

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

### Study on the Regulation of Wholesale Broadband Markets

A study issued by the Telecommunications Regulatory Authority of the Kingdom of Bahrain

26 March 2009

#### Request for comments:

The Telecommunications Regulatory Authority ("TRA") invites comments on this consultation document from all interested parties. **Comments should be submitted by 4pm on 7 May 2009.**

Responses should be sent to TRA for the attention of the General Director preferably by e-mail (or by post) to:

The General Director  
[consult@tra.org.bh](mailto:consult@tra.org.bh)  
Telecommunications Regulatory Authority  
P.O. Box 10353, Manama, Kingdom of Bahrain  
+973 1753 2125

**Purpose:** To define the appropriate set of regulated wholesale products for wholesale broadband markets.



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Authority

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## Study on the Regulation of Wholesale Broadband Markets

### Table of contents

<b>TABLE OF CONTENTS</b> .....	2
<b>INSTRUCTIONS FOR SUBMITTING A RESPONSE</b> .....	3
<b>LIST OF ACRONYMS</b> .....	4
<b>1. INTRODUCTION</b> .....	5
<b>2. APPROPRIATE ACCESS REMEDIES IN WHOLESAL BROADBAND MARKETS</b> .....	6
2.1 LLU AND BITSTREAM ARE COMPLEMENTARY WHOLESAL PRODUCTS.....	7
2.2 HAVING LLU AND BITSTREAM IN PLACE, THE REGULATION OF WHOLESAL DSL IS NO LONGER NECESSARY AND SHOULD BE PHASED OUT .....	14
2.3 CONCLUSION ON APPROPRIATE ACCESS REMEDIES IN WHOLESAL BROADBAND MARKETS.....	15
<b>3. ASSESSING WHETHER IT IS NO MORE THAN IS APPROPRIATE AND NECESSARY TO IMPOSE UPON BATELCO AN OBLIGATION TO PROVIDE LLU TO ADDRESS THE MARKET FAILURE IDENTIFIED</b> .....	16
3.1 THE TECHNICAL AND ECONOMIC VIABILITY OF INSTALLING COMPETING FACILITIES TO THE EXISTING LOCAL LOOP, IN LIGHT OF THE LEVEL AND RATE OF MARKET DEVELOPMENT .....	16
3.2 THE FEASIBILITY AND EFFICIENCY OF PROVIDING LLU, PARTICULARLY IN LIGHT OF THE AVAILABLE CAPACITY .....	18
3.3 TRA'S DUTY TO SAFEGUARD AND ENCOURAGE THE LONG-TERM DEVELOPMENT OF COMPETITION AND THE LONG-TERM INTERESTS OF END-USERS .....	21
3.4 OVERALL CONCLUSION .....	24
<b>ANNEX 1: CONSOLIDATED LIST OF QUESTIONS</b> .....	25
<b>ANNEXE 2: BENCHMARKS OF RETAIL BROADBAND OFFERS</b> .....	26
<b>ANNEXE 3: DOMESTIC BENCHMARKS OF RETAIL BROADBAND OFFERS</b> .....	31

# CONSULTATION

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[consult@tra.org.bh](mailto:consult@tra.org.bh)  
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Responses should include:

- the title printed on the envelop or subject of the sent email should be “**LLU Consultation**”,
- the name of the company/institution/association etc.,
- the name of the principal contact person, and
- full contact details (physical address, telephone number, fax number and e-mail address),
- in the case of responses from individual consumers, name and contact details.

In the interest of transparency, TRA intends to make all submissions received available to the public, subject to the confidentiality of the information received. TRA will evaluate requests for confidentiality in line with relevant legal provisions and TRA’s published guidance on the treatment of confidential and non-confidential information.<sup>1</sup>

Respondents are required to mark clearly any information included in their submission that is considered confidential. Where such confidential information is included, respondents are required to provide both a **confidential** and a **non-confidential** version of their submission. If a part or a whole submission is marked confidential, reasons should be provided. TRA may publish or refrain from publishing any document or submission at its sole discretion.

Once TRA has received and considered responses to this consultative document, TRA will issue a final version of this Study, together with the report on the consultation.

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<sup>1</sup> TRA, A Guidance Paper issued by the Telecommunications Regulatory Authority on its treatment of confidential and non-confidential information, September 2007.

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

### List of Acronyms

AGCOM	Autorita per le Garanzie nelle Comunicazioni
ARCEP	Autorité de Régulation des Communications Electroniques et des Postes (French telecommunications regulatory authority)
BD	Bahraini Dinnars
ComReg	Commission for Communications Regulation (Irish telecommunications regulatory authority)
DSL	Digital Subscriber Line
DSLAM	Digital Subscriber Line Access Multiplexer
EC	European Commission
ERG	European Regulators' Group
EU	European Union
EU15	The 15 countries of the European Union before 1 May 2004
EU27	The 27 countries of the European Union
KPI	Key Performance Indicator
LLU	Local Loop Unbundling
MDF	Main Distribution Frame
MSAN	Multi-Service Access Node
NFWS	National Fixed Wireless Services
OECD	Organisation of Economic Cooperation and Development
Ofcom	Office of Communications (United Kingdom telecommunications regulatory authority)
Oftel	Office of Telecommunications (United Kingdom), superseded by Ofcom
OLO	Other Licensed Operators
SLA	Service Level Agreement
TRA	Telecommunications Regulatory Authority of the Kingdom of Bahrain

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

### 1. Introduction

1. In defining appropriate remedies in wholesale markets in which Batelco has been found dominant, TRA seeks to promote competition for the long term benefits of end-users while providing an environment conducive to efficient investment by Batelco and OLOs.
2. In its Draft Determination on Wholesale Broadband Markets,<sup>2</sup> TRA has identified the following market failures:
  - Batelco is dominant in the wholesale physical network infrastructure access market in the Kingdom of Bahrain;
  - Batelco is dominant in the wholesale market for broadband access in the Kingdom of Bahrain.
3. The purpose of this Study is to determine appropriate wholesale remedies to address these market failures. According to Article 3.5 of the Access Regulation issued on 30 April 2005 possible access remedies are:
  - Wholesale DSLs (Article 3.5(d));
  - unbundled local loops (Article 3.5(e));
  - main distribution frames or concentrators for Bitstream access or DSL collocation (Article 3.5(f))
4. Batelco currently offers a Bitstream (corresponding to Article 3.5(f)) and Wholesale DSL (corresponding Article 3.5(d) to OLOs in the Kingdom of Bahrain, but not LLU (which would correspond to Article 3.5(e)).
5. In this document, TRA presents the findings of its study on the regulation of wholesale broadband markets with respect to the obligation imposed upon Batelco to provide wholesale services:
  - Section 2 identifies the appropriate access remedies with respect to wholesale services in the wholesale broadband markets. TRA is of the view that LLU and Bitstream are complementary products that ought to be provided by the incumbent. TRA also considers that the regulation of Wholesale DSL will no longer be necessary once LLU and Bitstream are in place subject to appropriate safeguards.
  - Section 3 assesses whether it is no more than is appropriate and necessary to impose upon Batelco an obligation to provide LLU. As Bitstream is already provided by Batelco, a study of the matters indicated under Article 3.7 of the Access Regulation issued on 30 April 2005 is only required for LLU.

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<sup>2</sup> TRA, Wholesale Broadband Markets Review, Draft Determination, March 2009.

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

### 2. Appropriate access remedies in wholesale broadband markets

6. Having regard to the characteristics of the various wholesale products along the broadband value chain, international experience, expected market development and the imperative for regulation to focus on bottlenecks and to be as minimal as possible, TRA is of the view that: LLU shall be introduced, Bitstream shall remain in place and Wholesale DSL shall, as a regulated product, be phased out subject to appropriate safeguards.
7. In its Draft Determination on wholesale broadband markets<sup>3</sup>, TRA has identified the following market failures:
  - Batelco is dominant in the wholesale physical network infrastructure access market in the Kingdom of Bahrain;
  - Batelco is dominant in the wholesale market for broadband access in the Kingdom of Bahrain.
8. In other words, in the absence of regulation, Batelco would not be sufficiently constrained from behaving independently of its competitors, subscribers and ultimately of users such that prices would be constrained in the relevant markets. There are many types of market failures and market power represents one of the most relevant in regulatory and competition policy contexts.
9. As a dominant operator, Batelco may be required under Article 3.5 of the Access Regulation issued on 30 April 2005, to provide various access services in relation to the following telecommunications network elements or telecommunications facilities directly relevant to broadband services:
  - Wholesale DSLs (Article 3.5(d));
  - unbundled local loops (Article 3.5(e));
  - main distribution frames or concentrators for Bitstream access or DSL collocation (Article 3.5(f))
10. All these access services are wholesale services enabling OLOs to provide broadband internet access services to end-users.
11. Batelco currently offers a Bitstream (corresponding to Article 3.5(f)) and Wholesale DSL (corresponding Article 3.5(d)) to OLOs in the Kingdom of Bahrain, but not LLU (which would correspond to Article 3.5(e)).
12. TRA notes that there is demand for LLU. Interviews conducted by TRA with alternative operators in November 2008 have indicated that there is potential demand from alternative operators for having access to the local

<sup>3</sup> TRA, Wholesale Broadband Markets Review, Draft Determination, March 2009.

