

Source: Batelco

290. Further clarifications were then sought by the Authority to assess whether charges are fair, reasonable and non-discriminatory. In response to these requests, Batelco made further submissions. The lack of complete answers, inconsistencies in the data submitted, errors and reluctance of Batelco to provide the required information necessitated a large number of iterations between the Authority and Batelco as detailed below:

- a. On 17 May 2010, the Authority issued an article 53 request for information to Batelco in relation to the review of the RO. Sections 7 and 8 were related to CAT/LLCO.
- b. On 15 June 2010, the Authority reminded Batelco that the information pertaining to CAT/LLCO was still outstanding (Ref. MCD/06/10/066).
- c. On 17 June 2010, the Authority sent questions on CAT/LLCO.
- d. On 20 June 2010, Batelco provided answers to questions on CAT/LLCO (Ref: GCL/235/10).
- e. On 23 June 2010, referring to a Batelco's response on CAT/LLCO received 20 June 2010 to the Authority's article 53 information request issued 17 May 2010, the Authority requested Batelco to action the elements included in the Annex to its letter (Ref. MCD06/10/069).
- f. On 27 June 2010, Batelco answered the points raised by the Authority on 23 June 2010 (Ref. GCL/249/10). The numbers of copper pairs in use were all updated.
- g. On 29 June 2010, the Authority required Batelco to clarify a number of outstanding matters, including the apparent inconsistencies in the number of circuits and the number of pairs used.
- h. On 1 and 11 July 2010, the Authority sent two emails in order to clarify data on the fibre length and on the costs of CPEs.
- i. On 11 July 2010, Batelco answered questions received on 29 June 2010 (Ref. CAT/LLCO GCL/279/10 - #2).
- j. On 14 July 2010, after reviewing Batelco's responses dated 11 July 2010, the Authority reminded Batelco that there were still outstanding matters and unanswered questions.
- k. On 19 July 2010, Batelco answered the questions received on 14 July 2010 (Ref. GLC/292/10 - #3).



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- i. On 20 July 2010, after having reviewed Batelco's responses dated 19 July 2010 (Ref. GLC/292/10), the Authority reminded Batelco that there were still outstanding matters and unanswered questions.
- m. On 21 July 2010, Batelco answered questions received on 20 July 2010 (Ref. CAT/LLCO GCL/279/10 - #4).
- n. On 22 July 2010, referring to Batelco's further response on CAT/LLCO dated 21 July 2010, the Authority reminded Batelco that there were still outstanding matters and unanswered questions.
- o. On 22 July 2010, Batelco answered to this request by providing some comments on outstanding questions.
- p. On 25 July 2010, the Authority sent clarifications regarding unanswered questions.
- q. On 25 July 2010, Batelco answered one of the outstanding questions.
- r. On 29 July 2010, Batelco answered the latter request (Ref. CAT/LLCO GCL/279/10 - #5).
- s. On 2 August 2010, a conference call was organized to discuss remaining issues. Several clarifications were provided by the Authority to Batelco. Several questions remained to be answered by Batelco.
- t. On 5 August 2010, Batelco answered one of the outstanding questions (Ref. RO assessment - GCL/315/10).
- u. On 9 August 2010, Batelco answered the remaining questions on protection lines and fibre length (Ref. GCL/318/09).
- v. On 19 August 2010, following a request from the Authority dated 16 August 2010, Batelco sent a document consolidating all questions and answers (Ref. CAT/LLCO RO Assessment 6th iteration GCL/332/10).

#### **CAT/LLCO service charges for speeds of up to and including 2 Mbps**

291. With respect to CAT/LLCO services for speeds of up to and including 2 Mbps, the charges proposed by Batelco are made of 5 elements:

- a. wholesale activity costs;
- b. access copper costs;
- c. MSAN costs;
- d. CPEs costs; and
- e. transmission costs.

292. These charges are calculated for a mix of legacy and NGN technologies. Batelco uses a top-down approach based on its 2008 FAC regulatory accounts cost to derive charges.

293. Compared to the existing prices based on 2007 costs, the charges proposed by Batelco represents an increase of between 30% (or about BD 50 for higher speeds) and 50% (or about BD 30 for lower speeds).



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294. Having reviewed the information submitted by Batelco relating to CAT/LLCO services for speeds of up to and including 2 Mbps, the Authority concludes that the charges proposed by Batelco are neither fair nor reasonable (wholesale activity costs) and that they include a mathematical error (MSAN and transmission costs). This is explained hereafter where each line item of the cost stack is reviewed.

#### **Wholesale activity costs**

295. With respect to the wholesale activity costs, Batelco has used a top-down approach that differs from the approach used by the Authority and agreed upon to set CAT/LLCO in previous years. The Authority remains of the view that time-based activity costing is the most appropriate approach of calculating the cost of the wholesale department. The bottom-up approach encourages Batelco to be more efficient and reduces the risk of over recovery inherent to a top-down approach. In addition, the top-down calculations proposed by Batelco are complex and not transparent: wholesale costs are allocated between the different products based on estimates of time spent on each product type. The approach taken by the Authority consists of calculating - on the basis of a bottom-up approach - the cost of each activity carried out by the wholesale department in the provision of services. The relevant activities of the wholesale department are: order processing; technical support and maintenance; and billing. Based on Batelco's previous submissions<sup>26</sup> of the time spent on each of these activities and the staff grade conducting them, the monthly cost of the wholesale activities for all circuits equates to 30 minutes of a G1 staff and 15 minutes of a G2 staff. Using the chargeout rates provided by Batelco in an annex to its RO submission,<sup>27</sup> and considering that the wholesale activity costs are the same for all speeds,<sup>28</sup> the wholesale activity costs are calculated as BD [X] per circuit per month.

#### **Access copper costs**

296. With respect to the access copper costs, Batelco calculates the access copper costs per circuit by multiplying:

- a. the monthly cost per copper pair, which is BD 6.09 (this number reconciles back to the regulatory accounts);
- b. by the number of access copper pairs per circuit, which is 2, since CAT/LLCO always have two ends;
- c. by the average number of pairs per access depending on the speed. This is estimated on the basis that legacy circuits for speeds over 1 Mbps use two pairs

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<sup>26</sup> See "A Draft Order issued by the Telecommunications Regulatory Authority ("TRA") on the Reference Interconnection Offer and Reference Access Offer of the Bahrain Telecommunications Company B.S.C. 6 July 2009".

<sup>27</sup> Submission of 1 April 2010 (file 20100401\_UMP\_SNFM\_Service\_Description\_Charges).

<sup>28</sup> This assumption is used by Batelco for CAT/LLCO low speeds and also for retail products. This assumption appears reasonable: there is no reason why the time taken by the wholesale department to deliver a 64Kbps leased line and a 2048 Kbps leased line would be different.



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per access, and that NGN circuits use one pair per access. 2008 volumes for both 1 and 2 Mbps NGN and legacy circuits are used to compute the average.<sup>29</sup>

297. The Authority considers that the charges proposed by Batelco in the context of CAT/LLCO for dedicated access copper appear to be fair and reasonable.

#### **MSAN costs**

298. With respect to the MSAN costs (i.e. the IP based access platform which provides multiple access services, including data services), Batelco has calculated a MSAN G.SHDSL Card cost per NGN circuit. This unit cost is then applied to all circuits. This is neither fair nor reasonable, since not all circuits use this equipment. In 2008, [X]% of the circuits were legacy circuits which did not use this element. Batelco's calculation would result in over-recovery of MSAN G.SHDSL Card cost allocated to CAT/LLCO. The Authority is of the view that the fair and reasonable MSAN costs are equal to the cost of the MSAN G.SHDSL Card allocated to CAT/LLCO divided by the total number of circuits rather than only the number of NGN circuits. This produces an average MSAN cost per circuit of BD [X]. The Authority notes that this approach is particularly suitable in a period of transition when the number of NGN-based CAT/LLCO is increasing rapidly: there were [X] NGN circuits in 2009 compared to only [X] in 2008.

#### **CPE**

299. With respect to the costs of CPE, Batelco calculates a cost per circuit by multiplying:

- a. the monthly cost of one CPE based on Batelco's 2008 FAC regulatory accounts;
- b. by the number of CPEs per circuit, which is 2 as there is one CPE on each circuit end.

300. The charges proposed by Batelco for CPE costs appear to be fair and reasonable.

#### **Transmission costs**

301. With respect to the costs of transmission (also called network costs):

- a. Batelco first calculates a monthly cost per E1 (2Mbps) circuit. This transmission cost is based on a mix of legacy and NGN networks:
  - i. For legacy circuits: the monthly unit cost per E1 is derived by dividing the total costs of the network element "CN52 Transmission - Local Leased" by the total number of E1 on the SDH network (or specifically by the total number of E1 that were utilizing various access networks: fully BDDN, fully ASCOM, and a combination of the two, multiplied by the percentage of legacy E1).
  - ii. For NGN circuits: Batelco applies a routing factor to all NGN network elements<sup>30</sup> except for CN38 "MPLS Core Data". The routing factor (equal to

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<sup>29</sup> For example, the access copper cost for a for 2 Mbps circuits,  $1.9 = (1 \text{ Pair} \times \% \text{ of NGN-based 2Mbps Circuits}) + (2 \text{ Pairs} \times \% \text{ of Legacy-based 2Mbps Circuits})$ .



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1.32) was calculated on the basis that in 2008, 68% of the MPLS circuits were Layer 3 (multipoint circuits with one end only) and that 32% were Layer 2 (point-to-point circuits with two ends). The monthly unit cost per E1 for NGN circuits is therefore equal to the sum of the costs per E1 of these elements.

iii. The transmission cost per circuit is based on the volume weighted average cost of legacy and NGN transmission costs.

b. Batelco then calculates the transmission cost for all other speeds in proportion to the transmission costs of an E1.

302. The Authority is of the view that calculating an average price for legacy and NGN circuits is reasonable and consistent with the principle of technology neutrality. This approach also guarantees a natural convergence of prices to costs.

303. The Authority observes that Batelco has derived the average cost of the NGN network per E1 by dividing the total cost of the NGN network by the total number of E1 (legacy and NGN) and by a routing factor of 1.32 (see above).<sup>31</sup> However the Authority is of the opinion that it is irrelevant to use a routing factor in the calculation, because this routing factor is not reused by Batelco to derive CAT/LLCO prices at the end. The Authority is of the view that it is sufficient to divide the total cost of the NGN network by the total number of E1 (legacy and NGN) to get the average cost of the NGN network per E1 which is then added to the average cost of the legacy network per E1 to get a blended cost of transmission per E1. After correction, the average monthly transmission cost per E1 circuit is BD [X] against BD [X].

304. Compared to 2007 unit costs (2009 prices), the calculated transmission cost per E1 represents an increase of 20%. This increase is explained by a decrease of [X]% of the number of CAT/LLCO legacy circuits ([X] for 2007 and [X] for 2008 for legacy circuits and [X] for 2007 and [X] for 2008 for legacy and NGN circuits), while legacy transmission cost remain ostensibly unchanged (BD [X] for 2007 and BD [X] for 2008).<sup>32</sup>

305. The Authority is of the view that the decrease in the number of CAT/LLCO circuits observed in 2008 is abnormal and does not reflect the long term trend: in 2009, the number of CAT/LLCO circuits increased significantly compared to 2008 ([X] circuits in 2009<sup>33</sup> compared to [X] in 2008).

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<sup>30</sup> "CN19 Distribution - Core Link (Data)", "CN21 Aggregation - Distribution Link (Data)", "CN40 MPLS Aggregation (Data)", "CN56 MPLS - Distribution Routers (Data)".

<sup>31</sup> More specifically, Batelco divides the total cost of the NGN network by the number of NGN E1 and by the routing factor and then multiply it by the percentage of NGN E1 out of the total number of E1 (NGN + legacy). This is as if Batelco had divided the total cost of the NGN network by the routing factor and the total number of E1 (NGN+legacy). The routing factor is not used for CN38 MPLS Core Data.

<sup>32</sup> Batelco answer Ref: GCL/235/10, Table 4.

<sup>33</sup> Source: Batelco, 20100725 RO assessment article 53 request - phase 1 part 5\_Q51 Response.



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### Annex – Order Legal Basis and Reasoning

Figure 4: Evolution of the number of CAT/LLCO circuits



Source: The Authority based on Batelco's submission

306. As a consequence, the Authority is of the view that using 2008 circuit figures is not reasonable because transmission costs are mainly fixed costs and the costs calculated here are used to set CAT/LLCO prices for 2010 and beyond. This means that, if the number of CAT LLCO circuits in 2008 is abnormal, then this number should not be used to set charges going forward. The Authority has therefore decided to scale the 2008 average monthly transmission cost per E1 by the 2009 number of CAT/LLCO.<sup>34</sup> This is a conservative adjustment considering that the 2010 number of circuits is likely to be greater than the 2009 number. The fair and reasonable transmission cost per E1 circuit is BD [X] against BD [X].

307. The review of Batelco's submission on CAT/LLCO has also identified other significant issues regarding operational data which greatly impact transmission cost. First it would appear that a number of high speed circuits are not included in the number of E1.<sup>35</sup> Second, it is only after repeated questioning regarding the number of E1 used to calculate the transmission cost per E1 and despite initial denial by Batelco,<sup>36</sup> that Batelco finally acknowledged that its calculation of the cost per E1 was erroneous. There are two significant inaccuracies in Batelco's calculation of the traffic handled by the legacy transmission network (email Ref. RO assessment - GCL/315/10) sent on 5 August 2010):

- a. First of all, Batelco explained that the total traffic used to allocate the legacy transmission costs to the different retail and wholesale products and to calculate the transmission cost per Mbps (or per E1) did not include concatenated (i.e. non channelized) circuits. Due to this inaccuracy, the traffic handled by the network is underestimated and the transmission cost per Mbps overestimated.

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<sup>34</sup> All other parameters remaining unchanged: e.g. total transmission costs, mix of NGN/legacy circuits, mix of CAT/LLCO speed).

<sup>35</sup> Batelco has been unable to explain why one STM-16 is not counted in the number of E1s.

<sup>36</sup> A number of high speed circuits also appear to be missing.



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- b. Second, Batelco explained that it is currently undergoing a “SDH modernization project” which shows that many circuits used for the calculation of the traffic were connected but not in use. According to Batelco, this leads to an overestimate of the traffic by [X]%. Due to this second inaccuracy, the traffic is overestimated and the transmission cost per Mbps underestimated.

308. Batelco then explained that these two inaccuracies were partly compensating each other and were overall leading to a higher transmission cost per Mbps than the one calculated above. Batelco therefore recommended that “*this area of costing is not reviewed until subsequent reference offer assessments (reflecting the data cleansing exercise to be completed after the SDH migration project is completed)*”. Based on the information provided by Batelco, it is not feasible to form a definitive view on which of the two opposing effects dominates the other.

309. Overall, it does not appear feasible to adjust the legacy transmission cost per Mbps for the inaccuracies identified. It would appear that they can only be properly addressed when the regulatory accounts are prepared. The Authority therefore proposes to use the cost per Mbps calculated above which is a conservative estimate in the absence of more accurate information from Batelco. The Authority also requires Batelco to address the inaccuracies of its operational data for the 2009 regulatory accounts.

310. On the basis of these adjustments, the final CAT/LLCO charges ordered on Batelco for speed up to 2Mbps are summarised in the table below.<sup>37</sup>

**Table 46: Draft order CAT and LLCO NB charges**

speed	#pair / speed	WS Factor	Wholesale Activities Cost	Access Copper pair Cost per one Circuit	MSAN G.SHDSL per circuit	Cost per one circuit (2 CPEs)	Network Cost	Total cost
64Kbps	[X]	[X]	[X]	[X]	[X]	[X]	[X]	50.29
128Kbps	[X]	[X]	[X]	[X]	[X]	[X]	[X]	52.73
256Kbps	[X]	[X]	[X]	[X]	[X]	[X]	[X]	57.60
384Kbps	[X]	[X]	[X]	[X]	[X]	[X]	[X]	62.48
512Kbps	[X]	[X]	[X]	[X]	[X]	[X]	[X]	67.35
768Kbps	[X]	[X]	[X]	[X]	[X]	[X]	[X]	77.11
1024Kbps	[X]	[X]	[X]	[X]	[X]	[X]	[X]	97.93
1536Kbps	[X]	[X]	[X]	[X]	[X]	[X]	[X]	117.32
2048Kbps	[X]	[X]	[X]	[X]	[X]	[X]	[X]	137.11

Source: The Authority

311. Thus, while Batelco’s proposal is between 30% and 52% above 2009 prices, the Authority Final prices are between -13% for 64 Kbps and -20% for 2 Mbps circuits.

<sup>37</sup> The price of circuits below 64Kbps is the equal to the price of 64Kbps circuits.



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**Table 47: CAT and LLCO NB charges comparison**

Speed	2009 Prices	Batelco submission	The Authority's fair and reasonable charges	Batelco / 2009	The Authority / 2009
64Kbps	58.00	88.25	50.29	52%	-13%
128Kbps	61.00	92.21	52.73	51%	-14%
256Kbps	68.00	100.14	57.60	47%	-15%
384Kbps		108.07	62.48		
512Kbps	81.00	115.99	67.35	43%	-17%
768Kbps		131.84	77.11		
1024Kbps	119.00	158.76	97.93	33%	-18%
1536Kbps	145.00	190.24	117.32	31%	-19%
2048Kbps	171.00	222.22	137.11	30%	-20%

Source: The Authority

312. It should also be emphasized that CAT/LLCO 2008 prices have allowed Batelco to recover more than its 2008 costs. Based on the number of circuits per speed for 2008, and based on 2008 prices, Batelco's CAT/LLCO turnover<sup>38</sup> is about [X] above its costs.

**CAT and LLCO services for higher speeds (DS3, STM1, STM4)**

313. On 1 April 2010, Batelco submitted its proposed charges for high speed services. High speed services are offered in three different speeds: DS3 (speed of 34 Mbps), STM-1 (speed of 155 Mbps), and STM-4 (speed of 622 Mbps). Batelco provided a spreadsheet detailing how the proposed charges are calculated. While there are similarities in the calculation of these charges with the calculation of charges for CAT/LLCO services for lower speeds (especially for wholesale costs and transmission costs), there are also significant differences, including:

- a. CAT/LLCO services for higher speeds are based on fibre and not copper on the access side;
- b. CAT/LLCO services for higher speeds use the SDH transmission network and not the NGN transmission network. Batelco stated that high speed circuits do not make use of the NGN network. The Authority requires Batelco to substantiate this point.

314. With respect to CAT and LLCO services for higher speeds, the charges proposed by Batelco are made of 4 elements:

- a. wholesale activity costs;
- b. access fibre costs;
- c. equipment costs; and
- d. transmission costs.

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<sup>38</sup> Multiply the 2008 prices by the 2008 number of circuits.



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**Table 48: Cost stacks for high speed CAT/LLCO**

speed	WS Factor	Wholesale Activities Cost	Access Fibre Cost for 2 ends	Equipment Cost for two ends	Network Cost	Total cost
DS3	[X]	[X]	[X]	[X]	[X]	5,207.67
STM1	[X]	[X]	[X]	[X]	[X]	8,777.50
STM4	[X]	[X]	[X]	[X]	[X]	17,342.95

WS Factor: STM-1 and STM-4 activity are similar hence (1+4)/2

Source: Batelco

315. Having reviewed the information submitted by Batelco related to CAT/LLCO services for higher speeds, the Authority concludes that the charges proposed by Batelco are neither fair nor reasonable. This is explained hereafter where each line item of the cost stack is reviewed.

**Wholesale activity costs**

316. With respect to wholesale activity costs for higher speeds, Batelco has used a top-down approach that differs from the approach used by the Authority for the CAT/LLCO 2009 RO. As explained above in the context of existing CAT/LLCO speeds, the Authority is of the view that a time-based activities costing approach remains the most appropriate approach to calculate the cost of the wholesale department.

317. When asked to explain why the total amount of wholesale activity costs included in Batelco's proposed cost stack for existing speed CAT/LLCO was so different from the amount included in the cost stack for high speed CAT/LLCO,<sup>39</sup> Batelco responded that "[t]hese calculations are based on Number of Staff and Time Management as stated in the approved 2008 APM."<sup>40</sup>

318. As for existing speed CAT/LLCO, the Authority considers that wholesale activity cost should be derived from appropriate time-based estimates. The fair and reasonable wholesale activity cost for high speed CAT/LLCO have been estimated by scaling up the wholesale activity cost estimated by the Authority for existing speeds CAT/LLCO. This is done by multiplying the wholesale activity cost estimated for existing speeds by the ratio of wholesale activity cost per circuit for high speed circuits (as submitted by Batelco) over wholesale activity cost per circuit for existing speed circuits (as submitted by Batelco). The resulting wholesale activity cost is BD [X].

319. Further, the Authority is of the view that Batelco's proposed approach to have different wholesale activity cost by speed is neither fair nor reasonable. It is inconsistent with Batelco's own proposed approach for equivalent cost categories:

- a. For CAT/LLCO services for low speeds, Batelco proposes wholesale activity costs that are the same for all speeds.

<sup>39</sup> For example, wholesale costs for a STM-1 are equal to BD [X] while they are equal to BD [X] for a E1, i.e. [X] times higher.

<sup>40</sup> See Batelco's document Ref. CAT/LLCO GCL/279/10 - #4, on 21 July 2010.



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- b. [X]  
[X]
- c. [X]  
[X]

320. The approach taken to estimate wholesale support activity cost may require adjustments in the future depending notably on the uptake of the service following its introduction.

#### Access fibre costs

321. With respect to the **access fibre costs**, Batelco calculates a monthly cost per circuit by:

- a. dividing the total annual fibre cost;
  - i. by the total access fibre adjusted length (which is [X] km);
  - ii. by 12;
- b. then by multiplying it
  - i. by the average length of a fibre (assumed to be 1 km);
  - ii. by the number of fibre per circuit, which is 2, since CAT/ LLCO always have two ends; and
  - iii. by 2, as Batelco always has a working line and a protection line for redundancy.

322. For the reasons set out below, the Authority considers that this calculation is incorrect and inconsistent with Batelco's responses to the Authority's questions. As a consequence it is neither fair nor reasonable.

- a. Adjusted length: The use of adjusted length to calculate the cost of ducts is incorrect for calculating the cost of fibre per km. While the use of adjusted length is appropriate to calculate the cost per km of duct, its use to calculate the cost per km of fibre cable is incorrect and would lead to over-recovery. Using the example in the diagram below and assuming that a 1 km of duct cost of 100, the fibre cost per km would be 100 (100/1 or 50/0.5) whereas the correct answer is 50 (100/2). In the example below where the duct is shared by 2 cables, Batelco's approach would lead to double recovery of duct cost. Once duct costs have been allocated to different cables, actual cable lengths should be used to determine the fibre cost per km.

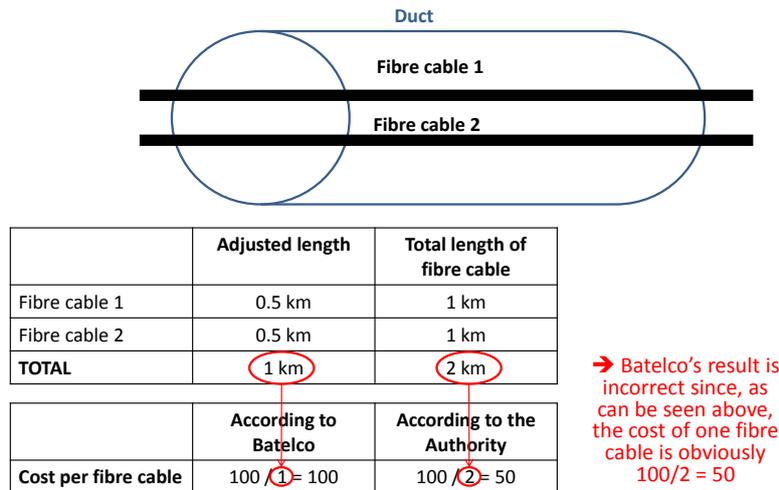


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Figure 5: Example of adjusted length

**Example: one duct of 1 km with 2 fibre cables in it. Total cost allocated to fibre cables is 100 (recovers total cost of the fibre + ducts)**



Source: The Authority

- b. Fibre cable length: The fibre length used by Batelco is its calculation is 1km. This is inconsistent with both the average fibre length ([X]) based on adjusted fibre length and the average fibre length ([X]) based on unadjusted fibre length.<sup>41</sup> Should fibre length be used to calculate the fibre cost of high speed leased lines, then the average based on unadjusted fibre length should be used (i.e. [X]).
- c. Protection line: The incremental cost of a protection line should be negligible as the protection line follows exactly the same path as the “original” one.<sup>42</sup> Indeed, if the protection line uses the same trenches and is included in the same cable, then its incremental cost is effectively zero.<sup>43</sup> On 19 August 2010,<sup>44</sup> Batelco further explained that it “cannot provide absolute assurance this is the case [that protection lines are in the same cable]. If and when the cable has spare fibre then that fibre will be used for the protection line and will be in the same cable. However it may be in a separate cable when no spare fibre is available and we do not have records of the split without carrying out site surveys of all the circuits”. The Authority notes therefore that Batelco has chosen to provide protection lines that follow the same path as fibre lines.<sup>45</sup> The Authority is of the view that in the vast majority of cases, protection lines will be in the same cable because a given fibre cable has several fibres in it and that the number of fibres

<sup>41</sup> Adjusted fibre length is [X], unadjusted fibre length is [X] and the number of fibre in 2008 was [X].

<sup>42</sup> See Batelco's document Ref. CAT/LLCO GCL/279/10 - #4, on 21 July 2010, Batelco's response to question 59: “Is the protection line following the same path as the other fibre line (same trench, same cable)? YES in the Access side and in the core side, it's a ring configuration”.

<sup>43</sup> Batelco confirmed further by email dated 10 August 2010, that “if and when the cable has spare fibre, then that fibre will be used for the protection line and will be in the same cable”.

<sup>44</sup> Ref. CAT/LLCO RO Assessment 6th iteration GCL/332/10.

<sup>45</sup> Batelco could have proposed a protection line that follows a different path and in so doing it would have provided a more effective protection.

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in use is relatively small in the Kingdom of Bahrain ([X]) in 2008 to be compared with a number of fixed lines above 200,000). This means that it is likely that there are a lot of unlit fibres in existing fibre cables.

323. For these reasons, the Authority is of the view that the fair and reasonable monthly cost per km for access fibre is equal to BD [X], i.e. total fibre cost (BD [X]) divided by the total unadjusted fibre length ([X]).

324. As the average length of fibre is [X] km, and as access fibres have two ends, the monthly cost per circuit for access fibre is [X] BD.

#### Equipment costs

325. With respect to equipment costs, Batelco indicates that the following equipment are necessary for each customer:

- a. One DDF;
- b. One ODF;
- c. One CPE (OSN3500); and
- d. One Core Huawei port.

326. Batelco calculates the monthly equipment cost per circuit as follows:

- a. by calculating a monthly cost per equipment component derived:
  - i. by multiplying the annual unit cost for each type of equipment required: DDF, ODF, Core Huawei port and CPE (OSN3500);
  - ii. by the number of equipment components required per circuit, depending of the speed;
  - iii. by 2, because the same equipment components are required at both ends of the delivered circuit;
  - iv. and dividing the total by 12;
- b. then by calculating a monthly cost per circuit derived:
  - i. by multiplying the monthly cost per equipment component;
  - ii. by the number of equipment components required for each circuit, depending of its speed.

327. While this method appears appropriate, the monthly unit cost of each equipment is neither fair nor reasonable and it includes a mathematical error as explained below.

328. As a preliminary comment, it should be noted that based on the information provided to the Authority, the Authority cannot conclude whether the cost of the OSN3500 is not double counted. Batelco has explained that the OSN3500 cost “has been extracted manually from the system from the SDF and then the cost of OSN3500 has been used for both ISI/CSI which is the same cost that was used for BB high speed CAT/LLCO”<sup>46</sup>. Batelco added that it “would like to assure TRA that there is no double counting of OSN 3500 (which in this case is [X])”. Because Batelco has not provided sufficient details

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<sup>46</sup> Source: CAT/LLCO GCL/279/10 - #5



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regarding the extraction of the OSN3500 costs, the Authority is not in a position to verify that the manual extraction done for OSN3500 was done in an appropriate manner. The Authority has no other choice but to rely on Batelco's statements. The Authority notes that Batelco "will consider documenting these adjustments in future RO submissions to avoid any possible confusion". The Authority specifically requires Batelco to do so in its next RO submission.

329. Additional details on the calculation of the unit costs of DDF, ODE, Core Huawei port per OLO and OSN 3500 were provided by Batelco in the file "20100401 Annex K CSI ISI 2008 Fully Functioning.xls" transmitted to the Authority on 1 April 2010. The following formula has been used to derive the annual cost of each equipment:

$$AC = (CAPEX/AL) \times (1+S\&M+UC) + CAPEX \times WACC, \text{ with}$$

AC = the Annual unit cost of each equipment component;  
CAPEX = the Capital Expenditure of the equipment (provided by Batelco);  
AL = the Asset Life;  
S&M = the Support and Maintenance rate equal to 75% of total costs (calculated by Batelco on the basis of S&M costs in the access network);  
UC = the Un-attributable Costs rate equal to 7% of total costs (calculated by Batelco on the basis of S&M cost in the access network);  
WACC = the Weighted Average Cost Of Capital equal to 12.2%.

330. Firstly, this formula includes mathematical errors: the S&M and UC rates are not correctly applied. The S&M rate and the UC rate applied by Batelco (~~75%~~) correspond to the ratios of S&M and UC costs to the total costs of the access network. These S&M and UC rates should therefore be applied here to the total cost and not to the depreciation (CAPEX/AL). Batelco's use of these rates is therefore incorrect.

331. Secondly, the assumptions used by Batelco for S&M and UC are neither fair nor reasonable:

- a. With respect to support and maintenance costs, the S&M rate used by Batelco has been calculated based on the ratio of S&M costs for the access copper network. The application of this rate to high speed leased lines is neither fair nor reasonable as it results in over-estimated S&M costs. In the access copper network, depreciation charges tend to be low because the network is old and depreciated to a significant extent while operating costs tend to be high, notably because the network is old. The S&M rate is therefore expected to be high for the access copper network while it should be low for assets such as new CPE. It is also important to note that the equipment used for high speed CAT/LLCO are active equipment while the copper access network is mainly made of passive components which means that using the S&M rate of the access copper network is not an appropriate proxy. Also the equipment are installed indoors and are therefore not affected by the weather conditions which can generate operating costs for the copper access network (which is mainly located outdoors). Based on benchmarks, the Authority has decided to use a rate of 9% for S&M. It is in line with the rate used by other regulators for active equipment components located in



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exchanges.<sup>47</sup> This rate is more relevant to equipment costs as it reflects the operating costs for new active assets installed indoors. It is applied to investment cost (i.e. initial CAPEX).

- b. With respect to un-attributable costs, the correct rate was provided by Batelco in relation to LLU. The rate is [X] of total costs excluding the return on capital or [X] when calculated as a percentage of depreciation costs and S&M.<sup>48</sup>

332. Based on this value, the Authority has calculated the fair and reasonable equipment costs ((DDF, ODF, OSN3500 and core Huawei port) using the formula below:

$$AC = (CAPEX/AL + CAPEX \times 9\%) \times (1 + [X]\%) + CAPEX \times WACC$$

#### Transmission costs

333. With respect to transmission costs (also referred to as network costs), Batelco has used the same costs as for CAT/LLCO of existing speeds for SDH transmission: CAT/LLCO for higher speeds only use the SDH legacy transmission network (They do not use the NGN network as well as the BDDN and ASCOM legacy transmission networks).

334. Despite the issues highlighted above regarding transmission cost per Mbps, the Authority is of the opinion that using the same transmission costs for existing speeds and higher speeds is reasonable. Accordingly, the Authority has used the fair and reasonable average monthly SDH transmission cost per E1 circuit of BD [X].<sup>49</sup>

335. The fair and reasonable charges for CAT/LLCO high speed circuits are summarised in the below table.

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<sup>47</sup> In France, see the model built by ARCEP for LLU prices where OPEX = 10%\* of DSLAM investment.  
<http://www.arcep.fr/fileadmin/reprise/dossiers/degrouper/model-cout-accedeg-2807.xls>

In Sweden, see PTS decision where OPEX = 8.2% of GRC. 8.2% is used for RSS/RSM and LE which are active equipment components.  
<http://www.pts.se/upload/Documents/SE/Draft%20Reconciliation%20Report%2005-09-03.pdf>

<sup>48</sup> Un-attributable costs ratio = [X] = Un-attributable Costs / (Un-attributable Costs + Depreciation Costs + OPEX). This is equivalent an un-attributable costs ratio of [X] applied to depreciation cost and OPEX only: [X]% = Un-attributable costs / (Depreciation Costs + CAPEX).

This ratio is the same for all activities and was provided by Batelco in the document "unattributable\_cost\_including\_total\_cost.xls". The Authority has checked that this ratio is the same for the access copper network element.

<sup>49</sup> Batelco calculates a cost per E1 of BD [X] using 2008 number of circuits and 2008 SDH legacy transmission costs. When the 2009 number of circuits is used (see paragraphs 305 and 306 for the justification of the use of 2009 figures), the cost per E1 is BD [X].



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**Table 49: Final CAT and LLCO BB charges**

Speeds	WS Factor	Wholesale Activities Cost	Access Fibre Cost for 2 ends <sup>50</sup>	Equipment Cost for two ends	Network Cost	Total cost
DS3	[X]	[X]	[X]	[X]	[X]	4,388.90 <sup>51</sup>
STM1	[X]	[X]	[X]	[X]	[X]	5,606.28
STM4	[X]	[X]	[X]	[X]	[X]	11,101.00

Source: The Authority

336. Thus, compared to Batelco’s submission, the Authority’s final prices are comprised between -16% for DS3 and -36% for STM1 and STM4 circuits.

**Table 50: CAT and LLCO BB charges comparison**

Speeds	Batelco submission	The Authority’s fair and reasonable charges	TRA/Batelco
DS3	5,207.67	4,388.90 <sup>52</sup>	-16%
STM1	8,777.50	5,606.28	-36%
STM4	17,342.95	11,101.00	-36%

Source: The Authority

**Summary of Batelco’s response**

**LOW SPEED CAT/LLCO (services for speeds of up to and including 2 Mbps)**

**Wholesale activity costs**

337. In its response, Batelco disagrees with the Authority’s bottom-up approach to calculate wholesale activity costs and asks for further justifications.

338. In particular, Batelco states that by applying this approach the Authority excludes some wholesale costs incurred by Batelco. According to Batelco, WS02 (Commercial Operation- Access) and WS05 (Fixed Billing - IAA Access) costs are entirely excluded and the majority of WS01 costs (Wholesale & Carrier Relations - Access Product Management) are also excluded.<sup>53</sup>

<sup>50</sup> Based on an average length of fibre of 1.7 km.

<sup>51</sup> Mistakenly inserted as 4,686.32 by the Authority when the draft order was released.

<sup>52</sup> Mistakenly inserted as 4,686.32 by the Authority when the draft order was released.

<sup>53</sup> There are 7 wholesale cost categories in Batelco’s top-down system: OR06 Order Management and delivery & assurance- Order Manage, OR07 Order Management and delivery & assurance- Call Management, WS01 Wholesale & Carrier Relations - Access Product Management, WS02 Commercial Operation- Access, WS03 Finance Support Services - Reg & WS Support Access, WS04 Legal & Regulatory Affairs - Access Support, WS05 Fixed Billing - IAA Access



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**Copper costs**

339. Batelco does not comment on the figure of BD 6.09/line/month used by the Authority to derive copper costs for CAT/LLCO.

**MSAN costs**

340. Batelco argues that the Authority's calculation of MSAN G.SHDSL costs is erroneous. According to Batelco, the Authority has derived a MSAN G.SHDSL cost per line and per month by dividing the total MSAN G.SHDSL cost by the total number of circuits (legacy and NGN), while MSAN G.SHDSL equipment are only used for NGN circuits.

341. For Batelco, MSAN G.SHDSL costs should only be divided by the number of NGN circuits, because they are specific to NGN.

**Transmission**

342. With respect to transmission costs, the Authority has identified significant issues regarding operational data that greatly impact transmission costs. In its response, Batelco refers to its previous explanation that leads Batelco to recommend that *"this area of costing is not reviewed until subsequent reference offer assessments (reflecting the data cleansing exercise to be completed after the SDH migration project is completed)"* (20100819 - RO price terms article 53 request CAT LLCO - 6th iteration.docx).

343. Batelco indicates that it anticipates its SDH migration project to be completed by [X].

344. In support to the clarifications meeting held in the Authority's premises on 1 December 2010 and 12 December 2010, Batelco provided additional information on the SDH migration project.<sup>54</sup> At the beginning of December 2010, [X] SDH streams were either migrated or cleansed out of total [X]. Cleansed streams account for about one third of the [X] SDH streams. [X] streams are still to be migrated. If following the same proportion as the first group of migrated streams, a proportion of [X] should also be cleansed. The remaining [X] streams will not be migrated as they are mainly used for signalling and will be ceased at the end of migration.

345. As per a rough calculation conducted by Batelco in early December 2010 with the draft FAC 2009 model, the 2009 cost per E1 increasing due the combination of a slight reduction of the overall SDH cost compared to 2008 but which is more than compensated by a greater decrease in the number of circuits.<sup>55</sup> However the cleansing exercise has not yet been completed by Batelco's network team. Hence Batelco considers that any cost projection should be handled with caution at this point in time.

**Profitability**

346. The Authority has established in the draft RO Order at paragraph 312 that 2008 CAT/LLCO prices have allowed Batelco to recover more than its 2008 costs (by comparing

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<sup>54</sup> SDH Mig status 29112010.pptx

<sup>55</sup> 20101201 RO price submission Clarification meeting Batelco comments - Final.docx.



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revenues generated by 2008 prices with 2008 costs). Batelco asserts at paragraph 117 of its submission that this analysis is “*unusual*”, because it has only been applied to CAT/LLCO, and that “*a more holistic view may be appropriate*”.

347. For Batelco, the test would be “*artificial*” and the Authority’s assessment would overestimate revenues: the number of circuits measured at the end of the year (the number used by the Authority) would be higher than the average number of circuits during the year. Batelco adds, without any justification, that some cost elements may have been disregarded by the Authority before the assessment.

#### **HIGH SPEED CAT/LLCO (services for higher speeds (DS3, STM1, STM4))**

348. At paragraphs 118 to 132 of its submission, Batelco considers that high speed CAT/LLCO should not be included in its RO for the following reasons:

- a. Batelco argues that a generic cost stack is unlikely to reflect cost and hence to be fair and reasonable in so far the demand for high speed CAT/LLCO requires customised solutions (e.g. the equipment in place at both ends may be different by circuit and the services provided may be different).
- b. Inclusion of high speed CAT/LLCO in its RO is not necessary as Batelco has committed to continue to offer “price on application” for high speed CAT/LLCO.
- c. Batelco asserts that there is no persuasive reason why price on application is inadequate. Although it is less transparent upfront, it allows better price accuracy when the configuration is customised.
- d. If the Authority insists on having specific prices for CAT/LLCO delivered over SDH, then Batelco recommend that those prices are “price ceilings”.
- e. Batelco asserts that the market is competitive or prospectively competitive and requests the Authority to conduct a market review.
- f. On 11 December 2010, Batelco also submitted a confidential proposal in relation to the development of a wholesale service based on MPLS<sup>56</sup> which Batelco considers to be more flexible.
- g. Batelco also mentioned problems with SDH transmission costing which also affect CAT/LLCO. It recommends not adjusting SDH costs until the problems are addressed.

349. For these reasons, Batelco is in favour of a “price on application” configuration for CAT/LLCO on the SDH network rather than including a standard price in the RO.

350. In the subsequent clarification meeting held on 12 December 2010, Batelco has however agreed on the principle of a price ceiling mechanism. This agreement was later confirmed in an email from James Ibbetson to Alexandre Serot dated 21 December 2010.

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<sup>56</sup> 20101211 Wholesale MPLS discussion proposal.docx



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**The Authority's analysis and conclusion**

**LOW SPEED CAT/LLCO (services for speeds of up to and including 2 Mbps)**

***Wholesale activity costs***

351. With respect to wholesale activity costs, the Authority refer Batelco to paragraph 295 of the draft Order, where the Authority explained in detail, in accordance with previous RO reviews, why a bottom-up approach has been chosen.
352. The Authority is of the view that it has not excluded any wholesale cost. The bottom-up approach consists of multiplying the number of hours to complete the work by charge out rates that have been provided by Batelco in an Annex to its RO submission.<sup>57</sup> The Authority understands these rates to be fully loaded, which means that they include all fixed and variable costs necessary to complete the relevant activities. Accordingly it is inaccurate to assert that some costs have been entirely or partly excluded by the Authority.
353. As a consequence, wholesale activity costs estimated in the draft Order remain unchanged in the final Order.

***MSAN G.SHDSL costs***

354. With respect to MSAN G.SHDSL costs, the Authority is of the view that Batelco's approach to derive charges of MSAN G. SHDSL is incorrect.
355. As the Authority explained at paragraph 292 of the draft RO Order, CAT/LLCO "*charges are calculated for a mix of legacy and NGN technologies*". CAT/LLCO are indeed provided either on the basis of the legacy network or on the basis of the NGN network. Mixing costs of legacy and NGN technologies to derive one single blended set of charges for CAT/LLCO instead of two sets is a reasonable approach and is consistent with the principle of technology neutrality. This general approach has not been questioned by Batelco.
356. In this context, the Authority is of the view that Batelco's approach leads to an over-recovery of MSAN G.SHDSL costs. This can be demonstrated by a simple example which assumes that total MSAN G.SHDSL costs are equal to 100, the number of legacy circuits is 8 and the number of NGN circuits is 2.
- a. The Authority's approach consists of calculating successively the cost of a legacy circuit and the cost of a NGN circuit and then of calculating the weighted average cost of these two types of circuits. Average MSAN G.SHDSL cost for a legacy circuit is equal to 0 (0/8), average MSAN G.SHDSL cost for a NGN circuit is equal to 50 (100/2), and average blended MSAN G.SHDSL cost per circuit ( whatever

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<sup>57</sup> Submission of 1 April 2010 (file 20100401\_UMP\_SNFM\_Service\_Description\_Charges).



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the technology used) is equal to 10 ( $0*8/10+50*2/10$ ). Total MSAN revenues for all circuits are then 100 ( $10*10$ ) which is equal to total MSAN G.SHDSL costs.<sup>58</sup>

- b. Batelco's approach consists of calculating the average MSAN G.SHDSL cost for a NGN circuit by dividing total MSAN G.SHDSL costs by the number of NGN circuits and in using this figure for all circuits. The average MSAN G.SHDSL cost for a NGN circuit is 50 ( $100/2$ ). Accordingly using Batelco's approach, this is also the average MSAN G.SHDSL cost whatever the technology used. As a consequence, with such an approach, total MSAN G.SHDSL revenues for all circuits are then equal to 500 ( $10*50$ ) which is 5 times higher than the total MSAN G.SHDSL cost (100). Costs are therefore over-recovered with Batelco's approach.

357. The Authority therefore remains of the view that Batelco's approach is erroneous, as it leads to an over-recovery of MSAN G.SHDSL costs. The charges stated in the Draft Order related to MSAN G.SHDSL costs therefore remain unchanged.

#### **Profitability**

358. With respect to the profitability test, the Authority would like first to highlight that it has not been used to calculate the charges. The primary purpose of the profitability test was to highlight the impact of the fluctuating number of CAT/LLCO and the importance to have reliable and consistent data on the number of circuits, which Batelco has not been able to provide. The profitability test also supports the bottom-up approach used by the Authority to derive wholesale costs.

359. Further, unlike Batelco's assertion, the Authority's calculation does not overestimate 2008 revenues (2008 prices multiplied by 2008 end of period number of circuits): the number of circuits at the end of 2008 is lower than the number at the end of 2007 (~~10~~). As a consequence, the average number of circuits in 2008 should be higher than at the end of 2008 (somewhere between ~~10~~).<sup>59</sup>

360. The Authority considers that its analysis takes into account all relevant cost elements.<sup>60</sup>

361. For the above reasons, the Authority disagrees with Batelco's comments on the profitability test.

#### **SDH transmission costs**

362. The Authority has identified a serious problem in relation to the costing of SDH transmission which appear to result from issues with operational data (cf. paragraph 307 to 309) which Batelco has yet to address (see paragraph 342 to paragraph 345). Batelco does not have a clear understanding of the total number of SDH streams and therefore of SDH cost per E1.

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<sup>58</sup> This calculation can also be done directly by dividing the total MSAN G.SHDSL cost (100) by the total number of circuits whatever the technology (10), which gives an average MSAN G.SHDSL cost per circuit of 10.

<sup>59</sup> Considering the same split of the number of circuits per speed for 2007 and 2008.

<sup>60</sup> 2008 costs for CATs/LLCOs for speeds of up to and including 2 Mbps have been given by Batelco and is BD 273 905. Batelco's 2008 turnover has been calculated by multiplying the 2008 prices by the 2008 number of circuits per speed and is BD 327738. So Batelco's turnover is about 20% above its costs.



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363. In light of the uncertainty of SDH cost caused by Batelco's issues with operational data (decrease followed by increase) and in order to prevent wide fluctuations to CAT/LLCO charges, the Authority has decided to freeze low speed CAT/LLCO charges to their current level for the time being.
364. As high-speed CAT/LLCO are new services which are introduced for the first time in the RO, the Authority has decided to use the same network costs as originally submitted by Batelco on 1 April 2010 and therefore has not applied any of the aforementioned adjustments.

#### **HIGH SPEED CAT/LLCO (services for higher speeds (DS3, STM1, STM4))**

365. The Authority notes Batelco's arguments and agrees that high speed CAT/LLCOs services are more likely to be subject to customisation and therefore to differences in cost than the lower speed services. However the Authority is of the view that price on application is not acceptable as it does not give enough visibility to the market. In light of these considerations, the Authority orders the introduction of a price ceiling mechanism for High Speed CAT/LLCO services charges.
366. In line with the Telecommunications Law, the removal of the regulation of CAT/LLCO and any other regulatory remedies imposed on the basis of a finding of SMP or dominance, can only take place once the relevant market has been reviewed and no SMP or dominance has been found. Pending such a review, regulatory obligations, including the regulation of CAT/LLCO, stand.
367. To ensure no price discrimination and cost orientation, the Authority orders Batelco to report new high speed CAT/LLCO contracts on a quarterly basis. The reporting requirement starts from the effective date of application of this reference offer. The first quarterly report shall also include all the existing contracts. Reports shall be submitted no later than 5 working days from the end of the relevant calendar quarter (January to March, April to June, July to September and October to December). The Authority validates Batelco's draft reporting template submitted by Batelco on 12 December 2010<sup>61</sup> which the Authority may amend as required.

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<sup>61</sup> Cf. 20101212 RO response annex A + B.xlsx.



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**The Authority's ordered charges for CAT/LLCO services**

368. For all the above reasons, the Authority orders the following charges for CAT/ LLCO services:

**Table 51: Ordered charges for CAT/LLCO services**

Chargeable activity	Approved in 2009	Batelco proposed charge in 2010	TRA fair and reasonable charge in 2010	Evolution as compared to 2009
<b>CAT/LLCO ( 2-5, 2-6 )</b>				
<b>CAT/LLCO Narrowband</b>	<b>in BD</b>			
64Kbps	58.00	88.25	<b>58.00</b>	0%
128Kbps	61.00	92.21	<b>61.00</b>	0%
256Kbps	68.00	100.14	<b>68.00</b>	0%
384Kbps		108.07		
512Kbps	81.00	115.99	<b>81.00</b>	0%
768Kbps		131.84		
1024Kbps	119.00	158.76	<b>119.00</b>	0%
1536Kbps	145.00	190.24	<b>145.00</b>	0%
2048Kbps	171.00	222.22	<b>171.00</b>	0%
<b>CAT/LLCO Broadband</b>	<b>maximum price in BD * (price ceiling)</b>			
DS3		5,207.67	<b>4,686.31 *</b>	
STM1		8,777.50	<b>6,630.69 *</b>	
STM4		17,342.95	<b>15,211.84 *</b>	

Source: The Authority



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## 11 IPLC services

**Draft Order Text**

### **Service definition**

369. According to Batelco's RO, "[t]he International Private Leased Circuit ("IPLC") Service is a wholesale dedicated international private leased circuit service for carrying Access Seeker's traffic between an Access Seeker's Point of Presence in Bahrain and a location outside Bahrain. The IPLC Service is provided by Access Provider from the Point of Handover at a location in Bahrain up to the effective mid-point of the international segment of the circuit."<sup>62</sup>

### **Information provided by Batelco**

370. On 1 April 2010 Batelco submitted to the Authority its RO submission. The submission included one Excel file called "20100401 Annex F IPLC costs.xlsx" detailing the derivation of low speed IPLC services charges.
371. On 18 April 2010, the Authority sent an email requesting Batelco to confirm that it had submitted rates for high speed IPLC as part of the 2010 RO submission.
372. On 9 May 2010, Batelco indicated by email that it had not proposed high speed IPLC charges.
373. On 17 May 2010, the Authority requested Batelco to provide further information regarding its RO under article 53 (MCD/05/10/054). The information requested included a section on IPLC services. The deadline for Batelco to submit the information on IPLC was 14 June 2010. It was subsequently extended to 21 June 2010 for Low speed IPLC and to 28 June 2010 for high speed IPLC.
374. Following review by the Authority of the information submitted, the Authority wrote to Batelco (MCD/06/10/070) to request clarifications on a number of outstanding points no later than 4 July 2010.
375. On 28 June 2010, Batelco submitted proposed charges for high speed IPLCs (20100628 IPLC cost on FOG and SFO.xls).
376. On 4 July 2010, Batelco submitted its responses to the issues raised by the Authority on 28 June 2010. It submitted two attachments:
- a. 20100704 BTC RO interconnection further response annex working Q86 Q97.xlsx
  - b. 20100704 RO responses phase three - interconnection and IPLC products - further Batelco comments.docx.
377. On 11 July 2010, Batelco submitted a revised file called "20100711 High speed IPLC further responses".