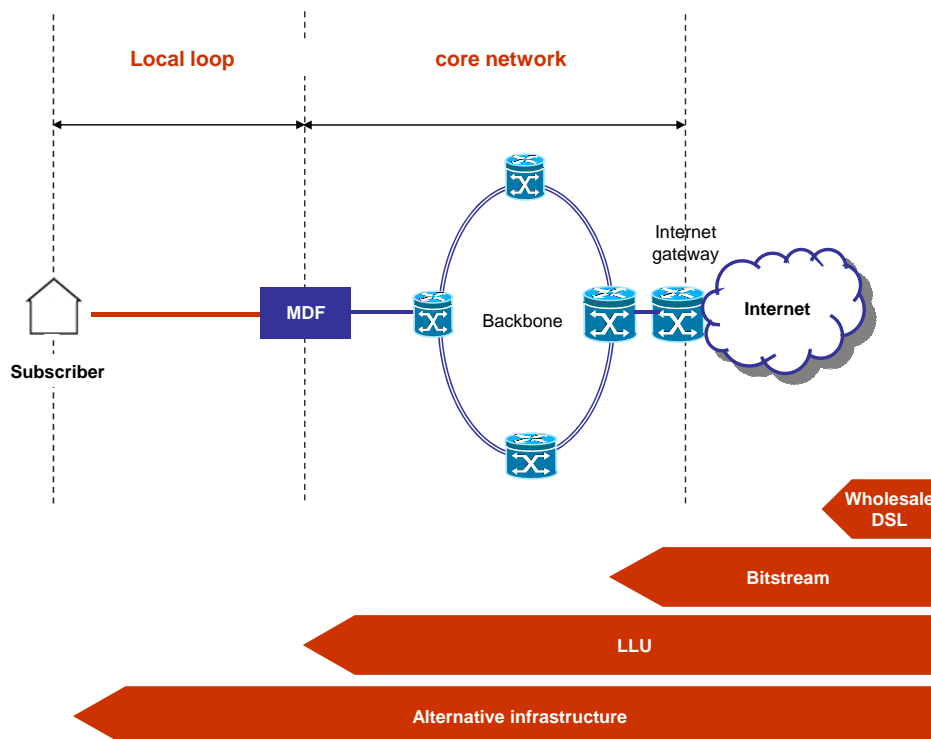
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## Study on the Regulation of Wholesale Broadband Markets

loop: five operators have expressed their interest in LLU, and four of them expressed their wish to see a LLU product available as soon as possible.

13. LLU is a product under which Batelco's copper local loops would be connected to the core network of an OLO to be used for its own broadband and connectivity services.
14. Bitstream is a product by which Batelco provides transmission capacity from end-users to a core network point in such a way as to allow an OLO to offer its own broadband services. Contrary to LLU, where OLOs have access to a passive link (i.e. the copper local loop) and have to deploy and manage their own active exchange equipment (including but not limited to DSLAM/MSAN) in the incumbent's Service Nodes/MDFs, Bitstream provides OLOs with access to an active link, and exchange equipments have to be managed by Batelco.
15. With Wholesale DSL, OLOs merely resell the retail DSL offers developed by Batelco for its end-users: the level of network investment required by OLOs is minimal as shown in Figure 1 below.

Figure 1 - Relative level of network investment required by OLOs with LLU, Bitstream and Wholesale DSL



### 2.1 LLU and Bitstream are complementary wholesale products

16. In its "Strategic and Retail Market Review", TRA concluded that LLU and Bitstream were complementary products: "TRA considers LLU to be a

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

complementary and not a substitute access product to Bitstream and Wholesale DSL”.<sup>4</sup>

17. In the following, TRA articulates the different layers of complementarities between LLU and Bitstream. These are:
- Having LLU and Bitstream in place enables more diversified (and ultimately stronger) competition, as OLOs can choose between LLU and Bitstream depending on their product strategy and financing capabilities;
  - Having LLU and Bitstream in place enables OLOs to phase their investments in the roll out of their network over time (temporal complementarities) as a complete LLU roll out is time-consuming and not achievable in the short run;
  - Having LLU and Bitstream in place enables OLOs to offer their services all over the country (geographical complementarities), as LLU is unlikely to be profitable in all Service Nodes.

### **Having LLU and Bitstream in place enables more diversified competition**

18. TRA underlines first that, although LLU allows greater independence from the incumbent, LLU also requires major investment from OLOs (related to backhaul and exchange equipment). LLU is sensitive to economies of scale/densities and is therefore profitable once the number of customers at Service Node level is sufficient. By contrast, economies of scale/densities for Bitstream-based entry play a much less significant role in Bahrain because the required investment by OLOs is much lower and the costs paid to Batelco are mainly variable costs.<sup>5</sup>
19. As a consequence, with LLU and Bitstream being available, OLOs have a greater choice for their development strategy: LLU offers higher flexibility and requires higher investment, while Bitstream offers lower flexibility but requires lower investment. This has been highlighted by the European Commission (“EC”) as well:<sup>6</sup>

“Unbundled loops typically give greater flexibility and control over the retail broadband service offered to the end-user and have typically been supplied at the main distribution frame (MDF). In contrast, wholesale broadband access in the form of a bit-stream service typically gives less flexibility over the retail service, and may be supplied at higher points in the network (such as regional interconnection points), as well as at the MDF.”

<sup>4</sup> TRA, Statement on the Strategic and Retail Market Review, 3 June 2008, page 7.

<sup>5</sup> With the exception of the current minimum charge per month as per the Bitstream reference offer.

<sup>6</sup> Commission staff working document, explanatory note. Accompanying document to “Commission Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services”.

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

### **Having LLU and Bitstream in place enables OLOs to phase their investments in network roll out over time (temporal complementarities)**

20. Because there are higher barriers to entry for OLOs with LLU than with Bitstream, TRA believes that some OLOs may prefer to acquire end-users first on the basis of Bitstream and then, once they have built up a market share and a critical mass of customers, invest in LLU.<sup>7</sup>
21. The European experience tends to show this kind of temporal complementarities: “In many Member States there is a trend towards migration between different wholesale products, mainly from resale and Bitstream towards LLU.”<sup>8</sup> Bitstream and LLU are thus complementary in time.
22. These complementarities in time have been highlighted in the investment ladder notion developed by Martin Cave<sup>9</sup>, where LLU is at the top. Martin Cave indeed states that:

“The key is the encouragement of investment both by the historic monopolist and by entrants. The latter may have to acquire capital assets progressively, as they acquire customers and revenues. This approach has been likened to climbing a ‘ladder of investment’, which should culminate in a high level of competition across the value chain. Achieving extensive competition of this kind has the inestimable advantage of making the next generation of technology contestable – in effect creating a race among the competitors to implement it.”
23. In the case of the broadband value chain, the Bitstream product enables OLOs to acquire customers progressively, generating revenues that will enable them to deploy backhaul and buy active exchange equipment (including but not limited to DSLAMs/MSANs) in order to unbundle lines.

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<sup>7</sup> These temporal complementarities could be considered of even greater relevance in times of more constrained capital markets.

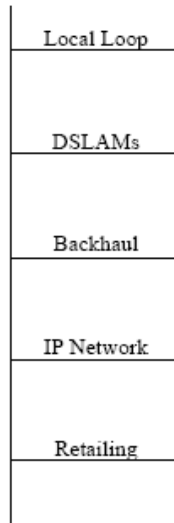
<sup>8</sup> Commission staff working document accompanying the communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Progress report on the single European electronic communications market 2007 (13th report).

<sup>9</sup> “Making the ladder of investment operational”, Martin Cave, November 2004.

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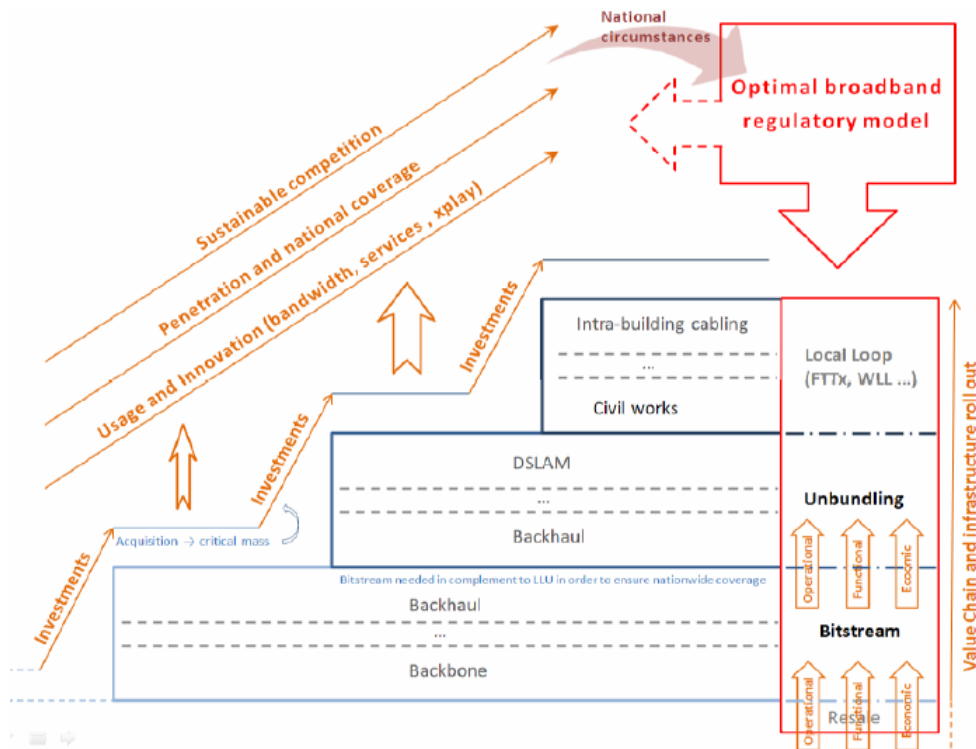
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Figure 2 - Broadband value chain described by Martin Cave



Source: "Making the ladder of investment operational", Martin Cave, November 2004

Figure 3 – Broadband value chain and optimal broadband regulatory model



Source: ITU

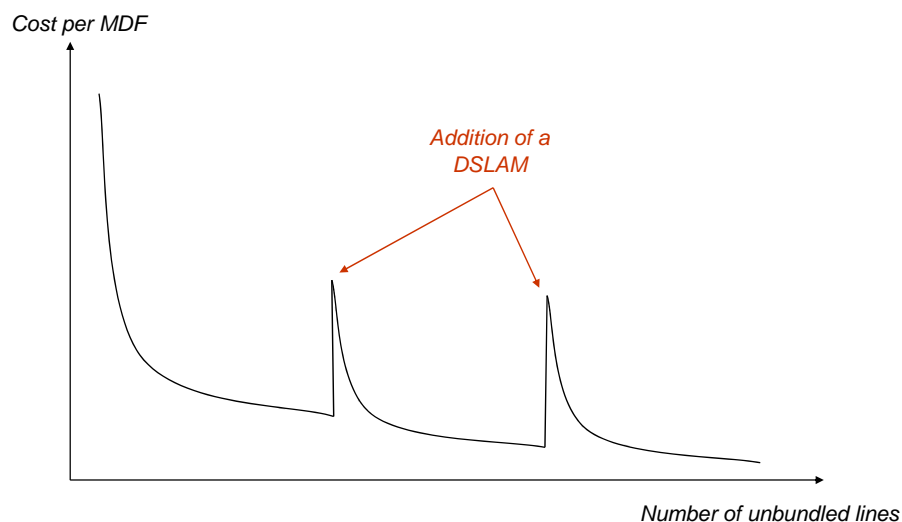
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## Study on the Regulation of Wholesale Broadband Markets

### Having LLU and Bitstream in place enables OLOs to offer their services all over the country (geographical complementarities)

24. TRA observes furthermore that OLOs cannot unbundle all of the Service Nodes of a given country in the medium term (or, at least in some cases, at all). In large European countries in which LLU has been implemented for 8 years, it is observed that OLOs have not unbundled the smallest Service Nodes yet. Because of the presence of economies of scale, it is indeed unlikely that all Service Nodes can be profitable for OLOs in the medium term. As a consequence, in the medium term, if only LLU was available, competition would be encouraged only in certain areas. Some areas would remain with only one DSL operator.
25. This also implies that OLOs would not be able to develop national retail offers. However, if both LLU and Bitstream are available, OLOs will be able to have coherent retail offers available throughout the country.

Figure 4 – Level of economies of scale per Service Node (or MDF)

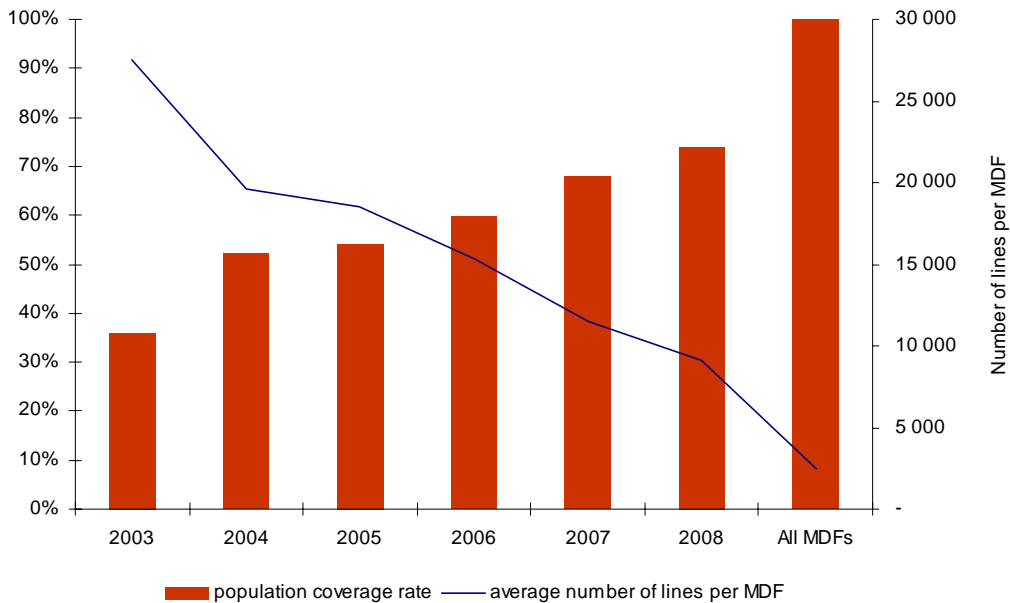


26. TRA foresees that, because of the importance of these economies of scale, which are a distinctive feature of the economics of unbundling in every country, OLOs will initially unbundle large Service Nodes.
27. Looking at the development of LLU in France, TRA notes that OLOs first unbundled large Service Nodes with the highest number of lines per MDF in order to get the largest economies of scale and then went for smaller Service Nodes with a lower number of lines per MDF. At the end of 2003 the smallest unbundled MDF had around 16,000 lines (around 400 MDFs had been unbundled). This number decreased to around 6,000 lines at the end of 2005. By the end of 2008 OLOs demonstrated that it was efficient to unbundle MDFs with less than 1,600 working lines, covering almost 75% of the total population with LLU.