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<sup>62</sup> Batelco, SERVICE DESCRIPTION 2-10: INTERNATIONAL PRIVATE LEASED CIRCUIT SERVICE (IPLC)



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**Proposed charges**

378. The 2010 proposed charges for the IPLC with prior year comparator are summarized in the following table.

**Table 52: IPLC submission charges proposed by Batelco (Monthly recurring charges in BHD for half-circuit, Open Service Period or 1 Year Fixed Service Period)**

Speed	Approved in 2009 (Current monthly charges)			Proposed by Batelco in 2010			Evolution		
	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3
64Kbps				192	223	231			
128Kbps (2x64Kbps)				226	289	305			
256Kbps (4x64Kbps)	380	606	913	294	422	452	-23%	-30%	-50%
512Kbps (8x64Kbps)	576	940	1,331	432	686	747	-25%	-27%	-44%
768Kbps (12x64Kbps)				569	951	1,042			
1Mbps (16x64Kbps)	961	1,510	2,050	706	1,215	1,337	-27%	-20%	-35%
1,5Mbps (24x64Kbps)				981	1,744	1,927			
2Mbps (32x64Kbps)	1,441	2,565	3,383	1,262	2,280	2,524	-12%	-11%	-25%
DS3				7,287			N/A		
STM-1				15,532			N/A		
STM-4				31,396			N/A		

Source: The Authority from Batelco's submissions

379. In comparison to current charges, the proposed charges in 2010 are on average 10% to 50% lower. Lower speed circuit charges decrease more than higher speed (-38% for 128 Kbps compared to -18% for 2 Mbps). It is also interesting to note that the proposed IPLC charges to Zone 3 (mostly Europe, the US and Asia) decrease more than IPLC to Zone 1 (GCC countries) and Zone 2 (mostly Africa) (-34% respectively against -20% and -18%).

380. At the Authority's request, Batelco has included in this year submission higher speed IPLC (DS3, STM-1 and STM-4). Batelco has proposed charges to the following destinations: Kuwait, Qatar and the UAE via the FOG cable and Saudi via the SFO cable. The Authority understands that the high speed IPLC offer is limited to the above destinations as all other destinations rely on third party suppliers and cable routes for which Batelco will only act as an intermediary and has no control over any quotes or prices. Charges for higher speed IPLC to other destinations remain available on request.

**The Authority's analysis of Batelco's methodology for calculating IPLC charge**

381. IPLC costs are made of two main components: a domestic component akin to a local leased line and an international component for international transmission. Whilst the Authority has identified a number of issues with the costing methodology proposed by Batelco and the cost stacks (e.g. wholesale cost, domestic component of IPLC) supplied, the Authority has accepted on this occasion the proposed charges with minor adjustments. The Authority intends to carry out a more thorough review of IPLC cost in the next RO review.



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#### **General comments on Batelco’s methodology to calculate charges**

382. There are a number of elements of the methodology used to calculate IPLC charges that are not clear. They include:

- a. the difference between circuits and virtual circuits;
- b. the equivalence of IPLC bandwidth in “E1 Bandwidth equivalent”; and
- c. the methodology to split cost between narrowband and broadband circuits.

383. The Authority reserves the right to further investigate IPLC costing methodology in future submissions.

#### **Discrepancies in operational data**

384. Following the article 53 information request of 17 May 2010, Batelco provided the number of retail IPLC, wholesale IPLC and the consolidated total for the years 2007, 2008 and 2009. In the context of the Periodic Telecommunications Markets Data Request issued twice a year, Batelco has also submitted similar information. However, as highlighted in the following table which compiles IPLC volumes for 2008, there are discrepancies in the number of IPLC between these two submissions.

**Table 53: Discrepancies in the number of IPLC**

IPLC speed	Total IPLC at the end of 2008 (Retail and WS) based on Batelco’s response dated 21 June 2010 to Art 53 request dated 17 May 2010		Total IPLC at the end of 2008 (Retail and WS) based on market data information submission	Gap
9.6K	[X]			
50k	[X]			
64K	[X]			
128K	[X]	[X]	[X]	[X]
256K	[X]			
512K	[X]			
768K	[X]			
1M		[X]	[X]	[X]
2M		[X]	[X]	[X]
4M		[X]	[X]	[X]
45M - DS3		[X]	[X]	[X]
155M – STM-1		[X]	[X]	[X]
622M – STM-4		[X]	[X]	[X]
STM-16		[X]	[X]	[X]
<b>Total</b>		[X]	[X]	[X]

Source: The Authority from Batelco’s submissions

385. For the purpose of reviewing IPLC charges, the Authority has made the assumption that the number of IPLCs provided in Batelco’s response to the article 53 information request of 17 May 2010 is correct.



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#### **Access copper Cost for circuit speed above 1 Mbps (low speed IPLC)**

386. The Authority has identified an error in the calculation of access copper cost for IPLC of speed above 1Mbps. In the submitted spread sheet “20100401 Annex F IPLC costs” and in the tab “WS IPLC Summary Cost”, the access copper cost for IPLC circuit speed of 1 Mbps and 1.5Mbps should be equal to [X] and not [X] as two copper pairs are necessary to provide a circuit of speed above 1 Mbps.

#### **Risk mark-up (low speed IPLC)**

387. Batelco has provided no rationale for the inclusion of a [X] risk mark-up (as opposed to [X] last year). As previously indicated by the Authority given the volume of wholesale circuits at present (around [X]), the Authority does not consider that this represents a significant risk justifying the proposed risk factor. The Authority has therefore excluded the [X] risk factor from the calculation.

#### **FOG Upgrade internal S&M and other allocations (high speed IPLC)**

388. There is an error in the calculation of S&M cost. Batelco considers that the cost of “Internal Service and Maintenance of FOG Upgrade” is [X] of annual depreciation cost. Internal S&M should therefore be equal to BD [X] and not BD [X] which represents [X] of annual depreciation cost.

#### **The Authority’s decision on fair and reasonable IPLC charges**

389. Taking into consideration all the above paragraphs, the Authority has recalculated the IPLC services charges which are presented in the following table. In the next RO review, the Authority intends to carry a more thorough review of IPLC costs with a view to establish a robust cost base.

**Table 54: The Authority’s decision on IPLC charges for 2010**

Speed	Approved in 2009			Proposed by Batelco in 2010			The Authority’s Fair and reasonable charges for 2010		
	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3
64Kbps				192	223	231	168	196	203
128Kbps (2x64Kbps)				226	289	305	198	254	267
256Kbps (4x64Kbps)	380	606	913	294	422	452	258	370	397
512Kbps (8x64Kbps)	576	940	1,331	432	686	747	379	602	655
768Kbps (12x64Kbps)				569	951	1,042	499	834	914
1Mbps (16x64Kbps)	961	1,510	2,050	706	1,215	1,337	626	1,072	1,179
1,5Mbps (24x64Kbps)				981	1,744	1,927	866	1,536	1,696
2Mbps (32x64Kbps)	1,441	2,565	3,383	1,262	2,280	2,524	1,107	2,000	2,214
DS3				7,287			7,186		
STM-1				15,532			15,296		
STM-4				31,396			30,565		

Source: The Authority from Batelco’s submissions



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**Summary of Batelco's response**

390. Batelco argues that the finding that Batelco is dominant in the wholesale market for access to international facilities made in 2006 should be revisited. It contends that this market should be split into two separate markets (one for the supply of international transmission capacity into Bahrain and one for the supply of international outbound call termination services from Bahrain to specific geographic areas) and that Batelco is not dominant, and has no SMP in each of these markets.
391. Thus Batelco submits that it is “unreasonable and in breach of section 3(a) of the Telecommunications Law” that IPLC continue to be regulated. It therefore “proposes, if the Authority wishes to proceed with the publication of high-speed IPLC prices for Zone 1 destinations for the first time, that those prices shall be deemed to be price ceilings to discourage excessive pricing.” (Batelco’s submission, paragraph 1366)
392. In a subsequent clarification meeting held on 12 December 2011, Batelco agreed with the principle of price ceilings for high-speed IPLC services to Zone 1 destinations provided that it applies to international cable and landing partner chosen by Batelco for each GCC destination. Batelco also proposed to report new contracts and orders from OLOs on a quarterly basis. Reporting would commence from the end of the first complete quarter following the effective date for the reference offer and would be submitted not later than 5 working days from the end of each quarter. Reporting would end on the earliest of:
- a. if the Authority concludes that Batelco is not dominant in the relevant wholesale market after conducting a market review;
  - b. the Authority informs Batelco that on-going reporting is no longer required;
  - c. similar reporting requirements requested by the Authority in another context; or
  - d. any other change in the Telecommunications Law, regulations or Batelco’s licences which render these reporting requirements obsolete in whole or in part.
393. Batelco provided on 12 December 2010 a draft reporting template and the list of international cable and landing partner for which Batelco can guarantee a price ceiling.<sup>63</sup>
394. In its submission, Batelco acknowledges its error in the calculation of the cost for FOG Upgrade internal S&M. Batelco expects that the explanation as to how it occurred likely flows from that assessment.

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<sup>63</sup> 20101212 RO response annex A + B.xlsx.



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**The Authority's analysis and conclusion**

**The Authority's ordered charges for IPLC link services**

395. IPLC charges are currently regulated by virtue of the finding of dominance of Batelco in the wholesale market for access to international facilities made in 2006.<sup>64</sup> In line with the Telecommunications Law, the removal of the regulation of IPLC and any other regulatory remedies imposed on the basis of a finding of SMP or dominance, can only take place once the relevant market has been reviewed and no SMP or dominance has been found. Pending such a review, regulatory obligations, including the regulation of IPLC, stand.

396. The Authority notes the demand by Batelco to conduct a market review of the wholesale market for access to international facilities, including a separate "application for a determination that Batelco is not dominant in the wholesale market for access to international facilities" made by Batelco on 14 December 2010. The Authority intends to communicate to Batelco its intention regarding this request for a market review in the first half of 2011.

397. Batelco does not seem to raise any concerns on the Authority's fair and reasonable low speed IPLC charges and therefore maintains the draft order decision.

398. In regards to high-speed IPLC for Zone 1 destinations, the Authority sets the draft order charges as price ceilings. For each Zone 1 country, the price ceiling is guaranteed only for the specified International cable and associated landing partner. Charges may differ from the price ceilings if another international cable and landing partner are requested by the ordering party.

399. To ensure no price discrimination and cost orientation, the Authority orders Batelco to report new orders/new contracts on a quarterly basis. The reporting requirements for high speed CAT/LLCO presented in paragraph 367 also apply for high speed IPLC services. The first quarterly report should therefore include all existing circuits.

**Table 55: Ordered charges for IPLC link services**

Chargeable activity	Approved in 2009	Batelco proposed charge in 2010	TRA fair and reasonable charge in 2010	Evolution as compared to 2009
<b>IPLC ( 2-10 )</b>				
<b>IPLC - Zone 1 – Low speed IPLC</b>	<b>in BD</b>			
64Kbps		192	<b>168</b>	
128Kbps (2x64Kbps)		226	<b>198</b>	
256Kbps (4x64Kbps)	380	294	<b>258</b>	-32%
512Kbps (8x64Kbps)	576	432	<b>379</b>	-34%
768Kbps (12x64Kbps)		569	<b>499</b>	
1Mbps (16x64Kbps)	961	706	<b>626</b>	-35%
1,5Mbps (24x64Kbps)		981	<b>866</b>	
2Mbps (32x64Kbps)	1,441	1,262	<b>1,107</b>	-23%

<sup>64</sup> The Authority, Dominance in Wholesale Markets by Batelco, 22 January 2010.



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Chargeable activity	Approved in 2009	Batelco proposed charge in 2010	TRA fair and reasonable charge in 2010	Evolution as compared to 2009																		
<b>IPLC - Zone 1 – High speed IPLC</b>		<b>maximum price in BD * (price ceiling)</b>																				
DS3		7,287	<b>7,186 *</b>																			
STM-1		15,532	<b>15,296 *</b>																			
STM-4		31,396	<b>30,565 *</b>																			
* The price ceiling applies when the IPLC uses the following international cable and landing partner:																						
<table border="1"> <thead> <tr> <th>Destination</th> <th>International Cable</th> <th>Landing Partner</th> </tr> </thead> <tbody> <tr> <td>UAE</td> <td>FOG</td> <td>Etisalat</td> </tr> <tr> <td>Kuwait</td> <td>FOG</td> <td>Ministry of Communications (MOC)</td> </tr> <tr> <td>Oman</td> <td>FALCON</td> <td>OmanTel</td> </tr> <tr> <td>Qatar</td> <td>FOG</td> <td>Qtel</td> </tr> <tr> <td>Saudi Arabia</td> <td>SFO</td> <td>STC Saudi</td> </tr> </tbody> </table>					Destination	International Cable	Landing Partner	UAE	FOG	Etisalat	Kuwait	FOG	Ministry of Communications (MOC)	Oman	FALCON	OmanTel	Qatar	FOG	Qtel	Saudi Arabia	SFO	STC Saudi
Destination	International Cable	Landing Partner																				
UAE	FOG	Etisalat																				
Kuwait	FOG	Ministry of Communications (MOC)																				
Oman	FALCON	OmanTel																				
Qatar	FOG	Qtel																				
Saudi Arabia	SFO	STC Saudi																				
Prices may differ from the above prices ceilings if another international cable and landing partner are requested by the ordering party.																						
<b>IPLC - Zone 2</b>		<b>in BD</b>																				
64Kbps		223	<b>196</b>																			
128Kbps (2x64Kbps)		289	<b>254</b>																			
256Kbps (4x64Kbps)	606	422	<b>370</b>	-39%																		
512Kbps (8x64Kbps)	940	686	<b>602</b>	-36%																		
768Kbps (12x64Kbps)		951	<b>834</b>																			
1Mbps (16x64Kbps)	1,510	1,215	<b>1,072</b>	-29%																		
1,5Mbps (24x64Kbps)		1,744	<b>1,536</b>																			
2Mbps (32x64Kbps)	2,565	2,280	<b>2,000</b>	-22%																		
<b>IPLC - Zone 3</b>		<b>in BD</b>																				
64Kbps		231	<b>203</b>																			
128Kbps (2x64Kbps)		305	<b>267</b>																			
256Kbps (4x64Kbps)	913	452	<b>397</b>	-57%																		
512Kbps (8x64Kbps)	1,331	747	<b>655</b>	-51%																		
768Kbps (12x64Kbps)		1,042	<b>914</b>																			
1Mbps (16x64Kbps)	2,050	1,337	<b>1,179</b>	-42%																		
1,5Mbps (24x64Kbps)		1,927	<b>1,696</b>																			
2Mbps (32x64Kbps)	3,383	2,524	<b>2,214</b>	-35%																		

Source: The Authority



## 12 Bitstream and Wholesale DSL services

Draft Order Text

### 12.1 Bitstream

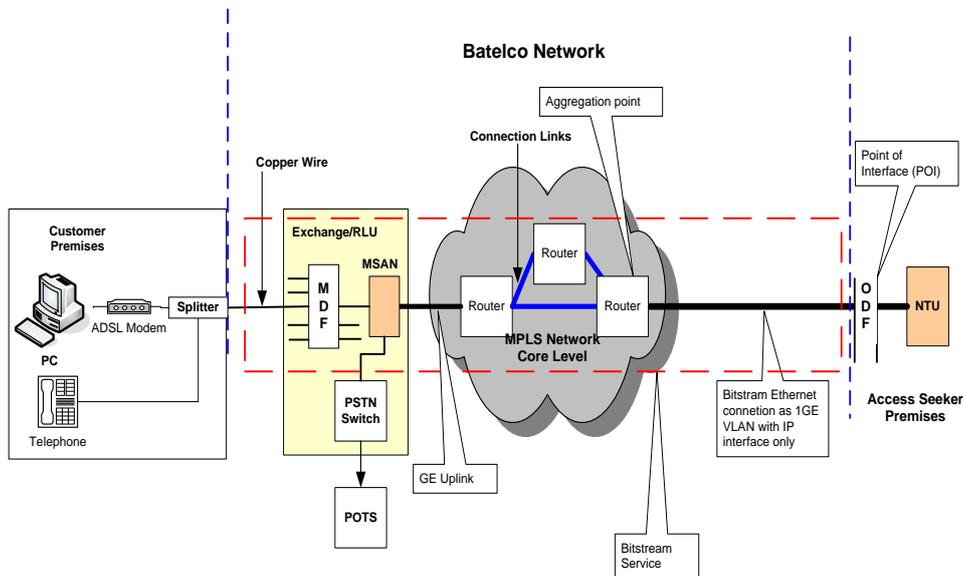
400. Batelco describes the Bitstream services as follows:

“[t]he Bitstream Service is an access service which enables the Access Seeker to provide high speed services to its End Users via a digital pathway across the Access Provider’s network. The digital pathway consists of one or more ADSL Links between End User premises and one or more Aggregation Links. A figure representing the Bitstream product prepared by Batelco is provided below.”

401. The figure below provides a representation of the Bitstream product.

Figure 6: Batelco’s Bitstream

#### **BATELCO BITSTREAM**



Source: Batelco



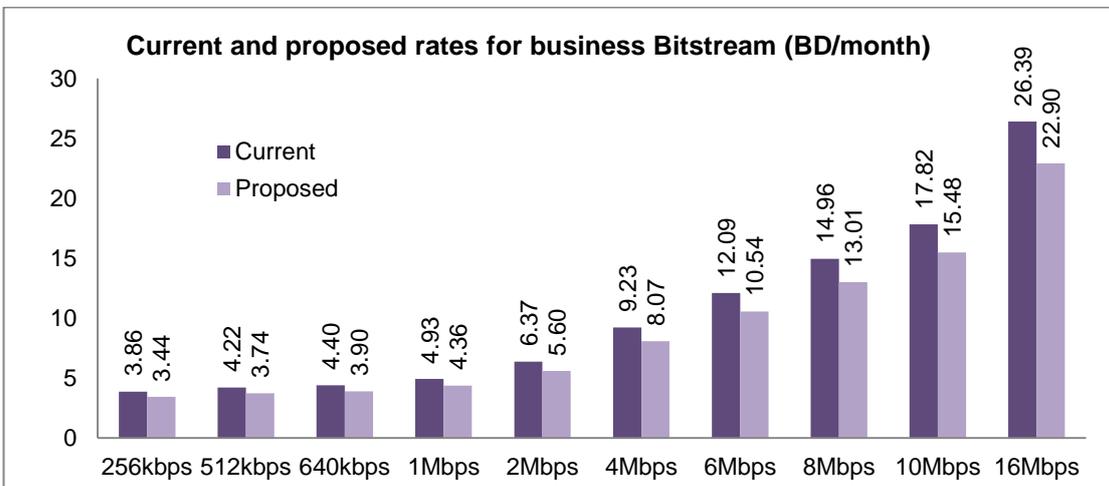
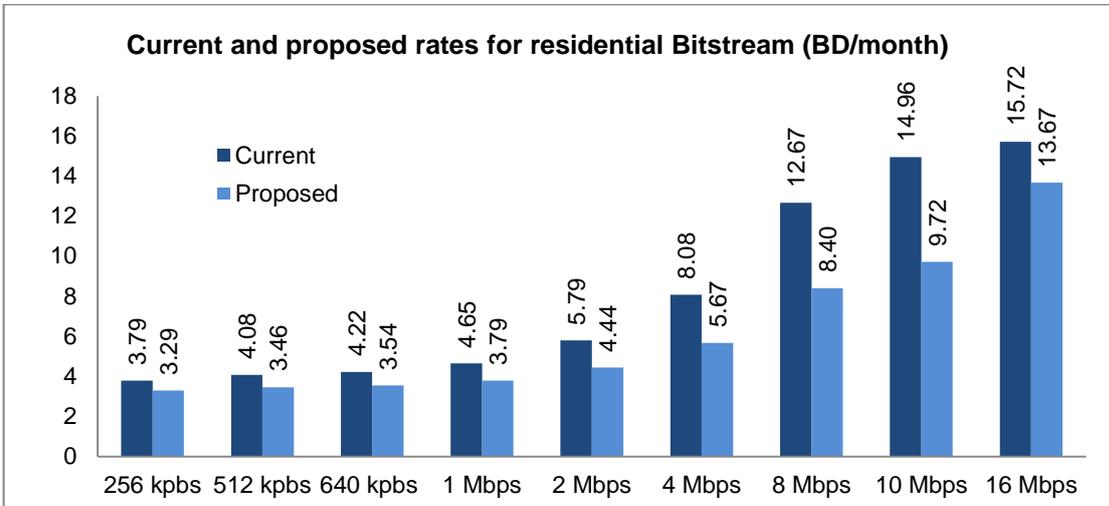
## Reference Offer Order

### Annex – Order Legal Basis and Reasoning

#### Proposed charges for Bitstream

402. In its 2010 submission, Batelco proposes significant price drops (between -11% and 35%) for its residential and business Bitstream service.

Figure 7: Bitstream current and proposed charges



Source: Batelco submission

403. The following table provides a snapshot of the cost stack submitted by Batelco to support its proposed charges.





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asked, Batelco was unable to provide any indication regarding the likely per port cost based on a fully capitalised AN17. The Authority considers that the 2008 unit cost underestimates the forward-looking unit cost of AN17 as the capital employed is only approximately [X]% of the fully capitalised level and any increase in the number of ports is unlikely to offset the increase in total cost of AN17 (according to Batelco the number of data port [X] in 2009).

408. The Authority also considers that it is inappropriate to remove AN04 from the cost stack in so far as it was used for the delivery of retail broadband, WDSL and WiFi as admitted by Batelco after repeated questioning.
409. Given the uncertainty regarding the forward-looking level of the unit port cost and the adverse effect on Batelco and the market of under-estimating cost and subsequently making corrective adjustment for services priced closed to cost, the Authority has decided to use a unit port cost of BD [X] to calculate the Bitstream and WDSL charges. This represents one third of the 2007 costs.

#### Core Transmission

410. The approach followed by Batelco to cost core transmission is consistent with the Authority's approach defined in Order No. 1 of 2009 issued by the Authority on 24 May 2009. The approach consists of calculating the cost of an un-contented clear 1 Mbps channel by dividing the total transmission cost of retail broadband, WDSL, and Bitstream by the number of equivalent customers. The number of equivalent customers is derived by: (a) multiplying the number of customers for each package by the headline download speed in Kbps divided by 1024; and then (b) by dividing this total by the relevant contention ratio.
411. Using this approach, Batelco's estimate of the monthly cost of 1Mbps un-contented clear channel is BD [X]. This compared to the BD [X] of Order 1 of 2009.
412. The Authority notes that Batelco has incorrectly used a contention ratio of 15:1 for calculating the number of equivalent customers for residential Bitstream. As per Order 1 of 2009, the contention ratio currently applicable for residential Bitstream is 10:1. Correcting this error gives a monthly cost of BD [X] for a 1Mbps un-contented clear channel (see Table below).

**Table 58: Estimates of core transmission costs**

	Batelco	TRA Fair and Reasonable
Transmission costs BB & WDSL& bitstream	[X]	[X]
Total number of channel	[X]	[X]
Total Equivalent Customers	[X]	[X]
Cost per 1Mb @ 1:1	[X]	[X]
Monthly Cost uncontended 1 Mbps	[X]	[X]
Res - Monthly cost for 1 Mbps contended	[X]	[X]
Bus - Monthly cost for 1 Mbps contended	[X]	[X]

Source: The Authority from Batelco

413. To calculate the cost of core transmission of each package, the monthly cost is then multiplied by the applicable contention ratio - which differs for business and residential



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customers – and then by the download speed of each package expressed in Mbps equivalent. Based on Batelco's submission it would appear that Batelco wishes to change the contention ratio applicable to residential Bitstream from the current 10:1 to 15:1. The corrected monthly cost for a 1Mbps contended channel reflecting the adjustment made to the monthly cost for core transmission is BD [X] for a residential and BD [X] for a business customer. This is marginally lower than Batelco's submission.

#### IP Link and Fibre Cable

414. The IP Link (Router) and Fibre Cable items represent the cost associated with providing the physical backhaul link to the OLO. The cost of the IP Link and Fibre Cable submitted by Batelco are BD [X] and BD [X] per port and per month, although the Authority notes that there is an error in the cost stack (see Table 56 above) submitted as Batelco uses a cost of BD [X] instead of BD [X]. The ordered charges in 2009 were BD [X] and BD [X]. The difference is explained by the lower maintenance and support cost (BD [X] against BD [X]) for the IP Link and an asset life of 10 year, instead of 20 year, for the fibre cable.
415. While the Authority has some reservations regarding the calculation of those cost and the parameters used for these two items, the Authority accepts the IP Link cost of BD [X]. However, the cost of the Fibre Cable is set at BD [X] as per the previously ordered cost based on a 20 year asset life.

#### Wholesale support activity costs

416. Batelco has submitted a monthly per port wholesale cost of BD [X] to cover wholesale activity costs.
417. The Authority identified in previous Orders (see e.g. Order 1 of 2009) those charges it considers fair and reasonable with respect to wholesale cost. Batelco has, yet again, chosen to include cost categories which have in previous orders been disallowed as not fair and reasonable because their inclusion would lead to duplication between the listed activities and those activities covered under the related relationship and help desk fees.
418. The Authority considers it is neither fair nor reasonable to include further charges over and above the relationship fee and helpdesk charge for Bitstream. Consequently, the BD [X]/port/month has been removed from the cost stack.

#### Copper contribution

419. All Batelco broadband products make use of the higher frequency channels of the copper whilst voice telephony makes use of the lower frequency channels. Therefore the question arises as to whether the cost stack of the broadband products at both the wholesale and retail level should include a contribution for the cost of copper. Traditionally, the cost of copper has been attributed to the provision of basic voice telephony services. Broadband services have been seen as incremental to voice services and therefore have not received any contribution towards the cost of copper. This approach is appropriate when tariffs are balanced.
420. In response to the Draft Statement "Re-balancing for Fixed Services and Price Monitoring" issued on 31 May 2009, in which the Authority invited Batelco to submit a rebalancing plan



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to address the current imbalance in fixed tariffs whereby fixed line monthly rentals appear insufficient to recover the direct cost associated, Batelco did not propose a re-balancing plan. It indicated that the case for a traditional approach to re-balancing was not clear. Instead it explained that consideration should be given to allocate copper cost to broadband services in order to maintain consistency between the pricing of wholesale input and retail broadband services.

421. In this context, the Authority concurs with Batelco's view that broadband services should contribute to the recovery of copper costs, especially at a time when broadband penetration is increasing, when there is competitive pressures on voice revenues (which have indirectly contributed to the recovery of copper cost) and when LLU is about to be launched. The Authority also notes that Batelco's 1 April 2010 Bitstream submission included a copper contribution of BD [X] (equal to BD [X] "access cost" minus BD [X] "rentals"). The Authority considers that a contribution equivalent to half the cost of copper should be included in the cost stack of Batelco's retail and wholesale broadband services. Broadband services effectively make use of the copper network and should therefore be allocated some of these costs. Based on Batelco data, revenues from voice services and broadband services each represent approximately [X]% of revenues. The fair and reasonable copper cost per line has been estimated by the Authority at BD 4.07 in its LLU Order.
422. The Authority considers that it is fair and reasonable to include in the cost stack of Batelco's broadband services a contribution of BD 2.04, equivalent to 50% of the cost of copper per line. The routing factor table used by Batelco to prepare its regulatory accounts should reflect the allocation of AN01 to broadband services.



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**Draft ordered charges for Bitstream**

423. The table below summarises the fair and reasonable and non-discriminatory monthly charges for Bitstream and supporting cost stacks.

**Table 59: Ordered Bitstream monthly charges per port and supporting cost stacks**

Residential	256 Kbps	512 Kbps	640 Kbps	1 Mbps	2 Mbps	4 Mbps	8 Mbps	10 Mbps	16 Mbps
Access port	[X]	[X]							
Copper contribution	[X]	[X]							
Core transmission	[X]	[X]							
IP Link (Router)	[X]	[X]							
Fibre Cable	[X]	[X]							
Wholesale cost	[X]	[X]							
<b>Total cost</b>	<b>3.99</b>	<b>4.16</b>	<b>4.24</b>	<b>4.48</b>	<b>5.14</b>	<b>6.44</b>	<b>9.05</b>	<b>10.36</b>	<b>14.28</b>

Note: Contention ratio of 15:1 and no longer 10:1

Business	256 Kbps	512 Kbps	640 Kbps	1 Mbps	2 Mbps	4 Mbps	6 Mbps	8 Mbps	10 Mbps	16 Mbps
Access port	[X]	[X]	[X]	[X]						
Copper contribution	[X]	[X]	[X]	[X]						
Core transmission	[X]	[X]	[X]	[X]						
IP Link (Router)	[X]	[X]	[X]	[X]						
Fibre Cable	[X]	[X]	[X]	[X]						
Wholesale cost	[X]	[X]	[X]	[X]						
<b>Total cost</b>	<b>4.14</b>	<b>4.44</b>	<b>4.59</b>	<b>5.05</b>	<b>6.28</b>	<b>8.73</b>	<b>11.18</b>	<b>13.63</b>	<b>16.08</b>	<b>23.43</b>

Note: Contention ratio of 15:1 for 256Kbps and 8:1 for other Bitstream products

Source: The Authority



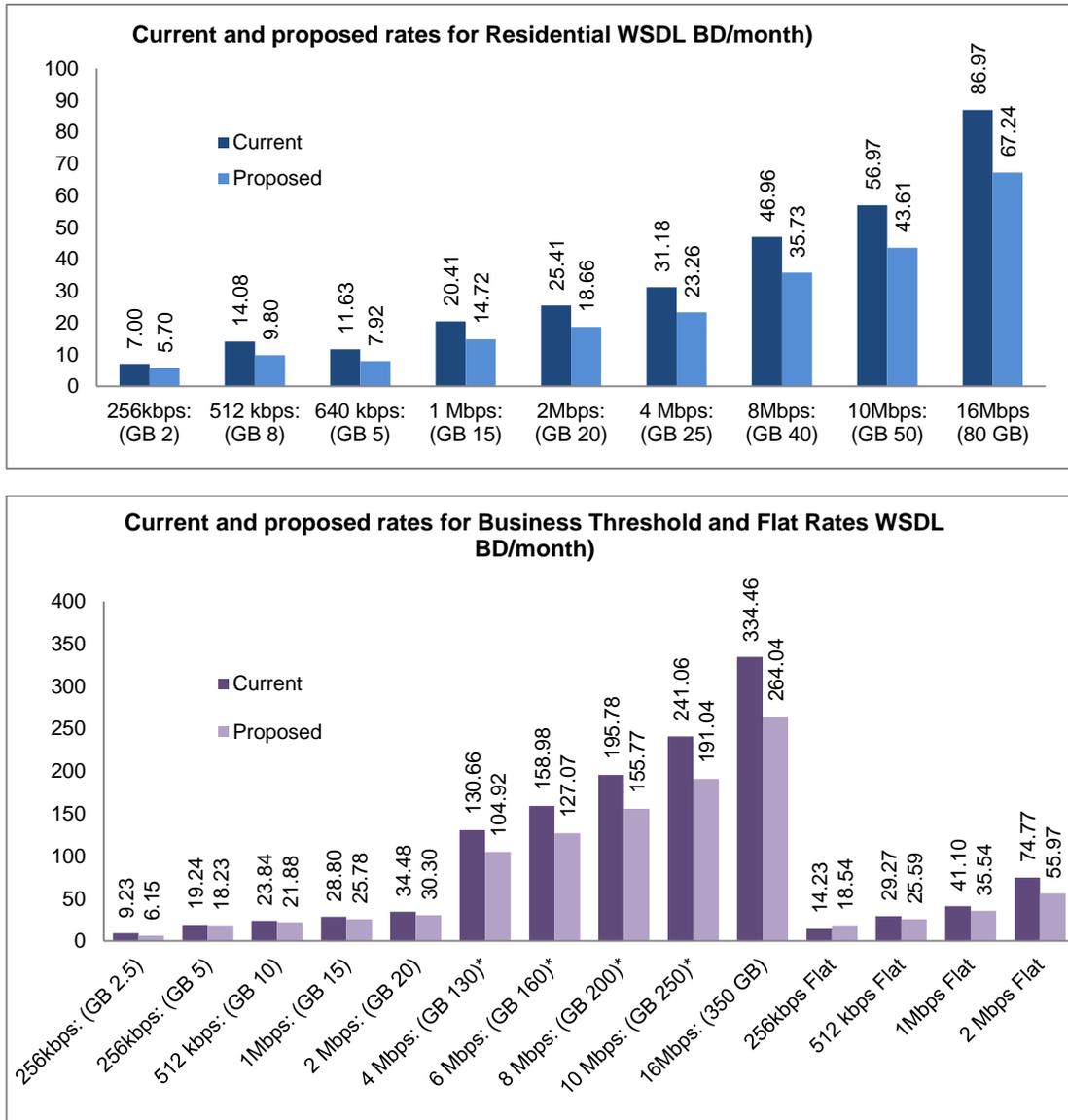
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**12.2 Wholesale DSL**

**Proposed charges for Wholesale DSL and cost stacks**

424. The proposed charges for Batelco’s Wholesale DSL (“WDSL”) product - as submitted on 1 April 2010 - are detailed in the graphs below. Proposed charges, with the exception of the 256 Kbps business flat package, are between 5% and 30% lower than the current charges.

**Figure 8: Batelco’s current and proposed charges for WSDL**



Source: Batelco

425. On 8 April 2010, Batelco submitted to the Authority a notification for revised retail broadband prices (“Consumer Broadband Retail Tariff Notification 210”). In response to the Authority’s letter dated 14 April 2010 (Ref:04/10/046), Batelco submitted on the same day the requested cost stacks for the equivalent new retail packages that it wishes to





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426. In what follows, the Authority assesses for each of the line items identified by Batelco in its submission, whether the costs proposed are fair, reasonable and non-discriminatory. Where they are not, the Authority makes the necessary adjustments.

#### Common elements between Bitstream and WDSL

427. As in previous orders (Reference Access Order of 23 May 2007, Draft Reference Offer Order of 30 April 2008, and Reference Access Order of 24 May 2009), the Authority has determined that the composition of the WDSL product is essentially the same as Bitstream with the exception of: (a) the IP Link (Router) and fibre which are not applicable for WDSL; (b) the MPLS BRAS, INET platform, and international uplinks which are included in the WDSL product.

428. The Authority has therefore used the same approach to costing WDSL as outlined above for Bitstream for common elements.

#### MPLS BRAS, INET Platform and International Uplinks

429. The MPLS BRAS cost of BD [X] proposed by Batelco reconciles back to the regulatory accounts and is accepted by the Authority.

430. To calculate the cost of the INET platform and international uplink of each package, the cost per GB of the INET platform and international uplink are calculated. In its submission, Batelco followed the same approach as in Order 1 of 2009: it divided the total cost by the total volume (measured in GB) of download in 2008. The proposed cost per GB for the INET platform and International Uplink are respectively [X]% and [X]% [X] in 2008 than 2007.

Table 61: INET Platform and International Uplink cost per GB

	2007*	2008	Evolution
Inet platform cost per GB	[X]	[X]	[X]
International uplink cost per GB	[X]	[X]	[X]
Total cost per GB	[X]	[X]	[X]

\*: As set in Order 1 of 24 May 2009

Source: Batelco and Order 1 of 24 May 2009

431. The Authority accepts the proposed cost of BD [X] per GB as submitted by Batelco. This charge applies for over the threshold download.

432. The next step consists of calculating the cost per GB for each package. The approach taken to calculate the fair and reasonable charges for each package is different depending on whether or not a capacity threshold is applied:

- a. Threshold based packages: the Authority assumes that the total capacity of the threshold is used; and
- b. Unlimited packages (Flat rate): the Authority has taken the average monthly capacity consumed at each speed.

433. The INET platform and international uplinks cost for each package are detailed below where the full cost stacks are presented.



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#### Wholesale support activity costs

434. Batelco is proposing to include 11 categories of wholesale cost, a large number of which were deemed not fair and reasonable in Order 1 of 2009. Having reviewed, the categories of cost the Authority considers that it is neither fair nor reasonable to include activities other than WS1 to WS05. The other six activities are either not relevant to WSDSL as they are performed by the OLO (e.g. helpdesk, revenue assurance) or already included in the WS activities cost.
435. Further, the Authority considers that the 2009 volume ([X]) instead of [X]) should be used to calculate unit cost.
436. The fair and reasonable wholesale support activity costs are set at BD [X] per port per month.

#### CPE for business

437. The cost stack for business packages includes another element named “CPE – Biz” which represents the cost of the ADSL router included in all business and education packages (with the exception of the 256k single user broadband package). The cost submitted of BD [X] is significantly higher than the previous year when it was BD [X]. Batelco explained the increase by a change in driver from number of faults to the number of CPEs. The cost per CPE reconcile back with the “AN 09 CPE – Data Equipment” of the regulatory accounts.
438. The Authority considers that the provision of the CPE should be optional for WDSL customers. Wholesale customers should have the option to purchase the WDSL product with and without CPE from Batelco.
439. The draft ordered business and education charges reflect this change.

#### Draft ordered charges for WDSL

440. The table below summarises the fair and reasonable and non-discriminatory monthly charges for WDSL and supporting cost stacks

**Table 62: Ordered charges for WDSL**

Residential	256 Kbps	512 Kbps	640 Kbps	1 Mbps	2 Mbps	4 Mbps	8 Mbps	10 Mbps	16 Mbps
Threshold	2	8	5	15	20	25	40	50	80
Access port	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Copper contribution	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Core transmission	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
<b>INET Platform</b>	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
MPLS BRAS	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
International Uplinks	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Wholesale cost	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
<b>Total cost</b>	<b>6.21</b>	<b>10.31</b>	<b>8.42</b>	<b>15.23</b>	<b>19.16</b>	<b>23.74</b>	<b>36.20</b>	<b>44.06</b>	<b>67.66</b>

Note: Contention ratio of 15:1



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Residential	New packages		
	640Kbps	1Mbps	2Mbps
<b>Threshold</b>	<b>2</b>	<b>8</b>	<b>15</b>
Access port	[X]	[X]	[X]
Copper contribution	[X]	[X]	[X]
Core transmission	[X]	[X]	[X]
INET Platform	[X]	[X]	[X]
MPLS BRAS	[X]	[X]	[X]
International Uplinks	[X]	[X]	[X]
Wholesale cost	[X]	[X]	[X]
<b>Total cost</b>	<b>6.45</b>	<b>10.63</b>	<b>15.88</b>

Note: Contention ratio of 15:1

Business	256 Kbps	256 Kbps Edu	512 Kbps	1 Mbps	2 Mbps	4 Mbps	6 Mbps	8 Mbps	10 Mbps	16 Mbps
<b>Threshold / Usage</b>	<b>2.5</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>	<b>130</b>	<b>160</b>	<b>200</b>	<b>250</b>	<b>350</b>
Access port	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Copper contribution	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Core transmission	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
INET Platform	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
MPLS BRAS	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
International Uplinks	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Wholesale cost	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
CPE	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
<b>Total cost with CPE</b>	<b>n/a</b>	<b>18.76</b>	<b>22.35</b>	<b>26.24</b>	<b>30.75</b>	<b>105.34</b>	<b>127.47</b>	<b>156.16</b>	<b>191.40</b>	<b>264.34</b>
<b>Total cost without CPE</b>	<b>6.54</b>	<b>8.32</b>	<b>11.90</b>	<b>15.80</b>	<b>20.30</b>	<b>94.90</b>	<b>117.03</b>	<b>145.71</b>	<b>180.96</b>	<b>253.90</b>

Note: Contention ratios of 15:1 for 256Kbps and 8:1 for all others. Over the threshold charge: 0.656 per GB

Business	256 Kbps Flat	512 Kbps Flat	1 Mbps Flat	2 Mbps Flat
<b>Threshold / Usage</b>	<b>[X]</b>	<b>[X]</b>	<b>[X]</b>	<b>[X]</b>
Access port	[X]	[X]	[X]	[X]
Copper contribution	[X]	[X]	[X]	[X]
Core transmission	[X]	[X]	[X]	[X]
INET Platform	[X]	[X]	[X]	[X]
MPLS BRAS	[X]	[X]	[X]	[X]
International Uplinks	[X]	[X]	[X]	[X]
Wholesale cost	[X]	[X]	[X]	[X]
CPE	[X]	[X]	[X]	[X]
<b>Total cost with CPE</b>	<b>19.01</b>	<b>26.06</b>	<b>36.00</b>	<b>56.24</b>
<b>Total cost without CPE</b>	<b>8.56</b>	<b>15.62</b>	<b>25.56</b>	<b>45.79</b>

Note: Contention ratios of 15:1 for 256Kbps and 8:1 for all others. Over the threshold charge: 0.656 per GB

Source: The Authority



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**12.3 Other charges applicable to Bitstream and WDSL**

**One-off charges applicable to Bitstream and WDSL**

441. Batelco proposes to increase most one-off charges applicable to Bitstream and WDSL by 5% (see table below). Batelco justifies the increase by a rise of 4% in the staff chargeout rates in 2008 compared to 2007.

**Table 63: Existing and proposed charges for one-off chargeable activities**

Item	Chargeable Activity	Existing charge (BD)	Proposed Charge (BD)	Evolution	Charge Basis
<b>Bitstream</b>					
BS.4	Port Connection	10	10.5	5%	Per event
BS.5	Charges for rejects, reversals, and withdrawals associated with Bitstream Order	5	5.25	5%	Per event
BS.6	Charges for a Change of Speed	5	5.25	5%	Per event
BS.7	External Removal charge	5	5	0%	Per event
<b>WDSL</b>					
DSL.3	Fee for processing DSL Transfer Request and completion	8	8.4	5%	Per event (additional tariff if installation required)
DSL.4	Charges for rejects, reversals, and withdrawals associated with DSL Transfer, Invalid Transfer	5	5.25	5%	Per event
DSL.5	Fee for a change of speed associated with DSL Transfer if applicable	5	5.25	5%	Per event
DSL.6	External Removal or Change Number	Equivalent to retail tariff	Equivalent to retail tariff		Per event

Source: The Authority

442. The Authority considers that the proposed charges are discriminatory between wholesale and retail customers. The Authority notes that Batelco has not sought to reflect the purported increase in chargeout rates at the retail level. The Authority notes in particular that Batelco has recently proposed the removal of connection charges for its retail customers arguing that thanks to the implementation of fully automated provisioning processes, the “only cost incurred is that of staff processing the request at the retail channel level. For existing lines, there is no manual port programming or service provisioning activities performed on the network in order to activate the services. They are now automatically activated through scripts that run automatically from Batelco’s provisioning system to the network”.<sup>65</sup> Batelco also indicated that the cost of handling the service provisioning is already recovered from the retail cost of broadband packages.

443. The Authority therefore considers that the proposed revision of one-off charge is neither fair nor reasonable. Consequently the one-off charges are set at their previous level. The Authority also reminds Batelco that Order 1 issued on 24 May 2009 explicitly required the

<sup>65</sup> See Batelco, NCT 4 Consumer Broadband Registration Fees, 14 July 2010, p3.



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implementation of fully automated provisioning processes for Bitstream and WDSL in order to maintain competitive neutrality.

444. The Authority further notes that in relation to NCT4 Batelco has proposed to waive the registration fees for WDSL and Bitstream.

#### Summary of Batelco's response

##### Access Port (MSAN Combo Cost)

445. Batelco contends that the Authority has miscalculated the cost of the MSAN. Batelco is of the view that, if a mixture of MSAN and DSLAM is used based on the Authority's methodology, then a weighted average cost per port would be appropriate. The weighted average cost calculated by Batelco is BD [X] Batelco also indicates that preliminary runs of the model for 2009 give a provisional MSAN cost for 2009 of BD [X].

##### Business CPE

446. Batelco disagrees with the proposal of the Authority to make optional the provision of the CPE for Business WDSL. At paragraphs 144 and 145 of its submission Batelco details its reasons for its position.

##### Copper contribution

447. Batelco is against the introduction of a copper contribution to broadband products. Its comments can be summarised as follows.

- a. It is of the view that the Authority should not separate the issue of copper contribution applied to retail and wholesale broadband offerings from the question of re-balancing.
- b. The Authority has the power to develop tariff re-balancing plans and has been mandated to do so under the Second National Telecommunications Plan dated 13 February 2008.
- c. Batelco considers that the Authority should not be implementing policy steps that undermine a fair rebalancing of tariffs, although Batelco does not explain how the copper contribution will "undermine a fair rebalancing of tariffs".
- d. It argues that the Authority's reference to Batelco's submission dated 30 June 2009 on the "Rebalancing for Fixed Services and Price Monitoring" Draft Statement issued 31 May 2009 is very selective. Batelco's response "was to the effect that the issue needed to be creatively considered with a broad view of product offerings and taking a market-wide approach to the question of what to do about line and service tariffs in a changing world" (Batelco's response, paragraph 152).
- e. It argues that a more encompassing solution to the issue of rebalancing is required although it does not provide any solution. It also indicated that it "would be a willing participant in a dialogue with the TRA to develop alternatives and



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options which are consistent with the overall mandate and requirement given to the TRA” (Batelco’s response, paragraph 192.a)).

- f. The Authority gives no indication that it has considered whether (and to what extent) other revenues are being counted in the definition of the copper contribution.
- g. It take issues with the omission by the Authority to mention that while the 1 April 2010 RO submission included a copper contribution, Batelco submitted a revised file on 8 April 2010 which did not include a copper contribution.
- h. It argues that the Authority’s position is inconsistent with the Order issued against Batelco on 24 May 2009.
- i. It considers that it is inequitable for the Authority to introduce a copper contribution without warning or consultation, and without a clear explanation of the basis on which the contribution has been assessed given that Batelco has developed its retail strategies assuming no copper contribution. It contends that the introduction of a copper contribution will have the effect of delaying Batelco’s retail tariff proposals and may deny Batelco’s long term ability to compete.
- j. The copper contribution has been estimated based on undisclosed analysis (The copper contribution is based on the fair and reasonable LLU rental charge detailed by the Authority in the LLU draft Order issued on 1 November 2010).
- k. Batelco is of the view that a revenue-based apportionment between broadband and voice service may not necessarily be the appropriate driver as it could mean that broadband services could over a short period of time end up bearing an increasing copper contribution. This, argues Batelco, would be no different from the “rate shock” concerns which have led to gradual re-balancing in other countries.
- l. Finally, Batelco put to the Authority’s consideration a confidential high level proposal which is reproduced below (Batelco’s response, paragraph 162.e)):

[X]



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[X]  
[X]  
[X]  
[X]  
[X]

**The Authority's analysis and conclusion**

**On "Access Port (MSAN Combo Cost)"**

448. The Authority remains of the view that an estimate of BD [X] per month for access port is appropriate, fair and reasonable. This is based on information available to the Authority and reflects the Authority's informed judgment having regards to the available evidence.

449. The Authority notes that the weighted average formula used by Batelco is mathematically incorrect as it applies successively two weights (i.e. number of customers and cost). The resulting outcome is wrong and would result in Batelco not recovering about 50% of its cost.<sup>66</sup>

**On Business CPE**

450. Having reviewed the comments made by Batelco, the Authority has decided not to make optional the provision of the CPE for business and education WDSL. Thus business and education WDSL are unchanged with respect to the treatment of the CPE compared to the currently available WDSL.

451. However, the Authority notes that the cost of CPE is very high, especially when compared to the actual cost of the equipment used and even when considering likely maintenance cost.<sup>67</sup> This is explained by the fact that the network element "AN 09 CPE –Data Equipment" of the regulatory accounts on which the cost of CPE is based includes both very expensive and less expensive CPEs.<sup>68</sup> Given the heterogeneity of this network element, the resulting average cost does not provide a good estimate of the cost of the CPE used for WDSL. Based on information provided by Batelco the Authority has adjusted the monthly cost of CPE to BD 4 instead of BD [X]. This is a conservative adjustment.<sup>69</sup>

**On "Copper contribution"**

452. Following the comments received from Batelco, the Authority remains of the view that it is fair and reasonable to include a copper contribution equivalent to 50% of the fair and

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<sup>66</sup> Based on the number of customers used by Batelco in its submission it would recover only BD [X] (BD [X] x [X] x 12) out of BD [X], leaving BD [X] not recovered.

<sup>67</sup> The cost of the CPE used by Batelco is BD [X].

<sup>68</sup> The APM provides the following definition of AN 09: "AN 09 represents the cost of CPE in the local access network, used to supply subscribers with access to national, international lease line and other Data products".