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Figure 5 – Development of LLU coverage in France, 2003–2008



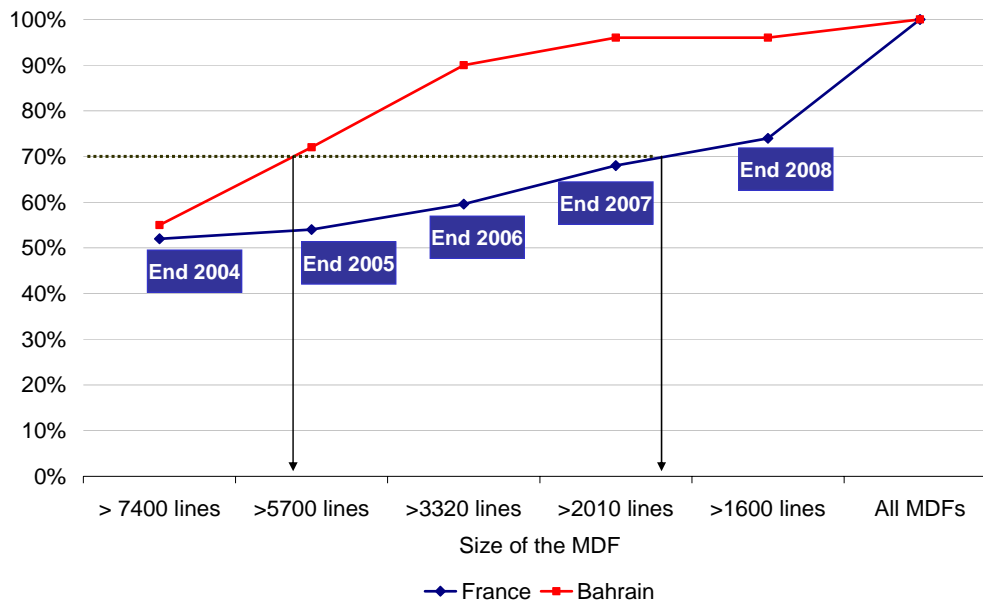
Source: ARCEP data, 2008

28. Comparing the number of lines per MDF in France and in the Kingdom of Bahrain, TRA considers that the level of economies of scale achievable should be high in the Kingdom of Bahrain. To cover between 65% and 75% of the total population with LLU, the smallest unbundled Service Nodes (or MDF) would have twice as many lines compared to France although the average size of unbundled MDFs in the two countries would be similar (See Figure 6). This is likely to be explained by the very high population density and geographic concentration of the population in Bahrain.

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

Figure 6 – Local loop distribution in France and Bahrain, 2003–2008



Source: ARCEP data and TRA data, 2008

29. Competition does not generally work well when only LLU is available, in particular outside densely populated areas. Commenting on the German case, the EC said:<sup>10</sup>

“The case of Germany demonstrates this particularly well as here, Bitstream access has been refused for years. As a result of this, the dominance of Deutsche Telekom is particularly high in non-metropolitan areas, which has led to substantially higher prices for broadband connections there.”

30. Another quote from the Italian regulator illustrates why Bitstream is a necessary and appropriate complementary wholesale product to LLU for nationwide competitive offers:<sup>11</sup>

“Although AGCOM originally considered LLU the main form of access, it soon realized that the market dynamics advanced the implementation of LLU too much and thus also mandated a Bitstream offer, which is also deemed the necessary complement for LLU providers in areas with less population density”.

31. Furthermore, TRA notes that, in 22 countries of the EU27, there are agreements on both LLU and Bitstream products between one or some OLOs and the incumbent.<sup>12</sup> These 22 countries include smaller countries

<sup>10</sup> European Commission, Memo, 21 August 2006.

<sup>11</sup> ERG, Broadband market competition report, 2005.

<sup>12</sup> Commission staff working document accompanying the communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – progress report on the Single European Electronic Communications Market 2007 (13th report).

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

like Slovenia (around 2 million inhabitants), Luxembourg (around 480,000 inhabitants), Latvia (around 2.3 million inhabitants) and Lithuania (around 3.3 million inhabitants). TRA notes also that in other regions of the world, such as in New Zealand,<sup>13</sup> both LLU and Bitstream are available.

32. For the reasons set out above, TRA considers that LLU and Bitstream are complementary wholesale products required.

**Question 1:** Do you agree with TRA's opinion that LLU and Bitstream are complementary wholesale products required in order to promote competition? Please elaborate.

### 2.2 Having LLU and Bitstream in place, the regulation of Wholesale DSL is no longer necessary and should be phased out

33. Batelco is currently offering Bitstream as well as Wholesale DSL to OLOs. In the particular case of the Kingdom of Bahrain, the difference between Wholesale DSL and Bitstream is much less than in other countries as:
- the level of investment required by OLOs for Bitstream is relatively low, because broadband traffic is delivered at a single aggregation point;
  - Bitstream does not enable significant product differentiation at the retail level compared to retail offers based on Wholesale DSL since the same download speeds are available with the two products, and Wholesale DSL products give the choice of several different threshold values (i.e. maximum amount of data that can be downloaded by end-users per month).
34. Having said that, TRA considers that Bitstream is the more suitable wholesale product to promote sustainable access-based competition for the long term benefit of end-users. Bitstream is already available and has greater potential to allow OLOs to differentiate further their retail offers from those of the incumbent. It is so because OLOs can have a greater control over the quality parameters of their services compared to merely reselling the retail product of the incumbent operator. Even if the level of differentiation offered currently by Bitstream is low compared to Wholesale DSL, TRA is of the view that Bitstream is preferable to pure resell product as the former can evolve.

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13

<http://www.comcom.govt.nz/IndustryRegulation/Telecommunications/StandardTermsDeterminations/UnbundledLocalLoopService/DecisionsList.aspx>

# CONSULTATION

## **Study on the Regulation of Wholesale Broadband Markets**

35. TRA considers that after LLU and Bitstream are both established as viable wholesale products that the need for continued regulation of Wholesale DSL will fall away.
36. For these reasons, TRA believes that it is no longer necessary to maintain an access obligation on Batelco for Wholesale DSL subject to appropriate safeguards.
37. Therefore, within 12 months from the date of the issuance of the Access Order<sup>14</sup>, TRA shall conduct a study to determine whether the Bitstream service is “fit for purpose”. Should TRA determine that Bitstream service is fit for purpose, TRA shall remove the obligation on Batelco to provide Wholesale DSL no sooner than 6 months from the issuance of that determination. This determination may include specific provisions for the migration of end users to an appropriate replacement service or other terms including but not limited to Bitstream or LLU.

### **2.3 Conclusion on appropriate access remedies in wholesale broadband markets**

38. Having regard to the characteristics of the various wholesale products along the broadband value chain, international experience, expected market development and the imperative for regulation to focus on bottlenecks and to be as minimal as possible, TRA is of the view that: LLU shall be introduced, Bitstream shall remain in place and Wholesale DSL shall, as a regulated product, be phased out subject to appropriate safeguards.

**Question 2:** Do you agree with TRA’s opinion that, having LLU and Bitstream in place, regulation of Wholesale DSL is no longer necessary, subject to appropriate safeguards? Please elaborate.

**Question 3:** Do you agree with TRA’s proposals regarding the withdrawal of Wholesale DSL as a regulated product, and in particular with the proposed safeguards? Please elaborate.

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<sup>14</sup> See Draft Access Order relating to Unbundling Local Loop and Bitstream Access.

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

### 3. Assessing whether it is no more than is appropriate and necessary to impose upon Batelco an obligation to provide LLU to address the market failure identified

39. Batelco currently does not offer LLU. As per Article 3.7 of the Access Regulation, the imposition of LLU as a new access obligation requires TRA to assess whether such obligation is no more than is appropriate and necessary to address the market failure identified, namely that Batelco is dominant in the Wholesale Physical Network Infrastructure Access market in the Kingdom of Bahrain. As per Article 3.7, in assessing whether the proposed access obligation will promote competition and the interest of users, TRA needs to consider:

- (a) the technical and economic viability of installing competing facilities, in light of the level and rate of market development;
- (b) the feasibility and efficiency of providing the form of access, particularly in light of the available capacity; and
- (c) the TRA's duty to safeguard and encourage the long-term development of competition and the long-term interests of end-users.

#### 3.1 The technical and economic viability of installing competing facilities to the existing local loop, in light of the level and rate of market development

40. Relevant competing facilities in the context of LLU are alternative local loops to the Batelco's copper local loop which can provide broadband services.

41. The local loop is the "last mile" of an operator's telecommunications network that connects the customer premises to the operator's core network (in which switching, routing and intelligent equipment are connected to each other). The local loop is "a highly capital-intensive business"<sup>15</sup>.

42. The technical and economic viability of installing competing facilities needs to be considered for the loops which are included in the relevant market, i.e. the market for physical network infrastructure access, as defined in the Draft Dominance Determination.

43. In fact, following an extensive analysis, TRA has concluded in its Draft Dominance Determination on Wholesale Broadband Markets that wireless local loops are not part of the wholesale physical network infrastructure

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<sup>15</sup> Cf. TRA, "Dominance in wholesale markets: a consultation issued by the Telecommunications Regulatory Authority on dominance in wholesale markets", 27 October 2005, page 34.