<sup>69</sup> The BD 4 is derived by dividing the CPE cost submitted by Batelco (BD [X]) by the assumed asset life (12 months) and rounding up the value to the next BD (BD 4).

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reasonable LLU cost estimated by the Authority (currently BD 4.07 per month) in the wholesale and retail broadband offerings of Batelco.

453. The Authority considers its approach to be economically sound and consistent with the promotion of efficient competition. A copper contribution is necessary in order for broadband services (both at the wholesale and retail levels), which make use of the copper pair, to contribute towards the recovery of the local loop costs, especially given that the retail line rental is significantly less than the associated cost of the line. The absence of a contribution would lead to the preservation and aggravation of distortions of competition as voice would continue to significantly cross-subsidise data products and thereby put operators who compete based on alternative infrastructures and/or who offer broadband services based on LLU at a competitive disadvantage. There are asymmetries between Batelco and OLOs in terms of revenue profiles and resulting ability to cross-subsidise. This is problematic given the dominance/SMP and incumbency advantages of Batelco. To include a contribution to copper loop costs only at the wholesale level would be discriminatory and would put OLOs at a competitive disadvantage. Further the re-balancing/cross-subsidy issue aims at enabling Batelco to recover its cost with competition for calling leading to lower calling rates and thus undermining the source of funds for the cross-subsidy. The cross subsidy may also act as a disincentive for infrastructure investment at the access level.
454. A number of regulators in other countries have set prices for broadband access services to include a contribution towards the cost of the copper loop over which such services are provided. For example, in Sweden and Denmark, 50% of the copper costs are allocated to data services. Similarly, ComReg has until recently shared the cost of the local loop equally between voice and data services.<sup>70</sup> According to ComReg, Eircom's tariffs have now been fully rebalanced – as competition has emerged in the retail calls market and eroded the high calling margins traditionally earned by the incumbent, Eircom has been able to increase its retail line rental charges, by approximately 39% since 2001.<sup>71</sup> As a result, ComReg considers that the full cost of the local loop network in Ireland is now being recovered through the PSTN line rental, and that maintaining a copper contribution in the line-sharing price would lead to over-recovery of copper costs.
455. As noted by ComReg, the allocation of a proportion of the cost of the copper loop to broadband services delivered over the copper is appropriate where the copper cost is not being fully recovered from the PSTN line rental. This is currently the case in Bahrain, as the residential and business line rentals are substantially below the cost-based LLU price estimated by the Authority.
456. At one extreme if there are no longer any voice revenues from access lines and instead all voice revenues are generated by broadband connections (e.g. voice over broadband and VOIP), then the cost of copper will have to be fully recovered from broadband and access lines.<sup>72</sup> As broadband penetration increases and voice revenues from access lines show a decreasing trend, it is essential that broadband contributes towards the recovery of the

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<sup>70</sup> ComReg "Rental Price for Shared Access to the Unbundled Local Loop, Consultation Paper" (08/106), 23 December 2008, page 8.

<sup>71</sup> *ibid*, page 11.

<sup>72</sup> For example, in New Zealand, a regulated "naked" bitstream service is available, where the end-user is not purchasing a local access and calling service from the access provider. In such cases, the pricing principle for the bitstream access price includes an explicit mark-up to recover the access provider's local loop network costs.



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cost of copper as otherwise Batelco will be increasingly unable to recover those costs and may have to cross-subsidise from revenues from other markets. As noted in the Authority's Re-balancing Draft Statement,<sup>73</sup> Batelco's ability to cross-subsidise access from other revenues such as voice calling revenues is likely to have been eroded through greater competition and declining calling rates. In other jurisdictions, such as Ireland mentioned above, and Australia, the incumbent has responded by rebalancing retail tariffs and increasing line rentals to recover line costs.<sup>74</sup>

457. In the event that Batelco has to rely on other services to cross-subsidise line rentals, this would be detrimental to competition and to Batelco. Investment and market entry decisions would also be distorted, for example with potentially inefficient entry into the market for voice services being attracted by above-cost retail calling rates, and potentially efficient network-based competition being discouraged by below-cost retail access rates. Likewise, retail rates that diverge from cost are likely to distort consumption decisions. As a result, economic efficiency is likely to be harmed. By ensuring that both voice and broadband services contribute to the costs of the copper line, Batelco's long term ability to compete on a fair basis with OLOs would not be compromised, as its competitors, whether LLU-based or pure facilities-based, will also need to recover the full cost of access from the services offered to end-users.
458. Further, given continued technological innovations, resulting changes in cost structures and usages, there is a tendency towards the recovery of cost through fixed charges and a corresponding decrease in volume dependent charges. For example broadband packages increasingly include free minutes of communications. In more advanced markets, certain broadband offers are all inclusive. Free, a French ISP offers for a flat rate a broadband connection with unlimited communications to domestic fixed and mobile numbers as well as to over a hundred international destinations. The introduction of a copper contribution will lead to a cost structure consistent with these trends which will support the advent of more competitive and innovative broadband offers by Batelco and OLOs.
459. The allocation of copper to broadband services is also timely and contrary to Batelco's view is not inequitable as it is introduced at a time when the cost of the network elements of broadband services decline. Compared to the current charges applicable to Bitstream and WSDL, the charges ordered in this Order represent a decrease of between 2% and 28%. Batelco can then pass through these cost reductions at the retail level if it so wishes. In other words, the allocation of copper cost to broadband services does not result in an increase in the total costs of broadband services. Hence it will not result in delays to Batelco's pending retail tariff proposals.
460. If no copper cost were allocated to broadband when the cost of other network elements decrease, then its introduction would be highly problematic at a later stage as it could result in price increases. This could give rise to a situation where there are no services against which to re-balance and to recover copper cost. A similar situation was described by Batelco in its submission on the Re-balancing Draft Statement, in which it explained

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<sup>73</sup> TRA, "Rebalancing for Fixed Services and Price Monitoring Draft Statement", 31 May 2009, paragraphs 21 and 22.

<sup>74</sup> The ACCC has observed that Telstra has undertaken significant rebalancing of its PSTN line rental and calling costs since 2000, increasing its line rental charges so as to better recover line costs. ACCC, "Review of the Line Sharing Service Declaration: Final Decision", October 2007, page 73. The ACCC was satisfied that Telstra's rebalancing had resulted in Telstra's fixed voice charges (mainly the line rental charges) recovering the full cost of the line (page 89).



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that because no re-balancing had been introduced early on in the market liberalisation process, there were no longer any services against which to re-balance. The “re-balancing window” had been closed. Hence Batelco called for a more creative approach to the issue which is what the Authority has sought to do.

461. The 50% contribution has been set having regards to the revenues derived by Batelco from the copper pair whereby about 50% are generated from voice (domestic and international) and 50% from broadband. This contribution is also consistent with other jurisdictions where loop costs have been spread across both voice and data services.<sup>75</sup>
462. The 50% contribution may evolve overtime to reflect changes in the number of broadband lines (an increase of which may warrant a decrease in copper contribution all else being equal) and in the revenues from voice over access lines (a decline of which may warrant an increase in copper contribution) for example. In order to provide certainty and stability to Batelco and the market, the Authority considers that the 50% contribution should be set for a number of years and that any changes of a significant magnitude could be implemented at suitable times and in a phased way in order to mitigate the risk of rate shocks. In setting a copper contribution of 50% to broadband, the Authority is effectively setting a 50% implicit contribution to voice services delivered over access lines.
463. The approach of the Authority reflects the market conditions of Bahrain and is consistent with Batelco’s call to think creatively about this issue and in particular to take a broad view of product offerings over which to allocated copper cost, including broadband.
464. By allocating copper cost to broadband the Authority is contributing to addressing the issue of re-balancing in line with its duties. The copper contribution and re-balancing are not separated, they are linked. However, the Authority notes that despite being invited to submit a re-balancing plan on the occasion of the Re-balancing Draft Statement consultation issued on 31 May 2009 Batelco has chosen not to do so. Further Batelco still has the opportunity to submit a re-balancing plan for the Authority’s consideration should it wish to do so. As previously indicated, the Authority considers that Batelco, as a commercial operator who has extensive knowledge of its customers, is better placed to develop and submit for the Authority’s approval a plan within the broad parameters and guidance of the Authority.<sup>76</sup> Thus following the consultation and the absence of a re-balancing plan being proposed by Batelco, the Authority adjusted its position expressed in the RO Order dated 24 May 2009 and decided to include a copper contribution to broadband consistent with the Authority’s position articulated at paragraph 40 of that Order. This adjustment is also motivated by market developments and the reasons indicated above.
465. The Authority also does not agree with the unsubstantiated claim of Batelco that the copper contribution would “undermine a fair re-balancing of tariff” and that the Authority has not adequately consulted.<sup>77</sup>

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<sup>75</sup> See ComReg “Rental Price for Shared Access to the Unbundled Local Loop, Consultation Paper” (08/106), 23 December 2008, Figure 2.

<sup>76</sup> While ensuring that rebalancing takes place to an acceptable extent is the responsibility of TRA, the actual design of packages and plans for consumers is a matter of commercial and marketing strategy.

<sup>77</sup> Batelco was formally consulted twice in the last two years, once following the 31 May 2009 Draft Statement and once following the issuance of the draft Order on 23 September 2010.



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466. Having decided to introduce a copper contribution the conditions that Batelco sought to impose on the Authority for consideration of Batelco's confidential high level proposal at paragraph 162.e) of its submission and reproduced above are not met.
467. Overall, for the reasons set out above, the Authority considers that it is fair and reasonable to introduce a copper contribution equivalent to 50% of the fair and reasonable LLU cost estimated by the Authority (currently BD 4.07 per month) to the wholesale and retail broadband offerings of Batelco. Allocating copper to wholesale and retail broadband services contribute to addressing the issue of re-balancing while providing a framework supporting the development of fair competition and of broadband offerings. Any changes to the copper pair cost will flow through the broadband charges. In the absence of a rebalancing plan from Batelco and in order to ensure certainty and stability to the market, the Authority intends to set the copper contribution of broadband access services to 50% of the LLU copper cost for the next three years.

#### **One-off charges applicable to Bitstream and WDSL**

468. Following Batelco's undertaking in relation to connection charges applicable to Bitstream and WDSL as part of NCT 8 Consumer Broadband Registration Fees, these charges are removed.



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#### The Authority’s ordered charges for Bitstream and WDSL

469. The tables below summarises the fair and reasonable and non-discriminatory monthly charges ordered for Bitstream and WDSL as well as and the supporting cost stacks and other charges. With the exception of the removal of the WDSL without CPE option, the adjustment to the CPE cost and the one-off charges, the final charges are the same as the charges of the draft Order.

**Table 64: Final ordered Bitstream monthly charges per port and supporting cost stacks**

Residential	256 Kbps	512 Kbps	640 Kbps	1 Mbps	2 Mbps	4 Mbps	8 Mbps	10 Mbps	16 Mbps
Access port	[X]	[X]							
Copper contribution	[X]	[X]							
Core transmission	[X]	[X]							
IP Link (Router)	[X]	[X]							
Fibre Cable	[X]	[X]							
Wholesale cost	[X]	[X]							
<b>Total cost</b>	<b>3.64</b>	<b>3.80</b>	<b>3.88</b>	<b>4.13</b>	<b>4.78</b>	<b>6.09</b>	<b>8.70</b>	<b>10.01</b>	<b>13.92</b>

Note: Contention ratio of 15:1 and no longer 10:1

Business	256 Kbps	512 Kbps	640 Kbps	1 Mbps	2 Mbps	4 Mbps	6 Mbps	8 Mbps	10 Mbps	16 Mbps
Access port	[X]	[X]	[X]	[X]						
Copper contribution	[X]	[X]	[X]	[X]						
Core transmission	[X]	[X]	[X]	[X]						
IP Link (Router)	[X]	[X]	[X]	[X]						
Fibre Cable	[X]	[X]	[X]	[X]						
Wholesale cost	[X]	[X]	[X]	[X]						
<b>Total cost</b>	<b>3.78</b>	<b>4.09</b>	<b>4.24</b>	<b>4.70</b>	<b>5.92</b>	<b>8.37</b>	<b>10.82</b>	<b>13.27</b>	<b>15.72</b>	<b>23.07</b>

Note: Contention ratios of 15:1 for 256kbps and 8:1 for other Bitstream products

Source: The Authority

**Table 65: Ordered charges for WDSL**

Residential	256 Kbps	512 Kbps	640 Kbps	1 Mbps	2 Mbps	4 Mbps	8 Mbps	10 Mbps	16 Mbps
<b>Threshold</b>	<b>2</b>	<b>8</b>	<b>5</b>	<b>15</b>	<b>20</b>	<b>25</b>	<b>40</b>	<b>50</b>	<b>80</b>
Access port	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Copper contribution	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Core transmission	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
<b>INET Platform</b>	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
MPLS BRAS	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
International Uplinks	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Wholesale cost	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
<b>Total cost</b>	<b>6.21</b>	<b>10.31</b>	<b>8.42</b>	<b>15.23</b>	<b>19.16</b>	<b>23.74</b>	<b>36.20</b>	<b>44.06</b>	<b>67.66</b>

Note: Contention ratio of 15:1



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Residential	New packages		
	640Kbps	1Mbps	2Mbps
<b>Threshold</b>	2	8	15
Access port	[X]	[X]	[X]
Copper contribution	[X]	[X]	[X]
Core transmission	[X]	[X]	[X]
INET Platform	[X]	[X]	[X]
MPLS BRAS	[X]	[X]	[X]
International Uplinks	[X]	[X]	[X]
Wholesale cost	[X]	[X]	[X]
<b>Total cost</b>	<b>6.45</b>	<b>10.63</b>	<b>15.88</b>

Note: Contention ratio of 15:1

Business	256 Kbps	256 Kbps Edu	512 Kbps	1 Mbps	2 Mbps	4 Mbps	6 Mbps	8 Mbps	10 Mbps	16 Mbps
<b>Threshold / Usage</b>	2.5	5	10	15	20	130	160	200	250	350
Access port	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Copper contribution	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Core transmission	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
INET Platform	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
MPLS BRAS	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
International Uplinks	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Wholesale cost	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
CPE		[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
<b>Total cost with CPE</b>	n/a	12.32	15.90	19.80	24.30	98.90	121.03	149.71	184.96	257.90

Note: Contention ratios of 15:1 for 256Kbps and 8:1 for all others. Over the threshold charge: 0.656 per GB

Business	256 Kbps Flat	512 Kbps Flat	1 Mbps Flat	2 Mbps Flat
<b>Threshold / Usage</b>	[X]	[X]	[X]	[X]
Access port	[X]	[X]	[X]	[X]
Copper contribution	[X]	[X]	[X]	[X]
Core transmission	[X]	[X]	[X]	[X]
INET Platform	[X]	[X]	[X]	[X]
MPLS BRAS	[X]	[X]	[X]	[X]
International Uplinks	[X]	[X]	[X]	[X]
Wholesale cost	[X]	[X]	[X]	[X]
CPE	[X]	[X]	[X]	[X]
<b>Total cost with CPE</b>	[X]	[X]	[X]	[X]

Note: Contention ratios of 15:1 for 256Kbps and 8:1 for all others. Over the threshold charge: 0.656 per GB



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**Table 66: Final ordered charges for one-off chargeable activities**

Item	Chargeable Activity	Amount in BD	Charge Basis
BS.4	Port Connection	0	Per event
BS.5	Charges for rejects, reversals, and withdrawals associated with Bitstream Order	5	Per event
BS.6	Charges for a Change of Speed	5	Per event
BS.7	External Removal charge	5	Per event
DSL.3	Fee for processing DSL Transfer Request and completion	0	Per event (additional tariff if installation required)
DSL.4	Charges for rejects, reversals, and withdrawals associated with DSL Transfer, Invalid Transfer	5	Per event
DSL.5	Fee for a change of speed associated with DSL Transfer if applicable	5	Per event
DSL.6	External Removal or Change Number	Equivalent to retail tariff	Per event

Source: The Authority



### **13 The costs of the wholesale department**

**Draft Order Text**

#### **13.1 Background**

470. In providing access and interconnection services to OLOs Batelco incurs costs (e.g. billing, carrier relations, product management and development, costing and regulatory). Batelco seeks to recover those costs through two categories of charges:

- a. the interconnect specific charge (“ISC”) which is applied to traffic; and
- b. the “wholesale support activities” which are applied to access products (e.g. CAT/LLCO, bitstream).

471. In its RO submission dated 1 April 2010 Batelco seeks, in total, to recover about BD [X] from OLOs (about BD [X] and about BD [X] for each of these charges respectively).

472. This represents the cost of the Wholesale and Carrier Relations Department (“Wholesale Department”). The Wholesale Department is responsible for the day-to-day management of all activities and relationship between Batelco and the OLOs as well as other activities, such as carrier relations with overseas carriers (e.g. for roaming, for international links and capacity, for international in-bound and out-bound termination) to the benefit of Batelco’s retail division. However as Batelco is neither functionally nor structurally separated the activities of the Wholesale Department benefit both the wholesale and retail activities of Batelco.

473. There are two main issues arising in relation to the cost of the Wholesale Department allocated to wholesale products:

- a. The composition and level of each charge:
  - i. What are the relevant costs of each charge?
  - ii. How have they been estimated?
  - iii. Do the costs claimed represent efficient cost?
- b. The appropriate method to recover these costs: What is the appropriate way to recover those costs?

474. This section:

- a. reviews in detail the information provided by Batelco regarding the composition of the ISC estimated by Batelco with a view to ascertain whether only relevant costs are included and whether the cost allocations are appropriate;
- b. also looks at the composition of wholesale support activity costs, although the recoverable cost for each access product are set with in the sections of the draft order that deal with each product.



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**13.2 Relevant principles to the analysis of wholesale costs**

475. There are a two principles relevant to the analysis of wholesale costs:
- a. Relevant cost: only relevant cost should be included; and
  - b. Efficient cost: Batelco should be able to recover only efficiently incurred cost.
476. With regards to the appropriate method for the recovery of cost, the relevant principles are:
- a. Cost causation: cost should be recovered from the services that cause the cost to be incurred;
  - b. Cost minimisation: the approach whereby cost are recovered should provide incentives for cost minimisation;
  - c. Distribution of benefits: the cost should be recovered from those who benefits from the cost being incurred; and
  - d. Competition and non-discrimination: cost recovery should not undermine competition and put any market players at a competitive disadvantage.

**13.3 The ISC**

477. The ISC was initially set at 1 fils in the Reference Interconnection Offer (“RIO”) order dated 6 August 2006. This was above the 0.74 fils forward-looking cost based ISC estimated at the time. This order stated that the “ISC represents an allocation of the general costs of those activities carried out because of the existence of wholesale markets”.<sup>78</sup>

**13.3.1 Evolution of the interconnect-specific costs claimed by Batelco**

478. The table below sets out the ISC costs claimed by Batelco for the years 2004 to 2008 inclusive. Examination of the table invites a number of observations and comments:
- a. Due to the composition and nature of the activities associated with the ISC it would normally be expected that year-on-year associated costs would remain stable and would not display the wide range of fluctuation evidenced in the data submitted by Batelco.
  - b. Between 2007 and 2008 the interconnect-specific costs have increased dramatically ([X]%) Batelco asserts that on a like-for-like basis the increase is limited to [X]% (about BD [X]) and is primarily driven by an increase in OPEX. However, Batelco has provided no justification to explain the reasons that underpin this increase.
  - c. There are inconsistencies between the RO submissions of Batelco and the costs contained within the regulatory accounts. Batelco has since at least 2006 included within its regulatory accounts a network element CN90 – ISC. Prior to the 2008 regulatory accounts (i.e. the latest regulatory accounts available which form the basis of this RO submission by Batelco), Batelco has performed an off-

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<sup>78</sup> RIO, 6 August 2006, page 21.



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line calculation for the interconnect-specific costs. The Authority notes that the cost claimed in 2007 was [X]% greater than the cost given in the regulatory accounts. However Batelco has not explained why it was necessary to do so when a specific network element existed.

**Table 67: Evolution of interconnect-specific costs claimed by Batelco**

CN 90: Interconnect Specific	2004	2005	2006	2007	2008	Delta
<b>Total cost in '000</b>	[X]	[X]	[X]	[X]	[X]	[X]
Capital employed in '000	[X]	[X]	[X]	[X]	[X]	[X]
Depreciation	[X]	[X]	[X]	[X]	[X]	[X]
Return on capital	[X]	[X]	[X]	[X]	[X]	[X]
OPEX	[X]	[X]	[X]	[X]	[X]	[X]
<b>Cost submitted by Batelco in its RO submissions</b>	[X]	[X]	[X]	[X]	[X]	[X]
<p>In response to questions 31 and 32 of the 17 May 2010 article 53 information request, Batelco explained that:</p> <ul style="list-style-type: none"> <li>- the submitted cost for 2007 were based on an off-line calculation and amounted to BD [X] and not BD [X].</li> <li>- "Given the fact that the ISC in 2007 was based on an offline calculation, Batelco would like to again point out that the actual difference in total cost does not sum up to BD [X] as the TRA indicates. The difference is BD [X] – that is only 29% increase, which is normal given the overall increase in 2008 OPEX. Furthermore, since 2007 calculation was done offline, capital employed portion of the CN90 was not considered in the calculation of that year. Hence, there is no comparison in terms of capital employed between the two years. "</li> <li>- the increase in the capital employed is mainly because of an increase in the NBV of the asset of (IT-Fixed Billing system) used for interconnection billing due to additions in 2008 of around BD [X].</li> </ul>						

Source: Regulatory accounts, RO submissions by Batelco, Batelco's responses to the 17 May 2010 and 26 July 2010 article 53 information requests.

### 13.3.2 Composition of the interconnect-specific costs

479. Beyond the broad definition above of the ISC, it is useful to look at the breakdown of the interconnect-specific costs. Basically, the ISC is composed of:

- a. billing, billing system and IT;
- b. costing, legal and regulatory;
- c. wholesale and carrier management, including inter-carrier settlements; and
- d. other support activities (e.g. corporate management, un-attributable costs).



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**Table 68: Descriptions of the components of CN90 interconnect-specific costs**

CN90 ISC: Breakdown 2008	Description
62400 [Costing & Regulatory]	This is the Costing & Regulatory Accounting that provides support for retail/wholesale services and to meet the regulatory requirements.
36552 [Market Comm]	Marcomm department is responsible to make Batelco ads as well as, maintaining the marketing side of our internet website
30500 [Wholesale & Carrier]	This is the wholesale department responsible for wholesale products and managing the wholesale operation within Batelco, including carrier relations (e.g. international carrier
64670 [Billing Systems]	This is the Bill processing department responsible of maintaining the IS systems. Such as [X] system.
UA01 [Corporate Management Services]	This is the unattributable cost associated with our "CE cost center," "internal audit cost center, "Corporate relation", "corporate affairs", "security& safety", "transformation office", "Planning & Strategy", "strategic initiative" and "corporate finance charges" cost centers.
62100 [Commercial Operation]	This is the cost center of wholesale finance responsible for maintaining wholesale business, inter admin charges and settlements from other operators. Activities performed are: 1. Settlements of Roaming calls exchanged with other operators outside Bahrain 2. Settlements with other domestic operators 3. Updating international rates and dealing with any problem which may arise
21050 [IT - Fixed Billing]	Billing assets represents the bill processing of the fixed, IP and mobile. It includes: (a) the [X] the rating and billing system that handles Inter-Admin accounts, i.e. responsible for billing local and international (wholesale) for fixed and mobile services. It supports agreement management and settlement of every kind of traffic; (b) [X]/Retail (fixed billing): the rating and billing system for fixed wire services
30400 [Legal & Regulatory]	This is the cost center of the legal and regulatory team, supporting the retail as well as the wholesale side.
UA04 [Corporate Plannig And Accounting]	This is unattributable activity relating to "financial information" cost center
UA03 [Information Security]	This unattributable activity relating to "information security" cost center
Other Reconciliation & capital projects items	It is mainly the net balance of the all Receivable and Payable accounts between Batelco and OLOs. The balances usually settled early the year after.

Source: Batelco's answers to 17 May 2010 and 26 July 2010 article 53 information requests



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#### 13.3.3 The fair and reasonable interconnect-specific costs

480. The Authority is required to determine in approving the costs submitted by Batelco that such costs represent a fair and reasonable estimation of the necessary efficiently incurred costs associated with the provision of services. The table below provides Batelco's submission with respect to the amount allocated to CN90 for each component of CN90, the allocation destinations of each component included in CN90 and the allocation basis.

**Table 69: Detailed breakdown of CN90 interconnect-specific costs**

CN90 ISC: Breakdown 2008	Allocation destinations	Total	Amount allocated to CN90	CN90 / Total	Allocation Basis
62400 [Costing & Regulatory]	CN90, WS03 "Finance support" and SA16 "Finance Support Services"	[X]	[X]	[X]	Staff Analysis
36552 [Market Comm]	FR21 - Market Comm- Marcom Residential (Fixed); MR21 - Market Comm- Marcom Residential (mobile); OR21 - Market Comm- Marcom Residential (Others)	[X]	[X]	[X]	Combination of number of staff, number of services and actual marketing expenditure analysis
30500 [Wholesale & Carrier]	CN90, WS01 "Wholesale & Carrier Mgt, Access product Mgt", IN01 "International swithes", NA01 "Manage international Capacity"	[X]	[X]	[X]	Time estimates
64670 [Billing Systems]	FR27 – Billing (Fixed); MR27 – Billing (Mobile); OR27 – Billing (Other)	[X]	[X]	[X]	Staff analysis and time estimates
UA01 [Corporate Management Services]	To all retail and network elements	[X]	[X]	[X]	EPMU
62100 [Commercial Operation]	CN90; WS02- Commercial Operation- Access; WS06- Commercial Operation - Roaming; IN01 International switches	[X]	[X]	[X]	Time estimates
21050 [IT - Fixed Billing]	CN90, WS05 Fixed billing - IAA Access, FR27 Billing Fixed	[X]	[X]	[X]	Unclear see note below
30400 [Legal & Regulatory]	SA85 [Legal admin & litigation services]; WS04 [Legal & Regulatory Affairs - Access Support]; MR36 [Legal & Regulatory Affairs- TPR support (Mobile)]; CN90 [Interconnect Specific]; UB01 [Joint ventures]; OR36 [Legal & Regulatory Affairs- TPR support (Others)]; IN01 [International Switches]; FR36 [Legal & Regulatory Affairs- TPR support (Fixed)]	[X]	[X]	[X]	Time estimates
UA04 [Corporate Plannig And Accounting]	To all retail and network elements	[X]	[X]	[X]	EPMU
UA03 [Information Security]	To all retail and network elements	[X]	[X]	[X]	EPMU
Other Reconciliation & capital projects items	n/a	[X]	[X]		
<b>Total cost CN90</b>			<b>[X]</b>		



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Source: Batelco's response to 17 May 2010 and 26 July 2010 article 53 information requests as well as 2008 APM.

Notes:

62400 [Costing & Regulatory]: While Batelco initially confirmed that the total cost was BD [X], it subsequently modified its answer. The Authority notes that the final number provided by Batelco does not appear consistent as the sum of the amount allocated to CN90, WS03, retail activities and SA16 do not reconcile with the final number provided.

36552 [Market Comm]: According to the 2008 APM and the Note to the 2008 regulatory accounts, no Market Comm cost should have been allocated to CN90.

64670 [Billing Systems]: in the 2008 APM which was approved by the Authority no cost were allocated to CN90. A note to the LRIC regulatory accounts mentioned the change.

21050 [IT - Fixed Billing]: The Authority understands that the TBMS system and a portion of the IAA system is allocated to FR27 based on "information obtained from the head of the department maintaining those assets". The costs are then allocated to CN90 and WS05. However it is not clear which information is used to allocate the cost of the systems and which metric is used to allocate cost between the network elements and retail activities.

481. The Authority considers that for the reasons set out below the ISC cost stack is neither fair nor reasonable. The Authority considers that the proposed ISC cost as submitted by Batelco includes costs that are not essential and therefore irrelevant to the calculation of the ISC and cost allocations that are in some circumstances inappropriate. As a consequence the Authority considers that the proposed interconnect-specific costs as submitted by Batelco is an excessive and has accordingly made adjustments to the composition of this charge.

482. The Authority considers it important that the context within which these remarks are made is set out. Based on the information provided to the Authority, the Authority is unable to ascertain whether the costs submitted represent efficiently incurred costs. The Authority notes in particular the use of time estimates to allocate costs. These could be used to strategically allocate costs while giving an illusion of precision. By way of example, this is likely to be the case when the incentives structure (e.g. commercial targets, bonus) of the Wholesale Department is aligned with the targets of the overall company (e.g. company profits) and not geared towards growing the wholesale business for example. At present the incentives structure of the Wholesale Department is not known to the Authority. Such a misalignment could potentially lead to costs being artificially loaded to the Wholesale Department at its detriment and the benefit of the retail division, thereby loading cost onto products and services for which Batelco faces no competitive pressure. Correspondingly this would lead to an under allocation of costs at the retail level where Batelco does face competitive pressure. Under this scenario there would be little or no incentive to minimise the cost of the Wholesale Department.

483. The Authority does not have information on the incoming costs into each component of CN90 and how these costs have been allocated. Therefore, the analysis of the Authority cannot reveal whether each component includes only relevant costs.

484. In what follows the Authority provides comments on each component included in the ISC cost stack and where considered appropriate makes amendment to the amount allocated to CN 90.

#### **62400 [Costing & Regulatory]**

485. Batelco is seeking to recover [X]% of 62400 from OLOs ([X]% through CN90 and [X]% through WS 03 Finance Support Services – Reg & WS Support Access) and [X]% from the rest of the business.



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486. Batelco's regulatory and costing team supports both the retail and wholesale activities of Batelco by ensuring at the regulatory level that Batelco as an entity is compliant with its regulatory obligations and at the costing level by ensuring that the entire cost base of Batelco is understood. This cost base is subsequently used to establish the prices for both retail and wholesale products and services offered by Batelco. Therefore it logically flows that the costs associated with Batelco's regulatory and costing function should be allocated between both wholesale and retail activities. However since the majority of revenues are generated from Batelco's retail business it is not appropriate for the majority of the costs of the regulatory and costing activities to be carried by the Wholesale Department.
487. The regulatory accounts for 2008 show that the revenue distribution between retail and wholesale activities was [X]% and [X]% respectively. The Authority therefore considers that the proposed allocation of [X]% of the costs associated with Regulatory and Costing activities to CN90 is excessively disproportionate. The Authority has consequently adjusted this to [X]% a figure still considered by the Authority to be conservative and which may require further consideration in Batelco's next submission.

#### 36552 [Market Comm]

488. Batelco is seeking to recover about BD [X] of marketing and communications cost from OLOs. Batelco claims that these costs reflect the cost of the wholesale part of Batelco's website.
489. Batelco explains that the first step in the allocation of 36552 is to split the cost based on the number of staff working on either the "website" or "ads". The "cost" of the website is then allocated based on the number of wholesale and retail services of which Batelco has counted 29 wholesale and 16 retail services.
490. The Authority considers that the allocation keys for 36552 are inappropriate and have led to the allocation of irrelevant cost (i.e. marketing and advertising for retail products) to CN90 and to a significant overstatement of costs being allocated to the Wholesale Department.
491. The first step results in an overestimated "website cost" as marketing and advertising costs related to retail products are allocated to it and indirectly to CN90. This is incorrect as marketing and advertising costs are not relevant to CN90.
492. The second step results in an over-allocation of the "website cost" to CN90. The products list used by Batelco is incorrect and has the effect of minimising the number of retail services whilst maximising the number of wholesale products. The allocation leads to Batelco claiming [X]% of the cost of the website cost against the Wholesale Department whereas even a cursory examination of the website clearly reveals that the majority of the focus of the site is pointed towards the retail services of Batelco. Consequently the part of Batelco's website dedicated to the wholesale business is only marginal. The primary purpose of the Batelco website is essentially to market retail services, it forms the online portal to Batelco as a business. The Authority considers that the if product counting is to be considered as an allocation key the most appropriate list of retail and wholesale products can be found in the APM. This would result in a percentage allocation of about [X]% as opposed to [X]%. The Authority also notes that Batelco's generates most of its revenues from retail services and not from wholesale products.



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493. The Authority is of the view that only the incremental costs related to the maintenance and updating of the website for wholesale products are relevant to CN90. Marketing and advertising costs are not relevant to CN90 as they relate to retail activities.
494. The Authority estimates that it would take at the most one day per month to maintain and update the wholesale part of the website. Absent further information, the Authority considers that allocating BD 10,000 per year for the maintenance and updating of the wholesale part of Batelco's website is very conservative.

#### **64670 [Billing Systems] and 21050 [IT Fixed Billing]**

495. As indicated by Batelco, 64670 represents the cost of the “bill processing department responsible for maintaining the IS system. Such as TBMS system”. This department looks after all of Batelco's retail and wholesale services.
496. The other billing cost that Batelco seeks to recover relates to 21050 which includes billing assets. More specifically, Batelco has allocated [X]% of 21050 to OLOs ([X]% to CN90 and [X]% to WS05 Fixed Billing – IAA Access). In passing, the Authority notes that the naming and descriptions of 64670 and 21050 are confusing and not self-evident: although 64670 is referred to as “billing systems”, it does not include billing assets.
497. Batelco seeks to recover [X]% of the cost of 64670 and [X]% of the costs of 21050 from OLOs. The allocation basis by which these percentages are derived is time estimates.
498. Whilst the Authority has not been able to verify the time estimates the resulting allocation of [X]% and [X]% would not appear to be fair or reasonable when viewed in the context of the volume and scale of billing activity carried out by the Wholesale Department in comparison to the retail service billing and the relative complexity from a billing perspective of the services covered by each elements. The Authority therefore considers that costs are being inappropriately transferred from retail services to the Wholesale Department.
499. Absent further information, the Authority considers that the fair and reasonable allocation to CN90 is [X]% for 64670 and [X]% for 21050.

#### **30500 [Wholesale & Carrier]**

500. Batelco seeks to recover about [X]% of 30500 from OLOs ([X]% through CN90 and [X]% through WS01 “Wholesale & Carrier Mgt, Access product Mgt” which is applied to access products). The other allocation destinations of 30500 are WS06 Roaming and IN01 international switches. Based on available information and keeping in mind that they are based on time estimates, it is difficult for the Authority to ascertain whether the proposed allocations are fair and reasonable. However, having regards to the nature of the activities included in 30500 and the revenues derived by each activity, the Authority considers that the percentages of cost allocated to CN90 and WS01 are high.
501. Notwithstanding this, the Authority has decided not to modify this allocation.

#### **62100 [Commercial Operation]**

502. Batelco seeks to recover about [X]% of 62100 from OLOs ([X]% through CN90 and [X]% through WS02 Commercial Operations – Access, which is applied to access



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products). According to Batelco there are three main activities included in this element: settlements of roaming calls with operators outside Bahrain; settlement with domestic operators; and updating and dealing with issues related to international rates. Based on information available to the Authority, the Authority is unable to ascertain whether the proposed allocations based on time estimates are fair and reasonable. However, having regards to the volume and revenues generated by each activity included, as well as the nature of each activity (e.g. international rates are modified very frequently), the percentages allocated to CN90 and WS02 are on the high side.

503. Notwithstanding this, the Authority has decided not to modify this allocation.

#### **30400 [Legal & Regulatory]**

504. The Authority has no specific comments on the amount of 30400 allocated to CN90.

#### **Other Reconciliation & capital projects items**

505. Based on the description provided by Batelco of this activity (see table above), the Authority considers that this item is not relevant to CN90. Batelco has not explained the exact nature of this item and why it is relevant to CN90 and whether it is not already recovered elsewhere. Therefore, this component has been removed from CN90.

#### **Other components: UA03 [Information Security]; UA04 [Corporate Planning And Accounting]; UA01 [Corporate Management Services]**

506. These elements represent the cost of un-attributable activities. They are allocated to CN90 through the EPMU method.

507. Whilst it could be argued that only incremental cost should be included in CN90 and that the activities included in UA01 are not relevant, the Authority has decided not to adjust these allocations.

508. Further, the amount of un-attributable cost allocated to CN90 should in principle be adjusted following the removal of irrelevant costs and the adjustment to certain cost allocations as less un-attributable costs should be allocated to CN90 through the EPMU method. However, on this occasion the Authority has decided not to adjust the amount of un-attributable cost allocated to CN90, partly because the necessary information is not available to the Authority. This is a conservative decision of the Authority.

#### **Conclusions concerning CN90**

509. The analysis above has demonstrated that the cost stack of the ISC proposed by Batelco is neither fair nor reasonable. The Authority considers that the fair and reasonable interconnect-specific costs are BD [X] against the BD [X] proposed ([X]%). These conservative adjustments are summarised in the below table.



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**Table 70: The fair and reasonable CN90 ISC cost stack**

CN90 ISC: Breakdown 2008	Total	Proposed Batelco		TRA Fair and Reasonable	
		Amount allocated to CN90	% of total allocated to CN90	Revised % of total allocated to CN90	Revised Amount allocated to CN90
62400 [Costing & Regulatory]	[X]	[X]	[X]	[X]	[X]
36552 [Market Comm]	[X]	[X]	[X]	[X]	[X]
30500 [Wholesale & Carrier]	[X]	[X]	[X]	[X]	[X]
64670 [Billing Systems]	[X]	[X]	[X]	[X]	[X]
UA01 [Corporate Management Services]	[X]	[X]	[X]	[X]	[X]
62100 [Commercial Operation]	[X]	[X]	[X]	[X]	[X]
21050 [IT - Fixed Billing]	[X]	[X]	[X]	[X]	[X]
30400 [Legal & Regulatory]	[X]	[X]	[X]	[X]	[X]
UA04 [Corporate Plannig And Accounting]	[X]	[X]	[X]	[X]	[X]
UA03 [Information Security]	[X]	[X]	[X]	[X]	[X]
Other Reconciliation & capital projects items		[X]	[X]	[X]	[X]
<b>Total cost CN90</b>		[X]			[X]
				Delta	[X]

Source: Batelco and the Authority's analysis

#### 13.3.4 The fair and reasonable ISC

510. In its RO submission, Batelco is proposing an ISC of 1.12 fils per minute. Having established above that the ISC cost stack of BD [X] on which the 1.12 fils is based is neither fair nor reasonable, the next step is to establish the appropriate method to recover those costs. For the reasons set out below, the Authority is of the opinion that contrary to Batelco's proposed approach to include only wholesale minutes, the interconnect-specific costs should be recovered from all minutes which passes through Batelco's mobile and fixed networks.
511. Although the principle of cost causation would in theory suggests that the interconnect-specific costs should be recovered only from wholesale minutes as it is the need for interconnection that cause this cost to be incurred, other relevant principles (effective competition and non-discrimination, distribution of benefits and cost minimisation) clearly point to the recovery of interconnect-specific costs from all minutes, that is minutes which are either conveyed or transited through Batelco's fixed and mobile networks.
512. As argued by the Authority in previous draft and final Orders, if Batelco retail did not pay the ISC or it was not included in its retail costs stacks , this would put OLOs at a competitive disadvantage in downstream markets in which they compete with Batelco as they pay the ISC. Thus in order to maintain a competitive and non-discriminatory playing field, the interconnect-specific costs should be recovered from all minutes.
513. Second, if cost where only recovered through wholesale minutes, Batelco will have no incentive to minimise interconnect-specific costs as they would be entirely recovered from OLOs. Batelco would actually have an incentive to inflate interconnect-specific costs in so far as this would increase the cost base of OLOs relative to Batelco. Therefore, the application of the principle of cost minimisation indicates that interconnect-specific costs should be recovered from all minutes.



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514. Third, all consumers benefit from being able to call and be called as well as to receive and send messages. The interconnection of networks underpins competition in the telecommunications sector. Thus, the application of the distribution of benefits principle indicates that the interconnect-specific costs should be recovered from all minutes and not only from OLOs' customers.
515. Overall, the Authority considers that the appropriate method to recover the interconnect-specific costs is through all the minutes conveyed and transited on Batelco's fixed and mobile networks. To the extent that Batelco Wholesale incurs cost in the provision of interconnection services to Batelco retail, those costs should be pooled with the interconnect-specific costs in order to achieve competitive parity and ensure that there is no distortion of competition.
516. The approach established above is consistent with the approach taken by Ofcom for the equivalent charge.<sup>79</sup> It differs from the Ofcom approach in that mobile minutes are included. However, BT had no mobile arm and therefore no mobile minutes.
517. In setting the forward-looking ISC, it is important to look at the historical recovery of interconnect-specific costs, notably because volume and cost vary over time. To do so, the Authority has used historical traffic data for the years 2004 to 2009 provided by Batelco and modelled the recovery of interconnect-specific costs. In its analysis, the Authority converted the per event data for SMS and MMS into minutes equivalent by dividing the per event data by 0.0025 and 0.333 respectively (these are the routing factors used by Batelco) in order to express all traffic into a common metric.
518. The table below sets out the Authority's analysis of the historical recovery of interconnect-specific costs. The analysis shows by end 2009:
- a. [X]  
[X]  
[X];
  - b. [X]  
[X];
  - c. [X]  
[X].

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<sup>79</sup> See Ofcom, Review of BT's product management, policy and planning (PPP) charge, Statement, 30 July 2004.



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**Table 71: ISC cost recovery**

Traffic in '000 (minutes equivalent)	2004	2005	2006	2007	2008	2009	
Batelco - relevant minutes	[X]	[X]	[X]	[X]	[X]	[X]	
TRA - relevant minutes, including mobile on-net	[X]	[X]	[X]	[X]	[X]	[X]	
<b>ISC cost</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	
Cost claimed by Batelco	[X]	[X]	[X]	[X]	[X]	[X]	
TRA fair and reasonable cost	[X]	[X]	[X]	[X]	[X]	[X]	
<b>ISC</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>Average</b>
ISC claimed by Batelco	1.91	3.11		1.12	1.12		1.82
Applicable ISC	1	1	1	1	1	1	1
Fair and reasonable ISC	[X]						
<b>Recovery analysis</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	
Explicit cost recovery (wholesale min)		[X]	[X]	[X]	[X]	[X]	
Implicit cost recovery (all min)		[X]	[X]	[X]	[X]	[X]	
Explicit annual over(under) recovery		[X]	[X]	[X]	[X]	[X]	
Implicit annual over(under) recovery		[X]	[X]	[X]	[X]	[X]	
Explicit cumulative net [X]		[X]	[X]	[X]	[X]	[X]	
Implicit cumulative net [X]		[X]	[X]	[X]	[X]	[X]	

**Notes:**

The Authority's fair and reasonable cost taken into account in this table includes a 15% up-lift reflecting the Authority's assumption of the cost that Batelco may incur in the provision of interconnection to Batelco retail. This is a conservative assumption considering the Ofcom decision in which Ofcom accepted on the face of it the estimate provided by BT which represented 6.7% of the PPP cost.

The Authority's fair and reasonable cost for years prior to 2008 have been derived by adjusting the original cost by the same % difference between the 2008 cost submitted by Batelco and the fair and reasonable cost determined by the Authority.

Annual over(under) recovery is equal to the product of the applicable minutes by 1 fils minus the ISC cost of the previous year.

The analysis above does not take into account 2010 traffic. The magnitude of [X] is therefore under-estimated.

Source: Batelco's response to 17 May 2010 and 26 July 2010 article 53 information request; previous RO submissions, Draft Orders and Orders, The Authority's analysis

519. Having regards to Batelco's proposal to set the ISC at 1.12 fils per minute, the fair and reasonable ISC estimated at about [X] fils per minute, the [X] of the interconnect-specific costs by Batelco since 2004, the Authority is of the view that the ISC should be set at **0.7 fils per minute**. At this level the ISC leaves substantial head-room for Batelco to recover the efficiently incurred cost of wholesale activities, such as capital intensive product development and enhancements, including the implementation of local loop unbundling. Those activities may otherwise results in charges which may prove to be a barrier to entry and therefore not compatible with the development of competition. High charges may also stifle Batelco which may be unable to meet margin squeeze requirements at the retail level.

520. Setting the ISC at 0.7 fils per minute is a conservative decision of the Authority. The ISC applicable to SMS and MMS is set at 0.018 fils and 0.233 fils per event respectively to reflect the conversion factors (0.025 and 0.33) used to convert SMS and MMS in minutes equivalent.



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**13.4 Wholesale support activities**

521. While the level and recovery of the other broad category of cost of Batelco Wholesale (i.e. the cost associated with the so-called Wholesale Support Activities) are set in various sections of this draft order, the wholesale support activities costs and their allocation are described in this section.

**13.4.1 Wholesale support activities cost and description**

522. Batelco claims that the cost of wholesale support activities amount to about BD [X] for 2008. As can be seen from the tables below Batelco identifies four relevant wholesale support activities. Between 2007 and 2008, the total cost of wholesale support activities have increased by [X] with some activities increasing significantly and other decreasing.

**Table 72: Description of wholesale support activities**

WS01 Wholesale & Carrier Relations - Access Product Management	This is the wholesale department cost of Managing the access products and services.
WS02 Commercial Operation- Access	Portion of Commercial Operation department's cost(62100) which mainly handling the OLO accounts, preparing invoices, adjusting the rating on monthly basis configuring new scenarios for new WS products..etc...
WS03 Finance Support Services - Reg & WS Support Access	The cost of the Regulatory Costing Team providing the support and meeting the wholesale regulatory requirements.
WS04 Legal & Regulatory Affairs - Access Support	The regulatory and legal team's cost of supporting wholesale access services and products.
WS05 Fixed Billing - IAA Access	The cost of billing systems related Interadmin (including the Int'l and OLO accounts).

Source: Batelco's responses to 17 May 2010 article 53 information request on RO, 20100614 RO assessment article 53 response phase one excel.

**Table 73: Wholesale support activities cost**

Code	2007	2008	Delta 08/07	Explanation of evolution
WS01 [Wholesale & Carrier Relations - Access Product Management]	[X]	[X]	[X]	Although there is a general increase in the overall OPEX of all cost centres, in which wholesale cost centre is also part. However, the % change in the cost of wholesale activities is mainly due to the change in the driver %'s i.e time estimates changes.
WS02 [Commercial Operation- Access]	[X]	[X]	[X]	
WS03 [Finance Support Services - Reg & WS Support Access]	[X]	[X]	[X]	
WS04 [Legal & Regulatory Affairs - Access Support]	[X]	[X]	[X]	
WS05 [Fixed Billing - IAA Access]	[X]	[X]	[X]	depreciation of the assets increased as a result of the additions to the billing system ... In 2008 there was additions and transfers from AUCs around BD [X]
<b>Total WS Activities</b>	[X]	[X]	[X]	

Source: Batelco's responses to 17 May 2010 article 53 information request on RO, 20100614 RO assessment article 53 response phase one excel.

523. The total cost of each wholesale support activity is composed of an activity specific cost centre and three un-attributable activities (see table below). All the cost centres that feed into wholesale activities also feed into CN90. They are allocated on the same basis, i.e. in most cases based on "time estimates".



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**Table 74: Wholesale support activities cost**

<b>WS01 Wholesale &amp; Carrier Relations - Access Product Management</b>	<b>Total</b>	<b>WS 1</b>	<b>% of total</b>	<b>Staff</b>
30500 [Wholesale & Carrier]	[X]	[X]	[X]	[X]
UA01 [Corporate Management Services]	[X]	[X]	[X]	[X]
UA04 [Corporate Plannig And Accounting]	[X]	[X]	[X]	[X]
UA03 [Information Security]	[X]	[X]	[X]	[X]
<b>Total</b>	[X]	[X]		
<b>WS02 Commercial Operation- Access</b>	<b>Total</b>	<b>WS2</b>	<b>% of total</b>	<b>Staff</b>
62100 [Commercial Operation]	[X]	[X]	[X]	[X]
UA01 [Corporate Management Services]	[X]	[X]	[X]	[X]
UA04 [Corporate Plannig And Accounting]	[X]	[X]	[X]	[X]
UA03 [Information Security]	[X]	[X]	[X]	[X]
<b>Total</b>	[X]	[X]		
<b>WS03 Finance Support Services - Reg &amp; WS Support Access</b>	<b>Total</b>	<b>WS3</b>	<b>% of total</b>	<b>Staff</b>
62400 [Costnig & Regulatory]	[X]	[X]	[X]	[X]
UA01 [Corporate Management Services]	[X]	[X]	[X]	[X]
UA04 [Corporate Plannig And Accounting]	[X]	[X]	[X]	[X]
UA03 [Information Security]	[X]	[X]	[X]	[X]
<b>Total</b>	[X]	[X]		
<b>WS04 Legal &amp; Regulatory Affairs - Access Support</b>	<b>Total</b>	<b>WS4</b>	<b>% of total</b>	<b>Staff</b>
30400 [Commercial Lawyer]	[X]	[X]	[X]	[X]
UA01 [Corporate Management Services]	[X]	[X]	[X]	[X]
UA04 [Corporate Plannig And Accounting]	[X]	[X]	[X]	[X]
UA03 [Information Security]	[X]	[X]	[X]	[X]
<b>Total</b>	[X]	[X]		
<b>WS05 Fixed Billing - IAA Access</b>	<b>Total</b>	<b>WS5</b>	<b>% of total</b>	<b>Staff</b>
21050 [IT - Fixed Billing]	[X]	[X]	[X]	[X]
UA01 [Corporate Management Services]	[X]	[X]	[X]	[X]
UA04 [Corporate Plannig And Accounting]	[X]	[X]	[X]	[X]
UA03 [Information Security]	[X]	[X]	[X]	[X]
<b>Total</b>	[X]	[X]		

Source: Batelco's response to 26 July 2010 article 53 information request

### 13.4.2 The allocation of wholesale activity cost to wholesale products

524. Batelco then allocates the cost of each wholesale activity to the following products: CAT/LLCO, IPLC, Duct Access, Bitstream, WDSL. The “time estimates” for “WS 01 Wholesale & Carrier Relations - Access Product Manageme” are used to allocate the cost of the other wholesale support activities. The Authority notes that “time estimates” have fluctuated widely between 2007 and 2008 and that the application of the “time estimates” for “WS 01 Wholesale & Carrier Relations - Access Product Manageme” to all wholesale activities is unlikely to reflect the cost of each wholesale support activity.
525. Moreover, the Authority is sceptical of the resulting uniform percentages at the wholesale activity level which imply that a similar level of effort has been engaged for each wholesale activity for the provision of the duct rental service. The Authority would expect estimates of time spent on access products to be detailed at the wholesale activity level.