# CONSULTATION

## **Study on the Regulation of Wholesale Broadband Markets**

access market (i.e. the market in which includes fixed loops) and hence cannot be strictly considered as “competing facilities”.

44. Given the characteristics of wired local loops, TRA considers that the technical and economic viability of installing and deploying such competing facilities on a nationwide basis is highly unlikely in light of the level and rate of market development. In fact, building a wired local loop, be it based on copper or fibre, involves very substantial civil-work costs and cable costs in order to reach all customer premises to such an extent as existing Batelco’s copper-based local loop does. The capital requirement, coupled with the sunk nature of the cost involved in deploying a wired local loop, and demand conditions make the duplication of wired local loops on a significant scale particularly challenging and highly unlikely on a commercial basis. Wired local loops, in some countries such as France, are qualified as “essential facilities”, i.e. facilities which have very limited, if any, prospects of being duplicated and access to which is required to compete in related markets.<sup>16</sup>
45. In addition to sunk cost, economies of scale and scope constitute another considerable barrier to entry. Batelco benefits from significant economies of scale (or density) and economies of scope, as Batelco provides voice and internet access services through its copper local loop. An operator building an alternative local loop would be unlikely to benefit from the same level of economies of scale and would have to offer the same suite of services to reach a similar level of economies of scope.
46. TRA also notes the deployment of an alternative wired local loop would be particularly time-consuming.
47. Further, TRA is unaware of any OLO intending to deploy an alternative copper local loop and considers it highly unlikely in the relevant timeframe of this analysis.
48. Finally, for the reasons set out above and by appropriately pricing local loops TRA is of the view that imposing upon Batelco an obligation to provide LLU is unlikely to adversely impact potential investment in competing local loops in light of the level and rate of market development in the relevant timeframe of this analysis.

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<sup>16</sup> See Conseil de la Concurrence, Avis No 04-A-01 du 8 janvier 2004.

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

49. Overall, taking into account the technical and economic viability of installing competing facilities in light of the level and rate of market development, TRA considers that it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU as:
- Batelco's copper local loop is highly unlikely to be replicable by an alternative wired local loop in the relevant timeframe of the analysis;
  - By appropriately pricing local loops, imposing upon Batelco an obligation to provide LLU to OLOs is unlikely to negatively impact investment incentives in competing facilities.

**Question 4:** Do you agree with TRA's opinion that, taking into account the technical and economic viability of installing competing facilities in light of the level and rate of market development, it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU? Please elaborate.

### 3.2 The feasibility and efficiency of providing LLU, particularly in light of the available capacity

#### Feasibility of providing LLU

50. International experience in numerous jurisdictions demonstrates that it is perfectly feasible to provide LLU. It is mandated in the vast majority of, if not all, OECD countries. An extensive benchmarking exercise of developed countries conducted by the New Zealand Commerce Commission in 2007 found that LLU was working in about 30 developed countries around the world.<sup>17</sup>
51. Further, as shown in the table below for selected countries (large and small), the share of LLU lines among broadband lines in various European countries is now significant, standing at 24%, 28%, 33% and 35% respectively in Italy, the UK, Germany and France in July 2008. TRA notes also that in some smaller European countries such as Cyprus and Slovenia, the populations of which are approximately 900,000 and 2,000,000 respectively (i.e. in line with the population of Bahrain), the level of LLU lines compared to the number of broadband lines is significant (15% and 17% respectively at mid-2008).<sup>18</sup>

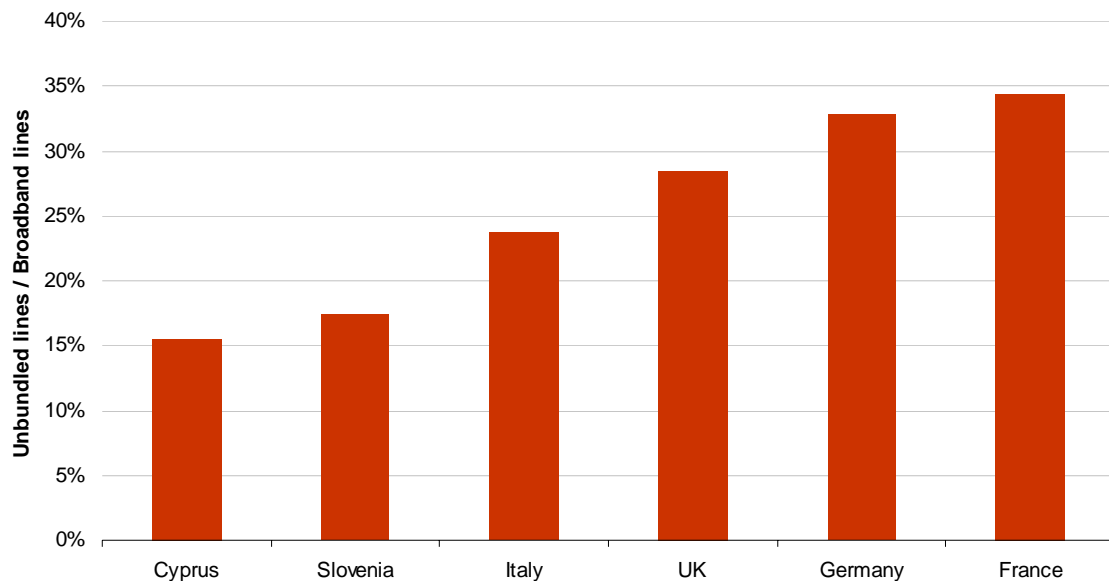
<sup>17</sup> See Commerce Commission, 2007, Draft Decision 609, Appendix D.

<sup>18</sup> Source: European Commission, "Broadband access in the EU", 2008.

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

Figure 7 – Ratio of unbundled lines out of broadband lines in selected EU countries, July 2008



Source: European Commission data, July 2008

52. Furthermore:

- As the copper local loop offers a dedicated link for each end-user, this prevents the risk of insufficient capacity being available;
- In the context of this assessment, TRA has undertaken a review of selected Service Nodes of Batelco and is of the view that there is *prima facie* no major issue in terms of available capacity for collocation. In the unlikely event of future capacity constraints, distant collocation could provide an alternative to collocation within the MDF site of Batelco.

53. Therefore, having regards to the fact that LLU has been successfully implemented in both large and small countries, all over the world by incumbent operators, TRA is of the view that providing LLU as a wholesale product is *prima facie* feasible by Batelco.

### Efficiency of providing LLU

54. TRA notes that the demand in terms of broadband services in the Kingdom of Bahrain is high, as there are currently nearly 100,000 broadband customers for between 200,000 and 300,000 fixed lines. Also, the level of prices for broadband is currently high compared to other countries: for a 2 Mbps offer, Batelco's broadband prices are among the highest compared to EU 15 countries, GCC countries and selected Arab countries and smaller states – See the price benchmarks included in

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

Annex 2 and Teligen/Aregnet Price Benchmarking Study.<sup>19</sup> TRA also notes that the download speeds offered currently are still relatively low and the threshold values are low as per international standards.<sup>20</sup>

55. In the “Strategic and Retail Market Review”, issued on 3 June 2008, TRA proposed a set of nine measures to further promote competition and the interests of consumers in the telecommunications sector in the Kingdom of Bahrain, among which was the introduction of LLU.<sup>21</sup>
56. TRA considers that Bahrain will greatly benefit from the introduction of LLU. LLU can be expected to bring significant efficiency gains by: strengthening competition in broadband markets; facilitating the introduction of innovative and more diversified services; putting pressures on prices; fostering increases in available download speeds and thresholds. TRA is of the view that these benefits will outweigh *prima facie* the costs of implementing LLU. Overall, LLU will contribute to lifting up the performance of the domestic telecommunications sector more in line with advanced countries.
57. Greater competition will give rise to:
- Productive efficiency gains, as in a more competitive environment, operators will have stronger incentives to become more efficient in the provision of their broadband services.
  - Allocative efficiency gains, as in a more competitive environment, end-users will enjoy lower prices. This in turn will lead to a higher penetration for broadband services, including higher download speeds and threshold.
  - Dynamic efficiency gains, as a more competitive environment fosters innovation, leading to an overall expansion in the broadband market.

### Conclusion

58. Overall, taking into account the feasibility and efficiency of providing the form of access, particularly in light of the available capacity, TRA considers that it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU for the following reasons:
- Providing LLU as a wholesale product is *prima facie* feasible by Batelco as LLU has been implemented in significant number of large as well as small countries, all over the world by incumbents,
  - As the copper local loop offers a dedicated link for each end-user, this prevents the risk of insufficient capacity,

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<sup>19</sup> Teligen, Telecoms Price Benchmarking for Arab Countries, June 2008.