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**Table 75: The allocation of wholesale support activities cost to wholesale products**

Wholesale Activity cost allocation by product 2008	Total	CAT LLCO	IPLC	Duct	Bitstream	WDSL
WS01 Wholesale & Carrier Relations - Access Product Managemem	[X]	[X]	[X]	[X]	[X]	[X]
WS02 Commercial Operation- Access	[X]	[X]	[X]	[X]	[X]	[X]
WS03 Finance Support Services - Reg & WS Support Access	[X]	[X]	[X]	[X]	[X]	[X]
WS04 Legal & Regulatory Affairs - Access Support	[X]	[X]	[X]	[X]	[X]	[X]
WS05 Fixed Billing - IAA Access	[X]	[X]	[X]	[X]	[X]	[X]
<b>Total</b>	[X]	[X]	[X]	[X]	[X]	[X]

Note: Allocation basis is "Time estimates" of WS 01

Wholesale Activity cost allocation by product 2008 %	Total	CAT LLCO	IPLC	Duct	Bitstream	WDSL
WS01 Wholesale & Carrier Relations - Access Product Managemem	[X]	[X]	[X]	[X]	[X]	[X]
WS02 Commercial Operation- Access	[X]	[X]	[X]	[X]	[X]	[X]
WS03 Finance Support Services - Reg & WS Support Access	[X]	[X]	[X]	[X]	[X]	[X]
WS04 Legal & Regulatory Affairs - Access Support	[X]	[X]	[X]	[X]	[X]	[X]
WS05 Fixed Billing - IAA Access	[X]	[X]	[X]	[X]	[X]	[X]

Source: Batelco's response to 17 May 2010 and 26 July 2010 article 53 information request.

### 13.4.3 Wholesale support activity cost recovered by access products

526. As indicated above, Batelco should only be allowed to recover efficient cost. In the sections pertaining to WDSL, Bitstream, and CAT/LLCO, the Authority has adjusted the wholesale activity cost recoverable from those products. For duct and IPLC, the Authority has accepted the wholesale support activity cost as proposed by Batelco.

#### Summary of Batelco's response

527. In addition to its submission on the draft Order, Batelco also submitted a report on the ISC and the recovery of LLU implementation cost prepared by Ernst and Young (the "EY Report")<sup>80</sup> with its submission on the draft RO Order on LLU issued on 1 November 2010 (MCD/10/10/097). At the request of Batelco, the Authority has decided to consider the EY Report as part of this regulatory proceeding. The points raised by the EY Report that have not already been raised in the Batelco response are summarized and addressed below.

528. In its response, Batelco indicates that an ISC set at BD 0.7 fils/min would be fair and reasonable provided that the recovery of major access project costs (such as the upfront costs of LLU) are not recovered from that amount.

<sup>80</sup> Ernst & Young, Comments on the TRA's review of interconnect specific cost, 14 December 2010.



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#### ***Batelco's comments on Section 13.3.1 of the draft Order "Evolution of the ISC costs claimed by Batelco"***

529. Batelco considers that the Authority's observation that the total interconnect-specific costs would normally be expected to be stable is "not safe" because:

- a. The total cost may change due to accounting practices (e.g. creation of new cost centres, change in cost drivers);
- b. The cost associated with wholesale activities can be lumpy (e.g. development of cost models, implementation of LLU, development and implementation of a reference access offer, upgrade to inter-operator systems); and
- c. "while the set of activities classified as wholesale-related might become stable over time, this is not an assurance that all the activities and costs associated with those activities have been effectively captured in the past" (Batelco's response, paragraph 166.c)).

530. Batelco also explained that the reason why Batelco has done an off-line calculation for the interconnect-specific cost in the past was "there had been no IT development to the model allowing reporting of a breakdown of the costs merely an overall amount" (Batelco's response, paragraph 167).

#### ***Batelco's comments on "Costing and Regulatory"***

531. While the EY report agrees with the Authority that the costing and regulatory accounting department support both the retail and wholesale activities of Batelco, it considers that because of the existence of more wide-ranging regulatory requirements at the wholesale level than the retail level, more time is spent by the Costing and Regulatory Accounting Department in supporting wholesale-related activities. It also considers that the revenue of individual products may not be an appropriate proxy for the time spent on regulatory costing and accounting in respect of any specific product as the time spent on any product is likely to be driven by factors such as the extent to which and the manner in which a product is regulated and the number of disputes with OLOs and the Authority.

#### ***Market Comm cost center***

532. Batelco indicated that it is "open to understand further the basis on which the suggested BD10,000 is derived or, in the alternative, the TRA to suggest a more cogent methodology [...]" (Batelco's response, para 169).

533. Batelco re-explained in its submission that:

- a. the cost allocated is not a pure direct cost of staff as it includes indirect cost as well as other overhead cost (e.g. support and un-attributable cost); and
- b. the cost of the web-site cannot be identified prior to allocation.

534. In response to the Authority's concerns regarding the allocation basis used by Batelco, Batelco proposes to use the "number of pages updated to wholesale vs number of pages updated for retail". Accordingly [X]% (BD[X]) of the overall department cost would be allocated to CN90 instead of [X]% (BD[X]).



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535. Batelco considers that this revised cost driver underestimates the cost that should be allocated to CN90 because (Batelco's response, paragraph 171):
- a. "[e]very piece of marketing and advertising will contain not just information about a specific retail product, but also general messages about Batelco and Batelco's integrated brand";
  - b. Prior to February 2010, the sole regulatory requirement for updating Batelco's web-site arose on the wholesale rather than retail side. Therefore Marcom cost should be diverted more towards wholesale rather than retail; and
  - c. Because the Authority has taken into account retail generated minutes costs but has not taken into account all costs which would be caused if retail was a stand-alone or un-integrated arm of Batelco wholesale, Marcom and other cost categories would represent a higher values on this basis.
536. In its report, EY "understand that marketing and advertising costs are considered retail activities by both Batelco and the TRA, and are therefore not allocated to CN90" (EY Report, page 4). While it notes that there is considerable uncertainty over the appropriate allocation driver, it considers that the Batelco proposal to use the number of updated pages as broadly consistent with the principle of cost causation.

#### ***Billing Systems and IT – fixed billing***

537. The EY Report not only includes the number of bills issued and their complexity as potential cost driver for the billing systems and its related activities as the Authority but also indicates that it is likely that the process of "wholesale billing is more complex and hence time consuming than retail billing on a per customer basis, due to the inherent complexity in interconnection transactions, including tariff structures, size of customers and breadth of offerings and bill reconciliations compared to retail bills" (page 5). EY concludes that wholesale billing would be expected to account for a larger than proportionate share of billing costs compared with an allocation based simply on the relative numbers of retail and wholesale bills.

#### ***Legal and regulatory***

538. Batelco argues that because the Authority has adjusted downward some of the wholesale cost allocated to wholesale access products, additional legal and regulatory cost should be allocated to the interconnect-specific costs.
539. Batelco further indicates that it expects legal and regulatory cost for 2009 and subsequent years to increase.

#### ***Batelco's comments on "Other Reconciliations and capital projects"***

540. In its response Batelco explained that this reconciliation is "mainly the net balance of all receivable and payable accounts between Batelco and OLOs. The balances are usually settled in the following year" (Batelco's response, paragraph 168).
541. In response to a request for clarification dated 25 November 2010 from the Authority asking Batelco to justify why this item should be allocated to CN90 and why Batelco does not consider it as working capital and record it as such, Batelco further explained that



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“[t]his item includes the net balance [...] which is considered as working capital (capital employed), hence multiplied by the WACC rate applicable for that year accounts” (See File 20101201 RO price submission Clarification meeting Batelco comments - Final). On 12 December 2010 Batelco confirmed that the total amount of A\_56c “Interconnect Reconciliation and Suspense” is allocated to CN90 (see file 20101212 RO agenda response additional - Batelco).

#### ***Equivalent cost for the provision of interconnection services***

542. Commenting on the 15% mark-up added by the Authority to the fair and reasonable ISC for the cost that Batelco may incur in the provision of interconnection to Batelco's downstream operations, the EY Report says that it may be appropriate for the Authority to undertake further analysis of this point given the materiality of this assumption.
543. It also mentions the omission by the Authority to add the 15% uplift for the year prior to 2009. This has been corrected in the final analysis.

#### ***Conclusion***

544. Batelco is of the view that further work and investigation is required to reach a conclusion on the total interconnect-specific cost. Batelco further considers that the cost information used by the Authority to assess interconnect-specific cost is not accurate.

#### ***Appropriate traffic base***

545. Batelco very strongly opposes the recovery of interconnect-specific cost from on-net minutes. It submits that the Authority should form its own views instead of relying on the position adopted by another regulator, Ofcom, in 2004.
546. In its draft Order, the Authority identified four principles to guide its decision in relation to the appropriate method to the recovery of interconnect-specific cost.
547. In relation to the principle of cost causation, Batelco explained that its application points to the recovery of interconnect-specific cost from the traffic which causes the interconnect-specific cost to be incurred, i.e. interconnection traffic only as the cost are related to activities which are caused by inter-operator activity.
548. Batelco further explained that proper weighting should be given to the other principles the Authority considers relevant.
549. With regards to the principle of cost minimization, while Batelco recognizes that it has a role to play, it argues that its role has to be properly assessed and balanced against other factors:
- a. “the principle can only act such that Batelco either chooses to allocate costs so that they are absorbed in some other part of Batelco's business the TRA will force such allocation” (Batelco's response paragraph 182.a));
  - b. “the principle, when applied here, also has the unreasonable material effect of “double handling” in so far as “the TRA is proposing to decide that 44% of Batelco's relevant costs are to be denied” (Batelco's response paragraph 182.b));
  - c. there are limits to the extent to which Batelco control actual costs as some are driven by the Authority's actions; and



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- d. “the principle has limited scope to apply” as some costs are either completely removed or adjusted by TRA, thereby preventing Batelco from exercising rational cost control (Batelco’s response paragraph 182.d)).
550. With regard to the principle of distribution of benefits, Batelco contends that customers who benefit from off-net connections already pay the cost of establishing interconnection services (Batelco’s response, paragraph 183):
- when retail customers make an off-net call to OLO customers they pay the imputed equivalent ISC in the termination paid to OLOs;
  - Batelco’s retail customers who use services such as CPS and freephone origination already pay an ISC through the origination charges that form part of their retail charges;
  - OLO retail customers, in the reverse scenario of (a) pay an ISC.
551. With regard to the principle of effective competition and non-discrimination, Batelco understands the argument but considers that the notion of discrimination is misplaced as “Batelco’s retail customers must, one way or another, pay (Batelco’s response paragraph 186):
- all the cost of the on-net and intra-Batelco off-net equivalent wholesale costs;
  - all the costs in which the TRA denies recovery of in respect of wholesale costs; and
  - the equivalent of an ISC in respects of calls made off-net to OLOs”.
552. Batelco proposed that at the most the relevant traffic could be expanded to “intra-Batelco off net traffic”. Following a request for clarification dated 25 November 2010, this traffic was subsequently defined by Batelco as “the traffic exchanged between Batelco fixed and mobile networks”.<sup>81</sup> Batelco argues that it is not appropriate to apply interconnect-specific cost to any on-net traffic since Batelco contends that the principles outlined by the Authority either do not apply or not in the way the Authority considers them to apply.
553. Batelco submits that the analysis contained in paragraph 356 of the draft Order should be removed. In material provided by Batelco in a subsequent clarification meeting, Batelco indicated that all references to [X]  
[X].<sup>82</sup>

#### **EY analysis**

554. In its report, EY conducted an analysis of the historic recovery of interconnect-specific cost along the lines of the Authority’s analysis. The four cases modelled by EY and associated results are summarised in the below table. EY analysis shows that the amount of [X] ranges between BD [X] to BD [X] for the period 2004-2009 inclusive. In light of the variation in results amongst the four cases considered, EY concludes that it may be

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<sup>81</sup> See document titled: 20101201 RO price submission Clarification meeting Batelco comments – Final. According to Batelco it includes the following six traffic scenarios: PSTN National to mobile postpaid 102c; PSTN National to Mobile prepaid 102d; ISDN to mobile postpaid 702c; ISDN to mobile prepaid 702d; GSM postpaid to PSTN national 300f; GSM prepaid to PSTN national 301e.

<sup>82</sup> See file titled 20101212 Agenda for second RO draft order clarification meeting - Batelco response.



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appropriate for the Authority to undertake further analysis of previous years’ cost and of the cost that Batelco may incur in providing interconnection to Batelco’s retail arm.

555. With regards to the relevant minutes to be included for the recovery of interconnect-specific cost, EY indicates that:

- a. the inclusion of mobile on-net minutes appears to represent a significant change from previous practice; and
- b. “Batelco does not provide interconnection services to Batelco’s mobile operations, which instead purchases dedicated transmission from the fixed network”. According to EY, this suggests that the inclusion of mobile on-net minutes “may not be appropriate” (EY Report, page 8).

556. According to EY, removing mobile on-net minutes from the relevant minutes gives estimates of [X] of between BD [X] to BD [X] as opposed to BD [X] to BD [X]. In light of this substantial variation, EY concludes that “it may be reasonable for the TRA to conduct a more detailed analysis of the relevant minutes to be included in its calculation” (page 8).

**Table 76: EY Interconnect-Specific Cost Recovery Analysis**

Scenario/Case	Cumulative recovery between 2005 and 2009 in BD	Cumulative recovery between 2005 and 2009 in BD (excluding mobile on-net minutes)
<b>Case 1:</b> The Authority’s parameters	[X]	[X]
<b>Case 2:</b> Same as case 1 but with 15% uplift applied to previous years cost	[X]	[X]
<b>Case 3:</b> Batelco’s submitted costs as reported in Table 63 of the draft RO Order with the Authority’s minutes	[X]	[X]
<b>Case 4:</b> Batelco’s adjusted costs (reflecting Batelco’s change to Marcom cost but excluding “other reconciliation and capital projects items”)	[X]	[X]

Source: EY Report, page 7

***Recovery of LLU implementation cost via the ISC***

557. Batelco considers that it is incorrect that minute-based interconnection services carry costs of access services like the introduction of LLU.

558. In their report EY argues that LLU implementation cost (i.e. the cost associated with product development, the establishment of technical systems, its provision to downstream providers, and any required adjustment to its billing systems) should be recovered from LLU services and not through the ISC. It considers that doing otherwise would violate the principle of cost causation and distort demand and investment incentives of OLOs.



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#### ***Offsetting historic recovery against future costs***

559. The EY report indicates that the conclusions of the Authority according to which Batelco has [X] the ISC may give rise to the suggestion that this [X] is used to off-set Batelco's forward-looking costs of providing wholesale services, including the costs associated with the implementation of LLU. EY argues that this practice would be equivalent to retrospectively adjusting the ISC and hence would represent an ex-post amendment to an ex-ante regulatory pricing decision. Regardless of whether the ISC has exceeded the associated costs, EY is of the view that such an approach could risk reducing regulatory certainty for all operators in Bahrain and the incentive benefits of price controls.

#### ***Batelco's heading "This is not what was agreed"***

560. In its submission, Batelco contends that the work carried out by the Authority in relation to the ISC is not consistent with what was agreed. Batelco understands that the 2009 arrangement provided that (Batelco's response, paragraph 192):

- a. "that there would be a full study of the costs/minutes/methodology in the next Reference Offer round;
- b. The assessment would look at historic costs and calculations, but no adjustment would be made in ISC going forward on the basis of historical calculations."

561. Batelco takes issue with the analysis of the Authority. It argues that the Authority has:

- a. artificially reconstructed a backward-looking assessment of cost as the categories which existed in 2009 did not exist previously;
- b. applied those adjusted costs to minutes which had not been deemed relevant in the past; and
- c. on this basis assessed "[X]".

562. Batelco concludes that the analysis conducted by the Authority is:

- a. wrong at law "since possible outcomes of the past if a different policy or price had applied other than the one determined by the TRA to be fair and reasonable is an irrelevant consideration to the setting of an interconnection price" (Batelco's response paragraph 196.a);
- b. inconsistent with the commitment made by the Authority in 2009;
- c. unhelpful to the setting of the current ISC since it is so inflammatory;
- d. gratuitous and unnecessary.

563. Batelco further argues that the Authority's analysis:

- a. takes an aggressive position in respect to current costs; and
- b. ignores actual historic cost under recovered by ignoring all the cost incurred in 2003 and reconfiguring all historical costs by imputing similar cost reductions.



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**The Authority's analysis and conclusion**

***On Batelco's comments on "Costing and Regulatory"***

564. Having considered the points and opinions raised by Batelco and its consultants E&Y the Authority does not consider that the arguments presented justify a change of its position as articulated in the draft Order. The Authority notes in particular that the pricing decisions, marketing and commercial strategies of Batelco are informed by the regulatory accounts. The product profitability analyses conducted by Batelco also relies heavily on these regulatory accounts. Hence it would be unfair for Batelco to recover more than [X]% of the cost of the "Costing and Regulatory" function from OLOs since Batelco's retail operation greatly benefits from the work done as part of the RO review for the establishment of cost stacks and regulatory accounts. Much of the "Costing and Regulatory" function is horizontal and can be classified as a common cost which should be allocated based on revenues as argued in the draft Order or through EPMU.
565. For the reasons above and considering the horizontal nature of the "Costing and Regulatory" function as well as the fact that Batelco's retail and unregulated operations benefit from the activities undertaken by the Costing and Regulatory team, the Authority considers that allocating 35% of the cost of this team to CN90 is extremely conservative as a more appropriate allocation basis would be either revenues or EPMU.

***On Batelco's comments on Section 13.3.1 of the draft Order "Evolution of the ISC costs claimed by Batelco"***

566. Whilst the Authority recognises that the wholesale activities and associated costs can be lumpy, it remains of the view that the total interconnect-specific cost would be expected not to display the wide range of fluctuations observed in the past ([X]% between 2007 and 2008).
567. The Authority also notes the inconsistency in Batelco's response (paragraph 166.b)): whilst Batelco argues in this submission that the ISC should not cover any access products, its response at paragraph 166.b) indicates that access-related costs are included in interconnect-specific costs.
568. The Authority is grateful for the explanation provided by Batelco concerning the reason why an off-line calculation for the interconnect-specific cost was previously made (no IT development made). The Authority had previously asked this question but was not provided with a specific reason for doing an off-line calculation (See Batelco's response to Questions 31 and 32, file 20100630 RO assessment article 53 response phase one\_Further Details\_FINAL ).

***On Batelco's comment on Market Comm cost center***

569. The Authority remains of the view that *at the most* only the incremental cost of updating the web-site should be allocated to CN90. Absent a robust estimate of the cost of updating the web-site, the Authority has taken a very generous approach to defining the cost to be allocated to CN90. The Authority considers that at the most it would take one day per



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month to update the wholesale part of the Batelco web-site.<sup>83</sup> The Authority also notes that the allocation of Marcom costs to CN90 was not approved by the Authority as part of the APM review process.<sup>84</sup>

570. Since there are no direct marketing or advertisements targeted to wholesale customers, including marketing costs to CN90 would neither be fair nor reasonable. It would not be fair and reasonable for wholesale customers to bear some of the cost incurred by Batelco to promote its own brand image and retail services with which OLOs might compete on the basis of Batelco's wholesale products. Consequently this would distort competition in favour of Batelco. The Authority notes that the EY Report prepared on behalf of Batelco concurs with the Authority's conclusion that marketing and communications activities related to retail should not be allocated to CN90 (EY Report, page 4).
571. As explained in the draft Order, the purpose of Batelco's website is to market Batelco retail services. As a marketing tool, Batelco regularly updates its website not because it is a regulatory requirement (with the exception of the wholesale part) but because it is an important marketing and communications tool between it and its retail customers.
572. With respect to Batelco's comments at paragraph 171.c), the Authority disagrees with Batelco's argument that because the Authority has taken into account retail generated minutes, additional marcom related costs should be included in CN90. It remains that only the wholesale related cost of Batelco's web-site are relevant in this case. Consistent with the Authority's view that all minutes should be included, the Authority notes that it has included in the total interconnect-specific costs an uplift of 15% reflecting the cost that Batelco may incur in the provision of interconnection services to Batelco retail.
573. For the above reasons the alternative allocation basis proposed by Batelco (i.e. number of updated pages) is rejected and the draft Order position of the Authority is maintained. At the most, only the incremental cost of updating the wholesale part of the web-site is relevant to CN90. In the absence of robust cost estimate, the Authority has in this instance decided to allocated BD 10,000 to CN90.

#### ***On Batelco's comments on Billing Systems and IT – fixed billing***

574. The Authority does not consider that Batelco's submission justify a change of position compared to the draft Order in which the Authority indicated that absent further information it considered that the fair and reasonable allocation to CN90 was [X]% for billing systems and [X]% to IT –fixed billing as opposed to [X]% and [X]%.
575. In relation to Batelco's comments on billing systems and IT – fixed billing, the Authority does not disagree with the point made by EY that the billing cost per customer would be greater for a wholesale than a retail customer. However, the Authority disagrees with the EY Report which states that wholesale billing is more complex and the implicit conclusion that the adjustments made by the Authority are not appropriate. Further to the points made in the draft Order, the Authority considers that wholesale billing is simpler than retail billing.

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<sup>83</sup> Assuming one man day per month to update the wholesale part of the Batelco website gives a monthly equivalent loaded cost for the staff involved of BD 16K ( BD 10K / 12 (number of days over the year) x 20 (number of working days per month).

<sup>84</sup> According to the 2008 APM and the Note to the 2008 regulatory account, no Market Comm cost should have been allocated to the interconnect-specific costs. In other words, Market Comm were added when the regulatory accounts were prepared and the Authority was only informed ex-post of their inclusion.



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The reconciliation and mediation at the retail level far exceed those of the wholesale level. Furthermore wholesale billing has accuracy thresholds whereby if the purported discrepancy is within the threshold, no claim is issued. The complexity of bills of corporate customers and associated accuracy requirements can be expected to be greater than for the bills of most OLOs. The Authority further notes that retail tariff structures (e.g. mobile plans) tend to be more complex than wholesale tariff structures.

#### ***On Batelco's comments on Legal and regulatory***

576. As explained in the draft Order, the Authority has adjusted certain wholesale activity cost allocated to access products using an activity-based approach to counteract the pitfalls of the top-down approach used by Batelco. The comments of Batelco in relation to wholesale activity costs of access products are addressed in the various sections on access products.

577. The Authority also notes that at 0.7 fils/min, the ISC charge provides substantial headroom in so far as the cost based ISC would be around 0.3 fils/min.

#### ***On Batelco's comments on Other Reconciliations and capital projects***

578. Based on the clarifications provided by Batelco and despite reservations, the Authority has decided for the purposes of this Order to include the item "Other Reconciliations and capital projects" as part of the relevant interconnect-specific cost. This is in addition to the working capital already included in the various items of the interconnect-specific cost. However, as previously noted by the Authority (e.g. Report sent to Batelco on 27 May 2010, MCD letter ref MCD/05/10/062), the level of working capital is very significant and generates substantial additional revenue requirement which does not appear justified.

#### ***Conclusion on interconnect-specific cost***

579. Having considered Batelco's comments and the information provided by Batelco on which the Authority has based its analysis, the Authority concludes that the fair and reasonable interconnect-specific cost is BD [X] as detailed in the below table. The only change compared to the draft Order relates to "Other Reconciliation and Capital Projects Items" which has been included following Batelco's comments.

580. As indicated in the draft Order, only relevant and efficiently incurred cost should be included. In that regard the comments made in paragraphs 481-483 of the draft Order are particularly relevant.



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**Table 77: The fair and reasonable ISC cost stack**

CN90 ISC: Breakdown 2008	Total	Proposed Batelco		TRA Fair and Reasonable	
		Amount allocated to CN90	% of total allocated to CN90	Revised % of total allocated to CN90	Revised Amount allocated to CN90
62400 [Costing & Regulatory]	[X]	[X]	[X]	[X]	[X]
36552 [Market Comm]	[X]	[X]	[X]	[X]	[X]
30500 [Wholesale & Carrier]	[X]	[X]	[X]	[X]	[X]
64670 [Billing Systems]	[X]	[X]	[X]	[X]	[X]
UA01 [Corporate Management Services]	[X]	[X]	[X]	[X]	[X]
62100 [Commercial Operation]	[X]	[X]	[X]	[X]	[X]
21050 [IT - Fixed Billing]	[X]	[X]	[X]	[X]	[X]
30400 [Legal & Regulatory]	[X]	[X]	[X]	[X]	[X]
UA04 [Corporate Plannig And Accounting]	[X]	[X]	[X]	[X]	[X]
UA03 [Information Security]	[X]	[X]	[X]	[X]	[X]
Other Reconciliation & capital projects items		[X]	[X]	[X]	[X]
<b>Total cost CN90</b>		[X]	[X]		[X]
				Delta	-28%

Source: The Authority

***On the appropriate traffic base***

581. In light of the comments made by Batelco and the further EY report, the Authority remains firmly of the view that the interconnect-specific cost should be recovered from all the minutes conveyed or transited on Batelco's fixed and mobile networks. On balance, the cost recovery principles defined by the Authority point to the recovery of interconnect-specific cost through all minutes.
582. While Batelco does not dispute the principles defined by the Authority it strongly disagrees with their application and their relative weighting by the Authority.
583. On cost causation, as indicated by the Authority in the draft Order, this principle suggests that interconnect-specific cost should be recovered from interconnect traffic as it is the need for interconnection services which causes those costs to be incurred. However, it could be also be argued that it is the Government who caused the interconnect-specific cost to be incurred by passing the 2002 legislative decree promulgating the Telecommunications Law which contemplates the liberalisation of the market and the interconnection of competing networks. According to this interpretation, the cost could be appropriately recovered from the whole industry. In other words, the application of the principle of cost causation does not point unequivocally to the recovery of cost from OLOs as argued by Batelco.
584. Batelco argues that the principle of cost minimisation has a more limited role to play and must be assessed and balanced against other factors. While this argument may have some merit, it remains that this principle still has an important role to play when



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considering the appropriate method for recovering costs: if Batelco were allowed to pass on to OLOs whatever cost it advocates, then it would have no incentive to minimise cost. To the contrary it may have an incentive to strategically allocate cost (see paragraph 482 of the draft Order), particularly as Batelco would have the ability to increase costs borne by its competitors and thereby soften competitive pressures in downstream markets. The application of the principle of cost minimisation suggests that the ISC should be recovered from all minutes. Further, as repeatedly mentioned, only relevant and efficient cost should be included in CN90. In its submission Batelco seems to confuse cost allocation with cost minimisation, efficient cost and cost control. These are different.

585. With regards to the points raised by Batelco in relation to the application of the distribution of benefits principle which indicates that the interconnect-specific cost should be recovered from all minutes, the Authority notes that Batelco's submission does not take into account the benefits derived by customers who receive / are able to receive calls. In the position advocated by Batelco, those customers would not contribute to the recovery of interconnect-specific cost although they derive benefits from the interconnection of networks. This is a major flaw as customers benefit from making / the ability to make *and* from receiving / the ability to receive calls. Further the Authority does not see the relevance of the points made by Batelco in paragraphs 183.a) and 183.c) of its response: Batelco's customers and OLOs' customers contribute to the recovery of the interconnect-specific cost of their respective operators. When a Batelco retail customer makes an off-net call to an OLO's customer it contributes to the interconnect-specific cost of Batelco (via the ISC which forms part of the service cost stack) and the interconnect-specific cost of the OLO via the termination rate of the OLO. The same applies in the reverse scenario. In relation to paragraph 183.b) of Batelco's submission, the Authority notes that it would put OLOs at a competitive disadvantage and therefore conflicts with the principle of effective competition and non-discrimination.
586. None of the points raised by Batelco in relation to the last principle, effective competition and non-discrimination, considers the question of effective competition. This is a major deficiency as this principle is a key cost recovery principle derived from the duty of the Authority set in the Telecommunications Law to promote competition. The application of this principle clearly points to the recovery of interconnect-specific cost not only from OLOs but from all minutes since otherwise it would put OLOs at an unfair cost disadvantage. Taking the example of international calls originated on Batelco's fixed lines, if the ISC is not included in the retail cost stacks of Batelco, an OLO would have a structural disadvantage over Batelco in the provision of international calls as it would have to incur the ISC (currently set at 1 fils per minute) whereas Batelco would not. Even if the OLO is as efficient as Batelco in the provision of international calls, it will not be able to match Batelco's price. To level the playing field, the Authority has also included in the interconnect-specific cost equivalent cost that Batelco may incur in the provision of interconnection services to Batelco retail.
587. With respect to the EY report, the Authority notes that EY is in broad agreement with the conclusions of the Authority. Contrary to Batelco's submission, the EY report, prepared on behalf of Batelco, does not dispute the appropriateness of including Batelco fixed on-net minutes. It only suggests that because "Batelco does not provide interconnection services to Batelco's mobile operations, which instead purchases dedicated transmission from the fixed network" the inclusion of mobile on-net minutes "may not be appropriate" (page 4). However, this tentative position of EY does not rely on the application of any cost recovery principles. This contrasts with the principle-based analysis of the Authority set out above



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which has shown that interconnect-specific cost should be recovered from all minutes transited and conveyed on Batelco's fixed and mobile networks. In any case the Authority does not consider valid the reason put forward by EY to remove mobile on-net minutes. Interconnect links (ISI and CSI) can be seen as the equivalent of dedicated transmission links between the fixed and mobile networks referred to by EY. In so far as OLOs pay for interconnect links, it does not appear logical to remove mobile on-net minutes on the basis that Batelco mobile purchases from Batelco fixed dedicated transmission links as each operator pays for its interconnect links, e.g. OLOs pay to Batelco for their ISI and CSI.

588. After considering carefully the question of the relevant traffic to use for the calculation of the ISC, the Authority concludes that mobile traffic should be included. This is consistent with what the Authority indicated in the 17 July 2007 Reference Interconnection Offer Order in which the Authority said that it was still considering whether mobile traffic should be included and reserved its judgment at that stage.
589. Regarding the point made by Batelco regarding the removal of the Authority's analysis of paragraph 495, the Authority has decided to redact certain elements of its analysis.
590. Overall, the Authority remains of the view that all minutes conveyed or transited on Batelco's fixed and mobile networks form the basis for the recovery of interconnect-specific cost.

#### ***On "This is not what was agreed" and offsetting historic recovery against future costs***

591. The Authority disagrees with the assertions made by Batelco according to which the Authority has not conducted a review of the ISC in line with the 2009 RO approval letter dated 17 September 2009 (Ref: GDO/0909/031).
592. The Authority considers that it has conducted a comprehensive analysis of the ISC, the relevant cost and relevant minutes, although it recognizes that contrary to what was anticipated in the 2009 RO approval letter, this analysis has been conducted as part of the RO review and not prior. Although the Authority did not have to, it has admitted a subsequent submission (the EY Report) dated 14 December 2010 which deals with the ISC and broadly concurs with the position of the Authority. Furthermore Batelco has been consulted on this issue and has had numerous opportunities to contribute and provide information and data it deems relevant since its RO submission of 1 April 2010.
593. For its analysis, the Authority has requested Batelco to provide detailed information regarding matters such as the composition (present and historical) of the ISC, historical traffic data, the basis for the allocation of cost and the various items included in the ISC.<sup>85</sup> It was also clearly communicated to Batelco that the Authority was conducting a comprehensive review of the ISC in line with the 17 September 2009 letter (see e.g. Page 5, 4<sup>th</sup> line of the Authority's letter dated 23 May 2010, MCD/05/10/057). In this context, Batelco initially chose to challenge the validity of the 17 May 2010 information request which contained numerous questions related to the ISC. It subsequently provided information as per the requests formulated by the Authority but did not submit information

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<sup>85</sup> Article 53 request dated 17 May 2010 (MCD0510054 RO Question A53.docx and Questions on RO submission FINAL.docx); mail from Alexandre Serot to Denise Enockl dated 21 July 2010 (RE: Unattributable cost); Article 53 request on 26 July 2010 (MCD0710078 Art 53 Info Request Wholesale Cost and Traffic.docx); and mail from Alexandre Serot to James Ibbetson dated 23 August 2010 (RE: Art 53 Request on Wholesale cost + traffic GCL/333/10).



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beyond that requested. While Batelco calls for further analysis of the ISC, it has not submitted further data it may deem relevant for the understanding of the ISC (neither as part of its response to the draft Order nor as part of the EY report).

594. In reaching a conclusion on the ISC, the Authority has looked at the historical composition of the interconnect-specific cost based on available information. Based on its analysis of the relevant minutes to which the ISC cost should be allocated, it has then modelled the implicit and explicit under/over recovery since 2004. However and contrary to what Batelco is suggesting, the Authority has not and is not indicating that the past [X] between 2004 and 2009 estimated by the Authority [X] [X].

#### Recovery of LLU implementation cost and other access-related cost via the ISC

595. With respect to Batelco's argument according to which it is incorrect for minute-based interconnection services to carry cost of access products, the Authority notes that Batelco made a submission to that effect in January 2009 in which it calculated an ISC based on interconnection and access cost (see file title Annex D ISC and Access Calculation submitted in January 2009).
596. While the recovery of LLU implementation costs through the ISC may conflict with the application of the principle of cost causation, the Authority has determined that an ISC of 0.7 fils/minute is appropriate for the current period, particularly in light of the current uncertainty over the level of efficient implementation costs for access products such as LLU. At 0.7 fils, the ISC [X] [X] for the recovery of efficiently incurred LLU implementation costs. The Authority does not intend to review the ISC until the process commences for the assessment of Batelco's RO that is due to be submitted to the Authority in December 2011. At that point, the Authority may reconsider the appropriateness of setting the ISC at 0.7 fils/minute. Any such reconsideration will include an assessment of whether implementation costs relating to wholesale access products, such as any **unrecovered** system set-up costs for LLU, should be recovered through separate and explicit charges rather than through the ISC. In the event that separate recovery of such costs is considered appropriate, such cost recovery will be in accordance with the same cost recovery principles that are set out and discussed in this Order in paragraph 476. For example, in the case of LLU implementation costs, these principles strongly suggest that such costs should be recovered across all DSL services, including Batelco's retail DSL services, so as to provide Batelco with incentives for cost minimisation, and to ensure that the recovery of such costs does not create a barrier to LLU-based entry. This would also ensure that all beneficiaries of LLU-based competition, including Batelco's own retail DSL subscribers, would contribute to the cost of implementing LLU.<sup>86</sup>
597. The Authority also notes that if the implementation costs of wholesale access products are to be recovered through separate charges, the ISC should be reduced to a level that reflects interconnection-related costs. Given the Authority's analysis of such costs and the relevant traffic base that is set out in this Order, the Authority's point estimate of a fair and

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<sup>86</sup> When considering the same issue, Ofcom concluded that any efficiently-incurred costs associated with setting up LLU-based systems should be recovered across all DSL lines. See Ofcom, "Review of the wholesale local access market", 16 December 2004, paragraphs 8.24-8.25.



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reasonable cost-based ISC for 2009 is [X] fils/minute (see Table 78 below). Allowing for the relevant sensitivities discussed below, the Authority is of the view that a cost-based ISC would be no greater than [X] fils/minute.

#### The fair and reasonable ISC and sensitivity analysis

598. The table below set out the Authority's revised calculations of the ISC and its historical recovery of interconnect-specific cost. Compared to the draft Order, two changes have been made following the comments received:

- a. the category "Other reconciliation & capital projects items" has been included in the relevant cost category; and
- b. the Authority's fair and reasonable cost for years prior to 2008 have been derived by adjusting the original cost by the same percentage difference between the 2008 cost submitted by Batelco and the fair and reasonable cost determined by the Authority.

599. The Authority has not modified its 15% uplift assumption for the equivalent cost that Batelco may incur in the provision of interconnection to Batelco retail. The Authority remains of the view that this is a conservative assumption.<sup>87</sup> The Authority also notes that its conclusions in relation to the ISC are not dependent on this assumption (see sensitivity analysis below).

600. The analysis contained in the table below shows:

- a. [X]  
[X];
- b. [X].
- c. [X]  
[X]  
[X]

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<sup>87</sup> BT equivalent cost represented 6.7% of the fair and reasonable interconnect specific cost determined by Ofcom. The equivalent cost were submitted by BT and accepted on the face of it by Ofcom. See Ofcom, Review of BT's product management, policy and planning (PPP) charge, Statement 30 July 2004, p27.



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**Table 78: ISC revised cost recovery analysis**

Interconnect-specific cost in BD	2004	2005	2006	2007	2008	2009	Average
TRA fair and reasonable cost	[X]						
Cost claimed by Batelco	[X]						
Traffic (in '000 minutes equivalent)	2004	2005	2006	2007	2008	2009	Average
TRA fair and reasonable traffic	[X]						
Traffic claimed by Batelco	[X]						
ISC (in fils per minute)	2004	2005	2006	2007	2008	2009	Average
TRA Fair and Reasonable	[X]						
ISC claimed by Batelco	1.28	2.98	1.34	1.17	1.17	1.28	1.54
Applicable ISC	1	1	1	1	1	1	1
Recovery analysis	2004	2005	2006	2007	2008	2009	Cumulative
Revenues in BD TRA Fair & Reasonable		[X]	[X]	[X]	[X]	[X]	[X]
Cost in BD TRA Fair & Reasonable	[X]						
Over(under) recovery		[X]	[X]	[X]	[X]	[X]	[X]

Notes:

TRA fair and reasonable cost taken into account in this table includes a 15% up-lift reflecting TRA's assumption of the cost that Batelco may incur in the provision of interconnection to Batelco retail. This is a conservative assumption considering the Ofcom decision in which Ofcom accepted on the face of it the estimate provided by BT which represented 6.7% of the PPP cost.

TRA fair and reasonable cost for years prior to 2008 have been derived by adjusting the original cost by the same % difference between the 2008 cost submitted by Batelco and the fair and reasonable cost determined by the Authority as well as by adding a 15% uplift.

Over(under) recovery is equal to the product of the applicable minutes by 1 fil minus the interconnect-related cost of the previous year.

The analysis above does not take into account 2010 traffic. The magnitude of [X] is therefore under-estimated.

Source: Batelco's response to 17 May 2010 and 26 July 2010 article 53 information request; previous RO submissions, Draft Orders and Orders, TRA analysis.

601. To complement its analysis, the Authority carried out further analysis based on different parameters (see table below). The results of this sensitivity analysis support the Authority's finding that the ISC needs to be lowered. More specifically, it shows:

- a. [X]  
[X];
- b. [X]  
[X];
- c. [X]  
[X];
- d. [X];
- e. [X]  
[X];
- f. [X]  
[X];
- g. [X]  
[X].



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**Table 79: ISC sensitivity analysis**

	Recovery of interconnect-specific cost		ISC per min	
	Cumulative 2004-9	2009	Average 2004-9	2009
<b>TRA fair and reasonable</b>	[X]	[X]	[X]	[X]
Sensitivity 1: TRA cost less equivalent cost	[X]	[X]	[X]	[X]
Sensitivity 2: Cost claimed by Batelco with TRA minutes	[X]	[X]	[X]	[X]
Sensitivity 3: Cost claimed by Batelco plus Equivalent Cost with TRA minutes	[X]	[X]	[X]	[X]
Sensitivity 4: TRA cost with TRA minutes less mobile on-net traffic	[X]	[X]	[X]	[X]
Sensitivity 5: Equivalent cost of 30% instead of 15%	[X]	[X]	[X]	[X]

602. In setting the ISC at 0.7 fils/min, the Authority has had regards to the cost-based ISC, estimated at [X] fils/min over the period 2004 to 2009 ([X] for 2009 alone) and the [X] an ISC at 0.7 fils/min gives to Batelco to recover the efficiently incurred implementation cost of wholesale activities, such as LLU. For example, assuming constant interconnect-specific cost and traffic for 2010, the head-room is estimated at BD [X]. As explained in paragraph 597, the Authority considers the recovery of access products implementation costs by this head-room to be appropriate. Further, at 0.7 fils/min, the ISC provides adequate headroom to accommodate fluctuations in the relevant cost and traffic. Even with a 30% increase in cost and 10% drop in traffic, the headroom, i.e. difference between the revenues and cost is estimated at BD [X] per annum.

**Conclusion on the ISC**

603. Having conducted a comprehensive review of the ISC, considered the comments and concerns raised by Batelco the Authority has decided to set the ISC at 0.7 fils/min.
604. At this level, the ISC leaves adequate head-room for the recovery of efficiently incurred costs of certain wholesale activities, such as capital intensive product development and enhancements, including the implementation of LLU as well as the fluctuation of relevant cost and traffic.
605. Setting the ISC at 0.7 fils per minute is a conservative decision of the Authority. The ISC applicable to SMS and MMS is set at 0.018 fils and 0.233 fils per event respectively to reflect the conversion factors (0.025 and 0.33) used to convert SMS and MMS in minutes equivalent.
606. The Authority does not intend to review the ISC until the process commences for the assessment of Batelco’s RO that is due to be submitted to the Authority in December 2011 unless the Authority deems it appropriate to review it before. Any such reconsideration will include an assessment of whether implementation costs relating to wholesale access products, such as any unrecovered system set-up costs for LLU, should be recovered through separate and explicit charges rather than through the ISC.



## **14 Other matters raised by Batelco**

### **Summary of Batelco's response**

607. Batelco raised a number of matters not addressed in the draft RO Order:

- a. the implementation of the order;
- b. the treatment of international inbound traffic to fixed and mobile networks;
- c. Wholesale outbound switched minutes (WSIDD); and
- d. the treatment of regulatory accounts.

### **Implementation date of the order**

608. Batelco submits that the price changes should not be effective within two working days following the RO Order publication. Batelco argues that implementing price changes on a particular date can be problematic as they require manual recalculation. This issue would be particularly acute this year as Batelco is in the process of deploying a new wholesale billing system and would have to perform manual interventions in both the new and old systems.

609. Batelco also notes that the Authority had already recognized such implementation difficulties in its RO approval letter dated 17 September 2009. The effective date of price changes in the previous year RO review has been adjusted to take into account billing cycle in order to minimise implementation cost and reduce the risk of billing dispute.

610. Batelco also submits that article 5.5 of the Access Regulation provides for the publication of the reference access offer within two weeks of its approval or ordering.

611. Batelco suggests that all price changes should take effect from the first day of the calendar month following the Authority's approval or Order for this year RO and future ROs.

### **International inbound traffic to fixed and mobile networks**

612. In its RO submission dated 1 April 2010 Batelco proposed to include a wholesale buffer in respect of the delivery of international inbound traffic delivered to mobile and fixed networks. The Batelco submission did not specify the exact buffer and indicated that this issue should be discussed.

613. Batelco also noted that this concept has "the in-principle support of other operators in Bahrain who invest significantly in customer-connection network infrastructure" (Batelco's submission, paragraph 198).

614. Batelco also put forward an alternative proposal which would consist of introducing a price floor for inbound charges. The floor would be consistent with benchmarks recommended by the Arab League Committee of telecommunications with respect to voice termination.

615. Batelco's submission included some background on the glide path and the rationale for the introduction of a buffer.



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**WSIDD**

616. With regards to comments on WSIDD, Batelco refers to its comments made at paragraph 133-135 of its submission in relation to IPLCs. In these three paragraphs, Batelco argues that the finding that Batelco is dominant in the wholesale market for access to international facilities made in 2006 should be revisited. It contends that this market should be split into two separate markets (one for the supply of international transmission capacity into Bahrain and one for the supply of international outbound call termination services from Bahrain to specific geographic areas) and that Batelco is not dominant, and has no SMP in each of these markets.

**Treatment of regulatory accounts**

617. Batelco contends that having recently approved the APM, which is the basis on which the regulatory accounts are prepared, the Authority selectively changes decisions already made in the APM. This has the effect of changing some of the cost stacks. Batelco submits that this should not happen since if changes are deemed necessary they should be made in the APM which will flow into calculations in future RO submissions.

618. Batelco also contends that in some cases adjustments are applied to a whole range of products/model (e.g. number of minutes) while in other instances they are applied only to the case identified. Batelco submits that this approach is arbitrary and appears both unreasonable and unfair.

**The Authority's analysis and conclusion**

**Implementation of the order**

619. The Authority agrees with Batelco and set the effective date of price changes on the first day of the calendar month following the RO Order publication issuance with the exception of Wholesale DSL charges which shall apply from the start of the next billing cycle following the RO Order publication issuance. For this year RO review, the effective date is therefore 1 February 2011.

620. All future RO price changes, whereas approved or ordered by the Authority, will apply on the first day of the calendar month following approval/order date of the RO with the exception of Wholesale DSL charges which shall apply from the start of the next billing cycle following approval/order date of the RO.

621. The Authority's decisions must be reflected in Batelco's RO 10 working days following the date of issuance of this Order. Batelco shall inform all its wholesale customers and the Authority by email of the new charges and their associated effective dates within 2 working days following the date of issuance of this Order.

**International inbound traffic to fixed and mobile network**

622. The Authority considers that the issue of international inbound traffic to fixed and mobile networks is an industry-wide issue and as such needs to be addressed in a separate regulatory proceeding. This is recognized by Batelco and certain other operators, who



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have approached in the past the Authority. The Authority intends to look at this issue in the first half of 2011.

**WSIDD**

623. WSIDD rates are currently regulated by virtue of the finding of dominance of Batelco in the wholesale market for access to international facilities made in 2006.<sup>88</sup> In line with the Telecommunications Law, the removal of the regulation of WSIDD and any other regulatory remedies imposed on the basis of a finding of SMP or dominance, can only take place once the relevant market has been reviewed and no SMP or dominance has been found. Pending such a review, regulatory obligations, including the regulation of WSIDD, stand.
624. The Authority notes the demand by Batelco to conduct a market review of the wholesale market for access to international facilities, including a separate “application for a determination that Batelco is not dominant in the wholesale market for access to international facilities” made by Batelco on 14 December 2010. The Authority intends to communicate to Batelco its intention regarding this request for a market review in the first half of 2011.

**Treatment of regulatory accounts**

625. Accounting separation and the setting of wholesale charges are different activities which serve different purposes. There is an accounting separation requirement placed on Batelco which obliges Batelco to prepare regulatory accounts in accordance with an approved APM. The regulatory accounts are then used as the basis for Batelco to prepare its RO submission. However and contrary to Batelco’s view, it may be necessary to make adjustments to the output of regulatory accounts in order to derive wholesale charges. The Authority considers that adjustments to the cost base of regulated wholesale products derived from regulatory accounts may be necessary even though the APM has been approved by the Authority. Adjustments may be required to set prices in accordance with the relevant provisions of the Telecommunications Law, including providing appropriate investment incentives and the promotion of competition.<sup>89</sup>
626. Accounting separation is typically done at the business unit or market level whereas the RO deals with individual products and services. Accounting separation is used primarily to assess past behaviour (e.g. anti-competitive behaviour, excessive pricing reflecting a lack of competition and price discrimination), although it can and is currently used by Batelco and the Authority to set wholesale charges in the absence of alternative cost models. It is undertaken at the business unit level and does not necessarily provide sufficiently granular information to enable the costing of individual products and services. For example Batelco makes adjustments to the information provided by its regulatory accounts to derive the cost of duct rental or of its CAT/LLCO.
627. Adjustments may also be required to ascertain whether only relevant costs are included and that allocation bases are appropriate for the pricing of individual services as opposed

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<sup>88</sup> The Authority, Dominance in Wholesale Markets by Batelco, 22 January 2010.

<sup>89</sup> See also Retail Tariff Notification Guidelines, part 5, 18 February 2010, for costs adjustments in the context of retail tariffs.



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to the top-down fully allocated cost approach followed in the regulatory accounts. It may also be warranted to make efficiency adjustments. Because there is a substantial lag between the time at which the cost are incurred and the time at which the regulatory accounts are available and the RO is submitted and new wholesale charges are applicable, it may be appropriate to update costing information in order for wholesale charges to better reflect current cost. For instance the charges ordered for this RO will be applicable in 2011 but the costing information on which Batelco's submission relies is the 2008 regulatory accounts, i.e. 2008 cost. Thus, asset lives or the applicable cost of capital may need to be amended,<sup>90</sup> and has been amended for a number of products where it was essential to make the changes.

628. Adjustments made by the Authority are detailed and explained in the services sections.

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<sup>90</sup> While the latest determination on the cost of capital (which superseded the previous one) was issued in November 2009, the cost of capital used in the 2008 is based on the 2005 determination.