<sup>20</sup> Cf. Annexe B.

<sup>21</sup> TRA, “Statement on the strategic and retail market review”, 3 June 2008, page 5.

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

- Following a review of selected Service Nodes of Batelco TRA is of the view that there is *prima facie* no major issue in terms of available capacity for collocation. In the unlikely event of future capacity constraints, distant collocation could provide an alternative to collocation within the MDF site of Batelco,
- LLU will provide significant efficiency net gains and will contribute to bringing the performance of the telecommunications sector in terms of broadband more in line with advanced countries.

**Question 5:** Do you agree with TRA's opinion that, taking into account the feasibility and efficiency of providing the form of access, particularly in light of the available capacity, it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU? Please elaborate.

### 3.3 TRA's duty to safeguard and encourage the long-term development of competition and the long-term interests of end-users

#### Long-term development of competition

59. As indicated in its "Strategic and Retail Market Review", issued on 3 June 2008, TRA considers that LLU makes the introduction of competition into associated broadband retail markets easier, as it removes one of the major barriers to entry, which is the installation of a full-fledged alternative local loop.
60. As exemplified by experience overseas<sup>22</sup>, LLU will encourage competition. The advent of LLU-based services will incentivise operators to compete over quality and prices. The emergence of alternative DSL technologies using LLU will also continue to transform the number and type of services that can be delivered via the copper local loop to end-users, thereby generating innovation and bringing dynamic efficiency gains.
61. These competitive benefits of LLU have been articulated by regulators, as illustrated by the following quotes from ComReg (the Irish regulator) and ARCEP (the French regulator):

"The direct benefit of having a LLU product is that OLOs are more able to compete in the retail broadband market, and that this then has a positive impact on consumer services and on the prices for those services"<sup>23</sup>.

<sup>22</sup> E.g. See EC progress report on the single European electronic communications market 2007.

<sup>23</sup> ComReg, Wholesale unbundled access market analysis, June 2008

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

“Voice over broadband and television were primarily developed by OLOs. It is on those services that ISPs can more easily differentiate themselves in terms of quality of services provided or features included in the ‘box’. Unbundling is therefore a driver of innovation competition, and market development”<sup>24</sup>.

62. Further, it is interesting to note that in some European countries triple play services have first been offered by LLU operators: Free in France, Fastweb in Italy and Magnet in Ireland.
63. However TRA is aware that there are competing arguments according to which LLU may discourage infrastructure based competition, and in particular in competing platforms, be it wired or wireless. As explained above in Section 2.1 above, TRA considers that provided that LLU is appropriately priced, it is unlikely to negatively impact investment incentives in competing facilities in Bahrain.
64. TRA notes that LLU is associated with investment in infrastructure, as OLOs will need to deploy a core network to reach Service Nodes (of MDFs) of the incumbent and install their own active exchange equipment (including but not limited to DSLAMs/MSANs). LLU will therefore contribute to strengthening the sustainability of competition in related retail markets, as it limits the dependence of OLOs on the incumbent. Some OLOs may use LLU as their sole means of reaching the retail market. Others may use LLU products to supplement their own infrastructure.
65. TRA notes furthermore that, in other jurisdictions, LLU is actually becoming a stepping stone toward the deployment of alternative local loops based on fibres (e.g. OLOs such as Fastweb in Italy and Free in France). There are high barriers to entry associated with the deployment of an alternative wired local loop, as it is time- and capital-intensive. In this context, LLU can help secure the critical mass of customers at local level that may make the investment in FTTH/FTTB more attractive.

### Long-term interests of end-users

66. TRA expects LLU to bring long-term benefits to end-users in terms of lower prices, higher download speeds and threshold values as well as additional retail services such as video on demand, television, music on demand, wideband voice services. Better broadband services can be expected to encourage the use of broadband and make applications such as e-government and e-commerce applications, more attractive.

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<sup>24</sup> ARCEP, Wholesale market analysis, 2008

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

67. In its “Strategic and Retail Market Review”<sup>25</sup> TRA observed that, despite a relatively high penetration rate compared to other GCC countries, there is a “lack of competitive broadband services beyond the speed of 2Mbps and the absence of ‘unlimited’ broadband offerings for residential users”.
68. Despite the launch of NFWS-based offers and the availability of Wholesale DSL and Bitstream, Bahrain is still not performing satisfactorily by international benchmarks.
69. TRA acknowledges that the launch of NFWS-based broadband offers has increased the level of competition for the provision of broadband services, with more aggressive pricing. Batelco’s prices for 2 Mbps are nevertheless among the highest compared to incumbents’ offers in other countries such as EU15 countries, GCC countries, selected Arab countries and smaller states – See benchmarks contained in Annex 2 and the Teligen/Aregnet Price Benchmarking Study of Arab Countries<sup>26</sup>. TRA is of the view that LLU will provide additional competitive pressure on prices in Bahrain.
70. TRA notes also that the download speeds offered by NFWS operators are relatively limited and the threshold values (maximum number of Mbps that can be downloaded per user and per month) are low.<sup>27</sup> TRA is of the view that LLU will provide additional competitive pressure on download speeds and threshold values in Bahrain
71. More generally, TRA believes that the views expressed by the OECD on the potential benefits of LLU for end-users are entirely applicable for Bahrain:<sup>28</sup>

“The majority of countries consider that LLU has the potential to enhance local competition and assist in the development of competition for broadband services as well as in its diffusion. From this perspective, implementation of LLU is expected to benefit consumers by reducing not only local telephony but also broadband internet access costs and accelerating the supply of new services.”

### Conclusions

72. Overall taking into account TRA’s duty to safeguard and encourage the long-term development of competition and the long-term interests of end-users, TRA considers that it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU for the following reasons:

<sup>25</sup> TRA, “2007, Strategic and Retail Market Review: – Consultation”, 27 August 2007.

<sup>26</sup> Teligen, Telecoms Price Benchmarking for Arab Countries, June 2008.

<sup>27</sup> Cf. Annexe B.

<sup>28</sup> OECD, Working Party on Telecommunication and Information Services Policies – developments in local loop unbundling, 10 September 2003.

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

- LLU, when appropriately priced, is unlikely to negatively impact investment incentives in competing facilities,
- LLU will further strengthen competition for the long terms benefits of end-users and hence, LLU is fully consistent with TRA's duty to encourage competition and the interest of end-users,
- LLU will contribute to closing the gap between the prices and types of broadband services available in Bahrain and those available in more advanced countries.

**Question 6:** Do you agree with TRA's opinion that, taking into account the TRA's duty to safeguard and encourage the long-term development of competition and the long-term interests of end-users, it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU? Please elaborate.

### 3.4 Overall conclusion

73. For the reasons set out above, TRA considers that it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU.
74. The details of the proposed approach for the implementation of LLU are presented in the separate consultative document.

**Question 7:** Do you agree with TRA's overall conclusion that it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU? Please elaborate.

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

### Annex 1: Consolidated list of questions

**Question 1:** Do you agree with TRA's opinion that LLU and Bitstream are complementary wholesale products required in order to promote competition? Please elaborate.

**Question 2:** Do you agree with TRA's opinion that, having LLU and Bitstream in place, regulation of Wholesale DSL is no longer necessary, subject to appropriate safeguards? Please elaborate.

**Question 3:** Do you agree with TRA's proposals regarding the withdrawal of Wholesale DSL as a regulated product, and in particular with the proposed safeguards? Please elaborate.

**Question 4:** Do you agree with TRA's opinion that, taking into account the technical and economic viability of installing competing facilities in light of the level and rate of market development, it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU? Please elaborate.

**Question 5:** Do you agree with TRA's opinion that, taking into account the feasibility and efficiency of providing the form of access, particularly in light of the available capacity, it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU? Please elaborate.

**Question 6:** Do you agree with TRA's opinion that, taking into account the TRA's duty to safeguard and encourage the long-term development of competition and the long-term interests of end-users, it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU? Please elaborate.

**Question 7:** Do you agree with TRA's overall conclusion that it is no more than appropriate and necessary to address the market failure identified to impose upon Batelco an obligation to provide LLU? Please elaborate.

# CONSULTATION

## Study on the Regulation of Wholesale Broadband Markets

### Annexe 2: Benchmarks of Retail Broadband Offers

75. This benchmark looks at four areas (EU15, GCC, selected Arab countries and smaller states). In each area two metrics are analysed:

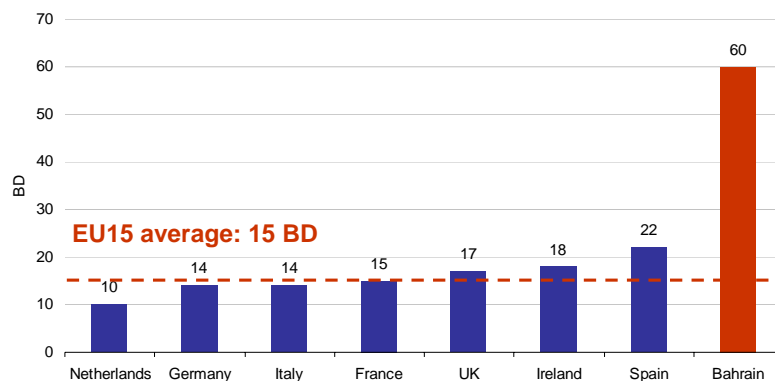
- retail prices;
- maximum download speed offered.

76. As 2 Mbps is a standard offer in Europe, prices have been compared for this type of broadband offers.

#### EU15

77. For 2 Mbps offers, Batelco's broadband retail prices are far higher than prices available in Europe, where the average of EU15 is only BD 15 compared to BD 60 for Batelco.

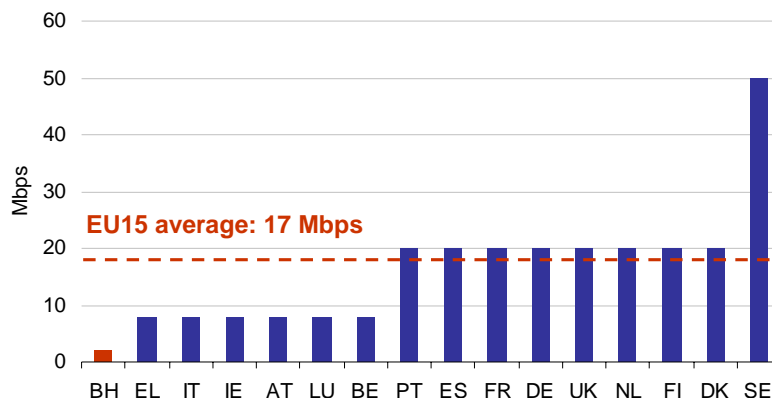
Figure 8 – Broadband monthly residential prices, VAT included, 2007



Source: *Development of broadband access in Europe, Idate, October 2007*

78. In addition, the maximum download speed offered in Europe is almost 10 times higher than Batelco's, which stands at only 2 Mbps.

Figure 9 – Maximum download speed offered, 2008



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## **Study on the Regulation of Wholesale Broadband Markets**

*Source: Development of broadband access in Europe, Idate, October 2007*

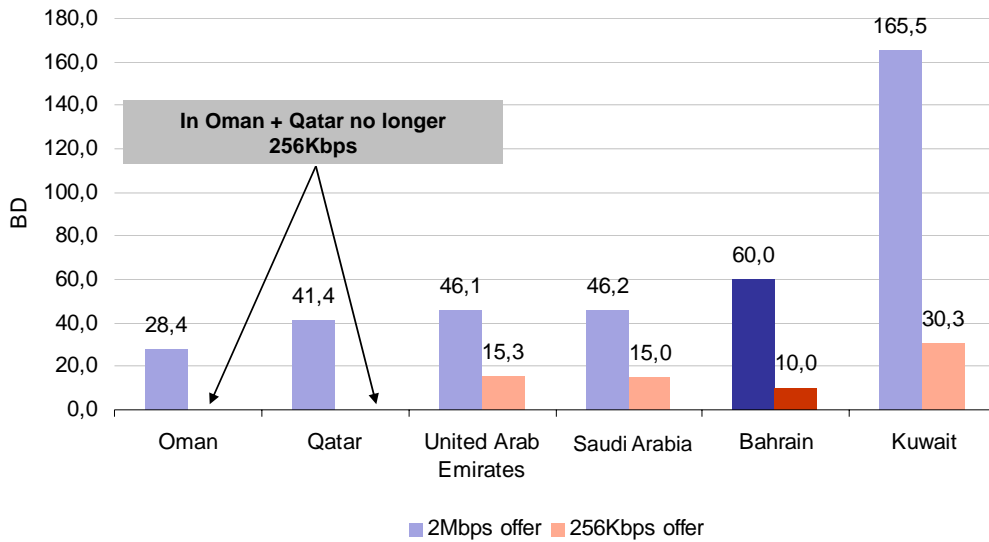
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## Study on the Regulation of Wholesale Broadband Markets

*GCC (comparison between incumbents' offers)*

79. Whereas 256 kbps residential offers in Bahrain are the cheapest, 2 Mbps offers are not in a good position compared to other GCC countries.

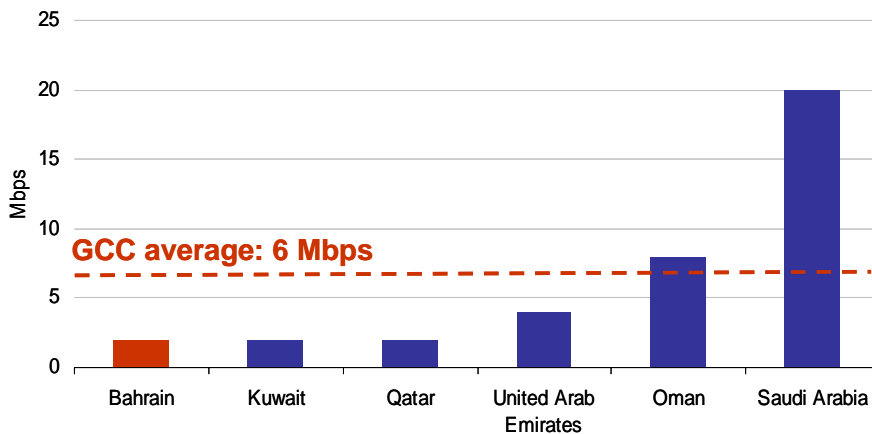
Figure 10 – Broadband residential prices, VAT included (for 256 kbps and 2 Mbps), 2008



Source: Operator's websites, Nov. 2008

80. The Bahraini maximum download speed is far below speed available in Saudi Arabia, where it goes up to 20 Mbps. Recent reports also suggest that Etisalat might introduce shortly triple play services in partnership with FT in the UAE.

Figure 11 – Maximum download speed offered, 2008



Source: Operator's website, Nov. 2008

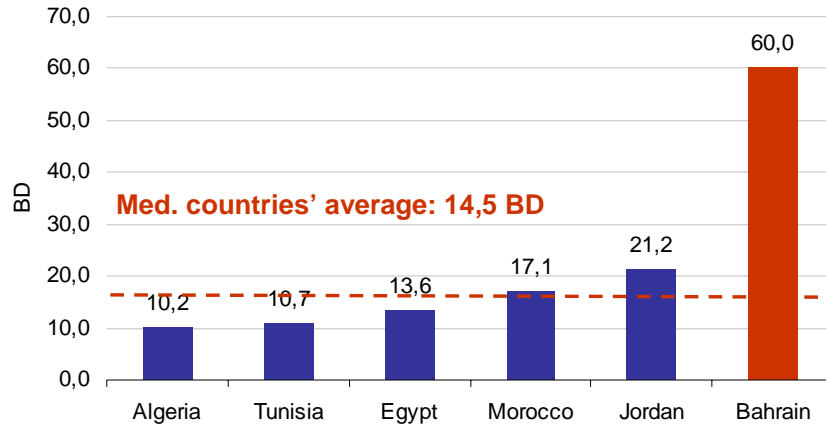
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## Study on the Regulation of Wholesale Broadband Markets

*Selected Arab countries (comparison between incumbents' offers)*

81. The price comparison on 2 Mbps offers shows that Bahrain is the most expensive country for residential subscribers.

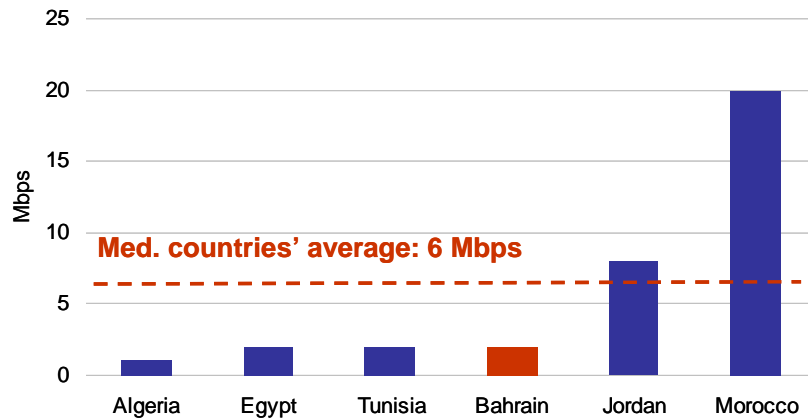
Figure 12 – Broadband residential prices, VAT included (for 2 Mbps), 2008



Source: Operator's website, Nov. 2008

82. Morocco already has broadband offers of up to 20 Mbps and triple play - though most of residential users are still on 256 kbps offers).

Figure 13 – Maximum download speed offered, 2008



Source: Operator's website, Nov. 2008

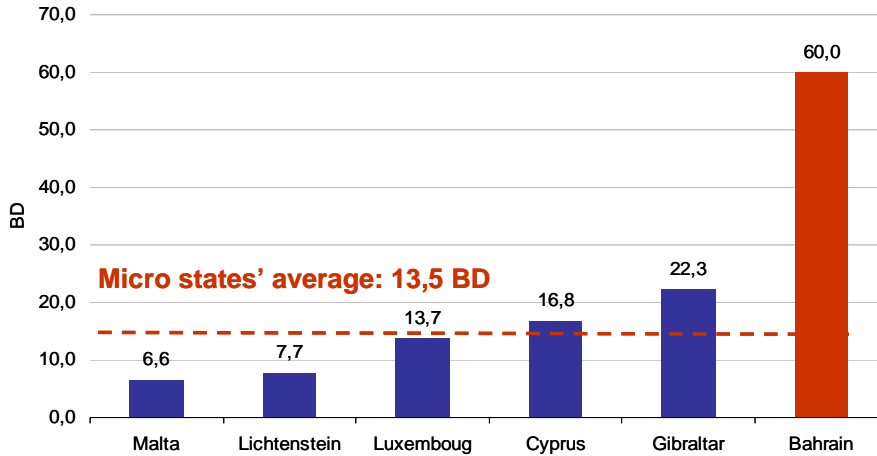
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*Smaller states (comparison between incumbents' offers)*

83. Among smaller states, Bahrain is again the most expensive country, whether for residential or for business customers.

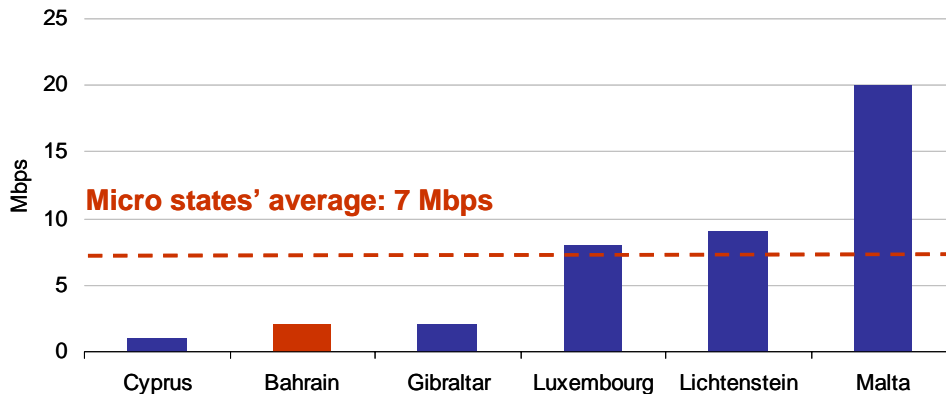
Figure 14 – Broadband residential prices, VAT included (for 2 Mbps), 2008



Source: Operator's website, Nov. 2008

84. Bahrain also has one of the lowest levels of maximum download speed, providing only 2 Mbps.

Figure 15 – Maximum download speed offered, 2008



Source: Operator's website, Nov. 2008

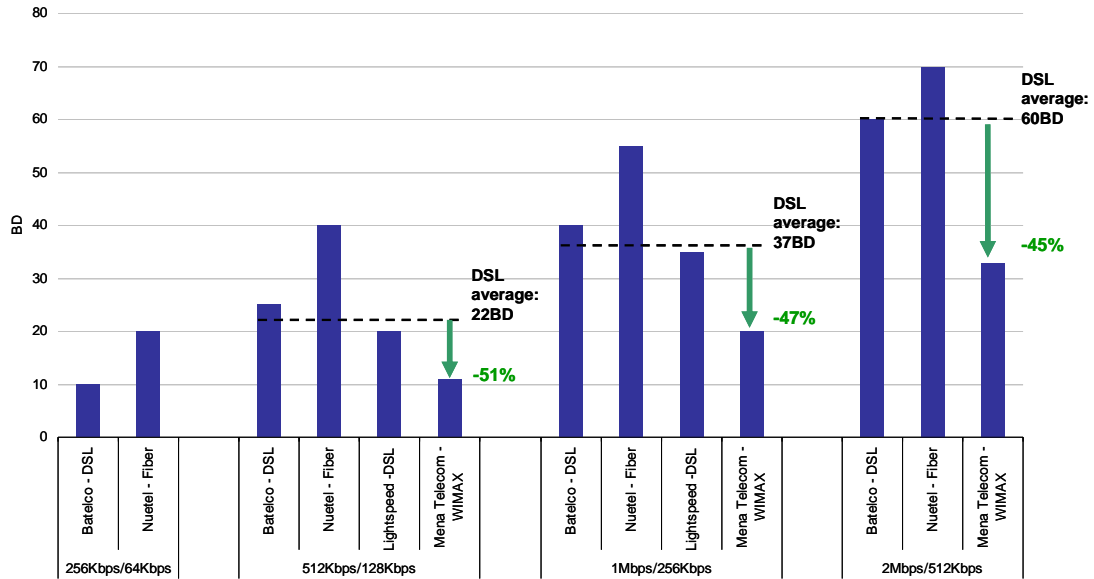
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## Study on the Regulation of Wholesale Broadband Markets

### Annexe 3: Domestic Benchmarks of Retail Broadband Offers

85. The Figures below shows that whichever the download speed, the latest Wimax offers from Mena Telecom have lower prices than those using DSL technology (approximately 50% for all download speeds).

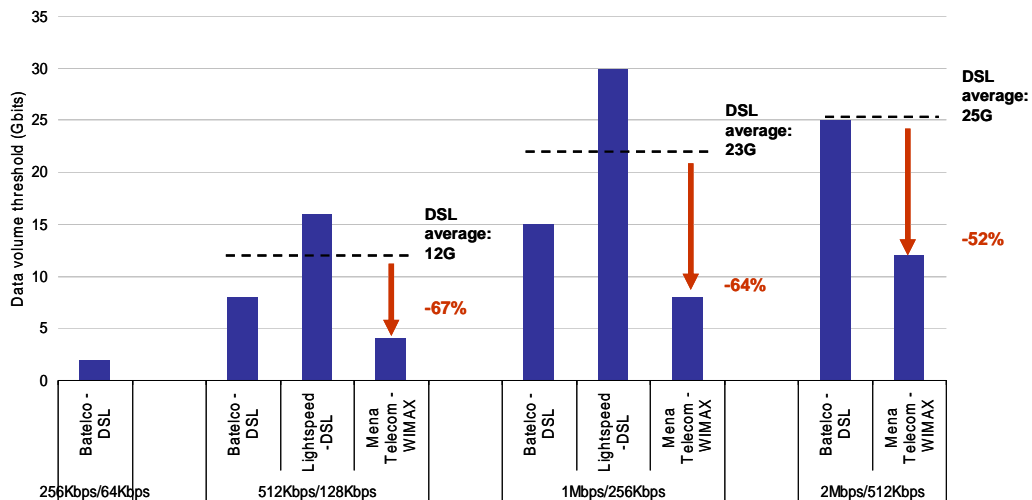
Figure 16 – Price of residential offers, November 2008



Source: Operator's website, Nov. 2008

86. Contrary to prices, the threshold is at a much lower level with Wimax than operators using DSL technology (approximately 60% less for Wimax). Wimax subscribers are much more rapidly throttled, at a download speed of 128 kbps.

Figure 17 – Threshold of residential offers, November 2008



Source: Operator's website, Nov. 2008